

The Limits of Restoration

Habitat Conservation Forum
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Germanna Community College

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Natural Resources Division





Photo by Gary P. Fleming

Native plants are those that occur locally and naturally, without direct or indirect human intervention.



Photo by R.H. Simmons



Photo by R.H. Simmons

Native plants have co-evolved with animals and microorganisms over millennia, each occupying its particular niche but collectively forming the Eastern Deciduous Forest that many of us live in the midst of.

Today, many fine remnants of this once-vast forest still remain in our region, but there is also much fragmentation and disturbance, including new threats such as non-native invasive plants, insects, and diseases.

The Southern Megalopolis

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 fairly pristine, extensive natural communities.

This region also contains the greatest diversity of oak species.

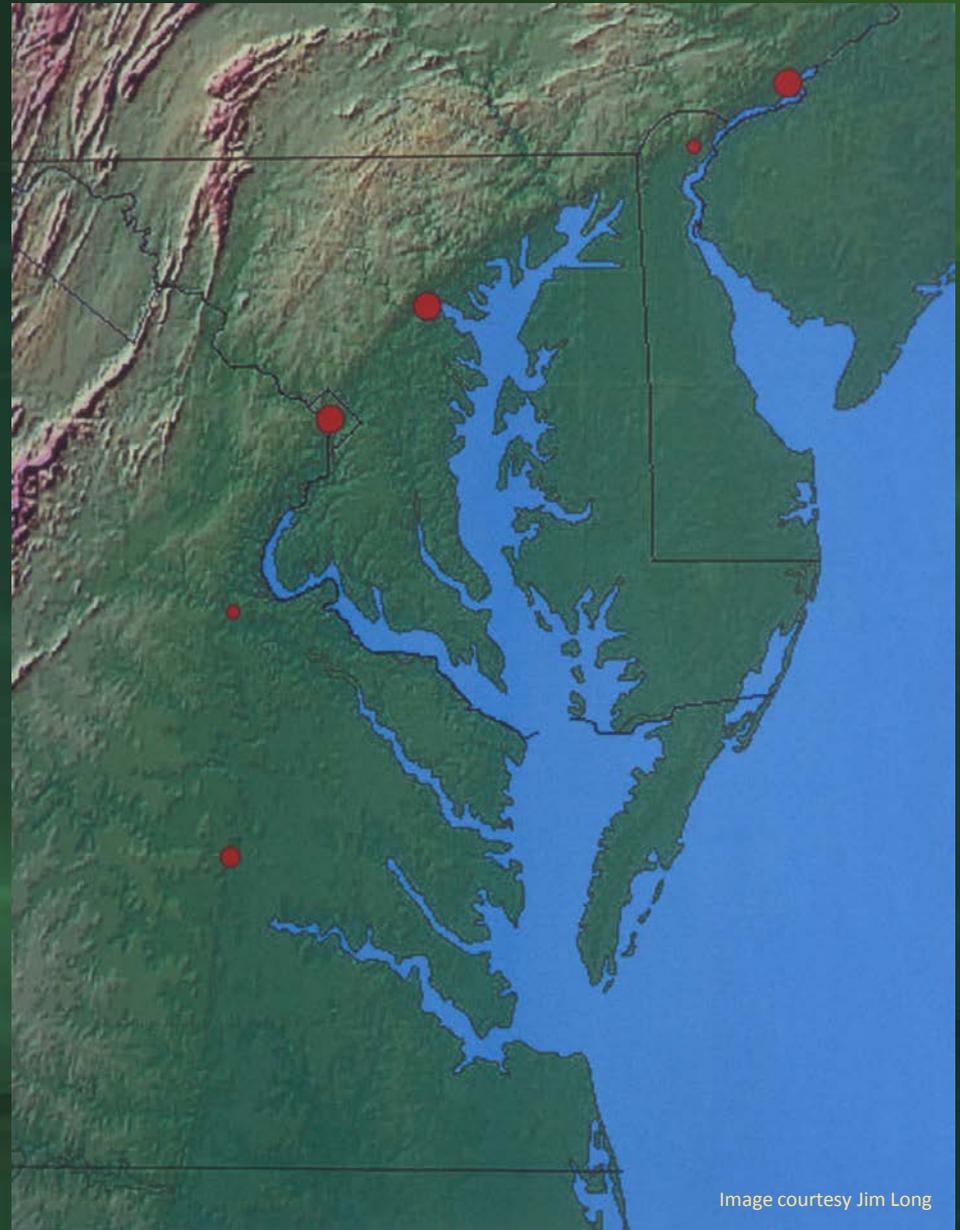


Image courtesy Jim Long

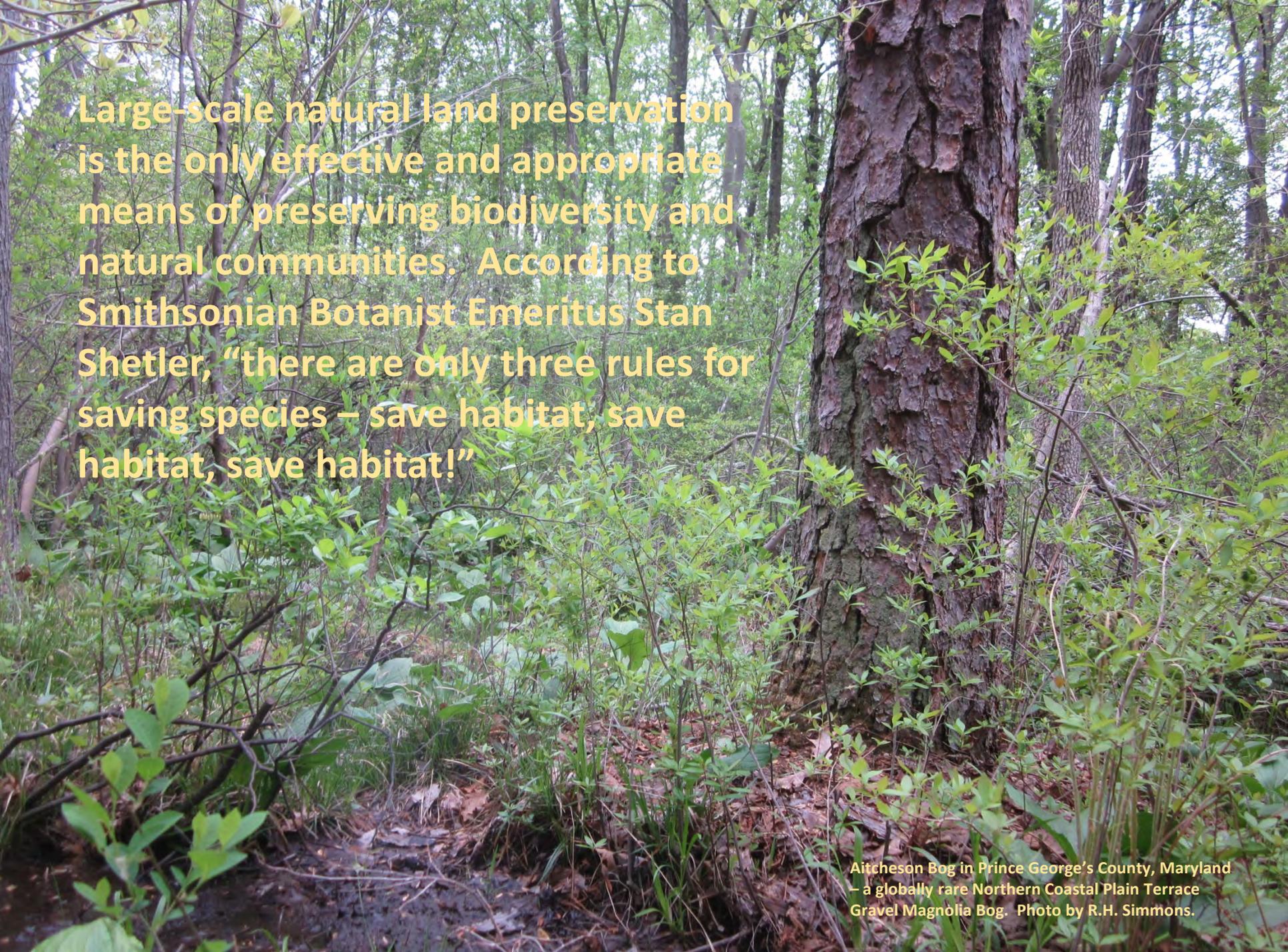


Stand of old-growth Tulip Tree (*Liriodendron tulipifera*) at Joyce Kilmer Memorial Forest, Nantahala National Forest, North Carolina (left) and old-age Tulip Tree at Wilburdale Park near the headwaters of Backlick Run in Annandale, Fairfax County, Virginia (right).



Photo by R.H. Simmons

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: CEGLO06055).

A photograph of a forest. In the foreground, a large, thick tree trunk with rough, dark bark is prominent on the right side. The ground is covered with a dense layer of green plants, including various shrubs and grasses. The background is filled with more trees and foliage, creating a lush, green environment. The lighting is natural, suggesting a daytime setting.

Large-scale natural land preservation is the only effective and appropriate means of preserving biodiversity and natural communities. According to Smithsonian Botanist Emeritus Stan Shetler, “there are only three rules for saving species – save habitat, save habitat, save habitat!”

Aitcheson Bog in Prince George’s County, Maryland
– a globally rare Northern Coastal Plain Terrace
Gravel Magnolia Bog. Photo by R.H. Simmons.

Chapman Forest – Jewel in Southern Maryland

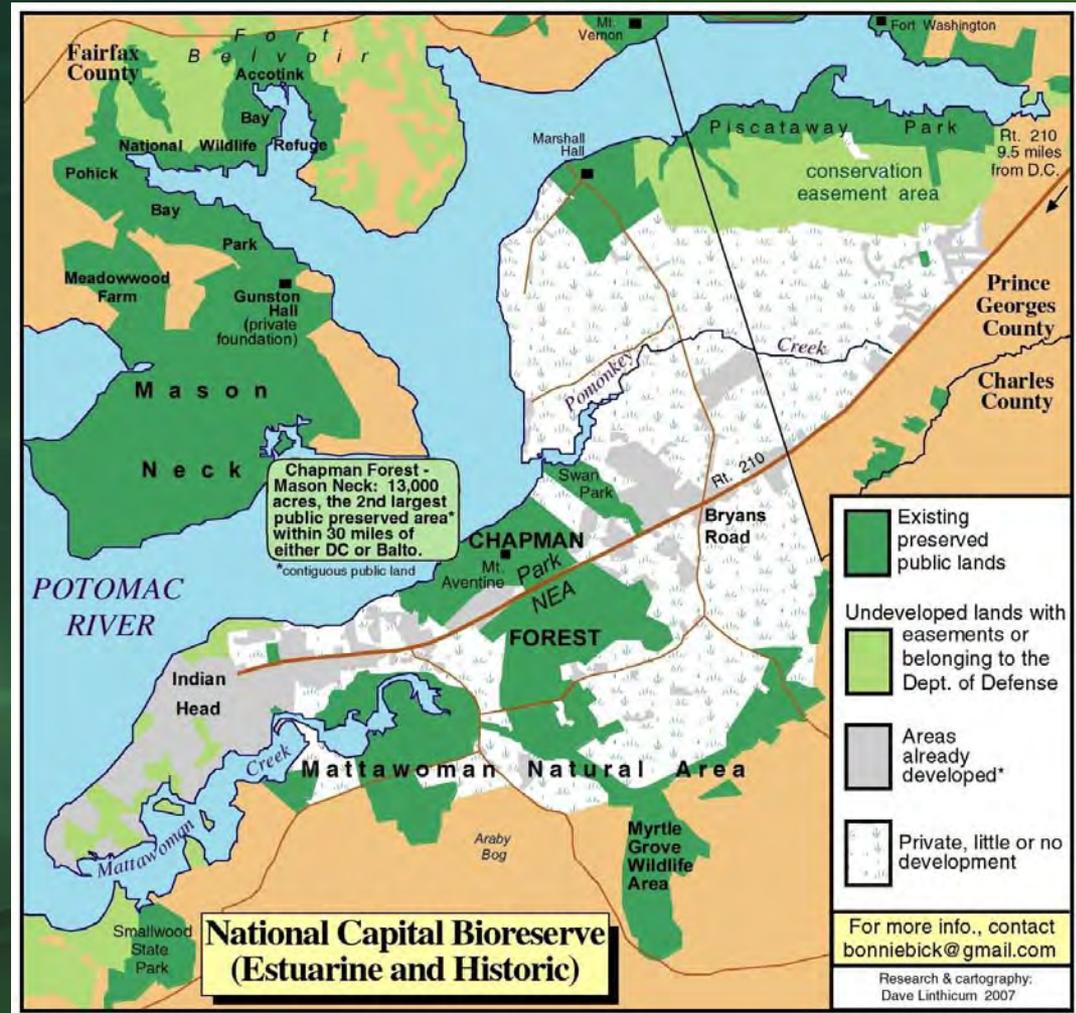


- ◆ North Tract – Chapman State Park: Potomac Drainage
- ◆ South Tract – Parris N. Glendening NEA: Mattawoman Drainage



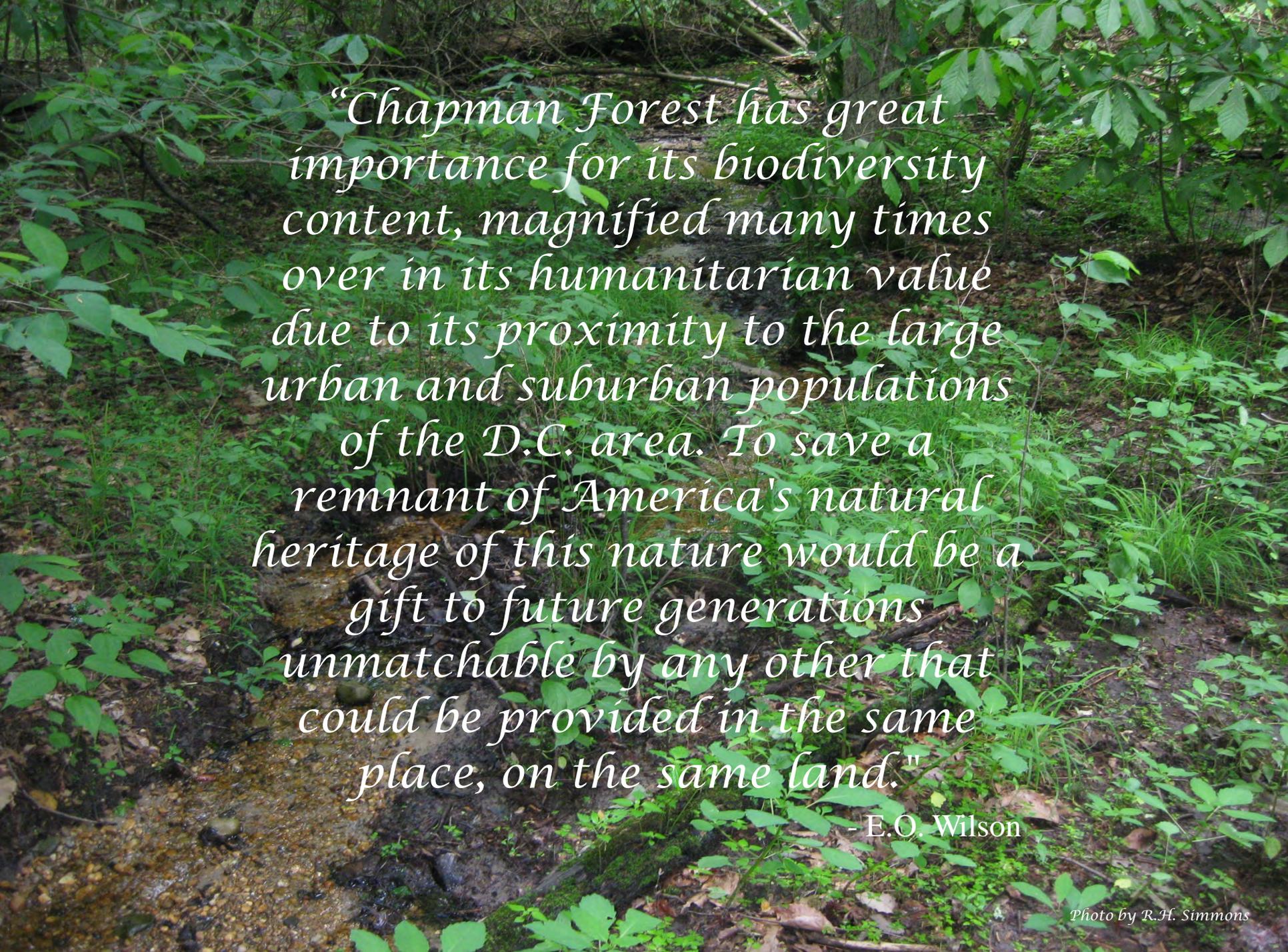
Keystone Linking Multiple Greenways

- ◆ Rare species often need corridors of connected habitat and deep interior spaces
- ◆ Chapman Forest connects natural areas in the VA and MD Potomac region to the Mattawoman Natural Area
- ◆ The Chapman Forest Important Bird Area (IBA) is contiguous with the Mattawoman IBA





Steep, rugged bluffs 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.



“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.”

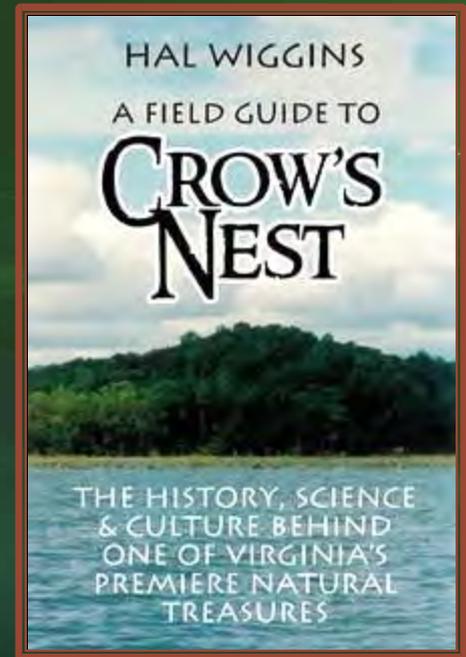
- E.O. Wilson

Similar History & Ecology

“Crow’s Nest 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*

- ◆ Same geology – Aquia Formation
- ◆ Similar Ecological Communities:
 - Calcareous Ravine Forest
(G2, globally imperiled)
 - Basic Mesic Forest
(G2, globally imperilled)
 - Basic Oak-Hickory Forest
(G2, globally imperiled)



Negative effects of urbanization



Photo by R.H. Simmons



Photo by R.H. Simmons



Photo by R.H. Simmons



Photo by R.H. Simmons



Extensive construction and infill practices in urban areas severely fragment aquifers and lower natural water tables, creating virtual deserts and greatly reduced groundwater reserves for existing trees and vegetation.



Photo by R. H. Simmons

Modern construction practices unnecessarily ruin existing soils by clearing all canopy trees and vegetation, using much of the site as a staging area, importing large amounts of artificial and non-biodegradable material, burying construction debris and refuse on site, compacting soils, and destroying beneficial soil microorganisms.



Photo by R.H. Simmons

Old-age White Oak (*Quercus alba*) trees at the historic Alcova estate in Arlington County, Virginia exhibiting signs of severe crown dieback – likely the result of a fragmented and greatly diminished water table, numerous, consecutive years of extreme drought and heat, and possible damage to the root systems.



Photo by R.H. Simmons



Photo by R.H. Simmons

The presence of non-native invasive plants is largely the result of soil and habitat disturbance.

Major threats to natural communities are those caused by soil disturbance that foster the spread of pervasive non-native invasive weeds like Japanese Stiltgrass, Wavyleaf Basketgrass (*Oplismenus undulatifolius*), and others.

In addition to habitat loss, misapplied plantings – site-inappropriate “native” plants - in natural areas, roadsides, meadows, and waterways thwart natural succession, smother in situ seed banks, promote the spread of invasive plants, and generally degrade sites.

Ravenna grass (*Tripsidium ravennae*) is slowly becoming established in pristine Little Bluestem (*Schizachyrium scoparium* var. *scoparium*) glades at Travilah Serpentine Barrens via nearby “New American Garden” style plantings.

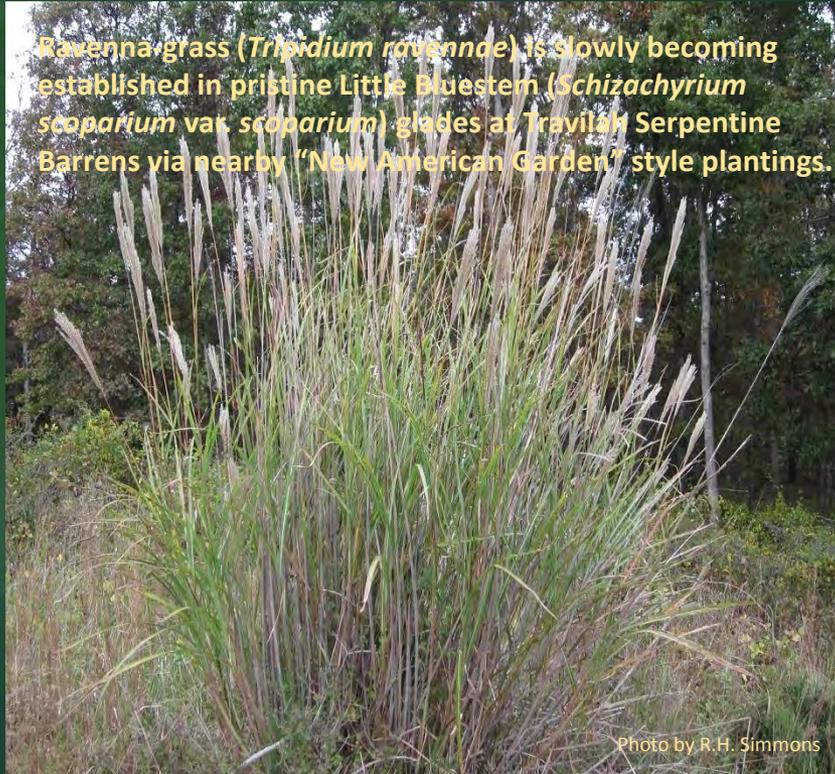


Photo by R.H. Simmons

Japanese Stiltgrass (*Microstegium vimineum*) invasion via deer and soil disturbance into otherwise pristine interior forest at Chapman State Park.



Photo by R.H. Simmons

Mayapple (*Podophyllum peltatum*)



Photo by Gary P. Fleming

Less is more: fewer species and simplicity of design are often far more effective and appealing than a cluttered landscape that begins to resemble a nursery lot.

Common Milkweed (*Asclepias syriaca*)



Photo by R.H. Simmons

It is important to select common and successional native plants for landscaping purposes and not rare species, as common plants are the appropriate foundation for most habitats and wildlife.



Photo by R.H. Simmons

Native shade trees – single specimens or groves - are typically the most important landscape material.



Photo by R.H. Simmons

Old-age White Oak (*Quercus alba*), left, and Black Oak (*Quercus velutina*), right, of remnant forest grove in Fairfax County, Virginia.



Old-age remnant forest grove of Black Oak (*Quercus velutina*), White Oak (*Quercus alba*), and Chestnut Oak (*Quercus montana*) in the City of Falls Church, Virginia.



Old remnant Acidic Oak-Hickory Forest grove and low maintenance “freedom lawn” of Poverty Oatgrass (*Danthonia spicata*) and other diminutive native herbaceous plants at Barcroft Apartments, Arlington, Virginia. Lime and fertilizers (nutrient loading) and pesticides destroy such acidic communities and eventually the trees themselves.



Photo by R.H. Simmons

Pristine **Piedmont Acidic Oak - Hickory Forest**: *Quercus alba* - *Quercus rubra* - *Carya alba* / *Cornus florida* / *Vaccinium stamineum* / *Desmodium nudiflorum* Forest (USNVC: CEGLO08475) along the west side of Shirley Highway (395) opposite Bren Mar in Fairfax County, Virginia. These diverse communities are common in the piedmont, but along the fall line are essentially restricted to ancient colluvial slope 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.

Common Upland Oaks

White Oak (*Quercus alba*)

Post Oak (*Quercus stellata*)

Chestnut Oak (*Quercus montana*)

Scarlet Oak (*Quercus coccinea*) – successional oak that requires fairly high solar exposure; lifespan of about 100-120 years

Black Oak (*Quercus velutina*)

Southern Red Oak (*Quercus falcata*) – characteristic tree of the coastal plain; becomes uncommon to rare in the piedmont; one of the longest lived of the red oak group

Blackjack Oak (*Quercus marilandica*) – small tree of dry forest edges; serpentine barrens; Oak-Heath Forest

Red Oak (*Quercus rubra*) – prefers more mesic soils than above oaks; also characteristic of mafic and ultramafic “flatwoods” in the piedmont

Pin Oak (*Quercus palustris*) – characteristic tree of swamps and bottomlands; also upland hardpan clays and Upland Depression Swamps

Swamp White Oak (*Quercus bicolor*) – characteristic tree of swamps and bottomlands; also upland hardpan clays and Upland Depression Swamps



Black Gum (*Nyssa sylvatica*)



Photo by R. H. Simmons

Variability of shapes and forms of Eastern Red Cedar (*Juniperus virginiana*).
One of the most important wildlife food and habitat plants.



Photo by R.H. Simmons

Rugged street trees: old-age Eastern Red Cedar (*Juniperus virginiana*) along sidewalk and main street adjoining the grounds of historic St. Philip's Episcopal Church in downtown Southport, North Carolina.



Photo by R.H. Simmons

Old stand of Yellow or Short-leaf Pine (*Pinus echinata*) intermixed with White and Northern Red oaks, Sweetgum, and other hardwoods along Backlick Run in the City of Alexandria.

Common Trees of Mesic and Rich Soils

White Ash (*Fraxinus americana*)

Red Oak (*Quercus rubra*)

Black Walnut (*Juglans nigra*)

Bitternut Hickory (*Carya cordiformis*)

American Elm (*Ulmus americana*) – a common tree of floodplains, stream banks, and bottomland forests

Tulip Tree (*Liriodendron tulipifera*) – one of the longest-lived and durable forest trees in the eastern U.S.

Beech (*Fagus grandifolia*) – a fine, long-lived tree originally of mesic coves and stream banks. However, in the 20th century, as a result of repeated logging and disturbance, it has invaded upland oak forests and is changing forest composition.

Sycamore (*Platanus occidentalis*) – a large, common tree of floodplains and streambanks.

Important native shrubs of woodland edges

Smooth Sumac (*Rhus glabra*)



Photo by R.H. Simmons

Hawthorns (*Crataegus* spp.)



Photo by R.H. Simmons



Devil's Walking-stick (*Aralia spinosa*)

Photo courtesy NCNPS

Increasingly uncommon native shrubs of woodland edges

Sweet Crabapple (*Malus coronaria*)



Photo by Stan Malcolm

New Jersey Tea (*Ceanothus americanus*)



Photo by R.H. Simmons

Pasture Rose (*Rosa carolina*)



Photo by R.H. Simmons

Hay-scented Fern (*Dennstaedtia punctilobula*)



Photo by R.H. Simmons

Spreading ferns as groundcovers for dry to mesic, acidic, upland wooded sites.

New York Fern (*Parathelypteris noveboracensis*)



Photo by R.H. Simmons

Spreading ferns as groundcovers for moist, acidic, wooded sites and stream valleys.

Broad Beech Fern (*Phegopteris hexagonoptera*)



Photo by R.H. Simmons

Southern Lady Fern (*Athyrium asplenoides*)



Photo by R.H. Simmons

Christmas Fern (*Polystichum acrostichoides*)



Photo by R.H. Simmons

Ferns for damp to wet areas

Sensitive Fern (*Onoclea sensibilis* var. *sensibilis*)



Southern Lady Fern (*Athyrium asplenifoides*)



Cinnamon Fern (*Osmundastrum cinnamomeum*)





Suburban gardens with remnant forest are important refugia for wildlife, especially those adjoining parks and natural areas.



A surprising diversity of wildlife still to be found in urban and suburban areas



Clockwise from top left: Locust Borer, Red Eft, Gray Treefrog, and Common Garter Snake



Photo by R.H. Simmons

Once-common wildflowers of roadsides and woodland edges that have become increasingly scarce throughout our region through overuse of herbicides and over-plantings of non-native weeds.

Common Wild Petunia (*Ruellia caroliniensis*)



Photo by R.H. Simmons

Maryland Golden Aster (*Chrysopsis mariana*)



Photo by R.H. Simmons

Hoary Mountain Mint (*Pycnanthemum incanum* var. *incanum*)



Photo by Lisa Bright

Late Purple Aster (*Symphotrichum patens* var. *patens*)



Photo by R.H. Simmons

Yellow Wild Indigo (*Baptisia tinctoria*)



Photo by R.H. Simmons

Grass-leaf Blazing Star (*Liatris pilosa*)



Photo courtesy New England Wild Flower Society

Pasture Thistle (*Cirsium pumilum*)



Photo by R.H. Simmons

Wild Bergamot (*Monarda fistulosa*)



Photo by R.H. Simmons

Virginia Goat's-rue (*Tephrosia virginiana*)



Photo by R.H. Simmons

Downy Yellow False Foxglove (*Aureolaria virginica*)



Photo by R.H. Simmons

Purple False Foxglove (*Agalinis purpurea*)



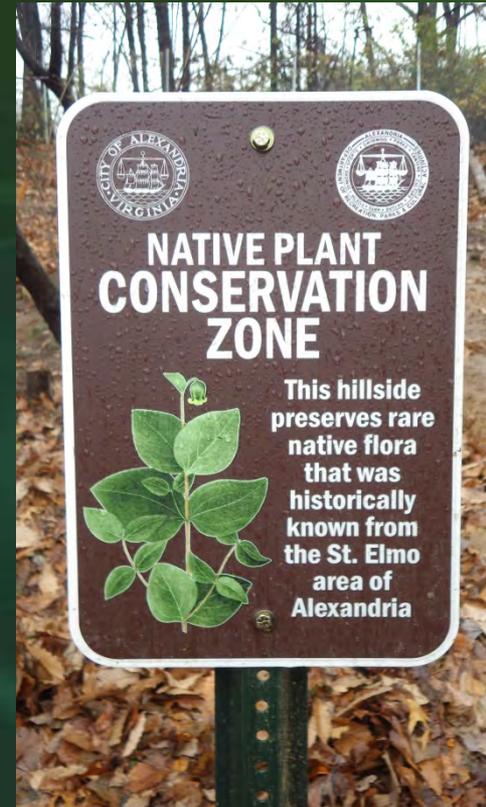
Photo by R.H. Simmons



Responsibly collected, local provenance native plant material is the foundation of ecological restoration plantings, as well as the preferred source for other native plantings. Earth Sangha, Chesapeake Natives, and VNPS, Potowmack Chapter, all propagate locally sourced plants.



Photo by R.H. Simmons



Natural Area Stewardship and Ecological Restoration Plantings



Photo by R.H. Simmons

Model of a successful ecological restoration project along (Un)Lucky Run in Arlington County that was planned and implemented from start to finish by Jim Hurley, with assistance from the Arlington Regional Master Naturalists.



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