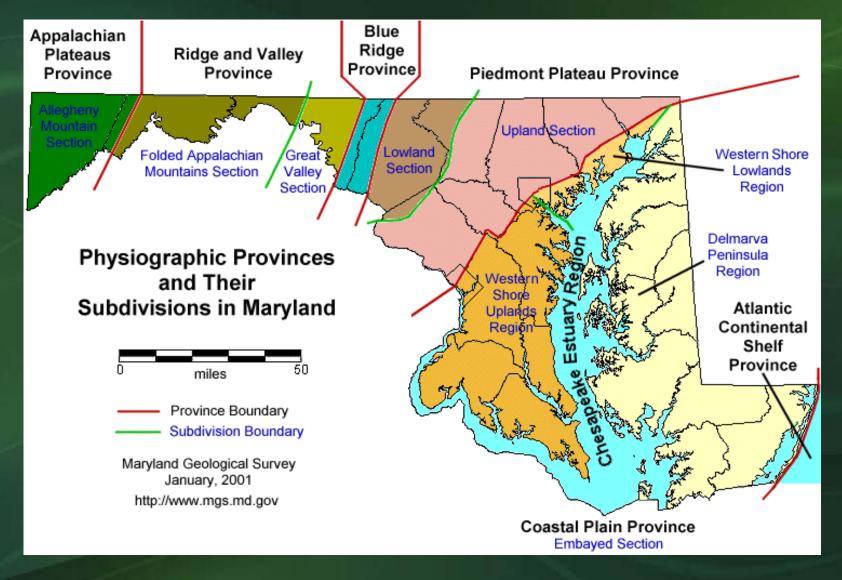
Heath Diversity in Maryland: Distribution and Representative Natural Community Types

Maryland Native Plant Society

April 30, 2013 Rod Simmons Much like oaks (*Quercus* spp.) and pines (*Pinus* spp.), with which they are typically associated, ericaceous plants (Heath Family) are especially dominant in terms of total area covered and occur throughout most of the physiographic provinces in Maryland and mid-Atlantic region. Forty-four species of heaths, including infraspecific taxa and hybrids, are known to occur naturally in Maryland, with many restricted to particular physiographic regions and habitats.





June 2003 Maryland Native Plant Society field trip to explore heath diversity at the New Jersey Pine Barrens, which collectively form the Pinelands National Reserve (PNR). Bearberry (*Arctostaphylos uva-ursi*) forms nearly continuous carpets along the ground in dry to mesic, sandy-peaty soil of open areas and woodland glades.



Southern New Jersey Mesic Pine Barrens: *Pinus* (*rigida, echinata*) – *Quercus coccinea / Ilex opaca* Woodland (USNVC: CEGL006115) along Rt. 347 near intersection with Rt. 550 near Belleplain State Forest, with nearly continuous colonies of Black Huckleberry (*Gaylussacia baccata*).



Mixed heath and Pitch Pine (*Pinus rigida*) community on gravel ridge at Elk Neck State Forest in Cecil County – Maryland's northern Eastern Shore. Mountain Laurel (*Kalmia latifolia*) is prominent with other heaths.



Inland Dune Ridge Forest: *Pinus virginiana* – *Quercus falcata* – *Carya pallida* Forest (USNVC: CEGL006354) at the Henson Scout Reservation along the Nanticoke River in eastern Dorchester County. This xeric oak-pine community of the central Atlantic Coastal Plain occurs on inland sand dune ridges. Typical ericads include Black Huckleberry (*Gaylussacia baccata*), Dangleberry (*Gaylussacia frondosa*), Lowbush Blueberry (*Vaccinium pallidum*), Deerberry (*Vaccinium stamineum*), and Sheep Laurel (*Kalmia angustifolia*).



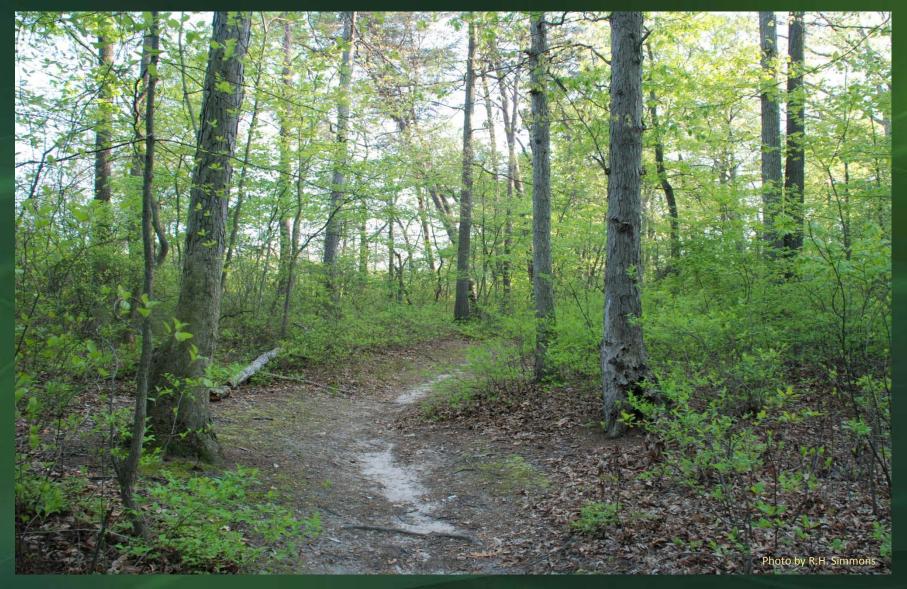
Coast Azalea, Dwarf Azalea (Rhododendron atlanticum) (Ashe) Rehder G4G5,S4

A low shrub of dry to mesic, sandy, oak-pine-heath woods primarily of the Atlantic coastal plain, ranging from eastern Pennsylvania and Delaware south to Georgia. In Maryland, it is known only from sandy woods of the Eastern Shore (ES).

Sourwood (*Oxydendrum arboreum***)** (L.) DC. G5,S1

Maryland's only tree of the Ericaceae occurs in acidic, dry to mesic, upland forest slopes and openings, as well as sandy woods of the coastal plain. It ranges in eastern North America from Indiana, Ohio, and Pennsylvania south to Louisiana and Florida. It occupies an extreme range distribution in Maryland, with sole extant populations in dry to mesic, acidic forests of the Appalachian Plateau (AP) in Garrett County and historical occurrence in sandy woods of Worchester County (ES). It is absent from the Western Shore (WS), piedmont (PD), Blue Ridge (BR), and Ridge and Valley (RV) in Maryland.

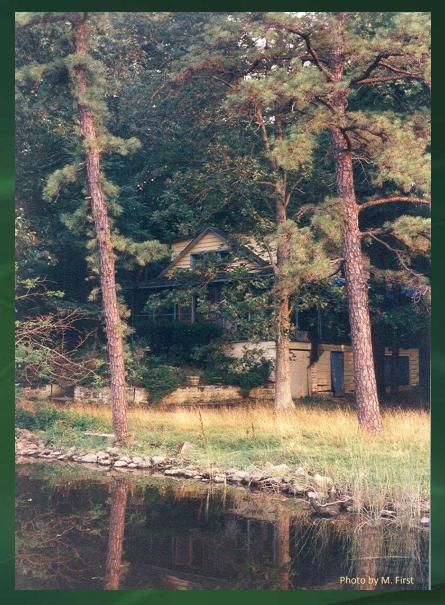




Pristine, sandy Oak-Pine-Heath Forest on knoll at Sawmill Creek Park above Sawmill Creek near the eastern end of Dorsey Road in Glen Burnie, Anne Arundel County. Dangleberry (*Gaylussacia frondosa*) is co-dominant with a diversity of ericads, including New Jersey Blueberry (*Vaccinium caesariense*),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



Bill Sipple (far left) and MNPS field trip participants amidst extensive Leatherleaf (*Chamaedaphne calyculata*) (L.) Moench colony at Fresh Ponds, Anne Arundel County in October 1999. Leatherleaf is a low, colony-forming shrub of peatlands, ranging from subarctic and boreal Alaska and Canada, Nfld., and Labr. south to Georgia (does not occur in Virginia and West Virginia). Boreal, relict peatland ponds in northern Anne Arundel County are the only stations in eastern Maryland for Leatherleaf. It was historically known from similar communities in Delaware, but not from Maryland's Eastern Shore, and is considered extirpated on the Delmarva. It is highly rare in Maryland (G5,S1).



Stands of mature Pitch Pine (*Pinus rigida*) along the south shore of the upper Magothy River in northeastern Anne Arundel County. The Box Huckleberry station was on a wooded slope a short distance from the back of the house.



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 (rank G5,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, 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.



Sweet Pinesap, Pygmy-pipes (*Monotropsis odorata***)** Schwein. ex Elliott G3,S1

A very small (often hidden in leaf litter and duff), very fragrant, mycotrophic plant of dry to mesic, Oak-Pine-Heath forests, ranging from Virginia and Delaware south to Alabama and Florida. In Maryland, it is mainly known from sandy woods of the upper Severn Run area in northeastern Anne Arundel County (WS).

Pipsissewa (*Chimaphila umbellata***)** (L.) W.P.C. Barton G5,S3

A small, evergreen plant of acidic, dry to mesic, coniferous forests and Oak-Pine-Heath forests, ranging from boreal Canada, Nfld., and Labr. south to North Carolina (in the eastern U.S.). It occurs in all physiographic provinces in Maryland, though may be declining in some areas as a result of forest maturation and deer over-browsing.

The similar and familiar **Spotted Wintergreen** (*Chimaphila maculata*) (L.) Pursh, with maculate (spotted or blotched) leaves, occupies similar habitats and range (though extends south to Florida in the U.S. and into Mexico and Central America).

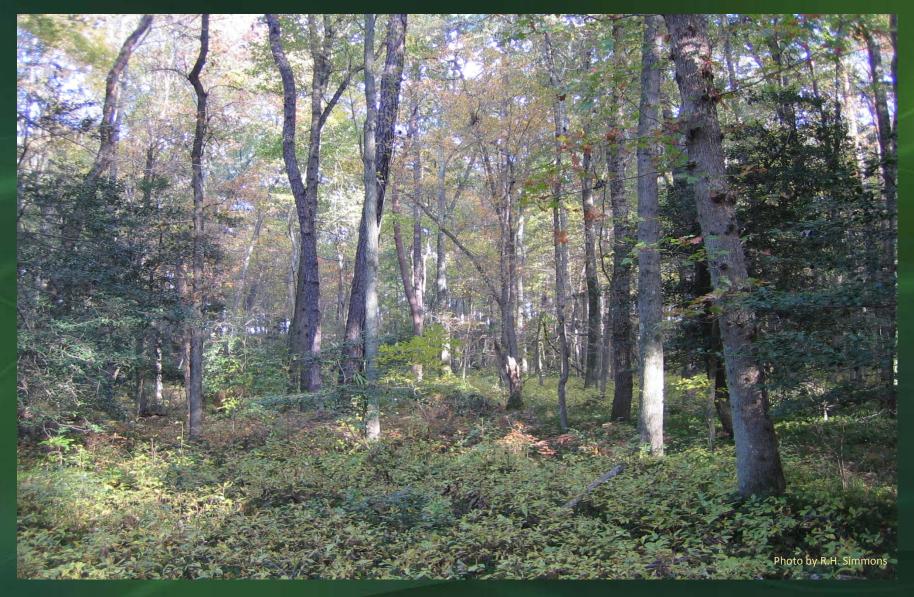




Extensive upland pine barrens of the Western Shore: *Pinus rigida* – *Quercus coccinea* – *Quercus falcata* / (*Quercus marilandica*) / *Gaylussacia frondosa* Woodland (USNVC: CEGL006329) at the "Central Farm" of the Beltsville Agricultural Research Center (BARC) in northern Prince George's County. Global/State Ranks: G1/S1.



Lowland pine barrens of the Western Shore at the "Central Farm" of the Beltsville Agricultural Research Center (BARC) in northern Prince George's County with extensive, co-dominant colonies of Dangleberry (Gaylussacia frondosa). Global/State Ranks: G1/S1.



Pitch Pine – Red Maple Saturated Forest: *Pinus rigida – Nyssa sylvatica / Clethra alnifolia – Eubotrys racemosus* Forest (USNVC: CEGL006926) in lowland pine barrens of the Western Shore at the "East Farm" of the Beltsville Agricultural Research Center (BARC) in northern Prince George's County.



Coastal Plain / Outer Piedmont Acidic Seepage Swamp: Acer rubrum – Nyssa sylvatica – Magnolia virginiana / Viburnum nudum / Osmundastrum cinnamomeum – Woodwardia areolata Forest (USNVC: CEGL006238). Extensive examples of this community type occur in sandy lowlands throughout the "Central Farm" and "East Farm" of the Beltsville Agricultural Research Center (BARC) in northern Prince George's County, as well as northern Anne Arundel County and the Western Shore.



Pristine example of old-age Central Appalachian / Inner Piedmont Low-Elevation Chestnut Oak Forest: *Quercus montana - (Quercus coccinea, Quercus rubra) / Kalmia latifolia / Vaccinium pallidum* Forest (USNVC: CEGL006299) atop high gravel terrace of the fall line (zone) in the City of Alexandria, Virginia. Lowbush Blueberry (*Vaccinium pallidum*) and Black Huckleberry (*Gaylussacia baccata*) are co-dominant at this site.



Pink-flowered form of Trailing Arbutus (*Epigaea repens*) in old-age section of gravelly Oak-Heath Forest at the INOVA Alexandria Hospital Scenic Easement in the City of Alexandria, Virginia. At the fall line and inner coastal plain, Trailing Arbutus typically grows on steep, mossy, somewhat windswept, north-facing forested slopes and banks.



Large Dangleberry (*Gaylussacia frondosa*) colony in diverse section of Oak-Heath Forest on sandy slope above the Winkler Bog complex in the City of Alexandria, Virginia. The western extent of sandy-gravelly, coastal plain soils of the Potomac Formation along the fall line (zone) is generally the western extent of Dangleberry, except for rare occurrences in the piedmont and mountains to the south.



Staggerbush (Lyonia mariana) (L.) D. Don G5,S5

A medium-sized shrub of acidic, dry to mesic, Oak-Pine-Heath forests, ranging from New York and Connecticut south to Texas and Florida (disjunct in some central and deep south states). A plant of the coastal plain in Maryland and Virginia, it is rare in the piedmont and absent from the mountains.

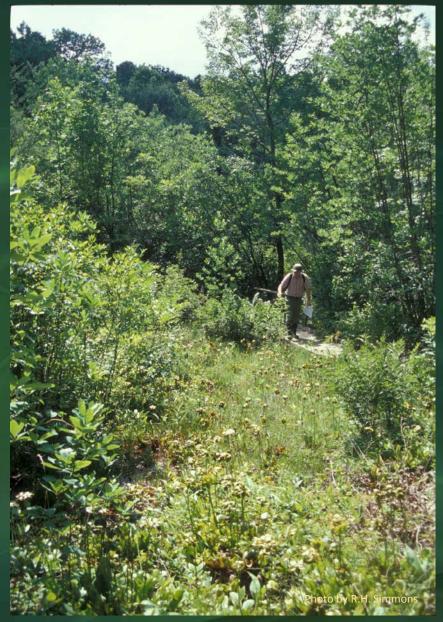
Maleberry (*Lyonia ligustrina*) (L.) DC. var. ligustrina G5,S5

A medium to tall (to 4 m), upright shrub of seepage swamps, bogs, depression ponds and swamps, dry to mesic Oak-Heath Forest, acidic coves, and heath balds, ranging from Maine south to Alabama and Georgia. Like Black Highbush Blueberry (Vaccinium fuscatum), Deerberry (Vaccinium stamineum), and Pinxterbloom Azalea (Rhododendron periclymenoides), it is widespread throughout Maryland and grows in soils that are less acidic and infertile, such as those of the Triassic Basin in the piedmont (PD).





The aptly-named "Fern Belt" at the northeastern edge of the former Winkler Botanical Preserve in the City of Alexandria, Virginia as it appeared in the early 1990s. This pristine wetlands was regionally famous as one of the best 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: CEGL006219). A large colony of the earlier-blooming, low, pink-flowered, glaucous-leaved variety of Swamp Azalea (Rhododendron viscosum) (L.) Torr. var. ? occurs in a large seepage to the northeast of this site; also historically throughout similar communities in Arlington County, Virginia; D.C.; and the Western Shore.



Mark Strong at the Suitland Bog in Prince George's County, near the Bog Huckleberry (*Gaylussacia bigeloviana*) site.

Bog Huckleberry (*Gaylussacia bigeloviana***)** (Fern.) Sorrie & Weakley G?,S1



A low shrub that superficially resembles Black Huckleberry (*Gaylussacia baccata*) and known only in Maryland and vicinity from sphagnous edges of Western Shore seepage bogs in D.C., Prince George's County, and Anne Arundel County, with the only known extant station at Suitland Bog. Its primarily northeastern range extends from Quebec, Nfld., Labr., and Nova Scotia south to South Carolina, including Washington, D.C. and Maryland, and likely Virginia.

The very similar **Dwarf Huckleberry** (*Gaylussacia dumosa*) (Andrews) Gray is primarily a plant of sandy soils of the coastal plain, with rare occurrences in the inner piedmont and mountains. As currently circumscribed, it ranges from West Virginia and Virginia south through the southeastern states to Louisiana and Florida. It is not known to occur in Maryland, but is reported from sand barrens of Delaware.

The larger corolla (and maybe fruit) size of *G. bigeloviana* (6.5-7.5 mm) vs. smaller corolla size of *G. dumosa* (3-5 mm) and generally larger size of *G. bigeloviana* (6-10 dm tall) vs. 1-3 dm tall in *G. dumosa* are the main distinguishing characteristics.



Pristine stand of Central Appalachian / Inner Piedmont Low-Elevation Chestnut Oak Forest: *Quercus montana* - (*Quercus coccinea, Quercus rubra*) / *Kalmia latifolia* / *Vaccinium pallidum* Forest (USNVC: CEGL006299), with codominant colonies of Mountain Laurel, on rugged, north-facing slope of Laurel Formation bedrock above Rock Creek at Rock Creek Park, Washington, D.C.

Shinleaf (Pyrola spp.) range and distribution



Steep, north-facing slope of Laurel Formation bedrock at the upper Northwest Branch Gorge, Montgomery County, Maryland. Round-leaved Pyrola (*Pyrola americana*) occurs here with a diversity of ericads.

Round-leaved Pyrola (Pyrola americana) Sweet G5,S5

Dry to mesic, coniferous or deciduous forest, typically mixed oak forest in our area, ranging from boreal Canada, Nfld., and Labr. south to Tennessee and North Carolina.

Waxflower Shinleaf (Pyrola elliptica) Nutt. G5,S5

Dry, upland forests, ranging from boreal Canada, Nfld., and Labr. south to North Carolina.

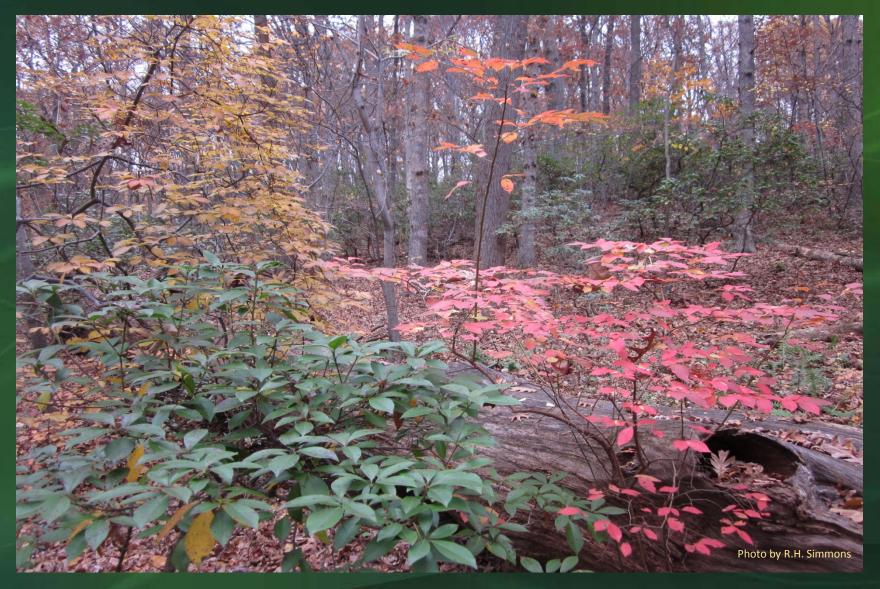


Green-flowered Wintergreen (*Pyrola chlorantha***)** Sweet (syn. *Pyrola virens*) Schweigg & Korte G5,S5

Dry to mesic forests, ranging from subarctic and boreal Canada south to Virginia (in the eastern U.S.).

One-sided Shinleaf (*Orthilia secunda***)** L. House (syn. *Pyrola secunda*) L. G5,SH

Dry to mesic, coniferous and mixed forest, ranging from Arctic, Greenland, boreal Canada, Nfld., and Labr. south to Virginia (in the eastern U.S.). Typically associated with *Pinus virginiana* in Virginia (Flora of Virginia).



Fall colors of Pinxterbloom Azalea (*Rhododendron periclymenoides*) (gold; far left) and Black Highbush Blueberry (*Vaccinium fuscatum*) (red; far right) with Mountain Laurel (*Kalmia latifolia*) along a tributary of Accotink Creek in the piedmont of Fairfax County, Virginia.



Upland Depression Swamp at Travilah Serpentine Barrens in Montgomery County with co-dominant stands of Black Highbush Blueberry (*Vaccinium fuscatum*) and Fetterbush (*Eubotrys racemosus*). Fetterbush is increasingly rare to absent throughout the inner piedmont and mountains.

Highbush Blueberry (Vaccinium spp.) range and distribution



Highbush Blueberry (Vaccinium corymbosum) L. G5,S5

A tall shrub with narrowly to broadly elliptic leaves (2-3 cm wide) and white-pubescence on midrib of leaf under surface. It characteristically occurs in acidic seepage wetlands, swamps, bogs, coastal flatwoods, depression ponds, and damp, acidic forests, ranging from Nova Scotia westward to Michigan and south to Tennessee and South Carolina. Flora of North America (FNA) includes *V. caesariense, V. formosum*, and *V. fuscatum* within *V. corymbosum*. In Maryland, *V. corymbosum* mainly occurs in damp, boggy, and sphagnous seepage wetlands and flatwoods of the coastal plain and outer piedmont (see ¹Uttal 1987). Tetraploid.

¹Uttal, L.J. 1987. The genus Vaccinium L. (Ericaceae) in Virginia. Castanea 52: pp. 231-255.

Black Highbush Blueberry (Vaccinium fuscatum) Aiton G5,S5

A tall shrub with gray-green pubescent leaves and black fruit. It grows in similar habitats as *V. corymbosum*, but has a broader range in Maryland and perhaps a higher tolerance for drier, less acidic soils. It ranges from southern Ontario and Maine south to Texas and Florida and is the dominant highbush blueberry of the piedmont in Maryland and northern Virginia. Two "races" occur in Virginia: a diploid with narrowly-elliptic leaves and a tetraploid with larger, broadly elliptic leaves (Uttal 1987).

New Jersey Blueberry (Vaccinium caesariense) Mack. G4?,SU

A tall shrub with glabrous, narrowly elliptic leaves to 2 cm wide that are strongly glaucous on the underside. A plant of the Atlantic coastal plain, ranging from Maine (westward to central New York) and south predominately along the coastal plain to northern Florida. Apparently rare in Virginia (Uttal 1987). Diploid.

Southern Blueberry (Vaccinium formosum) Andrews G5,S5(?)

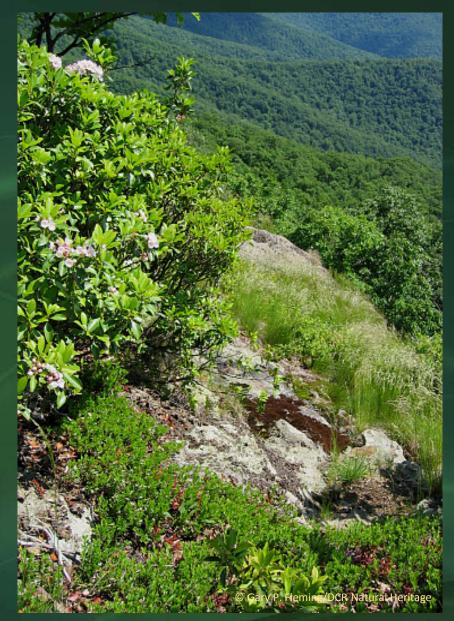
A tall shrub with glabrous leaves (2.5-4.5 cm wide) that are broadest below the middle and often glaucous on the underside. A plant of the Atlantic coastal plain, ranging from New Jersey south to Alabama and northern Florida. Tetraploid.

Vaccinium x marianum Wats. GU,SU

V. formosum "hybridizes and forms a continuum (V. x marianum) with V. fuscatum, without wiping out the parents." (Uttal 1987). "Generally keys to V. corymbosum" (VDA 2013).



Blue Ridge Physiographic Province in Maryland: western Frederick County and eastern Washington County.



Bearberry (*Arctostaphylos uva-ursi*), Mountain Laurel (*Kalmia latifolia*), and Wavy Hairgrass (*Deschampsia flexuosa*) in an acidic woodland opening at Miller's Head, Page County, Virginia.

Bearberry (Arctostaphylos uva-ursi) (L.) Spreng. G5,S1



A dwarf, creeping, evergreen shrub that somewhat resembles Box Huckleberry (*Gaylussacia brachycera*). It is found in acidic, sandy or rocky soils and ranges from subarctic and boreal Canada, Greenland, Nfld., and Labr. south to Virginia (in the eastern U.S.).

In Virginia, Bearberry is known only from Miller's Head, Shenandoah National Park, Page County in the Northern Blue Ridge on exposed, high-elevation granitic outcrops (VBA 2013). Maryland's sole station for this plant is "exposed shale along ridgeline above Sideling Hill Creek" in Allegany County, where it was discovered in 1998 (2Knapp 2011).

¹Virginia Botanical Associates. 2013. Digital Atlas of the Virginia Flora (http://www.vaplantatlas.org).

²Knapp, W.M., R.F.C. Naczi, W.D. Longbottom, C.A. Davis, W.A. McAvoy, C.T. Frye, J.W. Harrison, and P. Stango, III. 2011. Floristic discoveries in Delaware, Maryland, and Virginia. Phytoneuron 64: pp. 1–26.



Roseshell (*Rhododendron prinophyllum*) (Small) Millais is "strongly disjunct" in its distribution from New Hampshire and Massachusetts south to Missouri, Oklahoma, Texas, Alabama, and North Carolina. It occurs mainly in the mountains of Maryland in dry to mesic, rocky woods, along stream banks, seepage swamps, and bogs.

Deciduous Azalea (*Rhododendron* spp.) diversity, range, and distribution in western Maryland



Flame Azalea (*Rhododendron calendulaceum*) (Michx.) Torr. at Dolly Sods, West Virginia. An allotetraploid species of mainly high-elevation mixed deciduous forests, heath balds, and stream banks, ranging from Ohio and Pennsylvania south to Tennessee and Georgia. It is restricted to the Appalachian Plateau in Maryland with global and state ranks of G5,S1.

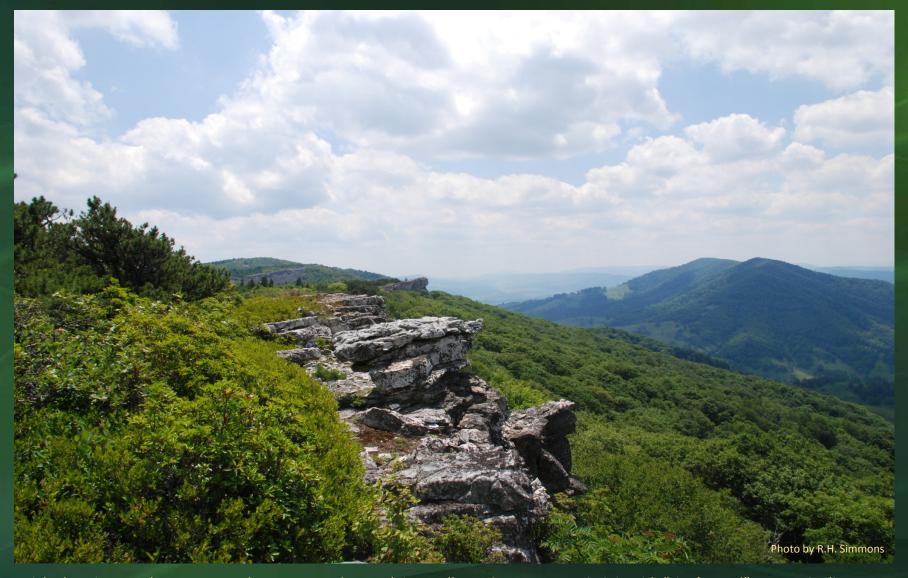
Smooth Azalea (*Rhododendron arborescens***)** (Pursh) Torr. G4G5,S4

A plant of rocky stream banks, rocky seeps, rocky woodland, and heath balds, ranging from Pennsylvania south to Alabama and Georgia. In Virginia, it usually occurs "within or just above the zone of frequent flood-scouring" (VBA 2013), such as along the Potomac River in Fairfax County. Its easternmost extent in Maryland is the Potomac Gorge area of Montgomery County, where it is rare or historical, and is relatively uncommon throughout the uplands of western Maryland.





Rosebay or Great Laurel (*Rhododendron maximum*) L. is a large, evergreen shrub of rocky stream banks, north-facing mesic woodland, high elevation acidic coves and seepage swamps, and heath balds, ranging in distribution from Maine south to Alabama and Georgia. It is a dominant plant of the Appalachians and in Maryland is common in the Ridge and Valley and Appalachian Plateau. Its easternmost extent in Maryland is more or less the fall line area of Montgomery County and Rock Creek Park in Washington, D.C.



High elevation, sandstone outcrop barren at Panther Knob in Pendleton County, West Virginia with "Lion's Head" outcrop in distance (back center of photo). **Early Lowbush Blueberry (Vaccinium angustifolium)** Aiton is a low, colony-forming shrub of dry, high-elevation forests and sandy open areas, barrens, and boulder fields and outcrops, as well as seepage swamps and bogs, "especially under spruce" (VBA 2013). It ranges from boreal Canada, Nfld., and Labr. south to Tennessee and North Carolina. In Maryland, it occurs primarily in the Ridge and Valley and Appalachian Plateau provinces.



High elevation, sandstone outcrop barren atop Panther Knob in Pendleton County, West Virginia with Table Mountain Pine (*Pinus pungens*), Black Huckleberry (*Gaylussacia baccata*), **Velvetleaf Blueberry or Sourtop (***Vaccinium myrtilloides*) Michx., and Mountain Laurel (*Kalmia latifolia*). Velvetleaf Blueberry is a dwarf, colonial shrub of high-elevation outcrops and forest, boreal glades, and bogs, with densely white-pubescent (velvety) twigs and leaves. It ranges from boreal Canada, Nfld., and Labr. south to Virginia and is a "Watch List" species in Maryland (G5,S3), where it is known only from Garrett County (AP).



High elevation, sandstone outcrop barren atop Panther Knob in Pendleton County, West Virginia with dense colonies of Black Huckleberry (*Gaulussacia baccata*) in foreground and Minniebush (*Menziesia pilosa*) growing in exposed rock crevices along the edge of the ridge and cliffs and boulder slopes (middle center and right).

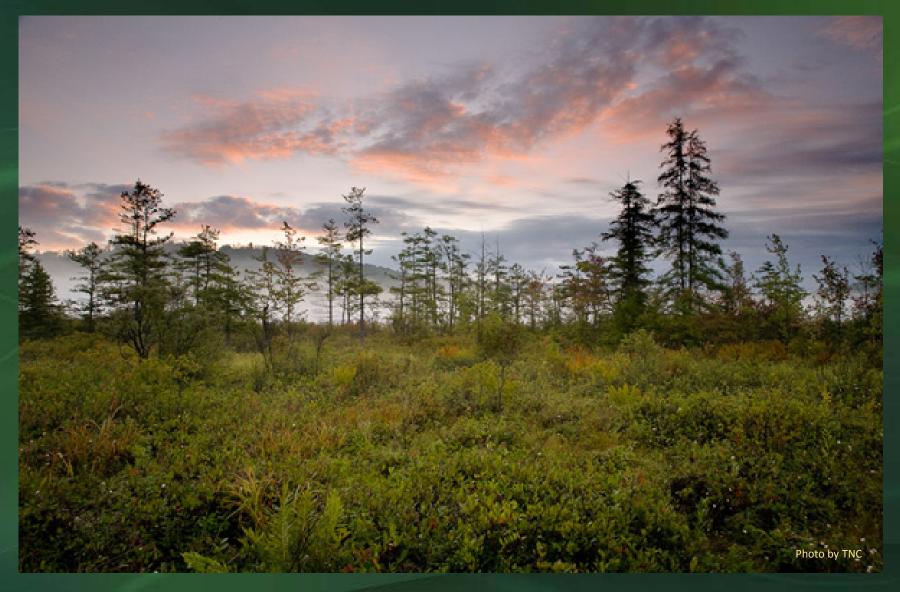
Minniebush (Menziesia pilosa) (Michx.) Juss. G4G5,S4

A medium-sized shrub of heath balds, rocky summits and boulder slopes, dry to mesic, acidic forests, and sphagnous bogs and seepage swamps, ranging from southern Pennsylvania to Georgia.

It is a central and southern Appalachian endemic, occurring mainly at high elevations, and is a conservation concern throughout much of its range (FNA).

In Maryland, it is known from the Ridge and Valley and Appalachian Plateau.





Cranesville Sub-Arctic Swamp on the West Virginia border in Garrett County, Maryland on the Appalachian Plateau.

Boreal ericads of high elevation bogs and acidic seepage wetlands in Garrett County with a primarily northern range and distribution



Dense, semi-floating mat of Small Cranberry (small leaves with whitish undersides), glossy-leaved Eastern Teaberry (*Gaultheria procumbens*), and red color phase of *Sphagnum* moss at Cranesville Swamp, Garrett County - a high elevation, boreal relict, seepage wetland.

Creeping Snowberry (Gaultheria hispidula) (L.) Muhl. ex Bigelow G5,S1

A small, evergreen, vining-creeping shrub of high-elevation coniferous forests and sphagnous seepage wetlands and bogs, ranging from boreal Canada, Nfld., and Labr. south to Maryland and West Virginia.

Small Cranberry (Vaccinium oxycoccos) L. G5,S2

A vining, evergreen shrub known in Maryland from sphagnous, high elevation bogs, mountain pond edges, and acidic seepage wetlands in Garrett County (AP). This tetraploid species may be distinguished from diploid *Vaccinium macrocarpon* by its smaller size; leaves that are strongly revolute and whitish on the undersides; and the situation of pedicillar bracts below the middle of the pedicel (see ¹Uttal 1987).

Large Cranberry (Vaccinium macrocarpon) Ait. G4,S3

A vining, evergreen shrub known primarily in Maryland from sphagnous, high elevation bogs, mountain pond edges, and acidic seepage wetlands in Garrett County (AP) and ice age relictual, sphagnous seepage bogs in Anne Arundel County (WS). The Wicomico County occurrence (ES) is likely extirpated. The large clone southeast of the boardwalk at Suitland Bog in Prince George's County (WS) is considered to have been introduced in the early-to-mid 20th century.

¹Uttal, L.J. 1987. The genus Vaccinium L. (Ericaceae) in Virginia. Castanea 52: pp. 231-255.

Acknowledgements:

PowerPoint presentation by R.H. Simmons; template courtesy Diana Carter.

Maryland Native Plant Society, especially Chris Puttock, Kirsten and Dwight Johnson, Joe Metzger, Charlie Davis, Cris Fleming, Karyn Molines, and Marney Bruce.

Chris Frye, Wes Knapp, and Jason Harrison of the Maryland Department of Natural Resources, Wildlife and Heritage Service.

Gary Fleming and the Virginia Botanical Associates.

Mark Strong and the D.C. Herbarium of the U.S. National Herbarium (US), Smithsonian National Museum of Natural History, Tapia Schuster, Curator of the Norton-Brown Herbarium (MARY); Andrea Weeks, Curator of the Ted. R. Bradley Herbarium (GMUF); and Alan Weakley, Director and Curator of the UNC Herbarium (NCU), North Carolina Botanical Garden.

Photos: R.H. Simmons, Gary P. Fleming, TNC, Chris Frye, Jason Harrison, Garth Wedemire, Garden Centre Group, MNPS Archives, M. First, Will Cook, James Henderson, Janet Novak, Fleanor Saulys, Flore du Quebec, Deep Creek Cellars, Michael Juskelis and Don Ni, and Chuck Allen.

City of Alexandria Department Recreation, Parks, and Cultural Activities, Natural Resources Division and Park
Operations Division, especially Scott Graham and Fatmata Tibbs.

Ericaceae. Volume 8. In: Flora of North America Editorial Committee (eds.). 2009. Flora of North America North of Mexico. New York, New York.

Friends of the City of Alexandria Herbarium.