Attachment O

Conowingo Hydroelectric Project
(FERC Project No. 405)

Shoreline Management Plan
("SMP")

CONOWINGO HYDROELECTRIC PROJECT
FERC PROJECT NUMBER 405

SHORELINE MANAGEMENT PLAN

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TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ADA	Americans with Disabilities Act
APE	Area of Potential Effect
BEMP	Bald Eagle Management Plan
CLI	Conservation Landscape Initiative
Conowingo Project	Conowingo Hydroelectric Project (FERC Project No. 405)
FERC	Federal Energy Regulatory Commission
FWS	U. S. Fish and Wildlife Service
HPMP	Historic Properties Management Plan
IBA	Important Bird Area
LWCF	Land and Water Conservation Fund
MDE	Maryland Department of the Environment
MDNR	Maryland Department of Natural Resources
MHT	Maryland Historical Trust
NPS	National Park Service
PADCNR	Pennsylvania Department of Conservation and Natural Resources
PADEP	Pennsylvania Department of Environmental Protection
PBAPS	Peach Bottom Atomic Power Station
PFBC	Pennsylvania Fish and Boat Commission
PGC	Pennsylvania Game Commission
PHMC	Pennsylvania Historical and Museum Commission
RMP	Recreation Management Plan
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SMP	Shoreline Management Plan

EXECUTIVE SUMMARY

The Conowingo Hydroelectric Project (Federal Energy Regulatory Commission (FERC) Project No. 405) (Conowingo Project) Shoreline Management Plan (SMP) was developed beginning in 2009 and filed with FERC August 30, 2012 after considerable consultation with the public, local townships, county officials, and Resource Agencies including but not limited to the United States Fish and Wildlife Service (FWS), Pennsylvania Department of Environmental Protection (PADEP), Pennsylvania Department of Conservation and Natural Resources (PADCNR), Maryland Department of Natural Resources (MDNR), Maryland Department of the Environment (MDE), Susquehanna River Boating Commission (SRBC), and the National Park Service (NPS). FERC issued the Conowingo Hydroelectric Project License on March 19, 2021. The FERC License includes Article 428, which reads as follows:

> *Article 428.* Shoreline Management Plan*. Within six months of license issuance, the licensee must file with the Commission for approval, a revision to the Shoreline Management Plan filed on August 31, 2012. The revised plan must include the following modifications:*
>
> *a) A provision for reviewing and updating the plan every 10 years, with the first update to be filed with the Commission in 2030.*
>
> *b) A requirement that, prior to submitting a proposed update to the Shoreline Management Plan to the Commission, the licensee must submit to the Maryland Department of the Environment (MDE) for review and comment all proposed modifications, including an assessment of the impacts of deleted, revised, or new measures on water quality.*
>
> *c) A requirement that, prior to submitting an application to FERC for a non-project use of project land, the licensee must, in addition to complying with the requirements of Article 430: (i) prepare, or require the third-party requesting the non-project use of project land to prepare, a written assessment of the impacts on water quality of the proposed use; (ii) provide this assessment to MDE for review to determine whether the proposed use is consistent with Maryland water quality standards, including designated and achieved uses; and (iii) consult with MDE regarding the proposed use.*
>
> *d) With the exception of any activities required pursuant to the license, prior to making any modifications to shoreline vegetation for viewshed maintenance and development and recreation access within the project boundary, a requirement that the licensee must: (i) prepare a written assessment of the impacts on water quality of the proposed modifications; (ii) provide this assessment to MDE for a determination regarding whether the proposed modifications are consistent with Maryland water quality standards, including designated and achieved uses; and (iii) not undertake any such modifications until MDE notifies the licensee in writing that it has no objections to the proposed modifications.*
>
> *e) A requirement that the licensee must consult with MDE regarding any proposed modification of an existing use of project lands in cases where such use may affect any sensitive aquatic resource identified by licensee in the "sensitive resources overlays" included in licensee's Shoreline Management Plan.*

> *Each proposed update to the plan must be developed after consultation with the U.S. Fish and Wildlife Service, the National Park Service, the Pennsylvania Department of Conservation and Natural Resources, the Maryland Department of Natural Resources, and MDE. The licensee must include with the updated plans an implementation schedule, documentation of consultation, copies of recommendations on the completed plan after it has been prepared and provided to the entities above, and specific descriptions of how the entities' comments are accommodated by the plan. The licensee must provide a minimum of 30 days for the entities to comment and to make recommendations before filing the updated plans with the Commission. If the licensee does not adopt a recommendation, the filing must include the licensee's reasons, based on project-specific information.*
>
> *The Commission reserves the right to require changes to the plan. Implementation of the plan must not begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval, the licensee must implement the plan, including any changes required by the Commission.*

As a result, Exelon has updated the SMP to incorporate the requirements in Article 428. In addition, Exelon has made minor updates to several outdated references.

The Conowingo Project SMP is a framework for the management of Project lands and river shoreline areas consistent with broader local, regional, state, and federal regulations, initiatives, and planning guidelines. The SMP enables Exelon to fulfill its license responsibilities and obligations for the Project, including the protection and enhancement of the Project's environmental and recreational values. More specifically, the SMP will:

- Protect environmental attributes such as wetlands, habitat, and spawning areas.
- Preserve the scenic quality of the Project lands for boaters and shoreline recreationists.
- Maintain existing water quality.
- Protect historic and cultural resources.
- Ensure cooperation with federal, state, and local government agencies to coordinate adjacent land uses and proposed infrastructure with shoreline uses.
- Ensure coordination with separate regulatory authority permitting review and approval efforts.
- Minimize conflicts among differing uses.

In accordance with Article 428 (a), the SMP will be reviewed and updated every 10 years, with the first update to be filed with FERC in 2030. Prior to submitting a proposed update of the SMP to FERC, in accordance with Article 428 (b), Exelon will submit a draft proposed update to the FWS, NPS, PADCNR, MDNR, and MDE for review and comment of all proposed modifications, including an assessment of the impacts of deleted, revised, or new measures on water quality.

The 570.15 megawatt Conowingo Project is located in a rural setting on the Susquehanna River in Pennsylvania (Lancaster and York Counties) and Maryland (Cecil and Harford Counties). Conowingo Dam and the lowermost six miles of the Project reservoir, Conowingo Pond, are located in Maryland and the upper eight miles of the reservoir are located in Pennsylvania. The FERC Project boundary extends

approximately 2.5 miles downstream of the dam along the east bank of the river and approximately one-half mile downstream along the west bank of the river. Lands within the FERC Project boundary comprise approximately 9,923 acres, including 8,868 acres of open water and 1,055 acres above the normal high water elevation in Lancaster and York Counties in Pennsylvania and Harford and Cecil Counties in Maryland.

The Conowingo Project provides access to many recreational and natural resources within the lower Susquehanna River Corridor. Access to additional resources are provided by other FERC-regulated hydroelectric projects and through county, state, and federal preservation initiatives and recreational facilities. At the Conowingo Project, Exelon provides various public recreational facilities. Over 736 acres of the 1,055 acres of Project lands are used for this purpose. These recreation facilities include trails, day use and interpretive sites, boat launch facilities, a swimming pool, shoreline fishing access, and public access lands.

Exelon has programs and policies that guide and support the recreational use and management of the Project lands. These programs and policies are consistent with FERC regulations requiring licensees to provide public access and recreational opportunities on Project lands which meet area recreational needs. The Project's public recreation facilities are managed under a Recreation Management Plan (RMP), which is specified in Article 426 of the license issued on March 19, 2021 and is incorporated by reference into this SMP.

Exelon has developed a six-category land use classification system for Project lands based on aerial photography interpretation, ground truthing, and corporate operating procedures and policies. These land classifications are defined as follows:

- Class 1: Project Operations: Lands used for power generation and electric transmission/distribution infrastructure and purposes.

- Class 2: Developed Recreation: Lands managed for developed public recreational facilities and activities. This includes commercial recreation facilities.

- Class 3: Natural/Undeveloped: Lands that are primarily undeveloped and generally available for public access and use.

- Class 4: Industrial and Other Non-Project Lands: Lands managed for industrial/commercial uses and other non-Project uses including shoreline stabilization projects.

- Class 5: Public Access Lands: Public access lands are Project lands managed by federal, state, county agencies or conservation organizations under agreement with Exelon. Public access and use of the lands is generally allowed, though it may be governed by the managing entity according to the type or level of activity or by season. These are typically unimproved lands, though parking areas, trails and other infrastructure may be provided.

- Class 6: Cottage Lands: Lands leased to individuals for seasonal use.

Consistent with these land use classifications, the SMP outlines specific shoreline management measures that have been developed to minimize or eliminate negative effects to shoreline resources. Exelon's focus on erosion control as a measure to improve overall water quality in the Susquehanna River watershed is reflected in both the shoreline management measures of the Plan and the best management practices (BMPs) included in Appendix A of the Plan. The measures included in this SMP are described below.

Shoreline Erosion Control. Modifications are allowed to shoreline vegetation in order to construct erosion control measures, provided the modifications do not impair the overall function of the vegetated buffer. Trees and shrubs on steep slopes will be maintained whenever possible. If the buffer function is impaired, a planting plan, using native species included in the native plant guide for this SMP, will be devised and implemented to mitigate for the reduced function.

General Maintenance. Modifications are allowed to shoreline vegetation to maintain the health of the shoreline vegetation, provided the modifications do not impair the overall function of the vegetated buffer. If the buffer function is impaired by vegetation removal, a planting plan, using only native species included in the native plant guide for this SMP, will be devised and implemented to mitigate for the reduced function.

Erosion and Remediation Policy. Exelon has identified and characterized incidences of erosion in the Conowingo Project boundary. Erosion areas that affect Project shoreline resources will be addressed through a remediation and monitoring program.

Woody Debris Management. Woody debris is defined as trees and woody material that extend from the shoreline into the impoundment. This material can provide important habitat for fish and wildlife and shall be left in place unless the debris is a navigational or safety hazard. If the woody debris must be removed, it shall be managed and disposed of in accordance with the policies outlined in the Debris Management Plan required by Article 427.

Approval of Non-Project Use of Project Lands. Any use of lands and waters or construction within the Conowingo Project boundary by a non-licensee must be permitted by all applicable local, county, state, or federal agencies. Exelon must also approve the activity before work can begin. In accordance with Article 430 Use and Occupancy, parties requesting non-Project use of Project lands will provide details to Exelon regarding the location and desired development or use, and Exelon will address Article 428, paragraph (c) requirements to comply with the requirements of Article 430 and, "(i) prepare, or require the third-party requesting the non-project use of project land to prepare, a written assessment of the impacts on water quality of the proposed use; (ii) provide this assessment to MDE for review to determine whether the proposed use is consistent with Maryland water quality standards, including designated and achieved uses; and (iii) consult with MDE regarding the proposed use" prior to submitting an application to FERC for a non-project use of project land. If it is determined that an activity will be allowed and has received all necessary permits and approvals, including FERC and/or MDE approval when required, Exelon will issue written permission to the party for its development and/or use of Project lands.

Shoreline Vegetation Management. Shoreline vegetation provides many benefits to the Conowingo Project including wildlife habitat, aesthetic value, and maintaining water quality by providing a filter strip to control run-off. Existing shoreline vegetation will be preserved in accordance with license requirements and Maryland water quality standards. It currently varies in extent depending on the location of the Conowingo Project boundary relative to the impoundment shoreline and current land use. Existing improved and developed areas with limited shoreline vegetative cover such as the cottage clusters, the Peach Bottom Atomic Power Station (PBAPS), recreation sites and facilities, and the dam and associated generating facilities, can be maintained as they currently exist. Modifications to the shoreline vegetation in other areas will be considered for viewshed maintenance and development, recreation access, shoreline erosion control, and general Project related maintenance of the vegetated shoreline. With the exception of any activities required pursuant to the license, prior to making any modifications to shoreline vegetation for viewshed maintenance and development and recreation access within the project boundary, Exelon will address Article 428, paragraph (d) requirements and "(i) prepare a written assessment of the impacts on water quality of the proposed modifications; (ii) provide this assessment to MDE for a determination regarding whether the proposed modifications are consistent with Maryland water quality standards,

including designated and achieved uses; and (iii) not undertake any such modifications until MDE notifies the licensee in writing that it has no objections to the proposed modifications."

Viewsheds. Modifications and maintenance of vegetation is allowed to provide a reasonable view of the water, provided the modifications do not impair the overall function of the vegetated buffer. If the buffer function is impaired, a planting plan, using the native species plant list included in this SMP, will be devised and implemented to mitigate for the reduced function from vegetation removal. Modifications to shoreline vegetation related to viewsheds are subject to the requirements of Article 428 and require the written assessment and consultation with MDE as described above.

Access Trails. Modification of the existing vegetation is allowed to provide access trails to the water, provided the modifications do not impair the overall function of the vegetated buffer. If the buffer function is impaired, a planting plan, using the native species plant list included in this SMP, will be devised and implemented to mitigate for the reduced function from vegetation removal. Modifications to shoreline vegetation related to viewsheds are subject to the requirements of Article 428 and require the written assessment and consultation with MDE as described above.

Sensitive Natural Resource Protection Overlays and Policies. Research and numerous studies were conducted to assess and determine the potential effects of project operations on various resources. Exelon has compiled existing and new data on these resources to develop a "sensitive resources" overlay to apply to the six land use classifications described above. This overlay is defined as areas within the Conowingo Project boundary that contain (or may contain) resources protected by state or federal law or executive order, and other natural features important to the area or natural environment. In accordance with Article 428, Exelon must consult with MDE regarding any proposed modification of an existing use of project lands in cases where such use may affect any sensitive aquatic resource identified by Exelon.

Bald Eagle Management Plan. Exelon developed a Bald Eagle Management Plan (BEMP) in consultation with the FWS and the Pennsylvania Game Commission (PGC) to address the use of Exelon-owned lands by Bald Eagles for nesting, roosting, foraging, and in accordance with the Muddy Run Pumped Storage Project FERC License. This plan will be updated in accordance with Article 421. The BEMP provides for the management of Bald Eagle on Exelon lands by implementing the FWS' National Bald Eagle Management Guidelines (2007) and state agency guidance. The range of protective measures include, but are not limited to, seasonal restrictions, distance buffers, and landscape buffers.

Osprey Management Policy. In consultation with state and federal agencies, Exelon will implement measures on Exelon lands to protect Osprey from potential disturbances or other impacts. Protective measures will include, but are not limited to, seasonal restrictions, distance buffers, and appropriate permitting prior to any necessary nest management.

Historic Properties Management Plan. Exelon has developed, in consultation with Pennsylvania Historical and Museum Commission (PHMC) and the Maryland Historic Trust (MHT), an Historic Properties Management Plan (HPMP) to address historic and cultural resources in accordance with Article 429.

Conowingo Islands Public Use Policy. Exelon's Conowingo Islands Public Use policy establishes guidelines for the use of the islands located in the upper reach of Conowingo Pond from the Pennsylvania Route 372 bridge approximately 1.3 miles downstream, as well as Mt. Johnson Island, which is located five miles downstream of the Route 372 bridge. The policy restricts and regulates island use in order to protect the islands' rare species, cultural resources, and unique geologic and physical features. The Policy is included in Appendix B and will be updated as needed.

Cottage Rules and Regulations. Exelon has developed rules and regulations regarding the use of Project lands for seasonal cottages. Lessees are required to comply with all applicable local, state, and federal laws

for the development and use of the land, as well as Exelon's land use rules. Exelon's rules and regulations for cottages address such issues as erosion control, vegetation removal, wastewater disposal, shoreline development, and cultural resource protection. It is Exelon's policy not to create any new cottage lease lots within the Conowingo Project boundary. In addition, leases for existing cottages that are abandoned or become damaged and are not replaced by structures conforming to all applicable regulations will be terminated. All structures and improvements will be removed from the leased lot and the land will be restored to a natural condition. No future cottage leases will be issued at the site. The rules and regulations are included in Appendix C and are currently being modified to include the provisions of the license. Exelon reserves the right to amend the policy from time to time as circumstances may require, subject to FERC approval, as necessary.

Public Recreation and Access Facilities. Subject to Exelon's ability to comply with applicable license conditions, Exelon leases numerous parcels of land to local, county, and state agencies and to commercial vendors for development and operation of public recreation and access facilities, within and around the Conowingo Project. The agreements specify that the respective lessees will use the properties for park and public recreation, including providing river access and facilities such as boat launches while complying with all applicable local, state, and federal regulations. All of these sites and facilities, within the Conowingo Project boundary, are Project recreation facilities regulated under Exelon's FERC license. Exelon will continue to partner with the agencies and vendors for the operation of these facilities and their use by the public. With the exception of any activities required pursuant to the license, prior to making any modifications to shoreline vegetation for viewshed maintenance and development and recreation access within the project boundary, Exelon will address Article 428, paragraph (d) requirements and "(i) prepare a written assessment of the impacts on water quality of the proposed modifications; (ii) provide this assessment to MDE for a determination regarding whether the proposed modifications are consistent with Maryland water quality standards, including designated and achieved uses; and (iii) not undertake any such modifications until MDE notifies the licensee in writing that it has no objections to the proposed modifications."

In addition, Exelon has developed and implemented "Rules and Regulations Governing the Use and Occupancy of Leased Premises" for Project lands. This document has been included as part of the lease agreements for the two existing Project marina facilities, Glen Cove Marina and Peach Bottom Marina. These rules are included in Appendix D. The Rules and Regulations Governing the Use and Occupancy of Leased Premises are currently being updated and up-to-date revisions will be posted on Exelon's Conowingo, FERC License Renewals website under a Shoreline Management Plan (SMP) link.

Limitations on Public Recreational Access. Exelon provides public recreation and access to Project lands and waters pursuant to its FERC license requirements. Access and use of certain portions of Project lands will be restricted for operational, safety, and security reasons.

- Fishing in Project waters accessible to the public will be governed by applicable state regulations. Fishing will not be allowed within secure areas or areas that present public safety concerns. This includes shoreline fishing within 100 yards of the base of Conowingo Dam at Fisherman's Park (west shore) and for 4,000 feet along the east shoreline downstream of the dam. These areas are restricted for public safety reasons due to changes in water elevations and velocities from generating flows and spilling water during gate operations. In addition to safety concerns, the area along the west shore is also used as a staging and storage area related to Project operations and maintenance.

- Hunting is not allowed within the secure area of the Conowingo Project, or on other Project lands posted against hunting by Exelon. This restriction is intended to protect the public, adjacent landowners, lessees, sensitive resources, and Licensee's operating capabilities. Exelon issues

permits for offshore (water access only) stationary duck blinds and duck blind sites on Exelon land to hunters on an annual basis. The permits allow applicants (up to four individuals per permit) to have no more than two blinds or sites.

- Use of off-road vehicles on Project lands is prohibited.

- Drone use on or within the Conowingo Project boundary is prohibited unless pre-approved by Exelon. This requirement applies to small unmanned aerial systems (sUAS, UAS, or drone), that is a drone weighing less than 55lbs as defined by the Federal Aviation Administration (FAA), and applies to recreational and commercial drone users on Exelon property. Appendix E provides the full requirements of drone usage in context of the SMP.

Overall Land Use Monitoring and Enforcement. Exelon will conduct regular inspections and manage the Conowingo Project in accordance with the terms of its license and applicable FERC rules and regulations.

1 INTRODUCTION

1.1 Purpose and Scope of the Plan

The Shoreline Management Plan (SMP) for the Conowingo Hydroelectric Project (Project) provides rules and guidelines for managing multiple resources and uses of the Conowingo Project shoreline. These rules and guidelines will ensure the protection and enhancement of the Conowingo Project's recreational, environmental, historical, cultural, and scenic resources and the Conowingo Project's primary function, the generation of electricity.

The SMP enables Exelon to fulfill its license responsibilities and obligations for the Conowingo Project, including the protection and enhancement of the Conowingo Project's environmental and recreational values. More specifically, the SMP will:

- Protect environmental attributes such as wetlands, habitat, and spawning areas.
- Preserve the scenic quality of the Conowingo Project lands for boaters and shoreline recreationists.
- Maintain existing water quality.
- Protect historic and cultural resources.
- Ensure cooperation with federal, state, and local government agencies to coordinate adjacent land uses and proposed infrastructure with shoreline uses.
- Ensure coordination with separate regulatory authority permitting review and approval efforts.
- Minimize conflicts among differing uses.

The SMP applies to all Conowingo Project lands.

1.2 Background

Following the filings of proposed and revised study plans in 2009 an interim SMP was filed in February 2011. A draft SMP filed with the Federal Energy Regulatory Commission (FERC) in January 2012. The draft SMP was developed as an element of Exelon's relicensing of the Conowingo Project. Comments received from stakeholders were addressed in the version of the SMP filed with FERC on August 31, 2012[1].

On March 19, 2021 the Conowingo Project was issued a new FERC License. The FERC License requires Exelon to file for approval, a revised version of the SMP based on the requirements in FERC Article 428, which reads as follows:

> *Article 428.* Shoreline Management Plan*. Within six months of license issuance, the licensee must file with the Commission for approval, a revision to the Shoreline Management Plan filed on August 31, 2012. The revised plan must include the following modifications:*

[1] A comprehensive consultation record for the draft SMP was included in Appendix 7 of the plan filed on August 31, 2012.

a) A provision for reviewing and updating the plan every 10 years, with the first update to be filed with the Commission in 2030.

b) A requirement that, prior to submitting a proposed update to the Shoreline Management Plan to the Commission, the licensee must submit to the Maryland Department of the Environment (MDE) for review and comment all proposed modifications, including an assessment of the impacts of deleted, revised, or new measures on water quality.

c) A requirement that, prior to submitting an application to FERC for a non-project use of project land, the licensee must, in addition to complying with the requirements of Article 430: (i) prepare, or require the third-party requesting the non-project use of project land to prepare, a written assessment of the impacts on water quality of the proposed use; (ii) provide this assessment to MDE for review to determine whether the proposed use is consistent with Maryland water quality standards, including designated and achieved uses; and (iii) consult with MDE regarding the proposed use.

d) With the exception of any activities required pursuant to the license, prior to making any modifications to shoreline vegetation for viewshed maintenance and development and recreation access within the project boundary, a requirement that the licensee must: (i) prepare a written assessment of the impacts on water quality of the proposed modifications; (ii) provide this assessment to MDE for a determination regarding whether the proposed modifications are consistent with Maryland water quality standards, including designated and achieved uses; and (iii) not undertake any such modifications until MDE notifies the licensee in writing that it has no objections to the proposed modifications.

e) A requirement that the licensee must consult with MDE regarding any proposed modification of an existing use of project lands in cases where such use may affect any sensitive aquatic resource identified by licensee in the "sensitive resources overlays" included in licensee's Shoreline Management Plan.

Each proposed update to the plan must be developed after consultation with the U.S. Fish and Wildlife Service, the National Park Service, the Pennsylvania Department of Conservation and Natural Resources, the Maryland Department of Natural Resources, and MDE. The licensee must include with the updated plans an implementation schedule, documentation of consultation, copies of recommendations on the completed plan after it has been prepared and provided to the entities above, and specific descriptions of how the entities' comments are accommodated by the plan. The licensee must provide a minimum of 30 days for the entities to comment and to make recommendations before filing the updated plans with the Commission. If the licensee does not adopt a recommendation, the filing must include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. Implementation of the plan must not begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval, the licensee must implement the plan, including any changes required by the Commission.

In developing this SMP, the licensee consulted with various stakeholders throughout the planning and development process. The revised SMP includes the following revisions:

- Project descriptions were updated to reflect existing conditions and the amended FERC Project Boundary approved in April 2021;
- Summaries of federal, commonwealth, and county management plans were updated as of July 2021;
- Summaries of resource management plans for the Conowingo Project (i.e. Bald Eagle and Historic Properties Management Plan) reference the articles and requirements from the FERC License issued on March 19, 2021.

2 PROJECT DESCRIPTION

2.1 Project Location and Regional Setting

The Project is located in a rural setting on the Susquehanna River in Pennsylvania (Lancaster and York Counties) and Maryland (Cecil and Harford Counties). Conowingo Dam and the lowermost six miles of the Conowingo Project reservoir, Conowingo Pond, are located in Maryland. The upper eight miles of the reservoir are located in Pennsylvania (Figure 2.1-1). The Project extends approximately 2.5 miles downstream of the dam along the east bank of the river and approximately one-half mile downstream along the west bank of the river.

Located at river mile 10, Conowingo Dam is the most downstream of the five hydroelectric projects located on the lower Susquehanna River. The upstream projects (York Haven, Safe Harbor, Holtwood, and Muddy Run) are located at river miles 56, 32, 24, and 22, respectively. Tidewater extends up the river to within approximately four miles of Conowingo Dam.

York and Lancaster Counties in Pennsylvania have 449,058 and 545,724 residents, respectively, and population densities of 481 and 550.4 people per square mile, respectively. Cecil and Harford Counties in Maryland have 102,855 and 255,441 residents, respectively, and population densities of 292 and 560 people per square mile, respectively. The nearest metropolitan area within the Susquehanna River watershed is Lancaster, Pennsylvania, approximately 32 miles to the northeast, with a population of about 59,265 people. Major metropolitan areas within 60 miles of the Conowingo Project include Baltimore, MD, Wilmington, DE, Lancaster, PA and Harrisburg, PA with populations of approximately 593,490, 70,166, 59,265 and 49,271 respectively (U.S. Census Bureau 2019).

While 79 percent of Lancaster County's population, 76 percent of York County's population (city-data.com, 2021), and 79 percent of the State of Pennsylvania's population are classified as living in urban areas (Center for Rural Pennsylvania 2019), a full 100 percent of the residents of the five Pennsylvania townships (Martic, Drumore, Fulton, Lower Chanceford, Peach Bottom) adjacent to the Conowingo Project are classified as living in rural areas. 42% percent of the population of Cecil County resides in a rural area, much lower than neighboring Harford County (82 percent) (city-data.com, 2021) and the State of Maryland as a whole (86 percent) (MDP 2010).

2.2 Project Boundary and Adjoining Land Uses

The Project has 9,923 acres of land within the Conowingo Project boundary: 8,868 acres of Project waters and 1,055 acres above the normal high-water elevation in Lancaster and York Counties in Pennsylvania and Harford and Cecil Counties in Maryland. The lands contained within the Conowingo Project boundary are those lands necessary for the operation of the Conowingo Project (See Figure 2.2-1). Project lands serve many project-related purposes, including (but not limited to) Project operations, public access, recreational use, and wildlife habitat conservation.

There are approximately 46 miles of shoreline (excluding island shoreline) within the Conowingo Project boundary: 43 miles associated with Conowingo Pond and 3 miles associated with the Susquehanna River downstream of Conowingo Dam. The Norfolk Southern rail line is largely located within the Conowingo Project boundary and abuts the entire length of the east shore of Conowingo Pond. Downstream of Conowingo Dam on the easterly side of the river, MD Route 222 is located roughly parallel to and in some areas abuts the Conowingo Project boundary.

Non-Project land adjoining the Conowingo Project boundary is primarily undeveloped forest land with scattered agricultural, residential, and industrial use. Land to the east of the rail line is mostly undeveloped forest lands with some agricultural land and residential development. Susquehannock State Park and the Ferncliff Wildflower and Wildlife Preserve, a National Natural Landmark, abut the rail line to the east. Conowingo Community Park is located adjacent to the Conowingo Project boundary near Octoraro Creek on land leased to Cecil County by Exelon. Adjoining lands along the west shore of the impoundment consist of undeveloped forest, agricultural, and residential lands. The percentage of agricultural and residential lands is higher than on the east shore.

PBAPS is located on the west shore of Conowingo Pond at river mile 18. Downstream of the Conowingo Dam, the Norfolk Southern rail line is west of MD Route 222 and is not located within the Conowingo Project boundary.

Recreation facilities in the immediate vicinity of the Conowingo Project include state and county parks, campgrounds, picnic areas, shoreline access facilities, boat launches, fishing sites, canoe portages, scenic overlooks, nature preserves, a wildflower preserve, an Environmental Center (a visitor center with interpretative displays), hiking trails, and Pennsylvania Game Lands.

2.3 Hydroelectric Facilities

The principal features of the Conowingo Project consist of the following:

- Conowingo Dam, a 4,648 foot long, 94-foot-tall structure.
- Conowingo powerhouse, integral to the dam, containing 11 generating units with a capacity of 570.15 megawatts.
- An 8,540-acre reservoir (Conowingo Pond), and approximately 1,055 acres of land within the FERC Project boundary.

Conowingo Pond also serves as the lower reservoir of the Muddy Run Pumped Storage Project (FERC Project No. 2355) and provides a source of cooling water for the PBAPS. The Muddy Run powerhouse facility is located adjacent to the northeasterly portion of the Conowingo Project impoundment (river mile 22) and PBAPS is located on the west shore of the impoundment at river mile 18. Several transmission lines associated with the three electric facilities also cross Conowingo Pond and the river.

Non-project use of Conowingo Pond is authorized for the following users in accordance with the FERC Order issued on September 2, 2015 and FERC Article 404; Peach Bottom Atomic Station, the City of Baltimore, Chester Water Authority, York Energy Center, Wildcat Point Generation Facility, and is a public water supply source for both the City of Baltimore and the Chester Water Authority, pursuant to the terms set forth in their non-project use of project lands authorizations.

The Project boundary extends approximately 2.5 miles downstream from the Conowingo Dam (east shore), and one-half mile on the west shore. Public access to some of these areas and facilities is restricted due to public safety and plant operational and security concerns.

2.4 Existing Recreation Facilities

Visitors to the Conowingo Project have the opportunity to participate in numerous recreational activities. The existing recreational facilities associated with the Conowingo Project are described below and shown

on Figure 2.4-1. The Project's public recreation facilities are managed under an RMP, which was developed in accordance with Article 426 and is incorporated by reference into this SMP.

2.4.1 Existing Facilities

Lock 13 (York County, PA.)

The Susquehanna and Tidewater Canal was a regionally important transportation canal which was in operation between 1840 and 1900. It was constructed on the west bank of the Susquehanna River and went as far north as Wrightsville, Pennsylvania (approximately 20 miles north of the Conowingo Dam), and terminated in Havre De Grace in Harford County, Maryland.

Lock 13, which consists of the unrestored remains of Lock 13 of the Susquehanna Tidewater Canal, is accessed via the Mason-Dixon Trail, located approximately 1,100 feet south of the U.S. Route 372 bridge over the Susquehanna River. The site is owned by the Licensee, although trailhead access is from the PPL Holtwood, LLC Lock 12 parking lot (Holtwood Project, FERC No. 1881).

Lock 15 (York County, PA.)

The restored Lock 15 of the Susquehanna and Tidewater Canal is accessed from Route 372 via River Road (south) and is owned and managed by the Licensee. The site includes parking for 36 vehicles, a footpath to the restored lock, interpretive displays, a picnic area, and portable restrooms.

Muddy Creek Boat Launch (York County, PA)

Muddy Creek boat launch is directly downstream of and connected to Lock 15 by a footpath. Improvements include a 20-foot-wide hard surface boat ramp, docks, parking for 44 vehicle and trailer combinations (boat trailers) and 26 cars, interpretive and informational panels, and a portable restroom. The site is owned by the Licensee and the facilities are maintained by the Pennsylvania Fish and Boat Commission (PFBC).

Cold Cabin Boat Launch (York County, PA.)

Cold Cabin boat launch is located approximately three miles downstream of U.S. Route 372 and is accessed from Route 74 by the Paper Mill Road and Cold Cabin Road. Improvements include a 12-foot-wide hard surface boat ramp, informal parking for approximately five vehicles, a picnic area, and interpretive and informational displays. The site is owned by the Licensee and the facilities are maintained by Peach Bottom Township under a lease agreement with the Licensee.

Dorsey Park (York County, PA.)

Located just upstream of the PBAPS, Dorsey Park is accessed from Flintville Road via Lay Road. The site provides two 32-foot-wide hard surface boats ramps, docks, parking for 25 boat trailers and 30 cars, a picnic area, interpretive and informational displays, and portable restrooms. The facility is owned and maintained by the Licensee.

Line Bridge (Harford County, MD.)

Line Bridge is located approximately one-half mile south of the Pennsylvania/Maryland state line and is accessed by the Line Bridge Road from Maryland State Route 623. The site provides a small, three car parking area and unimproved shoreline access for fishing and carry-in boat launching. The site is owned by the Licensee and the facilities are managed and maintained by Harford County under lease agreement with the Licensee.

Broad Creek Public Landing (Harford County, MD.)

This site is approximately two miles south of the Pennsylvania/Maryland state line and is directly off Maryland State Route 623. Facilities include a 16-foot-wide hard surface boat ramp, dock, an on-site parking area for four vehicles, and an off-site parking area for 33 boat trailers. The site is owned by the Licensee and the facilities are managed and maintained by Harford County under a lease agreement with the Licensee.

Glen Cove Marina (Harford County, MD.)

This commercial marina facility is located approximately two miles upstream of Conowingo Dam and is accessed from Maryland State Route 623 by Glen Cove Road and Berkley Road. The facility provides a hard surface boat ramp, dock, 74 boat slips, a picnic area, portable restrooms, and parking for 16 boat trailers and 20 cars. A launch fee is charged to use the ramp. Other services are provided including fuel dispensary, repair services, and slip rentals. This facility also serves as the take-out location for the Conowingo Dam canoe portage. The site and facilities are owned by the Licensee and managed and operated by a commercial contractor.

Conowingo Dam Pool and Visitors Center (Harford County, MD.)

This area is located just upstream of Conowingo Dam and is accessed directly off U.S. Route 1. The pool facility includes swimming and wading pools, a locker and changing room, a picnic area, a playground, restrooms, and a concession stand. The facility is owned by the Licensee and operated by a commercial contractor.

The Visitor Center contains informational displays and brochures focused on the region, restrooms and conference rooms, and office space for the Lower Susquehanna Heritage Greenway. The center is owned, operated and staffed by the Licensee. A small picnic area is also provided. A common parking lot providing 213[2] spaces is shared by the two facilities.

Peach Bottom Marina (Lancaster County, PA.)

This commercial marina is located approximately seven miles upstream of Conowingo Dam. Access to the facility is from Route 222 to Peach Bottom Road. The facility includes a 25-foot-wide hard surface boat ramp, dock, parking for 17 boat trailers and 33 cars, and a portable restroom. A launch fee is charged to use the ramp. Other services provided include fuel dispensary, repair services, and boat slip rentals. The site is owned by the Licensee and managed and operated by a commercial contractor.

Conowingo Creek Boat Launch (Cecil County, MD.)

The boat launch is located approximately two miles north of Conowingo Dam and is accessed from Route 222 via the Mt. Zoar Road and Conowingo Lake Road. The facility includes an 80-foot-wide hard surface boat ramp, boat tie up area, parking for nine boat trailers and ten cars, and a small picnic area. The site is owned and managed by the Licensee.

[2] Exelon completed recreation studies in 2008/2009 for the Recreation Management Plan. The results show that less than 40% of the 213 spaces are needed on an average summer weekend (approximately 80 parking spaces used). Currently Exelon uses 48 of the 213 spaces for non-recreation purposes and the remaining spaces provide sufficient recreational parking. If future demand increases, the 48 spaces can be re-appropriated for recreational use.

Funks Pond (Cecil County, MD.)

Funks Pond is located just upstream of Conowingo Dam and is accessed directly off U.S. Route 1. A non-motorized trail leads from a parking area for 24 cars off Route 1 approximately one-half mile to Funks Pond, a small (approximately two acre) inlet on the Susquehanna River. A small picnic area with two tables is located at the pond. The site is owned and managed by the Licensee.

Conowingo Dam Overlook (Harford County, MD.)

The overlook is located on the west end of Conowingo Dam off U.S. Route 1 and accessed from Shuresville Road. The site is not currently open to the public. The site provides parking and overlook of Conowingo Dam. The site is owned and managed by the Licensee. This facility is being considered as a laydown/staging area for Conowingo fish passage construction projects. The site will be reopened to the public after the fish passage construction projects are completed in accordance with the schedule specified in the recreation management plan (Article 426).

Fisherman's Park at Shures Landing (Harford County, MD.)

This site is located directly downstream of Conowingo Dam and is accessed from the Shures Landing Road. Facilities include Americans with Disabilities Act (ADA) compliant fishing platform, a picnic pavilion, picnic areas, bank fishing access, a carry-in boat launch, observation platforms, interpretive and informational displays, parking for 14 boat trailers and 104 cars, public restrooms (open during the day), and portable restrooms. The northerly trailhead for the Lower Susquehanna Heritage Greenway is located at the southerly end of the parking lot. The site is owned and managed by the Licensee. The site also serves as a canoe portage trail put-in below the dam.

Octoraro Creek Access (Cecil County, MD.)

The Octoraro Creek Access is located approximately one mile downstream of Conowingo Dam directly off Maryland Route 222. The facility includes a parking area for 12 cars, interpretive and informational display, and ADA compliant trail (approximately one-half mile in length) along Octoraro Creek to its confluence with the Susquehanna River. The site is owned and managed by the Licensee.

2.4.2 Other Recreation Sites/Facilities Using Project Lands and Waters

Mason-Dixon Trail (York County, PA. and Harford County, MD.)

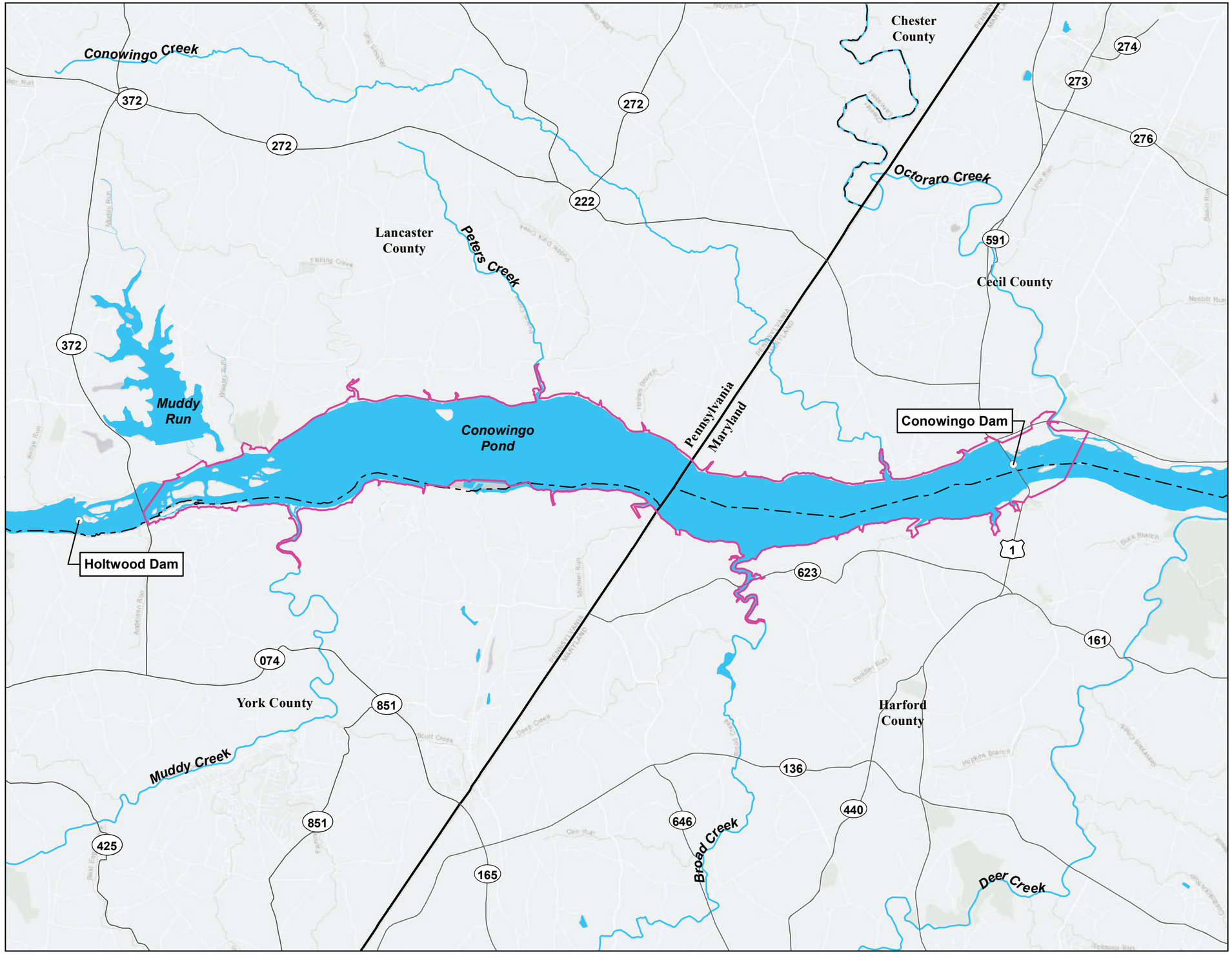
The 193-mile-long Mason-Dixon Trail connects the Appalachian Trail in Cumberland County, Pennsylvania with the Brandywine Trail in Chadds Ford, Pennsylvania. While most of the trail is well outside the Conowingo Project boundary, portions of it are located on the Licensee's Project (approximately 3.75 miles) and non-project (approximately 10.5 miles) lands. The trail passes through several of the above described recreation sites (Locks 13 and 15, Muddy Creek, Cold Cabin, Broad Creek, Glen Cove, and the Conowingo Swimming Pool/Visitor Center). The trail is both within the Conowingo Project boundary and on Exelon's non-Project lands and is maintained and managed by the volunteer Mason-Dixon Trail System, Inc. organization under a contractual agreement with the Licensee.

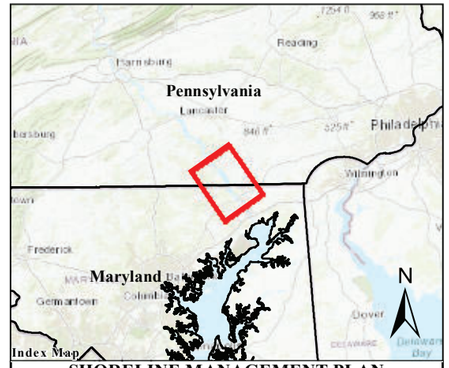
Susquehanna River Water Trail (Pennsylvania and Maryland)

The Lower Section of the Susquehanna River Water Trail, which extends approximately 53 miles from Harrisburg, Pennsylvania to the Broad Creek Boat Launch, is part of the Chesapeake Bay Gateways and Watertrails Network and is also a designated National Recreation Trail.

2.5 Enhanced Recreation Facilities

As part of the FERC license application for the Conowingo Project, Exelon is proposing Project recreation enhancements. These enhancements are included the RMP per Article 426 that addresses Exelon's management of public recreational facilities within the Conowingo Project boundary in accordance with the license. These recreation enhancement construction activities, which are pursuant to the license, will not require the written assessments described in Article 428 paragraph (d).





SHORELINE MANAGEMENT PLAN

Figure 2.1.1:
Conowingo Project Location

Legend

- Project Boundary
- State Boundary
- County Boundary

N

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0 0.75 1.5 3 Miles

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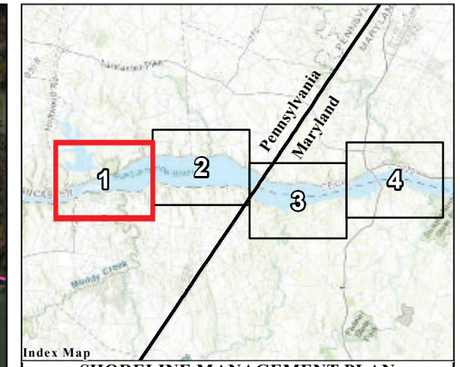

SHORELINE MANAGEMENT PLAN

Figure 2.2-1:
Conowingo Project Boundary
Map 1

Legend

- Project Boundary
- State Boundary
- County Boundary

N

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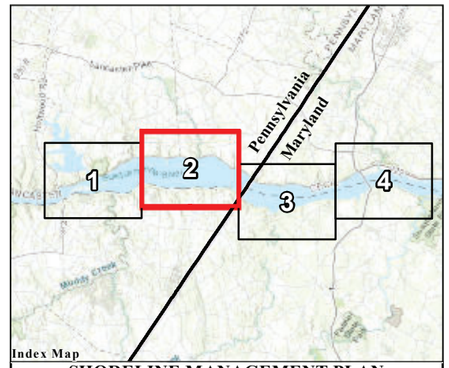

SHORELINE MANAGEMENT PLAN

Figure 2.2-1:
Conowingo Project Boundary
Map 2

Legend

- Project Boundary
- State Boundary
- County Boundary

N

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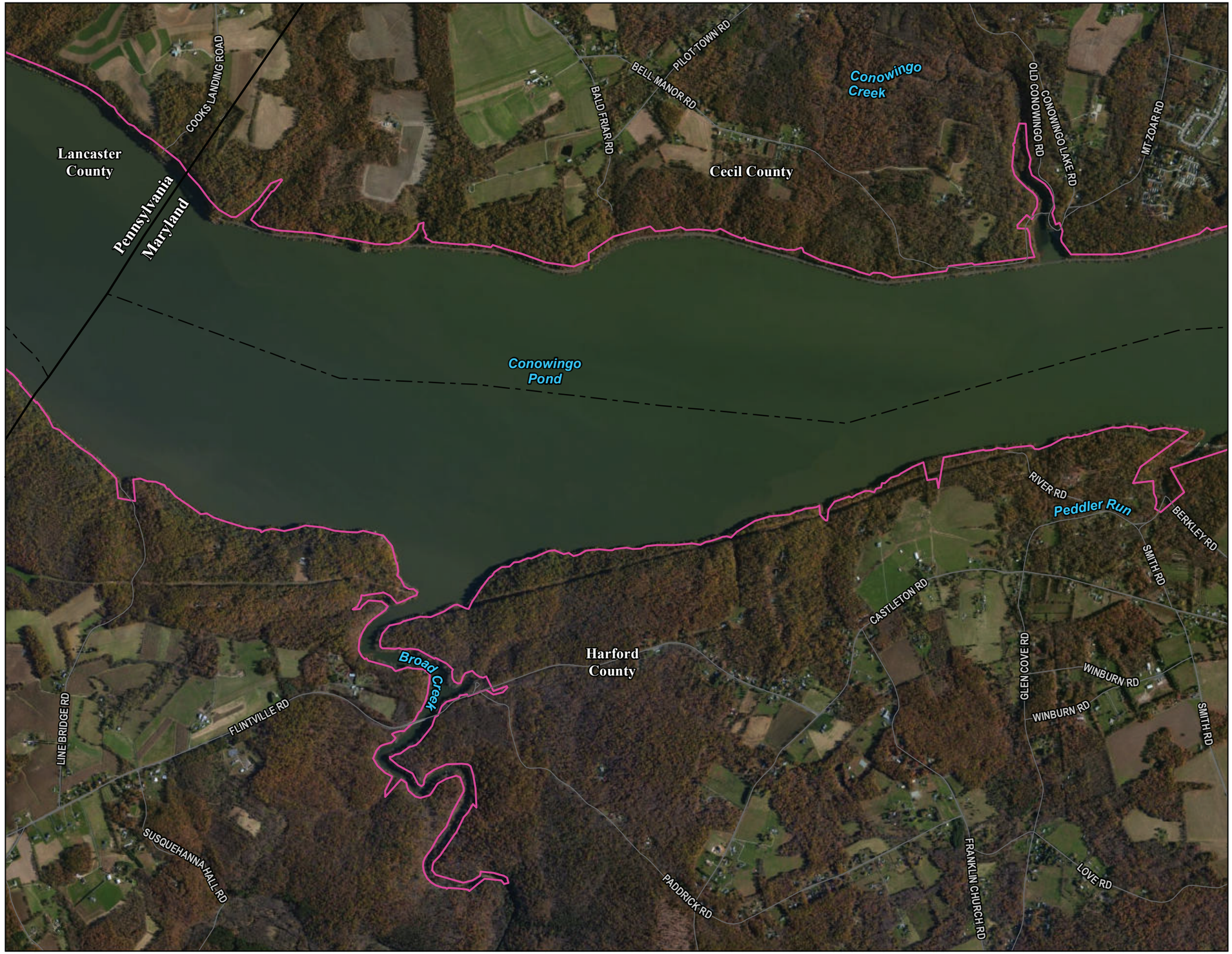

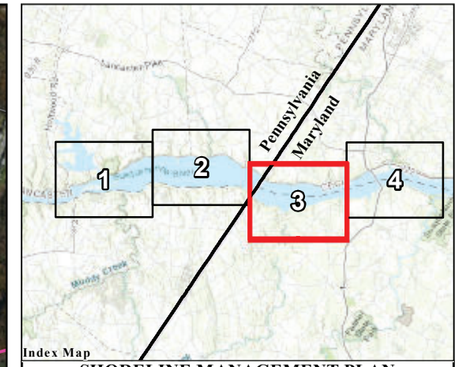

SHORELINE MANAGEMENT PLAN

Figure 2.2-1:
Conowingo Project Boundary
Map 3

Legend

- Project Boundary
- State Boundary
- County Boundary

N

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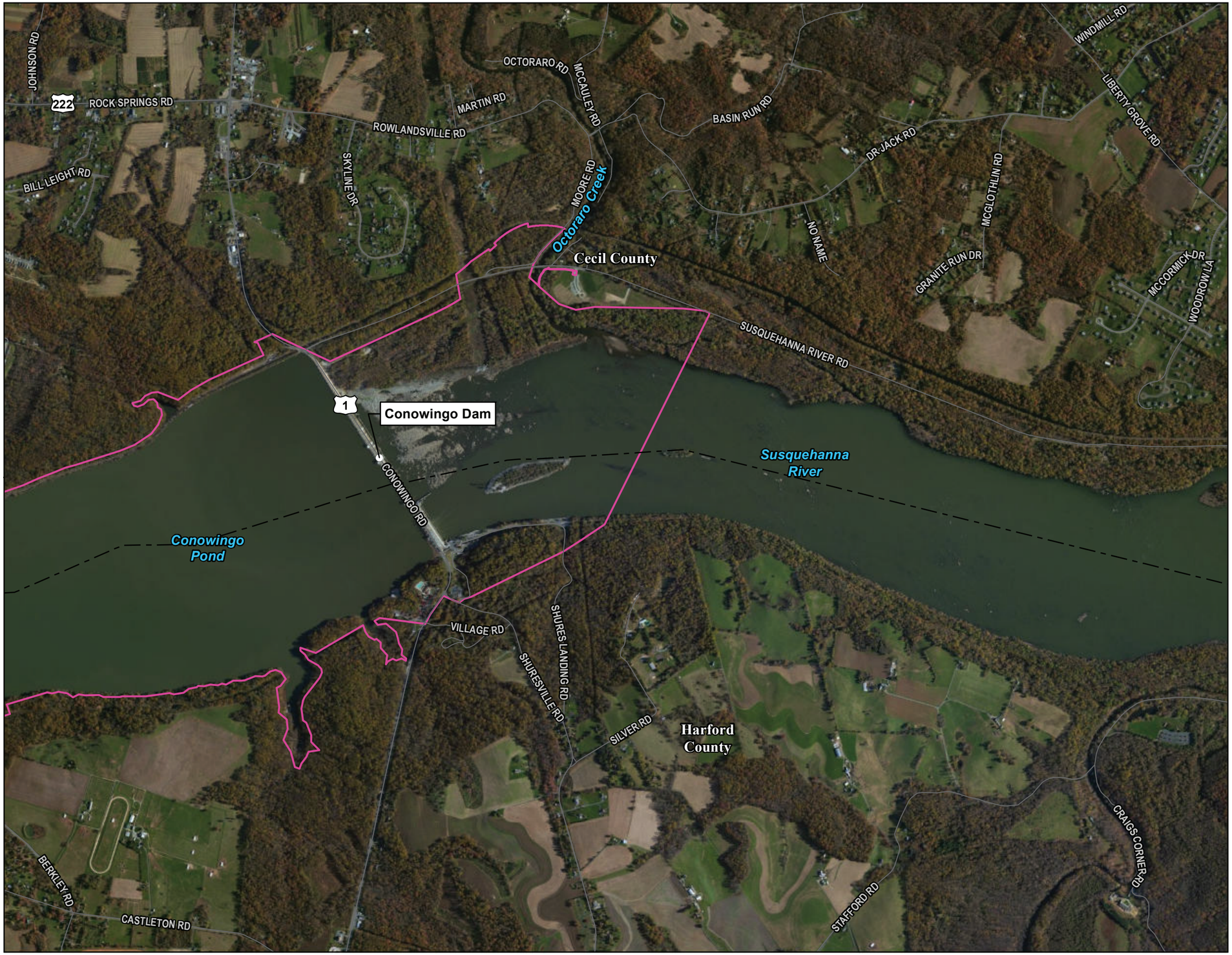

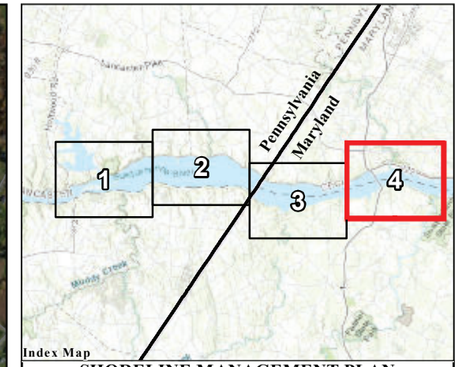

SHORELINE MANAGEMENT PLAN

Figure 2.2-1:
Conowingo Project Boundary
Map 4

Legend

- Project Boundary
- State Boundary
- County Boundary

N

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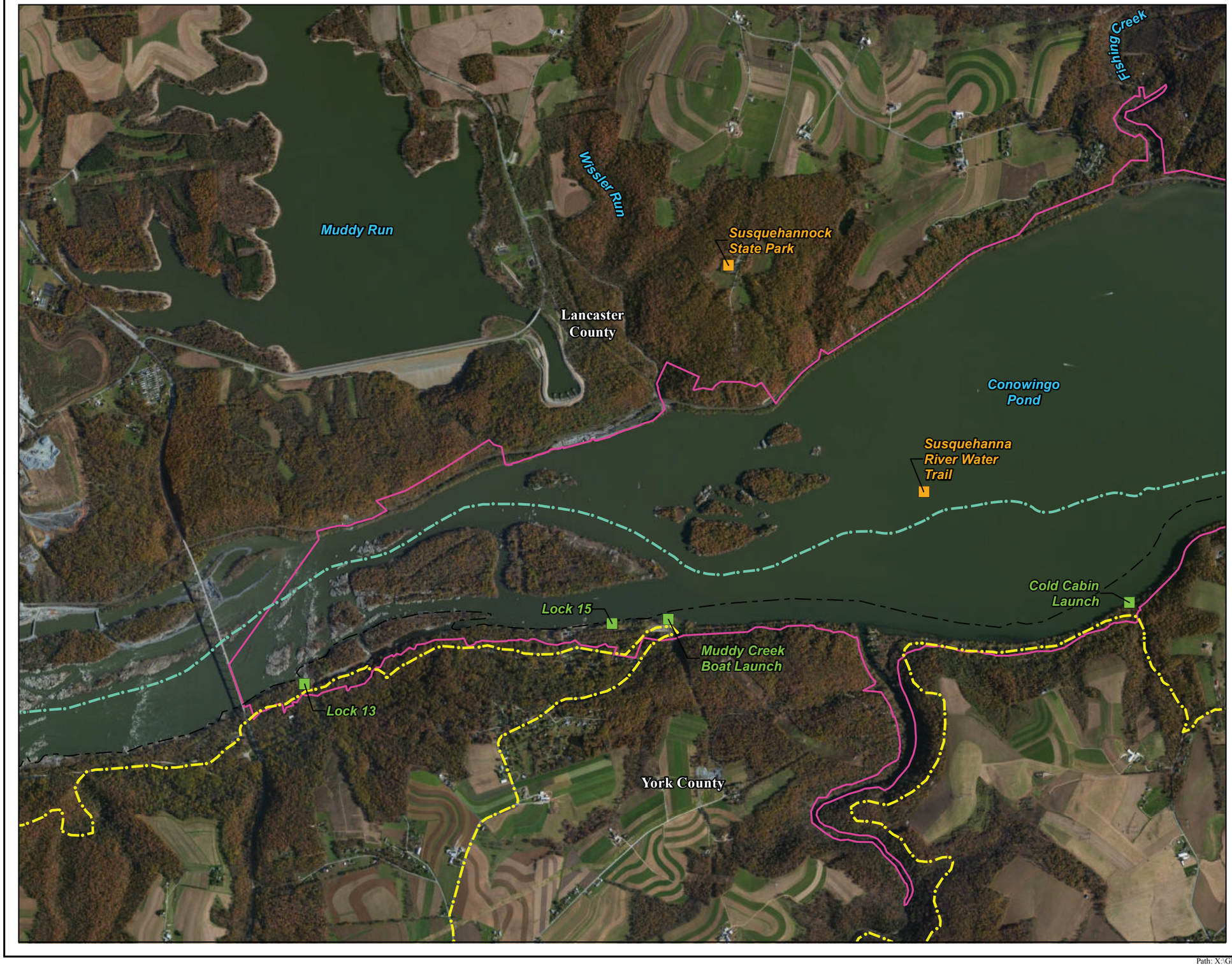

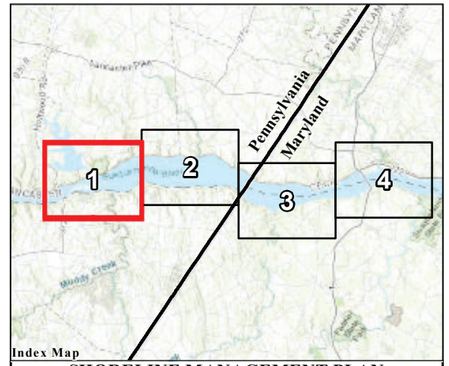

SHORELINE MANAGEMENT PLAN

Figure 2.4.1:
Conowingo Project and Non-Project Recreation Facility Map
Map 1

Legend

- Project Boundary
- Non-Project Recreation Site
- Project Recreation Site
- Mason Dixon Trail
- Susquehanna River Water Trail
- State Boundary
- County Boundary

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User

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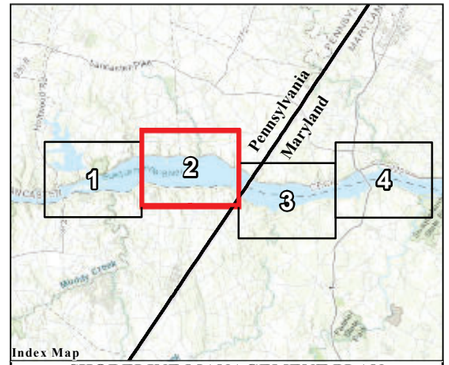

SHORELINE MANAGEMENT PLAN

Figure 2.4.1:
Conowingo Project and Non-Project Recreation Facility Map
Map 2

Legend

- Project Boundary
- Non-Project Recreation Site
- Project Recreation Site
- Mason Dixon Trail
- Susquehanna River Water Trail
- State Boundary
- County Boundary

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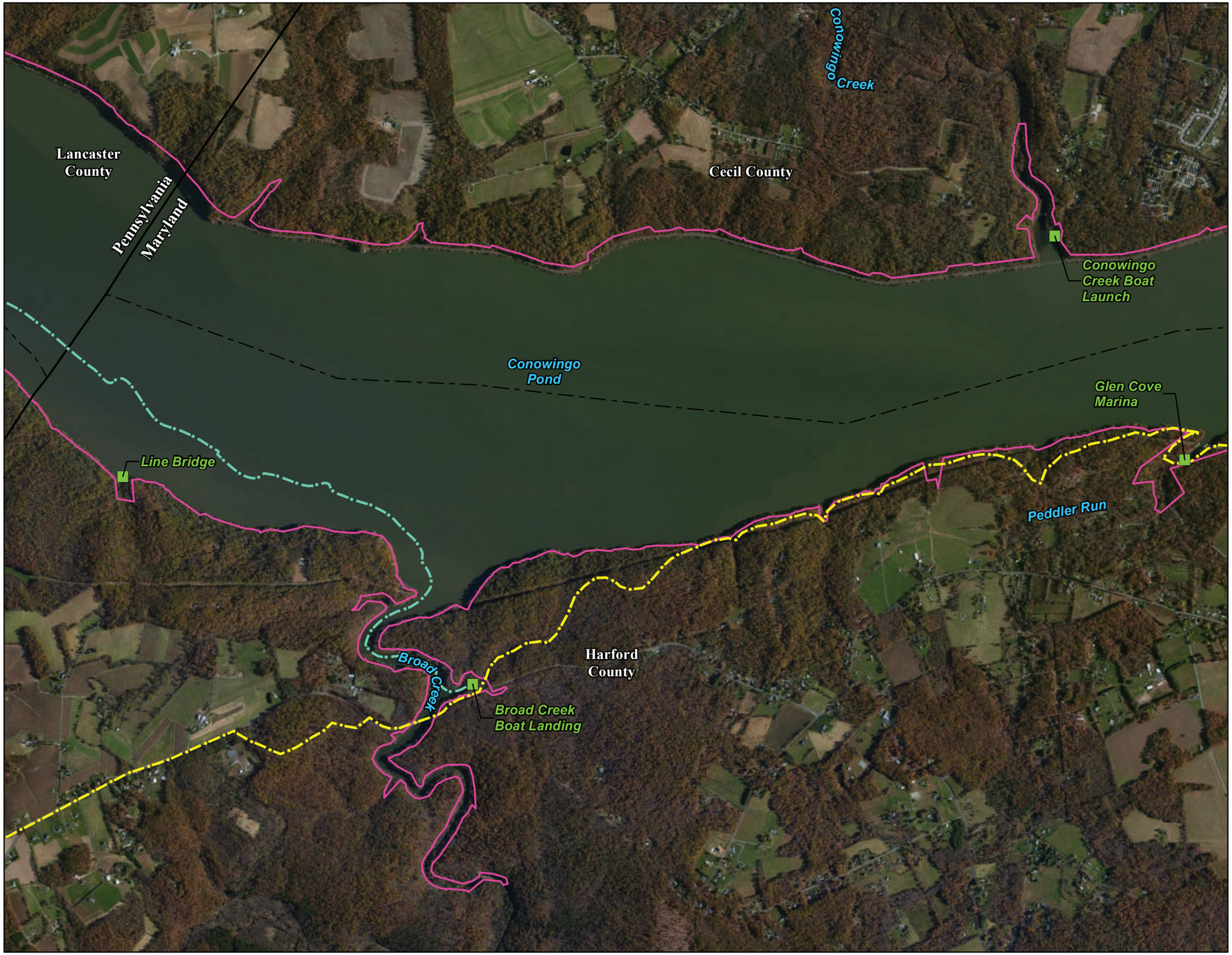

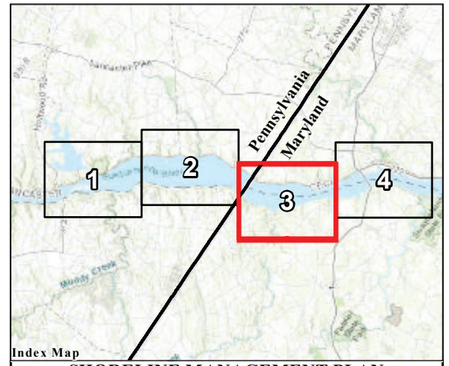

SHORELINE MANAGEMENT PLAN

Figure 2.4.1:
Conowingo Project and Non-Project Recreation Facility Map
Map 3

Legend

- Project Boundary
- Non-Project Recreation Site
- Project Recreation Site
- Mason Dixon Trail
- Susquehanna River Water Trail
- State Boundary
- County Boundary

N

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User

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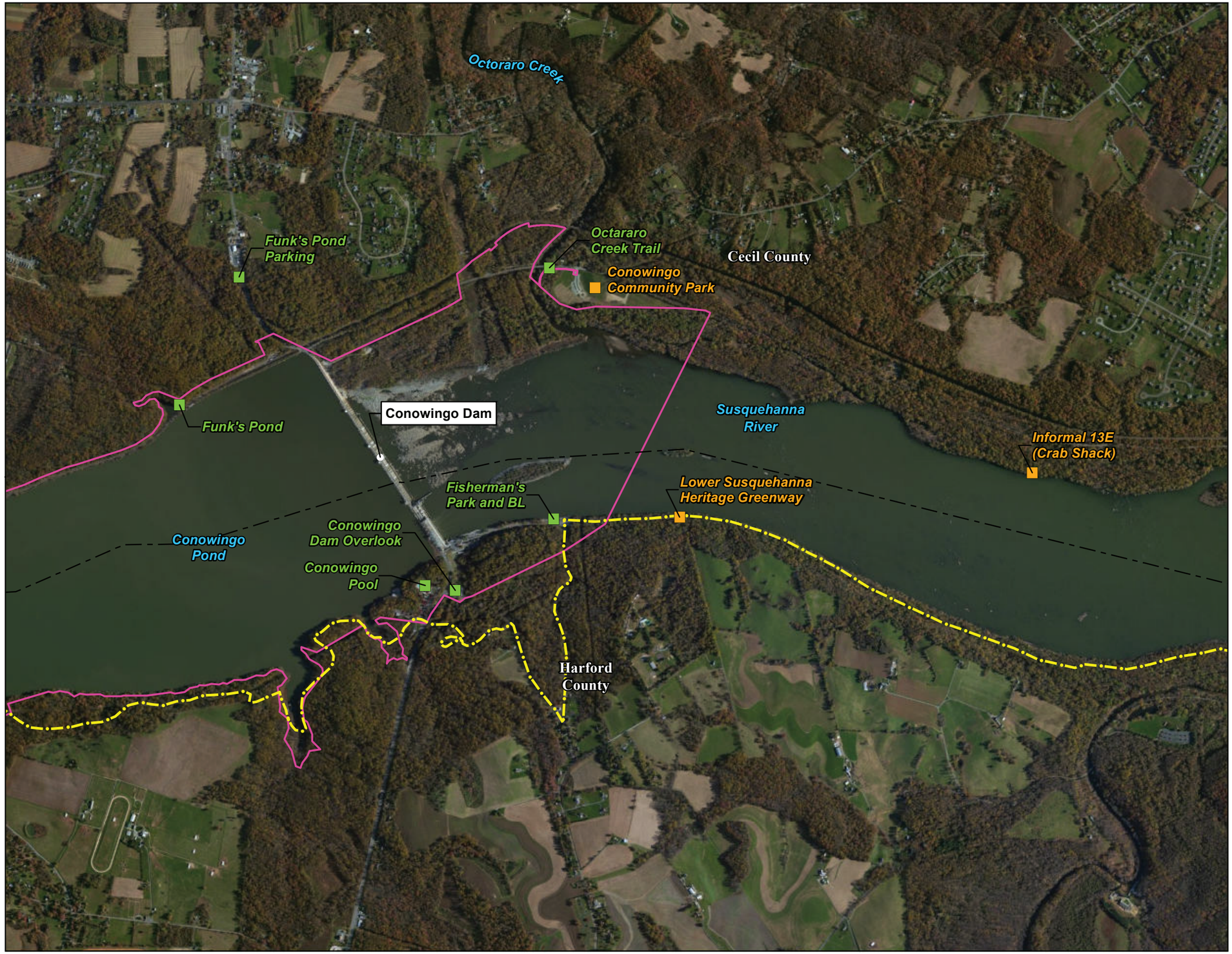

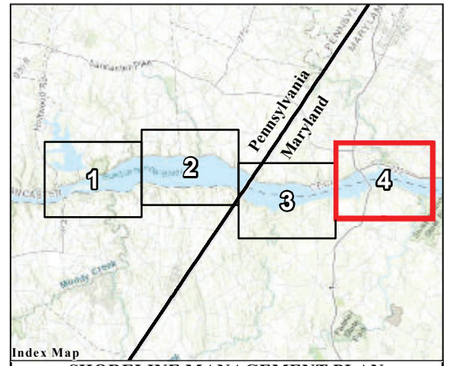

SHORELINE MANAGEMENT PLAN

Figure 2.4.1:
Conowingo Project and Non-Project Recreation Facility Map
Map 4

Legend

- Project Boundary
- Non-Project Recreation Site
- Project Recreation Site
- Mason Dixon Trail
- Susquehanna River Water Trail
- State Boundary
- County Boundary

N

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User

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3 EXISTING ENVIRONMENTAL AND CULTURAL RESOURCES

This section discusses the resources potentially affected by activities which are managed by this SMP. Specifically, the section discusses shoreline resources that are either influenced by existing land uses or influence land use decisions. A comprehensive environmental assessment for the relicensing was provided in the Conowingo Project's Draft and Final License Applications and FERC's Final Environmental Impact Statement.

Shoreline land uses within the Conowingo Project boundary may affect existing natural resources and habitat as a result of increased surface runoff rates and nutrient loading. To address this potential impact, Exelon will incorporate BMPs to minimize or eliminate sediment and nutrient delivery to these resources as applicable, minimizing or eliminating any impacts resulting from both existing and proposed shoreline activities. In addition to BMPs such as soil erosion, sediment control, and restriction of impervious surfaces associated with new construction activities, Exelon will implement BMPs for landscaping and lawn care (pesticide and fertilizer) practices, and restrictions for vegetation removal, all of which will be beneficial to the aquatic and terrestrial resources and associated habitat of the Conowingo Project lands. A complete list of BMPs is included in Appendix A. In conjunction with the implementation of BMPs as applicable, potential effects to aquatic and terrestrial resources have been considered in the development and implementation of Project land use restrictions outlined in Section 6.0 of the SMP.

3.1 Water Resources

Conowingo Pond extends approximately 14 miles upstream from Conowingo Dam to the lower end of the Holtwood Project (FERC No. 1881) tailrace. The Conowingo Pond exhibits a surface area of 8,868 acres and contains a variety of aquatic habitats. The upper reach of the waterbody (in Pennsylvania) is characterized by potholes, deep pools and channels carved into the bedrock, with rugged island rock formations. The upper reach is relatively shallow (6.5 to 20 feet). However, a few potholes and deep pools of up to almost 100 feet deep occur along the eastern shoreline of Conowingo Pond in the vicinity of the Muddy Run powerhouse. Below the Muddy Run powerhouse to the Conowingo Dam, the Conowingo Pond broadens significantly and exhibits greater average depths (greater than 60 feet) and lower water velocities.

Downstream of the dam, bedrock formations with scattered areas of variable-sized cobble characterize the majority of the substrate in the non-tidal habitat area below the tailrace and spillway, creating a predominance of riffle and pool[3] habitat. In the summer months, there is typically little to no spill over the spillway which creates lentic (lake-like) pools among the bedrock cobble. Water will spill over the spillway when river flows exceed the capacity of the Conowingo Project (86,000 cfs). Depending on the magnitude of spill over the dam, the river becomes increasingly dominated by flowing water habitat.

All surface waters in Pennsylvania are protected for aquatic life, water supply (potable, industrial, livestock, wildlife, and irrigation), and recreation (boating, fishing, water contact sports, and aesthetics). Pennsylvania has assigned a warm water fishes aquatic life designated water use to the Pennsylvania portion of the Conowingo Pond. In addition to narrative standards that are applicable to all surface waters, specific water quality criteria for parameters such as pH, alkalinity, bacteria, color, dissolved oxygen, temperature, and certain ions, metals, and nutrients, are established for critical uses (i.e., the most sensitive designated or existing use designated for protection) in Pennsylvania.

In Maryland, all surface waters are protected to support water contact recreation, fishing, aquatic life, wildlife, and water supply (public drinking water supply, agricultural and industrial). In addition, each major stream segment within the state has been assigned to a designated use category with associated

[3] A riffle is an area of shallow swift water, while a pool is an area of deep, slow water.

minimum water quality criteria. Numeric water quality criteria for various water quality parameters (e.g., bacteria, dissolved oxygen, temperature, pH, turbidity, color, toxic substances, etc.) are specified for each designated use.

Fisheries Resources

The Conowingo Pond in both Pennsylvania and Maryland maintains a diverse warm water fishery including the anadromous American Shad (*Alosa sapidisima*). Studies completed for the relicensing in 2010 and 2011 show year to year similarities in catches amongst the various Susquehanna River sampling efforts. Thirty-four species have been documented to be present downstream of Conowingo Dam.

Gizzard Shad, Channel Catfish, Bluegill and Spotfin Shiner dominate the overall species composition. All other species formed less than 5% of the catch. Condition factor and length weight relationships of representative common fish species downstream of Conowingo Dam are comparable to those from other normal, natural populations. This is indicative of relatively favorable conditions and habitats in the lower Susquehanna (Normandeau Associates & GSE 2011).

Exelon will manage aquatic invasive species in accordance with Article 419. Exelon will consult with MDNR, MDE, PADEP, PFBC and FWS regarding invasive species management. Invasive predators including Northern Snakeheads, Blue Catfish and Flathead Catfish are known to be present in the lower Susquehanna River drainage and represent new species within area of the formal sampling program (MDNR 2021a)

3.2 Terrestrial Resources

3.2.1 Upland Habitats

The region encompassing the Conowingo Project boundary is characterized by a diversity of terrestrial botanical resources, which are influenced by soil type, hydrology, climate, and historic and current land use. The lower Susquehanna River corridor exhibits steep riverbanks, which create a rapid transition to upland habitat from the river's edge. General plant communities in the Conowingo Project area include woodlands, old fields, and cultivated fields. The primary natural plant communities include mixed mesophytic and rich hemlock-mesic hardwood forest, dry oak-mixed hardwood or red oak-mixed hardwood forest, and Virginia pine-mixed hardwood forest.

3.2.2 Wetland Resources

In addition to the open waterbodies of Conowingo Pond and the Susquehanna River below the Conowingo Dam, the Conowingo Project encompasses a variety of water-dependent habitats that can be variously defined by frequency of inundation, water depth, and geomorphic position in the landscape adjacent to an open body of water. These habitats are primarily characterized by temporarily flooded deciduous broad-leaved forested and scrub-shrub wetlands. There are few mapped wetlands on Project lands, largely due to the relatively steep sloped shoreline topography, which creates a narrow transition zone from open water to upland habitat. National Wetland Inventory mapped wetlands within the Conowingo Project boundary are depicted on Figure 3.3-1.

3.2.3 Wildlife Habitat

The forested lands within the Conowingo Project boundary provide habitat for a variety of common woodland species such as red and gray fox, raccoon, opossum, red and gray squirrel, chipmunk, turkey, and white-tailed deer. Avian wildlife species such as the Yellow-Billed Cuckoo, Black Capped Chickadee, House Wren, Song Sparrow, White-Breasted Nuthatch, Brown Creeper, and an assortment of woodpeckers have been documented along the wooded shorelines of the lower Susquehanna River. Avian species frequently interacting with the existing transmission lines where they cross Conowingo Pond include

raptors such as Bald Eagle (*Haliaeetus leucocephalus*), Osprey (*Pandion haliaetus*), Black Vulture (*Coragyps atratus*), and Turkey Vulture (*Cathartes aura*), which use towers for perching and roosting. Great Blue Herons (*Ardea herodias*) travel up and down the shorelines of the river to forage and may be traveling back and forth to a rookery downstream below Conowingo Dam. Double-crested Cormorants (*Phalacrocorax auritus*) and Herring Gulls (*Larus argentatus*) congregate in large numbers on rocky areas in the channels between Turkey Island and Lower Bear Island in the upper Conowingo Pond.

3.3 Protected Species and Habitat

3.3.1 Bald Eagle

A substantial number of Bald Eagles have established roosts within the forested shoreline of the Susquehanna River above and below the Conowingo Dam in the vicinity of the Conowingo Project. Data from studies performed by Exelon in 2018 document that Bald Eagles of all age classes utilize shoreline habitat at the Conowingo Pond and Dam area for foraging, nesting, and roosting. The shoreline forests in the Conowingo Project boundary, the Muddy Run Pumped Storage Project boundary and nearby Exelon-owned lands along Conowingo Pond and the Susquehanna River downstream of Conowingo Dam provide habitat that supported 35 nests that were identified as being either Active, Occupied, or Productive during the 2018 Bald Eagle assessment (Watts & Paxton 2019). The shoreline along the Conowingo Pond and the Susquehanna River downstream of Conowingo Dam were used with varying frequency for perching, roosting, and foraging. Eleven of the identified nests are located within the Conowingo Project boundary. Four communal roosts were found in the Conowingo Project boundary demonstrating the area's concentrated use by Bald Eagles (Watts & Paxton 2019).

As discussed in Section 6.1.11, provisions for protecting and managing Bald Eagle habitat are defined in the BEMP approved with modifications by Article 421. The BEMP addresses the use of Project lands by Bald Eagles for nesting, roosting, and foraging. The BEMP manages Bald Eagle habitat on Exelon lands by implementing the FWS' National Bald Eagle Management Guidelines (2007) and state agency guidance.

3.3.2 Osprey

Ospreys are large, fish-eating birds of prey most often seen around water. Osprey are protected by the federal Migratory Bird Treaty Act of 1918 as well as the Pennsylvania Game and Wildlife Code.

The species has historically occurred in the Conowingo Project boundary and field studies performed by Exelon in 2010 and 2011 confirm that this species was present in the Conowingo Project. In 2010, a total of 11 active Osprey nests were found in the Conowingo Project boundary and four (4) pairs of osprey successfully fledged one or more chicks. In 2010, seven of these active Osprey nests were located in the Pennsylvania portion of the Conowingo Project and three were located in the Maryland portion of the Conowingo Project Survey Area in 2010. A fourth nest located close to but not within the Conowingo Project boundary or on Project lands was also active. In 2011, these same nests were present and active with the exception of two nests in Pennsylvania. Osprey are still present within the Conowingo Project boundary in 2021.

Exelon's Osprey Management Policy is detailed in Section 6.1.12.

3.3.3 Indiana and Northern Long-eared Bat

Per Article 425, the following measures are required to protect Indiana and northern long-eared bat habitat:

> *…the licensee must avoid cutting trees equal to or greater than 3 inches in diameter at breast height on project lands from June 1 through July 31, unless a tree poses an immediate threat to human life or property. Tree removal is defined herein as cutting down, harvesting, destroying, trimming, or manipulating in any other way the trees,*

saplings, snags, or any other form of woody vegetation greater than 3 inches in diameter likely to be used by Indiana and northern long-eared bats.

3.3.4 Other Protected Species

Additional protected plant and animal species and species' habitats are present along the shoreline of the Susquehanna River and its tributaries within the Conowingo Project boundary. Exelon avoids impacting protected species through established avoidance measures and consultation with appropriate resource agencies. Consultation takes place through the USFWS' Information for Planning and Consultation online program, the Pennsylvania Natural Heritage Program's Pennsylvania Natural Diversity Inventory Environmental Review Tool, information requests to the Maryland Natural Heritage Program, and through direct contact with local, state, and federal agency staff.

Specific plans are under development for the protection of waterfowl (per Article 422), bog turtle (per Article 423), and northern map turtle (per Article 424). These plans will be filed with FERC in March 2022 following consultation with resource agencies.

3.4 Cultural Resources

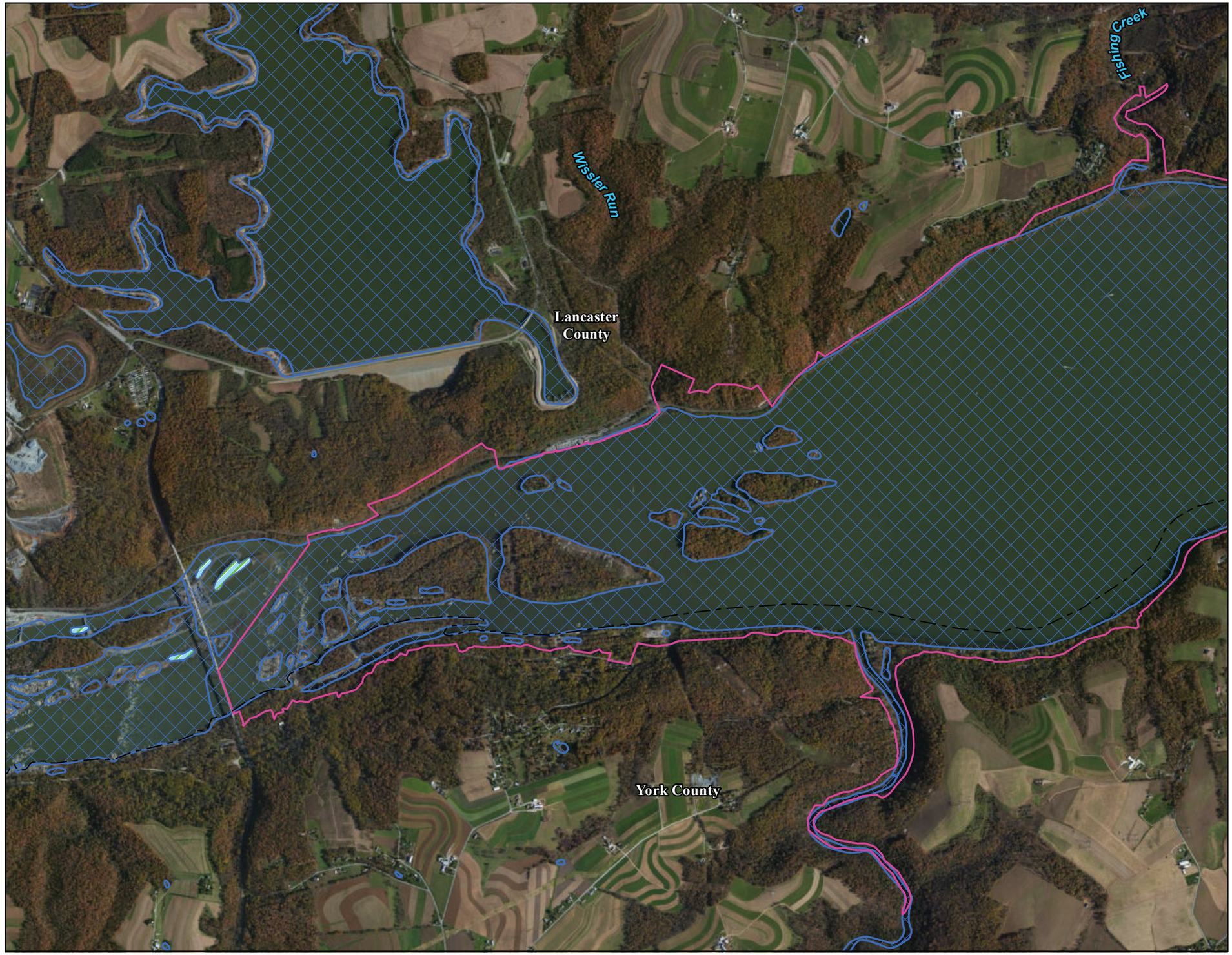
Native American archaeological sites, as well as historic architectural sites, are known to exist within the vicinity of the Conowingo Project boundary and throughout the surrounding region. The presence of archaeological sites within the Conowingo Project's Area of Potential Effect (APE)[4] and additional sites within a one-mile radius was initially documented through research at the MHT and PHMC. Historic architectural sites were documented though the completion of historical background and cartographic research at the MHT and PHMC. This research revealed that the early history of the general Project region was marked by agriculture, iron forging, quarrying, and milling, and this trend continued into the mid-nineteenth century. The development of many of the settlements and villages surrounding the Conowingo Project boundary relate directly to the proximity to the Susquehanna River and its tributaries and creeks.

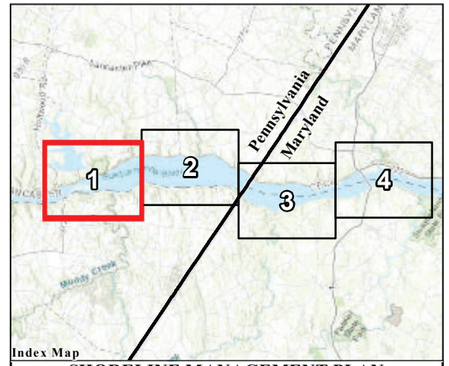
Field studies were performed by Exelon in 2010 and 2011 for historic properties including both historic architectural and archaeological resources located within the APE to determine whether any historic properties within the Conowingo Project's APE are eligible for listing on the National Register of Historic Places. These studies guided the development of a HPMP which was filed on August 31, 2012.

On May 5, 2017, a "*Programmatic Agreement Between the Federal Energy Regulatory Commission, the Pennsylvania Historic Preservation Officer, and the Maryland Historic Preservation Officer for Managing Historic Properties that May be Affected by Issuing a New License to Exelon Generation Company, LLC, for the Continued Operation of the Conowingo Project in Lancaster and York Counties, Pennsylvania, and Cecil and Harford Counties, Maryland"* (FERC No. 405-106) was executed.

In accordance with Article 429 Exelon will prepare and file a revised HPMP based on the HPMP filed with the Commission on August 31, 2012. The HPMP specifies how Exelon will consider and manage the historic properties within the APE throughout the term of the new License and includes the process for assessing Project-related maintenance and ground-disturbing activities to determine whether or not archaeological sites would be affected.

[4] The Project APE is defined as the lands enclosed by the Conowingo Project boundary and lands or properties outside of the Conowingo Project boundary where Conowingo Project construction and operation or Conowingo Project-related development or other enhancements may cause changes in the character or use of historic properties, if any historic properties exist.





SHORELINE MANAGEMENT PLAN

Figure 3.3-1:
National Wetland Inventory
Wetland Locations
Map 1

Legend

- Project Boundary
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Open Water
- State Boundary
- County Boundary

N

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User

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EXELON GENERATION COMPANY, LLC
CONOWINGO HYDROELECTRIC PROJECT
PROJECT NO. 405

Exelon

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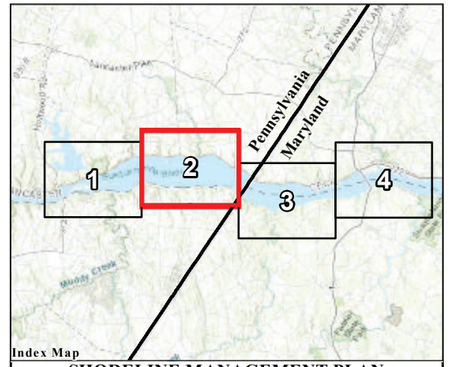

SHORELINE MANAGEMENT PLAN

Figure 3.3-1:
National Wetland Inventory
Wetland Locations
Map 2

Legend

- Project Boundary
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Open Water
- State Boundary
- County Boundary

N

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User

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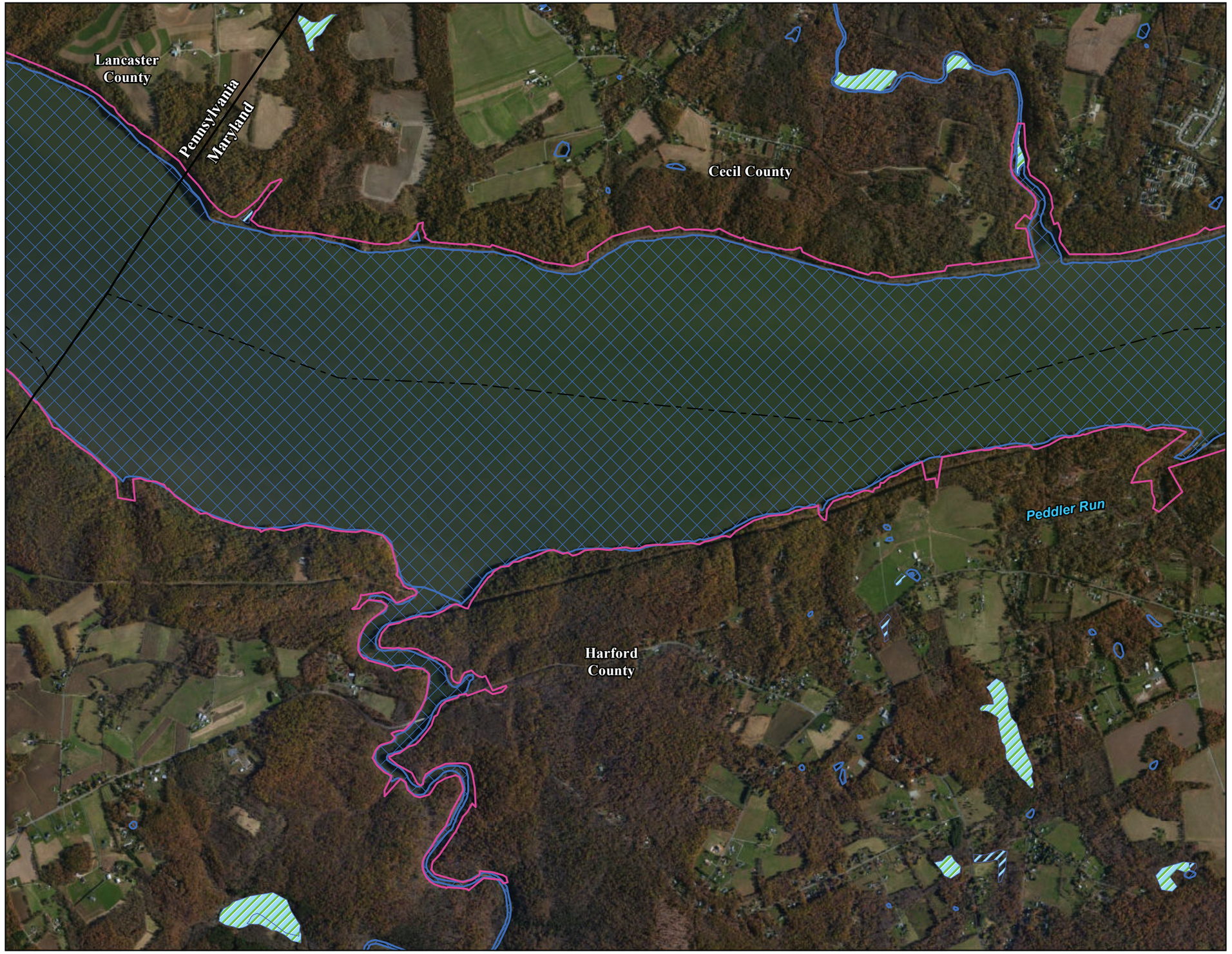

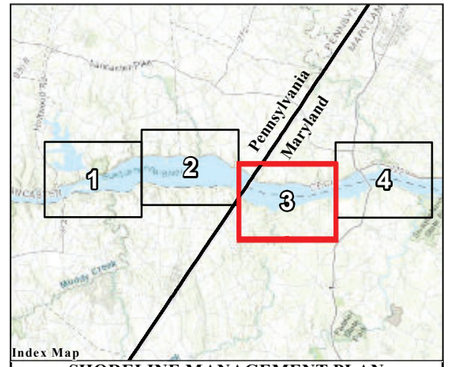

SHORELINE MANAGEMENT PLAN

Figure 3.3-1:
National Wetland Inventory
Wetland Locations
Map 3

Legend

- Project Boundary
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Open Water
- State Boundary
- County Boundary

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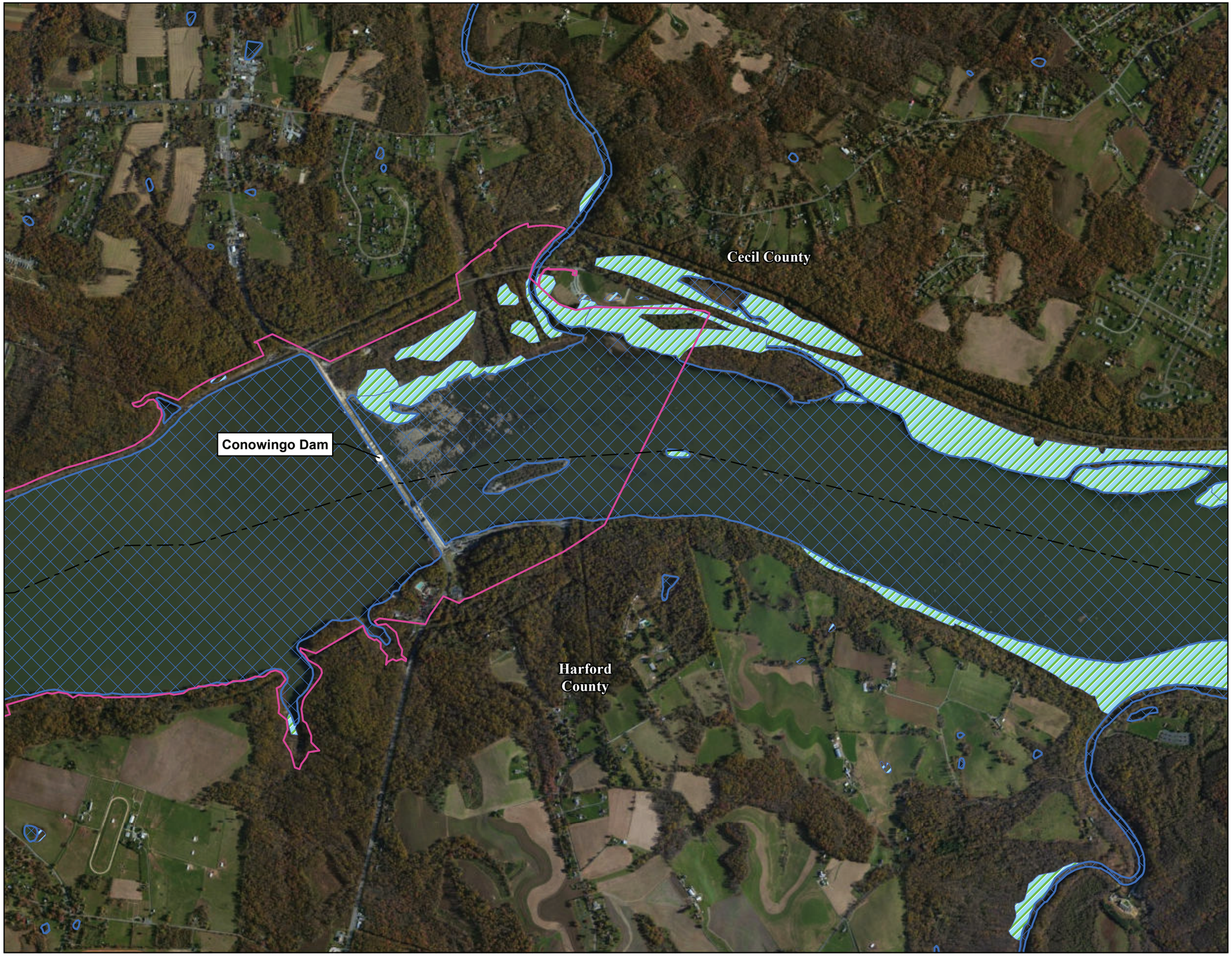

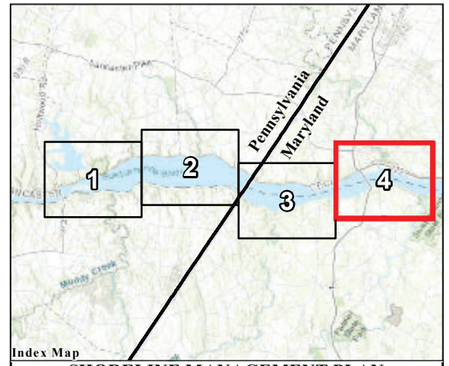

SHORELINE MANAGEMENT PLAN

Figure 3.3-1:
National Wetland Inventory
Wetland Locations
Map 4

Legend

- Project Boundary
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Open Water
- State Boundary
- County Boundary

N

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User

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EXELON GENERATION COMPANY, LLC
CONOWINGO HYDROELECTRIC PROJECT
PROJECT NO. 405

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4 FEDERAL, STATE, COMMONWEALTH AND COUNTY MANAGEMENT PLANS AND PROGRAMS

Numerous federal, state and county agencies, as well as other organizations, have developed regional plans and programs to recognize, promote, protect and conserve the cultural, historic, natural, and recreational resources near the Conowingo Project. During the SMP development process, Exelon identified several plans and programs that address these resources in the lower Susquehanna River. They are summarized below. Exelon intends that the SMP, where possible, be consistent with the goals and objectives of these plans and programs.

4.1 Federal Management Plans and Programs

4.1.1 National Trail System Act of 1968

The National Trail System Act of 1968 authorized creation of a trail system comprised of National Recreation Trails, National Scenic Trails, and National Historic Trails. While National Scenic Trails and National Historic Trails may only be designated by an Act of Congress, National Recreation Trails may be designated by the Secretary of Interior or the Secretary of Agriculture to recognize exemplary trails of local and regional significance in response to an application from the trail's managing agency or organization. National Recreational Trails are administered by the NPS in partnership with American Trails, a national non-profit organization advocating for all trail interests (NPS 2018, NPS 2021b). Portions of the following designated trails are located in or adjacent to the Conowingo Project boundary:

- Captain John Smith Chesapeake National Historic Trail (parts of the trail within the Conowingo Project boundary) (LSHG 2021)
- Susquehanna River Water Trail (within the Conowingo Project boundary)
- Mason-Dixon Trail (parts of the trail are within the Project boundary) -

4.1.2 National Park Service Chesapeake Bay Gateways and Watertrails Network

The Chesapeake Bay Gateways and Watertrails Network is a growing partnership system of 170 parks, wildlife refuges, museums, historic sites, and water trails in the Chesapeake Bay watershed. Through a Memorandum of Understanding with the NPS, the partners work to provide Chesapeake experiences, interpret their Chesapeake connections, co-market the network, and promote citizen stewardship (NPS 2017). Gateway features within the Conowingo Project boundary include the Susquehanna River Water Trail (Lower Section) which traverses Conowingo Pond. The network also includes the Susquehanna State Park, located along the Susquehanna downstream of the Conowingo Project.

4.1.3 National Natural Landmark Program

Administered by the NPS, this voluntary program recognizes and encourages the conservation of sites containing outstanding biologic and geologic resources. Ferncliff Wildflower and Wildlife Preserve is a privately-owned designated National Natural Landmark in Lancaster County and is adjacent to the Conowingo Project boundary (NPS 2021)

4.1.4 Audubon Society – Important Bird Areas Program

Designated by the National Audubon Society, Important Bird Areas (IBAs) include migratory staging areas, winter roost sites, and prime breeding areas. The Project boundary overlaps with two IBAs: the 16,047-acre Lower Susquehanna River Gorge – Conowingo/Muddy Run IBA, and the 10,014-acre Susquehanna River IBA (National Audubon Society, n.d.). The Lower Susquehanna River Gorge IBA site plan lists

conservation concerns including spraying of herbicides and pesticides as well as cutting of warm season grasses before June, which disrupts ground-nesting bird species (National Audubon Society, 2013a). The Susquehanna River IBA Site Report says that the main threats to this site include over-browsing of the forest by deer, land development, invasive plant species, erosion from high levels of recreational use, and stream sedimentation (National Audubon Society, 2013b).

4.2 Maryland and Pennsylvania Management Plans and Programs

4.2.1 Statewide Comprehensive Outdoor Recreation Plans

The Land and Water Conservation Fund (LWCF) Act of 1965 requires a Statewide Comprehensive Outdoor Recreation Plan (SCORP) from each state prior to consideration by the Secretary of the Department of the Interior for financial assistance for acquisition and development projects. The LWCF Act specifically requires the states' SCORP to:

- Identify outdoor recreation issues of statewide importance based upon, but not limited to, input from the public participation program. The plan must also identify those issues the State will address through the LWCF and those issues which may be addressed by other means.
- Evaluate demand, i.e., public outdoor recreation preferences, but not necessarily through quantitative statewide surveys or analyses.
- Evaluate the supply of outdoor recreation resources and facilities but not necessarily through quantitative statewide inventories (NPS 2021a).

Pennsylvania and Maryland's current SCORPs address the period from 2020 through 2024 and 2019 through 2023 respectively. Goals of the respective plans are:

Maryland

- Identify the recreation wants and needs of citizens.
- Improve the Maryland Department of Natural Resources' (MDNR) delivery of educational services.
- Find additional mechanisms to finance day to day operations of state land units, expansion of services, capital improvements to facilitate public access, and land acquisitions.
- Continue partnering with local governments and other land conservation interests to protect and manage land and provide assistance to local governments and landowners on resource management matters.
- Research and planning.
- Land acquisition.
- Program Open Space (MDNR 2019).

Pennsylvania

- Help citizens achieve greater access and enjoyment from experiences in the commonwealth's abundance of local and state parks, state and national forests, trails, rivers, lakes, game lands, and other recreation spaces.

- Strengthen connections between outdoor recreation, healthy lifestyles, and economic benefits in communities.
- Reconnect people to the outdoors and develop a stewardship ethic through outdoor recreation opportunities and experiences.
- Develop a statewide land and water trail network to facilitate recreation, transportation, and healthy lifestyles.
- Enhance outdoor recreation through better state agency cooperation (PADCNR 2020).

4.2.2 Wild and Scenic Rivers

Each state, as well as the federal government, has a scenic and wild river program intended to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. No rivers within the Conowingo Project boundary are designated as Wild and Scenic Rivers by the federal government (DOI, n.d.), Pennsylvania, the Conowingo Project or Maryland (MDNR, n.d.).

4.2.3 Maryland State-wide Water Trails Program

Administered by MDNR, this program is responsible for promoting the protection and creation of sites that provide public access to waterways and the development of water trails and other recreational boating opportunities throughout Maryland. Currently, maps are being developed depicting the Susquehanna River based water trail between the Pennsylvania line to the Chesapeake Bay (FYC 2019).

4.2.4 Maryland Lower Susquehanna Heritage Greenway Management Plan

The Lower Susquehanna Heritage Greenway Management Plan, published in May 2000, outlines strategies for enhancing heritage resources, achieving optimum visitations, encouraging compatible economic development, establishing mechanisms to improve stewardship and insuring long-term preservation and protection of cultural, historic, scenic, and natural resources within the Heritage Area (Glen Cove to Chesapeake Bay) (Redman/Johnston Associates *et. al*, 2000). In December 2012, the Lower Susquehanna Heritage Greenway (LSHG) published a five-year plan for fiscal years 2013 to 2018 with an update to priorities and plan for future investment (LSHG 2012). The LSHG is the oversight organization for this plan.

4.2.5 Maryland Natural Heritage Program

The program seeks to sustain populations of rare plants and animals through the maintenance of healthy natural ecosystems. The ecosystems are maintained by the restoration of degraded habitats, field surveys, research into natural history requirements, and public education. The program also reviews proposed development projects for potentially harmful effects on rare species. Managed by MDNR, the program occasionally works with other agencies and private organizations to purchase properties supporting natural communities (MDNR 2021b).

4.2.6 Pennsylvania Exceptional Value Streams

Designated by PADCNR, streams with high biotic integrity and health are protected under PADEP water quality regulations under the Clean Water Act. These regulations do not permit uses along the stream that leads to any degradation of the stream quality. Fishing Creek is a designated Exceptional Value Stream (PADEP 2010).

4.2.7 Pennsylvania Lower Susquehanna Conservation Landscape Initiative

The Conservation Landscape Initiative (CLI), a PADCNR program, is a place–based strategy for natural resources stewardship and advocacy in key landscapes (PADCNR 2011b). The CLI program focuses on lands where there are strong natural assets and local readiness and support for land conservation, locally driven planning, and community economic revitalization efforts. The Lower Susquehanna CLI encompasses the Susquehanna River and riverside lands in York and Lancaster Counties.

Goals of the Lower Susquehanna CLI include:

- Improve public access to the river.
- Preserve environmentally sensitive areas.
- Preserve the forested river landscape.
- Improve water quality.
- Provide additional land and water based recreational opportunities.

4.2.8 Maryland Green Infrastructure Program

Developed by MDNR, this program is implemented as a tool to help identify and prioritize areas of greatest statewide ecological importance. It identifies large contiguous blocks of natural land interconnected by corridors to allow animal and plant propagate dispersal and migration. Individual parcels are evaluated for their relative conservation value to prioritize them for acquisition funding. Mapping of green infrastructure is available through MDNR (MDNR 2015).

4.2.9 Pennsylvania Natural Heritage Program

A partnership between The Western Pennsylvania Conservancy, PADCNR, PFBC, and PGC, in cooperation with FWS, this program gathers and provides information on the location and status of important ecological resources such as plants, vertebrates, invertebrates, natural communities, and geologic features. The program provides current, reliable, objective information to help inform environmental decisions associated with land development or land use changes (PNHP 2019).

4.3 County Management Plans and Programs

4.3.1 Lancaster County, Pennsylvania Management Plans and Programs

The Lancaster County Comprehensive Plan includes a Growth Management Element that identifies areas appropriate for urban growth and reinvestment and areas that should be maintained in agriculture, natural resource conservation, and similar uses.

In 2009, Lancaster adopted a new plan, “Greenscapes; The Green Infrastructure Element” of the Lancaster County Comprehensive Plan. This plan defines goals, objectives, and strategies to preserve, conserve, restore, and enhance natural resources through the establishment of a countywide, integrated green infrastructure system (Lancaster County 2009). Recreation goals and objectives of Greenscapes are as follows.

- Protect large open spaces for passive outdoor recreational opportunities.
- Provide a diversity of close-to-home, active recreation opportunities within Designated Growth Areas.

- Create a countywide network of open/green spaces and connections between them.
- Provide convenient, accessible opportunities for outdoor recreation and exercise.

4.3.2 York County, Pennsylvania Management Plans and Programs

The York County Comprehensive Plan is also composed of several components including an Agricultural Protection Plan, Environmental Resources Inventory, Natural Areas Inventory, and an Open Space and Greenways Plan. The Agricultural Protection Plan was established in December 2008 and analyzes designated rural areas in townships with regard to existing and proposed development, large farm parcels, soil quality, lands adjacent to preserved farms, and use of agricultural protection tools. It also provides a detailed action plan for the protection and preservation of agricultural land in township rural areas.

The Environmental Resources Inventory was last updated in February 2018 and distinguishes between areas appropriate for growth and development and areas appropriate for open space and conservation uses. The Natural Areas Inventory was last amended in October 2004 and contains information on the locations of rare, threatened, and endangered species and on the highest quality natural areas in the County.

The Open Space and Greenways Plan was adopted in December 2006 and provides a "greenprint" for developing a statewide network of greenways. The plan provides a vision for coordinated and comprehensive system of open space and greenways and supports the maintenance and enhancement of open space and greenways throughout York County. (York County 2011).

4.3.3 Cecil County, Maryland Management Plans and Programs

The Comprehensive Plan serves as the policy guide and framework for the future growth and development in Cecil County. The plan components examine land use, water resources, transportation, public facilities, economic development, housing, environmentally sensitive areas, mineral resources, and other natural resources (Cecil County 2010). Key goals and objectives of the plan include:

- Encourage the conservation of agricultural and forested lands.
- Plan and develop bicycle/pedestrian trails to create a network of trails.
- Protect recreational open space and resource lands and integrate greenways into the County's planning and development review process.
- Protect environmentally sensitive resources and natural features in all areas of the County, comprising steep slopes, streams, wetlands, floodplains, and habitat including the habitats of threatened and endangered species.

4.3.4 Harford County, Maryland Management Plans and Programs

The Harford County Master Plan and Land Use Element Plan provide direction for addressing future growth, revitalization, adequate public facilities, economic development, and preservation and protection of natural resources, agricultural lands, and historic resources. Land use policies are the core of the Master Plan.

The 2016 Harford County NEXT Master Plan uses a holistic approach to planning and focuses on six concepts; growth with a purpose, economic vitality, environmental stewardship, preserving heritage, mobility and connectivity, and promoting healthy communities -ensuring that the County is working to meet the needs of the present without compromising the ability of future generations to meet their own needs (Harford County 2016).

Additional Harford County Master Plan Elements include the following:

- Chesapeake Bay Critical Area Program – addresses land use within 1,000 feet of tidal waters and wetlands.

- Land Preservation, Parks, and Recreation Plan – addresses the County's needs for preserving open space, natural resources, and agricultural lands and providing a variety of quality recreational environments.

- The Natural Resources and Water Resources Element Plan – Includes methods for protecting environmental resources, including streams and their buffers, steep slopes, floodplains and the habitats of threatened and endangered species.

- Historic Preservation Element Plan – addresses the County's historic preservation efforts.

5 EXISTING USE OF PROJECT LANDS AND WATERS

Exelon must ensure that any shoreline development activity that occurs within the Conowingo Project boundary is consistent with Project license requirements.

There are approximately 46 miles of shoreline currently within the Conowingo Project boundary. Forty-three miles are associated with the Conowingo Pond impoundment and three miles downstream of the Conowingo Dam. The land serves many Project-related purposes, including (but not limited to) Project operations, public access, recreational use, wildlife habitat, seasonal cottages, and protection and conservation of rare, unique, and special features and biota.

Project lands along Conowingo Pond are primarily a mixture of steep wooded slopes with interspersed areas of ledge outcrops. Downstream of Conowingo Dam, Project lands consist of level wooded lands with intervals with steep slopes beyond the Conowingo Project boundary. Land use is limited is some areas due to the topography and slopes; slopes in many areas exceed 25%. The majority of Project land is undeveloped.

Exelon has programs and policies that guide and support the recreational use and management of the Conowingo Project lands (Appendices E and F). FERC regulations require licensees to provide public access and recreational opportunities on Project lands consistent with area recreational needs. In some instances, approval from FERC is required for the non-project use of Project lands. Numerous public recreation sites and facilities are located within the Conowingo Project. These range from fully built out facilities such as a public swimming pool to minimally improved boat carry-in access sites. Other portions of Project lands are managed under agreements with state, municipal, and non- governmental agencies as public recreation facilities. Two commercial marina operations are also located on Project lands.

Various utility structures, facilities and operations also occur on and adjacent to Project lands. These include electric utility generation facilities and transmission lines, municipal and utility water intakes, and an oil pipeline. The transmission lines and the pipeline which cross Project lands impact a very minimal amount of land and shoreline. Peach Bottom Atomic Power Station is located along approximately 1.5 miles of Project land along the west shore of Conowingo Pond but is not located within the Conowingo Project boundary.

Non-project use of Conowingo Pond is authorized for the following users: Peach Bottom Atomic Station, the City of Baltimore, Chester Water Authority, York Energy Center, Wildcat Point Generation Facility, and is a public water supply source for both the City of Baltimore and the Chester Water Authority, pursuant to the terms set forth in their non-project use of project lands authorizations. The various water intakes have a minimal footprint on Project lands.

There are ten clusters of seasonal cottages (totaling approximately 350) on Project lands. The majority of the cottages are located on the shorelines, but a few are also located on islands in the upper half of Conowingo Pond. Cottages are located on Big Chestnut, Little Chestnut, Hennery, and Wolf Islands, while shoreline cottages are clustered in the vicinity of Muddy Creek and Broad Creek on western side of Conowingo Pond, and Fishing Creek and Peters Creek on the eastern side.

Cottages on the Conowingo Pond islands are subject to Exelon's "Conowingo Islands Public Use Policy" (Appendix B) which regulates vegetation management and restricts any earth disturbance to minimize erosion and protect cultural resources. All cottages on Project lands are also subject to Exelon's "Cottage Rules and Regulations" (Appendix C) which includes numerous requirements focused on development standards, erosion control and natural resource protection. The Cottage Rules and Regulations are currently being updated and up-to-date revisions will be posted on Exelon's Conowingo, FERC License Renewals website under a Shoreline Management Plan (SMP) link.

Exelon has developed and maintains a number of designated recreational sites and facilities within the Conowingo Project boundary for public recreation. The Project's public recreation facilities are managed under an RMP, which is incorporated by reference into this SMP.

In addition to the RMP, Exelon has developed a land use classification system for Project lands based on aerial photography interpretation, ground truthing and corporate operating procedures and policies. Existing land uses are placed into one of the following land use classifications on the basis of the primary land use.

Class 1: Project Operations: Lands used for power generation and electric transmission/distribution infrastructure and purposes.

Class 2: Developed Recreation: Lands managed for developed public recreational facilities and activities. This includes commercial recreation facilities.

Class 3: Natural/Undeveloped: Lands that are primarily undeveloped and generally available for public access and use.

Class 4: Industrial and Other Non-Project Lands: Lands managed for industrial/commercial uses and other non-Project uses including shoreline stabilization projects.

Class 5: Public Access Lands: Public access lands are Project lands managed by federal, state, county agencies or conservation organizations under agreement with Exelon. Public access and use of the lands is generally allowed, though may be governed by the managing entity according to the type or level of activity or by season. These are typically unimproved lands, though parking areas, trails, and other infrastructure may be provided.

Class 6: Cottage Lands: Lands leased to individuals for seasonal use. These land classifications are depicted graphically on Figure 5.0-1.

Approximately 885 acres (81 percent of the terrestrial lands within the Conowingo Project boundary) of the 1,055 acres of Project lands are fully open for public use. These public use lands comprise approximately 40.5 miles of shoreline within the Conowingo Project boundary. Table 5.0-1 provides an overview of the amount of Project lands (acres) and the amount of Project shoreline (miles) for each of the six land classifications:

Table 5.0.-1: Project Acreage and Shoreline Miles by Land Use Classification

Conowingo Project	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6
Area (acres)	43	96	620	127	20	149
Shoreline (miles)	3	5	25	2.5	0.5	10

5.1 Project Operations (Class 1)

These lands include 43 acres and three miles of shoreline that are specifically or primarily for power generation and transmission purposes. They include generating facilities, substations/switchyards, intake and discharge areas, and transmission line facilities and corridors and, where necessary, a secure buffer area around the facilities. For security and safety purposes, access to these lands is restricted to Exelon employees and contractors.

5.2 Developed Recreational Lands (Class 2)

This classification includes 96 acres and five miles of shoreline lands that are developed and managed for public recreational opportunities and access. The lands may be managed and operated by Exelon, a commercial vendor, or a private lessee, and may have specific allowable recreational uses and operating hours.

5.3 Natural/Undeveloped Lands (Class 3)

These lands include 620 acres and 25 miles of shoreline that is mostly in a natural state without significant improvement or development and is generally available for low impact public access and use and may support improved public non-motorized trails. Natural/Undeveloped lands may be used or developed and reclassified for other purposes subject to all applicable regulations.

5.4 Industrial and Other Non-Project Lands (Class 4)

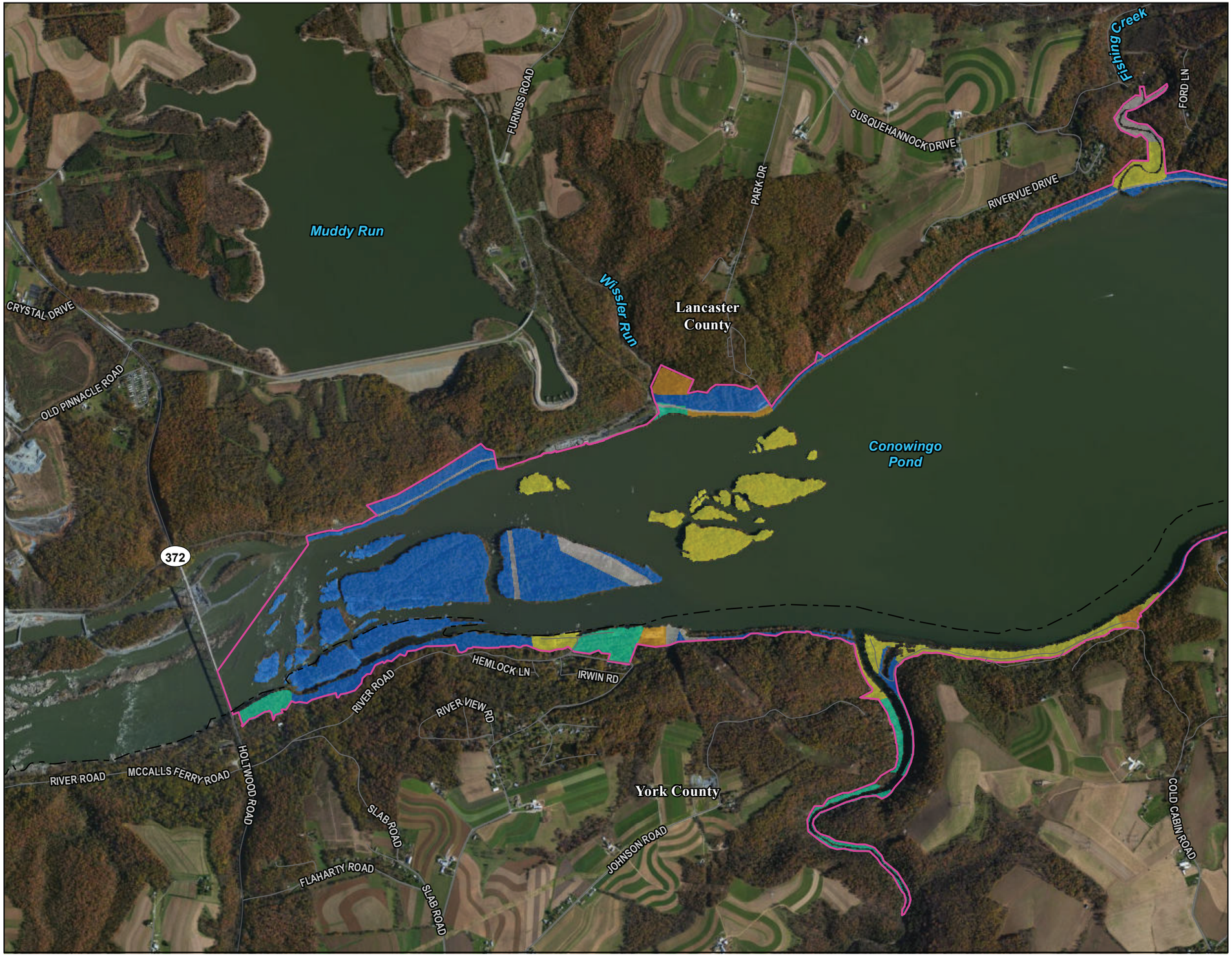
This classification includes 127 acres and 2.5 miles of shoreline lands used for industrial or commercial purposes, including non-project electric utility facilities and other non- project uses such as agriculture. These lands may be managed and operated by third parties under agreement with Exelon. Therefore, public access and other uses may be restricted. These lands may be used or developed and reclassified for other purposes subject to all applicable regulations.

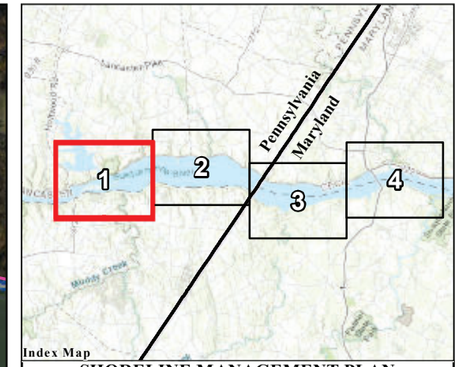
5.5 Public Access Lands (Class 5)

These lands include 20 acres and one-half mile of shoreline that are both developed recreational facilities and lands in a natural state without significant improvement or development. Public access lands are Project lands managed by federal, state, county agencies or conservation organizations under agreement with Exelon. Public access and use of the lands is generally allowed, though may be governed by the managing entity according to the type or level of activity or by season. These are typically water access recreational facilities or unimproved lands, though parking areas, trails, and other infrastructure may be provided in minimally developed areas. Other uses of these lands may be permitted by the managing entity based on the terms and conditions of the agreement with Exelon, but only if the other uses are also consistent with the requirements of the standard use and occupancy article of the FERC License.

5.6 Cottage Lands (Class 6)

Cottage lands include 149 acres and 10 miles of shoreline land that are leased to individuals for seasonal recreation. This includes the presence of seasonal structures (“cottages”) and other infrastructure for their use (access roads, utilities, docks, etc.). Use of these lands is exclusive to the lessee subject to lease terms and conditions, unless the lands are needed for Project purposes. All cottages are located on Conowingo Pond (see Figure 5.6-1).





SHORELINE MANAGEMENT PLAN

Figure 5.0-1:
Project Land Use Classification Map
Map 1

Legend

- Project Boundary
- State Boundary
- County Boundary

Land Use Classifications

- Project Operations
- Recreation
- Industrial/Other Uses
- Natural/Undeveloped Lands
- Public Access Lands
- Cottages

N

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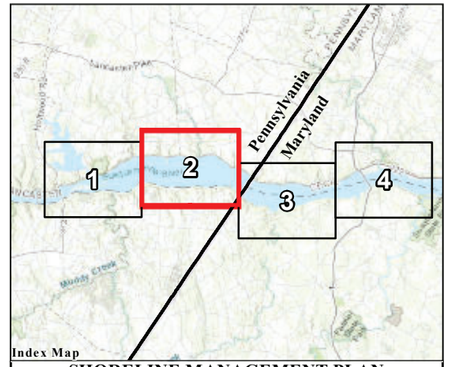

SHORELINE MANAGEMENT PLAN

Figure 5.0-1:
Project Land Use Classification Map
Map 2

Legend

- Project Boundary
- State Boundary
- County Boundary

Land Use Classifications

- Project Operations
- Recreation
- Industrial/Other Uses
- Natural/Undeveloped Lands
- Public Access Lands
- Cottages

N

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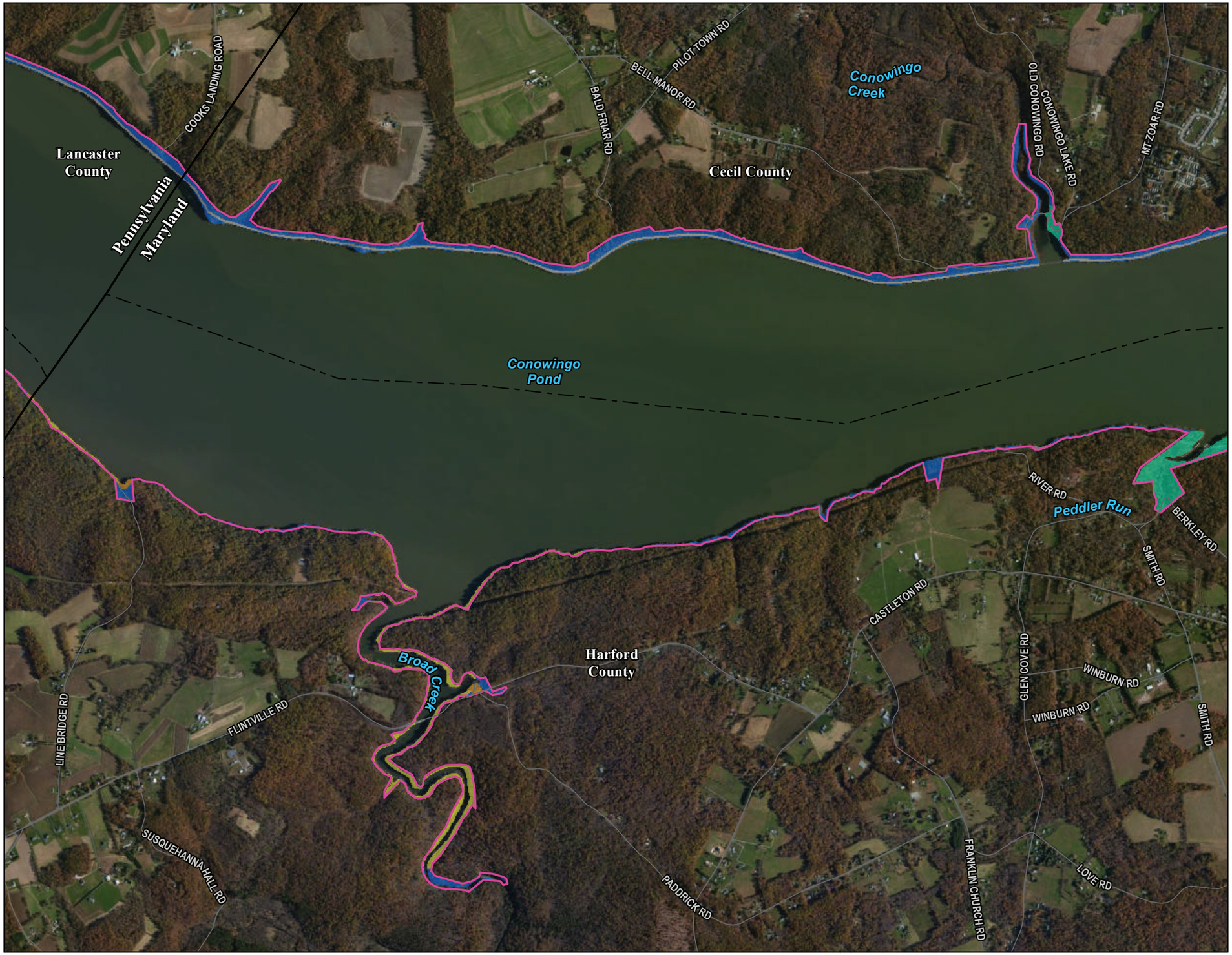

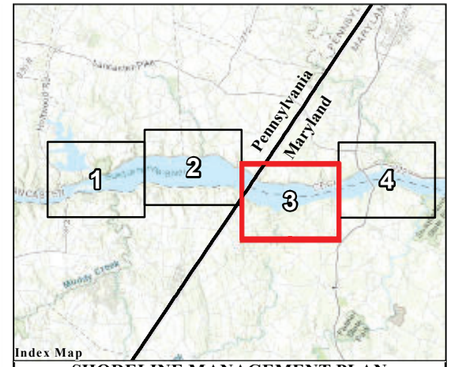

SHORELINE MANAGEMENT PLAN

Figure 5.0-1:
Project Land Use Classification Map
Map 3

Legend

- Project Boundary
- State Boundary
- County Boundary

Land Use Classifications

- Project Operations
- Recreation
- Industrial/Other Uses
- Natural/Undeveloped Lands
- Public Access Lands
- Cottages

N

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User

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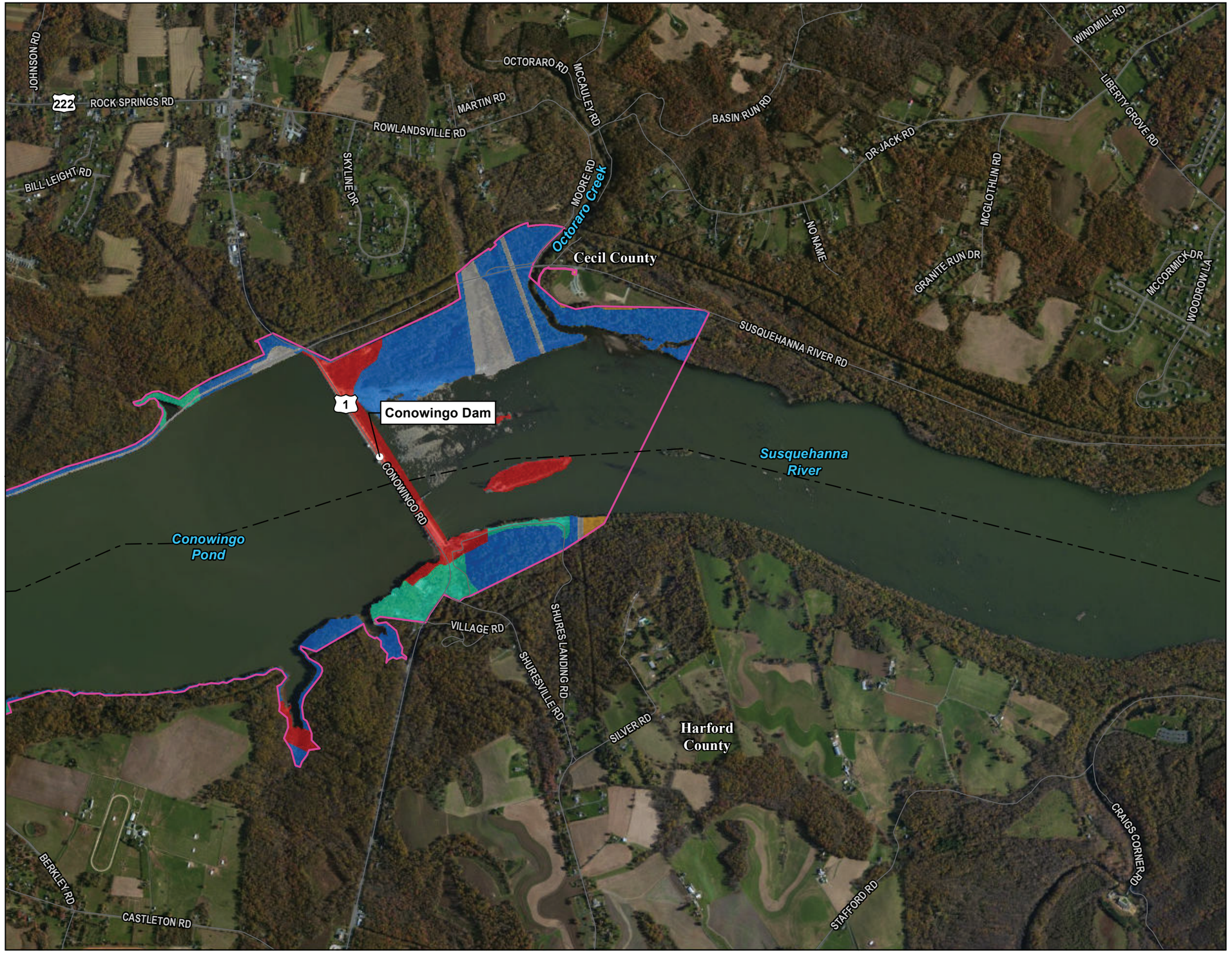

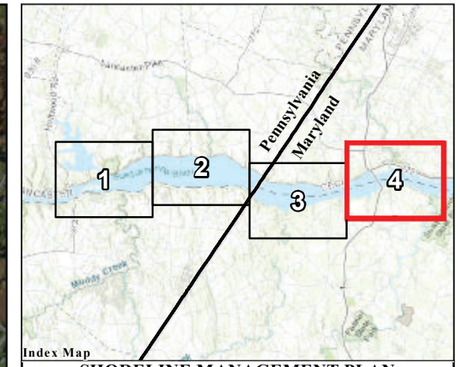

SHORELINE MANAGEMENT PLAN

Figure 5.0-1:
Project Land Use Classification Map
Map 4

Legend

- Project Boundary
- State Boundary
- County Boundary

Land Use Classifications

- Project Operations
- Recreation
- Industrial/Other Uses
- Natural/Undeveloped Lands
- Public Access Lands
- Cottages

N

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User

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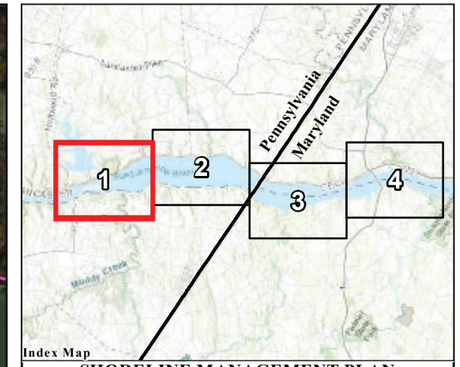

SHORELINE MANAGEMENT PLAN

Figure 5.6-1:
Cottage Clusters
Map 1

Legend

- Project Boundary
- Cottage Lot
- State Boundary
- County Boundary

N

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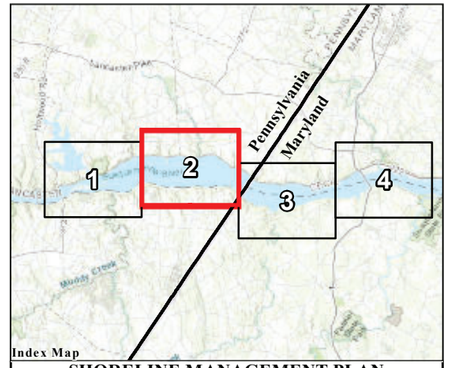

SHORELINE MANAGEMENT PLAN

Figure 5.6-1:
Cottage Clusters
Map 2

Legend

- Project Boundary
- Cottage Lot
- State Boundary
- County Boundary

N

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User

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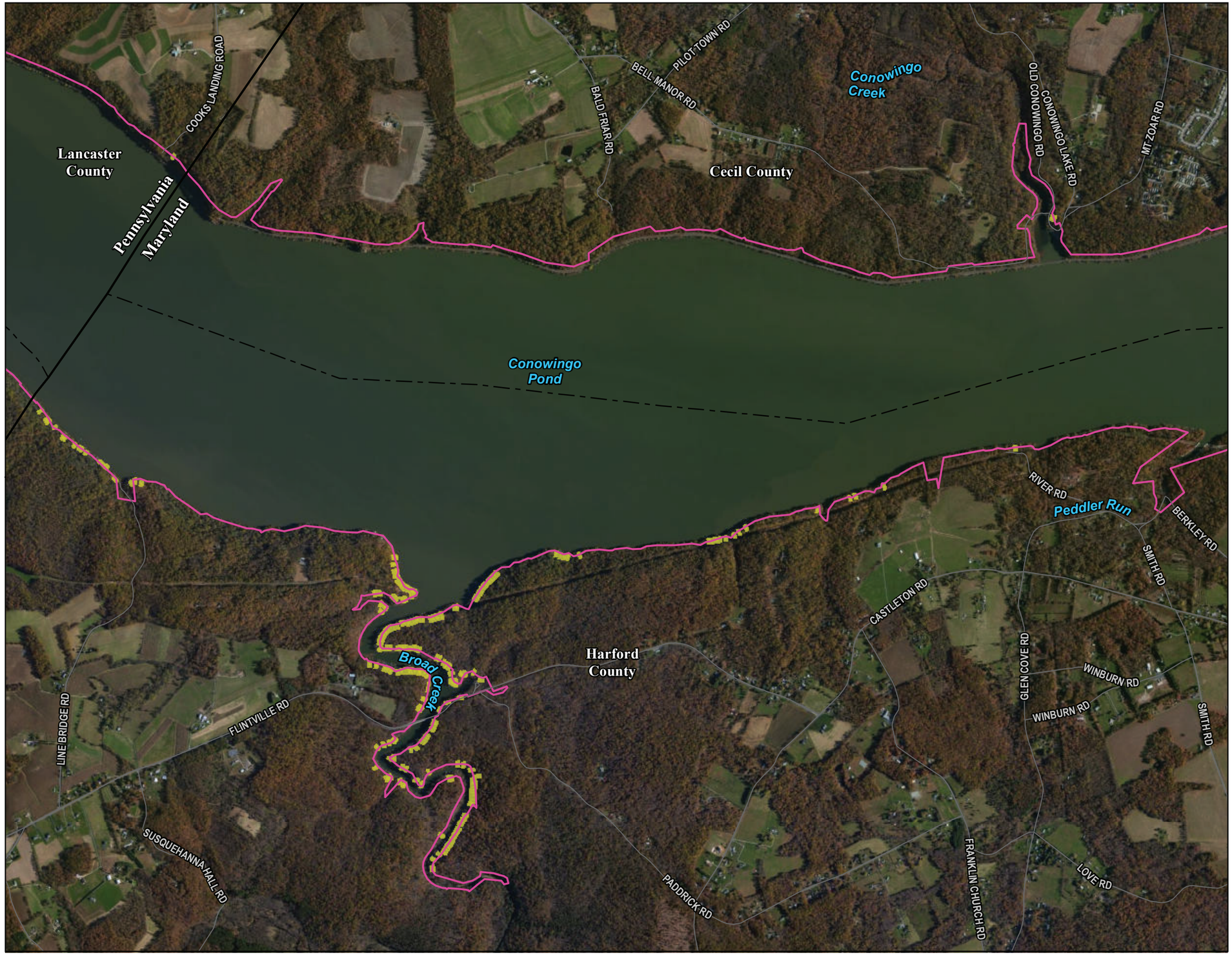

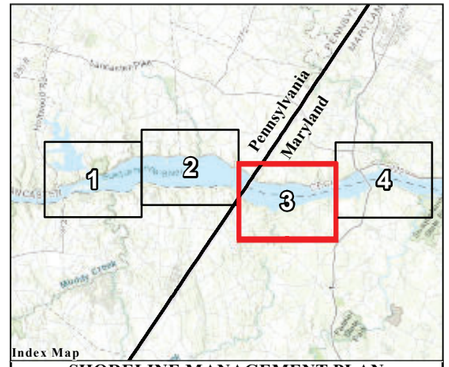

SHORELINE MANAGEMENT PLAN

Figure 5.6-1:
Cottage Clusters
Map 3

Legend

- Project Boundary
- Cottage Lot
- State Boundary
- County Boundary

N

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User

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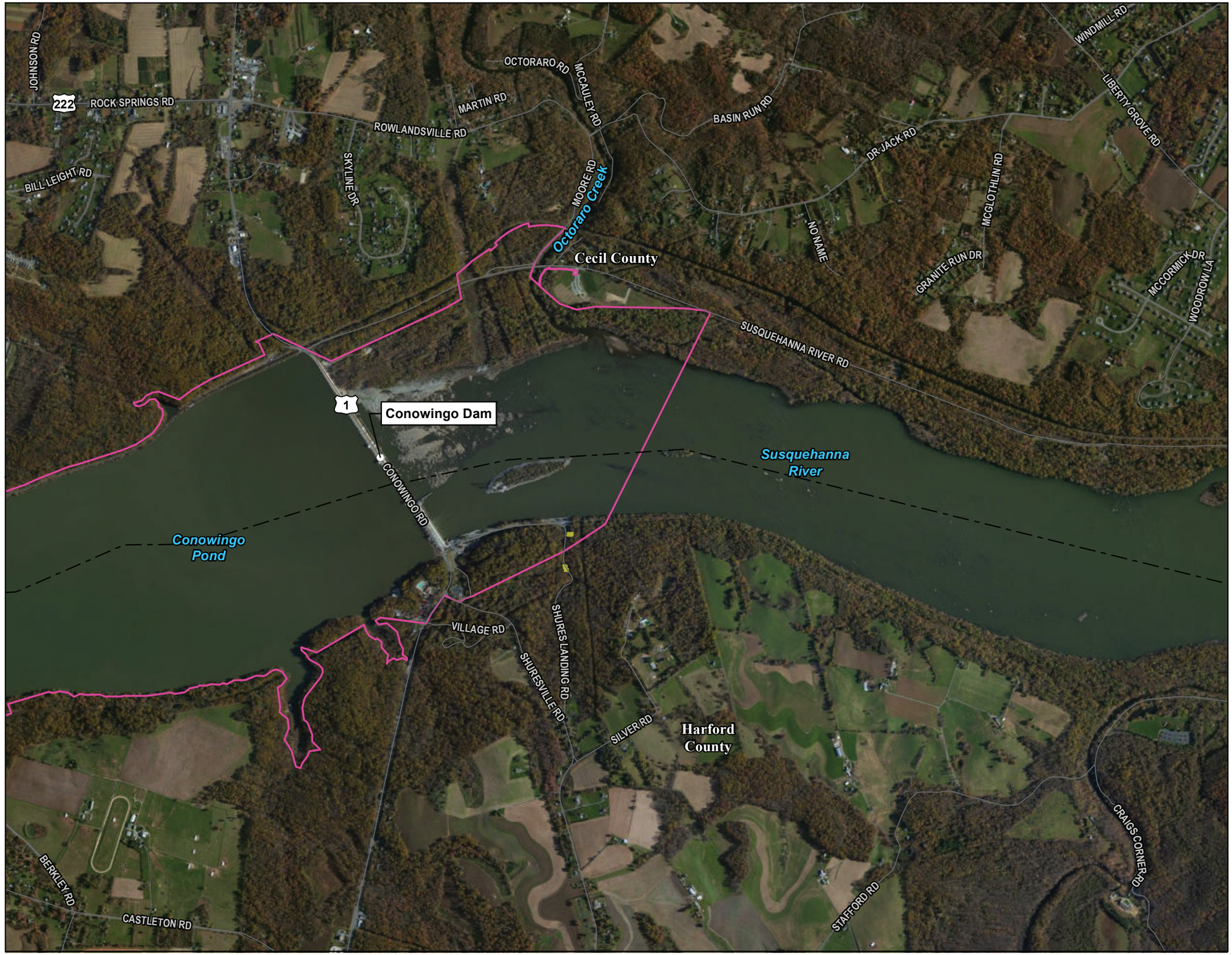

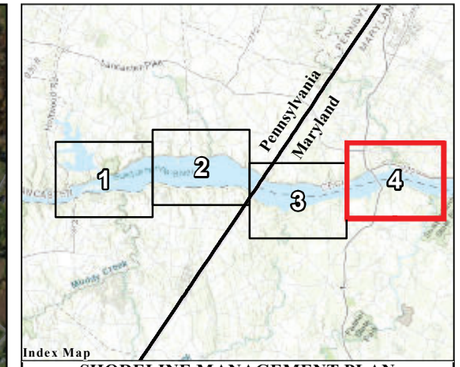

SHORELINE MANAGEMENT PLAN

Figure 5.6-1:
Cottage Clusters
Map 4

Legend

- Project Boundary
- Cottage Lot
- State Boundary
- County Boundary

N

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User

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6 SHORELINE MANAGEMENT PLAN MEASURES

Multiple resources were utilized to obtain information on the Conowingo Project area in developing this SMP. Primary resources include Project relicensing studies and federal, state and regional plans pertaining to land use, development, protection and conservation, which were reviewed to determine their relationship to Project lands. Exelon's existing land use policies and programs were also reviewed, and where necessary, revised to ensure compliance with the conditions of this SMP (refer to Appendices A through G).

6.1 Shoreline Management Policies

6.1.1 General Policy

Exelon is implementing the SMP to manage multiple resources and uses of the Conowingo Project shoreline. These policies will ensure the protection and enhancement of the Conowingo Project's recreational, environmental, historical, cultural, and scenic resources, consistent with the Conowingo Project's primary function of generating electricity.

To accommodate safe uses of lands and waters within the Conowingo Project boundary by the general public, Exelon maintains designated recreational areas for public recreation including formal camping, picnicking, hiking, fishing and other day-use activities. All other Exelon owned lands, except where specifically posted, are available for informal day use activities.

In accordance with Article 428 (a), the SMP will be reviewed and updated every 10 years, with the first update to be filed with FERC in 2030. As required by Article 428 (b), prior to submitting a proposed update to the SMP to FERC, Exelon will submit to the FWS, NPS, PADCNR, MDNR, and MDE for review and comment all proposed modifications, including an assessment of the impacts of deleted, revised, or new measures on water quality. Exelon will provide a minimum of 30 days for the entities listed above to comment and make recommendations before filing updated plans with FERC. Exelon will include with the updated plans an implementation schedule, documentation of consultation, copies of recommendations on the completed plan after it has been prepared and provided to the entities above, and specific descriptions of how the entities' comments are accommodated by the plan. If Exelon does not adopt a recommendation, the filing must include the Exelon's reasons, based on Project-specific information.

6.1.2 Shoreline Erosion Control

Modifications are allowed to shoreline vegetation in order to construct erosion control measures, provided the modifications do not impair the overall function of the vegetated buffer and are performed consistently with applicable BMPs. Trees and shrubs on steep slopes will be maintained whenever possible. If the buffer function would be impaired, a planting plan, using the native species plant list included in Appendix F of this SMP, will be devised and implemented to mitigate for the reduced function of the disturbed shoreline.

6.1.3 General Maintenance

Modifications are allowed to shoreline vegetation to maintain the health of the shoreline vegetation, provided the modifications do not impair the overall function of the vegetated buffer. Dead, dying, diseased or hazardous trees and shrubs may be removed in accordance with Section 6.1.7 below. In addition, non-native invasive vegetation may be removed, although cut vegetation (including stems, leaves, seeds and roots) shall be containerized and properly disposed of to avoid regrowth or spreading of the invasive vegetation. If the buffer function would be impaired by vegetation removal, a planting plan will be devised and implemented to mitigate for the reduced function of the disturbed shoreline. Planting plans required by actions subject to this SMP will be prepared using the native species list included in Appendix F.

6.1.4 Erosion and Remediation Policy

Exelon has identified and characterized incidences of erosion on lands in the Conowingo Project boundary. If it is determined that any erosion areas affect Project resources, Exelon will include these areas in a remediation program, monitor the areas, and perform any required improvements in accordance with applicable BMPs.

6.1.5 Woody Debris Management

Woody debris is defined as trees and woody material that extend from the shoreline into the impoundment. This material can provide important habitat for fish and wildlife and shall be left in place unless the debris is determined, on a case-by-case basis, to be a navigational or safety hazard. If the woody debris must be removed it shall be managed and disposed of in accordance with the policies outlined in the Debris Management Plan required by Article 427.

6.1.6 Approval of Non-Project Use of Project Lands

Any use of or construction on lands within the Conowingo Project boundary by a non-licensee must be permitted by the appropriate agencies and receive Exelon approval before work can begin. Parties requesting non-Project use of Project lands will be required to provide Exelon with sufficient information for Exelon to determine if the proposed use or occupancy is consistent with the requirements of the Conowingo Project license, including this SMP, and otherwise consistent with Exelon's applicable policies. Exelon will also determine whether the proposed use or occupancy can be approved pursuant to the standard use or occupancy license article (Article 430), or whether prior approval by FERC is required. If Exelon, in its discretion, decides to support the proposed use or occupancy, it will execute the necessary conveyance of rights when it has received any necessary approval from FERC and the non-licensee has obtained all necessary permits and approvals.

In addition to complying with the requirements of Article 430, prior to submitting an application to FERC for a non-Project use of Project land, Exelon will address Article 428 paragraph (c) requirements to comply with the requirements of Article 430 and to, "(i) prepare, or require the third-party requesting the non-project use of project land to prepare, a written assessment of the impacts on water quality of the proposed use; (ii) provide this assessment to MDE for review to determine whether the proposed use is consistent with Maryland water quality standards, including designated and achieved uses; and (iii) consult with MDE regarding the proposed use" prior to submitting an application to FERC for a non-project use of project land.

Exelon has developed specifications and standards associated with the cottages to address shoreline development such as piers, docks, boat ramps, and bulkheads, as well as effects on cultural resources, and compliance with local, county, state and federal laws and regulations (see Appendix C).

6.1.7 Shoreline Vegetation Management

There are approximately 46 miles of shoreline associated with the impoundments comprising the Conowingo Project including 43 miles associated with Conowingo Pond and three miles associated with the area downstream of Conowingo Dam. Much of the shoreline is currently buffered with natural vegetation.

Shoreline vegetation provides many benefits to the Conowingo Project including wildlife habitat, maintaining water quality by providing a filter strip to control run-off, erosion, and aesthetics. Existing shoreline vegetation will be preserved where feasible. It currently varies in depth depending on the location of the Conowingo Project boundary relative to the impoundment shoreline and current land use. Existing improved and developed areas with limited shoreline vegetative cover such as the cottage clusters, the PBAPS, recreation sites and facilities, and the dam and associated generating facilities, can be maintained

as they currently exist. Modifications to the shoreline vegetation in other areas will be considered for viewshed maintenance and development, recreation access, shoreline erosion control, and general Project related maintenance of the vegetated shoreline.

With the exception of any activities required pursuant to the license, prior to making any modifications to shoreline vegetation for viewshed maintenance and development and recreation access within the Conowingo Project boundary, Exelon will address Article 428, paragraph (d) requirements and "(i) prepare a written assessment of the impacts on water quality of the proposed modifications; (ii) provide this assessment to MDE for a determination regarding whether the proposed modifications are consistent with Maryland water quality standards, including designated and achieved uses; and (iii) not undertake any such modifications until MDE notifies the licensee in writing that it has no objections to the proposed modifications."

6.1.8 Viewsheds

Modifications and maintenance of vegetation is allowed to provide a reasonable view of the water, provided the modifications do not impair the overall function of the vegetated buffer. If the buffer function would be impaired, a planting plan, using the native species plant list included in this SMP, will be devised and implemented to mitigate for the reduced function from vegetation removal.

With the exception of any activities required pursuant to the license, prior to making any modifications to shoreline vegetation for viewshed maintenance and development and recreation access within the project boundary, Exelon will address Article 428, paragraph (d) requirements and "(i) prepare a written assessment of the impacts on water quality of the proposed modifications; (ii) provide this assessment to MDE for a determination regarding whether the proposed modifications are consistent with Maryland water quality standards, including designated and achieved uses; and (iii) not undertake any such modifications until MDE notifies the licensee in writing that it has no objections to the proposed modifications."

6.1.9 Access Trails

Modifications are allowed to the vegetation to provide access trails along the shoreline and to the water, provided the modifications do not impair the overall function of the vegetated buffer. If the buffer function would be impaired, a planting plan, using the native species plant list included in this SMP, will be devised and implemented to mitigate for the reduced function from vegetation removal.

Trees and shrubs may be pruned or removed to provide or maintain an access trail. Trails will not exceed six feet and should be located so that a cleared line of sight to the water through the vegetated buffer is not created. Where possible, new trails will meander, in order to trap precipitation runoff more effectively with vegetation and natural depressions within the vegetated area.

To control trail surface erosion, areas of exposed soil will be vegetated, mulched, or surfaced with a permeable material.

With the exception of any activities required pursuant to the license, prior to making any modifications to shoreline vegetation for viewshed maintenance and development and recreation access within the project boundary, Exelon will address Article 428, paragraph (d) requirements and "(i) prepare a written assessment of the impacts on water quality of the proposed modifications; (ii) provide this assessment to MDE for a determination regarding whether the proposed modifications are consistent with Maryland water quality standards, including designated and achieved uses; and (iii) not undertake any such modifications until MDE notifies the licensee in writing that it has no objections to the proposed modifications."

6.1.10 Sensitive Natural Resource Protection Overlay and Policies

Research and numerous studies were conducted to assess and determine the existence of or potential effects (if present) of project operations on various resources, including rare, threatened and endangered species, terrestrial and aquatic habitat, historic and cultural sites and structures, wetlands, unique natural areas, and steep slopes. The presence of these resources may partially or completely limit or restrict land use and/or development, regardless of the applicable land classification described above.

Prior to the implementation of any proposed modification of an existing use or new use of Project lands by Exelon or a non-licensee, Exelon will determine if the potential use would affect any sensitive resources. Exelon will survey (or require the non-licensee proposing a non-Project use of Project lands to survey) the affected land to determine if it hosts any sensitive resources not previously identified. If any sensitive resources are identified, as provided for in Article 428 (e) Exelon will consult with MDE regarding any proposed modification of an existing use of Project lands in cases where such use may affect sensitive aquatic resources. Exelon will take appropriate protective actions developed in consultation with appropriate resource agencies prior to undertaking the proposed use, or require a non-licensee proposing to use Project lands to take the same measures as a condition of conveying the right to use or occupy project lands.

6.1.11 Bald Eagle Management Plan – Article 421

Bald Eagles use Project lands and waters for nesting, roosting, and foraging. The BEMP addresses potential impacts to Bald Eagles on Exelon lands, including the project area lands for the Conowingo Project and adjacent lands under Exelon ownership.

The BEMP provides for the management of Bald Eagle habitat on Exelon lands based on recommendations from the FWS National Bald Eagle Management Guidelines and state agency guidance. Bald eagle habitat, including nest sites, forage sites, and communal roost sites on Exelon lands will be managed through a range of measures. The range of measures will be tailored to types of activities with potential to impact eagles and will include, but not be limited to, seasonal restrictions, distance buffers, and landscape buffers.

6.1.12 Osprey Management

Exelon does not maintain a database of current Osprey nests within the Conowingo Project boundary. However, when an occupied Osprey nest is identified, Exelon will follow the PGC's Best Management Practices for Occupied Osprey Nests in Pennsylvania (Appendix G, PGC, n.d.) whenever feasible. These BMPs identify three zones, or nest buffers, around an occupied nest. When Project management needs are identified that conflict with these BMPs or may disturb nesting Osprey in any way, Exelon will consult with the FWS Chesapeake Bay Field Office, PGC, and the US Department of Agriculture Wildlife Services[5] to determine appropriate avoidance measures. PGC's published BMPs do not address problem nests located in electric transmission towers. In the event that nests located in electric transmission towers or other structures are identified as problem nests, Exelon will consult with the FWS, PGC, and the US Department of Agriculture Wildlife Services to identify the appropriate BMPs and obtain applicable permits for nest removal or relocation. A typical BMP for problem nests in towers is the installation of nest platforms on towers nearby.

[5] MDNR provided the following information for contacting the US Department of Agriculture Wildlife Service: 1-877-463-6497 (personal communication, B. Harvey, MDNR, July 2021).

6.1.13 Historic Properties Management Plan – Article 429

Exelon has developed, in consultation with PHMC and MHT, a draft HPMP to address historic and cultural resources within the Conowingo Project's APE. In accordance with Article 429 Exelon will prepare and file a revised HPMP based on the HPMP filed with the Commission on August 31, 2012. The HPMP is incorporated herein by reference.

6.1.14 Conowingo Island Public Use Policy

The policy establishes guidelines for the use of the islands located in the upper reach of Conowingo Pond from the Pennsylvania Route 372 bridge to approximately one mile downstream, as well as Mt. Johnson Island, which is located five miles downstream of the Route 372 bridge. The policy restricts and regulates island use in order to protect rare species, cultural resources, and unique geologic and physical features. The "Conowingo Islands Public Use Policy" is included as Appendix B. The Rules and Regulations Governing the Use and Occupancy of Leased Premises are currently being updated and up-to-date revisions will be posted on Exelon's Conowingo, FERC License Renewals website under a Shoreline Management Plan (SMP) link.

6.1.15 Leased Premises Policies

6.1.15.1 Cottages

Exelon has developed rules and regulations regarding the use of Project lands for seasonal cottages. Lessees are required to comply with all applicable local, state and federal laws for the development and use of the land, as well as the Exelon imposed land use rules. Exelon rules and regulations for cottages address such issues as erosion control, vegetation removal, wastewater disposal, shoreline development, and cultural resource protection. Rules and regulations have been developed for Pennsylvania and Maryland cottages, and copies for each State are attached as Appendix C and are currently being updated to reflect the applicable provisions of the License.

It is Exelon's policy not to create any new cottage lease lots within the Conowingo Project boundary. In addition, as existing cottages are abandoned or become damaged and are not replaced due to local zoning restrictions, leases will be terminated. All structures and improvements removed from the leased lot and the property will be restored to a natural condition. No future cottage leases will be issued at the site.

6.1.15.2 Public Recreation and Access Facilities

Exelon leases numerous parcels of land to local, county and state agencies and to commercial vendors for development and operation of public recreation and access facilities within and adjacent to the Conowingo Project boundary. The agreements specify that the respective lessees will use the properties for park and public recreation access and facilities and comply with all applicable local, state and federal regulations. All of these sites and facilities within the Conowingo Project boundary are Project recreation facilities under Exelon's FERC license.

Exelon has developed "Rules and Regulations Governing the Use and Occupancy of Leased Premises" and have made this part of the lease agreements for the two existing Project marina facilities, Glen Cove Marina and Peach Bottom Marina and will be updated as needed. These rules and regulations parallel those developed for the cottages in addressing many of the same issues, and a copy is attached as Appendix D.

Exelon will continue to partner with the agencies and vendors for the operation of these facilities and their use by the public. As the Licensee, Exelon ultimately has responsibility for the operation and maintenance of the Conowingo Project facilities.

6.1.16 Policy Restricting Certain Recreational Uses

Exelon provides public recreation and access to Project lands and waters pursuant to its FERC license requirements. Access and use of certain portions of Project lands will be restricted for operational, safety and security reasons.

Fishing: Fishing in Project waters accessible to the public will be governed by applicable state regulations. Fishing will not be allowed within secure areas or areas that present public safety concerns of the Conowingo Project. This includes shoreline fishing within 100 yards of the base of Conowingo Dam at Fisherman's Park (west shore) and for 4,000 feet along the east shoreline downstream of the dam. These areas are restricted for public safety reasons due to changes in water elevations and velocities from generating flows and spilling water during gate operations. In addition to safety concerns, the area along the west shore is also used as a staging and storage area related to dam maintenance.

Boating: Boating in Project waters accessible to the public will be governed by applicable state regulations. Boating is prohibited in areas 400 yards above and 400 yards below Conowingo Dam pursuant to the Code of Maryland Annotated Regulations, Title 08.18.26.05. The boating exclusion zones are marked by buoys on Conowingo Pond and by signs downstream of the dam.

Hunting: Hunting on Project lands accessible to the public will be governed by applicable state regulations. Hunting will not be allowed on Project lands posted against hunting by Exelon, as necessary, to protect the public, adjacent landowners, lessees, employees, sensitive resources, and Licensee's operating capabilities. Hunting on Project lands accessible to the public will be governed by Exelon policies and applicable state regulations.

Exelon issues permits for offshore (water access only) stationary duck blinds and duck blind sites on Exelon land to hunters on an annual basis. The permits allow applicants (up to four individuals per permit) to have no more than two blinds or sites.

Off-Road Vehicles: Use of off-road vehicles on Project lands is prohibited. Exceptions may be made for company related purposes for employees and contractors, emergency personnel, agency personnel during their normal duties, and instances where an off-road vehicle is for ADA access for an approved activity or use.

Drones: Use of drones on Project lands is prohibited unless pre-approved by Exelon. The policy is attached as Appendix E.

7 MONITORING AND COMPLIANCE BY NON-PROJECT USERS OF PROJECT LANDS

Exelon will ensure that uses and occupancies of Project lands are consistent with the license's requirements for the protection and enhancement of environmental resources, scenic character, historic and cultural resources, the provision of public recreation, public health and safety, and the safe operation of the Conowingo Project's generating facilities.

Each conveyance of the right to use or occupy Project lands for a non-project purpose will be made subject to Exelon's obligation to comply with the Conowingo Project license. To facilitate compliance, Exelon will periodically monitor and assess affected lands and any structures thereon, as necessary. If a non-licensee fails to cure any violation of its agreement with Exelon or acts to prevent Exelon from exercising its rights with respect to monitoring and access, Exelon will revoke the conveyance and require the non-licensee to remove any improvements on Project property and restore the site to its pre-conveyance condition. In addition, each conveyance will reserve Exelon's right to take legal action as necessary to enforce the agreement or obtain remedies for breach of the agreement.

8 AMENDMENTS

In order for the SMP to remain a functional plan over the life of the FERC license, Exelon will evaluate appropriate amendments to the SMP as the facts and circumstances may warrant.

As required by Article 428 (a), the SMP will be reviewed and updated every 10 years, with the first update to be filed with FERC in 2030. Prior to submitting a proposed update of the SMP to FERC, in accordance with Article 428 (b), Exelon will submit to the FWS, NPS, PADCNR, MDNR, and MDE for review and comment of all proposed modifications, including an assessment of the impacts of deleted, revised, or new measures on water quality. Exelon will provide 30 days for the entities listed above to comment and make recommendations before filing updated plans with FERC. Exelon will include with the updated plans an implementation schedule, documentation of consultation, copies of recommendations on the completed plan after it has been prepared and provided to the entities above, and specific descriptions of how the entities' comments are accommodated by the plan. If Exelon does not adopt a recommendation, the filing must include the Exelon's reasons, based on Project-specific information.

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APPENDIX A. BEST MANAGEMENT PRACTICES FOR WATER QUALITY PROTECTION CONOWINGO SHORELINE MANAGEMENT PLAN

Best Management Practices

Conowingo Shoreline Management Plan

Table of Contents

BMP Implementation Criteria

This SMP outlines management measures which apply to all of the lands within the Conowingo Project boundary. In addition to the overall measures contained in the SMP, Exelon will incorporate, where applicable, the Best Management Practices (BMPs) included herein to the extent practicable. In addition, improvement projects which occur on Project lands that involve earth disturbance and are subject to land use permitting requirements (site plan or building permits) must also be in compliance with all applicable municipal, county, state, and federal permitting requirements associated with erosion and sedimentation measures and control.

Project Facility Landscaping and Lawn Care BMPs

Proper Storage and Handling of Chemicals

- Store chemicals in a secure facility with an impervious floor and good ventilation. The floor should have a curb, sump, or lip to contain spilled contaminants.
- Research proper construction materials and designs for storage facilities.
- Provide a secondary containment system that will hold a larger volume than the largest container/tank used.
- Store the chemicals in their original containers and organize them according to application (herbicides, pesticides, insecticides).
- Prior to use check equipment calibration and look for leaking, especially valves and overflowing tanks.
- Develop a permanent mixing/loading and washing zone on an impervious surface where washwater can be easily contained or collected. Note: Pesticide washwater should be handled separately from other washwater unless a system has been developed to handle both.
- Always follow the directions pertaining to the storage, mixing, and disposal of chemicals that are on the labels.
- All areas involved in the storage, mixing, or disposal of chemicals should be located away from surface, ground, and well-water sources.
- Maintain a current material safety data sheet for each chemical on-site. Employees should be made aware of how to safely apply chemicals.
- Have an on-site emergency plan in the event of an uncontained spill or another emergency including information on what emergency response teams to notify (LandStudies Inc. & Pennsylvania Environmental Council 17).

Selection and Application of Chemicals

Selection

- Choose chemicals with short half-lives, low toxicity, and medium sorption rates to reduce the effects of leaching and reduce runoff.
- Consider how quickly a chemical accumulates in live tissue.
- Don’t use broad-spectrum herbicides, use the most specific chemicals available.
- In general limit the use of pesticides with soils that have a persistence greater than 21 days, a soil adsorption value less than 300, and a solubility greater than 30 mg/l (per the Delaware River Basin Commission).
- Avoid using wettable powders, which are more prone to runoff.
- Vary which chemicals you use to reduce pest resistance.
- Select turf species that are resistant to pests and disease.
- Limit practices or the use of products that could possibly contribute to pollution.

Application

- Consider the weather conditions prior to application. Spray drift is affected by particle size and wind. Rain within 12 hours of application can greatly increase chemical runoff. Depending on the mode of action of the applied chemical, light irrigation or rain can increase the amount of chemical reaching the soil.
- Calibrate and check that equipment application rates are appropriate.
- Strictly follow product labels.
- Regularly look for ways to improve soil health. This will improve turf health and increase its defense against pests and disease and it will limit the amount of chemical treatment required.
- Use the life cycle of pests to determine when they are most vulnerable and time when chemicals are applied.
- Record when chemicals were applied and the effectiveness of the application for future management.
- Prior to application consider environmentally sensitive areas such as groundwater recharge areas (sinkholes, highly permeable soils, soils with low adsorptive capacity, wells), surface water bodies, and non-target areas (water bodies, natural areas and wildlife). Decide if treatment is necessary and which chemicals to use. Spot treatment or the use of covered booms may be appropriate (LandStudies Inc. & Pennsylvania Environmental Council 19).

Development of a Nutrient Management Plan

- Use quick release fertilizers primarily for turf establishment. For other areas use slow release fertilizers which release nutrients at a pace which is similar to the nutrient intake rate of the plants.
- Do not apply nutrients on frozen ground.
- Follow nutrient application recommendations from a reliable source.
- Mow, topdress, and aerate to maximize fertilizer effectiveness (LandStudies Inc. & Pennsylvania Environmental Council 21).
- Apply appropriate fertilizers and amounts based upon the plant needs for that area.
- Create non-fertilized buffers along bodies of water.
- Use slow-release fertilizers on or near steep slopes and sandy soils.
- Do not use fertilizers to deice anything.
- Stabilize disturbed soils quickly.
- Route drainage systems to low-maintenance filtering zones such as tall grass (LandStudies Inc. & Pennsylvania Environmental Council 22).

Buffer Strip Vegetation

- New vegetation should be chosen from Exelon’s native plant list included in the Shoreline Management Plan for the Project.
- Limit or eliminate fertilizer or chemical use in buffers to maximize their filtering abilities.
- Buy vegetation from local nurseries.
- Monitor and maintain health of buffers using a pest management plan.
- Install signs and fencing to protect buffers.

- Do not dispose grass clippings or pruning within buffers.
- Mow buffers once or twice a year, but make sure it is done in accordance with any applicable RTE species management plans (LandStudies Inc. & Pennsylvania Environmental Council 32).

Composted Materials Usage

- Composted material should include grass and other herbaceous clippings, green leaves, non-fat/non-animal food wastes, and small woody material. This mixture will help fight diseases your vegetation may encounter.
- Maintain the correct proportions of air, water, carbon, nitrogen and pH. Appropriate levels of each will kill undesired weed seeds.
- Consult multiple sources before beginning to compost (LandStudies Inc. & Pennsylvania Environmental Council 35).
- Use compost on clay soils to reduce surface crusting and compaction, provide nutrients, promote drainage, and improve overall soil structure.
- Use compost on sandy soils to add nutrients, increase microbial activity, and increase the capacity of the soil to hold nutrients and water.
- Use core aeration to better incorporate the compost with the soil.
- Use a 3:1 ratio, by volume, of carbon-rich material (dried leaves) to nitrogen-rich material (clippings).
- Compost material for two years to maximize the benefits for the turf.
- Test the compost for nutrients prior to application and adjust fertilization practices accordingly.
- Review and familiarize yourself with local and state regulations before beginning a compost operation (LandStudies Inc. & Pennsylvania Environmental Council 36).

Pet Waste Education/Treatment

Definition

Teaching visitors the benefits to water quality from cleaning up after their pets.

Purpose

Animal waste washed into the water supply decrease oxygen supplies, carry diseases and promote eutrophication (weed and algae growth). All of which have negatively effects on water quality.

Conditions Where Practice Applies

Public recreational locations where people own and interact with pets.

Design Criteria

Launch an education campaign describing the negative effects of leaving pet waste alone and emphasize the effects on water quality.

Install signs in public spaces asking owners to pick up after their pets.

Create stations in parks, recreational areas, or other public places with plastic bag dispensers for owners to use.

Pet waste shall be picked up and disposed of appropriately by the pet owner. Removal of pet waste from the public recreation facility shall be the responsibility of the pet owner.

Maintenance

These programs require residents and recreational users to enforce the practice amongst themselves.

Signs may need to be installed.

Generic Design Parameters

NA

Structural and Natural BMPs

Vegetated Riparian Buffers

Definition

Areas of natural vegetation maintained to protect the water quality of nearby water bodies of conveyances.

Purpose

To trap sediment, improve groundwater recharge, and slow runoff.

Conditions Where Practice Applies

For all new activities, riparian buffers may be created wherever vegetation can be supported next to bodies of water, especially on floodplains, near wetlands, on unstable slopes, or along streambanks.

Design Criteria

Make sure soil is not compacted.

Determine buffer width using slope, species of vegetation, runoff sediment characteristics, annual rainfall, pollutants and potential volumes, soils, and depth to impermeable layers.

Increase buffer width as slope increases.

Mix various types of vegetation, shrubs, grasses, and trees.

In areas where there is fast, concentrated flow incorporate other measures such as level spreaders to prevent erosion and rilling.

Maintenance

Initially buffers can require weed/pest control, fertilizing, mulching, seeding, mowing, irrigating, and pruning. Once installed check the buffer after heavy rainfall or once a year, focusing on the development of gully erosion, vegetation density, damage from foot or vehicle traffic, or damage from concentrated flows. When or if 6” of sediment has accumulated remove it.

Generic Design Parameters

Slopes should be less than 5 percent unless erosion control blankets are used (“Vegetated buffers” 2006).

Rain Garden/Bioretention Pond

Definition

Parking lot islands or small landscaped areas used to detain and treat stormwater runoff.

Purpose

To slow and treat water before it is collected in storm drain systems.

Conditions Where Practice Applies

Rain Gardens/Bioretention Ponds will be considered for all future new construction or major rectonstruction. This BMP is not applicable to existing facilities.

Raingardens may be used in locations where there are concentrations of pollutants greater than in normal stormwater only when an impermeable layer has been installed along the bottom of the filter bed.

Raingardens may be developed in highly urban areas because they can fit into parking lot islands.

Design Criteria

Bioretention areas should usually be implemented with drainage areas less than 5 acres. Designing for larger drainage areas can present clogging and conveyance issues.

The slope of the drainage area is usually around 5 percent.

The raingarden should be higher than the highest groundwater table elevation in order to prevent groundwater contamination.

The raingarden should be able to direct flow to a nearby storm drain in the event of overflow during a large storm event.

In terms of landscaping most of the plants used should be native. Plants towards the bottom of the raingarden should be able to withstand wet and dry conditions. Plants at the top of the bioretention facility should be durable and resilient, while plants of the edges should be dry.

When the soils are beneficial to infiltration process the underdrain may only be installed under some of the raingarden; otherwise, install the perforated pipe underneath the entire raingarden.

Maintenance

Standard (as needed)

- Remulch
- Treat diseased plants
- Mow grass/turf

After Project Completion

- Water plants daily for 2 weeks

Monthly

- Inspect soil and repair eroded sections
- Remove litter and debris

Twice a Year

- Remove and replace dead/diseased vegetation

Once per Year

- Add mulch
- Replace tree stakes and wires

Generic Design Parameters

Raingardens are not flood control devices.

The size of a raingarden should be 5-10 percent of the impervious area draining to it.

The soil bed should be comprised of a sand/soil mix with a layer of mulch on top of it. The raingarden should be able to hold a small 6-9" deep pond on top of these layers of soil.

Consider using pretreatment measures such as a vegetated channel to eliminate some of the sediment and pollutants from the runoff and reduce the burden put on the rain garden ("Bioretention (rain gardens)" 2006).

Rain Barrels

Definition

Large containers used to collect rooftop runoff from.

Purpose

To collect the runoff from roofs and improve overall water quality by disconnecting impervious areas.

Conditions Where Practice Applies

Structures that have roofs and receive large quantities of rainfall.

Rain barrels will be considered for all future new construction or major rectonstruction. This BMP is not applicable to existing facilities.

Design Criteria

Consider using another method unless the water being stored will be used actively by the resident/business owner in gardening, landscaping, or in some other facet.

A plan for overflow and freezing conditions should be considered.

Maintenance

Keep the hose off the ground to avoid freezing/cracking. Clean out the tank once a year. Maintain a tight seal around the barrel to prevent mosquito breeding.

Generic Design Criteria

Use a drip tape or common garden hose for watering.

Control flow through the hose using an adjustable valve.

Storm Drain Marking

Label any newly constructed storm drain that enters surface water. Complete annual survey of storm drain covers, refresh labels as necessary.

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APPENDIX B. CONOWINGO ISLANDS PUBLIC USE POLICY

CONOWINGO ISLANDS

PUBLIC USE POLICY

The "Conowingo Islands" are a group of islands located in the Susquehanna River (Conowingo Pond) extending from the Norman Wood Bridge (PA Route 372) south approximately 1.3 miles and including Mount Johnson Island located 5 miles south of PA Route 372. The islands "... constitute one of Pennsylvania's most unusual and important assemblages of rare species (Cook, 1986). The Islands also posses unique geological and other physical features (Erdmann, 1978) and important cultural resources. The Philadelphia Electric Company and its subsidiaries, The Susquehanna Power Company and Philadelphia Electric Power Company recognize the importance of these Islands and have developed this policy to maximize the protection afforded the Islands.

It is the policy of the Philadelphia Electric Company, The Susquehanna Power Company and Philadelphia Electric Power Company that use of the Islands will be restricted to:

1. Employees of Philadelphia Electric Company and Susquehanna Electric Company in performance of their official duties

2. Persons conducting bona fide scientific studies on the Islands and who have obtained prior written permission from the Real Estate Department, Philadelphia Electric Company

3. Persons participating in group tours approved in writing by the Real Estate Department, Philadelphia Electric Company

4. Tenants (and invited guests) of the Philadelphia Electric Power Company who have a current Agreement of Lease for use of (or portion of) said Islands

5. Personnel of either a law enforcement or regulatory agency, having jurisdiction over the islands, in performance of their official duties, and

6. Employees of approved contractors for the Philadelphia Electric Company, The Susquehanna Power Company or Philadelphia Electric Power Company in the performance of their official duties.

All persons not meeting one of the six critieria described above will be considered to be tresspassing and are subject to prosecution under the law.

RULES AND REGULATIONS GOVERNING THE USE AND OCCUPANCY OF LEASED PREMISES ON ISLANDS

PURPOSE

The Islands located in the Conowingo Pond contain important biological and cultural resources. The Company recognizes the importance of these valuable resources and seeks to protect them. In addition, the Conowingo Hydro-electric Project is a federally licensed project and the Company is required under its License to protect the environmental, scenic, and cultural resources found in the project. As tenants of the Philadelphia Electric Power Company you also have an obligation to help protect these important resources.

The following rules and regulations have been developed specifically for Island tenants. All conditions, procedures, and restrictions contained in the "Rules and Regulations Governing The Use and Occupancy of Leased Premises" shall apply.

GENERAL CONDITIONS

1. Tenants and their guests are responsible for helping to protect the exceptional biological, cultural, and physical features of the islands.

2. Tenants shall restrict their regular use activities on the islands to their leased premises except when required for a means of access to their leased premises.

3. Tenants are restricted to one access (or landing area) per tenant. Tenants are encouraged, when possible, to share access areas. All access areas must be properly stabilized to prevent erosion. A path from the landing area to the leased premises must be designated and properly maintained.

4. Tenants are required to report (as soon as practical) to the Real Estate Department any unauthorized use(s) of the Islands. The tenant shall supply the Department as much information about the violator(s) as possible. Pertinent information may include; boat registration numbers, hunting or fishing license numbers, physical description of persons, date, time, location, activity, etc. Violations of State laws should be reported directly to the appropriate state law enforcement Agency(Fish Commission, Game Commission, or State Police).

5. Tenants must display their cottage identification number (C.I.N.) on the stern of their boat(s) using 3 inch high letters.

6. Tenants will not be allowed to expand their existing structures or add any new structures. Exceptions may be made if the proposed structure will reduce other negative impacts to the island (ex. boardwalks).

7. Tenants are not allowed to use any rock outcrop areas (except for currently existing uses) because these areas are very fragile and ecologically important. Tenants are encouraged to phase out existing uses of these areas.

VEGETATION

1. Tenants shall not plant any type of non-native vegetation (including trees, shrubs, vines, flowers, grass, etc.) without obtaining prior written permision from the Real Estate Department. If you have any questions or doubts, contact the Department by telephone (215 841-6894) or in writing for clarification.

2. **NO** trees, shrubs, vines, flowers or vegetation of any kind may be removed from the island. No vegetation of any kind may be cut or trimmed except for the regular trimming of ornamental shrubs and mowing of lawns.

3. The Department may require the tenant to remove any non-native plants.

4. Many of the islands and adjacent shallow water areas contain plants that are listed as species of special concern by the Commonwealth of Pennsylvania.
NOTE: It is a violation of State Law to "... disturb, pick, take possess, destroy, mutilate, remove, collect, or transplant plants classified as Pennsylvania Endangered or Pennsylvania Threatened..."

5. Certain Islands or portions of Islands may be designated as ecological resource protection areas and will be off limits to all unauthorized personnel.

CULTURAL RESOURCES

1. No digging of any type is allowed on any island except as authorized in writing by the Real Estate Department under paragraphs 2 and 3 of this section.

2. A Building License Application must be submitted to the Department prior to beginning any construction activity or removal of existing structures. This provision also applies to any repair work that requires excavation or the placing of fill on the islands.

3. Tenant is required to obtain the approval of the Pennsylvania Historical and Museum Commission for any new construction or repairs that will require subsurface soil disturbance.

4. Upper and Lower Bear (Bare) Islands are on the National Register of Archeologcial Sites. The disturbance of any archeological site (whether previously known or not) is a violation of federal law.

5. Certain Islands or portions of Islands may be designated as cultural resource protection areas and will be off limits to all unauthorized personnel.

EROSION CONTROL MEASURES

1. Tenant is responsible for correcting or controlling any erosion problems resulting from their use of the leased premises, even if the problem is not on the leased premises.

2. Non-structural erosion control measures should be utilized if sufficient to correct or control the problem. These measures include using vegetation and/or rip rap.

FOR INFORMATION OR QUESTIONS, CONTACT:

Real Estate Department
Philadelphia Electric Power Company
2301 Market Street
Philadelphia, PA 19101 (215) 841-6894

Conowingo Recreation Office & Visitors Center
P. O. Box 71
Conowingo, MD 21918 (301) 457-5011

TO REPORT VIOLATIONS OF STATE LAW:

PENNSYLVANIA FISH COMMISSION:
Jim Wagner (717) 786-4662

PENNSYLVANIA GAME COMMISSION:
Southeast Division Office 1 800-228-0791

PENNSYLVANIA STATE POLICE:
Lancaster (717) 367-4141

APPENDIX C. COTTAGE RULES AND REGULATIONS (PENNSYLVANIA AND MARYLAND)

RULES AND REGULATIONS – MARYLAND

I. GENERAL CONDITIONS

A. General Information

All questions and inquiries should be directed to:

Exelon Generation Company LLC (Landlord)
Conowingo Hydroelectric Generating Station
Attn: Cottage Program Manager
2569 Shures Landing Road
Darlington, MD 21034
Telephone: 610-765-5200

B. General Conduct

1. Tenant shall use the leased premises ("Premises"), which is part of Landlord's Conowingo Hydroelectric Project ("Landlord's Property") as a vacation retreat and for recreational activities only. Tenant shall not use or occupy the Premises as a domicile, primary or permanent residence. Tenant shall not permit any person or persons to use or occupy the Premises as a domicile, primary or permanent residence. "Domicile" means the place at which a person has been physically present and that the person regards as home. "Residence" means the act or fact of living in a given place for a period of time with an intent to treat it as a home. TENANT MUST EXECUTE THE CABIN AFFIDAVIT ATTACHED TO THE LEASE. Landlord has the right to verify Tenant's primary address, including but not limited to requiring Tenant to provide acceptable proof of domicile and residence.

2. The predominant use and occupation of the Premises should be by the Tenant and the Tenant's family, not by guests or other occupants of the Tenant. Guests or other occupants of the Tenant must not stay, without the Tenant present, for longer than two weeks at a time.

3. All of the conduct required of the Tenant shall be required of Tenant's guests, and Tenant shall ensure that such guests adhere strictly to the Rules and Regulations and all Laws. Tenants are responsible for the actions of their guests and occupants.

4. Tenant shall not assign or otherwise transfer or encumber the lease of the Premises ("Lease") without the prior written consent of Landlord. Tenant may only assign or otherwise transfer the Lease to an individual person (not to exceed two). Any attempted transfers to a trust, corporation, partnership, limited liability company ("LLC"), or any other legal entity shall be null and void. See Section II D below. Tenant shall make all requests for Landlord's

consent to assignment in accordance with these Rules and Regulations. Any assignment without the prior written request of Landlord shall be null and void. This includes among family members. Tenant shall not enter into any type of arrangement with anyone else regarding the use and occupancy of the Premises, including but not limited to sub leases, “caretaking” or any other arrangement that exchanges money and/or services for the use and occupancy of the Premises.

5. Tenant shall not permit any noise or other nuisances to interfere with the quiet enjoyment of other Tenants’ use of their properties or with the use and operation of Landlord’s Property as determined by Landlord in its sole discretion. Landlord shall have the right to require that Tenant immediately cease and desist any such noise or other nuisance.

   Landlord has the right to permit or prohibit or adopt reasonable restrictions with respect to Tenants displaying flags, signs, banners, images or outside displays of any nature visible to the public on the exterior of the Premises or visible from outside of the Premises. Landlord shall also have the right to require that any Tenant immediately cease and desist displaying flags, signs, banners, images or outside displays of any nature visible to the public on the exterior of the Premises or visible from outside of the Premises that are offensive, obnoxious, indecent or seriously annoying or intolerable to members of the community as reasonably determined by Exelon. Notwithstanding the foregoing, Tenants may display the American Flag, the Maryland state flag, and flags of the United States Armed Forces, POW/MIA flags, and the flag of the Maryland National Guard.

6. Tenant shall not cause or allow un-permitted or uncontrolled fires. No open fires are permitted except in properly constructed barbecue pits and any burning must comply with all federal, state and local laws, rules, regulations and ordinances (“Laws”). No open burning of leaves or other vegetation debris is permitted.

7. Tenants and their guests are not permitted to park or store vehicles, boats or boat trailers overnight on Landlord’s property outside the Premises. Tenants and their guests are permitted to park a reasonable (in the sole determination of Landlord) number of vehicles, boats and boat trailers on the Premises, during periods of occupancy, as long as they have a current valid registration which is clearly visible.

8. Tenants are not allowed to park or store any type of construction or commercial vehicle, machinery, camper, trailer or RV on any Landlord property.

9. The use of any vehicles off road (including but not limited to trucks, ATVs, UTVs, motorcycles, etc.) on any Landlord property is prohibited.

10. Hunting and the use of firearms or other weapons is prohibited on all Landlord property.

11. Tenants are not permitted to accumulate possessions on the Premises that are not properly stored, and in no event store any debris, junk, etc. All storage sheds and other storage containers must be approved in writing by the Landlord per Section II B or will otherwise be required to be removed. The number of storage units and amount of personal property kept on the Premises will be limited to a reasonable amount (in the sole determination of Landlord). This includes firewood.

12. The six (6) digit Cottage Identification Number (CIN) which has been assigned to each Cottage must be placed on the outside wall of the cottage facing the water and also one facing the primary road/driveway/path that leads to the cottage entrance from the land, and must be clearly visible. If the cottage has been assigned an EMS (emergency services) address, that address (# and street name) must also be posted with the CIN. All posted characters must be at least 4 inches in height, treated with a reflective material and in a color contrasting with the sign background.

13. The six (6) digit Cottage Identification Number (CIN) must also be marked in at least 2-inch characters on all garages, sheds, large storage containers, docks, piers, car ports and any other large stand-alone structures and improvements.

14. All dogs must be kept securely tied or on a leash at all times. The number of dogs or cats at the Premises at any one time should be kept to a reasonable number (in the sole determination of Landlord), and not create a nuisance in any way including noise, aggressive behavior and the failure to immediately clean up after them. No other types of pets or animals are allowed without prior written Landlord permission.

15. Tenants are not permitted to use the Premises as a business location for the production or sale of goods and/or services nor engage in any commercial activities, including without limitation operating or leasing campgrounds or dock facilities.

16. Immediately upon discovery, Tenant must report any potentially hazardous condition to the Landlord and, as required by law, to the appropriate state and local authority or agency.

17. Tenant shall be responsible for the correction and/or control of any erosion caused by or resulting from improvements, and/or changes made to, or on the Premises. Landlord may require Tenant to rectify any erosion problems on or affecting the Premises. Landlord has no duty to Tenant to correct any naturally occurring erosion problems.

18. Tenants are not required to carry $1M of liability insurance, whether stated in their Lease agreement or not. Tenants should consult with their insurance agent and make their own decisions regarding what types and levels of insurance coverage are advisable. Landlord does not provide insurance coverage for the Tenants' interests. Landlord has obtained additional insurance that provides coverage only for Landlord's liability with respect to the cottage properties.

19. The use of fireworks or any explosives is prohibited on all Landlord property.

20. The Rules and Regulations contained herein are not intended to substitute for or absolve Tenant of his or her legal responsibility to comply with all applicable Laws. In a situation where the Rules and Regulations contained herein are in conflict with, or are less restrictive than, the applicable federal, state, or local Law, the more restrictive statute, rule, regulation, or ordinance shall apply.

II. IMPROVEMENTS

A. Definition of Improvements and Removal of Improvements

1. In these Rules and Regulations, "improvements" shall mean and include all dwellings, fixtures, utilities, outhouses, sheds, decks, porches, patios, buildings, roads, driveways, pathways, bridges, fences and Shoreline Improvements (defined in Section VII) and any other structures or material constructed by or placed on the Premises by the Tenant or any former tenant, whether or not said improvement is affixed in any manner to the land.

2. All improvements shall remain the personal property of the Tenant at all times and shall be removed by the Tenant upon the termination of the Tenant's Lease, unless Landlord has approved the transfer to a new tenant. Tenant is responsible for any and all costs incurred by Landlord should Landlord elect to remove Tenant's improvements after the termination of Tenant's Lease.

B. Construction and Demolition

1. WITH A FEW EXCEPTIONS AS NOTED IN THESE RULES, THERE WILL BE NO CONSTRUCTION PERMITTED WHICH ENLARGES THE SIZE OF THE EXISTING IMPROVEMENTS. Landlord is not responsible for constructing, maintaining, repairing, replacing, re-constructing or demolishing Tenant's improvements.

2. Should Tenant wish to perform construction, to demolish an existing improvement, or to renovate, alter or replace an existing improvement in any manner ("construction"), a Construction Application must be submitted

to the Landlord (with all appropriate attachments) REGARDLESS OF WHETHER ANY OTHER AGENCY OR ORGANIZATION REQUIRES PERMITTING OR APPROVAL. The Construction Application must be submitted to the Landlord prior to applying for any applicable permits or beginning any construction. All expenses incurred by Tenant related to such construction or demolition, including Landlord's consent, shall be the sole responsibility and risk of Tenant. No Construction nor permit activities should begin until the Tenant receives formal written permission from the Landlord.

3. Construction Applications must contain a detailed plan and drawing including but not limited to: materials to be used, methods of construction, a site map with project location, project drawings with dimensions covering at least two sides or cross-sectional views, photos of the existing project location and a list of required permits/permissions and the agencies requiring them. Tenant is responsible for determining which Laws apply to their proposed construction or demolition activities and to contact the applicable government or agency as required by said Laws. See Attachment 1 for the Construction Application.

4. No construction shall be permitted that expands beyond the size of the existing improvements, except as permitted under Rules II 5 and 6 below, provided however, approval of construction is at the sole discretion of Landlord.

5. A new deck may be approved if all of the following conditions are met:

    a. A complete Construction Application must be submitted and approved.
    b. Any new deck plan plus any existing decks, patios, porches or the equivalent cannot exceed a total of 200 square feet.
    c. Any new deck must be constructed with pressure treated lumber or a manufactured equivalent.
    d. Deck plans must be kept basic, cannot be covered and must meet all code requirements including proper railings.All required permits must be obtained, after receiving written Landlord permission to proceed with permitting

6. A new shed may be approved if all of the following are met:

    a. A complete Construction Application must be submitted and approved
    b. Any new shed plan plus any existing sheds, outbuildings or equivalent cannot exceed a total of 150 square feet at the most, and Exelon reserves the right to limit a new shed to a smaller size.
    c. Sheds will not be permitted to have concrete foundations.
    d. All required permits must be obtained, after receiving written Landlord permission to proceed with permitting

7. If a cottage is fifty percent (50%) or more destroyed by fire, flood or other casualty, as determined by Landlord, Tenant will not be permitted to rebuild and the Lease will be terminated.

8. Tenant must be in compliance with the terms of the Lease, including but not limited to being current with any Rent or other sums due and payable, prior to submitting a Construction Application.

9. Construction Applications will be subject to written approval of Landlord. Landlord may approve or deny a Construction Application in its sole discretion. If the Construction Application is acceptable to Landlord, Landlord shall issue to Tenant a preliminary approval in writing. If the Construction Application is denied, Landlord will give Tenant written notice of such denial.

10. Within ninety (90) days after Landlord's preliminary approval of the Construction Application and prior to beginning any work, Tenant must obtain all permits and licenses required by all Laws ("applicable permits") and provide copies of all such permits and licenses to Landlord.

11. Upon receipt of the applicable permits and licenses for the work approved by Landlord, Landlord shall issue written final approval of the Construction Application to the Tenant.

12. The final approval issued by Landlord expires one (1) year from the date of issuance. If the approved construction is not completed on or before the expiration date, the Tenant must resubmit a Construction Application to the Landlord and if preliminary approval is granted, renew any expired permits.

13. Landlord's approval of the Construction Application is contingent upon Tenant's compliance with setback requirements and all other applicable Laws and regulations.

14. Within thirty (30) days of completion of the approved construction, Tenant must submit photographs of the completed work to Landlord along with copies of any inspection reports received from any agency.

15. Tenant must notify Landlord in writing at the completion of any Landlord approved and permitted demolition or removal of improvements. Within ninety (90) days after the improvement is razed or removed, the area must be restored to a condition satisfactory to Landlord, including but not limited to establishing the appropriate vegetative cover.

16. Note that these Construction requirements cover the addition of or any significant changes to all utilities and major systems including but not limited to electrical/power, water supply and plumbing, sanitary, HVAC, fireplaces and any gas/oil/fuel related items.

17. Landlord may approve or reject requests for new construction at its sole discretion, including when required to ensure structural integrity, environmental protection and safe occupation of the Premises.

C. Maintenance

1. Tenant must maintain the Premises and all improvements thereon in good repair and appearance at all times. Should Landlord determine that the Premises is not in a state of good repair and appearance, Landlord may require Tenant to perform all reasonable and necessary repairs and maintenance, including but not limited to painting and removal of any and all junk, trash, debris, or other items determined by Landlord to constitute a nuisance.

2. Prior to performing any maintenance, consult Section II B in order to determine whether the activity would actually be considered Construction and require approval.

3. Improvements shall not present a hazard to the health or safety of any Tenant or other persons or property or to the environment or be in violation of any codes, Laws or requirement of any agency.

4. Landlord may require Tenant to correct, at Tenant's sole expense, any conditions that Landlord determines to be potentially hazardous, harmful to the environment, or in violation of these Rules and Regulations.

5. All chimneys must be fireproof and constructed of tile, brick, stone, or other approved material, equipped with spark arresters, and must otherwise comply with all applicable code specifications.

6. Tenant must install and maintain in good working condition at least one smoke detector in each dwelling on the Premises. All rooms used for sleeping must also contain a smoke detector and have code appropriate windows/egress.

D. Sale of Improvements, Lease Transfer Application and Changes to Tenants on Existing Leases

1. Tenant may not transfer Tenant's interest in the Lease without the prior written approval of Landlord. Tenant and the proposed Buyer shall submit at the same time a complete Lease Transfer Application to Landlord with all required attachments. Lease Transfer Applications must include a copy of each Buyer(s)'s Driver's license, a copy of the Agreement of Sale for the improvements, payment of applicable fees, a completed Water and Sanitary sign-off form, and all final inspection reports as noted herein. Regardless of whether required by the local municipality or not, a code compliance

inspection report without exceptions (for building, sanitary or others as required) must be submitted with the application. In certain municipalities this may take the form of a use & occupancy certificate. In all cases Tenant must also arrange to have a licensed(MD) / certified(PA) inspector perform a building, electrical, water and sanitary inspection of the Premises to ensure compliance with all Laws. Tenant will be required to correct all exceptions and have the inspector issue a revised report prior to submitting the Lease Transfer Application. See Attachment 2 for the Lease Transfer Application. Contact the Cottage Program Manager for additional guidance on submitting a Lease Transfer Application as requirements change. Incomplete application packages will not be reviewed. If the transfer is approved, Landlord will require the Buyer to enter into a new Lease of the Premises substantially in the form as Attachment 3. Tenant must be in compliance with the terms of the Tenant's Lease, including but not limited to being current in the payment of Rent or other sums due and payable, prior to submitting a Lease Transfer Application. Landlord reserves the right to deny the Lease Transfer Application in its sole discretion. Landlord will commence review of the Application only when all requirements for the Application are complete and submitted and will target to complete the review within forty-five (45) days (but may take longer). Landlord's review and approval of the transfer does not provide any representation or warranty to Tenant nor Buyer regarding the condition of the improvements nor the existence of all permissions and permits that may have been required for those improvements. Landlord reserves the right to demand in the future that any improvements that were installed without Landlord permission or proper permitting be removed at any time.

2. If the Lease Transfer Application is approved, Landlord shall issue an approval letter and a new Lease Agreement, which shall be properly executed by the proposed Buyer at settlement and returned to Landlord for Landlord's execution, along with a copy of a valid Bill of Sale for the improvements. Landlord will then forward to the new Tenant a fully signed copy of the new Lease Agreement.

3. If the Lease Transfer Application is denied, Landlord will give Tenant written notice of the denial.

4. All Sales Agreements and Bills of Sale for the improvements must contain this statement: "Only the Tenant's improvements are being sold and neither land, nor water rights are included in the sale. The Landlord has no responsibility for providing, maintaining or improving access to the leased premises."

5. Installment Sales or Lease Purchase Agreements that are intended to give possession of the cottage to the Buyer while the current Tenant (seller) holds the existing Lease are not permitted.

6. Proposed transfers to remove or add a co-tenant or among family members shall be subject to Landlord's approval in accordance with all of the procedures in this Section II (D), including the Lease Transfer Application. In the event of divorce between co-tenants, Landlord will require a copy of the divorce decree documenting the disposition of cottage ownership.

7. The number of Tenant parties on a Lease will be limited to two (2) and in no case will Landlord permit a Tenant to be a trust, corporation, partnership, LLC, trust or any other legal entity.

8. The parties to the Lease must be the same as the owners of the improvements.

9. In the event of the death of a Tenant, Landlord must be provided a copy of the death certificate. If there is no surviving spouse, Landlord must also be provided a copy of the Tenant's Last Will and Testament. LEASE AGREEMENTS DO NOT AUTOMATICALLY PASS FROM THE TENANT TO THEIR HEIRS. The heirs will need to go through Landlord's lease transfer process seeking approval. When performing estate planning, families should keep in mind that only the legal owner(s) of the cottage can be a Tenant on the lease and the number of Tenants per lease is limited to two (2).

10. Tenant shall not engage in any false or misleading communications associated with the Lease and the improvements. The existence of the Lease must be clearly disclosed to any prospective buyer of the improvements.

III. ROADS, BRIDGES AND ACCESS

A. Construction or Alteration of Roads, Driveways and Bridges

1. Written permission is required from Landlord for the construction or alteration of roads, driveways, or bridges in accordance with the procedures set forth in Section II (B) above. A survey and/or drawing showing the location of the road, driveway or bridge must accompany the Construction Application submitted to Landlord.

2. In addition to obtaining written permission from the Landlord, Tenant must obtain all federal, state and local permits, where required, before constructing or altering any road, driveway or bridge.

B. Maintenance

1. Tenant must maintain roads, driveways or bridges on the Premises in good condition, and provide proper drainage in accordance with Landlord's specifications.

2. Tenant is responsible for its proportionate share of the cost of maintenance and general upkeep of non-public roads and bridges used in common with other cottage owners.

3. Tenant is prohibited from blocking or otherwise limiting access to any roads, driveways or bridges located on the Premises or any other property owned by Landlord.

4. Should Tenant fail to perform its maintenance obligations under these Rules and Regulations, Landlord, after notice to Tenant, may in its sole discretion, (i) perform such maintenance and charge Tenant for its share of the cost, or (ii) prohibit the use of the road, driveway or bridge in need of repair. Landlord shall have no obligation to repair or maintain such roads, driveways or bridges.

C. Access

1. Landlord has no responsibility for providing, maintaining or improving access to the Premises. Egress and ingress as currently practiced is not guaranteed and could be altered at any time by Landlord.

2. Landlord may grant easements (the right to use parts of the Land) over any part of the Land to others for any purpose, such as (a) roads and/or highways; (b) utility lines, either underground or overhead.

3. Tenants are prohibited from posting any signs or making any other communications regarding No Trespassing or any other restrictions to accessing and using Landlord property. Tenants are prohibited from blocking access to any Landlord property.

IV. TREES & PLANTS

1. No trees or ornamental shrubs shall be injured or damaged, by Tenants or their guests. The attaching of lights, electric lines, clotheslines, docks, or any other item to any tree or shrub, either on a temporary or permanent basis, is prohibited. Care must be taken during any construction activities to prevent injuring trees or ornamental shrubs, and if necessary, temporary protective shields shall be installed around the trees or shrubs.

2. Tenant shall not remove any tree or shrub over two (2) inches in diameter without prior written permission of Landlord. If a tenant desires to trim, cut or remove significant portions of a tree, they must first obtain written permission from Landlord. If Tenant removes any tree or shrub in violation of the Rules, Tenant shall be subject to the fees in Section VIII and lease termination. If Tenant determines that a tree is an immediate safety hazard, Tenant should vacate the Premises and address it immediately by contacting Landlord for approval to remove the tree.

3. Tenant is responsible for correcting hazardous tree conditions on or adjoining the Premises. Landlord may notify in writing the Tenant of any trees that Landlord believes should be removed. It will be the responsibility of the Tenant to have such trees removed. If such trees are not removed within the specified time period, Landlord at its option may terminate the Tenant's Lease and/or remove the tree at the Tenant's expense.

4. Tenant shall not introduce or maintain any invasive plant species or noxious weeds (including bamboo) onto the Premises, on any of Landlord's properties, or within or upon any waters of the State and is responsible for removing any such growth from the Premises.

5. Tenant shall not plant anything that will grow above 6 ft. in height without the Landlord's prior written permission. Any planting and landscaping by the Tenant shall be limited to a reasonable amount (in the sole determination of Landlord) and done strictly within the Premises.

V. WATER

1. All Premises must be served by an approved potable water source, which could include a permitted well or bottled water.

2. Tenant must obtain written permission from Landlord and all applicable permits for existing or future wells prior to use. Wells may be shared by no more than 4 cottages, with a total maximum occupancy of 24 persons. All unpermitted or prohibited wells must be abandoned in accordance with applicable Laws.

3. The use of river, creek or spring water for human consumption is prohibited and such water sources may not be attached to pressurized plumbing. Human consumption includes drinking, bathing or showering, cooking, dish washing and oral hygiene.

4. River, creek or spring water may be used for purposes other than human consumption, provided it is not attached to pressurized plumbing and that Tenant obtains all applicable permits prior to its use.

5. Tenant shall take all reasonable measures to limit the use of water. Accordingly, swimming pools, hot tubs and spas, whether above or below ground, temporary or permanent, are prohibited.

6. All use of water by Tenant, in and about the Premises, shall be at the sole risk of Tenant. Landlord has not performed any water potability tests and makes no representations with regard to the suitability of the water for domestic purposes. Tenant is responsible for performing any applicable potability testing or other water analysis and permitting. All costs incurred in

connection with such testing and permitting shall be the responsibility of the Tenant. Landlord assumes no liability for, or on account of, any water used in any manner by Tenant or Tenant's guests.

7. No exclusive rights are given or inferred as being given as to the use of any water or spring, even though a spring may be located on the Premises.

8. Construction or drilling of a new well or other water source is subject to the prior approval of Landlord in accordance with the procedures set forth in Section II (B) above, including without limitation the obligation to obtain applicable permits prior to construction.

VI. SANITARY SYSTEM REQUIREMENTS

1. All Premises must be served by an approved sanitary system, which may be a septic system, holding tank, sealed pit privy, incinerator toilet, composting toilet or chemical toilet (temporary only) ("Sanitary System"). Before beginning the construction, installation or alteration of any Sanitary System, Tenant shall comply with the procedures set forth in Section II (B) above, including the obligation to obtain written permission from Landlord and all applicable permits.

2. In the event an approved and permitted Sanitary System does not exist on the Premises, Tenant must provide the site with a Sanitary System in compliance with all applicable Laws and these Rules and Regulations. No Sanitary System shall be located closer than one hundred (100) feet of any spring, stream, or other water supply source (except as otherwise permitted by applicable Laws).

3. Subject to Landlord's prior approval, sealed pit privies, holding tanks, composting toilets, incinerator toilets and chemical toilets are permitted. Tenant must enter into a written maintenance agreement with Landlord and with the applicable agency if required and obtain all applicable permits prior to installing such systems.

4. Gray water must be collected and disposed of in an approved, permitted wastewater disposal system. Tenant must enter into a written maintenance agreement with Landlord and with the applicable agency if required and obtain all applicable permits prior to installing such systems.

5. In the event a public sanitary sewer system is installed in the area, Tenant shall be required to connect into the system, whereupon Tenant shall be responsible for all connection, maintenance, and operation fees or costs.

6. All garbage, trash or refuse must be removed from the Premises every seven (7) days. In the interim, all garbage, trash and refuse must be kept in a closed container intended for the temporary storage of garbage, trash or

refuse secure from flies, rats or other insect or animal intrusion and maintained in a good and sanitary condition in compliance with applicable Laws.

7. All Sanitary Systems and gray water systems must be maintained at all times in good working order and sanitary condition and in compliance with all applicable Laws and any applicable holding tank agreement or sealed pit privy agreement. Tenant shall be responsible for the annual winterization of all water source, sanitary, and gray water systems. TENANT MAY BE REQUIRED TO PROVIDE LANDLORD WITH A FORM OF CERTIFICATION ACCEPTABLE TO LANDLORD THAT ALL SANITARY AND GRAY WATER SYSTEMS ARE IN GOOD WORKING ORDER IN ACCORDANCE WITH APPLICABLE LAWS, AND THAT TENANT IS NOT IN DEFAULT UNDER ANY SEWAGE PUMPING AGREEMENT OR HOLDING TANK AGREEMENT. TENANT MAY ALSO BE REQUIRED TO PROVIDE LANDLORD WITH THE MOST RECENT PUMPING RECEIPT.

8. Please note that although Water and Sanitary regulations differ among the various municipalities, Exelon reserves its rights under the Lease to require Tenants to adhere to more stringent standards. In addition, Federal, State and Local regulations are subject to change at any time. Please make sure you review Sections V and VI of the Rules and are aware of the standards to which you are subject. In any circumstance, any violation of Federal, State or Local regulations or Exelon Rules that create a health or environmental issue, will be considered a default of your Lease. It is your responsibility to ensure that all Water and Sanitary systems are functioning properly, inspected and serviced regularly, and that you satisfy all State and Local reporting requirements.

VII. SHORELINE PROTECTION PROGRAM

A. Application Procedures

1. The “shoreline” is considered to be the existing shoreline at mean high water.

2. All applicable Construction rules in Section II apply to the Shoreline. Prior to the construction or repair of a pier, dock, boathouse, boat ramp, marine railway, bulkhead, retaining wall or erosion control measures or excavation in any areas that may affect the shoreline (“Shoreline Improvements”), Tenant, must submit a Construction Application to Landlord in accordance with Section II (B) of these Rules and Regulations. Landlord will make an on-site inspection of the area to determine if what the applicant has proposed should be allowed or if another type of measure may be more appropriate. Landlord may deny any Construction Application in its sole discretion. Other than routine maintenance of existing Shoreline Improvements and new erosion control measures with the prior written consent of Landlord, construction of Shoreline Improvements outside of the applicant’s Premises is not permitted.

No construction may begin until the Tenant has received Landlord's written Approval and obtained all required local, state and federal permits and authorizations, including but not limited to all permits required by the applicable state agencies (Maryland Department of the Environment – MDE or Pennsylvania Department of Environmental Protection – PaDEP), and the U.S. Army Corps of Engineers.

B. Specifications and Procedures

In addition to the applicable Laws and all requirements set forth by the applicable permitting authorities, the following specifications shall apply. Should any specification herein conflict with any applicable local, state, or federal Law or regulation, the most restrictive requirement shall apply

1. Piers or Docks

a. All new or replacement piers or docks must be a temporary, floating construction and may not exceed a total length of fifty (50) feet (or extend more than fifty (50) feet from the shoreline). If the pier is located in a cove or in a stream, the length may not exceed 25% (1/4) of the width of the cove or stream where the pier is located. Floating piers/docks must be removed from the water annually from November 15 to March 15 and securely stored above the high-water line.

b. Flotation devices for floating piers must be constructed of environmentally sound material as approved by Landlord and permitting authorities. Barrels or similar flotation devices are not permitted.

c. Piers may not interfere with navigation, present a safety hazard, or block ingress or egress to adjoining areas.

d. If an existing pier must be replaced or repaired (other than minor repairs), it must conform to current standards.

e. Piers may not be anchored or tied to trees at any time.

2. Boat Ramps and Marine Railways

a. New boat ramps and entry paths into the water will not be permitted. Repairs or reconstruction of existing ramps must be constructed of stone and/or wood. Asphalt or other petroleum-based products are prohibited.

b. Ramps may not exceed fifteen (15) feet in width and thirty (30) feet in length. The length should not exceed that necessary to be functional.

c. Marine railways may use treated wood.

d. Marine railways may not exceed fifteen (15) feet in width and should be no longer than necessary to be functional. Landlord may, however, restrict the length because of site conditions.

3. Erosion Control Measures (Bulkheads, Retaining Walls, Sea Walls, Rip Rap, etc.)

a. No erosion control measure shall significantly alter the existing shoreline.

b. The planting of native species vegetative cover and/or rip-rapping shall be used if adequate to control the problem.

c. Erosion control measures, including bulkheads, retaining walls and rip rap, may not be installed or replaced without the prior written approval of Landlord.

d. The structure shall not significantly detract from the scenic value of the area. Landlord will typically prefer plans consisting of wood and/or stone but not the use of concrete.

C. Landlord assumes no liability for injury or damage in the construction, use or removal of any Shoreline Improvement made by the current or any former Tenant.

VIII. COMPLIANCE; AMENDMENTS

In the event of Tenant's failure to comply with these Rules and Regulations and Laws, Landlord may impose a fee on Tenant of up to $250 per day until such failure is cured and/or terminate Tenant's Lease in accordance with its terms. Landlord may also impose fixed fees of up to $2,500 for non-compliance issues and/or terminate Tenant's Lease in accordance with its terms. Landlord shall have the right to amend these Rules and Regulations at any time as Landlord deems necessary.

IX. CULTURAL RESOURCE PROTECTION GUIDELINES

Landlord has developed, in cooperation with the Pennsylvania Bureau of Historic Preservation and the Maryland Geological Survey, Division of Archeology, the following rules and regulations. The specific intent of these guidelines is to provide for the protection of cultural resources, and to avoid any disturbance of historic and prehistoric

sites except when justified for scientific purposes and/or when performed in accordance with such State and Federal regulations and guidelines as may apply.

A. No one shall mar, deface, remove, destroy or in any other way damage, any standing structure, ruins, foundation or other man-made feature of a potentially historic nature on lands of Landlord, without first having obtained the written permission of Landlord.

B. No one shall perform any sub-surface archaeological investigations, or in any way disturb the soil for the purpose of searching for and/or obtaining historic or prehistoric artifacts on land of Landlord without having first obtained the written permission of Landlord, nor shall same be performed without the prior knowledge and written sanction of the following:

In Maryland: The State Historic Preservation Officer and/or the Geological Survey, Division of Archeology

C. Full and complete reports must be prepared. Said reports shall incorporate maps, site profiles, descriptions and photographs of artifacts and features, soil descriptions, topography, excavation procedures, directions and distance to the nearest water and all such other related details as may be required.

D. Landlord shall be supplied with a copy of each report so generated. The appropriate State agency shall be supplied with two copies of same, one of which shall contain original photographs.

E. All artifacts and related material recovered in sub-surface investigations shall become the property of Landlord and shall be turned over to the respective State agency. Same shall remain available to Landlord and other responsible public and private organizations and agencies for the purpose of study and/or public display.

F. All artifacts must be properly labeled with site number and lot and must be readily identifiable by pit and level. Site numbers must conform to the trinomial numbering system adopted by both Pennsylvania and Maryland.

G. All burials encountered during the course of such archeological investigations shall be treated with the highest respect and shall be handled on a case by case basis under the strict control of the State agency having jurisdiction. It is the policy of said agencies and of Landlord, to discourage the removal or disturbance of human remains, unless there is a significant scientific purpose to be served by same, and unless provisions are made, in consultation with, and with the approval of living descendants of the interred, for the timely study and the ultimate reburial of the remains.

H. While the collection of artifacts from the surface is widespread, and though not strictly prohibited under these regulations, it does have a significantly negative

effect on archeological sites. The distribution of surface artifacts is the only information available for many sites. Those finding artifacts are therefore encouraged to report finds to Landlord so that same might be photographed and recorded.

I. Tenant is required to consult with the appropriate State Preservation Office prior to any construction work that may affect surface or sub-surface archaeological sites, and prior to new additions to existing structures or the construction of new structures.

J. On property which is within the boundaries of Federally-regulated projects such as the Conowingo Hydro-Electric Project (F.E.R.C. No. 405), Tenants' properties require additional precautions regarding cultural resources under the provisions of the National Historic Preservation Act of 1978 (section 106), Executive Order 11593, and the regulations of the Advisory Council on Historic Preservation (36 CFR 800).

X. CONTACT INFORMATION

1. Tenant Contact Information – for all changes to Tenant contact information including primary mailing address, phone numbers and email addresses, Tenant must complete Tenant Information form (see Attachment 4) and return to Landlord at the time of the change. Tenant Information form must be signed by all Tenants who had signed the Lease agreement. Failure to update Landlord as to changes in contact information that result in Landlord's inability to contact Tenant will prompt Landlord to terminate the Lease upon the next annual expiration date.

DISCLAIMER: The following list is intended as a reference to the Tenant for contacting the municipalities or agencies that may require permits or approvals for specified construction activities. The list is not intended to be an exclusive list and Landlord makes no guarantees or warranties as to the accuracy of the information contained herein below. Tenant is responsible for determining which federal, state, and/or local Laws apply to their proposed use, occupancy and construction activities and to contact the applicable government or agency as required by said Laws.

Maryland

River Basin Permit Section
Baltimore District
U.S. Army Corps of Engineers
P.O. Box 1715
Baltimore, MD 21203

Water Resources Administration
Maryland Department of Natural Resources
Tawes State Office Building
Annapolis, MD 21401

State Administrator of Archeology
Maryland Historical Trust
Shaw House
21 State Circle
Annapolis, MD 21401

Department of Planning and Zoning
Harford County, Maryland
220 S. Main Street
Bel Air, MD 21014

Office of Planning and Economic Development
Cecil County, Maryland
Room 300, Court House
Elkton, MD 21921

Department of Inspections, Licenses and Permits
Harford County, Maryland
220 S. Main Street
Bel Air, MD 21014
410.638.3344
http://www.harfordcountymd.gov/dilp/

Cecil County Dept of Permits & Inspections
200 Chesapeake Blvd., Suite 2200
Elkton, MD. 21921
Office: 410.996.5235
http://www.ccgov.org/dept_permits/

Port Deposit
64 South Main Street
Port Deposit, MD 21904
Administration: 410-378-2121

ATTACHMENT 1 – page 1 of 2

CONSTRUCTION APPLICATION

Tenant Information **Application Date:** _____

Name:_____ Cottage ID Number (C.I.N.) _____
Address:_____
City:_____ State:_____ Zip:_____
Home Phone:_____ Cell/Other Phone(s):_____
Email(s): _____

Authorization Requested For (check appropriate items)

Addition to Cottage _____ Deck/Patio _____ Boat Ramp _____
Shed/Outbuilding _____ Well _____ Sidewalk/Pathway _____
Fence _____ Sanitary _____ Landscaping/Plantings _____
Parking Area _____ Pier/Dock _____ Utilities/Major Systems _____
Bulkhead/Walls _____ Road/Bridge _____
New Construction (specify) _____
Removal or demolition of _____
Other (specify) _____

Procedure (see section II B of the current Rules & Regulations for additional guidelines & requirements)

1) Tenant must adhere to all requirements as contained in the Lease and the current Cottage Rules and Regulations document and obtain written preliminary approval from Exelon prior to applying for local, state or federal building permits.
2) This application must include with it a sufficient plan and drawing including but not limited to: materials to be used, methods of construction, a site map with project location, project drawings with dimensions (if applicable), photos of the existing project location and a list of all required permits/permissions and the agencies requiring them.
3) Exelon shall give Tenant written notice of preliminary approval or denial within 45 days of the receipt of all necessary and complete application documents. Incomplete packages will not be reviewed.
4) Within 90 days after receipt of the preliminary approval, Tenant must submit to Exelon copies of all permits issued by the appropriate local, state or federal authorities. Exelon will provide a final written approval or denial within 15 days of receiving all necessary permits.
5) **No work can be started until all necessary permits have been received AND Exelon issues its final written approval of this application.**
6) Failure to comply with this procedure may result in fees and/or termination of the Tenant's Lease in accordance with the Rules and Regulations. Exelon reserves the right to deny this application in Exelon's sole discretion.

Preparation Fee: Please submit a check in the amount of $50.00 with this application made payable to: Exelon Generation Company, LLC.

NOTE: COLLECTION/CASHING OF FEE/CHECK DOES NOT CONSTITUTE PROJECT APPROVAL

Please submit this application to:

Exelon Generation
Conowingo Hydroelectric Generating Station
Attn: Cottage Program Manager
2569 Shures Landing Road
Darlington, MD 21034

PLEASE DIRECT QUESTIONS TO (610) 765-5200 (Cottage Program Manager)

ATTACHMENT 1 – page 2 of 2

CONSTRUCTION APPLICATION

Failure to comply with this procedure may result in denial of the application and/or termination of the Tenant's Lease in accordance with the Rules and Regulations.

PLEASE DIRECT ALL QUESTIONS TO (610) 765-5200 (Cottage Program Manager).

Note that all Tenants listed on the existing Lease, must sign below

CURRENT TENANT(S):

_____
Signature

_____
Print Name

_____
Signature

_____
Print Name

EXELON USE ONLY

Reviewed (I) _____ APPROVED _____ _____
(F) _____ DATE
Fee Rec'd (C) _____

ATTACHMENT 2 – page 1 of 3

LEASE TRANSFER / CHANGE APPLICATION

This application must be submitted to Exelon Generation Company, LLC with all required and complete documentation. Contact the Exelon Cottage Program Manager for additional lease transfer guidelines as requirements change. Incomplete application packages will not be reviewed..

CURRENT TENANT(S) INFORMATION **APPLICATION DATE:** _____

Name: _____ Cottage ID Number (CIN): _____

Name: _____ Cottage Address: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone(s): _____ Email(s):_____

NEW TENANT(S) INFORMATION – all fields required
Name(s) (as should appear on Lease): Tenant 1: _____

Tenant 2: _____

How is Tenant 2 related to Tenant 1(Spouse/Parent/Child/Sibling/Other):_____

Address: _____

City: _____ State: _____ Zip: _____

Home Phone: _____ Cell Phone(s): _____

Email Address(es): _____

EST. SETTLEMENT DATE: _____ **PURCHASE PRICE:** _____

Please submit this Request to: **Exelon Generation**
Conowingo Hydroelectric Generating Station
Attn: Cottage Program Manager
2569 Shures Landing Road
Darlington, MD 21034

Procedure (see section II D of the current Rules and Regulations for additional guidelines and requirements)

NOTE: COLLECTION/CASHING OF FEE/CHECK DOES NOT CONSTITUTE LEASE TRANSFER APPROVAL

TO BE SUBMITTED WITH THIS APPLICATION:

1. The Lease Transfer Requirements Checklist (see page 3 of 3 for additional requirements)
2. An application fee in the amount of $250 by check made payable to Exelon Generation Company, LLC.
3. A clean inspection report from a licensed(MD) or certified(PA) inspector. Inspection should cover building, electrical, water and sanitary of the Premises to ensure compliance with local, state and federal codes/laws.
4. Copy of the Agreement of Sale for the Tenant improvements ("Improvements"). Agreement of Sale must include: "Only the Tenant's improvements are being sold and neither land, nor water rights are included in the sale. The Landlord has no responsibility for providing, maintaining or improving access to the leased premises."
5. Copy the Buyer(s)'s driver's license.
6. The completed Water and Sanitary Sign Off form.
7. Contact the Exelon Cottage Program Manager for additional application requirements as they do change.
8. **NO SALE should be finalized until you have Exelon's final written approval to proceed with closing.**

ATTACHMENT 2 – page 2 of 3

LEASE TRANSFER / CHANGE APPLICATION

TO BE SUBMITTED AFTER EXELON PRELIMINARY WRITTEN APPROVAL AND SETTLEMENT:

Within ten (10) days after settlement, the following must be submitted:

1. A "Bill of Sale" for the improvements signed by both parties. **NOTE: The New Tenant(s) on the Lease must be the same as the Buyers who have signed the Bill of Sale.** Bill of Sale must include the following: “Only the Tenant’s improvements are being sold and neither land, nor water rights are included in the sale. The Landlord has no responsibility for providing, maintaining or improving access to the leased premises.”
2. A new Lease Agreement (provided by Exelon at time of preliminary approval) signed by the new tenant(s).
3. All other documents that may be required as a result of Exelon’s preliminary approval.

Exelon reserves the right to deny this application if the Lease is in default or in Exelon’s sole discretion.

Failure to comply with this procedure may result in denial of the application and/or termination of the Tenant’s Lease in accordance with the Rules and Regulations.

PLEASE DIRECT ALL QUESTIONS TO (610) 765-5200 (Cottage Program Manager).

Note that all Tenants listed on the existing and future Leases, must sign below

CURRENT TENANT(S):	**NEW TENANT(S):**
_____	_____
Signature	**Signature**
_____	_____
Print Name	**Print Name**
_____	_____
Signature	**Signature**
_____	_____
Print Name	**Print Name**

EXELON USE ONLY

Fee received: _____ Date: _____
Approved: _____ Date: _____
File No.: _____

ATTACHMENT 2 – page 3 of 3

Lease Transfer Requirements Checklist Cottage Identification #:_____

This Form MUST be submitted as the cover page to your Lease Transfer Application package

All documents, in the required condition and with no errors or discrepancies, must be submitted at the same time with this checklist. Exelon will not accept documents if they are submitted at different times. This will delay the lease transfer review significantly.

Your lease transfer application package must include:

1) This **Lease Transfer Requirements Checklist** [ ]
2) The **Lease Transfer Application** including signature page [ ]
3) Copy of Drivers Licenses for all Buyers [ ]
4) Signed **Water and Sanitary Compliance Sign Off** form [ ]
5) **Agreement of Sale** with all of the following: [ ]
    a. Sales price
    b. Exelon six-digit Cottage Identification Number (CIN)
    c. EMS address of cottage (incl. Municipality/County/State)
    d. All Buyer and Seller Names and Signatures
    e. This exact wording: "Only the Tenant's improvements are being sold and neither land, nor water rights are included in the sale. The Landlord has no responsibility for providing, maintaining or improving access to the leased premises."
6) A **Well License** between Exelon and the current Tenant [ ] or N/A
    a. If there is a well on site and a license hasn't already been completed
7) The last **Septic Pumping Receipt** [ ] or N/A
    a. If not applicable, explain: _____
8) A third-party **Inspection Report** with no exceptions, within last 12 months [ ]
    a. Exceptions must be cleared and all photos and references regarding exceptions removed from the report to avoid confusion. NOTE that any work to clear exceptions that is considered Construction under the Exelon Rules and Regulations must be approved by Exelon in writing prior to starting.
    b. Report must clearly document the current condition and systems regarding the water source and sanitary/septic disposal and state that they "are in good working order and in compliance with applicable laws".
9) **Municipal Inspection Reports** with no exceptions, for PA cottages [ ] or Md
    a. Township will issue either:
        i. Separate Building/Zoning and Sewage reports
        ii. Or a passing building/zoning and sanitary inspections will be evidenced by a Certificate of Use and Occupancy (ie Drumore)

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ATTACHMENT 3 – Example Form of the Current Lease

THIS LEASE IS NOT TRANSFERABLE WITHOUT THE PRIOR WRITTEN APPROVAL OF LANDLORD

LEASE - Md

THIS LEASE AGREEMENT (this "Lease") is made this XXXXX day of XXXXXXXXXXXXXXXXXX, 20XXXXX (the "Effective Date"), by and between Exelon Generation Company, LLC ("Landlord") and XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX ("Tenant"). Tenant's liability shall be joint and several if Tenant is more than one party.

BACKGROUND

A. Landlord, as successor by merger to PECO Energy Power Company, is the owner of a parcel of land located in XXXXXXXXXXXX County, Maryland, identified as Lot No. XXXXXXXX, as outlined in red on the plan attached to this Lease as **Exhibit A** (the "Land").

B. Landlord and Tenant, intending to be legally bound hereby, intend to enter into a lease of the Land on the following terms and conditions.

1. Term. Unless sooner terminated in accordance with the terms of this Lease, Landlord agrees to lease the Land to Tenant for a term beginning on the Effective Date and ending on September 30th of the calendar year following the Effective Date (the "Term"). Thereafter, this Lease shall continue upon the same terms and conditions, subject to the adjustment of Rent in accordance with Paragraph 2 hereof, from year to year until terminated by either party by written notice at least thirty (30) days prior to the expiration of the then current term.

2. Payment of Rent. Tenant agrees to pay to Landlord annual rent in the amount of $XXXXXXXXXX ("Rent") on the first day of September. Tenant will send or deliver the Rent to Exelon Generation Company, LLC, 1310 Point Street, 18th Floor, Baltimore, MD, 21231, Attn: Real Estate & Facilities, unless Landlord notifies Tenant in writing that the Rent should be sent or delivered to another address. Except as otherwise provided herein, Landlord is not required to send Tenant a bill for the Rent, and the lack of a bill does not mean that Tenant is not required to pay Rent on or before the date set forth above. The Rent shall increase annually by the amount of three percent (3%), including the Rent which will be due on the September 1st following the Effective Date. Tenant shall pay to Landlord the adjusted Rent within five (5) days after receipt of a bill from Landlord for the adjusted Rent amount. Landlord reserves the right to charge Tenant as additional rent Landlord's costs arising out of this Lease, including without limitation the cost of enforcing the provisions of this Lease.

3. Late Charge. Tenant must pay the Rent by the first day of each September. If the Rent is not received by Landlord within ten (10) days after the Rent is due, Tenant must pay an additional charge equal to five percent (5%) of the overdue Rent.

4. Condition of Land. Tenant has inspected the Land before signing this Lease. Tenant accepts the Land "AS IS" on the day Tenant signs this Lease. Landlord has made no promises or representations to Tenant concerning the condition of the Land.

5. Maintenance and Repair; Ownership of Tenant's Improvements. Tenant owns and is solely responsible for all improvements on the Land. Tenant agrees to maintain in good condition all improvements on the Land, including without limitation all dwellings, fixtures, sheds, outhouses, decks, fences, driveways, bridges, Shoreline Improvements (as defined in the Rules and Regulations) and all other structures or materials placed on the Land by Tenant or any former tenant, whether or not said improvement is affixed to the Land ("Tenant's Improvements"). At the expiration or earlier termination of this Lease, Tenant will leave the Land in at least as good condition as when this Lease began, except for normal wear and tear.

6. Non-Interference. Landlord may use the Land to operate Landlord's facilities, including without limitation Conowingo Hydro-Electric Station, Muddy Run Pumped Storage Facility and Peach Bottom Generating Station (the "Project"). Tenant understands that efficient and economical operation of the Project is the main purpose of Landlord's use of its property including the Land. Tenant understands that the Landlord's operation of the Project may limit Tenant's use of the Land from time to time. Regardless of what else this Lease says, Tenant will not interfere with Landlord's use of the Land or the use of the Land by Landlord or its affiliates for the Project. Tenant waives or gives up any rights to file a lawsuit against Landlord or its affiliates for anything relating to the maintenance, operation or new construction of the Project or the use of the Land for Landlord's corporate purposes.

7. Landlord Reservations. Landlord may grant easements (the right to use parts of the Land) over any part of the Land to others for any purpose, such as (a) roads and/or highways; (b) utility lines, either underground or overhead. All standing timber on the Land shall remain the property of Landlord. Tenant may not cut, remove or destroy any timber nor remove any rock, stone, gravel, soil or other material from the Land.

8. Rules and Regulations. Tenant's use of the Land is subject to all Laws and Landlord's rules and regulations, a copy of which is attached hereto as **Exhibit B** as they may be amended from time to time (the "Rules and Regulations"). Landlord shall provide Tenant with copies of all changes in the Rules and Regulations as they occur. FAILURE TO COMPLY WITH ANY OF THE LAWS AND THE RULES AND REGULATIONS WILL BE CONSIDERED A VIOLATION OF THE TERMS AND CONDITIONS OF THIS LEASE AGREEMENT AND MAY RESULT IN A FEE OF UP TO $250.00 PER DAY IMPOSED AGAINST TENANT BY LANDLORD AND/OR TERMINATION OF THE LEASE. In addition to Landlord's right and option to assess fees against Tenant and to terminate the Lease, Landlord has the right but not the duty to enter the Land and cure any violation of the Rules and Regulations or other terms and conditions of this Lease, and to assess all costs incurred by Landlord as a result of curing any such violation(s) against Tenant. ATTACHED HERETO AS **EXHIBIT C** IS THE CABIN AFFIDAVIT EXECUTED BY TENANT.

9. Use of Land. Tenant shall use the Land only for a vacation retreat and recreational activities. Tenant shall **NOT:**

(a) **USE OR OCCUPY THE LAND AS A PRIMARY PERMANENT RESIDENCE OR DOMICILE.** "Domicile" means the place at which a person has been physically present and that the person regards as home. "Residence" means the act or fact of living in a given place for a period of time with an intent to treat it as a home.

(b) Construct or install any new buildings, structures or other improvements on the Land or enlarge any buildings, structures or Tenant Improvements, without the prior written consent of Landlord in accordance with the procedures set forth in the Rules and Regulations and all Laws.

(c) Dispose of or store any toxic or hazardous substances, including but not limited to hazardous waste, on the Land.

(d) Disturb other tenants of Landlord.

(e) Interfere with the Landlord's use of the properties surrounding the Land.

(f) Dispose or store any flammable, explosive or hazardous materials on the Land.

(g) Engage in any commercial activities, including without limitation operating or leasing campgrounds or dock facilities.

10. No Representations. Tenant agrees that:

(a) Landlord makes no promises about the condition of the Land.

(b) Landlord is not required to make any repairs or alterations to the Land either now or in the future.

(c) Landlord is not required to maintain the Land, the surrounding property, or the Tenant Improvements, building or structures on the Land.

(d) Landlord is not required to provide any utility service to the Land, such as telephone, electricity, heat, water, gas, sewer or trash removal, regardless of whether such services exist at the time the Tenant signs this Lease.

11. Access. Tenant is responsible for acquiring and maintaining access to the Land. Landlord has no responsibility for providing, maintaining or improving access.

12. Inspection of Premises. Landlord, its employees and representatives may inspect the Land at any time without providing Tenant with notice.

13. Taxes. Landlord will pay real estate taxes on the Land, including Tenant's Improvements, unless real estate taxes on Tenant's Improvements are separately assessed and billed directly to Tenant. Landlord will send Tenant a bill for the real estate taxes and Tenant will reimburse Landlord for the real estate taxes as additional rent within thirty (30) days after the date of the bill.

14. No Waiver. Landlord is not required to enforce this Lease. If Landlord does not enforce a part of this Lease, this does not mean Landlord cannot enforce the same part, or a different part, later. The payment of Rent by Tenant after Tenant violates this Lease does not mean that the violation of this Lease is forgiven.

15. Compliance with Laws. Tenant agrees to comply at its expense with all Federal, state and local laws that apply to Tenant's Improvements or Tenant's use of the Land ("Laws"). It is Tenant's responsibility to be aware of all Laws that apply to the Land.

16. Indemnification. Tenant assumes responsibility for any action by Tenant, Tenant's contractors, representatives or guests on or near the Land. If a claim is made against Landlord because of something that Tenant, its contractors, representatives or guests do on the Land, Tenant shall pay all of Landlord's costs and expenses which occur because of the claim (including Landlord's attorney's fees). If Landlord pays any money in order to settle or defend the claim, Tenant shall pay Landlord the amount that Landlord paid.

17. Insurance. Tenant will be solely responsible for purchasing insurance to cover damage or theft of the Tenant's Improvements and personal property located on the Land as well as for liability and any other risks. Landlord does not provide any insurance coverage for the Tenant's interests. Tenant assumes responsibility for any action by Tenant, Tenant's contractors, representatives or guests which violates the Tenant's insurance policy.

18. Waiver of All Claims. Tenant understands and recognizes that, by signing this Lease, Tenant waives any and all claims against Landlord relating to the Land, Tenant's Improvements or personal property thereon or any previous leases of the Land. This includes, but is not limited to, claims for lost value of Tenant's property; lost use of the Land; or, loss, removal or destruction of Tenant's Improvements or personal property. Tenant further waives any claims for damages grounded upon an expectation of future gain, restitution or unjust enrichment.

19. Default. Tenant shall be in default under this Lease, if any of the following occur (each an "Event of Default"):

(a) Tenant does not pay the Rent, additional rent or other amounts Tenant is required to pay under this Lease when it is due and fails to make payment to Landlord of the overdue Rent within five (5) days written notice from Landlord;

(b) Tenant violates any part of this Lease or the Rules and Regulations or misrepresents any facts as to occupancy and fails to cure such violation within thirty (30) days after receipt of notice from Landlord to cure such violation;

(c) Tenant has not used or occupied the Land for more than twelve (12) consecutive months;

(d) Tenant occupies the Cottage as a domicile, primary or permanent residence;

(e) Tenant permits anyone else to occupy the Cottage as a domicile, primary or permanent residence;

(f) Tenant becomes insolvent or files for bankruptcy; or

(g) Tenant's rights to the Land are sold under execution or other legal process.

After the expiration of applicable cure periods, Landlord shall have all rights and remedies allowed by law and equity, including, without limitation, the right to terminate this Lease by sending written notice to Tenant. If Landlord does not immediately terminate the Lease after Tenant violates this Lease, Landlord can terminate the Lease at a later date.

20. Removal of the Tenant's Property. Prior to the expiration of this Lease or within ninety (90) days after the earlier termination of this Lease due to an Event of Default or otherwise, Tenant shall remove all of Tenant's Improvements and personal property, including trailers, mobile homes and personal belongings, owned by Tenant and restore the Land to a condition satisfactory to Landlord, unless Landlord has previously approved the sale of the Tenant's Improvements in accordance with the Rules and Regulations and has issued a new lease to the purchaser of the Tenant's Improvements. In the event Tenant fails to remove the Tenant's Improvements and personal property prior to the expiration of this Lease or within ninety (90) days after the earlier termination of this Lease, then the Tenant's Improvements and personal shall become the property of Landlord without any further act or notice by Landlord to Tenant. Landlord may thereafter occupy, sell, lease, repair or remove Tenant's Improvements and personal property. However, in the event Landlord elects to remove Tenant's Improvements and personal property, Tenant agrees to pay Landlord the cost incurred by Landlord for such removal within thirty (30) days of receipt of a bill from Landlord.

21. Notices. All notices under this Lease, shall be deemed to have been properly given only when written notice has been served by (i) personal delivery, (ii) by certified mail, return receipt requested, or (iii) by recognized overnight carrier, to the other party at its address as follows:

If to Landlord:

Exelon Generation
Conowingo Hydroelectric Generating Station
Attn: Cottage Program Manager
2569 Shures Landing Road
Darlington, MD 21034

If to Tenant:
XXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXX

If a notice sent to Tenant by certified mail is not accepted by Tenant, Landlord may post the notice at the Land.

22. Brokerage Commissions. There are no commissions or fees to be paid to any real estate broker or salesperson for this Lease. If Tenant has agreed to pay any commission or fee to a real estate broker, Tenant will pay that commission or fee. If Landlord has agreed to pay any commission or fee to a real estate broker, the Landlord will pay that commission or fee.

23. Federal Energy Regulatory Commission ("FERC"). The Land is part of a project licensed by the Federal Energy Regulatory Commission (FERC). Because of the FERC License the following requirements apply:

(a) Tenant's use of the Land will not endanger health, create a nuisance or otherwise be incompatible with the recreational use on any part of Landlord's land. Tenant will take all reasonable precautions to ensure that the use and maintenance of the Land will protect the scenic, cultural, recreational and environmental value of the Land.

(b) Landlord may terminate this Lease if Landlord's License from FERC is terminated. If Landlord terminates the Lease for this reason, Landlord will give Tenant thirty (30) days notice before the termination date.

24. Floods. Tenant waives or gives up any claims against Landlord for flooding by water or the presence or flow of ice on the Susquehanna River or any of its tributaries.

25. Severability. If any part of this Lease is not legal for any reason, the rest of this Lease shall continue to be valid and enforceable.

26. Governing Law. This Lease is made in the Laws of the State of Maryland.

27. Legal Action. A lawsuit regarding this Lease may only be filed in the county where the Land is located, or in the United State District Court in the state in which the Land is located and in the division closest in proximity to the Land. BOTH PARTIES ALSO WAIVE THEIR RIGHT TO A TRIAL BY JURY IF A LAWSUIT IS FILED REGARDING THIS LEASE AGREEMENT. Tenant shall pay Landlord all of its costs and expenses, including without limitation attorneys' fees, incurred by Landlord in enforcing Tenant's obligations under this Lease whether or not Landlord files a lawsuit against Tenant.

28. No Assignment. Tenant shall not assign, sublease or otherwise transfer or encumber this Lease without the prior written consent of Landlord. Tenant shall make all requests for Landlord's consent to assignment in accordance with the Rules and Regulations. Any assignment without the prior written request of Landlord shall be null and void.

29. Entire Agreement. This Lease replaces and cancels all other leases between Landlord and Tenant for the Land. Tenant understands the promises in this Lease shall be binding upon Tenant. This Lease contains the full and complete agreement between Tenant and Landlord. Any change, modification or waiver of the promises in this Lease may only be made by a written agreement signed by Landlord and Tenant. No promises were made by Landlord to Tenant other than those promises contained in this Lease.

EXECUTED BY THE PARTIES ON THE NEXT PAGE

Landlord and Tenant, intending to be legally bound, agree to the terms of this Lease effective as of the Effective Date.

TENANT(S):

XXXXXXXXXXXXXXXXXXXXXXXXXX
Signature

XXXXXXXXXXXXXXXXXXXXXXXXXX
Print Name

XXXXXXXXXXXXXXXXXXXXXXXXXX
Signature

XXXXXXXXXXXXXXXXXXXXXXXXXX
Print Name

LANDLORD:

EXELON GENERATION COMPANY, LLC

BY:_____

File No. _____
Initials _____

CABIN AFFIDAVIT (Lease Exhibit C) **Type** or **print legibly**

Cabin Identification & Location:

Exelon Cottage Identification Number (CIN) _____ See Attachment A for Map

Street Number & Name (EMS) _____

Township, Borough or City Name _____

County and State _____

Cabin Owner/Tenant Name(s): – Must List all Cabin Owners/Tenants

Owner/Tenant 1 _____ Owner/Tenant 2 _____

List Any Other Owners/Tenants _____

Cabin Owner/Tenant Primary Addresses – Must Be Physical Address and Not PO Box:

Owner/Tenant 1:
Street Number & Name _____

City, State & Zip Code _____

Owner/Tenant 2:
Street Number & Name _____

City, State & Zip Code _____

Owner/Tenant Other:
Street Number & Name _____

City, State & Zip Code _____

Owner/Tenant Attestation:

I attest to the fact that the cabin identified above:

1. Will be utilized for recreational activities only.
2. Will not be utilized as a domicile ("domicile" means the place at which a person has been physically present and that the person regards as home), permanent or primary residence ("residence" means the act or fact of living in a given place for a period of time with an intent to treat it as a home) by myself or any other person for any period of time.
3. Will not be used for any commercial purposes or as a place of employment.
4. Will not exceed two stories in height (excluding the basement, if any).
6. Will not be a mailing address for bills or correspondence.
7. Will not be listed as any individual's place of residence on a tax return, driver's license, vehicle registration or voter registration.

For each Owner/Tenant provide two of the following showing name and primary address:☐ tax return,

☐ driver's license, ☐ vehicle registration, ☐ voter registration, ☐ passport, ☐ recent pay stub, ☐ recent utility bill.

I solemnly affirm under the penalties of perjury and upon personal knowledge that the contents of this document are true and correct.

_____
Owner/Tenant 1 Signature / Date

_____
Owner/Tenant 2 Signature / Date

_____
Owner/Tenant Other Signature / Date

Page left intentionally blank

ATTACHMENT 4

Exelon Cottage Program - Tenant Information Collection/Change Form

Cottage Identification # (CIN): _____

Today's Date: _____

Cottage Address: _____

Tenant Contact Information (all fields required)

Primary Residence (not a PO Box):

Address:_____ City/State/Zip:_____

Home Phone:_____ Cell Phone(s): _____

Other/Work/Cell Phone(s) if you wish to list: _____

Email address(s): _____

If mail needs to be sent to a PO Box:

Address:_____ City/State/Zip:_____

If the above includes changes from prior contact information please list the old address, phone # and/or email that is being replaced:

_____

_____

All Tenants listed on the Lease must sign below verifying the above information:

CURRENT TENANT(S):

_____
Signature

_____
Print Name

CURRENT TENANT(S):

_____
Signature

_____
Print Name

Return completed form to:
Exelon Generation
Conowingo Hydroelectric Generating Station
Attn: Cottage Program Manager
2569 Shures Landing Road; Darlington, MD 21034
Questions: 1-610-765-5200

RULES AND REGULATIONS – PENNSYLVANIA

I. GENERAL CONDITIONS

A. General Information

All questions and inquiries should be directed to:

Exelon Generation Company LLC (Landlord)
Conowingo Hydroelectric Generating Station
Attn: Cottage Program Manager
2569 Shures Landing Road
Darlington, MD 21034
Telephone: 610-765-5200

B. General Conduct

1. Tenant shall use the leased premises ("Premises"), which is part of Landlord's Conowingo Hydroelectric Project ("Landlord's Property") as a vacation retreat and for recreational activities only. Tenant shall not use or occupy the Premises as a domicile, primary or permanent residence. Tenant shall not permit any person or persons to use or occupy the Premises as a domicile, primary or permanent residence. "Domicile" means the place at which a person has been physically present and that the person regards as home. "Residence" means the act or fact of living in a given place for a period of time with an intent to treat it as a home. TENANT MUST EXECUTE THE CABIN AFFIDAVIT ATTACHED TO THE LEASE. Landlord has the right to verify Tenant's primary address, including but not limited to requiring Tenant to provide acceptable proof of domicile and residence.

2. The predominant use and occupation of the Premises should be by the Tenant and the Tenant's family, not by guests or other occupants of the Tenant. Guests or other occupants of the Tenant must not stay, without the Tenant present, for longer than two weeks at a time.

3. All of the conduct required of the Tenant shall be required of Tenant's guests, and Tenant shall ensure that such guests adhere strictly to the Rules and Regulations and all Laws. Tenants are responsible for the actions of their guests and occupants.

4. Tenant shall not assign or otherwise transfer or encumber the lease of the Premises ("Lease") without the prior written consent of Landlord. Tenant may only assign or otherwise transfer the Lease to an individual person (not to exceed two). Any attempted transfers to a trust, corporation, partnership, limited liability company ("LLC"), or any other legal entity shall be null and void. See Section II D below. Tenant shall make all requests for Landlord's

consent to assignment in accordance with these Rules and Regulations. Any assignment without the prior written request of Landlord shall be null and void. This includes among family members. Tenant shall not enter into any type of arrangement with anyone else regarding the use and occupancy of the Premises, including but not limited to sub leases, “caretaking” or any other arrangement that exchanges money and/or services for the use and occupancy of the Premises.

5. Tenant shall not permit any noise or other nuisances to interfere with the quiet enjoyment of other Tenants’ use of their properties or with the use and operation of Landlord’s Property as determined by Landlord in its sole discretion. Landlord shall have the right to require that Tenant immediately cease and desist any such noise or other nuisance.

   Landlord has the right to permit or prohibit or adopt reasonable restrictions with respect to Tenants displaying flags, signs, banners, images or outside displays of any nature visible to the public on the exterior of the Premises or visible from outside of the Premises. Landlord shall also have the right to require that any Tenant immediately cease and desist displaying flags, signs, banners, images or outside displays of any nature visible to the public on the exterior of the Premises or visible from outside of the Premises that are offensive, obnoxious, indecent or seriously annoying or intolerable to members of the community as reasonably determined by Exelon. Notwithstanding the foregoing, Tenants may display the American Flag or flags permitted in accordance with the Pennsylvania American, Commonwealth and Military Flag Act.

6. Tenant shall not cause or allow un-permitted or uncontrolled fires. No open fires are permitted except in properly constructed barbecue pits and any burning must comply with all federal, state and local laws, rules, regulations and ordinances (“Laws”). No open burning of leaves or other vegetation debris is permitted.

7. Tenants and their guests are not permitted to park or store vehicles, boats or boat trailers overnight on Landlord’s property outside the Premises. Tenants and their guests are permitted to park a reasonable (in the sole determination of Landlord) number of vehicles, boats and boat trailers on the Premises, during periods of occupancy, as long as they have a current valid registration which is clearly visible.

8. Tenants are not allowed to park or store any type of construction or commercial vehicle, machinery, camper, trailer or RV on any Landlord property.

9. The use of any vehicles off road (including but not limited to trucks, ATVs, UTVs, motorcycles, etc.) on any Landlord property is prohibited.

10. Hunting and the use of firearms or other weapons is prohibited on all Landlord property.

11. Tenants are not permitted to accumulate possessions on the Premises that are not properly stored, and in no event store any debris, junk, etc. All storage sheds and other storage containers must be approved in writing by the Landlord per Section II B or will otherwise be required to be removed. The number of storage units and amount of personal property kept on the Premises will be limited to a reasonable amount (in the sole determination of Landlord). This includes firewood.

12. The six (6) digit Cottage Identification Number (CIN) which has been assigned to each Cottage must be placed on the outside wall of the cottage facing the water and also one facing the primary road/driveway/path that leads to the cottage entrance from the land, and must be clearly visible. If the cottage has been assigned an EMS (emergency services) address, that address (# and street name) must also be posted with the CIN. All posted characters must be at least 4 inches in height, treated with a reflective material and in a color contrasting with the sign background.

13. The six (6) digit Cottage Identification Number (CIN) must also be marked in at least 2-inch characters on all garages, sheds, large storage containers, docks, piers, car ports and any other large stand-alone structures and improvements.

14. All dogs must be kept securely tied or on a leash at all times. The number of dogs or cats at the Premises at any one time should be kept to a reasonable number (in the sole determination of Landlord), and not create a nuisance in any way including noise, aggressive behavior and the failure to immediately clean up after them. No other types of pets or animals are allowed without prior written Landlord permission.

15. Tenants are not permitted to use the Premises as a business location for the production or sale of goods and/or services nor engage in any commercial activities, including without limitation operating or leasing campgrounds or dock facilities.

16. Immediately upon discovery, Tenant must report any potentially hazardous condition to the Landlord and, as required by law, to the appropriate state and local authority or agency.

17. Tenant shall be responsible for the correction and/or control of any erosion caused by or resulting from improvements, and/or changes made to, or on the Premises. Landlord may require Tenant to rectify any erosion problems on or affecting the Premises. Landlord has no duty to Tenant to correct any naturally occurring erosion problems.

18. Tenants are not required to carry $1M of liability insurance, whether stated in their Lease agreement or not. Tenants should consult with their insurance agent and make their own decisions regarding what types and levels of insurance coverage are advisable. Landlord does not provide insurance coverage for the Tenants' interests. Landlord has obtained additional insurance that provides coverage only for Landlord's liability with respect to the cottage properties.

19. The use of fireworks or any explosives is prohibited on all Landlord property.

20. The Rules and Regulations contained herein are not intended to substitute for or absolve Tenant of his or her legal responsibility to comply with all applicable Laws. In a situation where the Rules and Regulations contained herein are in conflict with, or are less restrictive than, the applicable federal, state, or local Law, the more restrictive statute, rule, regulation, or ordinance shall apply.

II. IMPROVEMENTS

A. Definition of Improvements and Removal of Improvements

1. In these Rules and Regulations, "improvements" shall mean and include all dwellings, fixtures, utilities, outhouses, sheds, decks, porches, patios, buildings, roads, driveways, pathways, bridges, fences and Shoreline Improvements (defined in Section VII) and any other structures or material constructed by or placed on the Premises by the Tenant or any former tenant, whether or not said improvement is affixed in any manner to the land.

2. All improvements shall remain the personal property of the Tenant at all times and shall be removed by the Tenant upon the termination of the Tenant's Lease, unless Landlord has approved the transfer to a new tenant. Tenant is responsible for any and all costs incurred by Landlord should Landlord elect to remove Tenant's improvements after the termination of Tenant's Lease.

B. Construction and Demolition

1. WITH A FEW EXCEPTIONS AS NOTED IN THESE RULES, THERE WILL BE NO CONSTRUCTION PERMITTED WHICH ENLARGES THE SIZE OF THE EXISTING IMPROVEMENTS. Landlord is not responsible for constructing, maintaining, repairing, replacing, re-constructing or demolishing Tenant's improvements.

2. Should Tenant wish to perform construction, to demolish an existing improvement, or to renovate, alter or replace an existing improvement in any manner ("construction"), a Construction Application must be submitted

to the Landlord (with all appropriate attachments) REGARDLESS OF WHETHER ANY OTHER AGENCY OR ORGANIZATION REQUIRES PERMITTING OR APPROVAL. The Construction Application must be submitted to the Landlord prior to applying for any applicable permits or beginning any construction. All expenses incurred by Tenant related to such construction or demolition, including Landlord's consent, shall be the sole responsibility and risk of Tenant. No Construction nor permit activities should begin until the Tenant receives formal written permission from the Landlord.

3. Construction Applications must contain a detailed plan and drawing including but not limited to: materials to be used, methods of construction, a site map with project location, project drawings with dimensions covering at least two sides or cross-sectional views, photos of the existing project location and a list of required permits/permissions and the agencies requiring them. Tenant is responsible for determining which Laws apply to their proposed construction or demolition activities and to contact the applicable government or agency as required by said Laws. See Attachment 1 for the Construction Application.

4. No construction shall be permitted that expands beyond the size of the existing improvements, except as permitted under Rules II 5 and 6 below, provided however, approval of construction is at the sole discretion of Landlord.

5. A new deck may be approved if all of the following conditions are met:

    a. A complete Construction Application must be submitted and approved.
    b. Any new deck plan plus any existing decks, patios, porches or the equivalent cannot exceed a total of 200 square feet.
    c. Any new deck must be constructed with pressure treated lumber or a manufactured equivalent.
    d. Deck plans must be kept basic, cannot be covered and must meet all code requirements including proper railings.All required permits must be obtained, after receiving written Landlord permission to proceed with permitting

6. A new shed may be approved if all of the following are met:

    a. A complete Construction Application must be submitted and approved
    b. Any new shed plan plus any existing sheds, outbuildings or equivalent cannot exceed a total of 150 square feet at the most, and Exelon reserves the right to limit a new shed to a smaller size.
    c. Sheds will not be permitted to have concrete foundations.
    d. All required permits must be obtained, after receiving written Landlord permission to proceed with permitting

7. If a cottage is fifty percent (50%) or more destroyed by fire, flood or other casualty, as determined by Landlord, Tenant will not be permitted to rebuild and the Lease will be terminated.

8. Tenant must be in compliance with the terms of the Lease, including but not limited to being current with any Rent or other sums due and payable, prior to submitting a Construction Application.

9. Construction Applications will be subject to written approval of Landlord. Landlord may approve or deny a Construction Application in its sole discretion. If the Construction Application is acceptable to Landlord, Landlord shall issue to Tenant a preliminary approval in writing. If the Construction Application is denied, Landlord will give Tenant written notice of such denial.

10. Within ninety (90) days after Landlord's preliminary approval of the Construction Application and prior to beginning any work, Tenant must obtain all permits and licenses required by all Laws ("applicable permits") and provide copies of all such permits and licenses to Landlord.

11. Upon receipt of the applicable permits and licenses for the work approved by Landlord, Landlord shall issue written final approval of the Construction Application to the Tenant.

12. The final approval issued by Landlord expires one (1) year from the date of issuance. If the approved construction is not completed on or before the expiration date, the Tenant must resubmit a Construction Application to the Landlord and if preliminary approval is granted, renew any expired permits.

13. Landlord's approval of the Construction Application is contingent upon Tenant's compliance with setback requirements and all other applicable Laws and regulations.

14. Within thirty (30) days of completion of the approved construction, Tenant must submit photographs of the completed work to Landlord along with copies of any inspection reports received from any agency.

15. Tenant must notify Landlord in writing at the completion of any Landlord approved and permitted demolition or removal of improvements. Within ninety (90) days after the improvement is razed or removed, the area must be restored to a condition satisfactory to Landlord, including but not limited to establishing the appropriate vegetative cover.

16. Note that these Construction requirements cover the addition of or any significant changes to all utilities and major systems including but not limited to electrical/power, water supply and plumbing, sanitary, HVAC, fireplaces and any gas/oil/fuel related items.

17. Landlord may approve or reject requests for new construction at its sole discretion, including when required to ensure structural integrity, environmental protection and safe occupation of the Premises.

C. Maintenance

1. Tenant must maintain the Premises and all improvements thereon in good repair and appearance at all times. Should Landlord determine that the Premises is not in a state of good repair and appearance, Landlord may require Tenant to perform all reasonable and necessary repairs and maintenance, including but not limited to painting and removal of any and all junk, trash, debris, or other items determined by Landlord to constitute a nuisance.

2. Prior to performing any maintenance, consult Section II B in order to determine whether the activity would actually be considered Construction and require approval.

3. Improvements shall not present a hazard to the health or safety of any Tenant or other persons or property or to the environment or be in violation of any codes, Laws or requirement of any agency.

4. Landlord may require Tenant to correct, at Tenant's sole expense, any conditions that Landlord determines to be potentially hazardous, harmful to the environment, or in violation of these Rules and Regulations.

5. All chimneys must be fireproof and constructed of tile, brick, stone, or other approved material, equipped with spark arresters, and must otherwise comply with all applicable code specifications.

6. Tenant must install and maintain in good working condition at least one smoke detector in each dwelling on the Premises. All rooms used for sleeping must also contain a smoke detector and have code appropriate windows/egress.

D. Sale of Improvements, Lease Transfer Application and Changes to Tenants on Existing Leases

1. Tenant may not transfer Tenant's interest in the Lease without the prior written approval of Landlord. Tenant and the proposed Buyer shall submit at the same time a complete Lease Transfer Application to Landlord with all required attachments. Lease Transfer Applications must include a copy of each Buyer(s)'s Driver's license, a copy of the Agreement of Sale for the improvements, payment of applicable fees, a completed Water and Sanitary sign-off form, and all final inspection reports as noted herein. Regardless of whether required by the local municipality or not, a code compliance

inspection report without exceptions (for building, sanitary or others as required) must be submitted with the application. In certain municipalities this may take the form of a use & occupancy certificate. In all cases Tenant must also arrange to have a licensed(MD) / certified(PA) inspector perform a building, electrical, water and sanitary inspection of the Premises to ensure compliance with all Laws. Tenant will be required to correct all exceptions and have the inspector issue a revised report prior to submitting the Lease Transfer Application. See Attachment 2 for the Lease Transfer Application. Contact the Cottage Program Manager for additional guidance on submitting a Lease Transfer Application as requirements change. Incomplete application packages will not be reviewed. If the transfer is approved, Landlord will require the Buyer to enter into a new Lease of the Premises substantially in the form as Attachment 3. Tenant must be in compliance with the terms of the Tenant's Lease, including but not limited to being current in the payment of Rent or other sums due and payable, prior to submitting a Lease Transfer Application. Landlord reserves the right to deny the Lease Transfer Application in its sole discretion. Landlord will commence review of the Application only when all requirements for the Application are complete and submitted and will target to complete the review within forty-five (45) days (but may take longer). Landlord's review and approval of the transfer does not provide any representation or warranty to Tenant nor Buyer regarding the condition of the improvements nor the existence of all permissions and permits that may have been required for those improvements. Landlord reserves the right to demand in the future that any improvements that were installed without Landlord permission or proper permitting be removed at any time.

2. If the Lease Transfer Application is approved, Landlord shall issue an approval letter and a new Lease Agreement, which shall be properly executed by the proposed Buyer at settlement and returned to Landlord for Landlord's execution, along with a copy of a valid Bill of Sale for the improvements. Landlord will then forward to the new Tenant a fully signed copy of the new Lease Agreement.

3. If the Lease Transfer Application is denied, Landlord will give Tenant written notice of the denial.

4. All Sales Agreements and Bills of Sale for the improvements must contain this statement: "Only the Tenant's improvements are being sold and neither land, nor water rights are included in the sale. The Landlord has no responsibility for providing, maintaining or improving access to the leased premises."

5. Installment Sales or Lease Purchase Agreements that are intended to give possession of the cottage to the Buyer while the current Tenant (seller) holds the existing Lease are not permitted.

6. Proposed transfers to remove or add a co-tenant or among family members shall be subject to Landlord's approval in accordance with all of the procedures in this Section II (D), including the Lease Transfer Application. In the event of divorce between co-tenants, Landlord will require a copy of the divorce decree documenting the disposition of cottage ownership.

7. The number of Tenant parties on a Lease will be limited to two (2) and in no case will Landlord permit a Tenant to be a trust, corporation, partnership, LLC, trust or any other legal entity.

8. The parties to the Lease must be the same as the owners of the improvements.

9. In the event of the death of a Tenant, Landlord must be provided a copy of the death certificate. If there is no surviving spouse, Landlord must also be provided a copy of the Tenant's Last Will and Testament. LEASE AGREEMENTS DO NOT AUTOMATICALLY PASS FROM THE TENANT TO THEIR HEIRS. The heirs will need to go through Landlord's lease transfer process seeking approval. When performing estate planning, families should keep in mind that only the legal owner(s) of the cottage can be a Tenant on the lease and the number of Tenants per lease is limited to two (2).

10. Tenant shall not engage in any false or misleading communications associated with the Lease and the improvements. The existence of the Lease must be clearly disclosed to any prospective buyer of the improvements.

III. ROADS, BRIDGES AND ACCESS

A. Construction or Alteration of Roads, Driveways and Bridges

1. Written permission is required from Landlord for the construction or alteration of roads, driveways, or bridges in accordance with the procedures set forth in Section II (B) above. A survey and/or drawing showing the location of the road, driveway or bridge must accompany the Construction Application submitted to Landlord.

2. In addition to obtaining written permission from the Landlord, Tenant must obtain all federal, state and local permits, where required, before constructing or altering any road, driveway or bridge.

B. Maintenance

1. Tenant must maintain roads, driveways or bridges on the Premises in good condition, and provide proper drainage in accordance with Landlord's specifications.

2. Tenant is responsible for its proportionate share of the cost of maintenance and general upkeep of non-public roads and bridges used in common with other cottage owners.

3. Tenant is prohibited from blocking or otherwise limiting access to any roads, driveways or bridges located on the Premises or any other property owned by Landlord.

4. Should Tenant fail to perform its maintenance obligations under these Rules and Regulations, Landlord, after notice to Tenant, may in its sole discretion, (i) perform such maintenance and charge Tenant for its share of the cost, or (ii) prohibit the use of the road, driveway or bridge in need of repair. Landlord shall have no obligation to repair or maintain such roads, driveways or bridges.

C. Access

1. Landlord has no responsibility for providing, maintaining or improving access to the Premises. Egress and ingress as currently practiced is not guaranteed and could be altered at any time by Landlord.

2. Landlord may grant easements (the right to use parts of the Land) over any part of the Land to others for any purpose, such as (a) roads and/or highways; (b) utility lines, either underground or overhead.

3. Tenants are prohibited from posting any signs or making any other communications regarding No Trespassing or any other restrictions to accessing and using Landlord property. Tenants are prohibited from blocking access to any Landlord property.

IV. TREES & PLANTS

1. No trees or ornamental shrubs shall be injured or damaged, by Tenants or their guests. The attaching of lights, electric lines, clotheslines, docks, or any other item to any tree or shrub, either on a temporary or permanent basis, is prohibited. Care must be taken during any construction activities to prevent injuring trees or ornamental shrubs, and if necessary, temporary protective shields shall be installed around the trees or shrubs.

2. Tenant shall not remove any tree or shrub over two (2) inches in diameter without prior written permission of Landlord. If a tenant desires to trim, cut or remove significant portions of a tree, they must first obtain written permission from Landlord. If Tenant removes any tree or shrub in violation of the Rules, Tenant shall be subject to the fees in Section VIII and lease termination. If Tenant determines that a tree is an immediate safety hazard, Tenant should vacate the Premises and address it immediately by contacting Landlord for approval to remove the tree.

3. Tenant is responsible for correcting hazardous tree conditions on or adjoining the Premises. Landlord may notify in writing the Tenant of any trees that Landlord believes should be removed. It will be the responsibility of the Tenant to have such trees removed. If such trees are not removed within the specified time period, Landlord at its option may terminate the Tenant's Lease and/or remove the tree at the Tenant's expense.

4. Tenant shall not introduce or maintain any invasive plant species or noxious weeds (including bamboo) onto the Premises, on any of Landlord's properties, or within or upon any waters of the State and is responsible for removing any such growth from the Premises.

5. Tenant shall not plant anything that will grow above 6 ft. in height without the Landlord's prior written permission. Any planting and landscaping by the Tenant shall be limited to a reasonable amount (in the sole determination of Landlord) and done strictly within the Premises.

V. WATER

1. All Premises must be served by an approved potable water source, which could include a permitted well or bottled water.

2. Tenant must obtain written permission from Landlord and all applicable permits for existing or future wells prior to use. Wells may be shared by no more than 4 cottages, with a total maximum occupancy of 24 persons. All unpermitted or prohibited wells must be abandoned in accordance with applicable Laws.

3. The use of river, creek or spring water for human consumption is prohibited and such water sources may not be attached to pressurized plumbing. Human consumption includes drinking, bathing or showering, cooking, dish washing and oral hygiene.

4. River, creek or spring water may be used for purposes other than human consumption, provided it is not attached to pressurized plumbing and that Tenant obtains all applicable permits prior to its use.

5. Tenant shall take all reasonable measures to limit the use of water. Accordingly, swimming pools, hot tubs and spas, whether above or below ground, temporary or permanent, are prohibited.

6. All use of water by Tenant, in and about the Premises, shall be at the sole risk of Tenant. Landlord has not performed any water potability tests and makes no representations with regard to the suitability of the water for domestic purposes. Tenant is responsible for performing any applicable potability testing or other water analysis and permitting. All costs incurred in

connection with such testing and permitting shall be the responsibility of the Tenant. Landlord assumes no liability for, or on account of, any water used in any manner by Tenant or Tenant's guests.

7. No exclusive rights are given or inferred as being given as to the use of any water or spring, even though a spring may be located on the Premises.

8. Construction or drilling of a new well or other water source is subject to the prior approval of Landlord in accordance with the procedures set forth in Section II (B) above, including without limitation the obligation to obtain applicable permits prior to construction.

VI. SANITARY SYSTEM REQUIREMENTS

1. All Premises must be served by an approved sanitary system, which may be a septic system, holding tank, sealed pit privy, incinerator toilet, composting toilet or chemical toilet (temporary only) ("Sanitary System"). Before beginning the construction, installation or alteration of any Sanitary System, Tenant shall comply with the procedures set forth in Section II (B) above, including the obligation to obtain written permission from Landlord and all applicable permits.

2. In the event an approved and permitted Sanitary System does not exist on the Premises, Tenant must provide the site with a Sanitary System in compliance with all applicable Laws and these Rules and Regulations. No Sanitary System shall be located closer than one hundred (100) feet of any spring, stream, or other water supply source (except as otherwise permitted by applicable Laws).

3. Subject to Landlord's prior approval, sealed pit privies, holding tanks, composting toilets, incinerator toilets and chemical toilets are permitted. Tenant must enter into a written maintenance agreement with Landlord and with the applicable agency if required and obtain all applicable permits prior to installing such systems.

4. Gray water must be collected and disposed of in an approved, permitted wastewater disposal system. Tenant must enter into a written maintenance agreement with Landlord and with the applicable agency if required and obtain all applicable permits prior to installing such systems.

5. In the event a public sanitary sewer system is installed in the area, Tenant shall be required to connect into the system, whereupon Tenant shall be responsible for all connection, maintenance, and operation fees or costs.

6. All garbage, trash or refuse must be removed from the Premises every seven (7) days. In the interim, all garbage, trash and refuse must be kept in a closed container intended for the temporary storage of garbage, trash or

refuse secure from flies, rats or other insect or animal intrusion and maintained in a good and sanitary condition in compliance with applicable Laws.

7. All Sanitary Systems and gray water systems must be maintained at all times in good working order and sanitary condition and in compliance with all applicable Laws and any applicable holding tank agreement or sealed pit privy agreement. Tenant shall be responsible for the annual winterization of all water source, sanitary, and gray water systems. TENANT MAY BE REQUIRED TO PROVIDE LANDLORD WITH A FORM OF CERTIFICATION ACCEPTABLE TO LANDLORD THAT ALL SANITARY AND GRAY WATER SYSTEMS ARE IN GOOD WORKING ORDER IN ACCORDANCE WITH APPLICABLE LAWS, AND THAT TENANT IS NOT IN DEFAULT UNDER ANY SEWAGE PUMPING AGREEMENT OR HOLDING TANK AGREEMENT. TENANT MAY ALSO BE REQUIRED TO PROVIDE LANDLORD WITH THE MOST RECENT PUMPING RECEIPT.

8. Please note that although Water and Sanitary regulations differ among the various municipalities, Exelon reserves its rights under the Lease to require Tenants to adhere to more stringent standards. In addition, Federal, State and Local regulations are subject to change at any time. Please make sure you review Sections V and VI of the Rules and are aware of the standards to which you are subject. In any circumstance, any violation of Federal, State or Local regulations or Exelon Rules that create a health or environmental issue, will be considered a default of your Lease. It is your responsibility to ensure that all Water and Sanitary systems are functioning properly, inspected and serviced regularly, and that you satisfy all State and Local reporting requirements.

VII. SHORELINE PROTECTION PROGRAM

A. Application Procedures

1. The “shoreline” is considered to be the existing shoreline at mean high water.

2. All applicable Construction rules in Section II apply to the Shoreline. Prior to the construction or repair of a pier, dock, boathouse, boat ramp, marine railway, bulkhead, retaining wall or erosion control measures or excavation in any areas that may affect the shoreline (“Shoreline Improvements”), Tenant, must submit a Construction Application to Landlord in accordance with Section II (B) of these Rules and Regulations. Landlord will make an on-site inspection of the area to determine if what the applicant has proposed should be allowed or if another type of measure may be more appropriate. Landlord may deny any Construction Application in its sole discretion. Other than routine maintenance of existing Shoreline Improvements and new erosion control measures with the prior written consent of Landlord, construction of Shoreline Improvements outside of the applicant’s Premises is not permitted.

No construction may begin until the Tenant has received Landlord's written Approval and obtained all required local, state and federal permits and authorizations, including but not limited to all permits required by the applicable state agencies (Maryland Department of the Environment – MDE or Pennsylvania Department of Environmental Protection – PaDEP), and the U.S. Army Corps of Engineers.

B. Specifications and Procedures

In addition to the applicable Laws and all requirements set forth by the applicable permitting authorities, the following specifications shall apply. Should any specification herein conflict with any applicable local, state, or federal Law or regulation, the most restrictive requirement shall apply

1. Piers or Docks

a. All new or replacement piers or docks must be a temporary, floating construction and may not exceed a total length of fifty (50) feet (or extend more than fifty (50) feet from the shoreline). If the pier is located in a cove or in a stream, the length may not exceed 25% (1/4) of the width of the cove or stream where the pier is located. Floating piers/docks must be removed from the water annually from November 15 to March 15 and securely stored above the high-water line.

b. Flotation devices for floating piers must be constructed of environmentally sound material as approved by Landlord and permitting authorities. Barrels or similar flotation devices are not permitted.

c. Piers may not interfere with navigation, present a safety hazard, or block ingress or egress to adjoining areas.

d. If an existing pier must be replaced or repaired (other than minor repairs), it must conform to current standards.

e. Piers may not be anchored or tied to trees at any time.

2. Boat Ramps and Marine Railways

a. New boat ramps and entry paths into the water will not be permitted. Repairs or reconstruction of existing ramps must be constructed of stone and/or wood. Asphalt or other petroleum-based products are prohibited.

b. Ramps may not exceed fifteen (15) feet in width and thirty (30) feet in length. The length should not exceed that necessary to be functional.

c. Marine railways may use treated wood.

d. Marine railways may not exceed fifteen (15) feet in width and should be no longer than necessary to be functional. Landlord may, however, restrict the length because of site conditions.

3. Erosion Control Measures (Bulkheads, Retaining Walls, Sea Walls, Rip Rap, etc.)

a. No erosion control measure shall significantly alter the existing shoreline.

b. The planting of native species vegetative cover and/or rip-rapping shall be used if adequate to control the problem.

c. Erosion control measures, including bulkheads, retaining walls and rip rap, may not be installed or replaced without the prior written approval of Landlord.

d. The structure shall not significantly detract from the scenic value of the area. Landlord will typically prefer plans consisting of wood and/or stone but not the use of concrete.

C. Landlord assumes no liability for injury or damage in the construction, use or removal of any Shoreline Improvement made by the current or any former Tenant.

VIII. COMPLIANCE; AMENDMENTS

In the event of Tenant's failure to comply with these Rules and Regulations and Laws, Landlord may impose a fee on Tenant of up to $250 per day until such failure is cured and/or terminate Tenant's Lease in accordance with its terms. Landlord may also impose fixed fees of up to $2,500 for non-compliance issues and/or terminate Tenant's Lease in accordance with its terms. Landlord shall have the right to amend these Rules and Regulations at any time as Landlord deems necessary.

IX. CULTURAL RESOURCE PROTECTION GUIDELINES

Landlord has developed, in cooperation with the Pennsylvania Bureau of Historic Preservation and the Maryland Geological Survey, Division of Archeology, the following rules and regulations. The specific intent of these guidelines is to provide for the protection of cultural resources, and to avoid any disturbance of historic and prehistoric

sites except when justified for scientific purposes and/or when performed in accordance with such State and Federal regulations and guidelines as may apply.

A. No one shall mar, deface, remove, destroy or in any other way damage, any standing structure, ruins, foundation or other man-made feature of a potentially historic nature on lands of Landlord, without first having obtained the written permission of Landlord.

B. No one shall perform any sub-surface archaeological investigations, or in any way disturb the soil for the purpose of searching for and/or obtaining historic or prehistoric artifacts on land of Landlord without having first obtained the written permission of Landlord, nor shall same be performed without the prior knowledge and written sanction of the following:

In Maryland: The State Historic Preservation Officer and/or the Geological Survey, Division of Archeology

C. Full and complete reports must be prepared. Said reports shall incorporate maps, site profiles, descriptions and photographs of artifacts and features, soil descriptions, topography, excavation procedures, directions and distance to the nearest water and all such other related details as may be required.

D. Landlord shall be supplied with a copy of each report so generated. The appropriate State agency shall be supplied with two copies of same, one of which shall contain original photographs.

E. All artifacts and related material recovered in sub-surface investigations shall become the property of Landlord and shall be turned over to the respective State agency. Same shall remain available to Landlord and other responsible public and private organizations and agencies for the purpose of study and/or public display.

F. All artifacts must be properly labeled with site number and lot and must be readily identifiable by pit and level. Site numbers must conform to the trinomial numbering system adopted by both Pennsylvania and Maryland.

G. All burials encountered during the course of such archeological investigations shall be treated with the highest respect and shall be handled on a case by case basis under the strict control of the State agency having jurisdiction. It is the policy of said agencies and of Landlord, to discourage the removal or disturbance of human remains, unless there is a significant scientific purpose to be served by same, and unless provisions are made, in consultation with, and with the approval of living descendants of the interred, for the timely study and the ultimate reburial of the remains.

H. While the collection of artifacts from the surface is widespread, and though not strictly prohibited under these regulations, it does have a significantly negative

effect on archeological sites. The distribution of surface artifacts is the only information available for many sites. Those finding artifacts are therefore encouraged to report finds to Landlord so that same might be photographed and recorded.

I. Tenant is required to consult with the appropriate State Preservation Office prior to any construction work that may affect surface or sub-surface archaeological sites, and prior to new additions to existing structures or the construction of new structures.

J. On property which is within the boundaries of Federally-regulated projects such as the Conowingo Hydro-Electric Project (F.E.R.C. No. 405), Tenants' properties require additional precautions regarding cultural resources under the provisions of the National Historic Preservation Act of 1978 (section 106), Executive Order 11593, and the regulations of the Advisory Council on Historic Preservation (36 CFR 800).

X. CONTACT INFORMATION

1. Tenant Contact Information – for all changes to Tenant contact information including primary mailing address, phone numbers and email addresses, Tenant must complete Tenant Information form (see Attachment 4) and return to Landlord at the time of the change. Tenant Information form must be signed by all Tenants who had signed the Lease agreement. Failure to update Landlord as to changes in contact information that result in Landlord’s inability to contact Tenant will prompt Landlord to terminate the Lease upon the next annual expiration date.

DISCLAIMER: The following list is intended as a reference to the Tenant for contacting the municipalities or agencies that may require permits or approvals for specified construction activities. The list is not intended to be an exclusive list and Landlord makes no guarantees or warranties as to the accuracy of the information contained herein below. Tenant is responsible for determining which federal, state, and/or local Laws apply to their proposed use, occupancy and construction activities and to contact the applicable government or agency as required by said Laws.

Pennsylvania

Pennsylvania Fish and Boat Commission
Executive Director
P.O. Box 67000
1601 Elmerton Avenue
Harrisburg, PA 17106-7000
717.705.7800

Fulton Township Supervisors
777 Nottingham Road
Peach Bottom, PA 17563
717.548.3514

Martic Township Supervisors
370 Steinman Farm Road
Pequea, Pa. 17565
717.284-2167

Drumore Township Supervisors
1675 Furniss Road
Drumore, PA 17518-0038
717.548.2660

Lancaster County Conservation District
1383 Arcadia Road, Room 200
Lancaster, PA 17601
717.200.5361 ext 5

Pennsylvania Department of
Environmental Protection (PADEP)
Department of Environmental Protection Headquarters
Rachel Carson State Office Building
400 Market Street
Harrisburg, PA 17101
717.783.2300

Peach Bottom Township Supervisors
6880 Delta Road, Suite 3
Delta, PA 17314
717.456.5083

Lower Chanceford Township Supervisors
4120 Delta Road
Airville, PA 17302
717.862.3589

York County Conservation District
118 Pleasant Acres Road
York, PA 17402
717.840.7430

U.S. Army Corps of Engineers
Philadelphia District
The Wanamaker Building
100 Penn Square East
Philadelphia, PA 19107
215.656.6728

ATTACHMENT 1 – page 1 of 2

CONSTRUCTION APPLICATION

Tenant Information **Application Date:** _____

Name:_____ Cottage ID Number (C.I.N.) _____
Address:_____
City:_____ State:_____ Zip:_____
Home Phone:_____ Cell/Other Phone(s):_____
Email(s): _____

Authorization Requested For (check appropriate items)

Addition to Cottage _____ Deck/Patio _____ Boat Ramp _____
Shed/Outbuilding _____ Well _____ Sidewalk/Pathway _____
Fence _____ Sanitary _____ Landscaping/Plantings _____
Parking Area _____ Pier/Dock _____ Utilities/Major Systems _____
Bulkhead/Walls _____ Road/Bridge _____
New Construction (specify) _____
Removal or demolition of _____
Other (specify) _____

Procedure (see section II B of the current Rules & Regulations for additional guidelines & requirements)

1) Tenant must adhere to all requirements as contained in the Lease and the current Cottage Rules and Regulations document and obtain written preliminary approval from Exelon prior to applying for local, state or federal building permits.
2) This application must include with it a sufficient plan and drawing including but not limited to: materials to be used, methods of construction, a site map with project location, project drawings with dimensions (if applicable), photos of the existing project location and a list of all required permits/permissions and the agencies requiring them.
3) Exelon shall give Tenant written notice of preliminary approval or denial within 45 days of the receipt of all necessary and complete application documents. Incomplete packages will not be reviewed.
4) Within 90 days after receipt of the preliminary approval, Tenant must submit to Exelon copies of all permits issued by the appropriate local, state or federal authorities. Exelon will provide a final written approval or denial within 15 days of receiving all necessary permits.
5) **No work can be started until all necessary permits have been received AND Exelon issues its final written approval of this application.**
6) Failure to comply with this procedure may result in fees and/or termination of the Tenant's Lease in accordance with the Rules and Regulations. Exelon reserves the right to deny this application in Exelon's sole discretion.

Preparation Fee: Please submit a check in the amount of $50.00 with this application made payable to: Exelon Generation Company, LLC.

NOTE: COLLECTION/CASHING OF FEE/CHECK DOES NOT CONSTITUTE PROJECT APPROVAL

Please submit this application to:

Exelon Generation
Conowingo Hydroelectric Generating Station
Attn: Cottage Program Manager
2569 Shures Landing Road
Darlington, MD 21034

PLEASE DIRECT QUESTIONS TO (610) 765-5200 (Cottage Program Manager)

ATTACHMENT 1 – page 2 of 2

CONSTRUCTION APPLICATION

Failure to comply with this procedure may result in denial of the application and/or termination of the Tenant's Lease in accordance with the Rules and Regulations.

PLEASE DIRECT ALL QUESTIONS TO (610) 765-5200 (Cottage Program Manager).

Note that all Tenants listed on the existing Lease, must sign below

CURRENT TENANT(S):

_____
Signature

_____
Print Name

_____
Signature

_____
Print Name

EXELON USE ONLY

Reviewed (I) _____ APPROVED _____ _____
(F) _____ DATE
Fee Rec'd (C) _____

ATTACHMENT 2 – page 1 of 3

LEASE TRANSFER / CHANGE APPLICATION

This application must be submitted to Exelon Generation Company, LLC with all required and complete documentation. Contact the Exelon Cottage Program Manager for additional lease transfer guidelines as requirements change. Incomplete application packages will not be reviewed..

CURRENT TENANT(S) INFORMATION **APPLICATION DATE:** _____

Name: _____ Cottage ID Number (CIN): _____

Name: _____ Cottage Address: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone(s): _____ Email(s):_____

NEW TENANT(S) INFORMATION – all fields required
Name(s) (as should appear on Lease): Tenant 1: _____

Tenant 2: _____

How is Tenant 2 related to Tenant 1(Spouse/Parent/Child/Sibling/Other):_____

Address: _____

City: _____ State: _____ Zip: _____

Home Phone: _____ Cell Phone(s): _____

Email Address(es): _____

EST. SETTLEMENT DATE: _____ **PURCHASE PRICE:** _____

Please submit this Request to:
Exelon Generation
Conowingo Hydroelectric Generating Station
Attn: Cottage Program Manager
2569 Shures Landing Road
Darlington, MD 21034

Procedure (see section II D of the current Rules and Regulations for additional guidelines and requirements)

NOTE: COLLECTION/CASHING OF FEE/CHECK DOES NOT CONSTITUTE LEASE TRANSFER APPROVAL

TO BE SUBMITTED WITH THIS APPLICATION:

1. The Lease Transfer Requirements Checklist (see page 3 of 3 for additional requirements)
2. An application fee in the amount of $250 by check made payable to Exelon Generation Company, LLC.
3. A clean inspection report from a licensed(MD) or certified(PA) inspector. Inspection should cover building, electrical, water and sanitary of the Premises to ensure compliance with local, state and federal codes/laws.
4. Copy of the Agreement of Sale for the Tenant improvements ("Improvements"). Agreement of Sale must include: "Only the Tenant's improvements are being sold and neither land, nor water rights are included in the sale. The Landlord has no responsibility for providing, maintaining or improving access to the leased premises."
5. Copy the Buyer(s)'s driver's license.
6. The completed Water and Sanitary Sign Off form.
7. Contact the Exelon Cottage Program Manager for additional application requirements as they do change.
8. **NO SALE should be finalized until you have Exelon's final written approval to proceed with closing.**

ATTACHMENT 2 – page 2 of 3

LEASE TRANSFER / CHANGE APPLICATION

TO BE SUBMITTED AFTER EXELON PRELIMINARY WRITTEN APPROVAL AND SETTLEMENT:

Within ten (10) days after settlement, the following must be submitted:

1. A "Bill of Sale" for the improvements signed by both parties. **NOTE: The New Tenant(s) on the Lease must be the same as the Buyers who have signed the Bill of Sale.** Bill of Sale must include the following: “Only the Tenant’s improvements are being sold and neither land, nor water rights are included in the sale. The Landlord has no responsibility for providing, maintaining or improving access to the leased premises.”
2. A new Lease Agreement (provided by Exelon at time of preliminary approval) signed by the new tenant(s).
3. All other documents that may be required as a result of Exelon’s preliminary approval.

Exelon reserves the right to deny this application if the Lease is in default or in Exelon’s sole discretion.

Failure to comply with this procedure may result in denial of the application and/or termination of the Tenant’s Lease in accordance with the Rules and Regulations.

PLEASE DIRECT ALL QUESTIONS TO (610) 765-5200 (Cottage Program Manager).

Note that all Tenants listed on the existing and future Leases, must sign below

CURRENT TENANT(S):	**NEW TENANT(S):**
_____	_____
Signature	**Signature**
_____	_____
Print Name	**Print Name**
_____	_____
Signature	**Signature**
_____	_____
Print Name	**Print Name**

EXELON USE ONLY

Fee received: _____ Date: _____
Approved: _____ Date: _____
File No.: _____

ATTACHMENT 2 – page 3 of 3

Lease Transfer Requirements Checklist Cottage Identification #:_____

This Form MUST be submitted as the cover page to your Lease Transfer Application package

All documents, in the required condition and with no errors or discrepancies, must be submitted at the same time with this checklist. Exelon will not accept documents if they are submitted at different times. This will delay the lease transfer review significantly.

Your lease transfer application package must include:

1) This **Lease Transfer Requirements Checklist** [ ]
2) The **Lease Transfer Application** including signature page [ ]
3) Copy of Drivers Licenses for all Buyers [ ]
4) Signed **Water and Sanitary Compliance Sign Off** form [ ]
5) **Agreement of Sale** with all of the following: [ ]
    a. Sales price
    b. Exelon six-digit Cottage Identification Number (CIN)
    c. EMS address of cottage (incl. Municipality/County/State)
    d. All Buyer and Seller Names and Signatures
    e. This exact wording: "Only the Tenant's improvements are being sold and neither land, nor water rights are included in the sale. The Landlord has no responsibility for providing, maintaining or improving access to the leased premises."
6) A **Well License** between Exelon and the current Tenant [ ] or N/A
    a. If there is a well on site and a license hasn't already been completed
7) The last **Septic Pumping Receipt** [ ] or N/A
    a. If not applicable, explain: _____
8) A third-party **Inspection Report** with no exceptions, within last 12 months [ ]
    a. Exceptions must be cleared and all photos and references regarding exceptions removed from the report to avoid confusion. NOTE that any work to clear exceptions that is considered Construction under the Exelon Rules and Regulations must be approved by Exelon in writing prior to starting.
    b. Report must clearly document the current condition and systems regarding the water source and sanitary/septic disposal and state that they "are in good working order and in compliance with applicable laws".
9) **Municipal Inspection Reports** with no exceptions, for PA cottages [ ] or Md
    a. Township will issue either:
        i. Separate Building/Zoning and Sewage reports
        ii. Or a passing building/zoning and sanitary inspections will be evidenced by a Certificate of Use and Occupancy (ie Drumore)

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ATTACHMENT 3 – Example Form of the Current Lease

THIS LEASE IS NOT TRANSFERABLE WITHOUT THE PRIOR WRITTEN APPROVAL OF LANDLORD

LEASE - Pa

THIS LEASE AGREEMENT (this "Lease") is made this XXXXX day of XXXXXXXXXXXXXXXXXX, 20XXXXX (the "Effective Date"), by and between Exelon Generation Company, LLC ("Landlord") and XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX ("Tenant"). Tenant's liability shall be joint and several if Tenant is more than one party.

BACKGROUND

A. Landlord, as successor by merger to PECO Energy Power Company, is the owner of a parcel of land located in XXXXXXXXXXXXXXX Township, XXXXXXXXXXXX County, Pennsylvania, identified as Lot No. XXXXXXXX, as outlined in red on the plan attached to this Lease as **Exhibit A** (the "Land").

B. Landlord and Tenant, intending to be legally bound hereby, intend to enter into a lease of the Land on the following terms and conditions.

1. Term. Unless sooner terminated in accordance with the terms of this Lease, Landlord agrees to lease the Land to Tenant for a term beginning on the Effective Date and ending on September 30th of the calendar year following the Effective Date (the "Term"). Thereafter, this Lease shall continue upon the same terms and conditions, subject to the adjustment of Rent in accordance with Paragraph 2 hereof, from year to year until terminated by either party by written notice at least thirty (30) days prior to the expiration of the then current term.

2. Payment of Rent. Tenant agrees to pay to Landlord annual rent in the amount of $XXXXXXXXXX ("Rent") on the first day of September. Tenant will send or deliver the Rent to Exelon Generation Company, LLC, 1310 Point Street, 18th Floor, Baltimore, MD, 21231, Attn: Real Estate & Facilities, unless Landlord notifies Tenant in writing that the Rent should be sent or delivered to another address. Except as otherwise provided herein, Landlord is not required to send Tenant a bill for the Rent, and the lack of a bill does not mean that Tenant is not required to pay Rent on or before the date set forth above. The Rent shall increase annually by the amount of three percent (3%), including the Rent which will be due on the September 1st following the Effective Date. Tenant shall pay to Landlord the adjusted Rent within five (5) days after receipt of a bill from Landlord for the adjusted Rent amount. Landlord reserves the right to charge Tenant as additional rent Landlord's costs arising out of this Lease, including without limitation the cost of enforcing the provisions of this Lease.

3. Late Charge. Tenant must pay the Rent by the first day of each September. If the Rent is not received by Landlord within ten (10) days after the Rent is due, Tenant must pay an additional charge equal to five percent (5%) of the overdue Rent.

4. Condition of Land. Tenant has inspected the Land before signing this Lease. Tenant accepts the Land "AS IS" on the day Tenant signs this Lease. Landlord has made no promises or representations to Tenant concerning the condition of the Land.

5. Maintenance and Repair; Ownership of Tenant's Improvements. Tenant owns and is solely responsible for all improvements on the Land. Tenant agrees to maintain in good condition all improvements on the Land, including without limitation all dwellings, fixtures, sheds, outhouses, decks, fences, driveways, bridges, Shoreline Improvements (as defined in the Rules and Regulations) and all other structures or materials placed on the Land by Tenant or any former tenant, whether or not said improvement is affixed to the Land ("Tenant's Improvements"). At the expiration or earlier termination of this Lease, Tenant will leave the Land in at least as good condition as when this Lease began, except for normal wear and tear.

6. Non-Interference. Landlord may use the Land to operate Landlord's facilities, including without limitation Conowingo Hydro-Electric Station, Muddy Run Pumped Storage Facility and Peach Bottom Generating Station (the "Project"). Tenant understands that efficient and economical operation of the Project is the main purpose of Landlord's use of its property including the Land. Tenant understands that the Landlord's operation of the Project may limit Tenant's use of the Land from time to time. Regardless of what else this Lease says, Tenant will not interfere with Landlord's use of the Land or the use of the Land by Landlord or its affiliates for the Project. Tenant waives or gives up any rights to file a lawsuit against Landlord or its affiliates for anything relating to the maintenance, operation or new construction of the Project or the use of the Land for Landlord's corporate purposes.

7. Landlord Reservations. Landlord may grant easements (the right to use parts of the Land) over any part of the Land to others for any purpose, such as (a) roads and/or highways; (b) utility lines, either underground or overhead. All standing timber on the Land shall remain the property of Landlord. Tenant may not cut, remove or destroy any timber nor remove any rock, stone, gravel, soil or other material from the Land.

8. Rules and Regulations. Tenant's use of the Land is subject to all Laws and Landlord's rules and regulations, a copy of which is attached hereto as **Exhibit B** as they may be amended from time to time (the "Rules and Regulations"). Landlord shall provide Tenant with copies of all changes in the Rules and Regulations as they occur. FAILURE TO COMPLY WITH ANY OF THE LAWS AND THE RULES AND REGULATIONS WILL BE CONSIDERED A VIOLATION OF THE TERMS AND CONDITIONS OF THIS LEASE AGREEMENT AND MAY RESULT IN A FEE OF UP TO $250.00 PER DAY IMPOSED AGAINST TENANT BY LANDLORD AND/OR TERMINATION OF THE LEASE. In addition to Landlord's right and option to assess fees against Tenant and to terminate the Lease, Landlord has the right but not the duty to enter the Land and cure any violation of the Rules and Regulations or other terms and conditions of this Lease, and to assess all costs incurred by Landlord as a result of curing any such violation(s) against Tenant. ATTACHED HERETO AS **EXHIBIT C** IS THE CABIN AFFIDAVIT EXECUTED BY TENANT.

9. Use of Land. Tenant shall use the Land only for a vacation retreat and recreational activities. Tenant shall **NOT:**

(a) **USE OR OCCUPY THE LAND AS A PRIMARY PERMANENT RESIDENCE OR DOMICILE.** "Domicile" means the place at which a person has been physically present and that the person regards as home. "Residence" means the act or fact of living in a given place for a period of time with an intent to treat it as a home.

(b) Construct or install any new buildings, structures or other improvements on the Land or enlarge any buildings, structures or Tenant Improvements, without the prior written consent of Landlord in accordance with the procedures set forth in the Rules and Regulations and all Laws.

(c) Dispose of or store any toxic or hazardous substances, including but not limited to hazardous waste, on the Land.

(d) Disturb other tenants of Landlord.

(e) Interfere with the Landlord's use of the properties surrounding the Land.

(f) Dispose or store any flammable, explosive or hazardous materials on the Land.

(g) Engage in any commercial activities, including without limitation operating or leasing campgrounds or dock facilities.

10. No Representations. Tenant agrees that:

(a) Landlord makes no promises about the condition of the Land.

(b) Landlord is not required to make any repairs or alterations to the Land either now or in the future.

(c) Landlord is not required to maintain the Land, the surrounding property, or the Tenant Improvements, building or structures on the Land.

(d) Landlord is not required to provide any utility service to the Land, such as telephone, electricity, heat, water, gas, sewer or trash removal, regardless of whether such services exist at the time the Tenant signs this Lease.

11. Access. Tenant is responsible for acquiring and maintaining access to the Land. Landlord has no responsibility for providing, maintaining or improving access.

12. Inspection of Premises. Landlord, its employees and representatives may inspect the Land at any time without providing Tenant with notice.

13. Taxes. Landlord will pay real estate taxes on the Land, including Tenant's Improvements, unless real estate taxes on Tenant's Improvements are separately assessed and billed directly to Tenant. Landlord will send Tenant a bill for the real estate taxes and Tenant will reimburse Landlord for the real estate taxes as additional rent within thirty (30) days after the date of the bill.

14. No Waiver. Landlord is not required to enforce this Lease. If Landlord does not enforce a part of this Lease, this does not mean Landlord cannot enforce the same part, or a different part, later. The payment of Rent by Tenant after Tenant violates this Lease does not mean that the violation of this Lease is forgiven.

15. Compliance with Laws. Tenant agrees to comply at its expense with all Federal, state and local laws that apply to Tenant's Improvements or Tenant's use of the Land ("Laws"). It is Tenant's responsibility to be aware of all Laws that apply to the Land.

16. Indemnification. Tenant assumes responsibility for any action by Tenant, Tenant's contractors, representatives or guests on or near the Land. If a claim is made against Landlord because of something that Tenant, its contractors, representatives or guests do on the Land, Tenant shall pay all of Landlord's costs and expenses which occur because of the claim (including Landlord's attorney's fees). If Landlord pays any money in order to settle or defend the claim, Tenant shall pay Landlord the amount that Landlord paid.

17. Insurance. Tenant will be solely responsible for purchasing insurance to cover damage or theft of the Tenant's Improvements and personal property located on the Land as well as for liability and any other risks. Landlord does not provide any insurance coverage for the Tenant's interests. Tenant assumes responsibility for any action by Tenant, Tenant's contractors, representatives or guests which violates the Tenant's insurance policy.

18. Waiver of All Claims. Tenant understands and recognizes that, by signing this Lease, Tenant waives any and all claims against Landlord relating to the Land, Tenant's Improvements or personal property thereon or any previous leases of the Land. This includes, but is not limited to, claims for lost value of Tenant's property; lost use of the Land; or, loss, removal or destruction of Tenant's Improvements or personal property. Tenant further waives any claims for damages grounded upon an expectation of future gain, restitution or unjust enrichment.

19. Default. Tenant shall be in default under this Lease, if any of the following occur (each an "Event of Default"):

(a) Tenant does not pay the Rent, additional rent or other amounts Tenant is required to pay under this Lease when it is due and fails to make payment to Landlord of the overdue Rent within five (5) days written notice from Landlord;

(b) Tenant violates any part of this Lease or the Rules and Regulations or misrepresents any facts as to occupancy and fails to cure such violation within thirty (30) days after receipt of notice from Landlord to cure such violation;

(c) Tenant has not used or occupied the Land for more than twelve (12) consecutive months;

(d) Tenant occupies the Cottage as a domicile, primary or permanent residence;

(e) Tenant permits anyone else to occupy the Cottage as a domicile, primary or permanent residence;

(f) Tenant becomes insolvent or files for bankruptcy; or

(g) Tenant's rights to the Land are sold under execution or other legal process.

After the expiration of applicable cure periods, Landlord shall have all rights and remedies allowed by law and equity, including, without limitation, the right to terminate this Lease by sending written notice to Tenant. If Landlord does not immediately terminate the Lease after Tenant violates this Lease, Landlord can terminate the Lease at a later date.

20. Removal of the Tenant's Property. Prior to the expiration of this Lease or within ninety (90) days after the earlier termination of this Lease due to an Event of Default or otherwise, Tenant shall remove all of Tenant's Improvements and personal property, including trailers, mobile homes and personal belongings, owned by Tenant and restore the Land to a condition satisfactory to Landlord, unless Landlord has previously approved the sale of the Tenant's Improvements in accordance with the Rules and Regulations and has issued a new lease to the purchaser of the Tenant's Improvements. In the event Tenant fails to remove the Tenant's Improvements and personal property prior to the expiration of this Lease or within ninety (90) days after the earlier termination of this Lease, then the Tenant's Improvements and personal shall become the property of Landlord without any further act or notice by Landlord to Tenant. Landlord may thereafter occupy, sell, lease, repair or remove Tenant's Improvements and personal property. However, in the event Landlord elects to remove Tenant's Improvements and personal property, Tenant agrees to pay Landlord the cost incurred by Landlord for such removal within thirty (30) days of receipt of a bill from Landlord.

21. Notices. All notices under this Lease, shall be deemed to have been properly given only when written notice has been served by (i) personal delivery, (ii) by certified mail, return receipt requested, or (iii) by recognized overnight carrier, to the other party at its address as follows:

If to Landlord:

Exelon Generation
Conowingo Hydroelectric Generating Station
Attn: Cottage Program Manager
2569 Shures Landing Road
Darlington, MD 21034

If to Tenant:
XXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXX

If a notice sent to Tenant by certified mail is not accepted by Tenant, Landlord may post the notice at the Land.

22. Brokerage Commissions. There are no commissions or fees to be paid to any real estate broker or salesperson for this Lease. If Tenant has agreed to pay any commission or fee to a real estate broker, Tenant will pay that commission or fee. If Landlord has agreed to pay any commission or fee to a real estate broker, the Landlord will pay that commission or fee.

23. Federal Energy Regulatory Commission ("FERC"). The Land is part of a project licensed by the Federal Energy Regulatory Commission (FERC). Because of the FERC License the following requirements apply:

(a) Tenant's use of the Land will not endanger health, create a nuisance or otherwise be incompatible with the recreational use on any part of Landlord's land. Tenant will take all reasonable precautions to ensure that the use and maintenance of the Land will protect the scenic, cultural, recreational and environmental value of the Land.

(b) Landlord may terminate this Lease if Landlord's License from FERC is terminated. If Landlord terminates the Lease for this reason, Landlord will give Tenant thirty (30) days notice before the termination date.

24. Floods. Tenant waives or gives up any claims against Landlord for flooding by water or the presence or flow of ice on the Susquehanna River or any of its tributaries.

25. Severability. If any part of this Lease is not legal for any reason, the rest of this Lease shall continue to be valid and enforceable.

26. Governing Law. This Lease is made in the Laws of the Commonwealth of Pennsylvania.

27. Legal Action. A lawsuit regarding this Lease may only be filed in the county where the Land is located, or in the United State District Court in the state in which the Land is located and in the division closest in proximity to the Land. BOTH PARTIES ALSO WAIVE THEIR RIGHT TO A TRIAL BY JURY IF A LAWSUIT IS FILED REGARDING THIS LEASE AGREEMENT. Tenant shall pay Landlord all of its costs and expenses, including without limitation attorneys' fees, incurred by Landlord in enforcing Tenant's obligations under this Lease whether or not Landlord files a lawsuit against Tenant.

28. No Assignment. Tenant shall not assign, sublease or otherwise transfer or encumber this Lease without the prior written consent of Landlord. Tenant shall make all requests for Landlord's consent to assignment in accordance with the Rules and Regulations. Any assignment without the prior written request of Landlord shall be null and void.

29. Entire Agreement. This Lease replaces and cancels all other leases between Landlord and Tenant for the Land. Tenant understands the promises in this Lease shall be binding upon Tenant. This Lease contains the full and complete agreement between Tenant and Landlord. Any change, modification or waiver of the promises in this Lease may only be made by a written agreement signed by Landlord and Tenant. No promises were made by Landlord to Tenant other than those promises contained in this Lease.

EXECUTED BY THE PARTIES ON THE NEXT PAGE

Landlord and Tenant, intending to be legally bound, agree to the terms of this Lease effective as of the Effective Date.

TENANT(S):

XXXXXXXXXXXXXXXXXXXXXXXXXX
Signature

XXXXXXXXXXXXXXXXXXXXXXXXXX
Print Name

XXXXXXXXXXXXXXXXXXXXXXXXXX
Signature

XXXXXXXXXXXXXXXXXXXXXXXXXX
Print Name

LANDLORD:

EXELON GENERATION COMPANY, LLC

BY:_____

File No. _____
Initials _____

CABIN AFFIDAVIT (Lease Exhibit C) **Type** or **print legibly**

Cabin Identification & Location:

Exelon Cottage Identification Number (CIN) _____ See Attachment A for Map

Street Number & Name (EMS) _____

Township, Borough or City Name _____

County and State _____

Cabin Owner/Tenant Name(s): – Must List all Cabin Owners/Tenants

Owner/Tenant 1 _____ Owner/Tenant 2 _____

List Any Other Owners/Tenants _____

Cabin Owner/Tenant Primary Addresses – Must Be Physical Address and Not PO Box:

Owner/Tenant 1:
Street Number & Name _____

City, State & Zip Code _____

Owner/Tenant 2:
Street Number & Name _____

City, State & Zip Code _____

Owner/Tenant Other:
Street Number & Name _____

City, State & Zip Code _____

Owner/Tenant Attestation:

I attest to the fact that the cabin identified above:

1. Will be utilized for recreational activities only.
2. Will not be utilized as a domicile ("domicile" means the place at which a person has been physically present and that the person regards as home), permanent or primary residence ("residence" means the act or fact of living in a given place for a period of time with an intent to treat it as a home) by myself or any other person for any period of time.
3. Will not be used for any commercial purposes or as a place of employment.
4. Will not exceed two stories in height (excluding the basement, if any).
6. Will not be a mailing address for bills or correspondence.
7. Will not be listed as any individual's place of residence on a tax return, driver's license, vehicle registration or voter registration.

For each Owner/Tenant provide two of the following showing name and primary address:☐ tax return,

☐ driver's license, ☐ vehicle registration, ☐ voter registration, ☐ passport, ☐ recent pay stub, ☐ recent utility bill.

I solemnly affirm under the penalties of perjury and upon personal knowledge that the contents of this document are true and correct.

_____
Owner/Tenant 1 Signature / Date

_____
Owner/Tenant 2 Signature / Date

_____
Owner/Tenant Other Signature / Date

Page left intentionally blank

ATTACHMENT 4

Exelon Cottage Program - Tenant Information Collection/Change Form

Cottage Identification # (CIN): _____

Today's Date: _____

Cottage Address: _____

Tenant Contact Information (all fields required)

Primary Residence (not a PO Box):

Address:_____ City/State/Zip:_____

Home Phone:_____ Cell Phone(s): _____

Other/Work/Cell Phone(s) if you wish to list: _____

Email address(s): _____

If mail needs to be sent to a PO Box:

Address:_____ City/State/Zip:_____

If the above includes changes from prior contact information please list the old address, phone # and/or email that is being replaced:

_____

_____

All Tenants listed on the Lease must sign below verifying the above information:

CURRENT TENANT(S):

_____
Signature

_____
Print Name

CURRENT TENANT(S):

_____
Signature

_____
Print Name

Return completed form to:
Exelon Generation
Conowingo Hydroelectric Generating Station
Attn: Cottage Program Manager
2569 Shures Landing Road; Darlington, MD 21034
Questions: 1-610-765-5200

APPENDIX D. RULES AND REGULATIONS GOVERNING USE AND OCCUPANCY OF LEASED PREMISES

RULES AND REGULATIONS
GOVERNING THE USE AND OCCUPANCY
OF LEASED PREMISES

GENERAL CONDITIONS

A. General Information

All questions, complaints, and problems should be directed to:
Real Estate & Facilities
PECO Energy Company
2301 Market Street, N3-3
Philadelphia, PA 19101.

Telephone: (215) 841-5409

B. General Conduct

1. Tenants and their guests shall not permit any noise, or other disturbance to interfere with the quiet enjoyment of others.

2. Tenants and their quests shall exercise great care to avoid the possibility of fire. No open fires are permitted except in properly constructed barbecue pits, or trash burning containers, and any burning must comply with local ordinances.

3. Tenants are responsible for the actions of their guests.

4. A six (6) digit Cottage Identification Number (C.I.N.) will be assigned to each Tenant and is to be placed on the outside wall of the cottage facing the water, and must be visible from the water. If the cottage is accessible from a road or fronts on a road, the C.I.N. must also be placed on the side of the cottage facing the road. All numbers must be at least 4 inches high.

5. All dogs must be kept securely tied or on a leash at all times.

6. Tenant must report possible hazardous conditions to the Landlord immediately upon discovery.

7. Tenant shall be responsible for the correction and/or control of any erosion caused by or resulting from improvements, and/or changes made to, or on the leased premises. Landlord may require Tenant to rectify any erosion problems on or affecting the leased premises.

However, Landlord has no duty to Tenant to correct any erosion problems.

IMPROVEMENTS

A. New Construction or Additions (Application Procedure)

1. A BUILDING LICENSE APPLICATION must be submitted (with all appropriate attachments and a check for application fee) to Landlord prior to beginning any new construction or additions, removals, or repairs which alter existing structures. (Application forms may be obtained from the Landlord in Philadelphia).

2. If the application is approved, Tenant will be notified in writing by Landlord. Tenant must then obtain a Building Permit from the local municipality. A copy of the Building Permit must be forwarded to Landlord prior to beginning any work.

3. Landlord will then issue a Building License which must be displayed in a prominent, visible location at the construction site along with the required local municipality Building Permit. If a Municipal Permit is not required, the Building License will be issued upon approval of the application by Landlord.

4. Set back regulations are variable based on site conditions, are guided by local regulations where applicable, and will be specified in the approval of the application issued by Landlord.

5. Within 30 days of completion of the approved construction, photographs of the completed construction must be submitted to Landlord.

6. Some construction projects may require permits in addition to the Municipal Building Permit. Tenants are responsible for obtaining any additional permits or approvals required by the appropriate government agencies. (The table at the end of these rules and regulations is intended as a guide to the permits or approvals required by the various agencies for specified construction activities. It is suggested that you consult with the appropriate agency prior to beginning construction.) Copies of all required permits or approvals must be submitted to Landlord before construction can begin.

7. Landlord must be notified in writing anytime a building or other improvement is to be razed or removed. The area must be

restored to a condition satisfactory to Landlord which shall include but is not limited to establishing the appropriate vegetative cover.

B. Maintenance

1. The leased premises and all improvements must be maintained in good repair and appearance. Landlord may require a Tenant to make repairs and perform necessary maintenance, including but not limited to painting, removal of junk, trash, vehicles, or other detractions from a neat and orderly appearance.

2. Improvements should not present a hazard to Tenants, or other persons or property.

3. Landlord may require conditions which it deems to be hazardous, or environmentally damaging, corrected to Landlord's specifications.

4. All chimneys must be fireproof and constructed of tile, brick, stone, or other approved material, and equipped with spark arresters.

C. Sale of Cottage (Application Procedure)

1. An "APPLICATION FOR SALE" form must be completed and submitted to Landlord at least 45 days prior to the date of settlement for the sale of the cottage. (Forms are available from Landlord or at the Recreation Office.)

2. A check for the current processing fee (as stated on the application) must accompany the completed form.

3. If the "APPLICATION FOR SALE" is approved, a new Lease Agreement will be issued prior to the settlement date, which shall be properly executed by the new owner at settlement and returned to Landlord for Landlord's execution, along with a valid Bill of Sale. A fully executed copy of the Lease Agreement will then be forwarded to the new owner.

4. All Sales Agreements must contain a statement that only the personal property of the Tenant is being sold and that no land or land rights are included in the sale. Bills of Sale must contain the same statement.

5. Installment Sales Agreements or Lease Purchase Agreements which are intended to give possession of the cottage to the buyer

while the current Tenant (seller) holds the existing Lease Agreement are not permitted.

6. Current Tenant must inform the prospective Tenant of all rules and regulations.

ROADS

A. Construction of new roads or alterations to existing roads (Application Procedure)

Written permission is required from Landlord for the construction of new roads or the alteration of existing roads. A sketch indicating the location of the road must accompany the Building License Application submitted to Landlord.

B. Maintenance of existing roads

1. Roads must be maintained in good condition, with proper drainage and meet with Landlord's specifications.

2. Landlord may require that a road be repaired to its satisfaction or the use of the road must be discontinued.

3. Tenants are responsible for maintenance and general upkeep of non-public roads in cottage areas, in common with other users.

TREES

1. No trees shall be injured or damaged, by Tenants or their guests. The attaching of lights, electric lines, clothes lines, docks, etc., either on a temporary or permanent basis is prohibited. Care must be taken during construction to prevent injuring trees, and if necessary, temporary protective shields shall be installed around the trees.

2. No trees (over 2 inches in diameter) can be cut without prior written permission of Landlord. If a tenant desires to cut down or remove significant portions of a tree, they must first obtain written permission from Landlord. Requests should be directed to the Recreation Office.

3. Requests for tree removals can only be made by the current Tenant.

4. Tenants are responsible for correcting hazardous tree conditions on or adjoining the leased premises. Landlord may notify the Tenant of any trees that Landlord believes should be removed. It will be the responsibility of the Tenant to have such trees removed. If such trees are not removed within the specified time period, Landlord at its option my terminate the Lease and/or remove the tree at the Tenant's expense.

WATER

1. All use of water by Tenant, in and about the leased premises, shall be at the sole risk of Tenant. Landlord makes no representations with regard to the water nor has it caused any of said water to be analyzed. If Tenant is using or intends to use any water for domestic purposes, it is suggested for Tenant's own protection, that before doing so and periodically thereafter, Tenant shall have said water tested by an approved lab for the purpose of determining the feasibility of safety using the water. All costs incurred in connection with such tests shall be the responsibility of the Tenant. Landlord assumes no liability for, or on account of any water used by Tenants or their guests.

2. No exclusive rights are given or inferred as being given as to the use of any water or spring, even though a spring may be located on the leased premises. Adjoining Tenants may use such water but may not unreasonably interfere with the enjoyment or use of the leased premises where the water is located.

3. All waterlines crossing roads must be buried to a depth of at least 30 inches.

SANITARY REQUIREMENTS

1. In the event a septic system does not exist on an improved site, said site must be provided with a sanitary toilet, with a vault at least four (4) feet in depth from the surface of the ground. No toilet shall be located closer than one hundred (100) feet to any spring, stream, or other water source of supply.

2. Before initiating the construction of any septic system, tenant shall consult with the appropriate county or township health department and obtain the necessary approval(s).

3. In the event a sanitary sewer system is installed in the area, Tenant shall be required to connect into the system, whereupon

tenant shall be responsible for all connection, maintenance, and operation fees or costs.

4. If garbage and/or trash is not removed from the area on a weekly (or more often) basis, each site must be provided with a garbage pit at least three (3) feet square and three (3) feet deep, and shall have a tight wooden (or other suitable material) cover. All trash and garbage must be kept in a closed container.

5. The toilet and/or garbage pit must be maintained in a good and sanitary condition.

6. In a situation where there is a difference between these regulations and the local ordinances or other regulations, the more stringent of the two shall apply.

SHORELINE PROTECTION PROGRAM

General Information (Application Procedure)

1. Anyone desiring to construct, replace, expand, or do major repairs to a pier (or dock), boathouse, boat ramp, marine railway, bulkhead, retaining wall, install any erosion control measures, or excavate in any areas that may affect the pond (or river) shoreline must submit a "BUILDING LICENSE APPLICATION" to Landlord with all appropriate attachments and/or application fees.

2. The applicant is responsible for obtaining all necessary permits (or other forms of permission) from the responsible government regulatory agencies. The table at the end of these rules and regulations is intended as a guide to the permits required by the various agencies for specified construction activities. Copies of all necessary permits or approvals must be sent to Landlord before construction can begin. Following completion of construction, photographs showing the new or modified structures must be submitted to Landlord. Landlord suggests that the Tenant consult with the appropriate agencies to determine what permits may be required before submitting the BUILDING LICENSE APPLICATION.

Specifications and Procedures

NOTE: The shoreline is considered to be the existing shoreline at mean high water.

A. Piers or Docks

1. Piers may be either permanent, floating, or a combination of both and may not exceed a total length of 50 feet (or extend more than 50 feet from the shoreline). If the pier is located in a cove or in a stream, the length may not exceed 25% (1/4) of the width of the cove or stream where the pier is located.

2. The width of the pier may not encroach across the projected lot lines or exceed 30 feet in width (whichever is less). A variance of this provision may be granted if the pier is used in common with other Tenants, permittees or licensees.

3. All permanent piers (or permanent sections of piers) must be built above the mean high water line.

4. Piers must be constructed of preservative treated lumber and pilings. Concrete, masonry, and metal construction is not permitted. Handrailings and covers on piers are permitted provided that the sides are open so as not to obscure cross vision. Covers are permitted only over the pier itself and may not extend out over the water.

5. Flotation devices for floating piers must be constructed of styrofoam billets or floats, or equivalent construction. Barrels or similar flotation devices are not permitted.

6. Piers may not interfere with navigation, present a safety hazard, or block ingress or egress to adjoining areas.

7. If an existing pier must be replaced or repaired (other than minor repairs), it must conform to current standards.

8. Piers may not be anchored or tied to trees at any time.

B. Boat Ramps and Marine Railways

1. Ramps must be constructed of poured concrete pads or precast concrete panels properly anchored and fastened together. Asphalt or other petroleum based products are prohibited.

2. Ramps may not exceed 15 feet in width and 30 feet in length. The length should not exceed that necessary to be functional.

3. Marine railways may use either treated wood or concrete ties.

4. Marine railways may not exceed 15 feet in width and should be no longer than necessary to be functional. Landlord may, however, restrict the length because of site conditions.

C. Erosion Control Measures (Bulkheads, Retaining Walls, Sea Walls, Rip Rap, etc.)

Anyone desiring to construct a bulkhead or other erosion control measure must submit a "Building License Application" to Landlord. A Division representative will make an on-site inspection of the area to determine if what the applicant has proposed should be allowed or if another type of measure may be more appropriate. If the Division approved of the proposed measure, the applicant must obtain the appropriate government agency permits or approvals before a "Building License" will be issued.

1. No erosion control measure shall significantly alter the existing shoreline.

2. The planting of vegetative cover and/or rip-rapping shall be used if adequate to control the problem.

3. Bulkheads and retaining walls must be constructed of preservative treated wood, concrete, or masonry.

4. The structure shall not significantly detract from the scenic value of the area.

CULTURAL RESOURCE PROTECTION GUIDELINES

PECO Energy Company has developed, in cooperation with the Pennsylvania Bureau of Historic Preservation and the Maryland Geological Survey, Division of Archeology, the following rules and regulations, which apply to all land owned by the Company and its subsidiaries. The specific intent of these regulations is to provide for the protection of cultural resources, and to avoid any disturbance of historic and prehistoric sites except when justified for scientific purposes and/or when performed in accordance with such State and Federal regulations and guidelines as may apply.

1. No one shall mar, deface, remove, destroy or in any other way damage, any standing structure, ruins, foundation or other man-made feature of a potentially historic nature on lands of PECO Energy Company (PECO Energy) or its subsidiaries, without first having obtained the written permission of Landlord.

2. No one shall perform any sub-surface archaeological investigations, or in any way disturb the soil for the purpose of searching for and/or obtaining historic or prehistoric artifacts on land of PECO Energy or its subsidiaries without having first obtained the written permission of Landlord, nor shall same be performed without the prior knowledge and written sanction of the following:

In Pennsylvania, The Bureau of Historic Preservation; In Maryland, The State Historic Preservation Officer and/or the Geological Survey, Division of Archeology.

a. Full and complete reports must be prepared. Said reports shall incorporate maps, site profiles, descriptions and photographs of artifacts and features, soil descriptions, topography, excavation procedures, directions and distance to the nearest water and all such other related details as may be required;

b. Landlord shall be supplied with a copy of each report so generated. The appropriate State agency shall be supplied with two copies of same, one of which shall contain original photographs;

c. All artifacts and related material recovered in sub-surface investigations shall become the property of PECO Energy, and shall be turned over to the respective State agency. Same shall remain available to PECO Energy and other responsible public and private organizations and agencies for the purpose of study and/or public display;

d. All artifacts must be properly labeled with site number and lot and must be readily identifiable by pit and level. Site numbers must conform to the trinomial numbering system adopted by both Pennsylvania and Maryland.

e. All burials encountered during the course of such archeological investigations shall be treated with the highest respect, and shall be handled on a case by case basis under the strict control of the State agency having jurisdiction. It is the policy of said agencies and of PECO Energy, to discourage the removal or disturbance of human remains, unless there is a significant scientific purpose to be served by same, and unless provisions are made, in

consultation with, and with the approval of living descendants of the interred, for the timely study and the ultimate reburial of the remains.

3. While the collection of artifacts from the surface is widespread, and though not strictly prohibited under these regulations, it does have a significantly negative effect on archeological sites. The distribution of surface artifacts is the only information available for many sites. Those finding artifacts are therefore encouraged to report finds to Real Estate & Facilities (R. T. Stark, 215-841-5193), PECO Energy Company, 2301 Market Street, Philadelphia, PA 19101, so that same might be photographed and recorded.

4. Tenant is required to consult with the appropriate State Preservation Office prior to any construction work that may affect surface or sub-surface archaeological sites, and prior to new additions to existing structures or the construction of new structures. Evidence of such consultation must be supplied to Landlord before a Building License will be issued.

Note: On property which is within the boundaries of Federally-regulated projects such as the Conowingo Hydro-Electric Project (F.E.R.C. No. 405), tenants' properties require additional precautions regarding cultural resources under the provisions of the National Historic Preservation Act of 1978 (section 106), Executive Order 11593, and the regulations of the Advisory Council on Historic Preservation (36 CFR 800).

FAILURE TO COMPLY WITH ANY OF THESE RULES AND REGULATIONS WILL BE CONSIDERED A VIOLATION OF THE TERMS AND CONDITIONS OF THE LEASE AGREEMENT AND MAY RESULT IN EITHER A $250.00 FINE LEVIED AGAINST THE TENANT OR POSSIBLE TERMINATION OF THE LEASE AGREEMENT.

River Basin Permit Section (COE)
Baltimore District
U. S. Army Corps of Engineers
P. O. Box 1715
Baltimore, MD 21203

Water Resources Administration (WRA)
Maryland Department of Natural Resources
Tawes State Office Building
Annapolis, MD 21401

State Administrator of Archeology
Maryland Historical Trust (MHT)
Shaw House
21 State Circle
Annapolis, MD 21401

Executive Director
Pennsylvania Fish Commission (PFC)
P. O. Box 1673
Harrisburg, PA 17120

Division of Waterways and Stormwater Management (DER)
Pennsylvania Department of Environmental Resources
P. O. Box 2357
Harrisburg, PA 17108-1026

Department of Planning and Zoning
Harford County, Maryland
220 S. Main Street
Bel Air, MD 21014

Office of Planning and Economic Development
Cecil County, Maryland
Room 300, Court House
Elkton, MD 21921

Martic Township Supervisors
R. D. #1
Pequea, PA 17565

Drumore Township Supervisors
R. D. #1
Drumore, PA 17518

Fulton Township Supervisors
R. D. #1
Peach Bottom, PA 17563

Peach Bottom Township Supervisors
R. D. #1
Delta, PA 17314

Lower Chanceford Township Supervisors
R. D. #2
Airville, PA 17303

Harford Soil Conservation District
1208 Churchville Road, Suite 201
Bel Air, MD 21014

Cecil Soil Conservation District
125 E. High Street
Elkton, MD 21921

York County Conservation District
118 Pleasant Acres Road
York, PA 17402

Lancaster County Conservation District
Room 6, Farm and Home Center
1383 Arcadia Road
Lancaster, PA 17601

APPENDIX E. DRONE USE REQUIREMENTS

Drone Use Requirements

1. Purpose

This document is intended to ensure proper drone use on Exelon property and compliance with all Federal, State, and Local guidelines.

These requirements apply to small unmanned aerial systems (sUAS, UAS, or drone), that is a drone weighing less than 55lbs as defined by the Federal Aviation Administration (FAA), and applies to recreational and commercial drone users on Exelon property.

These requirements are intended to supplement Federal, State, and local regulations regarding drone use. If Federal, State, Local, or Exelon guidelines change, the most current regulations must be followed when using drones on Exelon property.

2. Overview

All drone flights must be pre-approved by Exelon prior to any flights being conducted. No drone pilot may fly a drone within 1 mile of any power generation station including Conowingo Dam, Muddy Run Pump Storage facility or Peach Bottom Nuclear Power Plant. All drone pilots flying drones on Exelon property must be Part 107 certified and their certification must be current. All drone pilots must obey current FAA Tile 14 of the Code of Federal Regulations (14 CFR) Part 107 requirements. Refer to the FAA website for the most current regulations. No autonomous drone flights are permitted. All drones weighing more than 0.55lbs must have a current registration with the FAA. Drone pilots must report any incidents to Exelon that are reportable to the FAA in addition to any incidents resulting in damage to Exelon property or any person on Exelon property within 10 days of the incident. Any suspicious drone activity should be reported to local law enforcement.

1.1 General Guidelines

All drone pilots are required to follow the most current Federal, State, and local regulations including, but not limited to, the following:

- The drone may only be operated by a FAA Part 107 certified remote pilot (remote pilot in command)
- No one person may act as the remote pilot in command for more than one UAS at a time.
- The UAS must remain in the visual line-of-sight of the remote pilot in command. That is close enough to be seen without the aid of any device other than corrective lenses.
- Any drone weighing more than 0.55lbs must be registered with the FAA and a current registration must be maintained.
- The drone must only be operated during daylight hours, or during civil twilight (30 minutes before official sunrise to 30 minutes after official sunset, local time, with proper anti-collision lights.
- The drone must not exceed a ground speed of 100mph.
- The drone must not exceed a maximum altitude of 400 feet above ground level (AGL), or if higher than 400 feet AGL, the drone must remain within 400 feet of a structure.
- The drone must not carry any hazardous materials.
- The remote pilot in command must not operate a UAS if the pilot knows of any physical or mental condition that would interfere with the safe operation of the UAS.

- The remote pilot in command must inspect the drone prior to any flight activities.
- The UAS must not be operated in a reckless or careless manner.
- A visual observer, that is an additional person to aid the remote pilot in command in keeping aware of all surroundings, is encouraged but not required.

1.2 Environmental Guidelines

Once approved by Exelon, the drone operator must also follow the most current Federal, State, and local guidelines as well as minimize impact on the environment by following the environmental guidelines outlined below.

- Drone pilots should use take-off/landing pads to minimize soil or ground disturbance.
- All drone pilots shall review 1) Bald Eagle Management Plan, 2) Best Management Practices for Occupied Osprey Nests in Pennsylvania and 3) Bat Protection Measures for the Project, prior to flying drones on Exelon property. Drone flights must not interfere with Bald Eagles, Osprey, bats, or any other wildlife or habitat.
- Drone pilots should be aware of nesting & breeding seasons and do not fly close to Bald Eagle, Osprey or other nests.
- Drone pilots should fly the drone on a calm, clear day to ensure visual line of sight as well as better control over take-off and landing spots.
- Drone pilots and visual observers should stay on designated walking paths to minimize habitat disturbance.
- Drone pilots should be aware of the presence of the drone. Both the sight and sound can be disruptive to wildlife as well as other people in the vicinity.

2. References and Additional Resources

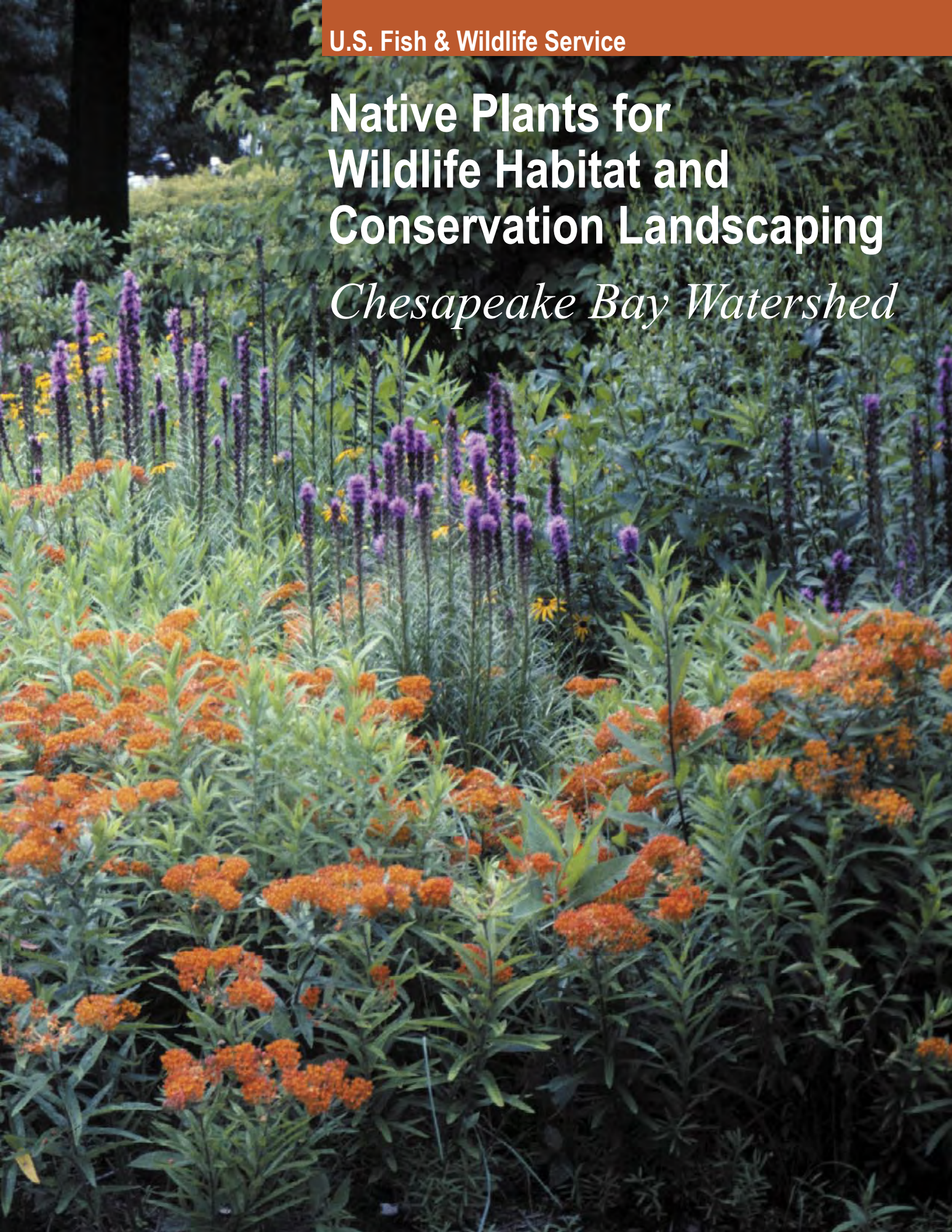
- The FAA website
  - https://www.faa.gov/uas/
- FAA Title 14 of the Code of Federal Regulations Part 107 – Small Unmanned Aircraft Systems
  - Electronic Code of Federal Regulations (eCFR)
- Final Rule on Operation of Small Unmanned Aircraft Systems Over People
  - Operations Over People General Overview (faa.gov)
- The FAA Reauthorization Act of 2018
  - FAA Reauthorization

APPENDIX F. NATIVE PLANTS FOR WILDLIFE HABITAT AND CONSERVATION LANDSCAPING

U.S. Fish & Wildlife Service

Native Plants for Wildlife Habitat and Conservation Landscaping

Chesapeake Bay Watershed



Acknowledgments

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Reviewers: species included in this guide were reviewed by the following authorities regarding native range, appropriateness for use in individual states, and availability in the nursery trade:

Rodney Bartgis, The Nature Conservancy, West Virginia.
Ashton Berdine, The Nature Conservancy, West Virginia.
Chris Firestone, Bureau of Forestry, Pennsylvania Department of Conservation and Natural Resources.
Chris Frye, State Botanist, Wildlife and Heritage Service, Maryland Department of Natural Resources.
Mike Hollins, Sylva Native Nursery & Seed Co.
William A. McAvoy, Delaware Natural Heritage Program, Delaware Department of Natural Resources and Environmental Control.
Mary Pat Rowan, Landscape Architect, Maryland Native Plant Society.
Rod Simmons, Maryland Native Plant Society.
Alison Sterling, Wildlife Resources Section, West Virginia Department of Natural Resources.
Troy Weldy, Associate Botanist, New York Natural Heritage Program, New York State Department of Environmental Conservation.

Graphic Design and Layout: Laurie Hewitt, U.S. Fish and Wildlife Service, Chesapeake Bay Field Office.

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2003

Table of Contents

To the Reader

The use of native plants in landscaping and of course habitat restoration is certainly not new. In fact, their use has grown exponentially in recent years. Natural resources professionals in turn have been flooded with requests for information on native plants to use in various types of planting projects. Communities, schools, businesses, nonprofit organizations, watershed groups, local governments, state and federal agencies and many others are enhancing and restoring habitat, solving ecological problems, reducing maintenance, or just beautifying surroundings, all using locally native plants. Natural resources professionals, in turn, have been flooded with requests for information on native plants to use in various types of planting projects. There are many excellent resources available on native plants - some more technical than others, some more comprehensive than others. The frustration voiced most frequently by users is the lack of color photographs of the plants. After all, it is the striking visual quality of these plants that is their best “selling point.”

This publication includes those pictures as well as user-friendly information on native species appropriate for planting in the Chesapeake Bay watershed and adjacent coastal regions. Although one guide cannot furnish the answers to every question, we have included as much useful information as possible in a limited space. Although the large number of species of plants included here may overwhelm some readers, this guide displays the great diversity of plants available. We hope you will bypass the over-used, non-native and sometimes invasive ornamental plants, and select the equally and often more attractive native plants. Pour through this guide the same way you look through nursery catalogs. Use it to plan and design your next planting, whether it’s a small corner of your front yard, a two-acre meadow seeding, or 100 acres of wetland restoration.

Native Plants for Wildlife Habitat and Conservation Landscaping:
Chesapeake Bay Watershed

Introduction

"Conservation landscaping" refers to landscaping with specific goals of reducing pollution and improving the local environment. In the Chesapeake Bay watershed (the land that drains to the Bay and its many tributaries), this style of landscaping is sometimes called "BayScaping," or beneficial landscaping.

Conservation landscaping provides habitat for local and migratory animals, conserves native plants and improves water quality. Landowners also benefit as this type of landscaping reduces the time and expense of mowing, watering, fertilizing and treating lawn and garden areas, and offers greater visual interest than lawn. Beneficial landscaping can also be used to address areas with problems such as erosion, poor soils, steep slopes, or poor drainage.

One of the simplest ways to begin is by replacing lawn areas with locally native trees, shrubs and perennial plants. The structure, leaves, flowers, seeds, berries and other fruits of these plants provide food and shelter for a variety of birds and other wildlife. The roots of these larger plants are also deeper than that of typical lawn grass, and so they are better at holding soil and capturing rainwater.

Benefits of conservation landscaping

Americans manage approximately more than 30 million acres of lawn. We spend $750 million per year on grass seed. In managing our yards and gardens, we tend to over-apply products, using 100 million tons of fertilizer and more than 80 million pounds of pesticides annually. The average homeowner spends 40 hours per year behind a power mower, using a quart of gas per hour. Grass clippings consume 25 to 40% of landfill space during a growing season. Per hour of operation, small gas-powered engines used for yard care emit more hydrocarbon than a typical auto (mowers 10 times as much, string trimmers 21 times, blowers 34 times). A yard with 10,000 square feet of turf requires 10,000 gallons of water per summer to stay green; 30% of water consumed on the East Coast goes to watering lawns.

The practices described in this guide reduce the amount of intervention necessary to have attractive and functional landscaping. Conventional lawn and garden care contributes to pollution of our air and water and uses up non-renewable resources such as fuel and water. Many typical landscapes receive high inputs of chemicals, fertilizers, water and time, and require a lot of energy (human as well as gas-powered) to maintain. The effects of lawn and landscaping on the environment can be reduced if properties are properly managed by using organic alternatives applied correctly, decreasing the area requiring gas-powered tools, using native species that can be sustained with little watering and care, and using a different approach to maintenance practices.

With conservation landscaping, there is often less maintenance over the long term, while still presenting a "maintained" appearance. Conservation landscapes, like any new landscape, will require some upkeep, but these alternative measures are usually less costly and less harmful to the environment. New plants need watering and monitoring during the first season until they become established. Disturbed soil is prone to invasion by weeds - requiring manual removal (pulling) instead of chemical application. Over time, desired plants spread to fill gaps and natural cycles help with pest control. Garden maintenance is reduced to only minimal seasonal cleanup and occasional weeding or plant management. The savings realized by using little or no chemicals, and less water and gas, can more than make up for initial costs of installing the landscaping. Redefining landscaping goals overall and gradually shifting to using native species provide even greater rewards in terms of environmental quality, landscape sustainability, improved aesthetics, cost savings, and bringing wildlife to the property.

Why use native plants?

Native plants naturally occur in the region in which they evolved. While non-native plants might provide some of the above benefits, native plants have many additional advantages. Because native plants are adapted to local soils and climate conditions, they generally require less watering and fertilizing than non-natives. Natives are often more resistant to insects and disease as well, and so are less likely to need pesticides. Wildlife evolved with plants; therefore, they use native plant communities for food, cover and rearing young. Using native plants helps preserve the balance and beauty of natural ecosystems.

This guide provides information about native plants that can be used for landscaping projects as well as large-scale habitat restoration. All of the plants presented are native to the designated areas, however not *all* of the native species for that area have been included. Rather, plants have been included because they have both ornamental and wildlife value, and are generally available for sale. This guide covers the entire Chesapeake Bay watershed, including south central New York; most of Pennsylvania, Maryland and Virginia; the District of Columbia; Delaware, west of Delaware Bay; and the eastern panhandle of West Virginia.

The region's wildlife, plants, habitats and network of streams and rivers leading to the Bay are tremendous resources. As the human population throughout the Chesapeake Bay watershed grows and land-use pressures intensify, it is increasingly important to protect our remaining natural areas and wildlife, and restore and create habitat. By working together, these treasures can be conserved for future generations. Individual projects are great, collective measures are even better, yet every action helps no matter what size.

Conservation landscaping elements

We can incorporate elements of natural systems into the existing areas where we live, work, learn, shop and play. Landscaping provides valuable opportunities to reduce the effects of the built environment. These areas can be both aesthetically pleasing and functional. Use of native species will make your garden or landscaping more environmentally beneficial. By combining plant selection with some of the other concepts below, you can achieve more environmental benefits.

Reduce disturbance. Carefully decide where new development will occur to avoid destruction of existing habitat as much as possible. Take advantage of the site's existing natural features.

Reduce lawn or high maintenance areas. Replace turf or ornamental plantings by adding new landscaping beds and/or enlarge existing ones with native plants.

Think big, but start small. Draw up a plan for your entire yard but choose one small area for your first effort. Trial and error with the first project will help you learn without being overwhelmed. Phase in the whole project over time.

Use native plants. Start by using natives to replace dead or dying non-native plants, or as a substitute for invasive non-natives in existing gardens or landscaping. Plan to use native plants in new landscaping projects.

Avoid invasive species. Non-native plants can be invasive. They have few or no naturally occurring measures to control them, such as insects or competitors. Invasive plants can spread rapidly and smother or out-compete native vegetation. Invasive, non-native plants are not effective in providing quality habitat. A copy of the publication "Plant Invaders of Mid Atlantic Natural Areas" can be downloaded from www.nps.gov/plants/alien/pubs/midatlantic/index.htm.

Improve water quality. Native species planted on slopes, along water bodies and along drainage ditches help prevent erosion and pollution by stabilizing the soil and slowing the flow of rainwater runoff. To collect and filter runoff, depressions can be created and planted with native plants suited to temporary wet conditions. These "rain gardens" will capture water and hold it *temporarily for a*

In certain conditions, some native plants can also become aggressive spreaders, though their spread is more limited by natural controls than non-native aggressors. Plants that seed readily (such as black-eyed Susan, *Rudbeckia* species), or that spread by lateral roots (such as mint family plants *Monarda* or *Physostegia* species) should be used sparingly or controlled in gardens. Certain native species that are difficult to control or show up uninvited should not be planted, such as cattail (*Typha* species).

day or two and remove pollutants washing off of the surrounding land.

Enhance and create wildlife habitat. An animal's *habitat* is the area where it finds food, water, shelter, and breeding or nesting space, in a particular arrangement. If we want our gardens to have the greatest ecological value for wildlife, we need to mimic natural plant groupings and incorporate features that provide as many habitat features as possible.

Plants are one of the most important features of an animal's habitat, because they often provide most, or even all of the animal's habitat needs. Animals in turn help plants to reproduce through dispersal of pollen, fruits or seeds. Consequently, plants and animals are interdependent and certain plants and animals are often found together. So, it is important that plants be selected, grouped, and planted in a way that is ecologically appropriate.

Each plant prefers or tolerates a range of soil, sunlight, moisture, temperature and other conditions, as well as a variety of other factors including disturbance by natural events, animals or human activities. Plants sharing similar requirements are likely to be found together in plant *communities* that make up different habitat types - particular groupings of plant communities commonly recognized as wetlands, meadows, forests, etc. Some plants may tolerate a wider range of conditions than others, and therefore can be found at more than one type of site, in association with a different set of plants at each. By matching plants with similar soil, sunlight, moisture and other requirements, and planting them to the existing site conditions, the planted landscapes will do a good job of approximating a natural habitat.

Instead of isolated plantings, such as a tree in the middle of lawn, group trees, shrubs and perennials to create layers of vegetation. A forest has, for example, a *canopy* layer (tallest trees), *understory* layers (various heights of trees and shrubs beneath the canopy) and a ground layer or forest floor. These layers provide the structure and variety needed for shelter, breeding or nesting space for a diversity of wildlife.

To provide food and cover for wildife year-round, include a variety of plants that produce seeds, nuts, berries or other fruits, or nectar; use evergreens as well as deciduous plants (those that lose their leaves); and allow stems and seedheads of flowers and grasses to remain standing throughout fall and winter.

All animals need water year-round to survive. Even a small dish of water, changed daily to prevent mosquito growth, will provide for some birds and butterflies. Puddles, pools or a small pond can be a home for amphibians and aquatic insects. A larger pond can provide for waterfowl, such as ducks and geese, and wading birds such as herons. Running or circulating water will attract wildlife, stay cleaner and prevent mosquitoes.

Rock walls or piles, stacked wood, or brush piles provide homes for insects, certain birds and small mammals. Fallen logs and leaf litter provide moist places for salamanders, and the many organisms that recycle such organic matter, contributing nutrients to the soil. Standing dead tree trunks benefit cavity-nesting wildlife such as woodpeckers.

Consider naturalistic planting, or habitat restoration. It may be feasible to create a more natural landscape instead of a formal one. Naturalistic landscaping uses patterns found in nature, and allows some nature-driven changes to occur. Plants multiply, and succession or gradual replacement of species may take place, with less human intervention. A property located near natural areas, such as forests, wetlands and meadows, is a good candidate for a habitat project. Expand existing forest by planting trees and shrubs along the woods line, using native species that grow in the area, and allow birds and wind to bring the understory plants over time. Wet sites, areas with clay soils, or drainage ditches can be converted to wetlands. An open piece of ground or lawn can be planted as a meadow or grassland. Schools, homes, small businesses, large corporate sites, municipalities, military installations, recreational areas and other public lands can all include habitat plantings.

How to choose plants

Finding ready information about what plants "go together" for habitat restoration, enhancement, or creation projects is difficult. Often, the professional will examine a nearby natural area and try to mimic the combination of plant species found there. That may not be possible for individuals unfamiliar with natural areas. Fortunately, by following some simple guidelines, you will have garden spaces that grow well on your site and mirror the plant communities found naturally in your area. The plant lists found at the end of this guide will also help give you a start at planting appropriate groupings.

- **Know your site and plant to the existing site conditions.** Check the sun exposure, soil moisture and soil type where you plan to plant, and choose plants that will grow and thrive in those conditions. For a few dollars your state or local cooperative extension office can analyze a small soil sample you send them (for contact information, see your government listings in the phone book). The results will include soil type (sand, clay, loam, etc.), pH and fertility status and recommendations for amending the soil to make it into "average garden soil." However, by selecting native species that thrive in the *existing* conditions, you won't need to add soil, fertilizer, lime or compost. There are a wide variety of plants that will thrive in most conditions, even the driest, poorest soil or very wet clay soil. If, however, the soil test shows extreme pH - very acidic (pH of less than 5) or very basic (pH 8 or above), your plant choices will be fairly limited. In that case, you might choose to follow the instructions for making the soil more neutral. If the soil is hard, compacted fill dirt, you might want to improve it by adding organic matter and work the ground so that it can more easily be planted. If you alter the site, then select plants suited to the new conditions.

- **Choose plants native to your region of your state.** Along with planting to the existing site conditions, use locally native plants. Use the map on page 9 to identify which **physio-geographic region** the planting site lies in. If you're close to a border dividing two regions, you may choose plants from either or both regions.

- **Choose a habitat type.** Try to create or emulate a specific habitat, like woods, wetland or meadow, and choose plants that are appropriate to both your site and the habitat. Look through this guide and mark the plants with growth requirements that match conditions at the planting site. This will help improve the success of your planting, the habitat value, and the ecological functioning of the project. This publication will eventually be made available online, in a format that can be electronically sorted by plant characteristics or growth conditions.

Where to find native plants

Most nurseries carry some native plants, and some nurseries specialize and carry a greater selection. As the demand for native plants has grown, so has the supply at nurseries. Some plants will be more readily available than others. Here, we've focused on species most appropriate for planting and available through the nursery trade. A limited number of species included here are not commonly available but are able to be nursery grown. Take this guide along with you when you visit nurseries and if you need help, ask for nursery staff familiar with native plants. If you see a plant you like, check to see if it's included in the guide for your state and physiographic region. For those species that are more difficult to find, the hope and intention is that this publication will spark a demand, and hence a greater supply. If you have a favorite plant that you can't obtain, be sure to ask your local nursery to consider adding it to their stock. A list of some of the many retail and wholesale native plant nurseries in the Chesapeake Bay region is available from the U.S. Fish and Wildlife Service, Chesapeake Bay Field Office at www.fws.gov/r5cbfo/bayscapes.htm.

For the greatest ecological value, select the "true" native species, especially if planting for wildlife benefit. There are cultivated varieties (*cultivars*) available for many native plants. These are named using the scientific name (Latin genus and species, such as *Rudbeckia fulgida*) plus the cultivar name, a third word in single quotation marks (such as *Rudbeckia fulgida* 'Goldsturm'). These varieties have been grown to provide plants with certain physical characteristics, perhaps a different flower color, different foliage or a compact shape or size. Although these are suitable for gardening use, use true species (not cultivars) if you are planning a habitat project to provide

food for wildlife. These plants are most suited to use by the native wildlife, and will increase your chances of attracting them.

Native plants should never be removed from the wild unless an area is about to be developed. Even then, it is difficult to transplant wild-collected plants and to duplicate their soil and other growth requirements in a home garden. Plants that are grown from seed or cuttings by nurseries have a much greater tolerance for garden conditions. Help to preserve natural areas by purchasing plants that have been grown, not collected.

Ask nurseries about the source of the native species sold. Did they come from seed or cuttings of plants found growing locally, or are they from another region? Ideally, the plants you use should come from stock from the same region, say, within about a 200-mile radius in the same physiographic province (coastal plain, Piedmont, or mountain). Differences exist from region to region even in the same plant species, due to differences in climactic conditions between distant locations. For example, a plant grown in Maine may flower at a different time than the same species grown in Maryland. They may have slight physical differences. These characteristics make a difference in designing gardens and they matter to wildlife seeking food sources. The more consumers ask for locally grown plants or seed, the more likely it is that nurseries will carry local stock.

Once you begin to explore and experiment with native plants, you'll soon discover that many of these plants go beyond just replacing worn out selections in your yard. Native plants will eventually reduce your labor and maintenance costs while inviting wildlife to your yard helping to create your own sense of place.

How to use this guide

Plant Names and Types

Plants are organized within each section alphabetically by scientific name. All scientific plant names used are based on names accepted by ITIS, the Integrated Taxonomic Information System. Plants are indexed at the back of the book by scientific as well as frequently used common names. Scientific names are changed periodically as new information is gathered; for those commonly recognized names that changed during development of this guide, the new names are used here, with a cross reference noted in the index. For example: *Aster divaricatus* is now *Eurybia divaricata*, so the plant is listed in the index under both *Aster* and *Eurybia*.

Plants are grouped by botanical categories: Ferns; Grasses & Grasslike Plants (includes grasses and plants with long slender leaves that may appear similar to a grass); Herbaceous Plants (includes flowers and groundcovers); Herbaceous Emergents (plants that grow in moist to wet soils, wetlands or in standing water with roots and part of their stems below water but with most of the plant above the water); Shrubs; Trees; and Vines.

A note about groundcovers: English ivy, periwinkle, creeping lily turf and Japanese pachysandra are some commonly used groundcovers, particularly for shade. However, these species are non-natives that are invasive in the landscape, so they should be *avoided*. What native alternatives can be used instead? A groundcover can be any plant that would physically cover or hide the bare ground from view. For the purposes of environmentally beneficial landscaping and habitat enhancement, any plant in the "herbaceous"category would make a good groundcover. For those gardeners and landscapers still seeking a low-growing, creeping, spreading, or clump-forming plant for a groundcover, these plants are marked with a GC symbol in the Notes column and a list is included at the end of the guide.

Characteristics

- **Height and/or Spread** The typical mature height or possible range of heights is given in feet, to the nearest half (0.5) foot. Height may vary depending on conditions (e.g., amount of moisture or sun). For trees and vines, spread is also given in feet. For trees, spread is the measurement of the crown of the plant; for vines, spread is the length a vine will grow along a surface.

- **Flowers: bloom period and flower color** The typical months in which the plant blooms are given. The exact time and duration of bloom may be shifted by days or weeks for different areas and/or depending on seasonal weather conditions and climactic trends. The basic, overall color of the flower is noted. The color of a flower's center or throat may not be included due to limited text space. For simplicity, some shades or tones of colors have been grouped, e.g. lavender, pale purple, bluish purple, even fuchsia may have been listed simply as purple; tan, brown, dark brown are all listed as brown; yellows and pinks may be similarly condensed.

- **Fruit: fruiting period, color and type** This information is provided for plants with more conspicuous fruits or visually interesting seeds. Terms used include: Achene, a dry flat seed such as in clematis; Berry, which includes small single berries such as blueberry, larger berries such as persimmon, aggregates such as blackberry and hips such as a rose hip; Capsule, including various types and sizes of dry fruits with two or more compartments containing seeds, such as iris, sweet pepperbush, hibiscus, or black-eyed Susan; Cone/cone-like such as pines, hemlock, or alder; fleshy pomes or drupes such as hawthorn, beach plum, paw paw, passion flower, or cherry; Nut/nut-like, as in acorns (oaks) or hickory; Pod, which may include pea-like legumes such as partridge pea or wild senna, *follicles* or other long pod-like *capsules* such as milkweeds, delphinium, or trumpet creeper; and Winged, such as the *samaras* of maples or elm.

- **Fall Color** The color listed indicates the fall color of the leaves, or of the stems for certain plants such as grasses. Some color shades have been grouped by the basic color, as for flower color. Evergreens, species that retain their leaves throughout the winter (in all plant categories), are designated with a ▲ symbol in the Notes column. Evergreens are popular for various landscaping uses and valuable for year-round cover for wildlife.

Growth Conditions

- **Light** The amount of sunlight a plant requires is defined as: Full Sun ☼, the site is in direct sunlight for at least six hours a day during the growing season; Partial shade ◐, the site receives approximately three to six hours of direct sunlight; and Shade ●, the site receives less than three hours of direct sunlight or filtered light.

- **Moisture** The amount of soil moisture a plant requires is defined as: Dry (D), areas where water does not remain after a rain (areas may be in full sun or in a windy location, on a steep slope, or have sandy soil); Moist (M), areas where the soil is damp, and may be occasionally saturated; and Wet (W), areas where the soil is saturated for much of the growing season, except in droughts. Many of the plants designated for wet areas tolerate specific ranges of water depths (see Flood Depth). Plants with the Dry designation can be considered drought tolerant.

- **Soil pH and Type** Many of the native plants listed will tolerate a range of soil types. Soil types are listed here as Organic (O), containing a high amount of organic material such as decayed leaves and bark; Clay or fine-textured (C) soils with a high clay content and some silt - very fine soil particles; Loamy or medium-textured (L) soils that contain a mix of mostly silt and sand but may contain some clay; and Sandy or coarse-textured (S) soils with larger particles. Soil information has necessarily been simplified for this guide, and lumped into these main categories, which will suffice for the novice. Soils in actuality are often a mixture or gradations of types, categorized by the percentages they contain of clay, silt or sand, for example clay loam (a certain mix of clay and sand); sandy clay; silt loam; or silty clay loam. For best results, select plants suited to existing site conditions rather than amending the soil. However, be aware that plant selection may be limited if your site has very sandy soil, heavy clay, compacted soil, or extreme soil pH (above 8 or below 5.5). In these cases, seek advice from a nurseryman, horticulturist, botanist, Cooperative Extension agent, or other expert.

- **Flood Depth** Some plants tolerate prolonged standing water, and occur in specific water depths or range of depths. In the Herbaceous Emergents section, the depth of water tolerated is indicated (in inches). Other types of wetland plants that can tolerate only intermittent flooding appear in other sections of the guide, and their flood tolerance

information is included in the Notes column. For more complete information on planning and planting wetlands, see the references listed at the end of this guide.

- **Salt Tolerance** Some plants that tolerate prolonged standing water can tolerate saltwater or brackish (partly salty) water. For plants in the Herbaceous Emergents section, the salinity range in which each of these plants will grow is given in parts (of salt) per thousand parts (of water) or ppt, from 0 ppt (fresh water) to the maximum salinity tolerated. For plants in other sections of the guide, the maximum salinity is given in the Notes column. Full seawater is approximately 32 ppt. If salinity is not given, then the plant grows in fresh water only or in drier conditions.

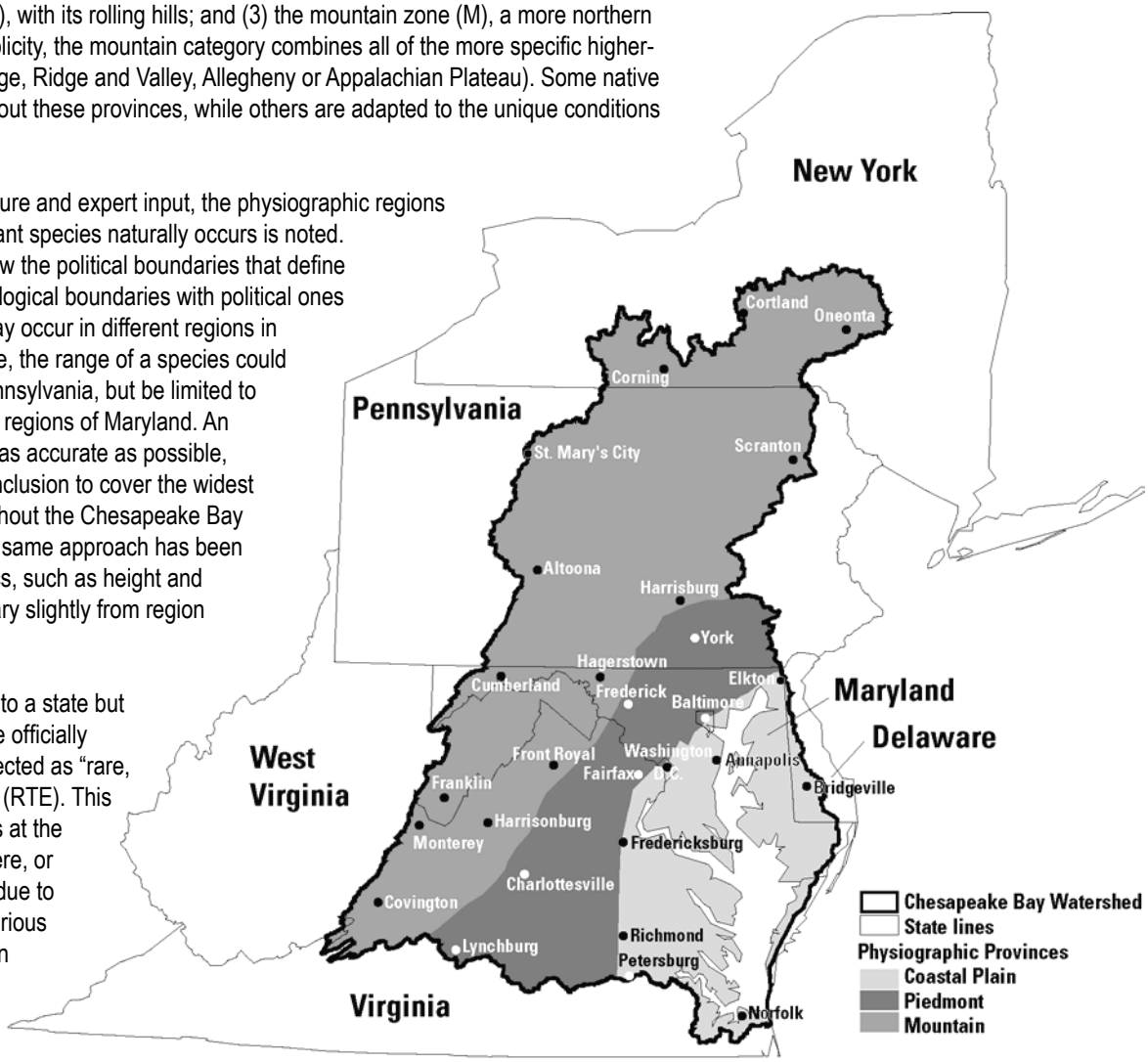
Habitat

For each plant in this guide, we include a description of habitats in which that plant may be found. Several habitat types may be mentioned as each plant is rarely found in one and only one habitat type. There are dozens of forest types, several types of wetlands including forested wetlands and even wet meadows. The habitats described include those that provide the conditions most preferred by each plant species. To help with planning projects, sample lists of plants to use in certain habitat types, or certain site conditions, are given in the back of this guide. More technically detailed information on plant communities can be found in resources listed in the references section.

Native To (Where To Use) - States and Physiographic Regions

From the sandy dunes of the coast to the rocky slopes of the mountains, the rich variety of habitats found throughout the region is strongly linked to its geology, topography and climate. For this guide, the states in the Chesapeake Bay watershed have been divided into three regions or provinces: (1) the coastal plain (C), an area with fairly flat topography and more southern climate; (2) the Piedmont plateau (P), with its rolling hills; and (3) the mountain zone (M), a more northern climate (see map). For simplicity, the mountain category combines all of the more specific higher-altitude provinces (Blue Ridge, Ridge and Valley, Allegheny or Appalachian Plateau). Some native plants are common throughout these provinces, while others are adapted to the unique conditions found only in one or two.

Based on the existing literature and expert input, the physiographic regions and states in which each plant species naturally occurs is noted. However, plants do not follow the political boundaries that define our states, so matching ecological boundaries with political ones is difficult. Certain plants may occur in different regions in different states. For example, the range of a species could extend throughout all of Pennsylvania, but be limited to the mountain and Piedmont regions of Maryland. An effort has been made to be as accurate as possible, while erring on the side of inclusion to cover the widest range of possibilities throughout the Chesapeake Bay watershed as a whole. This same approach has been used for other characteristics, such as height and bloom period, which may vary slightly from region to region.



Note: Some species native to a state but not commonly found may be officially designated and legally protected as "rare, threatened, or endangered" (RTE). This may be because the plant is at the edge of its natural range there, or its population has declined due to loss of habitat caused by various natural events and/or human activities in that region. Species that are listed in a state as RTE should

generally not be planted there, because importing species from elsewhere could potentially lead to damaging alteration of the gene pool of the remaining population. This guide lists only those states in which a plant is common and recommended for planting. As a general rule of thumb, if a plant you like is not designated in this guide for your state or your region of the state, we strongly encourage you to forego planting that and select another plant suited to your site.

Wildlife Value
The notation "high wildlife value" is based mainly on the value of the fruits, seeds and/or nectar used as food for wildlife, and the relative number of species using the plant for food. But remember that animals use leaves, twigs, roots and shoots for food or nesting material, and every plant has value as cover and/or nesting sites. In that respect, although we've marked those of higher wildlife (food) value, every plant in this guide has value to wildlife, as well as other environmental values.

The **types of wildlife** noted here are those desirable species that are likely to use the plants for food, including pollinators which are critical to plant reproduction, for gardens, natural areas and agricultural crops. The information here is fairly general. The songbird icon indicates use of a plant by small usually migratory birds, but may include upland game birds. The waterfowl icon may include shorebirds and wading birds along with ducks and geese. The hummingbird icon has been indicated separately because many people are interested specifically in attracting them. The butterfly icon may refer to the adults or to the larval stage that uses the plant as a host. The beneficial insect icon, besides butterflies, includes ladybugs, bees (essential pollinators) and other insects that serve as a pest control or other desirable role. The small mammal icon is noted for plants used by any of a variety of small animals, such as raccoons, opossums, foxes, etc., depending upon location and surrounding habitat.

Absent but not forgotten: Certain wildlife species are not represented, due in part to a lack of available information for every plant related to all types of animals. However, these are all likely to inhabit or occasionally visit a native plant garden or habitat planting, and their importance in the web of life should not be underestimated. Many insects have not been represented here, though they certainly use a wide variety of plants throughout their life cycles and are an integral part of the ecosystems we're trying to protect, conserve and enhance. Reptiles and amphibians, particularly salamanders, frogs and turtles, inhabit our yards as well as natural areas. They use plants for food and cover, and especially need water sources such as lakes, ponds, streams, puddles or even a small dish of water (aerated or changed daily to prevent mosquito breeding). Bats provide a valuable service as insect pest controllers and pollinators.

Notes
This catchall includes pertinent information that bears emphasizing or is not reflected in the other categories. It may include additional notes or clarification about the plant's characteristics, growth, and spread; tips or suggestions on cultivation; cultivars; or general use of the plant.

By providing these characteristics for each plant species we hope to provide you with a variety of choices to meet the conditions of your property as well as your personal preferences. Whether you are replacing a few individual plants, designing a new bed or planning for an entirely new look, this guide can help narrow the choices to plants most likely to thrive in your environment and create the landscape you desire.


Songbird


Waterfowl


Hummingbird


Butterfly


Beneficial insect


Small mammal

Providing the basic habitat structures described earlier and planting a diversity of plants (and therefore food sources) will bring a surprising and beneficial array of life to your property.

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Adiantum pedatum *northern maidenhair fern*  UWI MC	Height: 1-2' Fruit:	Light: ◐ ● Moisture: M Soil pH: 4.5-6.5 Soil type: L S O	moist woods, rocky shaded habitats	Region: M P C States: DC MD NY PA VA WV		grows in clumps; delicate texture; herbal uses GC
Asplenium platyneuron *ebony spleenwort*  RHW	Height: 0.5-1.5' Fruit:May-Sep	Light: ○ ◐ ● Moisture: M Soil pH: 4.5-7 Soil type: C L S	banks, open woods and thickets, slopes, rocky ledges, swamps	Region: M P C States: DC MD NY VA WV		easily transplanted; only moderate care needed; evergreen ▲ GC
Athyrium filix-femina *northern lady fern*  UWI KJS	Height: 1-3' Fruit:	Light: ◐ Moisture: M W Soil pH: Soil type: L S	woods, banks, wooded hillsides, sandy bogs	Region: M P C States: DC DE NY WV		varieties occur throughout region; in MD, VA can also use subspecies asplenioides (southern lady fern) GC
Botrychium virginianum *rattlesnake fern*  RHW	Height: 1-2' Fruit:	Light: ◐ ● Moisture: D M Soil pH: 5.6-6.9 Soil type: L O	rich, woods	Region: M P C States: DC DE MD NY VA WV		GC
Dennstaedtia punctilobula *hay-scented fern*  UWI RWF	Height: 1-3' Fruit:Jul-Oct	Light: ○ ◐ Moisture: D M Soil pH: Soil type: L	open woods and fields	Region: M P C States: DC MD NY VA WV		can spread over large areas of open understory or pasture GC
Dryopteris carthusiana (D. spinulosa) *toothed or spinulose woodfern*  UWI RWF	Height: 1-2.5' Fruit:Jun-Aug	Light: ◐ ● Moisture: M W Soil pH: 5-6 Soil type: L O	low woods, thickets, swamps, rich woods, rocky slopes	Region: M P States: DC DE MD NY PA VA WV		forms colonies; semi-evergreen ▲ GC
Dryopteris cristata *crested wood or shield fern, narrow swamp fern*  UWI RWF	Height: 1.5-2.5' Fruit:Jun-Sep	Light: ○ ◐ ● Moisture: M W Soil pH: 3.5-6.5 Soil type: C L	shallow emergent marshes, shrub swamps, wooded swamps, open shrubby wetlands	Region: M P C States: DC DE MD NY PA VA WV		small rosette fronds ▲ GC
Dryopteris intermedia *evergreen wood-fern*  UWI EJJ	Height: 2.5' Fruit:	Light: ◐ ● Moisture: D M W Soil pH: Soil type: L O	rich, moist to dry woods	Region: M P C States: DC DE NY PA VA WV		clump-former; not common on coastal plain; hybridizes with eight species ▲ GC

Ferns

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Dryopteris marginalis *marginal or evergreen shield fern, evergreen wood fern*  UWI RWF	Height: 1-3' Fruit:Jun-Oct	Light: ◐ ● Moisture: D M Soil pH: Soil type: C L S	moist woods, clearings	Region:M P C States: DC DE MD NY PA VA WV		clump-former; attractive; easily transplanted ▲ GC
Onoclea sensibilis *sensitive fern*  UWI KJS	Height: 1-3.5' Fruit:Jun-Oct	Light: ○ ◐ ● Moisture: M W Soil pH: Soil type: C L S	fresh tidal and nontidal marshes, meadows, swamps, woods	Region:M P C States: DC DE MD NY PA VA WV		spreads in wet areas; fertile fronds dark brown, erect GC
Osmunda cinnamomea *cinnamon fern*   RHW, UWI TK	Height: 2-5' Fruit:Apr-May	Light: ○ ◐ ● Moisture: M W Soil pH: 4.5-7 Soil type: C L	woods, marshes, swamps, bogs, streamsides	Region:M P C States: DC DE MD NY PA VA WV		tolerates drought; fertile fronds reddish brown, wooly GC
Osmunda claytoniana *interrupted fern*  UWI EJJ	Height: 1-4' Fruit:	Light: ◐ ● Moisture: M Soil pH: 4-6 Soil type: C L	fields, forest and swamp edges	Region:M P States: DC DE MD PA VA WV		grows in clumps GC
Osmunda regalis *royal fern*  UWI EJJ	Height: 1.5-6' Fruit:Apr-Jun	Light: ○ ◐ ● Moisture: M W Soil pH: 4-6 Soil type: C L S	fresh tidal and nontidal marshes and swamps, woods, irregularly, seasonally, or permanently saturated (up to 100% of growing season)	Region:M P C States: DC DE MD NY PA VA WV		tolerates full sun if moist; tolerates drought; tolerates irregular, seasonal or permanent saturation; only tolerates flooding for a few days GC
Polystichum acrostichoides *Christmas fern*  USFWS BES	Height: 0.5-2' Fruit:Jun-Oct	Light: ◐ ● Moisture: M Soil pH: 4.5-7 Soil type: L S	woods, thickets, rocky slopes	Region:M P C States: DC DE MD NY PA VA WV		grows in clumps; easily grown in rock gardens and shaded places; impartial to soil type ▲ GC
Pteridium *bracken fern*  CM NRCS	Height: 1.5-6' Fruit:	Light: ○ ◐ Moisture: D M W Soil pH: Soil type: C L S	dry pine woods, swamps, marshes, fields, waste places	Region:M P C States: DC DE MD NY PA VA WV		forms large colonies; host for several ant types GC
Thelypteris noveboracensis *New York fern*  USFWS BES	Height: 1-2.5' Fruit:Jun-Sep	Light: ◐ ● Moisture: M W Soil pH: 4-7 Soil type: C L S	forested wetlands, dry to damp woods, thickets	Region:M P C States: DC DE MD NY VA WV		tolerates drought; easily transplanted; forms large colonies; spreads easily GC

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Thelypteris palustris *marsh fern*	Height: 2-3' Fruit:Jun-Oct	Light: Moisture: M W Soil pH: Soil type: C L S	swamps, bogs, fields, thickets, fresh marshes, wooded streambank	Region:M P C States: DC DE MD NY VA WV		spreads GC
Woodwardia areolata *netted chain fern*	Height: 0.5-2' Fruit:Jul-Oct	Light: Moisture: M W Soil pH: Soil type:	bogs, swamps, woods	Region: P C States: DC DE MD VA		spreads by creeping rhizome GC
Woodwardia virginica *Virginia chain fern*	Height: 3-6' Fruit:Jul-Sep	Light: Moisture: M W Soil pH: Soil type:	swampy places, woods	Region: P C States: DC DE MD NY VA		spreads by creeping rhizome GC


UWI RWF


PLANTS RM91


PLANTS


RHW

Osmunda regalis


RHW

Osmunda cinnamomea


RS MNPS

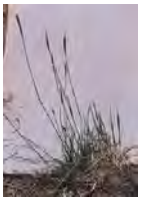
Polystichum acrostichoides


USFWS BES

New fern fiddleheads emerging.

Grasses & Grasslike Plants

		Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Agrostis perennans *autumn bentgrass*	 PLANTS RM95	Height: 1-3' Flowers: Jun-Oct	Light: ☼ ◐ ● Moisture: D M W Soil pH: 5.5-7.5 Soil type: C L	dry or moist thickets, open woods	Region: M P C States: DC DE PA VA WV		
Ammophila breviligulata *dunegrass, American beachgrass*	 UWI RRK	Height: 1.5-3.5' Flowers: Jul-Sep	Light: ☼ Moisture: D Soil pH: 5.8-7.8 Soil type: L S	maritime beaches, dunes, grasslands, shrublands	Region: C States: VA		prefers well-drained, sandy sites; spreads rapidly by rhizomes
Andropogon gerardii *big bluestem*	 RHW	Height: 2-6.5' Flowers: Jun-Sep	Light: ☼ ◐ Moisture: D M W Soil pH: 6-7.5 Soil type: C L S	dry or wet open woods, prairies, swales, shores; dry open areas	Region: M P States: DC DE NY PA VA WV		clump forming; attractive, with winter interest
Andropogon glomeratus (A. virginicus var. abbreviatus) *bushy bluestem*	 PLANTS	Height: 1.5-5' Flowers: Aug-Oct, reddish brown	Light: ☼ ◐ Moisture: M W Soil pH: 5-6.3 Soil type: C L S	fresh marshes, coastal areas	Region: M P C States: DC DE VA WV		tolerates drought; grows in tufts; reddish fall color
Andropogon virginicus *broomsedge*	 PLANTS JS	Height: 1-3' Flowers: Aug-Nov, reddish brown	Light: ☼ Moisture: D M W Soil pH: 4.9-7 Soil type: C L S	wet meadows, transition areas	Region: M P C States: DC DE MD NY VA WV		wildlife food and cover; tolerates drought; grows in tufts; reddish-tan fall color
Calamagrostis canadensis *bluejoint reedgrass*	 PLANTS 1995	Height: 1.5-5' Flowers: Jun-Aug	Light: ☼ ◐ Moisture: M W Soil pH: 4.5-8 Soil type: C L	meadows, bogs, thickets	Region: M States: DC DE NY VA WV		
Carex crinita var. crinita *long hair sedge*	 RHW	Height: 1-5' Flowers: Jun-Aug	Light: ☼ ◐ Moisture: M W Soil pH: 4-7.5 Soil type: C L	swales, thickets, low woods	Region: M P C States: DC DE NY VA WV		
Carex glaucodea *blue wood sedge*	 NYNHP, NYNHP	Height: 0.5-2' Flowers: May-Jul, brown to reddish	Light: ◐ ● Moisture: D M Soil pH: Soil type:	moist to dry woods and fields	Region: P C States: DC DE MD VA		clump-forming; alternative to Liriope GC

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Carex lurida *sallow sedge, lurid sedge*  RHW	Height: 1-3.5' Flowers: Jun-Oct	Light: ☼ ◐ Moisture: W Soil pH: 4.9-6.8 Soil type: C L S	swales, swamps, woods	Region: M P C States: DC DE NY PA VA WV		wetland plant; interesting seeds
Carex pensylvanica *Pennsylvania sedge*   CM NRCS, CM NRCS	Height: 0.5-1.5' Flowers: Apr-Jul, reddish to white	Light: ◐ ● Moisture: D M Soil pH: Soil type: S	open, dry, sandy or rocky woods, wooded slopes	Region: P C States: DC DE MD NY PA VA WV		alternative to lawn; plant densely; fine textured leaves less than 6 inches GC
Carex stricta *tussock sedge*  CM NRCS	Height: 1-3.5' Flowers: May-Aug, reddish to purple brown	Light: ☼ Moisture: M W Soil pH: 3.5-7 Soil type: C L S	fresh tidal and nontidal marshes, shrub swamps, forested wetlands, swales, fields	Region: M P C States: DC DE MD NY VA WV		grows in clumps; partly persists in winter; tolerates flooding to 6 inches
Carex vulpinoidea *fox sedge*  UWI RWF	Height: 0.5-3.5' Flowers: Jun-Aug	Light: ☼ ◐ Moisture: W Soil pH: 6.8-8.9 Soil type: C L	shallow emergent marshes, shrub swamps, floodplain forests, hardwood swamps	Region: M P C States: NY VA WV	 high wildlife value	grows in clumps; tolerates saturation and flooding to 6 inches
Chasmanthium latifolium *wild oats, river oats, sea oats, spanglegrass*  USFWS BES, USFWS BES	Height: 2-5' Flowers: Jul-Sep, green then tan	Light: ☼ ◐ Moisture: D M Soil pH: 5-7 Soil type: C L S	streambanks, alluvial woods	Region: M P C States: DC DE MD VA WV		
Danthonia spicata *poverty oatgrass, poverty grass*  UWI RWF	Height: 0.5-2' Flowers: May-Jul	Light: ☼ ◐ ● Moisture: D M Soil pH: Soil type: S	open woods, pastures, meadows	Region: M P C States: DC DE NY PA VA WV		GC
Dichanthelium clandestinum *deer-tongue*  USDA JE	Height: 2-5' Flowers: May-Oct	Light: ☼ ◐ Moisture: D M W Soil pH: 4-7.5 Soil type: C L S	moist woods, roadsides	Region: M P C States: DC DE NY PA VA WV		
Dichanthelium commutatum *variable panicgrass*  PLANTS 1997	Height: 1-2.5' Flowers: May-Oct	Light: ◐ ● Moisture: D M Soil pH: 4-6.5 Soil type: L S	rocky or sandy woods	Region: M P C States: DC DE NY PA VA WV		

Grasses & Grasslike Plants

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Elymus canadensis *Canada wild rye*	Height: 2-6.5' Flowers: Jun-Oct	Light: ☼ Moisture: D M Soil pH: 5-7.9 Soil type: C L S	dry, sandy, gravely, or rocky soil	Region: M P C States: DC MD VA WV		
Elymus hystrix (Hystrix patula) *bottlebrush grass*	Height: 2-4' Flowers: Jun-Aug	Light: ☼ ◐ ● Moisture: M Soil pH: Soil type: L	alluvial woods	Region: M P C States: DC DE MD NY PA VA WV		
Elymus riparius *riverbank wild-rye*	Height: 0.5-5' Flowers: Jul-Sep	Light: ☼ ◐ Moisture: D M W Soil pH: 4.5-7.2 Soil type: C L S O	rich thickets, streamsides, alluvial flats, meadows	Region: P C States: DE PA VA WV		good for streambank conditions
Elymus virginicus *Virginia wild rye*	Height: 1-5.5' Flowers: Jun-Oct	Light: ◐ ● Moisture: D M Soil pH: 5-7 Soil type: C L S O	rich thickets, shores, meadows	Region: M P C States: DC DE MD PA VA WV		tolerates a wide range of conditions; forms clumps
Festuca rubra *red fescue*	Height: 0.5-3' Flowers: May-Jul	Light: ☼ ◐ Moisture: M W Soil pH: 5-8 Soil type: C L	dry woods, roadsides, waste areas	Region: M States: DC DE MD VA		can be used as turf grass; grows best in part shade GC
Leersia oryzoides *rice cutgrass*	Height: 5' Flowers: Jun-Oct	Light: ☼ ◐ Moisture: M W Soil pH: 5.1-8.8 Soil type: C L S	fresh tidal and nontidal marshes, meadows, ditches, muddy shores	Region: M P C States: DC DE NY PA VA WV		good for sediment stabilization, erosion control; tolerates drought; tolerates flooding to 6 inches
Panicum amarum *bitter or coastal panic grass, beachgrass*	Height: 1-3' Flowers: Aug-Oct	Light: ☼ Moisture: D M Soil pH: 5-7.5 Soil type: L S	sandy coastal shores and dunes	Region: C States: DC DE MD VA		prostrate form, produces little viable seed, use transplants; Panicum amarum var. amarulum (coastal panicgrass), taller form, can be seeded.
Panicum virgatum *switchgrass*	Height: 3-6' Flowers: Jul-Oct	Light: ☼ ◐ Moisture: D M W Soil pH: 4.5-8 Soil type: C L S	fresh and brackish tidal and nontidal marshes, wet meadows, open woods, prairies, dunes	Region: M P C States: DC DE MD NY PA VA WV		food for sparrow species; grows in clumps; controls erosion


CM NRCS


RHW


UWI EJJ


CM NRCS


RS MNPS


PLANTS 1995


CM NRCS


USFWS BES

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Saccharum giganteum (Erianthus giganteus) *giant plumegrass, sugar cane*  USDA NRCS	Height: 3.5-10' Flowers: Aug-Oct	Light: ☼ ◐ Moisture: M W Soil pH: 3.5-7 Soil type: L S	swamps, low woods, swales	Region: P C States: DC DE VA		
Schizachyrium scoparium (Andropogon scoparius) *little bluestem*   USFWS BES, USFWS BES	Height: 1.5-4' Flowers: Aug-Oct	Light: ☼ Moisture: D Soil pH: Soil type: L S	open woods, pinelands, clearings	Region: M P C States: DC DE MD NY PA VA WV		tolerates poor soil; clump grass; winter interest and wildlife cover; excellent forage grass
Sorghastrum nutans *Indiangrass*  RHW	Height: 2.5-8' Flowers: Aug-Sep	Light: ☼ Moisture: D M Soil pH: 4.8-8 Soil type: C L S	dry slopes, prairies, borders of woods	Region: M P C States: DC DE MD NY PA VA WV		tall clump grass with beautiful seed head; nutritious for livestock
Tridens flavus *redtop, purpletop*  UWI EJJ	Height: 2-6.5' Flowers: Aug-Oct	Light: ☼ ◐ Moisture: D M Soil pH: 4.5-6.5 Soil type: C L S	dry fields, roadsides, openings, forest	Region: M P C States: DC DE VA WV		
Tripsacum dactyloides *gama grass*  CM NRCS	Height: 6-10' Flowers: Jun-Oct	Light: ☼ ◐ Moisture: M W Soil pH: 5.7-7.5 Soil type: C L	swales, fields, forest edges, shores	Region: M P C States: DC DE MD VA WV		excellent forage grass; often grows wild near corn fields; can hybridize with corn

See also:

In the *Herbaceous Plants* section:
Allium cernuum
Liatris pilosa v. pilosa (graminifolia), scariosa, spicata, squarrosa
Sisyrinchium angustifolium (graminoides), atlanticum

In the *Herbaceous Emergents* section:
Distichlis spicata
Dulichium arundinaceum
Iris prismatica, versicolor, virginica
Juncus canadensis, effusus
Schoenoplectus pungens v. pungens (Scirpus pungens, americanus), validus (Scirpus validus)
Scirpus atrovirens, cyperinus
Sparganium americanum
Spartina alterniflora, cynosuroides, patens, pectinata
Zizania aquatica

Andropogon virginicus provides a transition between the road and woods.


CM NRCS

Schizachyrium scoparium in a garden with **Liatris spicata** and **Asclepias tuberosa**.


USFWS BES


USFWS

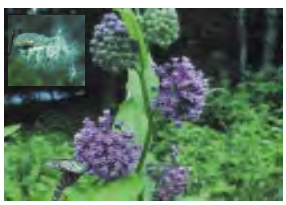
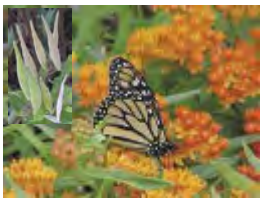
Schizachyrium scoparium in fall.


USFWS BES

Characteristic swirls of **Carex stricta**.

Herbaceous Plants

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Actaea pachypoda *doll's eyes*  RHW, RHW	Height: 1-3' Flowers: Apr-Jun, whitish Fruit: Jul-Oct, white or red, berry	Light: ◐ ● Moisture: M Soil pH: Soil type: C L S	rich open woods, thickets	Region: C States: DE NY PA VA WV		interesting berries; infrequent in Piedmont and mountain regions
Agalinis purpurea *purple false foxglove*  RHW	Height: 1-4' Flowers: Jul-Sep, rose-purple, white Fruit: capsule	Light: ○ Moisture: M W Soil pH: Soil type: S	moist fields, rocky shores, serpentine barrens	Region: P C States: DC DE MD NY VA WV		
Ageratina altissima var. altissima (Eupatorium rugosum) *white snakeroot*  UWI KJS, USFWS BES	Height: 1-5' Flowers: Jul-Oct, white Fruit: capsule	Light: ○ ◐ ● Moisture: D M Soil pH: Soil type: C L S	rich woods, thickets, clearings, meadows	Region: M P C States: DC DE MD NY PA VA WV		tough plant; cultivars available; prefers basic soils
Allium cernuum *nodding onion*  RHW	Height: 0.5-2.5' Flowers: Jun-Aug, pink, rose, white Fruit: capsule	Light: ○ ◐ Moisture: M Soil pH: Soil type: L S	ledges, gravels, rocky or wooded slopes	Region: M States: DC MD VA WV		
Anemone canadensis *round-leaved or Canadian anemone, thimbleweed*  RHW	Height: 0.5-3' Flowers: May-Jul, white Fruit:	Light: ○ ◐ Moisture: M Soil pH: Soil type: C L	damp thickets, meadows, gravelly shores	Region: P States: DC NY VA		
Anemone virginiana *thimbleweed, tall anemone*  RHW	Height: 1-2.5' Flowers: May-Aug, whitish Fruit:	Light: ○ ◐ Moisture: D M Soil pH: Soil type: C L S	dry rocky open woods, slopes, thickets	Region: M P States: DC DE MD NY PA VA WV		
Antennaria neglecta *field pussytoes*  UWI JRS	Height: 0.5-1.5' Flowers: Apr-Jul, white Fruit:	Light: ○ ◐ Moisture: D M Soil pH: 5.5-7.5 Soil type: C L	upland meadows, pastures, open woods	Region: M P States: DC DE MD NY PA VA WV		
Aquilegia canadensis *eastern or wild columbine*   RHW, USFWS BES	Height: 0.5-3' Flowers: Apr-Jul, red-yellow Fruit: capsule	Light: ○ ◐ Moisture: D M Soil pH: Soil type: L	rich rocky woods, slopes, cliffs, ledges, pastures, roadside banks	Region: M P C States: DC DE MD NY PA VA WV		commonly cultivated; spreads by seed GC

		Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Aralia nudicaulis *wild sarsaparilla*	 RHW	Height: 0.5-1.5' Flowers: May-Jul, white or green Fruit: May-Jul, purple-black, berry	Light: ◐ ● Moisture: D M Soil pH: 5-7.2 Soil type: C L S	dry to moist woods	Region: M P C States: DC DE MD NY PA VA WV		aromatic; single-leaved; lacks an above-ground stem; not common in coastal plain
Aralia racemosa *spikenard*	 RHW, RHW	Height: 1.5-6.5' Flowers: Jun-Aug, greenish-white Fruit: dark purple, berry	Light: ◐ ● Moisture: M Soil pH: Soil type: C L S	rich woods, thickets, wooded slopes and edges	Region: M P C States: DC DE MD PA VA WV		not common in coastal plain
Arisaema triphyllum *Jack-in-the-pulpit*	 USFWS BES, RHW	Height: 1-3' Flowers: Mar-Jun, striped, purple or green Fruit: berry	Light: ◐ ● Moisture: M W Soil pH: 4.8-7 Soil type: L S	woods, bogs swamps	Region: M P C States: DC DE MD NY PA VA WV		red berry clusters appear late summer to fall; unusual flower; spreads rapidly from seed
Aruncus dioicus *goat's-beard*	 USFWS BES	Height: 3.5-6.5' Flowers: May-Jul, white Fruit: pod	Light: ☼ ◐ Moisture: M W Soil pH: Soil type: C L S	wooded roadsides, rich woods, ravines	Region: M States: DC VA WV		
Asarum canadense *wild ginger*	 USFWS BES	Height: 0.5' Flowers: Apr-May, brownish-purple Fruit: brown, capsule	Light: ◐ ● Moisture: M Soil pH: Soil type: C L S	rich woods	Region: M P C States: DC DE MD NY PA VA WV		flower inconspicuous; attractive leaves; will spread; semi-evergreen GC ▲
Asclepias incarnata *swamp milkweed*	 USFWS RL	Height: 4-6' Flowers: May-Jun, pink to reddish Fruit: Aug-Nov, pod	Light: ☼ ◐ Moisture: M W Soil pH: 5-8 Soil type: C L	fresh tidal and nontidal marshes, meadows, shrub swamps, woods, shores, ditches	Region: M P C States: DC DE MD NY PA VA WV	 	can tolerate drought; interesting seed pod
Asclepias syriaca *common milkweed*	 RHW, RHW	Height: 3.5-6.5' Flowers: May-Aug, pale purple Fruit: Aug-Nov, pod	Light: ☼ Moisture: D Soil pH: Soil type: L S	thickets, roadsides, fields	Region: M P C States: DC DE MD NY PA VA WV	 	interesting seed pods; fragrant flower
Asclepias tuberosa *butterflyweed, butterfly milkweed, butterfly flower*	 USFWS RL, USFWS BES	Height: 1-3' Flowers: May-Jul, orange Fruit: Aug-Nov, pod	Light: ☼ ◐ Moisture: D M Soil pH: 4.8-6.8 Soil type: L S	dry fields, roadsides, shale barrens	Region: M P C States: DC DE MD NY PA VA WV	 	taproot does not transplant well but seedlings do; attractive seed pod

Herbaceous Plants

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Baptisia australis *wild blue indigo, false blue indigo*  USFWS BES, USFWS BES	Height: 3-5' Flowers: May-Jun, blue, purple Fruit:	Light: ☼ ◐ Moisture: D M Soil pH: Soil type: S	open woods, alluvial thickets, streambanks, floodplains	Region: M P States: DC MD VA WV		tolerates poor soils; flowers very showy; shrublike form
Baptisia tinctoria *yellow wild indigo*  RHW	Height: 1-3' Flowers: May-Sep, yellow Fruit:	Light: ☼ ◐ Moisture: D Soil pH: 5.8-7 Soil type: L S	open woods, clearings	Region: M P C States: DC DE MD PA VA WV		tolerates poor soils
Bidens cernua *nodding beggar-ticks, nodding bur marigold*  RHW	Height: 0.5-3' Flowers: Aug-Oct, yellow Fruit:	Light: ☼ ◐ Moisture: D M Soil pH: 5.1-7 Soil type: C L S	tidal marsh, sloughs, springs, pools, shore	Region: M P C States: DC DE MD NY PA VA WV		
Boltonia asteroides *star boltonia, white doll's daisy*  USFWS BES	Height: 0.5-2.5' Flowers: Jul-Sep, white Fruit:	Light: ☼ ◐ Moisture: D M W Soil pH: 5.3-7 Soil type: L S	gravelly shores, sandy thickets	Region: C States: DC DE VA WV		
Caltha palustris *marsh marigold*  RHW	Height: 1-2' Flowers: Apr-Jun, bright yellow Fruit:	Light: ☼ ◐ Moisture: W Soil pH: 4.9-6.8 Soil type: C L	forested wetlands, shrub swamps, streambanks, seeps, meadows	Region: M C States: DC DE MD NY VA WV		clump-forming; needs some periods of drier soil; tolerates flooding to 6 inches
Campanulastrum americanum (Campanula americana) *American or tall bellflower*  RHW	Height: 1.5-6.5' Flowers: Jun-Aug, light blue Fruit: capsule	Light: ◐ ● Moisture: M Soil pH: 5.5-7.5 Soil type: C L S	rich moist woods, rocky wooded slopes, streambanks	Region: M P States: DC MD NY VA WV		
Cardamine concatenata (Dentaria laciniata) *toothwort*  RHW	Height: 1-1.5' Flowers: Apr-Jun, white, purplish Fruit:	Light: ● Moisture: M Soil pH: Soil type: L S	rich woods, wooded bottoms, calcareous rocky banks	Region: M P States: DC DE MD NY VA WV		
Caulophyllum thalictroides *blue cohosh*  RHW	Height: 1-2.5' Flowers: Apr-Jun, green-yellow, green-purple Fruit: dark blue, berry	Light: ☼ ◐ Moisture: M Soil pH: 4.5-7 Soil type: L	rich woods	Region: M P C States: DC DE MD NY PA VA WV		

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Chamaecrista fasciculata (Cassia fasciculata) *partridge pea, prairie senna*  RHW	Height: 0.5-3' Flowers: Jul-Sep, yellow Fruit: pod	Light: Moisture: D Soil pH: Soil type: S	upland meadows, fields, streambanks	Region: M P C States: DC DE MD PA VA WV		pods coil after split open; spreads
Chamerion angustifolium spp. angustifolium (Epilobium angustifolium) *fireweed*  RHW, PLANTS GAM	Height: 3-10' Flowers: Jun-Sep, magenta, pink, rarely white Fruit: capsule	Light: Moisture: D M Soil pH: Soil type: C L S	recent clearings, burned woodlands, damp ravines, open sandy areas	Region: M States: DC DE MD PA VA WV		
Chelone glabra *white turtlehead, turtlehead*  RHW	Height: 1.5-6.5' Flowers: Jul-Oct, white Fruit: capsule	Light: Moisture: M W Soil pH: Soil type: C L S	woods, streambanks, swamps, thickets	Region: M P C States: DC DE MD NY PA VA WV		strong grower; herbal uses; host for Baltimore checkerspot butterfly
Chimaphila maculata *striped wintergreen, striped prince's pine*  RHW	Height: 0.5' Flowers: Jun-Aug, white Fruit: capsule	Light: Moisture: D Soil pH: Soil type: C L S	acidic woods, frequently under pines	Region: M P C States: DC MD NY PA VA WV		flowers fragrant GC
Chrysogonum virginianum *green-and-gold, golden knees*  USFWS BES	Height: 0.5-1' Flowers: Mar-Jun, yellow Fruit:	Light: Moisture: D M Soil pH: Soil type: L	open woods on limestone, rocky open woods	Region: M P C States: DC MD VA WV		will bloom longer if kept moist GC
Chrysopsis mariana *golden aster, Maryland golden aster*  RHW	Height: 0.5-2.5' Flowers: Jul-Oct, yellow Fruit:	Light: Moisture: D Soil pH: Soil type: S	woods, openings, roadsides, serpentine barrens	Region: P C States: DC DE MD VA		GC
Cimicifuga racemosa *black snakeroot, black cohosh, fairy candles*  RHW	Height: 2.5-8.5' Flowers: Jun-Sep, white Fruit: pod	Light: Moisture: M Soil pH: Soil type: C L S	rich woods, wooded slopes, ravines, thickets	Region: M P C States: DC DE MD NY PA VA WV		
Claytonia virginica *narrowleaf spring beauty, spring beauty*  RHW	Height: 0.5-1' Flowers: Mar-May, white with pink Fruit: capsule	Light: Moisture: M Soil pH: Soil type: L	rich woods, thickets, clearings	Region: M P C States: DC DE MD NY PA VA WV		

Herbaceous Plants

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Clitoria mariana *Maryland butterfly pea*  RHW	Height: 6' Flowers: Jun-Sep, pale blue or pinkish Fruit: pod	Light: ☼ ◐ Moisture: D Soil pH: Soil type: S	open areas	Region: M P C States: DC DE VA WV		vine-like
Conoclinium coelestinum (Eupatorium coelestinum) *mistflower, wild ageratum*  RHW	Height: 1-3.5' Flowers: Jul-Oct, blue, violet or purple Fruit: capsule	Light: ◐ ● Moisture: D M W Soil pH: Soil type: C L	old fields, meadows; dry sandy woods and clearings, damp thickets, streambanks	Region: C States: DC DE VA WV		
Coreopsis tripteris *tall coreopsis, tall tickseed*  RHW	Height: 3.5-10' Flowers: May-Sep, yellow Fruit: capsule	Light: ☼ ◐ Moisture: D M Soil pH: Soil type: L S	thickets, old fields, forest edges, roadsides	Region: M P C States: DC VA WV		flower has anise scent
Coreopsis verticillata *threadleaf coreopsis*  USFWS BES	Height: 0.5-3.5' Flowers: Jun-Oct, yellow Fruit: capsule	Light: ☼ ◐ Moisture: D M Soil pH: Soil type: L	dry open woods, clearings, roadsides	Region: P States: DC MD VA WV		GC
Delphinium tricorne *dwarf larkspur*  RHW	Height: 0.5-3' Flowers: Apr-Jun, blue, violet, white, variegated Fruit: pod	Light: ◐ ● Moisture: M Soil pH: Soil type:	rich woods, calcareous slopes, thickets, river bluffs	Region: M P States: DC VA WV		
Desmodium paniculatum *panicled or narrow-leaf tick-trefoil*  RHW	Height: 1-3.5' Flowers: Jul-Sep, purplish or green Fruit: pod	Light: ☼ ◐ Moisture: D Soil pH: 6-7 Soil type: C L	clearings, edges of moist or dry woods	Region: M P C States: DC DE MD NY VA WV		not found near coast
Dicentra canadensis *squirrel corn*  RHW	Height: 0.5-1' Flowers: Apr-May, greenish-white, rose tinge Fruit: capsule	Light: ◐ ● Moisture: M Soil pH: Soil type: L	rich woods	Region: M P States: DC MD NY PA VA WV		flowers hyacinth scented
Dicentra cucullaria *Dutchman's breeches*  RHW	Height: 0.5-1' Flowers: Apr-Jun, white to cream Fruit: capsule	Light: ◐ ● Moisture: M Soil pH: Soil type: L S	rich woods	Region: M P States: DC DE MD NY PA VA WV		leaves basal; dormant in summer

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Dicentra eximia *wild bleeding heart*  RHW	Height: 1.5-2' Flowers: Apr-Sep, pink/white Fruit: capsule	Light: ◐ ● Moisture: D M Soil pH: Soil type: L	rocky woods and cliffs, rich woods	Region: M P States: DC MD VA WV		sometimes cultivated
Dodecatheon meadia *shooting star*   RHW, RHW	Height: 0.5-2' Flowers: Apr-Jun, white with yellow, lilac Fruit: capsule	Light: ☼ ◐ ● Moisture: M Soil pH: Soil type: L S	open woods, meadows, slopes, prairies	Region: M States: DC MD VA WV		
Doellingeria umbellata var. umbellata (Aster umbellatus) *flat-top white aster, parasol whitetop*  RHW	Height: 1-7.5' Flowers: Aug-Oct, white Fruit:	Light: ☼ ◐ Moisture: M W Soil pH: Soil type: L S	open areas, woods	Region: M P States: DC DE MD NY PA VA WV		
Erigeron pulchellus *robin's plantain*  RHW	Height: 0.5-1.5' Flowers: Apr-Sep, blue, pink, white Fruit: capsule	Light: ◐ Moisture: D M Soil pH: Soil type: L S	open woods, meadows, wooded slopes, roadsides	Region: M P C States: DC DE MD NY PA VA WV		GC
Erythronium americanum *trout lily, yellow trout lily, dogtooth violet*  RHW	Height: 0.5-1' Flowers: Mar-Jun, yellow Fruit: capsule	Light: ◐ ● Moisture: M W Soil pH: Soil type: L S	woods, rich slopes, bottomlands, meadows	Region: M P States: DC DE MD NY PA VA WV		
Eupatorium dubium *Joe-Pye weed*  RHW	Height: 2-5' Flowers: Jul-Oct, purple, rarely white Fruit: capsule	Light: ☼ ◐ Moisture: M W Soil pH: Soil type: S	swamps, bogs, marshes, swales	Region: M P C States: DC DE MD VA		
Eupatorium fistulosum *Joe-Pye weed, trumpet weed*  RHW	Height: 1.5-10' Flowers: Jul-Oct, pink-purple Fruit: capsule	Light: ☼ ◐ Moisture: D M W Soil pH: 4.5-7 Soil type: C L	floodplains, meadows, thickets, roadsides	Region: M P C States: DC DE MD NY PA VA WV		herbal uses
Eupatorium hyssopifolium *hyssop-leaved thoroughwort, hyssop-leaved eupatorium*  RHW	Height: 1-4.5' Flowers: Jul-Oct, white Fruit: capsule	Light: ☼ ◐ Moisture: D M Soil pH: Soil type: S	dry fields, roadsides, railroad right of ways, woods, fields, salt meadows	Region: C States: DC DE MD VA		

Herbaceous Plants

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Eupatorium maculatum *spotted Joe-Pye weed*  CAB	Height: 2-6.5' Flowers: Jul-Sep, purple to pale lavender Fruit: capsule	Light: ☼ ◐ Moisture: M Soil pH: 5.5-7 Soil type: C L	floodplains, swamps, alluvial thickets, grasslands	Region: M P States: DC NY WV		
Eupatorium perfoliatum *common boneset*  RHW	Height: 1-5' Flowers: Jul-Oct, white Fruit: capsule	Light: ☼ ◐ ● Moisture: M W Soil pH: Soil type: C L S	floodplains, swamps, bogs, streambanks, meadows	Region: M P C States: DC DE MD NY PA VA WV		
Eupatorium purpureum *green-stemmed Joe-Pye weed*  RHW	Height: 2-6.5' Flowers: Jul-Oct, pink, purple, cream Fruit: capsule	Light: ☼ ◐ Moisture: D M Soil pH: Soil type: C L S	open woods, fields, floodplains	Region: M P C States: DC DE MD NY PA VA WV		occurs in drier, shadier habitats than other joe-pye-weeds; injured or dried plant has vanilla scent
Eurybia divaricata (Aster divaricatus) *white wood aster*  RHW, USFWS BES	Height: 0.5-3' Flowers: Jul-Oct, white Fruit:	Light: ◐ ● Moisture: D M Soil pH: Soil type:	dry woods, clearings	Region: M P States: DC DE MD NY PA VA WV		GC
Gentiana clausa *closed gentian, bottle gentian*  USFWS BES	Height: 1-3.5' Flowers: Aug-Oct, blue Fruit: capsule	Light: ◐ Moisture: M W Soil pH: 5.8-7.2 Soil type: L	moist open woods, streambanks, meadows	Region: M P C States: DC MD PA VA WV		
Geranium maculatum *wild geranium, wood geranium*  RHW	Height: 1-2' Flowers: Apr-Jul, lavender or pink Fruit: capsule	Light: ☼ ◐ Moisture: D M Soil pH: Soil type: L	woods, roadsides, fields	Region: M P C States: DC DE MD NY PA VA WV		adaptable plant; long bloom time; spreader; herbal uses; explosive seed capsule GC
Goodyera pubescens *downy rattlesnake plantain*  USFWS BES	Height: 0.5-1.5' Flowers: Jun-Aug, whitish Fruit:	Light: ◐ Moisture: D M Soil pH: Soil type: C L S	dry to moist woods	Region: M P C States: DC DE MD NY VA WV		very handsome throughout winter ▲
Helenium autumnale *yellow or common sneezeweed*  USFWS BES	Height: 1.5-6' Flowers: Jul-Nov, yellow Fruit: capsule	Light: ☼ ◐ ● Moisture: M Soil pH: 4-7.5 Soil type: C L S	woods, swamps, riverbanks, alluvial thickets, meadows, marshes, ditches	Region: M P C States: DC DE MD NY PA VA WV		tolerates wet areas; showy flowers; herbal uses

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Helianthus angustifolius *swamp sunflower*  RHW	Height: 1.5-5.5' Flowers: Aug-Oct, yellow Fruit: capsule	Light: Moisture: M W Soil pH: 4-7 Soil type: L S	swamps, moist, sandy areas	Region: C States: DC DE MD VA		
Helianthus decapetalus *ten-petaled or thin-leaved sunflower*  BZ	Height: 1.5-5' Flowers: Jul-Oct, yellow Fruit: capsule	Light: Moisture: M Soil pH: Soil type: S	fields, bottomlands, stream banks, roadsides	Region: M P C States: DC DE NY PA VA WV		
Helianthus divaricatus *woodland sunflower, rough sunflower*  RHW	Height: 1.5-6.5' Flowers: Jul-Sep, yellow Fruit: capsule	Light: Moisture: D M Soil pH: Soil type: S	dry open woods, wooded slopes, shale barrens, roadsides	Region: M P C States: DC DE MD NY PA VA WV		
Heliopsis helianthoides *oxeye sunflower, oxeye*  RHW	Height: 1-5' Flowers: Jun-Sep, pale yellow Fruit: capsule	Light: Moisture: D M Soil pH: 5.6-6.8 Soil type: L S	fields, open woods, floodplains, thickets, streambanks	Region: P C States: DC DE MD PA VA WV		long bloom time
Hepatica nobilis var. acuta (H. acutiloba) *sharp-lobed hepatica*  UWI KJS, UWI KJS, UWI JRS	Height: 0.5-2' Flowers: Mar-Jun, bluish, white, pink Fruit: capsule	Light: Moisture: D M Soil pH: Soil type: L S	rich upland woods, rocky slopes	Region: M States: NY PA VA		may bloom throughout year (rarely) GC
Hepatica nobilis var. obtusa (H. americana) *round-lobed hepatica, liverleaf*  RHW	Height: 0.5-2' Flowers: Mar-Jun, white to lavender Fruit: capsule	Light: Moisture: D M Soil pH: Soil type: L S	dry or rocky woods, dry upland slopes	Region: M P C States: DC DE MD NY PA VA WV		GC
Heracleum maximum (H. lanatum) *cow parsnip*  RHW	Height: 3.5-10' Flowers: May-Aug, white to pink Fruit:	Light: Moisture: M W Soil pH: 5.4-7.3 Soil type: C L S	rich woods, wooded roadside banks, marshy flats, streambanks, ditches	Region: M P C States: DC DE MD NY PA VA WV		can cause a dermatitis (skin) reaction
Heuchera americana *alumroot*  MOBOT	Height: 1-3.5' Flowers: Apr-Jun, green, white, pink, purple Fruit: capsule	Light: Moisture: D M Soil pH: Soil type: L S	rich woods, rocky slopes, shale cliffs	Region: M P States: DC DE MD NY PA VA WV		long bloom time; many cultivars and hybrids; semi-evergreen GC

Herbaceous Plants

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Heuchera villosa *hairy heuchera, hairy alumroot*  PLANTS JSP	Height: 1-2.5' Flowers: Jun-Oct, white to greenish to pinkish Fruit: capsule	Light: ◐ ● Moisture: D M Soil pH: Soil type:	damp rocks, rich wooded slopes	Region: M States: DC MD VA		GC
Houstonia caerulea *bluet, innocence, Quaker-ladies*  RHW	Height: 0.5-1' Flowers: Apr-Jun, blue, lilac, white Fruit: capsule	Light: ○ ◐ Moisture: M Soil pH: Soil type:	meadows, fields, and thickets, open woods, forest edges	Region: M P C States: DC DE MD VA WV		
Hydrophyllum virginianum *Virginia waterleaf*  RHW	Height: 1-2.5' Flowers: May-Aug, lavender, white Fruit: capsule	Light: ◐ ● Moisture: M Soil pH: Soil type: C L S	woods, thickets, streambanks	Region: M P C States: DC DE MD NY PA VA WV		
Hylotelephium telephioides (Sedum telephioides) *Allegheny stonecrop*  RHW	Height: 0.5-1.5' Flowers: Aug-Sep, pale pink Fruit: pod	Light: ○ ◐ ● Moisture: Soil pH: Soil type:	dry rocky places	Region: M States: DC MD NY VA WV		naturally occurs in bare rock outcrops, but does well in garden; rare in PA, threatened in NY GC
Impatiens capensis (I. biflora) *jewelweed, touch-me-not*  USFWS BES	Height: 1.5-5' Flowers: May-Oct, orange, yellow, white Fruit: capsule	Light: ◐ ● Moisture: M W Soil pH: 5.4-7.4 Soil type: C L S	moist meadows, swamps, streambanks, open woods	Region: M P C States: DC DE MD NY PA VA WV		ripe seed pod explodes with contact; remedy for poison ivy itching
Ionactis linariifolius (Aster linariifolius) *stiff-leaf aster, flaxleaf whitetop aster*  RHW	Height: 0.5-2' Flowers: Aug-Oct, blue, yellow eye Fruit:	Light: ○ Moisture: D M Soil pH: Soil type: S	grasslands, successional shrublands, oak-hickory forest, dry rocky woods and edges	Region: M P C States: DC DE MD NY VA WV		
Jeffersonia diphylla *twinleaf*  RHW	Height: 0.5-1' Flowers: Apr-May, white Fruit: capsule	Light: ◐ ● Moisture: M Soil pH: Soil type: L	rich woods	Region: M P States: DC MD VA WV		
Lespedeza capitata *round-head bush clover*  UWI KJS	Height: 2-6' Flowers: Jul-Sep, yellowish white Fruit:	Light: ○ Moisture: D Soil pH: Soil type: L S	fields, thin woods	Region: M P C States: DC DE NY PA VA WV		

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Liatris pilosa var. pilosa (L. graminifolia) *grass-leaf blazingstar*  RHW	Height: 1-3.5' Flowers: Aug-Oct, purple Fruit: capsule	Light: ☼ ◐ Moisture: D M Soil pH: Soil type: C L S	open woods, forest edge, salt marsh edges, dune hollows	Region: P C States: DC DE MD VA		
Liatris scariosa *eastern or northern blazing star, tall gayfeather*  RHW	Height: 1-3.5' Flowers: Aug-Sep, lavender to rose-purple Fruit: capsule	Light: ☼ ◐ Moisture: D M Soil pH: Soil type: L S	dry upland woods	Region: M P C States: DC DE MD VA WV		
Liatris spicata *gayfeather, blazingstar, spiked blazing star*  USFWS RL	Height: 1-6.5' Flowers: Jul-Aug, rose-purple or white Fruit: capsule	Light: ☼ ◐ Moisture: D M Soil pH: 5.6-7.5 Soil type: C L S	moist meadows, open areas	Region: P C States: DC DE VA WV		
Liatris squarrosa *plains blazing star*  RHW	Height: 0.5-2.5' Flowers: Jul-Sep, rose Fruit: capsule	Light: ☼ ◐ Moisture: M Soil pH: Soil type: L S	dry open fields and banks	Region: P C States: DC DE VA		
Lilium canadense *Canada lily*  RHW	Height: 1.5-6.5' Flowers: Jun-Aug, yellow, orange, red Fruit: capsule	Light: ☼ ◐ Moisture: M W Soil pH: Soil type: L	fields, thickets, woods	Region: M P States: DC DE MD NY PA VA WV		
Lilium philadelphicum *wood lily*  RHW	Height: 1-3.5' Flowers: Jun-Aug, yellow, red-orange Fruit: capsule	Light: ☼ ◐ Moisture: D Soil pH: Soil type: L S	open woods, forest edges, thickets	Region: M P C States: DC DE NY PA VA WV		
Lilium superbum *Turk's cap lily*  RS MNPS	Height: 4-8' Flowers: Jul-Aug, yellow-orange, orange-red Fruit: capsule	Light: ☼ ◐ Moisture: M W Soil pH: Soil type: L S	meadows, streamsides	Region: M P C States: DC DE MD NY PA VA WV		leaves in whorl around stem; takes several years to bloom
Limonium carolinianum *sea lavender*  PLANTS LA	Height: 0.5-2' Flowers: Jul-Oct, lavender Fruit:	Light: ☼ Moisture: M W Soil pH: 6-8.5 Soil type: C L S	irregularly flooded high salt marshes	Region: C States: DE MD NY VA		tolerates salinity to 30 ppt

Herbaceous Plants

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Lobelia cardinalis *cardinal flower*  RHW	Height: 2-4' Flowers: Jul-Oct, red Fruit:	Light: ☼ ◐ Moisture: M W Soil pH: 5.8-7.8 Soil type: C L	fresh tidal and nontidal marshes, wooded swamps, seeps, banks of ponds, rivers, streams	Region: M P C States: DC DE MD NY PA VA WV		long bloom time; biennial, must reseed
Lobelia siphilitica *great blue lobelia*  RHW, USFWS BES	Height: 1-5' Flowers: Aug-Oct, blue, violet Fruit: capsule	Light: ☼ ◐ ● Moisture: M W Soil pH: Soil type: C L S	woodlands, meadows, swamps	Region: M P States: DC DE MD NY PA VA WV		long bloom time; white cultivars available
Lupinus perennis *lupine, sundial lupine*  RHW	Height: 1-2' Flowers: Apr-Jul, blue, rarely pink or white Fruit: pod	Light: ☼ ◐ Moisture: D M Soil pH: Soil type: S	open woods, fields, roadsides, streambanks	Region: M P C States: DC DE NY VA WV		prefers acidic soil
Maianthemum canadense *Canada mayflower*  RHW	Height: 0.5' Flowers: May-Jul, white Fruit: pale red speckled, berry	Light: ◐ ● Moisture: M Soil pH: Soil type: C L S	woods	Region: M P C States: DC DE MD NY PA VA WV		fragrant flowers GC
Maianthemum racemosum ssp. racemosum (Smilacina racemosa) *false Solomon's seal*  PLANTS JA, PLANTS WSJ	Height: 1-3.5' Flowers: May-Jul, white Fruit: red, berry	Light: ◐ ● Moisture: M Soil pH: Soil type: C L S	dry to moist woods, clearings, bluffs	Region: M P C States: DC DE MD NY PA VA WV		flowers in plume-like clumps at tip of stem; herbal uses
Medeola virginiana *Indian cucumber*  RHW, RHW	Height: 1-3.5' Flowers: May-Jun, yellowish Fruit: dark purple or black, berry	Light: ☼ ◐ Moisture: M Soil pH: Soil type: L S	woods	Region: M P C States: DC DE MD NY PA VA WV		rhizome is edible
Melanthium virginicum *Virginia bunchflower*  RHW	Height: 2.5-6.5' Flowers: Jun-Aug, greenish Fruit: capsule	Light: ☼ ◐ Moisture: M Soil pH: Soil type: C L S	woods, seepages, clearings	Region: P C States: DC DE MD VA WV		
Mertensia virginica *Virginia bluebells*  RHW	Height: 1-2.5' Flowers: Mar-Jun, pink turning blue Fruit: Mar-May, nut/nut-like	Light: ◐ ● Moisture: M W Soil pH: 4.5-8 Soil type: C L	rich wooded slopes, floodplains	Region: M P C States: DC DE MD NY PA VA WV		dormant in summer; flower color blue, pink, or white according to soil acidity

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Mimulus ringens *monkeyflower, Allegheny monkeyflower*  RHW	Height: 1-3' Flowers: Jun-Oct, blue Fruit: capsule	Light: Moisture: W Soil pH: Soil type: L	open swamps, meadows, shores	Region: M P C States: DC DE NY PA VA WV		interesting flowers
Mitchella repens *partridgeberry*  USFWS, RHW	Height: 0.5' Flowers: May-Jul, white Fruit: July-Dec, scarlet, berry	Light: Moisture: D M Soil pH: Soil type: L S	dry acidic woods	Region: M P C States: DC DE MD NY PA VA WV		two flowers form one fruit; berry edible; slow creeper, forms mats under trees
Mitella diphylla *twoleaf miterwort, bishop's cap*  RHW, RHW	Height: 0.5-1.5' Flowers: Apr-Jun, white Fruit: capsule	Light: Moisture: M Soil pH: Soil type: C L S	rich, woods	Region: M P C States: DC DE MD NY PA VA WV		
Monarda bradburiana (M. fistulosa) *wild bergamot, horsemint*  RS MNPS	Height: 1.5-5' Flowers: Jun-Sep, pink to purple Fruit: nut/nut-like	Light: Moisture: D M Soil pH: 6-8 Soil type: C L	fields, thickets, roadsides, forest edges	Region: M P C States: DC DE MD NY PA VA WV		confused with bee-balm (M. didyma); aromatic; herbal uses
Monarda didyma *beebalm, Oswego tea*  USFWS BES	Height: 2-5' Flowers: Jul-Sep, red Fruit: nut/nut-like	Light: Moisture: M W Soil pH: Soil type: L	creek banks, floodplains, woods	Region: M States: DC MD NY PA VA WV		showy flowers; aromatic; herbal uses
Monarda punctata *horsemint, spotted bee-balm*  RHW	Height: 0.5-3.5' Flowers: Jun-Oct, yellow and purple Fruit: nut/nut-like	Light: Moisture: D Soil pH: Soil type: L S	open sandy fields	Region: M P C States: DC DE MD NY VA		
Nuttallanthus canadensis (Linaria canadensis) *blue, old-field, or Canada toadflax*  PLANTS WSJ	Height: 0.5-2.5' Flowers: Apr-Sep, light blue Fruit: capsule	Light: Moisture: D M Soil pH: Soil type: L S	maritime grasslands and shrublands, successional shrubland, woods, fields	Region: M P C States: MD NY VA WV		delicate flowers; prefers well-drained soil
Oenothera biennis *common evening primrose*  RHW	Height: 1.5-6.5' Flowers: Jun-Oct, yellow Fruit: capsule	Light: Moisture: D Soil pH: 5-7 Soil type: C L S	cultivated fields, waste ground, roadsides	Region: M P C States: DC DE MD NY PA VA WV		flowers open in evening; biennial

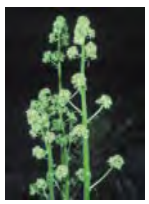
Herbaceous Plants

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Oenothera fruticosa *narrow-leaved sundrops*	 RHW	Height: 1-3' Flowers: May-Sep, yellow Fruit: capsule	Light: ☼ ◐ Moisture: D M Soil pH: 4.5-7 Soil type: C L S	fields, meadows, roadsides	Region: M P C States: DC DE MD NY PA VA WV		
Oenothera perennis *sundrops*	 UWI RWF	Height: 0.5-3' Flowers: May-Aug, yellow Fruit: capsule	Light: ☼ Moisture: D M Soil pH: Soil type: L S	fields, pastures, roadsides, shaly slopes	Region: M P States: DC DE MD NY PA VA WV		similar to evening primrose (O. biennis); long bloom time; spreader
Opuntia humifusa (O. compressa) *eastern prickly-pear cactus*	 RHW	Height: 0.5-1' Flowers: Jun-Jul, yellow Fruit: purplish to deep red, fleshy	Light: ☼ Moisture: D Soil pH: Soil type: L S	sandy coastal dunes, shaly soils	Region: M C States: DC DE MD VA WV		fruit edible, used for jelly GC
Osmorhiza longistylis *sweet cicely, anise root*	 RHW	Height: 1.5-4' Flowers: May-Jun, white to green Fruit:	Light: ◐ ● Moisture: M Soil pH: Soil type: C L S	rich woods, wooded slopes, thickets	Region: M P C States: DC DE MD NY VA WV		all plant parts have anise scent
Oxalis violacea *violet wood sorrel*	 RHW	Height: 0.5' Flowers: Apr-Jul, violet Fruit: capsule	Light: ◐ ● Moisture: D M Soil pH: Soil type: L	woods	Region: M P States: DC DE MD PA WV		GC
Packera aurea (Senecio aureus) *golden ragwort, golden groundsel*	 RHW	Height: 0.5-2.5' Flowers: Apr-Aug, yellow Fruit: capsule	Light: ☼ ◐ ● Moisture: M W Soil pH: Soil type: L	moist fields, woods, floodplains, roadsides	Region: M P C States: DC DE MD NY PA VA WV		wetland plant; long bloom time; aggressive spreader
Penstemon digitalis *beardtongue, tall white or foxglove beardtongue*	 USFWS BES, RHW	Height: 2-5' Flowers: Jun-Aug, white or faintly purple Fruit: capsule	Light: ☼ ◐ Moisture: D M Soil pH: 5.5-7 Soil type: C L S	open woods, meadows	Region: M P C States: DC DE MD NY PA VA WV		tolerates poor drainage; variety of cultivars
Penstemon laevigatus *smooth or eastern beardtongue*	 UWI MRB	Height: 1-3.5' Flowers: May-Jul, purplish Fruit: capsule	Light: ☼ ◐ ● Moisture: M Soil pH: Soil type:	rich woods, fields	Region: M States: DC MD VA WV		

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Phlox carolina *thick-leaved phlox*  PLANTS WSJ	Height: 1-2.5' Flowers: May-Jun, pink to purple, rarely white Fruit: capsule	Light: Moisture: D M W Soil pH: Soil type: L S	open woods	Region: M States: DC VA		GC
Phlox divaricata *woodland or wild blue phlox, wild sweet William*  RHW	Height: 1.5' Flowers: Apr-Jun, blue, lavender, white Fruit: capsule	Light: Moisture: M Soil pH: 5.5-7.2 Soil type: C L S	rich woods	Region: M P States: DC MD NY PA VA WV		aromatic; showy flower; dormant in summer (leaves disappear); frequently cultivated; evergreen
Phlox maculata *phlox, meadow phlox, wild sweet William*  PLANTS WSJ	Height: 1-3' Flowers: May-Sep, rose, pink, purple, rarely white Fruit: capsule	Light: Moisture: M W Soil pH: 5.9-6.8 Soil type: C L	meadows, streambanks, thickets	Region: M P C States: DE PA VA WV		aromatic; showy flowers; a frequent escapee from cultivation
Phlox paniculata *summer phlox, garden phlox*  RHW, USFWS BES	Height: 1.5-6.5' Flowers: Jul-Oct, pink, red-purple, white Fruit: capsule	Light: Moisture: M Soil pH: Soil type: L	rich, open woods, roadsides, streambanks, thickets	Region: M P C States: DC PA VA WV		aromatic; showy flowers frequently escapes from cultivation
Phlox stolonifera *creeping phlox*  RHW, USFWS BES	Height: 0.5-1.5' Flowers: Apr-Jun, blue, red-purple, violet Fruit: capsule	Light: Moisture: D M Soil pH: Soil type: L S	rich woods	Region: M States: DC MD VA WV		GC
Phlox subulata *moss phlox, moss-pink*  USFWS BES, USFWS BES, RHW	Height: 0.5' Flowers: Apr-Jun, rose, pink, white Fruit: capsule	Light: Moisture: D Soil pH: 5.7-7.5 Soil type: C L S	rock crevices, ledges	Region: M P States: DC MD NY VA WV		nice rock garden plant
Physostegia virginiana *obedient plant, false dragonhead*  USFWS BES, USFWS BES	Height: 1.5-5' Flowers: Jun-Sep, pink to purple Fruit: nut/nut-like	Light: Moisture: D M Soil pH: Soil type: C L S	moist open areas, streambanks, shorelines	Region: M P States: DC MD PA VA WV		flowers showy; spreads rapidly by underground stems; best in full sun; can escape cultivation
Podophyllum peltatum *Mayapple*  RHW	Height: 1-2' Flowers: Apr-May, white Fruit: yellow, berry	Light: Moisture: M Soil pH: Soil type: L	rich woods, open fields	Region: M P C States: DC DE MD NY PA VA WV		ripe fruit edible; woodland groundcover; mottled foliage GC

Herbaceous Plants

		Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Polemonium reptans *Jacob's ladder, Greek valerian*	 RHW	Height: 0.5-1.5' Flowers: Apr-Aug, blue Fruit: capsule	Light: ◐ ● Moisture: M Soil pH: Soil type: L S	rich or rocky woods, wooded floodplains	Region: M P States: DC DE MD PA VA WV		attractive flowers; slow spreader; herbal uses GC
Polygonatum biflorum *Solomon's seal, dwarf Solomon's seal*	 RHW	Height: 0.5-6.5' Flowers: Apr-Jun, white or green Fruit: blue to black, berry	Light: ◐ ● Moisture: D M Soil pH: Soil type: L	woods	Region: M P C States: DC DE MD NY PA VA WV		flowers dangle along stalk
Polygonatum pubescens *Solomon's seal, downy Solomon's seal*	 UWI KJS	Height: 1-3.5' Flowers: Apr-Jun, yellowish-green Fruit: blue to black, berry	Light: ☼ ◐ ● Moisture: D M Soil pH: Soil type: C L S	dry to moist woods	Region: M P C States: DE NY PA VA WV		herbal uses; edible
Porteranthus trifoliatus (Gillenia trifoliata) *Bowman's root*	 RHW	Height: 1.5-4' Flowers: May-Jul, white Fruit: pod	Light: ☼ ◐ Moisture: M Soil pH: Soil type: C L S	open upland woods, clearings, rocky slopes, roadsides	Region: M P States: DC DE MD PA VA WV		established plants drought tolerant; spreads to form tight clumps; seldom needs dividing; yellow fall color
Pycnanthemum incanum *hoary mountain mint*	 RHW	Height: 3' Flowers: Jul-Sep, white to lavender, purple spots Fruit: nut/nut-like	Light: ● Moisture: D Soil pH: Soil type: C L S	upland woods, fields, thickets, barrens	Region: M P C States: DC DE MD NY PA VA WV		
Pycnanthemum tenuifolium *narrow-leaved mountain mint*	 PLANTS RM89	Height: 1.5-2.5' Flowers: Jul-Sep, purple to white Fruit: nut/nut-like	Light: ☼ ◐ Moisture: D M Soil pH: Soil type: S	streambanks, floodplains, moist fields	Region: M P C States: DC DE NY PA VA WV		
Rhexia virginica *Virginia meadow-beauty*	 RHW	Height: 1-3.5' Flowers: Jun-Sep, dark pink Fruit: capsule	Light: ☼ Moisture: W Soil pH: Soil type: L	open areas	Region: M P C States: DC DE VA WV		also R. mariana for MD
Rudbeckia fulgida *early, eastern, or orange coneflower*	 USFWS RL	Height: 1.5-3.5' Flowers: Jul-Oct, yellow-orange, black eye Fruit: capsule	Light: ☼ ◐ Moisture: D M Soil pH: Soil type: L	moist fields, meadows	Region: P States: DC DE MD VA		cultivars have nice foliage

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Rudbeckia hirta *black-eyed Susan*  USDA MG	Height: 1-3.5' Flowers: Jun-Oct, yellow, black eye Fruit: capsule	Light: ☼ ◐ Moisture: D M Soil pH: 6-7 Soil type: C L	fields, meadows, roadsides	Region: M P C States: DC DE MD NY PA VA WV		
Rudbeckia laciniata *tall, green-headed, or cutleaf coneflower*  RHW	Height: 1.5-10' Flowers: Jul-Sep, yellow Fruit: capsule	Light: ☼ ◐ Moisture: M W Soil pH: 4.5-7 Soil type: C L S	floodplains, streambanks, fields	Region: M P C States: DC DE MD NY PA VA WV		herbal uses
Rudbeckia triloba *three-lobed coneflower*  PLANTS WSJ	Height: 1.5-4.5' Flowers: Jun-Oct, yellow or orange Fruit: capsule	Light: ☼ ◐ Moisture: D M Soil pH: Soil type: L S	fields, open woods, rocky slopes	Region: M P States: DC MD NY PA VA WV		
Ruellia caroliniensis *Carolina wild petunia*  RHW	Height: 0.5-3' Flowers: May-Aug, lavender-blue Fruit: capsule	Light: ☼ ◐ Moisture: M Soil pH: Soil type: C L S	woods, roadsides, thickets, waste places	Region: C States: DC DE MD VA WV		actually in the nightshade family, flower fragile; a highly variable species
Sabatia angularis *rose pink, common marsh-pink*  RHW	Height: 1-3' Flowers: Jul-Oct, pink or white Fruit: capsule	Light: ☼ ◐ Moisture: M Soil pH: Soil type: C L S	moist open woods, fields, marshes, meadows; uplands, shores	Region: M P C States: DC DE MD VA WV		
Salvia lyrata *lyre-leaf sage*  RHW	Height: 1-2' Flowers: Apr-Jun, violet Fruit: nut/nut-like	Light: ☼ ◐ Moisture: D M Soil pH: Soil type: L S	moist pastures, upland woods, thickets, waste areas	Region: M P C States: DC DE VA WV		
Sanguinaria canadensis *bloodroot*  RHW	Height: 0.5' Flowers: Mar-May, white Fruit: capsule	Light: ● Moisture: M Soil pH: Soil type: L	rich woods, open roadsides	Region: M P C States: DC DE MD NY PA VA WV		showy flowers, but blooms fleetingly; herbal uses
Saxifraga pensylvanica *eastern swamp saxifrage*  RHW	Height: 1-3' Flowers: Apr-Jun, white to green Fruit: capsule	Light: ☼ ◐ Moisture: W Soil pH: Soil type: C L S	wet woods, bogs, swamps	Region: M P C States: DC DE MD NY PA VA		

Herbaceous Plants

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Saxifraga virginiensis *early saxifrage*	Height: 0.5-1' Flowers: Mar-May, white Fruit: capsule	Light: ☼ ◐ ● Moisture: D M Soil pH: Soil type:	rock crevices, dry slopes, woods	Region: M P C States: DC DE MD NY PA VA WV		
Scutellaria integrifolia *rough or hyssop skullcap, helmet flower*	Height: 1-2.5' Flowers: May-Jul, blue, pink, white Fruit: blackish, nut/nutlike	Light: ☼ ◐ Moisture: D M W Soil pH: Soil type:	swamps, bogs, moist woods, fields	Region: M P C States: DC DE MD VA WV		
Sedum ternatum *mountain stonecrop, wild stonecrop*	Height: 0.5' Flowers: Apr-Jun, greenish-white Fruit: pod	Light: ◐ ● Moisture: M Soil pH: Soil type:	damp rocks, rocky banks, cliffs, woods	Region: M P C States: DC DE MD NY PA VA WV		creeping stems; used in rock gardens
Senna marilandica (Cassia marilandica) *Maryland or southern wild senna*	Height: 3-6.5' Flowers: Jul-Aug, yellow Fruit: pod	Light: ☼ ◐ Moisture: D M Soil pH: 4-7 Soil type: L S	dry roadsides, thickets, open woods	Region: M P C States: DC DE MD VA WV		pods important food for upland gamebirds
Silene caroliniana *wild pink*	Height: 0.5-1' Flowers: Apr-Jun, white to pink Fruit: capsule	Light: ☼ ◐ Moisture: D M Soil pH: Soil type: L	dry open woods, rocky slopes, roadside banks, shale barrens	Region: M C States: DC DE MD VA		semi-evergreen; native to limestone areas
Silene stellata *starry campion, widow's frill*	Height: 1-3.5' Flowers: Jun-Sep, white Fruit: capsule	Light: ☼ ◐ Moisture: D M Soil pH: Soil type:	wooded slopes, roadside banks, barrens	Region: M P C States: DC DE MD NY PA VA WV		drought-tolerant; naturalizes in woods
Silene virginica *fire pink*	Height: 1-3' Flowers: Apr-Jul, dark pink to red Fruit: capsule	Light: ☼ ◐ Moisture: D M Soil pH: Soil type: L	upland woods, wooded slopes, streambanks, clearings	Region: M P States: DC DE VA WV		
Silphium perfoliatum *cup plant*	Height: 3-8' Flowers: Jul-Oct, yellow Fruit: capsule	Light: ☼ ◐ ● Moisture: D M Soil pH: Soil type: L	floodplains, fields, moist meadows, woods	Region: M P States: DC VA WV		

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Sisyrinchium angustifolium (S. graminoides) *blue-eyed grass*  CM NRCS	Height: 0.5-1.5' Flowers: Apr-Jun, blue-violet Fruit: brown, capsule	Light: ☼ ◐ Moisture: D M Soil pH: 5-7 Soil type: C L	grassy areas, damp woods	Region: M P C States: DC DE MD NY VA WV		grasslike leaves; also S. montanum in NY
Sisyrinchium atlanticum *coastal or eastern blue-eyed grass*  UWI JS	Height: 0.5-2.5' Flowers: May-Jul, blue-violet Fruit: capsule	Light: ☼ Moisture: M W Soil pH: Soil type:	marshes, meadows, low woods	Region: P C States: DC DE MD VA		leaves grasslike, more slender than S. angustifolium
Solidago caesia *bluestem goldenrod, wreath goldenrod*  RHW	Height: 1-3.5' Flowers: Aug-Oct, yellow Fruit: capsule	Light: ☼ ◐ ● Moisture: D M Soil pH: 5.5-7 Soil type: C L	rich deciduous woods	Region: M P C States: DC DE MD NY PA VA WV		stems bluish or purplish
Solidago canadensis var. scabra (S. altissima) *tall or late goldenrod*  UWI, RRK	Height: 3.5-6.5' Flowers: Jul-Nov, yellow Fruit: capsule	Light: ☼ ◐ Moisture: D M Soil pH: Soil type: L	woods, fields, riverbanks, roadsides	Region: M P C States: DC DE MD NY PA VA WV		
Solidago canadensis *Canada goldenrod*  UWI MRB	Height: 1-6.5' Flowers: Jul-Oct, yellow Fruit: capsule	Light: ☼ ◐ Moisture: D M Soil pH: 4.8-7.5 Soil type: C L S	fields, roadsides	Region: M P C States: DE NY VA WV		
Solidago flexicaulis *broad leaf or zig zag goldenrod*  RHW	Height: 1-3.5' Flowers: Jun-Oct, yellow Fruit: capsule	Light: ◐ ● Moisture: D M Soil pH: 5.3-7 Soil type: L	moist woods, rocky wooded slopes	Region: M P States: DC DE MD NY PA VA WV		
Solidago juncea *early goldenrod*  RHW	Height: 1-4' Flowers: Jun-Oct, yellow Fruit: capsule	Light: ☼ Moisture: D M Soil pH: Soil type: S	fields, meadows, rocky slopes, roadsides	Region: M P C States: DC DE MD NY PA VA WV		
Solidago nemoralis *gray, dwarf, old-field, or one-sided goldenrod*  RHW	Height: 0.5-3' Flowers: Jun-Nov, yellow Fruit: capsule	Light: ☼ ◐ Moisture: D Soil pH: 6.5-7.5 Soil type: L S	fields, open woods, roadsides	Region: M P C States: DC DE MD NY PA VA WV		tolerates poor soils

Herbaceous Plants

		Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Solidago odora *sweet goldenrod*	 RHW	Height: 1.5-5' Flowers: Jul-Oct, yellow Fruit: capsule	Light: ☼ ◐ Moisture: D M Soil pH: Soil type: C L S	dry open woods, barrens	Region: M P C States: DC DE NY VA WV		
Solidago rugosa *wrinkle-leaf or rough-stemmed goldenrod*	 RHW	Height: 1-6.5' Flowers: Aug-Nov, Fruit: capsule	Light: ☼ ◐ Moisture: M W Soil pH: 5-7.5 Soil type: L S	fields, woods, floodplains, roadsides, waste places	Region: M P C States: DC DE MD NY PA VA WV		tough plant; aggressive; strongly colonial
Solidago sempervirens *seaside goldenrod*	 RHW	Height: 1-6.5' Flowers: Jul-Nov, yellow Fruit: capsule	Light: ☼ ◐ Moisture: D M Soil pH: 5.5-7.5 Soil type: L S	coastal areas, dunes	Region: C States: DC DE MD VA		coastal plant, may occur where road salts are used
Solidago speciosa *showy or slender goldenrod*	 PLANTS TGB	Height: 2-6.5' Flowers: Jul-Oct, yellow Fruit: capsule	Light: ☼ ◐ Moisture: D M Soil pH: Soil type: L S	dry to moist open woods and fields	Region: M P States: DC MD NY VA		
Spiranthes cernua *nodding ladies' tresses*	 USFWS BES	Height: 0.5-2' Flowers: Jul-Nov, white Fruit:	Light: ☼ ◐ Moisture: M W Soil pH: 4.5-6.5 Soil type: C L S	meadows, open woods, roadsides, bogs	Region: M P C States: DC DE MD NY PA VA WV		orchid flowers; herbal uses
Stachys tenuifolia (S. hispida) *hedge nettle*	 RHW	Height: 1.5-3.5' Flowers: Jun-Aug, white to pink Fruit: nut/nut-like	Light: ☼ ◐ ● Moisture: M W Soil pH: 5.7-7.4 Soil type: C L S	wooded bottomlands, streambanks, meadows, fields	Region: P C States: DC DE MD VA WV		
Stellaria pubera *star chickweed, great chickweed*	 RHW	Height: 0.5-1.5' Flowers: Mar-Jun, white Fruit: capsule	Light: ● Moisture: M Soil pH: Soil type:	woods, shaded rocky areas	Region: M P ? States: DC MD VA WV		
Symphyotrichum cordifolium (Aster cordifolius) *heart-leaved aster*	 RHW	Height: 1-5' Flowers: Aug-Oct, blue-violet to rose Fruit:	Light: ◐ ● Moisture: D M Soil pH: Soil type: C L S	upland meadows, woods	Region: M P C States: DC NY PA VA WV		

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Symphyotrichum ericoides var. ericoides (Aster ericoides) *heath, white heath, or dense-flowered aster; frostweed*  RHW	Height: 0.5-6.5' Flowers: Jul-Nov, white, rarely blue, violet, rose Fruit:	Light: ☼ ◐ Moisture: D M Soil pH: Soil type: L S	dry fields, forest edges, woods, thickets	Region: M P States: DC DE MD NY WV		forms dense mounds
Symphyotrichum laeve var. laeve (Aster laevis) *smooth blue aster*  MOBOT	Height: 1-5' Flowers: Aug-Oct, pale blue, violet, white Fruit:	Light: ☼ ◐ Moisture: D Soil pH: Soil type: C L S	open areas, forest edges	Region: M P C States: DC DE MD NY PA VA WV		
Symphyotrichum novae-angliae (Aster novae-angliae) *New England aster*  USFWS	Height: 1-6' Flowers: Aug-Oct, violet capsule Fruit:	Light: ☼ ◐ Moisture: M Soil pH: Soil type: L	open woods, seasonal wetlands, shores, meadows	Region: M P C States: DC DE MD NY PA VA WV		showy, frequently cultivated; tolerates drier soils and seasonal flooding GC
Symphyotrichum novi-belgii var. novi-belgii (Aster novi-belgii) *New York aster*  RHW	Height: 1-4.5' Flowers: Jul-Oct, blue-violet Fruit:	Light: ☼ ◐ Moisture: M W Soil pH: Soil type: L	thickets, meadows, shores	Region: P C States: DC DE MD NY VA		
Symplocarpus foetidus *skunk cabbage*  RHW, USFWS BES	Height: 1-3' Flowers: Feb-May, green to purple-brown Fruit:	Light: ◐ ● Moisture: W Soil pH: 4-7 Soil type: C L S	fresh tidal and nontidal marshes and shrub swamps, forested wetlands, seeps	Region: M P C States: DC DE MD NY VA WV		flower inconspicuous, emerges before leaves; sap has skunk-like odor
Thalictrum dioicum *early meadow rue*  RHW	Height: 1-2.5' Flowers: Apr-May, green to purple Fruit: capsule	Light: ● Moisture: M Soil pH: Soil type: L	rich rocky woods, ravines, alluvial terraces	Region: M P C States: DC MD NY PA VA WV		
Thalictrum pubescens (T. polygamum) *tall meadow rue*  RHW	Height: 1.5-9' Flowers: Jun-Aug, white Fruit:	Light: ☼ ◐ ● Moisture: M W Soil pH: Soil type:	rich woods, low thickets, swamps, meadows, streambanks	Region: M P C States: DC DE MD NY PA VA WV		foliage similar to columbines; clump-forming; delicate flowers; species very variable
Thalictrum thalictroides (Anemonella thalictroides) *rue anemone, windflower*  RHW	Height: 0.5-1' Flowers: Apr-Jun, white Fruit:	Light: ◐ ● Moisture: D M Soil pH: Soil type: C L S	wooded banks and thickets	Region: M P C States: DC DE MD NY PA VA WV		foliage similar to columbines

Herbaceous Plants

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Tiarella cordifolia *foamflower, false miterwort*  USFWS BES	Height: 0.5-1' Flowers: Apr-Jul, white Fruit: capsule	Light: ☼ ◐ ● Moisture: M Soil pH: Soil type: L	rich woods, moist rocky wooded slopes	Region: M P C States: DC MD NY PA VA WV		attractive, long-blooming; creeping, clump-forming; many cultivars GC
Tradescantia virginiana *Virginia spiderwort, widow's tears*  RHW	Height: 1-3' Flowers: Apr-Jul, deep blue-purple Fruit: capsule	Light: ☼ ◐ ● Moisture: M Soil pH: 4-8 Soil type: C L	wooded slopes, shale outcrops, fields, roadsides	Region: M P C States: DC DE MD VA WV		flowers showy
Trillium erectum *purple or red trillium, wakerobin*  RHW	Height: 1-1.5' Flowers: Apr-Jun, purple or greenish to white Fruit: dark red, berry	Light: ● Moisture: M Soil pH: Soil type: L	woods	Region: M P States: DC MD NY PA VA WV		flowers ill-scented
Trillium grandiflorum *white or large-flowered trillium*  RHW	Height: 0.5-1.5' Flowers: Apr-Jun, white then pink Fruit: black, berry	Light: ● Moisture: M Soil pH: Soil type: L	woods	Region: M P C States: DC MD NY PA VA WV		showy flowers; common, often in large colonies
Trillium sessile *toadshade*  RHW	Height: 0.5-1' Flowers: Apr-May, maroon, purple, green Fruit: berry	Light: ◐ ● Moisture: M Soil pH: Soil type: L	woods, floodplains	Region: M P States: DC MD VA WV		
Trillium undulatum *painted trillium*  RHW	Height: 1-1.5' Flowers: May-Jun, white with purple Fruit: bright red, berry	Light: ☼ ◐ ● Moisture: M Soil pH: Soil type: L	woods	Region: M P States: DC MD NY PA VA WV		
Uvularia grandiflora *large-flowered bellwort*  RHW	Height: 2.5' Flowers: Apr-Jun, orange-yellow Fruit: capsule	Light: ● Moisture: M Soil pH: Soil type: L	woods	Region: M States: DC NY VA WV		rhizome can be cooked and eaten; young shoots can be substituted for asparagus
Uvularia perfoliata *perfoliate bellwort, mealy bellwort*  RHW	Height: 0.5-2' Flowers: Apr-Jul, yellow Fruit: capsule	Light: ☼ ◐ Moisture: M Soil pH: Soil type: L	woods	Region: M P C States: DC DE MD NY PA VA WV		rhizome can be cooked and eaten; young shoots maybe substituted for asparagus

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Uvularia sessilifolia *straw lily*  RHW	Height: 0.5-1' Flowers: May-Jun, yellow Fruit: capsule	Light: ☼ ◐ ● Moisture: D M Soil pH: Soil type: L S	dry to moist woodlands	Region: M P C States: DC DE MD NY PA VA WV		rhizomes may be cooked and eaten; young shoots may be substituted for asparagus GC
Veratrum viride *green false hellebore, white hellebore*  RHW	Height: 2-5' Flowers: May-Jul, yellow-green Fruit: capsule	Light: ☼ ◐ ● Moisture: M W Soil pH: Soil type: C L S	swamps, woods	Region: M P C States: DC DE MD NY PA VA WV		leaf edges will brown if soil dries and plant is in windy area; does best in cooler temps; slugs like the foliage
Verbena hastata *blue vervain, simpler's joy*  RHW	Height: 1.5-5' Flowers: Jun-Oct, blue to purple Fruit: nut/nut-like	Light: ☼ ◐ Moisture: M W Soil pH: Soil type: C L S	meadows, swamps, floodplains, ditches, roadsides	Region: M P C States: DC DE MD NY PA VA WV		bright flowers; herbal uses
Verbesina alternifolia *wingstem, yellow ironweed*  RHW	Height: 3.5-8' Flowers: Aug-Oct, yellow Fruit: capsule	Light: ☼ Moisture: M Soil pH: Soil type:	wooded slopes, open woodlands, riverbanks, shaded lowlands, roadsides, fields	Region: M P C States: DC DE MD NY VA WV		threatened in NY
Vernonia noveboracensis *New York ironweed*  RHW	Height: 3.5-8' Flowers: Aug-Oct, purple Fruit: capsule	Light: ☼ ◐ Moisture: M W Soil pH: Soil type: L	streambanks, fields, freshwater marshes	Region: M P C States: DC DE MD NY PA VA WV		brilliant flowers; tall upright form adds structure to garden; spreads
Veronicastrum virginicum (Veronica virginica) *Culver's root*  RHW	Height: 3-6.5' Flowers: Jun-Sep, white, pink Fruit: capsule	Light: ☼ ◐ Moisture: M W Soil pH: Soil type: C L S	rich woods, meadows, thickets, swamps	Region: M P States: DC DE MD NY VA WV		
Viola conspersa *American dog violet*  UWI RWF	Height: 0.5-1' Flowers: Apr-Jul, pale blue, violet Fruit: green, capsule	Light: ☼ ◐ ● Moisture: M W Soil pH: Soil type:	woods, fields, swamps	Region: M P C States: NY PA VA WV		delicate plant and flower; edible GC
Viola cucullata *marsh blue violet, blue marsh violet*  RHW	Height: 0-0.5' Flowers: Apr-Jul, pale purple Fruit: green, capsule	Light: ◐ ● Moisture: M W Soil pH: Soil type: C L S	bogs, meadows, swamps	Region: M P C States: DC DE PA VA WV		stemless; self-sows; can become a nuisance GC

Herbaceous Plants

		Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Viola hastata *halberdleaf yellow violet*	 RHW	Height: 0.5-1' Flowers: Apr-May, yellow w/ violet Fruit: green, capsule	Light: Moisture: D Soil pH: Soil type:	rich deciduous woods	Region: M States: DC MD VA WV		GC
Viola pedata *bird's foot violet*	 RHW	Height: 0-0.5' Flowers: Mar-Jun, pale blue or w/ purple-black tips Fruit: green, capsule	Light: Moisture: D M Soil pH: Soil type: L S	sandy or rocky barrens, dry forested slopes	Region: M P C States: DC DE MD VA WV		stemless GC
Viola pubescens var. pubescens (V. pennsylvanica) *yellow violet, downy violet*	 RHW	Height: 0.5-1.5' Flowers: May-Jun, yellow, purple veins Fruit: green, capsule	Light: Moisture: M Soil pH: 6-7 Soil type: L	moist or dry woods, swamps	Region: M P States: DC DE NY PA VA WV		
Viola sororia (V. papilionacea) *common blue violet*	 RHW	Height: 0.5' Flowers: Mar-Jun, dark blue, violet Fruit: green with purple, capsule	Light: Moisture: M Soil pH: 6-7.8 Soil type: C L	dry to moist woods, swamps, thickets	Region: M P C States: DC DE MD NY PA VA WV		delicate plant and flower; edible; spreader; stemless
Viola striata *striped cream violet, striped violet*	 MP	Height: 0.5-1' Flowers: Apr-Jun, ivory w/ purple Fruit: green, capsule	Light: Moisture: M W Soil pH: Soil type: L	alluvial woods, swamps, fields	Region: M P C States: DC DE MD NY PA VA WV		
Yucca filamentosa (Y. flaccida) *Adam's needle*	 RHW	Height: 2-2.5' Flowers: Jun-Sep, white Fruit:	Light: Moisture: D Soil pH: 5.5-7.5 Soil type: L S	coastal sand dunes, outcroppings on thin rocky soils	Region: C States: DC DE MD VA		flower stalk can rise 5-15 feet above foliage
Zizia aurea *golden-alexanders*	 RHW	Height: 1-2.5' Flowers: Apr-Jun, yellow Fruit:	Light: Moisture: D M Soil pH: Soil type: C L S	wooded bottomlands, streambanks, moist meadows, floodplains	Region: M P C States: DC DE NY PA VA WV		

See also:

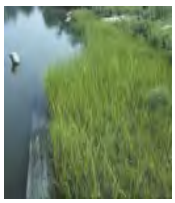
In the *Vines* section:
Smilax herbacea

In the *Herbaceous Emergents* section:
Iris prismatica, versicolor, virginica

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Distichlis spicata *saltgrass*  UWI EJJ	Height: 0.5-1.5' Flowers: Aug-Oct Fruit: pod	Light: Moisture: M W Soil pH: 6.4-10.5 Soil type: C L Flood Depth: Salinity: 0-50 ppt	tidal salt marshes, from Mean High tide above to spring tide level; high salinity; wet depressions	Region: C States: DC DE MD VA		often intermixed with Spartina patens, forms dense mats
Dulichium arundinaceum *three-sided sedge*  UWI AH	Height: 1-3.5' Flowers: Jul-Oct Fruit: brown, nut/nut-like	Light: Moisture: W Soil pH: 4.7-7.5 Soil type: C L S Flood Depth: 0-12"	fresh tidal and nontidal marshes, bogs, swamps, pond edges	Region: M P C States: DC DE NY PA VA WV		grows best where water rarely draws down
Hibiscus moscheutos (H. palustris) *rose mallow, eastern rosemallow*  CM NRCS	Height: 3-6' Flowers: Jul-Sep, cream, pink Fruit: Sep-Mar, brown, capsule	Light: Moisture: M W Soil pH: 4-7.5 Soil type: C L Flood Depth: 0-6" Salinity: 0-15 ppt	fresh to brackish tidal marshes, occasionally nontidal marshes	Region: C States: DC DE MD VA WV		common along coast; persists in winter; split seed capsules; use H. laevis in Piedmont
Iris prismatica *slender blueflag*  RHW	Height: 1-3' Flowers: May-Jun, blue Fruit: green to brown, capsule	Light: Moisture: M W Soil pH: Soil type: Flood Depth: 0-6" Salinity: 0-0.5 ppt	fresh to moderately brackish tidal marshes, meadows, shores, swamps, forested wetlands	Region: C States: DC DE VA		leaves 1/4-inch wide, narrower than Iris versicolor
Iris versicolor *blue flag*  RHW	Height: 3' Flowers: May-Jun, blue Fruit: green to brown, capsule	Light: Moisture: M W Soil pH: Soil type: L S Flood Depth: 0-6" Salinity 0-0.5 ppt	fresh to moderately brackish tidal marshes, meadows, shores, swamps, forested wetlands	Region: M P C States: DC DE MD NY PA VA		
Iris virginica *Virginia blue flag*  RHW	Height: 1-2' Flowers: May-Jul, blue Fruit: green to brown, capsule	Light: Moisture: W Soil pH: 4.8-7.3 Soil type: C L Flood Depth: 0-6" Salinity: 0-0.5 ppt	fresh to moderately brackish tidal marshes, meadows, shores, swamps, forested wetlands	Region: P C States: DC VA WV		
Juncus canadensis *Canada rush*  UWI AH	Height: 1-4' Flowers: Jul-Oct, greenish brown Fruit: brown, capsule	Light: Moisture: M W Soil pH: 4.5-5.9 Soil type: C L S Flood Depth: Salinity: 0-0.5 ppt	fresh to slightly brackish tidal and nontidal marshes, swamps, ponds and pond borders, shores, wet meadows, shallow water	Region: P C States: DC DE MD NY PA WV		
Juncus effusus *soft rush*   CM NRCS, USFWS BES	Height: 1-4' Flowers: Jun-Sep, greenish brown Fruit: brown, capsule	Light: Moisture: M W Soil pH: 5.5-7 Soil type: C L S Flood Depth: 0-12"	fresh tidal and nontidal marshes, shrub swamps, meadows, ditches	Region: M P C States: DC DE MD NY PA VA WV		often grows in clumps

Herbaceous Emergents

		Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Juncus roemerianus *black needlerush, needlegrass rush, needlegrass rush*	 PLANTS LA	Height: 1-4' Flowers: May-Oct, yellow-green Fruit: July-Nov, brown, capsule	Light: Moisture: M W Soil pH: 3.5-7 Soil type: C L Flood Depth: Salinity: 0-25 ppt	brackish and salt marshes, above Mean High tide to spring tide level	Region: C States: DE MD VA		some nitrogen fixing value
Justicia americana *American water-willow*	 RHW	Height: 1-3' Flowers: Jun-Oct, white with purple Fruit: achene (dry, flat seed)	Light: Moisture: W Soil pH: 5.4-7.6 Soil type: C L S Flood Depth:	muddy edges of shallow freshwater streams, lakes, ponds; shores	Region: M P States: DC MD PA VA WV		has underground stems and forms colonies
Kosteletzkya virginica *seashore mallow*	 RHW	Height: 1.5-4.5' Flowers: Jul-Sep, pink Fruit: brown, capsule	Light: Moisture: W Soil pH: Soil type: Flood Depth: Salinity: 0-10 ppt	irregularly flooded salt and brackish marshes, above Mean High tide to spring tide level	Region: C States: DC DE MD VA		common near the coast; looks similar to Hibiscus
Nuphar lutea (N. advena) *spatterdock, yellow water lily, cow-lily, American lotus*	 RHW	Height: 1-1.5' Flowers: May-Oct, yellow Fruit: green, berry	Light: Moisture: W Soil pH: Soil type: C L S Flood Depth: 12-36"	fresh tidal and nontidal marshes, swamps, ponds	Region: M P C States: DC DE MD NY VA WV		large leaves floating but rooted; fruit berry-like, many seeded, somewhat flattened, leathery
Nymphaea odorata *fragrant water lily, American water lily, white water lily*	 RHW	Height: 1-4' Flowers: Jun-Sep, white Fruit: green, berry	Light: Moisture: W Soil pH: Soil type: C L S Flood Depth: 12-48"	tidal and nontidal fresh waters, shallow lakes, ponds	Region: P C States: DC DE MD NY VA		large leaves floating but rooted; fruit berry-like, many seeded, somewhat flattened, leathery
Orontium aquaticum *golden club*	 RHW	Height: 1.5-2' Flowers: Apr-Jun, yellow Fruit: green, berry	Light: Moisture: W Soil pH: Soil type: C L S Flood Depth:	edges of regularly flooded tidal fresh marshes, inland shores, pond borders, on mud or in shallow water	Region: C States: DC DE MD VA WV		fruit is a thick fleshy spike covered with small dark green berry-like structures
Peltandra virginica *arrow arum*	  RHW, RHW	Height: 2' Flowers: Apr-Jul, green to white Fruit: green or black	Light: Moisture: W Soil pH: 5.2-9.5 Soil type: C L S Flood Depth: 0-12" Salinity: 0-2 ppt	fresh to moderately brackish tidal and nontidal marshes, swamps, shallow waters of lakes and ponds	Region: C States: DC DE MD NY VA WV		globular head of berries enclosed in green leathery case, curved downward
Pontederia cordata *pickerelweed*	 UWI MC	Height: 3.5' Flowers: Jun-Nov, purple Fruit:	Light: Moisture: W Soil pH: 6-8 Soil type: C L S Flood Depth: 0-18" Salinity: 0-3 ppt	fresh to moderately brackish, tidal and nontidal marshes, shallow water of ponds or lakes	Region: P C States: DC DE MD NY VA		spreads vigorously; a small bladder-like structure crested with toothed ridges holds one seed

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Sagittaria latifolia *duck potato, arrowhead, broadleaf arrowhead*  RHW	Height: 0.5-4' Flowers: Jul-Sep, white Fruit: green, achene (dry, flat seed)	Light: Moisture: W Soil pH: 4.7-8.6 Soil type: C L Flood Depth: 0-24" Salinity:	fresh tidal and nontidal marshes, swamps; borders of lakes, streams and ponds	Region: P C States: DC DE MD NY PA VA WV		
Saururus cernuus *lizard's tail*  RHW	Height: 1.5-4.5' Flowers: Jun-Sep, greenish white Fruit: capsule	Light: Moisture: W Soil pH: Soil type: C L S Flood Depth: 0-12"	fresh tidal and nontidal marshes, swamps, shallow water	Region: C States: DC DE MD VA WV		fragrant flower; often forms extensive colonies
Schoenoplectus pungens var. pungens (Scirpus pungens, Scirpus americanus) *common three-square*  CM NRCS	Height: 4' Flowers: Jun-Sep, brown Fruit: Jun-Sep, brown, achene (dry, flat seed)	Light: Moisture: W Soil pH: Soil type: C L S Flood Depth: 0-6" Salinity: 0-15 ppt	fresh and brackish tidal and nontidal marshes, shores, shallow water	Region: M P C States: DC DE MD VA	high wildlife value	spike above flower is up to 5 inches tall
Schoenoplectus validus (Scirpus validus) *great bulrush, soft stem bulrush*  PLANTS 1995	Height: 6-10' Flowers: Jun-Sep, brown Fruit: Jun-Sep, brown, achene (dry, flat seed)	Light: Moisture: W Soil pH: Soil type: C L S Flood Depth: 0-12" Salinity: 0-5 ppt	fresh to brackish tidal and nontidal marshes, pond edges, quiet waters, emergent marshes	Region: M P C States: MD NY PA VA	high wildlife value	spreads rapidly
Scirpus atrovirens *black or green bulrush, dark green bulrush*  PLANTS JA	Height: 3-6' Flowers: Jun-Aug, brown Fruit: Jun-Aug, brown, achene (dry, flat seed)	Light: Moisture: W Soil pH: 4-8 Soil type: C L Flood Depth: Salinity:	shallow emergent marshes, shrub swamps, floodplain forests, wooded swamp, bogs, wet meadows, swales, ditches	Region: M P C States: MD NY PA VA WV	high wildlife value	grows in clumps or sod-forming
Scirpus cyperinus *woolgrass, woolgrass bulrush*  USDA JK	Height: 4-5' Flowers: Aug-Sep, brown Fruit: Aug-Sep, brown, achene (dry, flat seed)	Light: Moisture: M W Soil pH: 4.8-7.2 Soil type: C L S Flood Depth: Salinity:	fresh tidal and nontidal marshes, swamps, forested wetlands, meadows, ditches, ponds, bogs	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	grows in large clumps, often extensive colonies
Sparganium americanum *American bur-reed*  RHW	Height: 5' Flowers: May-Aug, greenish Fruit: green to brown, achene (dry, flat seed)	Light: Moisture: W Soil pH: 4.9-7.3 Soil type: C L S Flood Depth: 0-6"	fresh nontidal marshes, shallow waters, muddy shores	Region: M P C States: DC DE NY PA VA WV		good for sediment stabilization
Spartina alterniflora *salt marsh or smooth cordgrass*  USFWS	Height: 2-7' Flowers: Jul-Sep Fruit:	Light: Moisture: M W Soil pH: 5.4-7 Soil type: C L S Flood Depth: Salinity: 0-35 ppt	salt and brackish tidal marshes (mid-tide up to Mean High tide level)	Region: C States: DC DE MD VA		good for shore stabilization; important in seaside habitats; short form (<1.5 ft) found in irregularly flooded high marsh, tall form in regularly flooded low marsh

Herbaceous Emergents

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Spartina cynosuroides *big cordgrass*  PLANTS LA	Height: 3.5-10' Flowers: Aug-Oct Fruit:	Light: Moisture: M W Soil pH: 5.8-7.5 Soil type: C L S Flood Depth: Salinity: 0-10 ppt	fresh and brackish tidal marshes, near Mean High tide and above to spring tide level	Region: C States: DC DE MD NY PA VA		soil stabilizer; not drought tolerant
Spartina patens *salt meadow hay*  CM NRCS	Height: 1-3' Flowers: Jul-Sep Fruit: achene (dry, flat seed)	Light: Moisture: M W Soil pH: 5.3-7.5 Soil type: C L S Flood Depth: Salinity: 0-35 ppt	coastal salt and brackish tidal marshes; irregularly flooded high marsh at or above Mean High tide line	Region: C States: DC DE MD VA		forms large mats; good for shore erosion control
Spartina pectinata *freshwater cordgrass, prairie cordgrass*  CM NRCS	Height: 4' Flowers: Jul-Sep Fruit: achene (dry, flat seed)	Light: Moisture: M W Soil pH: 6-8.5 Soil type: L Flood Depth: 0-6" Salinity: 0-3 ppt	brackish and fresh tidal and nontidal marshes, shores, wet meadows; upper half of intertidal zone and above to spring tide level	Region: M P C States: DC DE MD NY PA VA WV		shore stabilizer; low drought tolerance
Zizania aquatica *wild rice*  RHW	Height: 6-10' Flowers: Jun-Sep Fruit: achene (dry, flat seed)	Light: Moisture: M W Soil pH: 6.4-7.4 Soil type: C L S Flood Depth: 0-36" Salinity:	fresh tidal and nontidal marshes, streamsides, shallow waters	Region: C States: DC DE MD NY VA		annual; edible

See also:

In the *Ferns* section:
- **Dryopteris cristata**
- **Onoclea sensibilis**
- **Osmunda cinnamomea, regalis**
- **Thelypteris palustris**
- **Woodwardia areolata, virginica**

In the *Grasses & Grasslike Plants* section:
- **Andropogon glomeratus (virginicus var abbreviatus), virginicus**
- **Calamagrostis canadensis**
- **Carex crinita var. crinita, lurida, stricta, vulpinoidea**
- **Elymus virginicus**
- **Leersia oryzoides**
- **Panicum amarum, virgatum**

In the *Herbaceous Plants* section:
- **Asclepias incarnata**
- **Bidens cernua**
- **Caltha palustris**
- **Doellingeria umbellata var. umbellata (Aster umbellatus)**
- **Lobelia cardinalis**
- **Sabatia angularis**
- **Symphyotrichum novae-angliae (Aster novae-angliae)**
- **Symplocarpus foetidus**
- **Verbena hastata**
- **Vernonia noveboracensis**

Wetland plants (**Spartina alterniflora**, here) stabilize the shoreline without obstructing the homeowner's view.


USFWS

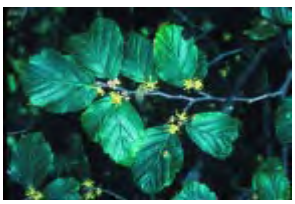
Wetlands of any size provide valuable habitat for wildlife.


USFWS BES


USFWS RM

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Alnus serrulata *smooth alder, hazel alder*  USFWS BES, PLANTS WSJ	Height: 12-20' Flowers: Mar-Apr, purple Fruit: Aug-Feb, brown, cone/cone-like Fall color: yellow, red	Light: Moisture: M W Soil pH: 5.5-7.5 Soil type: C L	fresh tidal and nontidal marshes, shrub swamps, forested wetlands	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	forms thickets along watercourses; nitrogen fixing; tolerates flooding to 3 inches
Aralia spinosa *Devil's walking stick*  RHW	Height: 20-30' Flowers: Jul-Aug, white Fruit: Aug-Sep, black, berry Fall color: yellow	Light: Moisture: D M Soil pH: 5.5-7.1 Soil type: C L S	moist woods, stream banks, roadsides	Region: M P C States: DC DE MD VA WV	high wildlife value	seeds are poisonous if chewed; low maintenance; spreads from new shoots; thorny, clublike stem
Baccharis halimifolia *high-tide bush, groundsel tree, sea myrtle*  USFWS BES	Height: 6-12' Flowers: Aug-Sep, white Fruit: Oct-Nov, silvery white, achene Fall color: purple	Light: Moisture: D M W Soil pH: 7-8.5 Soil type: C L S O	fresh to salt marshes, ditches, shores, dunes	Region: C States: DE MD VA		volunteers in disturbed places; shallow, lateral roots; tolerates flooding to 6 inches; tolerates salinity to 15 ppt
Callicarpa americana *American beautyberry, French mulberry*  USFWS BES	Height: 6' Flowers: Jun-Aug, lavender-pink Fruit: Sep-Mar, lavender, berry Fall color:	Light: Moisture: D M Soil pH: 4.8-7 Soil type: C L S		Region: C States: DC VA		flowers from new growth; if overgrown prune to 6-18 inches tall; will regain height in one season
Ceanothus americanus *New Jersey tea*  RHW	Height: 3' Flowers: May-Sep, white Fruit: Sep-Oct, black Fall color: yellow to tan	Light: Moisture: D Soil pH: 4.3-6.5 Soil type: C L S	meadows, fields, glades, open woods, borders, rocky areas, openings	Region: M P C States: DC DE MD NY PA VA WV		tough; tolerates moist soil if well drained; fixes nitrogen; tolerates dryness
Cephalanthus occidentalis *buttonbush*  RHW	Height: 6-12' Flowers: Jul-Aug, creamy white Fruit: Sep-Jan, green to brown Fall color: yellow-green	Light: Moisture: M W Soil pH: 6.1-8.5 Soil type: C L S O	fresh tidal and nontidal marshes, shrub swamps, forested wetlands; stream, lake and pond edges	Region: M P C States: DC DE MD NY PA VA WV		needs sun to flower; flowers fragrant; interesting fruit; tolerates drought; leaves may persist into winter; tolerates flooding to 36 inches
Clethra alnifolia *sweet pepperbush, summersweet*  USFWS	Height: 6-12' Flowers: Jul-Aug, white/pink Fruit: Sep-Feb, brown, capsule Fall color: yellow	Light: Moisture: M W Soil pH: 4.5-6.5 Soil type: C L S	tidal and nontidal forested wetlands, shrub swamps, bogs, woods, coastal river floodplains, lakeshores	Region: C States: DC DE MD NY VA		very fragrant; tolerates some flooding by partly salty water
Comptonia peregrina *sweetfern*  USFWS BES	Height: 3' Flowers: Apr-May, yellow-green Fruit: Aug-Oct, green to brown, cone/cone-like Fall color: brown	Light: Moisture: D Soil pH: 4-7 Soil type: L S O	hillsides, cliffs, woods openings, sand flats and barrens, fields, dunes	Region: M P C States: DC DE MD NY PA VA WV		fragrant; fixes nitrogen, leaves may persist into winter

Shrubs

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Cornus amomum *silky dogwood, red willow, silky cornel*  RHW	Height: 6-12' Flowers: May-Jun, white Fruit: Aug, blue, berry Fall color: orange, red or purple	Light: ☼ ◐ Moisture: M W Soil pH: 6.1-7.5 Soil type: C L S	forested wetlands, floodplains, shrub wetlands, stream and pond banks, clearings	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	
Cornus racemosa *red-panicled or gray dogwood*  UWI KJS, UWI KJS	Height: 6-12' Flowers: May-Jun, white Fruit: Aug-Sep, white, red stems, berry Fall color: purple	Light: ☼ ◐ ● Moisture: D M Soil pH: 6.1-8.5 Soil type: C L	open wooded floodplains, forested wetlands, shrub swamps, rocky woods or ledges, fencerows	Region: M P States: NY VA WV	high wildlife value	tolerates a variety of conditions; berries are food for many songbirds and small mammals
Corylus americana *American hazelnut or filbert*  UCONN, UCONN, UCONN	Height: 10-15' Flowers: Mar-Apr, brown or red Fruit: Aug-Sep, light brown, nut/nut-like Fall color: yellow orange	Light: ◐ Moisture: D M Soil pH: 6.1-7.5 Soil type: C L	dry woodlands, forest edges, hillsides, fence rows, ravines, floodplain woods, brushy pastures	Region: M P States: DC DE MD NY PA VA WV		forms large thickets; edible nut; male catkins brown, female red
Gaultheria procumbens *wintergreen, checkerberry*  RHW, RHW	Height: 0.5' Flowers: May-Aug, white to pink Fruit: Jul-Apr, red, berry Fall color: evergreen	Light: ◐ ● Moisture: D M Soil pH: 4-6.5 Soil type: L S O	clearings, steep rocky open slopes, sandy oak woods, hummocks in bogs	Region: M P C States: DC DE MD NY PA VA WV		dense, mat-like form; forms colonies; edible fruits, leaves; wintergreen taste and scent GC ▲
Gaylussacia baccata *black huckleberry*  RHW	Height: 1.5-3' Flowers: May-Jun, white to pink Fruit: Jul-Sep, black, berry Fall color: reddish-purple	Light: ◐ ● Moisture: D M W Soil pH: 4.5-6.5 Soil type: C L S	woods, thickets	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	very common; fruits edible but many-seeded
Gaylussacia frondosa *dangleberry*  CM NRCS	Height: 2-4' Flowers: Apr-Jun, greenish to purple Fruit: Jul-Oct, blue, berry Fall color: reddish-purple	Light: ☼ ◐ ● Moisture: D M W Soil pH: 4.5-6.5 Soil type: S	woods and thickets	Region: M C States: DC DE MD NY VA	high wildlife value	berries borne on long, drooping stems
Hamamelis virginiana *witch hazel*  RHW	Height: 15-30' Flowers: Sep-Dec, yellow Fruit: Oct-Nov, tan brown, capsule Fall color: yellow	Light: ◐ ● Moisture: D M Soil pH: 5.5-6.5 Soil type: C L S	woods or brushy fields, moist or dry	Region: M P C States: DC DE MD NY PA VA WV		noted for fall/winter bloom; medicinal uses, leaves may persist into winter
Hydrangea arborescens *wild or smooth hydrangea*  RHW	Height: 3-6' Flowers: Jun-Aug, white Fruit: Oct-Jan, brown, capsule Fall color: yellow	Light: ◐ ● Moisture: M Soil pH: 6.1-8.5 Soil type: L S	rich upland or floodplain woods, streambanks	Region: M P States: DC MD PA VA WV		eaves poisonous to humans; does best on loamy soils

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Hypericum densiflorum *dense St. John's wort*  RHW	Height: 1.5-6' Flowers: Jul-Sep, yellow Fruit: Oct-Apr, brown, capsule Fall color: yellow green	Light: Moisture: D M W Soil pH: 5.5-7 Soil type: C L S O	low boggy places, seepage slopes, pond and lake edges, wet meadows, streambanks, ditches, moist pinelands	Region: M P C States: DC DE MD VA		blooms small but form dense flat-topped clusters; can spread aggressively
Ilex glabra *inkberry*  USFWS BES, USFWS BES	Height: 6-10' Flowers: May-Jun, greenish white Fruit: Sep-Mar, black, berry Fall color: evergreen	Light: Moisture: D M Soil pH: 4.5-6 Soil type: C L S O	forested wetlands, shrub swamps, sandy woods	Region: C States: DE NY VA	high wildlife value	berries persist through winter; male and female flowers on separate plants; tolerates some salt flooding; short cultivars (4-5') available
Ilex laevigata *smooth winterberry*  RHW, RHW	Height: 10-12' Flowers: May-Jul, white to cream Fruit: Sep-Feb, red, scarlet, berry Fall color: yellow	Light: Moisture: M Soil pH: 4.5-6.5 Soil type: C L S O	wooded swamps	Region: C States: DC DE MD VA	high wildlife value	berries provide winter bird food; prefers soil with a calcareous layer
Ilex verticillata *winterberry, winterberry holly, black alder*  USFWS BES	Height: 6-12' Flowers: Jun-Jul, greenish white Fruit: Aug-Feb, red, Fall color:yellow to brown	Light: Moisture: M W Soil pH: 4.5-6.5 Soil type: C L S O	fresh tidal swamps, shrub swamps, forested wetlands	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	berries provide winter bird food, poisonous to humans; berries on female plants, need male plant to pollinate
Itea virginica *tassel-white, Virginia sweetspire*  USFWS BES	Height: 6-10' Flowers: Jun-Jul, white Fruit: Aug-Mar, brown, capsule Fall color: red to purple	Light: Moisture: M W Soil pH: 5.1-7.5 Soil type: C L S	forested wetlands, shrub swamps, streambanks, shallow water	Region: C States: DC DE MD VA		fruit capsules on stalk; plant will sucker, form thickets; tolerates flooding to 6 inches
Iva frutescens *marsh elder, high tide bush*  PLANTS LA, RHW	Height: 2-10' Flowers: Aug-Oct, greenish white Fruit: not conspicuous, capsule Fall color:	Light: Moisture: D M Soil pH: 5-5.7 Soil type: C L S	tidal brackish and salt marshes	Region: C States: DE MD VA		similar to Baccharis halimifolia but with opposite leaves; tolerates salinity to 15 ppt
Kalmia angustifolia *sheep laurel, lambkill*  CM NRCS	Height: 2-3' Flowers: May-Jul, white, pink, purple, red Fruit: Sep-Mar, brown, capsule Fall color: evergreen	Light: Moisture: M W Soil pH: 4.5-6 Soil type: C L S O	pastures, barrens, slow wooded streams, swamp borders, bogs, thickets	Region: C States: DC DE MD NY PA VA		foliage poisonous to hoofed browsers (not eaten by deer)
Kalmia latifolia *mountain laurel*  USFWS BES	Height: 12-20' Flowers: May-Jul, white to pink/purple Fruit: May-Jun, brown, capsule Fall color: evergreen	Light: Moisture: D M W Soil pH: 4.5-6 Soil type: C L S O	woods, ridge tops, fields, swamps, mountain meadows and slopes	Region: M P C States: DC DE MD NY PA VA WV		foliage poisonous to hoofed browsers; PA state flower

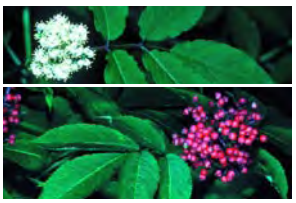
Shrubs

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Leucothoe racemosa *fetterbush, sweetbells* RHW, PLANTS WSJ 	Height: 13' Flowers: May-Jun, white, pinkish Fruit: brown, capsule Fall color:	Light: ◐ ● Moisture: M W Soil pH: 4.5-6 Soil type: C L	swamps, woods, thickets	Region: M P C States: DC DE MD NY PA VA		zig-zag twigs, reddish or greenish; tends to sucker, forming thickets
Lindera benzoin *spicebush* CM NRCS, RHW, CM NRCS 	Height: 6.5-16' Flowers: Mar-May, yellow Fruit: Sep-Oct, scarlet, berry Fall color: yellow	Light: ◐ ● Moisture: M W Soil pH: 4.5-6.5 Soil type: L S	woods, wooded slopes, dunes, floodplain forests	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	all parts edible and aromatic; herbal uses
Lyonia ligustrina *male-berry* RHW 	Height: 6-12' Flowers: May-Jul, white Fruit: Sep-Mar, brown, capsule Fall color: orange to red	Light: ◐ ● Moisture: M Soil pH: 4-6 Soil type: C L S O	open areas, swamps, woods	Region: M P C States: DC DE MD NY PA VA WV		berry-like capsules persist through winter
Lyonia mariana *stagger-bush* RHW, CM NRCS 	Height: 0.5-6.5' Flowers: May-Jun, white, pale pink Fruit: Sep-Feb, brown, capsule Fall color: red	Light: ◐ ● Moisture: D M Soil pH: 4-6 Soil type: S	swamps, moist or dry woods	Region: C States: DC DE MD VA		interesting woody capsules persist through winter
Morella caroliniensis (Myrica heterophylla) *southern or swamp bayberry* PLANTS 	Height: 8-12' Flowers: Apr-Jun, yellowish-green Fruit: Sep-Apr, bluish white, berry Fall color: evergreen	Light: ○ ◐ ● Moisture: D M W Soil pH: 4.5-7 Soil type: C L S	dry or moist thickets, woods, bogs	Region: C States: DE VA		glossy dark green leaves, leaves larger than M. cerifera, plants fuller
Morella cerifera (Myrica cerifera) *wax myrtle, southern bayberry* USFWS BES, PLANTS 	Height: 6-15' Flowers: Mar-Jun, yellowish-green Fruit: Sep-Apr, bluish white, berry Fall color: evergreen in southern areas	Light: ○ ◐ Moisture: D M W Soil pH: 5.5-7 Soil type: C L S	tidal and nontidal fresh and brackish marshes, swamps, sandy dune swales, upland woods	Region: C States: DE MD VA		fragrant; loses leaves north and west of Ches. Bay, MD north; may reach 30 feet; can be pruned as hedge; nitrogen fixer; tolerates salinity to 10 ppt
Morella pensylvanica (Myrica pensylvanica) *northern bayberry, candleberry* CM NRCS 	Height: 5-10' Flowers: Mar-Apr, yellowish-green Fruit: Sep-Apr, bluish white, berry Fall color:	Light: ○ ◐ Moisture: D M W Soil pH: 5.1-6.5 Soil type: C L S	tidal and nontidal fresh and brackish marshes, swamps, sand flats, dunes	Region: C States: DC DE MD NY VA	high wildlife value	fragrant leaves; tends to sucker and form large colonies; waxy berries persist through winter; tolerates salinity to 20 ppt
Photinia melanocarpa (Aronia melanocarpa) *black chokeberry* USFWS BES 	Height: 3-6' Flowers: Apr-May, white or pink-tinged Fruit: Sep-Nov, black, berry Fall color: crimson red	Light: ○ ◐ Moisture: D M W Soil pH: 5.1-6.5 Soil type: C L S O	bogs, swamps, springs, dunes, cliffs, fields, clearings, wet or dry thickets, creek banks, balds, rock outcroppings	Region: M P C States: DE MD NY PA VA WV		can be pruned as hedge

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Photinia pyrifolia (Aronia arbutifolia) *red chokeberry* USFWS BES, VT 	Height: 1.5-13' Flowers: Mar-May, white, purple-tinged Fruit: Sep-Dec, red, berry Fall color: orange to red	Light: ◐ ◑ Moisture: D M W Soil pH: 5.1-6.5 Soil type: C L S	forested wetlands, shrub bogs, upland forests, fields, dunes	Region: M P C States: DC DE MD NY PA VA WV		tolerates infrequent flooding by water with some salt; can be pruned as hedge
Physocarpus opulifolius *ninebark* USFWS BES 	Height: 5-12' Flowers: May-Jul, white, pink Fruit: Jul-Mar, orange to red, capsule Fall color:yellow to purple	Light: ◐ ◑ Moisture: M W Soil pH: 6.1-8.5 Soil type: C L	thickets, along streams in sand or gravel bars, rocky slopes	Region: M P States: DC NY PA VA WV		papery bark continually molts in thin strips; very drought tolerant; adaptable
Prunus maritima *beach plum* CM NRCS 	Height: 1-8' Flowers: Apr-May, white Fruit: Aug, blue-purple, fleshy Fall color:	Light: ◐ ◑ Moisture: D M Soil pH: 5.8-7.7 Soil type: L S	ocean dunes, roadsides, hedgerows	Region: C States: DE MD	high wildlife value	edible fruit, prized for jams and jellies; salt tolerant
Rhododendron atlanticum *dwarf or coast azalea* GM ARS, USFWS BES 	Height: 1-2.5' Flowers: Apr-May, white, purple-tinged Fruit: brown, capsule Fall color:	Light: ◑ ● Moisture: M Soil pH: 4.2-5.7 Soil type: S	coastal, sandy soils	Region: C States: DE MD VA		flowers very fragrant; colonial, arising from spreading underground stems;
Rhododendron calendulaceum *flame azalea* RHW 	Height: 5-9' Flowers: May-Jun, yellow, orange, red Fruit: Aug-Feb, brown, capsule Fall color: yellow green	Light: ◑ Moisture: D M Soil pH: 5.1-6 Soil type: C L	open oak woods, dry rocky woodlands, damp slopes, mountain streambanks, heath balds	Region: M States: VA WV		
Rhododendron canescens *sweet azalea* PLANTS, PLANTS 	Height: 3-10' Flowers: Apr-May, white or pink Fruit: brown, capsule Fall color:	Light: ◑ Moisture: M Soil pH: 4.2-5.7 Soil type: S	woods	Region: C States: DC DE MD		
Rhododendron maximum *great laurel, rosebay rhododendron* RHW, USFWS BES 	Height: 15-20' Flowers: May-Aug, white, pink Fruit: Sep-Nov, tan to red, capsule Fall color: evergreen	Light: ◑ ● Moisture: M W Soil pH: 4.5-6 Soil type: L	mountain slopes, woods, sheltered coves, ravines, streamsides	Region: M P States: DC MD NY PA VA WV		needs space; may form dense thicket
Rhododendron periclymenoides *pinxterbloom, pink azalea, pinxter flower* RHW 	Height: 3-10' Flowers: Apr-May, pink, purple, white Fruit: Aug-Mar, brown, capsule Fall color: dull yellow	Light: ◐ ◑ ● Moisture: D M W Soil pH: 4.5-5.5 Soil type: L	woods, low swampy areas, limestone cliffs	Region: M P C States: DC DE MD NY PA VA WV		will tolerate thin soils over bedrock; open, airy quality; susceptible to disease and insects

Shrubs

		Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Rhododendron prinophyllum *rose, roseshell, mountain or early azalea*	 PLANTS	Height: 2-8' Flowers: May-Jun, pink Fruit: May-Sep Fall color:	Light: ☼ ◐ ● Moisture: D M Soil pH: Soil type: O	rocky or rich woods	Region: M States: PA VA WV		may reach 15 feet tall, but rarely; flowers have clove-like scent
Rhododendron viscosum *swamp azalea*	 RHW	Height: 6.5-10' Flowers: May-Aug, white, pink Fruit: Aug-Mar, brown, capsule Fall color: yellow, orange, to purple	Light: ☼ ◐ Moisture: M W Soil pH: 4-6 Soil type: C L S O	wet floodplain woods, streambanks, swamp edges, hillside bogs, ditch banks, clearings	Region: M P C States: DC DE MD NY VA		attractive spreading, loose-branched habit; demands acid soil; susceptible to disease and insects
Rhus aromatica *fragrant sumac*	 RHW, RHW	Height: 6' Flowers: Mar-May, greenish yellow Fruit: Jul-Mar, dark wine red, berry Fall color: red	Light: ☼ ◐ Moisture: D Soil pH: 6.1-8.5 Soil type: L S	limestone cliffs, open upland woods, rocky bluffs, oak barrens, forednes, barren rock	Region: M P States: DC MD NY VA WV	high wildlife value	fuzzy edible berry clusters; aromatic leaves; shorter cultivars available; male and female separate plants
Rhus copallina *shining, winged, flameleaf, or dwarf sumac*	 RHW, CM NRCS	Height: 20-35' Flowers: Jul-Sep, greenish yellow Fruit: Oct-Nov, red, berry Fall color: rich red	Light: ☼ ◐ Moisture: D Soil pH: 5.3-7.5 Soil type: C L S	thickets, fields, open woods, roadsides, fencerows	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	forms large colonies; winter food for wildlife
Rhus glabra *sweet or smooth sumac*	 CM NRCS	Height: 2-20' Flowers: Jun-Jul, greenish Fruit: Aug-Oct, red, berry Fall color: red	Light: ☼ Moisture: D M Soil pH: 5.3-7.5 Soil type: L S	dry or moist open areas, shale barrens, fields, dry open slopes, roadsides, fencerows	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	fuzzy berry clusters; male and female may be on separate plants; extremely drought resistant
Rhus hirta (R. typhina) *staghorn sumac*	 RHW	Height: 35-50' Flowers: Jun-Jul, yellow-green Fruit: Jul-Feb, red, berry Fall color: orange-red	Light: ☼ Moisture: D M Soil pH: 4.5-7.2 Soil type: C L S	fields, roadsides, forest edges	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	spreads by lateral roots to form colonies; female plants produce seed; winter food for wildlife
Ribes rotundifolium *Appalachian or eastern gooseberry*	 USFWS BES	Height: 3-6' Flowers: May-Jul, greenish purple Fruit: Jul-Aug, purple or greenish, berry Fall color: red	Light: ◐ Moisture: D Soil pH: 6.1-8.5 Soil type: C L S	rocky upland woods	Region: M P States: DC MD NY VA WV		do not use near apple orchards; may spread cedar apple rust
Rosa carolina *pasture rose*	 RHW, RS MNPS	Height: 0.5-3' Flowers: May-Jun, pale pink Fruit: Aug-Mar, red, berry Fall color: yellowish to orange	Light: ☼ ◐ Moisture: D M Soil pH: 6.1-8.5 Soil type: C L S	dry fields, open woods; rocky banks, shale barrens	Region: M P C States: DC DE MD NY VA WV	high wildlife value	edible fruit is a berry-like hip; thorns

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Rosa palustris *swamp rose*  PLANTS WSJ	Height: 8' Flowers: Jun-Aug, pink Fruit: Jul-Mar, red, berry Fall color:	Light: ☼ ◐ ● Moisture: M W Soil pH: 4-7 Soil type: C L	fresh tidal and nontidal marshes, forested wetlands, shrub swamps, streambanks	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	edible fruit is a berry-like hip; thorns; tolerates flooding to 3 inches
Rubus allegheniensis *Allegheny blackberry*  USFWS BES, RHW	Height: 3-9' Flowers: May-Jun, white Fruit: Jul-Sep, black, berry Fall color: orange, red, to purple	Light: ☼ ◐ Moisture: D M Soil pH: 4.5-7.5 Soil type: C L	roadsides, fence rows, fields, thickets, open woods, clearings	Region: M P States: DC DE MD NY PA VA WV	high wildlife value	prickly; juicy edible fruit used by people and wildlife
Rubus odoratus *purple flowering raspberry, fragrant thimbleberry*  PLANTS WSJ	Height: 3-6' Flowers: Jun-Sep, rose purple Fruit: Jul-Sep, dull red, berry Fall color: pale yellow	Light: ◐ ● Moisture: M Soil pH: 5.1-6 Soil type: C L S	forest edges, rocky ledges, rocky wooded slopes	Region: M P States: DC DE MD NY PA VA WV	high wildlife value	feels sticky; fruit edible; spreads by suckers
Salix humilis *prairie willow*  PLANTS 1997	Height: 6-12' Flowers: Apr-May, greenish yellow Fruit: May-Jun, brown, capsule Fall color: dull yellow	Light: ☼ Moisture: D M W Soil pH: 6.1-7.5 Soil type: C L S O	dry thickets, openings, boggy swales; mountain ridges, barrens, meadows, roadsides	Region: M P C States: DC DE PA VA WV	high wildlife value	typically spreads up to twice it's height; flowers are catkins
Sambucus nigra ssp. canadensis (S. canadensis) *common elderberry, American elder*  RS MNPS, USFWS	Height: 6-12' Flowers: Jun-Jul, white Fruit: Aug-Sep, purple to black, berry Fall color: yellow green	Light: ☼ ◐ ● Moisture: D M W Soil pH: 6.1-7.5 Soil type: C L S O	fresh tidal and nontidal marshes, swamps, wet meadows, moist woods, fields	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	berries eaten by 48 species of birds
Sambucus racemosa var. racemosa (S. pubens) *red elderberry, scarlet elder*  RHW, RHW	Height: 6-12' Flowers: May, white Fruit: Jun-Jul, red, berry Fall color: yellow green	Light: ● Moisture: D M Soil pH: 6.1-8.5 Soil type: L	rich woods, dry rocky woods, along creeks, rock crevices, sheltered coves, ravines	Region: M States: PA VA WV	high wildlife value	important summer wildlife food; one of earliest blooming shrubs; fragrant
Spiraea alba var. latifolia (Spiraea latifolia) *broad-leaved meadow-sweet*  RHW	Height: 3-6' Flowers: Jun-Sep, white or pinkish Fruit: Sep-Mar, brown, capsule Fall color: yellow	Light: ☼ Moisture: M Soil pH: Soil type: L S	bogs, woods, barrens, swamps	Region: M States: DC DE MD NY VA WV		similar to S. alba but twigs more purplish or red
Spiraea alba *narrow-leaved meadow-sweet*  RHW	Height: 3-6' Flowers: Jun-Sep, white Fruit: Sep-Mar, brown to red brown, capsule Fall color: yellow	Light: ☼ Moisture: M Soil pH: 6.6-7.5 Soil type: C L S O	bogs, swamps, meadows	Region: M States: DC DE MD NY VA WV		bark may be shaggy, orange-brown

Shrubs

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Spiraea tomentosa *steeplebush, hardback spirea*	 RHW	Height: 3-6' Flowers: Jul-Sep, pink to purple Fruit: Sep-Mar, brown, capsule Fall color: yellow green	Light: ☼ Moisture: M W Soil pH: 5.1-6 Soil type: C L S O	meadows, fields, bogs, swamps, lake edges, marshes, dunes, swales	Region: M P C States: DC DE MD NY VA WV		cultivars available with white or red flowers
Staphylea trifolia *American bladdernut*	 RHW	Height: 3-15' Flowers: May, greenish white Fruit: Aug-Dec, red-brown, capsule Fall color: yellow	Light: ● Moisture: M Soil pH: 6.1-8 Soil type: L	rich woods, floodplain woods, ravines, shores of lakes and ponds, rocky wooded streambanks, shaded dunes	Region: M P States: DC MD PA VA WV		fruit is 3-lobed, papery, balloon-like capsule; branches green-white striped
Vaccinium angustifolium *lowbush blueberry*	 BES	Height: 1-2' Flowers: May-Jun, white or pink-tinged Fruit: Jul-Aug, blue to black, berry Fall color: red	Light: ☼ ◐ Moisture: D M Soil pH: 4-6 Soil type: C L S	dry woods, barrens, rock outcroppings	Region: M P States: DC MD NY PA VA WV	high wildlife value	edible berries often harvested, makes a nice ground layer GC
Vaccinium corymbosum *highbush blueberry*	 USFWS BES, USFWS BES	Height: 6-12' Flowers: Apr-Jun, white or pink-tinged Fruit: Jul-Aug, blue to black, berry Fall color: yellow to red	Light: ☼ ◐ ● Moisture: D M W Soil pH: 4-6.5 Soil type: L S O	forested wetlands, shrub swamps, bogs, dry to wet woods, thickets, streambanks, rock outcroppings	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	edible berries commonly cultivated
Vaccinium macrocarpon *cranberry*	 RHW	Height: 0.5-1' Flowers: Jun-Jul, white to pink Fruit: Sep-Nov, red, berry Fall color: dark green to purple to red	Light: ☼ ◐ Moisture: W Soil pH: 4-6 Soil type: L S O	sphagnum bogs, cool swampy areas	Region: M C States: DC DE MD NY PA WV		low mat form, can spread indefinitely; edible cranberries GC ▲
Vaccinium pallidum (V. vacillans) *early lowbush blueberry*	 RHW	Height: 1.5-2' Flowers: Apr-May, white, reddish Fruit: Jul-Aug, blue, berry Fall color:	Light: ☼ ◐ Moisture: D M Soil pH: Soil type: L S	dry woods and barrens	Region: M P C States: DC DE MD PA VA WV	high wildlife value	sweet berries GC
Vaccinium stamineum *deerberry*	 RHW	Height: 6-12' Flowers: Apr-Jun, white or purple Fruit: Sep-Oct, bluish black, berry Fall color: red	Light: ☼ ◐ Moisture: D M Soil pH: 4-6.5 Soil type: C L S	dry woods, openings, barrens; uplands, floodplain forests, clearings, thickets, rock outcroppings	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	berries edible but sour
Viburnum acerifolium *maple-leaved arrowwood*	 RHW, RHW	Height: 3-6' Flowers: Jun, creamy-white, pink Fruit: Aug-Dec, blue to black, berry Fall color: orange, red, purple	Light: ☼ ◐ ● Moisture: D M Soil pH: 5.1-6 Soil type: C L	floodplain forests, dry wooded slopes, woods,rocky slopes, rock outcrops, wooded ravines	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	dry, edible berries

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Viburnum dentatum (V. recognitum) *southern arrowwood*  USFWS BES, RS MNPS	Height: 10-15' Flowers: May-Jun, white Fruit: Sep-Nov, blue to black, berry Fall color: reddish-purple	Light: ☼ ◐ ● Moisture: D M W Soil pH: 5.1-6.5 Soil type: L S O	swamps, wet woods, bogs, floodplain forests, streambanks, low, wet acid-sand habitats	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	stems very straight, nice structure in winter
Viburnum nudum var. cassinoides (V. cassinoides) *witherod*  USFWS BES	Height: 6-12' Flowers: May-Jun, creamy white Fruit: Aug-Sep, pink to blue-black, berry Fall color: orange-red to purple	Light: ☼ ◐ Moisture: D M W Soil pH: 5.1-6.5 Soil type: L O	swamps, bogs, moist woods, barrens	Region: M P C States: MD PA		handsome stature; multiple fruit colors at once
Viburnum nudum *naked witherod, possum-haw viburnum*  RHW	Height: 6.5-20' Flowers: Jun-Jul, white to cream Fruit: Sep-Oct, red to blue, then black, berry Fall color: red to purple	Light: ☼ ◐ ● Moisture: M W Soil pH: 5.1-6 Soil type: L S	wet woods, rich upland woods, swamps, margins of vernal ponds, heath bogs	Region: M P C States: DC DE MD VA	high wildlife value	edible fruit but very acidic; shallow fibrous roots, transplants well
Viburnum prunifolium *black haw*  RHW	Height: 12-24' Flowers: Apr-May, white Fruit: Jul-Nov, pink to bluish-black, berry Fall color: reddish purple	Light: ☼ ◐ ● Moisture: D M W Soil pH: 4.8-7.5 Soil type: C L	woods, thickets, fields, roadsides	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	fruits edible, used for preserves

See also:

In the *Trees* section:
- **Castanea pumila**
- **Cornus alternifolia**
- **Juniperus virginiana**
- **Magnolia virginiana**
- **Malus (Pyrus) coronaria**
- **Quercus ilicifolia**
- **Salix sericea**

Rhus copallina

CM NRCS

Rosa palustris

CM NRCS

Itea virginica

USFWS BES

Vaccinium corymbosum in fall.

USFWS BES

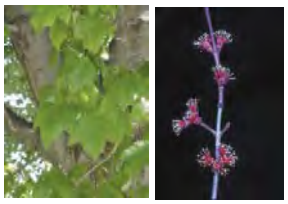
Kalmia angustifolia

RHW

Kalmia latifolia

RHW

Trees

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Acer negundo *box elder, ash leaf maple, Manitoba maple*  USFWS BES, RHW	Height: 30-60' Spread: 30-60' Flowers: Apr-May, yellow-green Fruit: Jul-Sep, tan brown, winged Fall color: yellow, red	Light: ☼ ◐ Moisture: M W Soil pH: 5.2-7 Soil type: C L S	along rivers, streams, ponds, and seasonally flooded areas	Region: M P C States: DC DE MD NY PA VA WV		brittle wood; thicket-forming
Acer rubrum *red, scarlet, swamp, or soft maple*  USFWS BES, RHW	Height: 40-100' Spread: 30-75' Flowers: Mar-Apr, (inconspicuous) Fruit: Apr-Jun, red-brown or yellow, winged Fall color: red, orange, yellow	Light: ☼ ◐ Moisture: M W Soil pH: 5.4-7.1 Soil type: C L S	swamps, uplands, rocky hillsides, dunes	Region: M P C States: DC DE MD NY PA VA WV		earliest spring bloomer; adaptable
Acer saccharinum *silver, white, river, or soft maple*  PLANTS DEH	Height: 50-100' Spread: 75-100' Flowers: Feb-Mar, greenish yellow Fruit: Apr-May, tan brown, winged Fall color: yellow	Light: ☼ ◐ Moisture: M W Soil pH: 5.2-7.1 Soil type: C L S	floodplains, streamsides, river bottoms, pond and lake edges	Region: M P States: DC DE MD NY PA VA WV		
Acer saccharum *sugar maple*  USDA JE	Height: 60-100' Spread: 50-75' Flowers: Apr-May, yellow-green Fruit: Sep-Oct, green, tan at maturity, winged Fall color: yellow, orange, red	Light: ☼ ◐ ● Moisture: M Soil pH: 4-7.3 Soil type: L S	upland woods, mountain coves and slopes	Region: M P States: DC DE NY PA VA WV	high wildlife value	fall color; maple syrup; state tree of New York and West Virginia
Acer spicatum *mountain maple*  RHW	Height: 20-35' Spread: 20-35' Flowers: May-Jun, yellow green Fruit: Jul-Sep, red or yellow, winged Fall color: orange to red	Light: ◐ ● Moisture: M Soil pH: 5.5-7 Soil type: L	cool rich woods, moist rocky slopes and flats, along small streams	Region: M States: MD NY PA VA WV	high wildlife value	short-lived, strong acid preference
Amelanchier arborea *downy serviceberry, shadbush*  RHW	Height: 15-25' Spread: Flowers: Mar-May, white Fruit: red to dark purple, fleshy Fall color: yellow, red	Light: ◐ ● Moisture: D M Soil pH: 5.5-7.5 Soil type: L S	wooded river banks, swamps, rocky slopes	Region: M States: DC DE MD NY PA VA WV		used by 58 wildlife species; 35 bird species; important early summer food; berries edible to people
Amelanchier canadensis *serviceberry, shadbush, shadblow*  CM NRCS	Height: 35-50' Spread: 35-50' Flowers: Apr-May, white Fruit: Jun-Jul, red to purple, fleshy Fall color: orange to red	Light: ◐ ● Moisture: M W Soil pH: 5.6-7.5 Soil type: C L S	swamps, low ground, woods, thickets	Region: M P C States: DC DE MD NY VA		
Asimina triloba *paw-paw*   PLANTS JSP, USFWS BES	Height: 20-35' Spread: 20-35' Flowers: Apr-Jun, purple Fruit: Aug-Sep, yellow, berry Fall color: yellow/ copper-red	Light: ☼ Moisture: M Soil pH: 5.2-7.2 Soil type: L S	river valleys, bottomlands, understory of woods	Region: C States: DC DE MD PA VA WV		

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Betula alleghaniensis *yellow birch*  PLANTS RM	Height: 60-80' Spread: 35-50' Flowers: Apr-May, yellow green Fruit: Jul-Oct, green to tan, cone/cone-like Fall color: golden yellow	Light: ◐ Moisture: M W Soil pH: 4.6-8 Soil type: L S	rich uplands, low swamps, streamsides, elevated floodplain terraces and knobs	Region: M States: MD NY PA VA WV	high wildlife value	fall color; attractive winter texture and color; prefers cool, moist conditions, common on calcareous
Betula lenta *sweet birch, black birch, cherry birch*   USFWS BES, RHW	Height: 50-75' Spread: 35-50' Flowers: Apr-May, yellow green Fruit: Aug-Nov, green to tan, cone/cone-like Fall color: golden yellow	Light: ○ ◐ Moisture: D M Soil pH: 4.8-6.8 Soil type: L S	steep rocky land and lower	Region: M P States: DE MD NY PA VA WV	high wildlife value	excellent fall color; prefers moist sites, tolerates dry; colonizes open or disturbed areas
Betula nigra *river birch, red birch, black birch*   USFWS BES, USFWS BES	Height: 50-75' Spread: 35-50' Flowers: Apr-May, dark brown Fruit: Jun-Aug, tan brown, cone/cone-like Fall color: yellow	Light: ○ ◐ Moisture: M W Soil pH: 4-6 Soil type: C L	along streams, rivers, ponds and swamps	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	attractive peeling bark;
Carpinus caroliniana *American hornbeam, musclewood, ironwood*  USFWS BES	Height: 13-40' Spread: 35-50' Flowers: Apr-May, red or reddish-green Fruit: Jun-Oct, nut/nut-like Fall color: orange, red	Light: ◐ ● Moisture: M Soil pH: 4-7.4 Soil type: L S	river margins, bottomlands, swamps	Region: M P States: DC DE MD NY PA VA WV		slow growing and short lived
Carya alba (C. tomentosa) *mockernut hickory*  USDA NRCS	Height: 60-100' Spread: 35-50' Flowers: May-Jun, light green Fruit: Sep-Oct, light reddish brown, nut/nut-like Fall color: yellow	Light: ◐ ● Moisture: D M Soil pH: 6.5-7.4 Soil type: L S	ridges, dry hills, hillsides	Region: M P C States: DC DE MD NY PA VA WV		good fall color
Carya cordiformis *bitternut or swamp hickory, pignut*  PLANTS	Height: 60-100' Spread: 60-100' Flowers: Apr-May, yellow-green Fruit: Aug-Oct, yellowish green, nut/nut-like Fall color: yellow	Light: ○ Moisture: M W Soil pH: 6.5-7.4 Soil type: C L S	rich bottomlands, swamps, frequently flooded areas, dry hillsides	Region: M P C States: DC DE MD NY PA VA WV		
Carya glabra *pignut, sweet pignut, or smooth bark hickory*  CM NRCS	Height: 60-100' Spread: 35-50' Flowers: Apr-May, yellow-green Fruit: Sep-Oct, dark brown, nut/nut-like Fall color: yellow	Light: ○ ◐ Moisture: D M W Soil pH: 6.5-7.4 Soil type: L	dry woods on hillsides and ridges	Region: M P C States: DC DE MD NY PA VA WV		
Carya ovata *shagbark, scalybark, or shellbark hickory*  USDA NRCS	Height: 70-100' Spread: 35-50' Flowers: May-Jun, yellow-green Fruit: Sep-Oct, dark or reddish brown, nut/nut-like Fall color: brown	Light: ○ Moisture: M Soil pH: 4-6.7 Soil type: L S	dry upland slopes, lowlands, valleys	Region: M P C States: DC DE MD NY PA VA WV		attractive peeling bark

Trees

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Castanea pumila *chinquapin, eastern or Allegany chinkapin*  RHW	Height: 12-20' Spread: 12-20' Flowers: Jun, pale yellow Fruit: Sep-Oct, dark brown, nut/nut-like Fall color: yellow or purple	Light: ☼ ◐ Moisture: D Soil pH: 4.5-7.5 Soil type: L S	rocky slopes, steep rocky land, rocky streambanks, sandy ridges, swamp edges, open woods	Region: M P C States: DC DE MD VA WV		sweet, edible fruit
Celtis occidentalis *common hackberry, sugarberry, nettletree*  UWI KK	Height: 40-100' Spread: 40-100' Flowers: Apr-May, yellow green, brown tint Fruit: Sep-Dec, purple brown, berry Fall color: yellow	Light: ☼ ◐ ● Moisture: D M W Soil pH: 6-7.8 Soil type: C L S	drainage basins, floodplains, wooded slopes, high rocky limestone bluffs bordering streams, windbreaks	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	butterfly larval host; drought tolerant; tolerates occasional flooding; saplings can sprout in deep shade, common on limestone soils
Cercis canadensis *eastern redbud*   USFWS BES, USFWS BES	Height: 20-35' Spread: 20-35' Flowers: Apr-May, pink to lavender Fruit: Jul-Dec, black, pod Fall color: golden yellow	Light: ◐ ● Moisture: D M Soil pH: 4.5-7.5 Soil type: L S	river bottoms and streambanks	Region: M P C States: DC DE MD PA VA WV		fixes nitrogen
Chamaecyparis thyoides *Atlantic white cedar*   PLANTS 1997, PLANTS GFR	Height: 75' Spread: Flowers: Mar-Apr, greenish brown Fruit: bluish, cone/cone-like Fall color: evergreen	Light: ◐ ● Moisture: M W Soil pH: 4.5-5.5 Soil type: C L S	freshwater swamps, woods	Region: C States: DE MD VA		
Chionanthus virginicus *white fringetree*   USFWS RS, RHW	Height: 20-35' Spread: 20-35' Flowers: May-Jun, white Fruit: Sep-Oct, bluish black, berry Fall color: yellow	Light: ☼ ◐ ● Moisture: D M Soil pH: 4.5-6.5 Soil type: L S	moist streambanks, ridges, hillsides in sandy to deep-rich soils	Region: M P C States: DC DE MD VA WV		
Cornus alternifolia *alternate-leaf or pagoda dogwood*  CM NRCS	Height: 15-25' Spread: 15-35' Flowers: May-Jun, creamy white Fruit: Jul-Aug, bluish black, berry Fall color: maroon	Light: ◐ ● Moisture: M Soil pH: 5.8-7.5 Soil type: L	dry woods, forest edges, rocky slopes	Region: M States: DE MD NY PA VA WV	high wildlife value	used by 64 wildlife species; 43 bird species; keep root zone moist and acidic; tolerates full sun; young stems often purple
Cornus florida *flowering dogwood*   RHW, USFWS RM	Height: 20-50' Spread: 20-50' Flowers: Apr-May, white Fruit: Sep-Dec, red to orange, berry Fall color: scarlet red	Light: ◐ Moisture: D M Soil pH: 5-7 Soil type: L	woods, woodland edges and openings, mountain slopes, coves	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	fall migrant birds eat berries; tolerates sun, best in moist, well-drained, acidic soil with organic matter, VA state tree
Crataegus crus-galli *cockspur hawthorn*  USDA JE	Height: 20-35' Spread: 20-35' Flowers: May-Jun, white Fruit: Aug-Jan, dull red or green, fleshy Fall color: orange to red	Light: ☼ ◐ Moisture: D M Soil pH: 4.5-7.2 Soil type: C L S	thickets, open areas, especially in dry or rocky places, low rich slopes	Region: M P C States: DC DE MD NY PA VA WV		

		Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Crataegus viridis *southern thorn, green hawthorn*	 PLANTS	Height: 20-35' Spread: Flowers: Apr, white Fruit: bright red to orange, fleshy Fall color: purple, scarlet	Light: ◐ ● Moisture: M W Soil pH: 6-7.3 Soil type: C L	lowlands and valleys	Region: C States: DE MD NY VA		
Diospyros virginiana *common persimmon*	  PLANTS 1997, PLANTS 1997	Height: 50-75' Spread: 35-50' Flowers: Jun, greenish yellow to cream Fruit: Sep-Nov, orange purple, berry Fall color: yellow or purple	Light: ☼ ◐ Moisture: D M Soil pH: 5-7 Soil type: C L	open, disturbed areas, deciduous woods	Region: M P C States: DC DE MD PA VA WV	high wildlife value	edible fruits
Fagus grandifolia *American beech*	 CM NRCS, CM NRCS	Height: 50-100' Spread: 50-75' Flowers: Apr-May, yellow-green Fruit: Sep-Nov, orange-green, nut/nut-like Fall color: yellow/ tan; retains leaves till spring	Light: ☼ ◐ Moisture: M Soil pH: 4.1-6.5 Soil type: L S	rich uplands and lowlands	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	edible nuts; attractive bark; leaves may persist into winter
Fraxinus americana *white ash*	 UWI KJS	Height: 50-100' Spread: 50-75' Flowers: Apr-May, deep purple Fruit: Aug-Feb, tan brown, winged Fall color: yellow, maroon	Light: ☼ ◐ Moisture: M Soil pH: 5-7.5 Soil type: C L S	upland slopes, valleys, coves, bottomlands	Region: M P C States: DC DE MD NY PA VA WV		fast growth; fall color
Fraxinus pennsylvanica *green ash, red ash, swamp ash*	 UWI KK	Height: 50-75' Spread: 35-50' Flowers: Apr-May, purple Fruit: Aug-Dec, tan brown, winged Fall color: yellow to orange	Light: ☼ ◐ Moisture: D M W Soil pH: 5-8 Soil type: C L S	tidal and nontidal freshwater forested wetlands; seasonally to regularly flooded or saturated	Region: M P C States: DC DE MD NY PA VA WV		tolerates drought; tolerates infrequent flooding and some salt; male and female flowers on separate plants
Ilex opaca *American holly*	 USFWS BES	Height: 15-50' Spread: 18-40' Flowers: May-Jun, white or cream Fruit: red, fleshy Fall color: evergreen	Light: ☼ ◐ ● Moisture: M Soil pH: 4-7.5 Soil type: C L	sandy woods	Region: M P C States: DC DE MD VA		birds eat berries; state tree of Delaware
Juglans nigra *black walnut, American walnut*	 PLANTS DEH	Height: 70-90' Spread: 75-100' Flowers: May-Jun, yellow-green Fruit: Aug-Sep, yellow-green, nut/nut-like Fall color: yellow	Light: ☼ Moisture: M Soil pH: 5.5-8 Soil type: L	woods, slopes, streamsides	Region: M P C States: DC DE MD NY PA VA WV		may stunt growth of nearby planst
Juniperus virginiana *eastern red cedar*	 RHW, CM NRCS	Height: 50-75' Spread: 35-50' Flowers: Mar-Apr, red purple Fruit: Jul-Mar, pale green to dark blue, cone/cone-like Fall color: evergreen	Light: ☼ Moisture: D M Soil pH: 5-8 Soil type: C L S	broad range of habitats	Region: M P C States: DC DE MD NY PA VA WV		berries consumed by over 50 species of birds; berries have culinary use

Trees

		Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Liquidambar styraciflua *sweet gum, red gum, sap gum*	 CM NRCS	Height: 60-100' Spread: 50-75' Flowers: Apr-May, yellow-green Fruit: Jul-Jan, brown, capsule Fall color: yellow, red	Light: Moisture: M W Soil pH: 4.5-7 Soil type: C L S	upland woods, slopes, ravines, floodplains, streambanks	Region: M P C States: DC DE MD NY VA		
Liriodendron tulipifera *tulip tree, tulip poplar, yellow poplar*	 RHW	Height: 70-100' Spread: 35-50' Flowers: Jun, greenish yellow Fruit: Aug-Nov, brown, winged Fall color: yellow	Light: Moisture: M Soil pH: 4.5-6.5 Soil type: L S	bottomland woods, mountain coves, lower slopes	Region: M P C States: DC DE MD NY PA VA WV		fast growth
Magnolia acuminata *cucumber magnolia*	 DFT DL, DFT HW, DFT HW	Height: 70-100' Spread: 35-50' Flowers: May-Jun, greenish-yellow Fruit: Sep-Nov, brown cone w/ scarlet seed, pod Fall color: ashy brown	Light: Moisture: M Soil pH: 5.2-7 Soil type: C L S	slopes, ravines, valleys, streamsides	Region: M States: MD NY VA WV		
Magnolia virginiana *sweetbay magnolia*	 RHW, USFWS BES	Height: 12-30' Spread: 12-30' Flowers: May-Jul, white to cream Fruit: Sep-Oct, red, berry Fall color: semi-evergreen	Light: ● Moisture: M W Soil pH: 5-6.5 Soil type: C L S	forested wetlands, seeps, stream and pond edges, sandy woods	Region: P C States: DC DE MD VA		semi-evergreen; fragrant flowers; tolerates occasional flooding, some salt
Malus coronaria (Pyrus coronaria) *sweet crabapple, American crabapple*	 PLANTS WSJ	Height: 10-30' Spread: 20-30' Flowers: Apr-May, pink to white Fruit: Sep-Oct, greenish, fleshy Fall color:	Light: Moisture: M Soil pH: Soil type: C L S	forest edges, rocky streams, fields	Region: M P C States: DC DE MD PA VA WV	high wildlife value	flowers fragrant; susceptible to insects and diseases; plant at least 500 feet from cedars; attracts bees and wasps; fruit sour;
Morus rubra *red mulberry, moral*	 UWI KK	Height: 35-60' Spread: 35-60' Flowers: May-Jun, greenish Fruit: Jun-Jul, red, berry Fall color: yellow	Light: Moisture: M Soil pH: 5-7 Soil type: C L S	floodplains, river valleys, hillsides	Region: M P C States: DC DE MD PA VA WV		fruit sweet
Nyssa sylvatica *black gum, sourgum, black or swamp tupelo*	 CM NRCS, RHW	Height: 30-75' Spread: 20-50' Flowers: Apr-Jun, greenish white Fruit: Sep-Oct, blue-black, fleshy Fall color: red	Light: Moisture: D M W Soil pH: 4.5-6 Soil type: L S	forested seasonal wetlands, swamp borders, upland woods, dry slopes; seasonally flooded or saturated	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	outstanding fall color
Ostrya virginiana *eastern hop-hornbeam, ironwood*	 PLANTS WSJ	Height: 25-50' Spread: 20-35' Flowers: May, red-brown Fruit: Jun-Oct, green turning brown, nut/nut-like Fall color: yellow	Light: ● Moisture: M Soil pH: 4.2-7.6 Soil type: C L S	slopes and ridges	Region: M P C States: DC DE MD NY PA VA WV		leaves may persist into winter

		Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Pinus echinata *shortleaf pine, shortstraw pine, southern yellow pine*	 BUG RFW	Height: 100' Spread: Flowers: Fruit: reddish brown, cone/cone-like Fall color: evergreen	Light: Moisture: D M Soil pH: 4.6-6 Soil type: C L S	dry mountain ridges, fields, floodplains	Region: M P C States: DC DE MD VA WV		best used for naturalizing
Pinus rigida *pitch pine*	 CM NRCS	Height: 50-75' Spread: 50-75' Flowers: May, red- purple Fruit: light brown, cone/ cone-like Fall color: evergreen	Light: Moisture: D Soil pH: 3.5-5.1 Soil type: L S	slopes and ridges of mountains, river valleys, and swamps	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	many birds feed on the seeds; provides winter cover; old trees are fire resistant due to thick bark
Pinus serotina *pond pine, marsh pine, pocosin pine*	 VT	Height: 50-60' Spread: Flowers: Fruit: yellowish brown, cone/cone-like Fall color: evergreen	Light: Moisture: M W Soil pH: 4.8-6.8 Soil type: L S	swamps, pocosins, bays, pond margins, flatwoods	Region: C States: DE PA VA	high wildlife value	many birds feed on the seeds; provides winter cover
Pinus strobus *white pine, Eastern white pine*	 USDA NRCS	Height: 75-100' Spread: 50-75' Flowers: May-Jul, red to purplish Fruit: Aug-Oct, green to light brown, cone/cone-like Fall color: evergreen	Light: Moisture: D M Soil pH: 4-6.5 Soil type: L	variety of habitats; does best on moist, well drained, sandy loam soils of ridges	Region: M P States: DC MD NY PA VA WV	high wildlife value	many birds feed on the seeds; provides winter cover
Pinus taeda *loblolly, old field, or North Carolina pine*	 USFWS BES	Height: 70-90' Spread: Flowers: Fruit: yellowish, cone/ cone-like Fall color: evergreen	Light: Moisture: D M W Soil pH: 4.5-7 Soil type: C L S	floodplains fields, slopes	Region: C States: DE MD VA	high wildlife value	many birds feed on the seeds; provides winter cover
Pinus virginiana *Virginia pine, scrub pine, Jersey pine*	 USDA NRCS	Height: 50-80' Spread: Flowers: Fruit: reddish brown, cone/cone-like Fall color: evergreen	Light: Moisture: D M Soil pH: 4.5-7.5 Soil type: C L S	well drained sites; often a pioneer species	Region: M P C States: DC DE MD PA VA WV	high wildlife value	many birds feed on the seeds; provides winter cover
Platanus occidentalis *American sycamore, American planetree*	 PLANTS LA, USDA NRCS	Height: 75-100' Spread: 75-100' Flowers: Apr-Jun, yellow-green Fruit: Aug-Dec, brown, achene (dry, flat seed) Fall color: yellow	Light: Moisture: M W Soil pH: 4.9-6.5 Soil type: L S	river bottoms, lake shores	Region: M P C States: DC DE MD NY PA VA WV		leafs out late spring; showy bark; leaves may persist into winter
Populus deltoides *eastern or southern cottonwood, Carolina poplar*	 UWI JK	Height: 75-100' Spread: 50-100' Flowers: Mar-Apr, red Fruit: May-Jul, yellow-green, capsule Fall color: yellow	Light: Moisture: M W Soil pH: 5.2-7.3 Soil type: C L S	along waterways	Region: P States: DC DE MD NY VA WV	high wildlife value	best used for naturalizing; grows fast but short lived

Trees

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Populus heterophylla *swamp cottonwood, swamp poplar, black cottonwood, downy poplar*  VT, PLANTS 1997	Height: 80' Spread: Flowers: Mar Fruit: Apr-May, , capsule Fall color: yellow	Light: Moisture: W Soil pH: 4.6-5.9 Soil type: C L	swamps and bottomlands	Region: P States: DE MD VA		
Prunus americana *American wild plum*  RHW	Height: 20-35' Spread: 20-35' Flowers: Apr-May, white Fruit: Aug-Sep, orange to red, fleshy Fall color: pale yellow	Light: Moisture: D M Soil pH: 5-7 Soil type: L S	woods, pastures, fencerows, streamsides	Region: M P States: DC DE MD NY PA VA WV	high wildlife value	edible fruit, used for making pies and jellies
Prunus pensylvanica *pin cherry, fire cherry*  RHW	Height: 20-35' Spread: 20-35' Flowers: May, white Fruit: Jul-Sep, bright red, fleshy Fall color: yellow	Light: Moisture: D Soil pH: 4.3-6.6 Soil type: C L S	woods	Region: M States: MD NY PA VA WV	high wildlife value	
Prunus serotina *black or wild cherry, black chokecherry*  CM NRCS, RHW	Height: 40-75' Spread: 20-35' Flowers: May-Jun, white Fruit: Aug-Sep, black, fleshy Fall color: yellow/ red	Light: Moisture: D M Soil pH: 5-7.5 Soil type: L	forests, fence rows, fields, forest edges	Region: M P C States: DC DE NY VA WV	high wildlife value	birds eat fruit
Prunus virginiana *choke cherry*  RHW	Height: 25-50' Spread: 20-35' Flowers: May-Jun, white Fruit: Aug-Sep, red, black, or yellow, fleshy Fall color: dark red-purple	Light: Moisture: M Soil pH: 5.2-8.4 Soil type: C L S	open moist sites; pioneer species after fires	Region: M States: DC DE MD NY PA VA WV		fast growing, short lived; fruit sometimes used for making jelly
Quercus alba *white oak, stave oak*  CM NRCS	Height: 75-100' Spread: 75-100' Flowers: Mar-May, yellow-green Fruit: Sep-Oct, brown, nut/nut-like Fall color: red	Light: Moisture: D M Soil pH: 4.5-6.8 Soil type: L S	dry to moist woods	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	acorns food for wildlife; majestic; MD state tree; leaves may persist into winter
Quercus bicolor *swamp white oak, swamp oak*  PLANTS RM89, OSU	Height: 60-100' Spread: 50-75' Flowers: May, yellow-green Fruit: Sep-Oct, tan brown, nut/nut-like Fall color: red/brown	Light: Moisture: W Soil pH: 4.3-6.5 Soil type: C L S	bottomlands, swamp and stream edges	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	acorns food for wildlife
Quercus coccinea *scarlet oak, red oak, black oak*  CM NRCS	Height: 40-75' Spread: 50-75' Flowers: May-Jun, yellow-green Fruit: Sep-Oct, reddish brown, nut/nut-like Fall color: scarlet	Light: Moisture: D M Soil pH: 4.5-6.9 Soil type: L S	dry uplands and slopes	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	acorns food for wildlife

		Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Quercus falcata *southern or swamp red oak, Spanish oak*	 DFT HW	Height: 70-80' Spread: Flowers: Apr-May Fruit: Oct, orange brown, nut/nut-like Fall color: brown	Light: Moisture: D M Soil pH: 4.8-7 Soil type: C L S	uplands	Region: C States: DC DE MD VA		acorns food for wildlife
Quercus ilicifolia *bear oak, scrub oak*	 CM NRCS	Height: 12-20' Spread: 12-20' Flowers: May-Jun, yellow-green or reddish Fruit: Sep-Jan, light brown, nut/nut-like Fall color: yellow, scarlet red to purplish	Light: Moisture: D Soil pH: 4-7.5 Soil type: C L S	barrens, balds, woods, dunes, fields	Region: M P States: PA VA WV	high wildlife value	leaves may persist into winter
Quercus marilandica *blackjack oak, Jack oak*	 CM NRCS	Height: 35-50' Spread: 35-50' Flowers: Apr-Jun, yellow-green Fruit: Sep-Oct, tan brown, nut/nut-like Fall color: yellow/brown	Light: Moisture: D Soil pH: 4.6-5.6 Soil type: L S	woods, ridges, slopes, sandy flatwoods	Region: P C States: DC DE MD VA WV	high wildlife value	acorns food for wildlife, leaves may persist into winter
Quercus michauxii (Q. montana) *swamp chestnut oak, basket oak, cow oak*	 PLANTS 1995	Height: 50-80' Spread: 75-100' Flowers: May, yellow-green Fruit: Sep-Oct, tan brown, nut/nut-like Fall color: red/ brown	Light: Moisture: M W Soil pH: 4.5-6.5 Soil type: L	bottomlands, ravine slopes, flatwoods over limestone	Region: M P C States: DE MD NY VA WV	high wildlife value	acorns food for wildlife
Quercus muehlenbergii *Chinquapin or chinkapin oak, yellow oak, chestnut oak*	 UWI KJS	Height: 35-50' Spread: 35-50' Flowers: May-Jun, yellow-green Fruit: Sep-Oct, light brown, nut/nut-like Fall color: yellow-brown	Light: Moisture: D M Soil pH: 6.5-8 Soil type: L	rich, woods, uplands, outcrops, dry bluffs, slopes	Region: M P C States: DC MD NY VA WV	high wildlife value	
Quercus nigra *water oak*	 PLANTS LA	Height: 50-80' Spread: Flowers: Apr-May Fruit: Oct, black, nut/nut-like Fall color: green persists late	Light: Moisture: M W Soil pH: 4.8-5.8 Soil type: C L	upland woods, bottomlands, hammocks, fields	Region: C States: DC DE MD VA		acorns food for wildlife
Quercus palustris *pin oak, swamp oak, Spanish oak*	 PLANTS RM91	Height: 50-80' Spread: 50-75' Flowers: Apr-May, yellow-green Fruit: Sep-Oct, light brown, nut/nut-like Fall color: red	Light: Moisture: M W Soil pH: 4.5-6.5 Soil type: C L	bottomlands or upland flats	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	popular shade tree; fall color; acorns food for wildlife; leaves may persist into winter
Quercus phellos *willow oak, pin oak, peach oak*	 USFWS BES	Height: 80-100' Spread: Flowers: Feb-May Fruit: light yellow or greenish brown, nut/nut-like Fall color: red	Light: Moisture: M W Soil pH: 4.5-5.5 Soil type: C L	bottomlands, low flatwoods, upland fields	Region: P C States: DC DE MD VA WV		acorns food for wildlife

Trees

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Quercus prinus (Q. montana) *chestnut oak, rock oak*  PLANTS 1997	Height: 40-80' Spread: Flowers: May-Jun, yellowish Fruit: Sep-Oct, brown, nut/nut-like Fall color: yellow/orange	Light: ☼ ◐ ● Moisture: D Soil pH: 4.5-7 Soil type: L S	rocky ridges and slopes	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	acorns food for wildlife; fall color
Quercus rubra *northern red oak*  UWI KJS	Height: 90' Spread: Flowers: Apr-May Fruit: scales reddish-brown, nut/nut-like Fall color: red or yellow	Light: ☼ ◐ Moisture: D M Soil pH: 4.3-6.5 Soil type: C L	slopes, coves, and drier ridges	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	acorns food for wildlife; hardy and long-lived; fall color
Quercus stellata *post oak, iron oak*  CM NRCS	Height: 35-50' Spread: 35-50' Flowers: Apr-Jun, yellow-green Fruit: Sep-Oct, light brown to almost black, nut/nut-like Fall color: brown	Light: ☼ Moisture: D M Soil pH: 4.8-7 Soil type: C L S	upland dry ridges to moist flatwoods	Region: M P C States: DC DE MD VA WV	high wildlife value	acorns food
Quercus velutina *black oak, yellow bark oak, quercitron oak*  BUG DJM	Height: 75-100' Spread: 75-100' Flowers: Apr-May, yellow-green Fruit: Sep-Oct, light red-brown, nut/nut-like Fall color: red/brown	Light: ☼ Moisture: D M Soil pH: 4.5-6 Soil type: C L S	dry upland ridges and slopes, flatwoods	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	acorns food for wildlife; leaves may persist into winter
Salix nigra *black willow, swamp willow*  CM NRCS	Height: 35-50' Spread: 20-35' Flowers: Mar-Apr, yellow green Fruit: Apr-May, green yellow, cone/cone-like Fall color: yellow green	Light: ☼ ◐ Moisture: M W Soil pH: 6-8 Soil type: C L S	fresh tidal marshes and swamps, forested wetlands, floodplains, wet meadows; seasonally to regularly flooded or saturated	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	streambank stabilizer; spreads by suckers; preferred food of ruffed grouse and pine grosbeak; tolerates flooding; tolerates salinity to 0.5 ppt
Salix sericea *silky willow*  CM NRCS	Height: 12' Spread: Flowers: Jun-Jul Fruit: Fall color: yellow	Light: ☼ ◐ ● Moisture: M W Soil pH: 5.2-7 Soil type: C L S	marshes, ditches, low woods	Region: M P States: DC DE MD NY PA VA WV	high wildlife value	
Sassafras albidum *sassafras*  USFWS BES, RHW	Height: 35-50' Spread: 35-50' Flowers: Apr, yellow-green Fruit: Sep-Oct, dark blue, fleshy Fall color: yellow, orange, purple	Light: ☼ ◐ Moisture: D M Soil pH: 4.5-7.2 Soil type: L S	moist, open woods	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	edible and medicinal uses; provides spring and fall color
Sorbus americana (Pyrus americana) *American mountain ash*  RHW, RHW	Height: 30-40' Spread: Flowers: May-Jul, white Fruit: Aug-Dec, orange, fleshy Fall color: orange, purple	Light: ☼ Moisture: M Soil pH: 5.3-6.8 Soil type: C L S	areas from borders of swamps to rocky hillsides; openings, uplands along forest edges, roadsides	Region: M States: MD VA WV	high wildlife value	slow-growing, short-lived; not drought or heat tolerant; plant at least 500 feet from cedars

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Taxodium distichum *bald cypress, cypress, swamp cypress*	Height: 50-100' Spread: 20-35' Flowers: Mar-Apr, deep purple Fruit: Oct-Dec, brown, cone/cone-like Fall color: purple to brown	Light: ☼ ◐ Moisture: W Soil pH: 4.5-6 Soil type: C L S	rivers, lake and pond margins, swamps, coastal marshes, pocosins, river bottoms	Region: C States: DE MD VA		deciduous conifer
Thuja occidentalis *arborvitae, northern white cedar*	Height: 50-75' Spread: 35-50' Flowers: May, red brown Fruit: Aug-Dec, reddish-brown, cone/cone-like Fall color: evergreen	Light: ☼ Moisture: M W Soil pH: 5.2-7 Soil type: C L S	calcareous areas	Region: M States: NY VA		prefers wet calcareous areas
Tilia americana *American basswood, linden*	Height: 70-100' Spread: 50-75' Flowers: Jun-Jul, yellow Fruit: Sep-Oct, tan brown, winged Fall color: yellow or brown	Light: ◐ ● Moisture: M Soil pH: 4.5-7.5 Soil type: L S	woods, slopes	Region: M States: DC DE MD NY PA VA WV		fragrant flowers; important pollen source for honey
Tsuga canadensis *eastern hemlock*	Height: 75-100' Spread: 35-50' Flowers: May-Jun, tan brown Fruit: Sep-Jan, light brown, cone/cone-like Fall color: evergreen	Light: ◐ Moisture: M Soil pH: 4.2-5.7 Soil type: L S	cool valleys	Region: M P States: DE MD NY PA VA WV	high wildlife value	susceptible to wooly adelgid and red spider mite; also T. caroliniana for VA
Ulmus americana *American elm, white elm, soft elm*	Height: 75-100' Spread: 75-100' Flowers: Mar-Apr, red brown Fruit: May, tan brown, winged Fall color: bright yellow	Light: ☼ ◐ Moisture: M W Soil pH: 5.5-8 Soil type: C L S	river bottoms, swamps, disturbed fields, road sides, cutover forests	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	Dutch elm disease caused decline; distinctive vase shape; favorite nesting site of Baltimore oriole
Ulmus rubra *slippery elm, red elm, soft elm*	Height: 70' Spread: Flowers: Mar-May Fruit: winged Fall color: yellow	Light: ◐ ● Moisture: D M Soil pH: 5.5-7 Soil type: C L S	moist slopes and bottomlands, drier sites on calcareous soils	Region: P States: DC DE MD NY PA VA WV	high wildlife value	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See also:

In the *Shrubs* section:
Hamamelis virginiana
Morella (Myrica) cerifera
Rhododendron maximum
Rhus copallina, hirta (typhina)
Viburnum prunifolium

Cornus florida


USFWS BES

A diverse forest offers food and cover throughout all seasons.

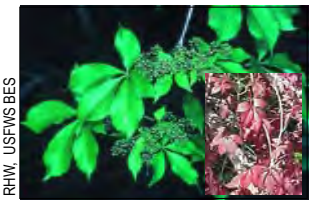
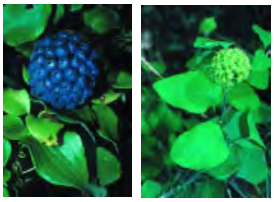

USFWS RM

Ilex opaca


CM NRCS

Vines

		Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Aristolochia macrophylla (A. durior) *pipevine, Dutchman's pipe*	 RHW	Spread: Flowers: May-Jun, yellowish to purplish Fruit: green to brown, pod Fall color: yellow green	Light: Moisture: M Soil pH: 6.1-8.5 Soil type: L O	rich woods, streambanks	Region: M States: VA WV		occasionally escapes from cultivation; host for pipevine swallowtail butterfly
Bignonia capreolata *crossvine*	 USFWS BES	Spread: 20-35' Flowers: May-Jun, orange with red Fruit: Aug-Oct, brown, pod Fall color: semi-evergreen; reddish-purple	Light: Moisture: D M W Soil pH: 6.1-8.5 Soil type: C L S	swampy forests, calcareous river banks, cliffs, dry open woods, bogs, fence rows, rock outcrops	Region: C States: MD VA		spreads across ground and climbs any structure it meets (control by cutting); semi-evergreen GC
Campsis radicans *trumpet vine, trumpet creeper*	 USFWS BES	Spread: 20-35' Flowers: Jul-Sep, orange Fruit: Aug-Mar, brown, pod Fall color: yellow green	Light: Moisture: D M Soil pH: 6.1-7.5 Soil type: C L S	moist woods, fence rows, roadside thickets, floodplain forests, rocky hillsides, open woods, streambanks, fields	Region: M P C States: DC DE MD PA VA		thick, twisted, aged woody vines; leaves/flowers may cause dermatitis (skin irritation) GC
Celastrus scandens *American bittersweet*	 PLANTS TGB, UWI DK	Spread: 6-20' Flowers: May-Jun, greenish Fruit: Sep-Dec, orange and red, capsule Fall color: yellow	Light: Moisture: D M Soil pH: 6.1-7.5 Soil type: C L S	roadsides, forest edges, fence rows, pastures, hedges, bluffs, rocky slopes, dunes, sandy oak woods	Region: M P C States: DC DE MD NY PA VA WV		distinguished from nonnative invasive Oriental bittersweet by flowers/fruits in clusters at ends of twigs GC
Clematis viorna *leather flower, vasevine*	 RHW	Spread: Flowers: May-Aug, purple Fruit: Aug-Nov, dark brown, achene (dry, flat seed) Fall color:	Light: Moisture: D M Soil pH: Soil type:	rich wooded banks, thickets	Region: P States: DC DE MD VA WV		feathery seeds
Clematis virginiana *virgin's bower*	 USFWS BES	Spread: 6-12' Flowers: Jul-Sep, white Fruit: Aug-Nov, brown, achene (dry, flat seed) Fall color: yellow, green or purplish	Light: Moisture: D M Soil pH: 6.1-8.5 Soil type: C L S O	fencerows, riverbanks, thickets, woods edge, roadside swales, swamps, overhanging cliffs	Region: M P C States: DC DE MD NY PA VA WV		fragrant flowers; feathery seeds; young plants can be transplanted; yellow, green or purplish fall color
Lonicera sempervirens *trumpet or coral honeysuckle*	 RHW, USFWS BES	Spread: 6-12' Flowers: Apr-Oct, coral to red with yellow Fruit: Aug-Mar, red, berry Fall color: semi-evergreen	Light: Moisture: D M Soil pH: 6.1-7.5 Soil type: C L S	thickets, fence rows, open woods, dry stony woods, forest edges, cliffs	Region: M P C States: DC DE MD NY VA		flowers intermittently until frost; flowers/fruits present together; transplants well; may have aphids - hose off, snip new growth and damaged buds; semi-evergreen
Mikania scandens *climbing hempvine*	 RHW	Spread: Flowers: Jun-Oct, pink or whitish Fruit: blue Fall color:	Light: Moisture: M W Soil pH: 5.7-7.5 Soil type: C L	swamps, thickets	Region: M P C States: DC DE MD NY VA		vines herbaceous, not woody

	Characteristics	Conditions	Habitat	Native to	Wildlife	Notes
Parthenocissus quinquefolia *Virginia creeper*  RHW, USFWS BES	Spread: 25-35' Flowers: Jun-Aug, greenish white Fruit: Sep-Feb, bluish black, berry Fall color: purple to crimson	Light: ☼ ◐ ● Moisture: D M W Soil pH: 5.1-7.5 Soil type: C L S	fence rows, forest edges, open woods, ravines, bluffs, cliffs	Region: M P C States: DC DE MD NY PA VA WV	high wildlife value	bank stabilizer; control by trimming; fruits eaten by variety of wildlife; purple to crimson fall color GC
Passiflora incarnata *passionflower, Maypops*  RHW	Spread: Flowers: Jun-Sep, purple and white Fruit: Sep-Oct, yellow, fleshy Fall color:	Light: ☼ Moisture: D M Soil pH: Soil type: C L S	fields, rocky slopes, thin woods, roadsides, fencerows, thickets	Region: C States: MD VA		herbaceous vine; large fleshy berry edible; fragrant
Smilax herbacea *smooth carrion flower*  RHW, RHW	Spread: Flowers: Apr-Jun, greenish-yellow Fruit: Jul-Nov, blue-black, berry Fall color:	Light: ◐ Moisture: M Soil pH: Soil type: C L S	thickets, woods, floodplains	Region: M P C States: DC DE MD NY WV		herbaceous, climbing vine, not prickly; flower malodorous; male and female plants separate
Wisteria frutescens *Atlantic wisteria, American wisteria*  SMSU, SMSU	Spread: Flowers: Apr-Aug, lilac Fruit: brown, pod Fall color:	Light: ☼ ◐ Moisture: M W Soil pH: 4-7 Soil type: C L S	forest and forested swamp edges, streambanks, thickets	Region: C States: DE VA		

See also:

In the *Herbaceous Plants* section:
Clitoria mariana

Characteristic pipe-shaped flower of **Aristolochia macrophylla.**


RHW

Lonicera sempervirens may bloom year-round.


USFWS BES

Bignonia capreolata in bloom adorns a porch.


USFWS BES

Parthenocissus quinquefolia used as a groundcover.


USFWS BES

Plants With a Purpose

This section includes lists of plant combinations that can be used to mimic the natural communities of plants found in wetlands, meadows, forests, etc. They can be used to create, restore or enhance existing habitat for wildlife. Also included are plants that can be used in solving problems such as stabilizing soils, or for specific landscaping uses. No matter what the purpose, it is imperative that species are chosen to suit planting site conditions and the physiographic location of the site. None of these lists are complete – there are additional suitable plants in this guide (and even more native species not included in this publication) that would suit these purposes. This document is intended to give project planners guidance in choosing appropriate plants for various projects, and additional learning is encouraged. For the most ecologically "correct" habitat restoration projects, consultation with professionals is recommended, as there are other factors to consider that are not addressed here.

Plants For Coastal Dunes

Note: the shrubs and trees listed would occur on the inner or secondary dunes and/or on interdunal swales.

Grasses and Grasslike Plants
Ammophila breviligulata
Panicum amarum (and var. amarulum)
Spartina patens
Panicum virgatum

Herbaceous Plants
Baptisia tinctoria
Liatris pilosa v. pilosa (graminifolia)
Nuttallanthus canadensis (Linaria canadensis)
Opuntia humifusa (compressa)
Oenothera biennis
Solidago sempervirens
Yucca filamentosa (flaccida)

Shrubs
Baccharis halimifolia
Morella (Myrica) cerifera, pensylvanica
Prunus maritima
Rhus copallina
Rosa carolina

Trees
Acer rubrum
Amelanchier arborea
Diospyros virginiana
Juniperus virginiana
Pinus rigida
Prunus pensylvanica, serotina

Vines
Celastrus scandens
Parthenocissus quinquefolia

Plants For Saltwater or Brackish Water Marshes

Plants in this list can be used for marsh plantings or to stabilize tidal fresh, brackish or saltwater shorelines based on salinity and wetness tolerances. Check the salinity and moisture requirements given in this publication for each plant, so they will be planted in the appropriate conditions. Those species for use in salinity greater than 15 ppt are marked (*).

Grasses and Grasslike Plants
Ammophila breviligulata *
Distichlis spicata *
Juncus canadensis
Juncus roemerianus *
Panicum amarum (and var. amarulum) *
Panicum virgatum
Schoenoplectus pungens v. pungens (Scirpus pungens, americanus)
Schoenoplectus (Scirpus) validus
Spartina alterniflora *
Spartina cynosuroides
Spartina patens *
Spartina pectinata

Note: Although grasslike, *Distichlis, Juncus, Schoenoplectus,* and *Spartina* species information can be found in the Herbaceous Emergents section of the guide.

Herbaceous Plants
Agalinus purpurea
Limonium carolinianum
Solidago sempervirens *

Herbaceous Emergents
Hibiscus moscheutos (palustris)
Iris prismatica, versicolor, virginica
Kosteletzkya virginica
Peltandra virginica
Pontederia cordata

Shrubs
Baccharis halimifolia *
Iva frutescens *
Morella (Myrica) cerifera *, *pensylvanica* *

Plants for Freshwater Wetlands and Other Wet Sites

The following plants may be used to create or enhance freshwater marshes or swamps or to stabilize and enhance streambanks, riverbanks or pond edges.

Remember to match the plants' growth requirements with the site conditions. Wetness tolerated by these plants is provided in this guide in terms of frequency and duration of soil saturation or inundation (flooding), and depth of standing water.

Ferns

Athyrium filix-femina
Dryopteris carthusiana (spinulosa), cristata, intermedia
Onoclea sensibilis
Osmunda cinnamomea, regalis
Pteridium aquilinum
Thelypteris noveboracensis, palustris
Woodwardia areolata, virginica

Grasses and Grasslike Plants

Agrostis perennans
Andropogon gerardii, glomeratus, virginicus
Calamagrostis canadensis
Carex crinita var. crinita, lurida, stricta, vulpinoidea
Dichanthelium clandestinum
Elymus riparius
Festuca rubra
Leersia oryzoides
Panicum virgatum
Saccharum giganteum (Erianthus giganteus)
Tripsacum dactyloides

Herbaceous Plants

Arisaema triphyllum
Asclepias incarnata
Caltha palustris
Chelone glabra
Conoclinium (Eupatorium) coelestinum
Doellingeria umbellata var. umbellata (Aster umbellatus)
Eupatorium dubium, perfoliatum
Gentiana clausa
Helianthus angustifolius
Heracleum maximum (lanatum)
Impatiens capensis (biflora)
Lobelia cardinalis, siphilitica
Mertensia virginica
Mimulus ringens
Monarda didyma
Packera aurea (Senecio aureus)
Phlox maculata
Rudbeckia laciniata
Saxifraga pensylvanica
Scutellaria integrifolia
Sisyrinchium atlanticum
Spiranthes cernua
Stachys tenuifolia (hispida)
Symphyotrichum (Aster) novae-angliae, novi-belgii
Symplocarpus foetidus
Thalictrum pubescens (polygamum)
Veratrum viride
Verbena hastata
Vernonia noveboracensis
Veronicastrum virginicum (Veronica virginica)
Viola conspersa, cucullata, striata

Herbaceous Emergents

Dulichium arundinaceum
Hibiscus moscheutos (palustris)
Iris prismatica, versicolor, virginica
Juncus effusus
Justicia americana
Nuphar lutea (advena)
Nymphaea odorata
Orontium aquaticum
Peltandra virginica
Pontederia cordata
Sagittaria latifolia
Saururus cernuus
Schoenoplectus (Scirpus) validus
Scirpus atrovirens, cyperinus
Sparganium americanum
Spartina pectinata
Zizania aquatica

Shrubs

Alnus serrulata
Cephalanthus occidentalis
Clethra alnifolia
Cornus amomum
Gaylussacia baccata, frondosa
Hypericum densiflorum
Ilex verticillata
Itea virginica
Kalmia angustifolia, latifolia
Leucothoe racemosa
Lindera benzoin
Lyonia ligustrina
Morella (Myrica) caroliniensis (heterophylla), cerifera, pensylvanica
Photinia (Aronia) melanocarpa, pyrifolia (arbutifolia)
Physocarpus opulifolius
Rhododendron maximum, periclymenoides, viscosum
Rosa palustris
Rubus allegheniensis
Salix humilis
Sambucus nigra ssp. canadensis (S. canadensis)
Spiraea alba v. latifolia (latifolia), tomentosa
Vaccinium corymbosum, macrocarpon
Viburnum dentatum (recognitum), nudum, nudum v. cassinoides (cassinoides), prunifolium

Trees

Acer negundo, rubrum, saccharinum
Amelanchier canadensis
Betula alleghaniensis, nigra
Carpinus caroliniana
Carya cordiformis, glabra
Celtis occidentalis
Chamaecyparis thyoides
Crataegus viridis
Fraxinus pennsylvanica
Liquidambar styraciflua
Magnolia virginiana
Nyssa sylvatica
Pinus serotina, strobus, taeda
Platanus occidentalis
Populus deltoides, heterophylla
Quercus bicolor, michauxii (montana), nigra, palustris, phellos
Salix nigra, sericea
Taxodium distichum
Thuja occidentalis
Tsuga canadensis
Ulmus americana

Vines

Bignonia capreolata
Mikania scandens
Parthenocissus quinquefolia
Wisteria frutescens

Plants Appropriate for Bogs or Bog Gardens

Ferns
Athyrium filix-femina
Onoclea sensibilis
Osmunda cinnamomea
Thelypteris noveboracensis , palustris
Woodwardia areolata

Grasses and Grasslike Plants
Calamagrostis canadensis
Carex stricta
Leersia oryzoides

Herbaceous Plants
Arisaema triphyllum
Caltha palustris
Chelone glabra
Doellingeria umbellata var. umbellate (Aster umbellatus)
Eupatorium dubium, perfoliatum
Gentiana clausa
Saxifraga pensylvanica
Scutellaria integrifolia
Spiranthes cernua
Symplocarpus foetidus
Veratrum viride
Viola cucullata

Herbaceous Emergents
Dulichium arundinaceum
Juncus effusus
Orontium aquaticum
Sagittaria latifolia
Scirpus atrovirens, cyperinus
Sparganium americanum

Shrubs
Clethra alnifolia
Gaultheria procumbens
Hypericum densiflorum
Kalmia angustifolia
Morella caroliniensis (Myrica heterophylla)
Photinia (Aronia) melanocarpa, pyrifolia (arbutifolia)
Rhododendron viscosum
Salix humilis
Spiraea alba, alba v. latifolia (latifolia)
Spiraea tomentosa
Vaccinium corymbosum, macrocarpon
Viburnum dentatum (recognitum), nudum, nudum v. cassinoides (cassinoides)

Trees
Acer rubrum
Chamaecyparis thyoides
Nyssa sylvatica

Vines
Bignonia capreolata

Plants for Dry Meadows

Grasses and Grasslike Plants
Andropogon gerardii
Danthonia spicata
Elymus canadensis, riparius, virginicus
Schizachyrium scoparium (Andropogon scoparius)
Sorghastrum nutans
Tridens flavus

Herbaceous Plants
Ageratina altissima v. altissima (Eupatorium rugosum)
Antennaria neglecta
Asclepias syriaca, tuberosa
Chamaecrista (Cassia) fasciculata
Conoclinum (Eupatorium) coelestinum
Coreopsis tripteris, verticillata
Desmodium paniculatum
Dodecatheon meadia
Erigeron pulchellus
Eupatorium hyssopifolium, purpureum
Heliopsis helianthoides
Ionactis (Aster) linariifolius
Lespedeza capitata
Liatris spicata, squarrosa
Lupinus perennis
Monarda bradburiana (fistulosa), punctata
Nuttallanthus (Linaria)canadensis
Oenothera biennis, fruticosa, perennis
Penstemon digitalis
Pycnanthemum incanum
Rudbeckia fulgida, hirta, triloba
Solidago canadensis, canadensis v. scabra (altissima), juncea, nemoralis, speciosa
Symphyotrichum (Aster) cordifolius, ericoides var. ericoides, laeve var. laeve (laevis), novae-angliae

Shrubs
Note: Listed are a few of the shorter shrubs that may appear in or at the edges of meadows. Using shrubs in a planting that is to remain as a meadow is not recommended, as they provide perching spots for birds, whose droppings will seed in unwanted plants, including trees. If the meadow is to be allowed to succeed eventually to forest, then adding shrubs is one prescribed method.

Ceanothus americanus
Comptonia peregrina
Rhus glabra
Rosa carolina
Rubus allegheniensis

Plants for Wet Meadows

Ferns
Onoclea sensibilis
Osmunda cinnamomea
Thelypteris palustris

Grasses and Grasslike Plants
Andropogon gerardii, virginicus
Calamagrostis canadensis
Carex glaucodea, stricta
Elymus riparius
Leersia oryzoides
Panicum virgatum
Tripsacum dactyloides

Herbaceous Plants
Agalinis purpurea
Asclepias incarnata
Caltha palustris
Doellingeria umbellata var. umbellata (Aster umbellatus)
Gentiana clausa
Eupatorium fistulosum, maculatum, perfoliatum
Helenium autumnale
Impatiens capensis (I. biflora)
Lilium canadense, superbum
Lobelia cardinalis, siphilitica
Mimulus ringens
Packera aurea (Senecio aureus)
Phlox maculata
Rudbeckia laciniata
Sabatia angularis
Scutellaria integrifolia
Silphium perfoliatum
Sisyrinchium atlanticum
Solidago rugosa
Spiranthes cernua
Stachys tenuifolia (hispida)
Symphyotrichum (Aster) novi-belgii
Thalictrum pubescens (polygamum)
Verbena hastata
Viola conspersa
Viola striata

Herbaceous Emergents
Iris prismatica, versicolor, virginica
Juncus effusus
Scirpus atrovirens, cyperinus
Spartina pectinata

Shrubs
Note: Listed are a few of the shorter shrubs that may appear in or at the edges of meadows. Using shrubs in a planting that is to remain as a meadow is not recommended, as they provide perching spots for birds, whose droppings will seed in unwanted plants, including trees. If the meadow is to be allowed to succeed eventually to forest, then adding shrubs is one prescribed method.

Cephalanthus occidentalis
Ilex verticillata
Rhododendron viscosum
Rosa palustris
Spiraea tomentosa

Plants for Forest or Woodland Plantings

Forests contain a diversity of plant types arranged in vertical layers, from the tallest (canopy or overstory) trees, through the understory of shorter trees and shrubs, to the forest floor or ground layer of low shrubs and herbaceous plants. Forest types are classified by the dominant trees present (e.g., oak-hickory-pine forest). Plant species occurring together in these different forest types are a function of the climate, altitude, geology and physiographic location, soil type, moisture, sunlight, and other conditions. So many combinations of plants occur in these different forests that space limitations prevent listing them all. Instead, the following represent plants found in a few of the more common forest types in the Chesapeake Bay watershed. These lists provide the basis for a viable forest or woodland project. Common ferns, grasses and herbaceous plants for the ground layer are listed separately, as they may occur in many of the forest types in various combinations. Remember to match the plants' growth requirements with the site conditions.

For new projects at open sites, it may take years for young trees to provide adequate shade. Consult other restoration resources and/or professionals for alternative methods of developing the ground layer, and for more comprehensive forest community information.

Forest Types, Basic Structure

Oak-Mixed Forest (Coastal Plain)
Canopy trees for well-drained sites
Carya cordiformis, tomentosa
Quercus alba, falcata, marilandica, phellos, prinus, stellata, velutina
Pinus species, occasional intermixed with the above

Canopy trees for moist sites
Acer rubrum
Fagus grandifolia
Quercus bicolor, michauxii, nigra, palustris, phellos
Liquidambar styraciflua
Liriodendron tulipifera
Nyssa sylvatica

Understory trees
Asimina triloba
Cercis canadensis
Cornus florida
Ilex opaca
Magnolia virginiana

Understory shrubs
Comptonia peregrina
Gaylussacia frondosa
Ilex glabra
Kalmia angustifolia, latifolia
Morella (Myrica) cerifera, pensylvanica
Vaccinium pallidum (vacillans), stamineum
Viburnum dentatum (recognitum), prunifolium

Pine Forest (Coastal Plain)
Overstory trees
Pinus taeda, virginiana, rigida (occasional)

Understory trees
Ilex opaca
Sassafras albidum

Understory shrubs
Clethra alnifolia
Morella (Myrica) cerifera, pensylvanica
Rhus copallina

Oak-Hickory Forest (Piedmont and Mountain, occasional on Coastal Plain)

Dominant overstory trees

Carya cordiformis, ovata
Quercus alba, prinus, rubra, velutina

Other trees

Amelanchier arborea, canadensis
Carya alba, glabra, tomentosa
Celtis occidentalis
Cercis canadensis
Cornus florida
Crataegus viridis
Fraxinus Americana
Juglans nigra
Prunus serotina
Quercus coccinea, falcata, lyrata, marilandica, muhlenbergii, stellata
Sassafras albidum
Tilia americana
Ulmus Americana

Additional trees for more moist sites

Acer rubrum
Liquidambar styraciflua
Liriodendron tulipifera
Ulmus americana

Shrubs

Kalmia latifolia
Vaccinium angustifolium, corymbosum, pallidum (vacillans), stamineum
Viburnum acerifolium

Red Oak - Mixed Hardwood Forest (Piedmont)

Dominant overstory trees

Acer rubrum
Carya ovata, tomentosa
Betula alleghaniensis (lutea), lenta
Fraxinus americana
Fagus grandifolia
Liriodendron tulipifera
Quercus alba, rubra, velutina
*Pinus strobus**
*Tsuga canadensis**

* These would be in the Hemlock-White Pine-Red Oak-Mixed Hardwood Forest (Piedmont and Mountain regions).

Understory trees and shrubs

Amelanchier species
Carpinus caroliniana
Hamamelis virginiana
Lindera benzoin
Viburnum acerifolium, dentatum (recognitum)

Hemlock-White Pine Forest (Mountain)

Dominant overstory trees

Acer saccharum
Betula alleghaniensis (lutea)
Fagus grandifolia
Pinus strobus
Tilia americana
Tsuga canadensis
also *Picea* rubens (red spruce, not included in this guide, but native in the Bay watershed in mountain region)

Other trees

Acer rubrum
Betula lenta
Liriodendron tulipifera
Quercus rubra, velutina

Shrubs

Hamamelis virginiana
Rhododendron maximum
Viburnum acerifolium

Mixed Mesophytic Forest (Mountain)

These forests are relicts of ancient mesic (moist) broadleaf deciduous forests. They can be very diverse.

Dominant overstory trees

Acer saccharum
Betula lenta
Carya ovata
Carpinus caroliniana
Fagus grandifolia
Fraxinus americana
Juglans nigra
Liriodendron tulipifera
Magnolia acuminata
Prunus serotina
Quercus rubra
Tilia americana

Understory trees and shrubs

Cercis canadensis
Hamamelis virginiana
Hydrangea arborescens
Lindera benzoin
Rhododendron maximum
Staphylea trifolia

Woodland Floor or Ground Layer Plants

These plants can also be used for gardens in or adjacent to wooded areas. Refer to specific habitat and growing conditions to match plants in appropriate groupings.

Ferns

All species included in this guide occur in woodlands.

Grasses and Grasslike Plants

Agrostis perennans
Andropogon gerardii
Carex crinita var. crinita, glaucodea, lurida, pensylvanica, vulpinoidea
Chasmanthium latifolium
Danthonia spicata
Dichanthelium clandestinum, commutatum
Elymus hystrix (Hystrix patula)
Festuca rubra
Panicum virgatum
Saccharum giganteum (Erianthus giganteus)
Schizachyrium scoparium (Andropogon scoparius)
Sorghastrum nutans
Tridens flavus
Tripsacum dactyloides

Herbaceous Plants

Actaea pachypoda
Ageratina altissima v. altissima (Eupatorium rugosum)
Aquilegia canadensis
Aralia nudicaulis, racemosa
Arisaema triphyllum
Aruncus dioicus
Asarum canadense
Campanulastrum americanum (Campanula americana)
Cardamine concatenata (Dentaria laciniata)
Caulophyllum thalictroides
Chelone glabra
Chimaphila maculata
Chrysogonum virginianum
Cimicifuga racemosa
Claytonia virginica
Delphinium tricorne
Dicentra canadensis, cucullaria, eximia
Erythronium americanum
Eurybia divaricata (Aster divaricatus)
Geranium maculatum
Helenium autumnale
Helianthus divaricatus
Heliopsis helianthoides
Hepatica nobilis var. acuta (acutiloba), var. obtusa (americana)
Heracleum maximum (lanatum)
Heuchera americana, villosa

(continued)

Hydrophyllum virginianum
Impatiens capensis (biflora)
Ionactis (Aster) linariifolius
Jeffersonia diphylla
Liatris scariosa
Lilium canadense, philadelphicum
Maianthemum canadense, racemosum (Smilacina racemosa)
Medeola virginiana
Melanthium virginicum
Mertensia virginica
Mitchella repens
Mitella diphylla
Monarda didyma
Osmorhiza longistylis
Oxalis violacea
Packera aurea (Senecio aureus)
Penstemon laevigatus
Phlox carolina, divaricata, stolonifera
Podophyllum peltatum
Polemonium reptans
Polygonatum biflorum, pubescens
Sanguinaria canadensis
Saxifraga pensylvanica, virginiensis
Scutellaria integrifolia
Sedum ternatum
Silene caroliniana, stellata, virginica
Solidago caesia, flexicaulis, rugosa
Stachys tenuifolia (hispida)
Stellaria pubera
Thalictrum dioicum, pubescens (polygamum), thalictroides (Anemonella t.)
Tiarella cordifolia
Tradescantia virginiana
Trillium erectum, grandiflorum, sessile, undulatum
Uvularia grandiflora, perfoliata, sessilifolia
Veratrum viride
Viola conspersa, hastata, pubescens (pennsylvanica), sororia (papilionacea), striata
Zizia aurea

Vines
Any of the vines included in this guide may be found in woodlands, occupying various vegetative layers, from the ground up.

Solutions for Slopes

Slopes of any kind are prone to erosion from rain, runoff; wave action, stream or river currents, and foot or lawnmower traffic. Plants with deep, spreading root systems help prevent erosion by holding soil in place. Some plants that are particularly well suited to and recommended for holding or stabilizing soils on a dry upland slope or hillsides such as a sloping yard or road embankment are listed below.

However, any plant suited to the site's sun, soil, and moisture conditions that could be planted on a flat surface could be planted on a slope, as long as the slope is accessible. Plants that naturally occur on slopes or hillsides can be found by searching the "habitat" notes provided with each plant in this guide.

For plants to use on a tidal shoreline, see the list of saltmarsh or freshwater marsh plants. For plants to use on a stream, pond or riverbank, see the list of freshwater marsh plants.

Plants That Provide Stabilization on Dry, Sunny Slopes or Hillsides

Grasses & Grasslike Plants
Ammophila breviligulata
Andropogon gerardii
Dichanthelium clandestinum
Elymus canadensis
Panicum virgatum
Panicum amarum
Schizachyrium scoparium

Herbaceous Plants
Any of the herbaceous plants that thrive in a sunny, dry site tend to be deep-rooted and would provide good slope stabilization. See the dry meadow plants list on for additional choices.

Baptisia tinctoria
Lespedeza capitata
Chamaecrista (Cassia) fasciculata

Shrubs
Comptonia peregrina
Ceanothus americanus
Clethra alnifolia
Cornus racemosa
Gaylussacia baccata, frondosa
Hypericum densiflorum
Kalmia latifolia
Morella pensylvanica
Physocarpus opulifolius
Rhus aromatica
Rhus copallina
Rhus glabra
Rosa carolina
Rubus allegheniensis
Vaccinium angustifolium
Viburnum acerifolium

Trees
The following are some of the tree species that may occur on slopes. However, for stabilization purposes, practitioners recommend planting herbaceous plants and shrubs, as trees will appear in time through succession.

Acer rubrum, saccharum, spicatum
Amelanchier arborea
Betula lenta
Carya alba (tomentosa), cordiformis, glabra, ovata
Castanea pumila
Celtis occidentalis
Chionanthus virginicus
Cornus alternifolia, florida
Crataegus crus-galli
Fraxinus americana
Juglans nigra
Liquidambar styraciflua
Liriodendron tulipifera
Magnolia acuminata
Morus rubra
Nyssa sylvatica
Ostrya virginiana
Pinus rigida, taeda
Quercus coccinea
Quercus marilandica, michauxii, muehlenbergii, prinus, rubra, velutina
Sorbus (Pyrus) americana
Ulmus rubra

Vines
Campsis radicans
Celastrus scandens
Passiflora incarnata
Parthenocissus quinquefolia

Evergreens

Ferns
Asplenium platyneuron
Dryopteris carthusiana (spinulosa), cristata, intermedia, marginalis
Polystichum acrostichoides

Herbaceous Plants
Asarum canadense
Goodyera pubescens
Heuchera americana
Mitchella repens
Phlox carolina, stolonifera, subulata
Sedum ternatum
Silene caroliniana
Solidago sempervirens
Yucca filamentosa (flaccida)

Shrubs
Gaultheria procumbens
Ilex glabra
Kalmia angustifolia, latifolia
Morella (Myrica) caroliniensis (heterophylla), cerifera
Rhododendron maximum
Vaccinium macrocarpon

Trees
Chamaecyparis thyoides
Ilex opaca
Juniperus virginiana
Magnolia virginiana
Pinus any species in this guide
Thuja occidentalis
Tsuga canadensis

Vines
B*ignonia capreolata*
Lonicera sempervirens

Plants to use as Groundcovers

Ferns
Any species in this guide

Grasses and Grasslike Plants
Carex glaucodea, pensylvanica
Danthonia spicata
Festuca rubra

Herbaceous Plants
Aquilegia canadensis
Asarum canadense
Chimaphila maculata
Chrysogonum virginianum
Chrysopsis mariana
Coreopsis verticillata
Erigeron pulchellus
Eurybia divaricata (Aster divaricatus)
Geranium maculatum
Hepatica nobilis var. acuta (acutiloba), nobilis var. obtusa (americana)
Heuchera americana, villosa
Hylotelephium (Sedum) telephioides
Maianthemum canadense
Mitchella repens
Opuntia humifusa (compressa)
Oxalis violacea
Phlox carolina, stolonifera, subulata
Podophyllum peltatum
Polemonium reptans
Sedum ternatum
Silene caroliniana
Tiarella cordifolia
Uvularia sessilifolia
Viola conspersa, cucullata, hastata, pedata

Shrubs
Gaultheria procumbens
Vaccinium angustifolium, macrocarpon
Vaccinium pallidum (vacillans)

Vines
Bignonia capreolata
Campsis radicans
Celastrus scandens
Parthenocissus quinquefolia

Plants for Spring and Fall Color

A search through this guide will reveal literally hundreds of plants of all types that will flower or fruit in spring or fall, providing a wide variety of choices to color a native landscaping project and to offer a diversity of food for wildlife. Remember to consider trees, shrubs and vines when choosing plants for their flower color; and to include fruit color in the palette. The fall color of many plants, particularly grasses, trees, shrubs and vines adds interest to the landscape. A landscape planned for seasonal color, throughout *all* seasons of the year, can also provide year-round food, cover and nesting structure for wildlife.

Deer Resistant Plants

Gardeners challenged by browsing deer often look for a definitive list of plants that deer will leave alone. Unfortunately, deer are not quite that predictable. In areas where high populations of deer have over-browsed the woodland understory, they are likely to eat any plant they can find to survive. Gardeners and habitat restorationists are strongly encouraged to use other appropriate barriers to exclude deer, in consultation with a local wildlife agency. Plants marked with an asterisk (*) may be browsed occasionally.

The list below was compiled from Bowman's Hill Wildflower Preserve and Deer Proofing Your Yard (Hart), see references.

Grasses and Grasslike Plants
Andropogon gerardii
Panicum virgatum

Herbaceous Plants
Actaea pachypoda
Allium cernuum
Aquilegia canadensis
Arisaema triphyllum
Aruncus dioicus
*Asarum canadense **
Asclepias tuberose
Baptisia australis
Campanulastrum americanum (Campanula americana)
Coreopsis tripteris
Dicentra eximia
Geranium maculatum
Helenium autumnale
Hibiscus moscheutos (H. palustris)
Jeffersonia diphylla
*Lobelia cardinalis *, siphilitica **
Lupinus perennis
Monarda didyma
Phlox divaricata, stolonifera
*Podophyllum peltatum **
Polemonium reptans
Rudbeckia fulgida, hirta
Solidago species
Symphyotrichum (Aster) novae-angliae
Veronicastrum virginicum (Veronica virginica)

Herbaceous Emergents
Iris prismatica, versicolor, virginica

Shrubs
Aralia spinosa
Clethra alnifolia
Cornus amomum
Hamamelis virginiana
Hypericum densiflorum
Ilex glabra, laevigata, verticillata
Kalmia latifolia
Leucothoe racemosa
Lindera benzoin
Morella (Myrica) cerifera, pensylvanica
Ribes rotundifolium
Spiraea alba, alba v. latifolia (latifolia), tomentosa
Viburnum acerifolium, dentatum (recognitum), prunifolium

Trees
Acer negundo, rubrum
Amelanchier canadensis
Betula nigra
Carpinus caroliniana
Cercis canadensis
Cornus alternifolia
*Cornus florida **
Diospyros virginiana
Fagus grandifolia
Fraxinus americana, pennsylvanica
Ilex opaca
Juniperus virginiana
Magnolia acuminata, virginiana
Nyssa sylvatica
Pinus — any species in this guide
Quercus — any species in this guide
Sambucus racemosa v. racemosa (S. pubens)

Vines
Celastrus scandens
*Clematis virginiana **
Lonicera sempervirens
*Wisteria frutescens **

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Each photograph is marked with an abbreviated form for the corresponding photographer, due to space limitations. Those abbreviations are listed here in alphabetical order, followed by the full credit information.

The Bugwood Network and Forestry Images Image Archive and Database Systems, The University of Georgia-Warnell School of Forest Resources and College of Agricultural and Environmental Sciences-Department of Entomology. www.bugwood.org

BUG DJM David J. Moorhead
BUG RFW Robert F. Wittwer

BZ Bob Zuberbuhler, www.westernpawildflowers.com

CAB Carole Ann Barth, Heal Earth Gardens, Silver Spring, Maryland.

CM NRCS Christopher F. Miller, Regional Plant Materials Specialist, U.S. Department of Agriculture, Natural Resources Conservation Service, Somerset, New Jersey.

Digital Flora of Texas Vascular Plant Image Library. www.csdl.tamu.edu/FLORA/galfolks.htm, or www.texasflora.org

DFT DL David Lemke, The State University-San Marcos, Department of Biology Herbarium.
DFT HW Hugh Wilson, TAMU Herbarium, Texas A&M University.

GM ARS George McLellan, Species Study Group of the Middle Atlantic Chapter, American Rhododendron Society. tjhsst.edu/~dhyatt/azaleas/atlanticum.html

MOBOT Missouri Botanical Garden. www.mobot.org/gardeninghelp/plantfinder/service.shtml. Digital images in this database were contributed by Martha Hill, Glenn Kopp and Alan Stentz.

MP Dan Tanaglia, Missouriplants. www.missouriplants.com

NYNHP Stephen M. Young, New York Natural Heritage Program. www.dec.state.ny.us/website/dfwmr/heritage

OSU Scott Biggs, Ohio State University. http://PlantFacts.osu.edu

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PLANTS 1997 U.S. Department of Agriculture Natural Resources Conservation Service. 1997 Northeastern Wetlands Flora.
PLANTS DEH Herman, D.E. et.al. 1996 North Dakota Tree Handbook. USDA NRCS. ND State Soil Conservation Committee. NDSU Extension and Western Area Power Administration. Bismark, ND.
PLANTS DL Douglas Ladd. U.S. Department of Agriculture Soil Conservation Service. 1989 Midwest Wetland Flora: Field Office Illustrated Guide to Plant Species. Midwest National Technical Center, Lincoln, NE.
PLANTS GAM Gary A. Monroe
PLANTS GFR George F. Russell
PLANTS JA Jennifer Anderson
PLANTS JS Jim Stasz
PLANTS JSP J.S. Peterson
PLANTS LA Larry Allain
PLANTS RM89 Robert H. Mohlenbrock. U.S. Department of Agriculture, Soil Conservation Service. 1989 Midwest Wetland Flora: Field Office Illustrated Guide to Plant Species. Midwest National Technical Center, Lincoln, NE.
PLANTS RM91 Robert H. Mohlenbrock. U.S. Department of Agriculture, Soil Conservation Service. 1991 Southern Wetland Flora: Field Office Guide to Plant Species. South National Technical Center, Fort Worth, TX.
PLANTS RM95 Robert H. Mohlenbrock. U.S. Department of Agriculture,Natural Resources Conservation Service. 1995 Northeast Wetland Flora: Field Guide to Plant Species. Northeast Technical Center, Chester, PA.
PLANTS TGB Thomas G. Barnes
PLANTS WSJ William S. Justice

RHW R. Harrison Wiegand, Maryland Department of Natural Resources, Wildlife and Heritage Service. www.dnr.state.md.us

RS MNPS Rod Simmons, Maryland Native Plant Society. www.mdflora.org

SMSU Paul Redfearn, Ozarks Regional Herbarium, Southwest Missouri State University. biology.smsu.edu/Herbarium

UCONN Mark Brand, UConn Plant Database, University of Connecticut. www.hort.uconn.edu/plants/about.html

USDA NRCS **U.S. Department of Agriculture, Natural Resources Conservation Service,** National Plant Materials Center, Beltsville, MD. www.plantmaterials.nrcs.usda.gov/mdpmc
USDA JE John Englert
USDA JK Jennifer Kujawski
USDA MG Martin van der Grinten

USFWS **U.S. Fish and Wildlife Service Chesapeake Bay Field Office,** Annapolis, MD 21401. www.fws.gov/r5cbfo
USFWS BES Britt Slattery
USFWS RL Randy Loftus
USFWS RM Rich Mason
USFWS RS Rich Starr

University of Wisconsin, Wisconsin State Herbarium, Madison, WI 53706-1381. www.botany.wisc.edu/herbarium
UWI AH Andrew Hipp, University of Wisconsin-Madison.
UWI DK Darrin Kimbler, University of Wisconsin-Madison.
UWI DWW Dennis W. Woodland, Andrews University.
UWI EJJ Emmet J. Judziewicz University of Wisconsin-Stevens Point and Madison.
UWI JK John Kohout, donated to Wisconsin Department of Natural Resources.
UWI JRS James R. Sime, Middleton, Wisconsin.
UWI JS Janice Stiefel, Bailey's Harbor, Wisconsin.
UWI KJS Kenneth J. Sytsma, University of Wisconsin-Madison.
UWI KK Kitty Kohout, donated to Wisconsin Department of Natural Resources.
UWI MC Michael Clayton, University of Wisconsin-Madison.
UWI MRB Merel R. Black, University of Wisconsin-Madison.
UWI RRK Robert R. Kowal, University of Wisconsin-Madison.
UWI RWF Robert W. Freckmann, University of Wisconsin-Stevens Point.
UWI TK Tim Kessenich, Wisconsin Department of Natural Resources.

VT Virginia Tech (Virginia Polytechnic Institute and State University), College of Natural Resources, Forest Biology and Dendrology Educational Sites. www.cnr.vt.edu/dendro/wwwmain.html

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Index

Latin name

Common Name

U.S. Fish & Wildlife Service
Chesapeake Bay Field Office
177 Admiral Cochrane Dr.
Annapolis, MD 21401
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www.fws.gov/r5cbfo

Adkins Arboretum
P.O. Box 100
Ridgely, MD 21660
410/634 2847
www.adkinsarboretum.org

Baltimore County Department of Environmental Protection and Resource Management
401 Bosley Ave., Ste. 416
Towson, MD 21204
410/887 4488
www.baltimorecountyonline.info

Chesapeake Bay Trust
60 West Street, Ste. 200-A
Annapolis, MD 21401
410/974 2941
www.chesapeakebaytrust.org

Irvine Nature Center
8400 Greenspring Avenue
Stevenson, MD 21153
410/484 2413
www.explorenature.org

Maryland Native Plant Society
P.O. Box 4877
Silver Spring, MD 20914
301/809 0139
www.mdflora.org
mnps@toad.net

National Fish and Wildlife Foudation
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Washington, DC 20036
202/857 0166
www.nfwf.org

The Nature Conservancy
Maryland/DC Chapter
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Bethesda, MD 20814
301/897 8570
www.nature.org

USDA NRCS
Cape May Plant Materials Center
1536 Rt. 9 North
Cape May Court House, NJ 08210
609/465 5901
plant-materials.nrcs.usda.gov

APPENDIX G. BEST MANAGEMENT PRACTICES FOR OCCUPIED OSPREY NESTS IN PENNSYLVANIA

BEST MANAGEMENT PRACTICES for
OCCUPIED OSPREY NESTS in Pennsylvania

Osprey nests typically occur over or adjacent to water in areas with high fish populations. Following are three management zones based on the osprey tolerance for disturbance and the Best Management Practices (BMP) for each zone. The distances for each zone are consistent with guidance provided by other states and Canadian provinces (Naylor, 2004). The zones are general guidance and every project with a potential impact must be reviewed by the PGC on a project by project basis.

Zone 1 consists of the area within 300 feet of the nest that is essential to maintain in order to promote current and future nesting. This zone may be reduced if a direct line of sight prohibits the activity from being observed by the nesting osprey while on the nest.

No permanent habitat alterations that could jeopardize the future existence of the nesting osprey.
No permanent habitat alterations that could jeopardize the existence of the stream, lake, or wetland that is adjacent or underneath the nest.
No significant tree removal or commercial logging operations. Super canopy trees (large trees providing the highest canopy) should not be removed.
Herbicide or pesticides should not be sprayed within Zone 1 during the nesting season (March 25 to July 31).
No human activities (with the exception of monitoring and research) during the active nesting season.
Special Use Permits, issued by the PGC, may be required for some projects within Zone 1 when the impacts may cause reduced nesting success.

Zone 2 is the area that extends from 300 to 500 feet from the nest and or the habitat area that certain disturbances could affect nesting success. Some activities may be permitted within this zone depending on the current level of disturbance that the birds are habituated to. For example, an existing road with consistent traffic and pedestrians currently exists in Zone 2 and that may indicate the birds are habituated to similar activities.

Some permanent habitat alterations could occur provided the amount of disturbance is not of a magnitude that could cause abandonment of the nest area by the osprey.
A limited amount of permanent habitat alterations may be acceptable to streams, lakes, or wetlands so long as the overall integrity of the systems remains intact.
A limited amount of tree removal may be acceptable outside of the nesting season (March 25 to July 31). Super canopy trees should be maintained.
Limited and infrequent human activity of a low impact might be acceptable.
Herbicide or pesticides should not be sprayed within Zone 2 during the nesting season (March 25 to July 31).

Zone 3 is the area extending from 500 feet to 800 feet of the nest that supports the future existence of the habitat that surrounds the nest.

Generally, this zone should be maintained in a natural habitat condition with minimal to no permanent fragmentation.
Logging can occur in this zone outside of the nesting season (March 25 to July 31). Super canopy trees should be maintained.
A limited amount of permanent habitat alterations may be acceptable to streams, lakes, or wetlands so long as the overall integrity of the systems remains intact.

Best Management Practices for all Zones:
Wetland creation in the area would be encouraged.
Fisheries management that encourages high fish density in shallow water.
Stabilization of the nest tree, if needed, and provide secondary nesting structures and dead trees.
Maintain a buffer of trees for roosting or nesting around streams and wetlands.
Reduction of disturbance from human activity.
Conservation easements can be used to protect the osprey nest and the appropriate buffer around it.
Hydrology to existing streams, lakes, and wetlands should be protected in order to maintain the wetlands and the foraging areas for osprey.
Zoning osprey nests and the associated wetlands as critical and unique habitat as non-development areas/open space.
Prevent acid mine drainage from impacting streams, lakes, and wetlands and treat existing discharges.
Prevent sedimentation in streams, lakes, and wetlands in the area.