

PowerPoint Presentation:

Forest Communities and Geology of Washington and Vicinity

May 10, 2017

Presentation co-sponsored by the Friends of Dyke Marsh, the Friends of Huntley Meadows Park, the Northern Virginia Conservation Trust, the Friends of Little Hunting Creek, the Four Mile Run Conservatory Foundation, and the Friends of Mason Neck State Park.

Presentation, photographs, and text (unless otherwise indicated) by:

Rod Simmons

Rod.Simmons@alexandriava.gov

Instructions:

The following script is designed to accompany the PowerPoint presentation. Each “■” indicates a slide transition.

- 1 Old-age Shell-Marl Ravine Forest at Chapman State Park (Chapman Forest North), Charles County, Maryland. This is Maryland’s largest and finest example of this rare community type.

- 2 The Washington-Baltimore region is probably the most geologically and floristically diverse area in the eastern United States.

Urban and suburban areas in and around these large old cities also typically contain the largest number and variety of old-age trees and remnant stands. Also, in close proximity to the Megalopolis are a surprising number of extensive, high quality natural communities, i.e., Patuxent Research Refuge, Beltsville Agricultural Research Center, Greenbelt Park, Chapman State Park, Mattawoman Wildlands, Huntley Meadows Park, Potomac Gorge, etc.

- 3 The Fall Line, or “Fall Zone”, is a first order physiographic boundary between the Piedmont Plateau on the west and the Atlantic Coastal Plain to the east. This zone of transition, where the hard, crystalline bedrock of the Piedmont descends under the soft sediments of the Coastal Plain, is defined by deeply-entrenched stream valleys that commonly form gorges, waterfalls, and rapids. It was also the farthest navigable limits upstream for oceangoing vessels, thus most of the old, large cities along the Atlantic seaboard are situated along it.

For the purpose of visualization, the Fall Zone is the geographical “backbone” of the area discussed in this presentation and is situated roughly in the middle between the inner Piedmont and outer Coastal Plain.

Slides of forest communities begin with the most widespread and characteristic natural communities first, from highest to lowest in elevation.

■4 **Central Appalachian / Inner Piedmont Low-Elevation Chestnut Oak Forest:** *Quercus montana* - (*Quercus coccinea*, *Quercus rubra*) / *Kalmia latifolia* / *Vaccinium pallidum* Forest (USNVC: CEGLO06299) on a gravel terrace above Pulpit Rock at Rock Creek Park, Washington, D.C. This is the evergreen heath type of Oak-Heath Forest, with Mountain Laurel dominant and usually on north-facing slopes and terraces. Witch Hazel (*Hamamelis virginiana*) is a common associate of this type on steep, north facing slopes above and along streams.

■5 **Piedmont / Central Appalachian Mixed Oak / Heath Forest:** *Quercus alba* - *Quercus (coccinea, velutina, montana)* / *Gaylussacia baccata* Forest (USNVC: CEGLO08521) atop high gravel terrace of the Fall Line (zone) in the City of Alexandria, Virginia. This is the deciduous type of Oak-Heath Forest, with extensive, intermixed colonies of deciduous heaths (ericads) like Lowbush Blueberry (*Vaccinium pallidum*), Black Huckleberry (*Gaylussacia baccata*), and Deerberry (*Vaccinium stamineum*) co-dominant.

■6 **Northern Coastal Plain / Piedmont Oak - Beech / Heath Forest:** *Fagus grandifolia* - *Quercus (alba, velutina, montana)* / *Kalmia latifolia* Forest (USNVC: CEGLO06919) on rugged, steep, north-facing bluffs below Oak-Heath Forest at Chapman State Park, Charles County, Maryland.

This northern coastal type contrasts nicely with the steep slope variant of Central Appalachian / Inner Piedmont Low-Elevation Chestnut Oak Forest (USNVC: CEGLO06299) with co-dominant Witch-hazel (*Hamamelis virginiana*) of the Fall Line and Piedmont. This is the main Oak-Heath Forest type in southern Fairfax County at Mason Neck State Park; southern Maryland; and the Northern Neck of Virginia.

■7 **Piedmont Acidic Oak - Hickory Forest:** *Quercus alba* - *Quercus rubra* - *Carya alba* / *Cornus florida* / *Vaccinium stamineum* / *Hylodesmum nudiflorum* Forest (USNVC: CEGLO08475) along the west side of Shirley Highway (395) opposite Bren Mar Park in Fairfax County, Virginia. These diverse communities are common in the Piedmont, but along the Fall Line are essentially restricted to ancient colluvial slopes and benches of weathered Potomac Formation clay, and are largely absent from the Coastal Plain. This type generally occurs as a gradient between Oak-Heath Forest and Mesic Mixed Hardwood Forest, usually on dry to mesic, acidic, southwest facing slopes with high solar exposure.

This is typically the most floristically diverse, non-palustrine community type along the Fall Line.

■8 Exceptional diabase and “flatwoods” with extensive Bashful Bulrush (*Trichophorum planifolium*) glades at the eastern edge of the Triassic Basin at Confederate Fortifications Historic Site, Fairfax County, Virginia. Triassic Siltstone flatwoods are equally diverse.

■9 Outstanding example of **Basic Oak-Hickory Forest (Northern Hardpan Type):** *Quercus alba* – *Carya glabra* – *Fraxinus americana* / *Cercis canadensis* / *Muhlenbergia sobolifera* – *Elymus hystrix* Forest (USNVC: CEGLO06216) - a Triassic Basin diabase glade at Cub Run Stream Valley Park, Fairfax County, Virginia. Global/State Ranks: G3/S3.

This is the most floristically diverse vegetation type of all Piedmont, Fall Zone, and Coastal Plain types.

■10 Old-age example of **Northern Coastal Plain / Piedmont Mesic Mixed Hardwood Forest**: *Fagus grandifolia* - *Quercus (alba, rubra)* - *Liriodendron tulipifera* / (*Ilex opaca* var. *opaca*) / *Polystichum acrostichoides* Forest (USNVC: CEGLO06075) on a steep slope of massive, underlying quartz monzonite in the Holmes Run Gorge in Fairfax County, Virginia. Tulip Tree (*Liriodendron tulipifera*), American Beech (*Fagus grandifolia*), Northern Red Oak (*Quercus rubra*), and Christmas Fern (*Polystichum acrostichoides*) occurring together, especially along stream banks, are diagnostic of this common stream bank and mesic forest community.

■11 Old-age example of the coastal variant of **Northern Coastal Plain / Piedmont Mesic Mixed Hardwood Forest (USNVC: CEGLO06075)** at Chapman State Park, Charles County, Maryland. In addition to White Oak (*Quercus alba*), American Beech (*Fagus grandifolia*), and Tulip Tree (*Liriodendron tulipifera*), dominant species include Southern Red Oak (*Quercus falcata*) and Pagoda Oak (*Quercus pagoda*) instead of Red Oak (*Quercus rubra*), and Sweetgum (*Liquidambar styraciflua*). American Holly (*Ilex opaca*) is especially prevalent. The coastal variant of this community is absent from Arlington and Alexandria westward, but is common in southeastern Fairfax County (minus *Q. pagoda*) southeastward along the Potomac River.

Old-age stands of Pagoda Oak at Chapman State Park represent the northernmost range limits of this species in the eastern U.S.

■12 Lush colonies of spring ephemerals and other wildflowers in **Coastal Plain / Outer Piedmont Basic Mesic Forest**: *Fagus grandifolia* - *Liriodendron tulipifera* - *Carya cordiformis* / *Lindera benzoin* / *Podophyllum peltatum* Forest (USNVC: CEGLO06055) of rolling uplands and ravines at Turkey Run Park, Fairfax County, Virginia.

■13 Extensive Ostrich Fern (*Matteuccia struthiopteris* var. *pennsylvanica*) colony in **Coastal Plain / Outer Piedmont Basic Mesic Forest**: *Fagus grandifolia* - *Liriodendron tulipifera* - *Carya cordiformis* / *Lindera benzoin* / *Podophyllum peltatum* Forest (USNVC: CEGLO06055) occupying an ancient alluvial bench at Plummers Island, Montgomery County, Maryland.

■14 **Piedmont / Central Appalachian Rich Floodplain Forest**: *Platanus occidentalis* - *Acer negundo* - *Juglans nigra* / *Asimina triloba* / *Mertensia virginica* Forest (USNVC: CEGLO04073). An extensive community type occupying rich, well-drained alluvial floodplains along the Potomac River, lower Patuxent River, and smaller order streams like Bull Run and Cub Run.

This is the community that draws all the spring ephemeral wildflower walks each March to May. Good places to visit to see this type are C&O Canal National Historical Park from D.C. westward along the Maryland side of the Potomac River (Lock 7 to Chain Bridge especially good); Riverbend Park, Scott's Run Park, and Turkey Run Park in Fairfax County, Virginia; Governor's Bridge in Anne Arundel County, Maryland; Bull Run Regional Park and Cub Run Stream Valley Park in Fairfax County, Virginia.

■15 **Coastal Plain / Piedmont Small Stream Forest:** *Liquidambar styraciflua* - *Liriodendron tulipifera* / *Lindera benzoin* / *Arisaema triphyllum* Forest (USNVC: C EGL004418) with extensive New York Fern (*Parathelypteris noveboracensis*) glades along Still Creek North Branch at Greenbelt Park, Prince George's County, Maryland. Unlike the rich floodplains of large streams and rivers, these perennially damp forest communities are flooded very rarely by stream overflows and are mainly fed by a mosaic of seeps and springs that emanate from the porous sandy-gravelly soils of slopes along the stream valleys.

■16 **Northern Coastal Plain / Inner Piedmont Mixed Oak Floodplain Swamp:** *Quercus (phellos, palustris, michauxii)* - *Liquidambar styraciflua* / *Cinna arundinacea* Forest (USNVC: C EGL006605) along the Patuxent River on the west side of the Baltimore-Washington Parkway in Prince George's County, Maryland. These forested "backswamps" occupy extensive, seasonally saturated depressions over impermeable clay within alluvial floodplains of large streams and rivers along the Fall Zone and inner Coastal Plain of the Washington, D.C. area. Swamp White Oak (*Quercus bicolor*) is often co-dominant at many such sites in this region as well.

Rare natural communities of the region

■17 "The Potomac Gorge encompasses a 15 mile stretch of the Potomac River valley from just above Great Falls to the vicinity of Georgetown in Washington, D.C. The valley in this stretch is deeply entrenched as the river drops 46 meters in elevation through rocks of the Fall Line at the eastern edge of the Piedmont Plateau. The south side of the river is in Virginia while the river itself and the north side are in Maryland and the District of Columbia. The Potomac Gorge has long been considered one of the most important natural areas in the mid-Atlantic region, and is especially significant because of its location within an urban and suburban setting. This exceptional site provides habitat for over 60 rare plants, animals, and natural communities."¹

¹ Vegetation Ecology of the Potomac Gorge, Fleming 2006

■18 **Exceptional Potomac River Bedrock Terrace Hardpan Forest:** *Carya glabra* - *Quercus (rubra, montana)* - *Fraxinus americana* / *Viburnum rafinesqueanum* / *Piptochaetium avenaceum* Forest (USNVC: C EGL006209) along the C&O Canal National Historical Park at Bear Island, Montgomery County, Maryland. Global/State Ranks: G1G2/S1.

■19 **Old-age Riverside Bedrock Terrace Woodland:** *Pinus virginiana* - *Juniperus virginiana* - *Quercus stellata* / *Amelanchier spicata* / *Danthonia spicata* / *Leucobryum glaucum* (USNVC: C EGL008449) along the C&O Canal National Historical Park at Bear Island, Montgomery County, Maryland. Global/State Ranks: G1/S1.

■20 **Old-age Piedmont / Coastal Plain Hemlock - Hardwood Forest:** *Tsuga canadensis* - *Fagus grandifolia* - *Quercus (montana, alba)* Forest at Hemlock Overlook Park along Bull Run in Fairfax County, Virginia (USNVC: C EGL006474). Global/State Ranks: G2G3,S2. Similar old-age Piedmont stands of Hemlock forest occur at Mink Hollow along the Patuxent River in Montgomery County.

■21 Globally rare, old-age “flatwoods” glade of **Piedmont Ultramafic Woodland** dominated by *Quercus stellata* and graminoids at **Travilah Serpentine Barrens**, Montgomery County, Maryland.

■22 Extensive **Pine Barrens Pine-Oak Woodland** of the Western Shore: *Pinus rigida* – *Quercus coccinea* – *Quercus falcata* / (*Quercus marilandica*) / *Gaylussacia frondosa* Woodland (USNVC: CEGL006329) at the “Central Farm” of the Beltsville Agricultural Research Center (BARC) in northern Prince George’s County. Global/State Ranks: G2G3/S3.

■23 **Pitch Pine (*Pinus rigida*)** is the dominant and characteristic tree of the New Jersey Pine Barrens, where it occurs on sandy soils in dry to moist conditions. Pitch Pine as a dominant community component is highly rare in the greater Washington, D.C. area, reaching its southern coastal extension in the eastern U.S. on the vast, deep Cretaceous sand deposits that extend from northeastern Prince George’s County through Anne Arundel County. All of the Pitch Pine communities in the region are allied with similar types in the New Jersey Pine Barrens and are globally rare¹.

¹Simmons, R.H., J.M. Parrish, M.D. Tice, and M.T. Strong. 2008. Conservation Priorities and Selected Natural Communities of the Upper Anacostia Watershed. *Marilandica* 12: pp. 1–22.

■24 The National Champion **Dwarf Chinquapin Oak (*Quercus prinoides*)**, above left, and the nearby State Champion **Sand Hickory (*Carya pallida*)**, above right, in sandy *Pinus rigida* – *Quercus coccinea* – *Quercus falcata* / (*Quercus marilandica*) / *Gaylussacia frondosa* Woodland (USNVC: CEGL006329) at the “East Farm” of the Beltsville Agricultural Research Center (BARC) in northern Prince George’s County.

■25 Pristine, sandy Oak-Pine-Heath Forest on knoll at Sawmill Creek Park above Sawmill Creek near the eastern end of Dorsey Road in Glen Burnie, Anne Arundel County. Dangleberry (*Gaylussacia frondosa*) is co-dominant here with a diversity of ericads, including Highbush Blueberry (*Vaccinium corymbosum*), Sheep Laurel (*Kalmia angustifolia*), Eastern Teaberry (*Gaultheria procumbens*), Trailing Arbutus (*Epigaea repens*), and others.

■26 Bear Oak (*Quercus ilicifolia*), Inkberry (*Ilex glabra*), Sheep Laurel (*Kalmia angustifolia*), and Wild Raisin (*Viburnum cassinoides*).

■27 Maryland’s last known station for **Box Huckleberry (*Gaylussacia brachycera*)** (Michx.) Gray was a small, dwindling population on a north-facing, sandy hillside in Oak-Pine-Heath Forest along the headwaters of the Magothy River near Lake Waterford Park in Anne Arundel County (G3,SH?).

Box huckleberry is a dwarf, evergreen shrub that forms extensive, self-sterile colonies. Its natural range is essentially the mid-Atlantic region, occurring in Pennsylvania, Delaware, Maryland, West Virginia, Virginia (S1), Kentucky, North Carolina, and Tennessee. It occurs in all physiographic provinces throughout its range, though is known only from the coastal plain of Delaware and Maryland (see ¹Pooler et al. 2006).

¹Pooler, M.R., R.L. Dix, and R.J. Griesbach. 2006. Genetic diversity among accessions of the endangered box huckleberry (*Gaylussacia brachycera*) based on AFLP markers. *Journal of the Torrey Botanical Society* 133(3), pp. 439-448.

■28 Old-age Pitch Pine (*Pinus rigida*) and tangle of graminoids (grass-like plants) and shrubs at the exceptionally pristine **Aitcheson Bog** on the west side of I-95 in northern Prince George's County, Maryland - one of the finest and last remaining examples of the globally rare **Fall Line Magnolia Bog community**: *Nyssa sylvatica* - *Magnolia virginiana* - (*Pinus rigida*) / *Rhododendron viscosum* - *Toxicodendron vernix* / *Smilax pseudochina* Woodland (USNVC: CEGLO06219). Global/State Ranks: G1/S1.

■29 **Coastal Plain / Outer Piedmont Acidic Seepage Swamp**: *Acer rubrum* – *Nyssa sylvatica* – *Magnolia virginiana* / *Viburnum nudum* / *Osmundastrum cinnamomeum* – *Woodwardia areolata* Forest (USNVC: CEGLO06238) typically arise at the outflow of bogs and form relatively large, braided, acidic swamps, which in turn form small seepage streams. Global/State Ranks: G3?/S3.

■30 **Chapman Forest – Jewel in Southern Maryland**

■31 **Keystone Linking Multiple Greenways**

■32 “Chapman Forest has great importance for its biodiversity content, magnified many times over in its humanitarian value due to its proximity to the large urban and suburban populations of the D.C. area. To save a remnant of America's natural heritage of this nature would be a gift to future generations unmatched by any other that could be provided in the same place, on the same land.”

- E.O. Wilson

■33 Globally-rare **Coastal Plain River-Bluff Xeric Oak Forest**: *Quercus montana* / *Deschampsia flexuosa* – *Solidago bicolor* Forest (USNVC: CEGLO06490) with large Hairgrass (*Avenella flexuosa*) glade atop bluffs above the Potomac River at Chapman State Park, Charles County, Maryland. Similar glades occur in acidic soil atop high river bluffs along the Potomac River at Leesylvania State Park, Prince William County, Virginia.

■34 Globally-rare **Coastal Plain Dry Calcareous Forest**: *Quercus muhlenbergii* / *Cercis canadensis* / *Dichanthelium boscii* - *Bromus pubescens* - *Erigeron pulchellus* var. *pulchellus* - *Aquilegia canadensis* Forest (USNVC: CEGLO07748) on steep, southwest-facing slope at Chapman State Park, Charles County, Maryland.

■35 Steep, rugged bluffs and ravines along the Potomac River at Chapman State Park in Charles County, Maryland opposite Mason Neck National Wildlife Refuge. This coastal plain landscape was formed where river bluffs and deep ravines over millennia exposed underlying calcareous and glauconitic marine sands and marl beds deposited during the Paleocene, Eocene, and Miocene epochs when the area was a shallow sea at the western edge of the Atlantic Ocean.

■36 The Maryland State Champion Chinquapin Oak (*Quercus muehlenbergii*) in old-age **Shell-Marl Ravine Forest** at Chapman State Park. At present, Shell-Marl Ravine Forest is perhaps best classified in the United States National Vegetation Classification (USNVC) as a coastal variant of **Coastal Plain / Outer**

Piedmont Basic Mesic Forest: *Fagus grandifolia* - *Liriodendron tulipifera* - *Carya cordiformis* / *Lindera benzoin* / *Podophyllum peltatum* Forest (USNVC: C EGL006055).

■37 Mixed, old-age stand of White Ash (*Fraxinus americana*), Bitternut Hickory (*Carya cordiformis*), Sweetgum (*Liquidambar styraciflua*), Chinquapin Oak (*Quercus muehlenbergii*), and Slippery Elm (*Ulmus rubra*) at Chapman State Park (Chapman Forest). The location and unique assemblage of these and other montane and coastal plain species strongly defines this type as a coastal variant of **Coastal Plain / Outer Piedmont Basic Mesic Forest** (USNVC: C EGL006055).

■38 Disjunct calciphiles of Shell-Marl Ravine Forest: Two-leaved Miterwort (*Mitella diphylla*), Foamflower (*Tiarella cordifolia*), White Bear Sedge (*Carex albursina*), and Tall Bellflower (*Campanula americana*) – among numerous others.

■39 “**Crow’s Nest** [in the Coastal Plain of Stafford County, Virginia] is considered one of the finest, if not the finest example of mature forests remaining in the Coastal Plain of Virginia.”

- *Virginia Department of Conservation and Recreation, Division of Natural Heritage, 1999*

■40 Oak-Heath Forest in **black slate canyon (Quantico Formation)** formed over millennia by the pristine headwaters of Neabsco Creek, just east of I-95 in Prince William County, Virginia. The Cretaceous-aged clay, silt, sands, and gravels of the Potomac Formation and Tertiary terrace gravels at the summits overlie the black slate.

Bottomlands and Wetlands

■41 Extensive, seasonally flooded **Non-Riverine Coastal Plain Flatwoods** with vast colonies of Brown Bog Sedge (*Carex buxbaumii*), Velvet Sedge (*Carex vestita*), and Button Sedge (*Carex bullata*) at Huntley Meadows Park in Fairfax County, Virginia. This is one of the finest examples of this community type in the state.

■42 Seasonally flooded **Coastal Plain Oak Floodplain Swamp:** *Quercus (phellos, palustris, michauxii)* – *Liquidambar styraciflua* / *Cinna arundinacea* Forest (USNVC: C EGL006605) along Mattawoman Creek, with Overcup Oak (*Quercus lyrata*), Pin Oak (*Quercus palustris*), Willow Oak (*Quercus phellos*), Sweetgum (*Liquidambar styraciflua*), Red Maple (*Acer rubrum*), American Elm (*Ulmus americana*), numerous carices (*Carex* spp.), and others.

■43 May 2009 joint MNPS, VNPS, Botanical Society of Washington, and Mattawoman Watershed Society “bioblitz” along the seasonally-flooded bottomland forests of Mattawoman Creek.

Maryland Native Plant Society, Virginia Native Plant Society, and Botanical Society of Washington regularly lead field trips to all of these sites throughout the year.

■44 Freshwater tidal channel of Farm Creek meandering through **Freshwater Tidal Marsh** at Featherstone National Wildlife Refuge, Prince William County, Virginia. Regularly flooded **Tidal Hardwood Swamp Forest**, characterized by hummock-and-hollow microtopography and diverse

hydrophytic herbs and shrubs, borders the open Tidal Freshwater Marsh and Tidal Shrub Swamp communities.

■45 Extensive colonies of state rare River Bulrush (*Bolboschoenus fluviatilis*) in high quality Tidal Freshwater Marsh (Mixed High Marsh Type): *Impatiens capensis* - *Persicaria arifolia* - *Peltandra virginica* - (*Typha angustifolia*) Tidal Herbaceous Vegetation (USNVC: CEGLO06325) at Dyke Marsh, Fairfax County, Virginia.

■46 **American Lotus (*Nelumbo lutea*)** at Mattawoman Creek, Charles County, Maryland. The extensive **Tidal Freshwater Marsh (Mixed High Marsh Type)**: *Impatiens capensis* - *Persicaria arifolia* - *Peltandra virginica* - (*Typha angustifolia*) Tidal Herbaceous Vegetation (USNVC: CEGLO06325) at Mattawoman Creek is among the very finest remaining in the Chesapeake Bay drainage.

Unfortunately, most freshwater tidal wetlands are now globally uncommon to rare as a result of restricted global range, sea level rise, non-native invasive plants, habitat loss, and other factors.

■47 Questions? Virginia Spiderwort (*Tradescantia virginiana*) at “Cactus Rock”, Plummers Island, Montgomery County, Maryland.

■48 Resources:

City of Alexandria Flora and Natural Communities webpage at <http://alexandriava.gov/22560>.

Geologic Atlas of the City of Alexandria, Virginia and Vicinity at <https://www.alexandriava.gov/89974>.

[The Natural Communities of Virginia, 2nd Approximation](#) - last updated 2/2016

[Rare Plants of Virginia](#) (PDF) - last updated 11/2016

Digital Atlas of the Virginia Flora at <http://www.vaplantatlas.org>.

“ [The Natural Communities of Maryland: 2016 Natural Community Classification Framework](#)”.

[Expanded Rare, Threatened, and Endangered Plants of Maryland](#)

■49 Acknowledgments