



Delaware Estuary Native Vegetation Classification System

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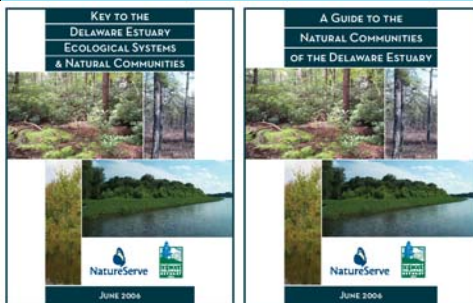
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Introduction

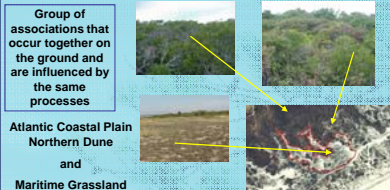
Natural communities are unique assemblages of plants and animals that recur within specific environmental-settings. These unique assemblages can reflect ecological conditions at a scale broader than the species' population, yet more refined than the landscape. **The Guide to the Natural Communities of the Delaware Estuary** describes 35 ecological systems and 185 natural community types known to occur in the region. The Guide also contains a cross-walking table between the NVCS classification and the New Jersey, Pennsylvania and Delaware state classification; therefore, assisting in regional resource management, conservation and restoration. Over the past two years, the Partnership has worked with NatureServe and the Nature Conservancy to prepare comprehensive maps of the ecological systems across the Delaware Estuary Program's study region, including areas of Delaware, New Jersey and Pennsylvania. Initial maps have been completed for the watershed in Delaware, New Jersey, and the Brandywine River area of Pennsylvania, and this work continues in Pennsylvania. In addition, an *Addendum to the Guide to the Natural Communities of the Delaware Estuary* has been drafted and will soon be finalized.

Community types were identified using the National Vegetation Classification System (NVCS), the federal vegetation classification standard, which provides a common language across multiple jurisdictions. The information contained in the *Guide* such as community structure and species composition; reference sites, and conservation status ranks helps guide natural resource planning and management by identifying sensitive native plant communities that merit high consideration for restoration and conservation. Ecological systems are being mapped relative to regional biophysical and land cover data. Field data collection will validate the model and ensure map accuracy. The Partnership is also providing educational opportunities to demonstrate how these products can be used to guide restoration. Contingent on funding, this effort might be expanded in the future to consider fauna and ecosystem services and functions associated with these natural communities.

- 7,000 square miles in PA, NJ, & DE
- 4 Eco-regions
- 35 Ecological Systems
- 200+ Community Types



Ecological Systems



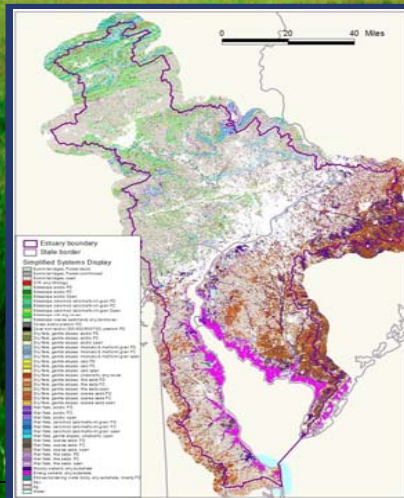
Atlantic Coastal Plain
Northern Dune
and
Maritime Grassland

Classification Approach

Two complementary classification systems are used to identify and describe the terrestrial portion of the Delaware Estuary. Ecological systems are identified using the International Terrestrial Ecological Systems Classification (example shown above and below) and natural communities are identified using the National Vegetation Classification (NVC), a subset of the International Vegetation classification.

The Delaware Estuary's unique assemblage of ecological systems and natural communities indicates a rich diversity across a varied landscape. The significant biological diversity of the region is owed, in part, to its physical location, crossing four eco-regions: the Central Appalachian Forest; the Lower New England/Northern Piedmont; the North Atlantic Coast; and, the Chesapeake Bay Lowlands. Eco-regions represent geographically distinct assemblages of vegetation types that have similar ecological dynamics, comparable environmental conditions, and share many of the same species.

Nearly 88% of the Delaware Estuary Watershed is terrestrial, while a little less than 12% is open water. This DE Estuary NVCS focuses on the terrestrial portion of the region, characterizing upland communities, wetland communities, and submerged aquatic vegetation. The *Guide* does not include descriptions of subterranean or deepwater systems.



NVCS AS A RESTORATION TOOL

Identifying restoration targets based on community types classified by the NVCS can help raise the standards of restoration being performed. It reinforces the idea that restoration occurs at the natural community scale instead of the broader land cover scale, i.e. warm seasonal grasses. By identifying reference sites, it can provide technical guidance for developing restoration specifications and provide criteria for developing performance standards to measure restoration efforts. It allows for comparisons of restoration projects across political boundaries so we can learn from our mistakes. It can help inform allied industries, such as native plant providers, on future needs, supplies, and services. And, the conservation status ranking of targeted natural communities helps to fully integrate ecological restoration in the framework of biodiversity conservation.

Demonstration Projects

In addition to the ecological systems maps and guide, two demonstration projects for the Native Vegetation Classification System (NVCS) were completed in fall 2008 to show how restoration targets can be set based on native plant communities. The first project, shown below, was an environmental enhancement project at the Harboro-Horsham School District's Jarrett Nature Center in PA. After pinpointing the location on the draft Ecological Systems Map for PA, two native plant classifications were selected as being most representative for the area, including Northeastern Interior Dry-Mesic Oak Forest and Central Appalachian Riparian. Approximately 100 trees and shrubs and 200 perennials and ferns were planted that are characteristic of these ecological systems, including black gum, white oak, and sensitive fern. Over 100 students from the school district's elementary, junior high, and high schools volunteered to help plant. These plants will remove pollutants picked up by rainwater and snowmelt before they can wash into an onsite tributary that leads to the Neshaminy Creek.



The second NVCS demonstration project, shown below, was a restoration project that took place at the University of Pennsylvania's New Bolton Center in Kennett Square, Pennsylvania, where NVCS was used to determine the species of plants for the specific region. Phase one of the project consisted of planting a 10-foot-wide buffer along a stream that flows through a pasture where animals are allowed to roam. This was needed because nutrient-rich waste was causing bacteria and algae to grow, which reduce the amount of oxygen available for aquatic plants living downstream. The two native plant classifications that could be found on the NVCS map included Northeastern Interior Dry-Mesic Oak Forest and Central Appalachian Riparian. Over 80 large trees and shrubs were planted along with 900 plugs of perennials and grasses. The native species of the region include white oak, sycamore, black gum, red-osier dogwood, winterberry holly, switch grass, and New England aster. Subsidiaries of Johnson & Johnson worked with the PDE to purchase and install the native trees, shrubs, and grasses. These were used to plant the streamside buffer alongside an important tributary to the Red Clay Creek, which flows to the Delaware River.



Site-specific uses:

- Inventory of vegetation
- Assessment of vegetation
- Establish baseline for monitoring change
- Model how types succeed into others
- Guide management decisions for vegetation and for individual species
- Target appropriate vegetation to restore each site

Table 1: Data gaps in the NVCS Guide

Terrestrial Classification	Freshwater Aquatic Classification	Marine/Coastal Classification
Functional Attributes	Rivers & Streams	Estuarine
Quality Rank	Ponds, Vernal Pools, Lakes	Coastal & Open Ocean
Faunal Components	Fish Community	Littoral Zone
Additional Inventory	Macro-Invertebrate Community	Benthic Zone
Information Gaps	Mussel Community	Pelagic Zone

Planning for the Future:

- 1.) Complete additional NVCS demonstration projects in Delaware and New Jersey.
- 2.) Finish the maps and produce a website with information on the native vegetation communities of the DE estuary and the GIS layers.
- 3.) Hold more workshops to train interested people on the proper use of the DE estuary NVCS (possibly contract with local gardens that hold classes such as Longwood Gardens, Winterthur, Mt. Cuba, etc.)
- 4.) Work with the Audubon Society to match native birds with each native vegetation community.
- 5.) Develop a NVCS for aquatic plant communities.
- 6.) Incorporate the NVCS in other PDE restoration projects such as the tidal wetland restoration project in 2009, etc.

Partners



HOW CAN I GET A COPY OF THE GUIDE AND DICHOTOMAS KEY?
Please visit http://www.delawareestuary.org/NVCS/studiesandreports_nvcs.asp to download the information you need.
You can also contact Laura Whalen via e-mail, LWhalen@DelawareEstuary.org, or by phone at 302-655-4990 x107.