

**AN INVENTORY
OF
THE SIGNIFICANT NATURAL AREAS
OF
POLK COUNTY,
NORTH CAROLINA**

David Campbell
Inventory Biologist

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and the
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ABSTRACT

This inventory of the significant natural areas, ecological communities, and rare species of Polk County was funded by the Pacolet Area Conservancy (now Conserving Carolina) and the Polk County Community Foundation. Dr. James F. Matthews also graciously provided initial funding (along with much critical advice and mentorship) for botanical inventory work prior to the inception of this formal study. This report identifies Significant Natural Heritage Areas (SNHAs) in Polk County, North Carolina. Background information is provided on the county, including descriptions of 32 Significant Natural Heritage Areas (SNHAs), comprising two of national significance, fifteen that are state significant, and fifteen regionally significant sites. Individual site reports include information relating to location, significance, community types, rare species, management needs and in some cases, comments. Field work for this inventory was initiated in 2011, with major portions taking place during 2015-2017. Voucher specimens collected during this study have been deposited at the Mecklenburg County Herbarium (UNCC) and the Herbarium of the University of North Carolina at Chapel Hill (NCU). This report is intended in part, to provide guidance for land use decisions undertaken by private landowners, conservation and land management agencies as well as officials in county government.

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Any errors or omissions are the sole responsibility of the author.

David Campbell, Botanist
June, 2018

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INTRODUCTION

OBJECTIVES

The primary objective of the present study was to locate and identify those sites within Polk County that contain the most significant natural heritage attributes. Significant sites are those that are considered to have outstanding representations of rare species and/or natural community types, as well as aesthetic, biodiversity, cultural, ecological, recreational, and overall scientific values. The continued preservation of these sites is critical in maintaining the viability of populations of at-risk species, the conservation of regional biodiversity, and the maintenance of water quality through groundwater recharge and pollution abatement.

This introduction provides a general synopsis of the methods employed during this inventory, as well as a description of Polk County's topographic, geological, and climatic features. Listings are also provided of the natural community types, rare plant, and animal species. The introductory section is followed by detailed site descriptions of all 32 Significant Natural Heritage Areas (SNHAs) that include maps, information relating to location, significance, community types, rare species, management needs, comments, and references.

METHODS

The methods used in this inventory are those established by the North Carolina Natural Heritage Program (NC NHP), part of the Office of Conservation and Community Affairs (OCCA), within the North Carolina Department of Environment and Natural Resources (NC DENR). The NC NHP maintains the state's primary database and geographic information for rare species (both plant and animal), as well as exemplary natural community types and significant SNHAs. This survey's focus was to identify Significant Natural Heritage Areas (SNHAs) wherever they might occur within Polk County.

The goals of this inventory were to identify and rank high quality natural areas qualifying as SNHAs. Natural areas, which are often somewhat disturbed, retain a substantial amount of their original composition and character. This inventory used data maintained by the NC NHP about 2 previously identified SNHAs and rare species occurrences, as well as previous reports on natural areas, topographic, soil, and geologic maps, and aerial photographs. Criteria used to determine significance of the various sites visited include quality and importance as well as the overall integrity of the site and areas surrounding it. For each site, natural communities and rare species were described using report formats developed by the NC NHP. SNHAs are rated as nationally, state, regional, or county significant using the criteria established by the NC NHP and The Nature Conservancy (TNC) which accesses statewide and global rarity for species and communities.

For a number of reasons, this inventory is not a complete record of all the natural areas in Polk County. Although thousands of acres were identified, surveyed, and found to be significant, this only represents a fraction of the land area within the county. Some potential areas were not

surveyed due to lack of landowner permission. Smaller, fragmented tracts in less pristine condition precluded survey in other areas. It is almost certain that additional natural areas will be found in due time as areas once inaccessible become available for biological survey.



Lampropeltis elapsoides; public domain

DESCRIPTION OF THE STUDY AREA

STUDY AREA

Founded in 1855 and named after Colonel William Polk of the American Revolutionary War, Polk County is located in southwestern North Carolina. Polk County shares its northern and eastern borders with Rutherford County, its western border with Henderson County, and its southern border with Greenville and Spartanburg Counties, South Carolina. According to US Census Bureau data, the population as of 2015 was 20,366. The county seat is Columbus, with the largest municipal area being Tryon. Polk County is popular with equestrians and has increasingly become a destination for retirees. The county has a total land area of 239 square miles, making it one of North Carolina's smallest counties. Figure 1 shows the major roads and municipalities of Polk County.

PHYSIOGRAPHY AND TOPOGRAPHY

Polk County includes sections of the Piedmont Physiographic Province (central and eastern portions of the county), as well as parts of the Blue Ridge Physiographic Province (western and northern portions of the county). Steep slopes and ridges with numerous streams are common in the mountainous areas of the county that are approximately above 1,200 feet. Those areas below 1,200 feet typically feature the rolling hills and broader rivers seen throughout the Piedmont. Elevations are greatest in the western sections of the County, with Tryon Peak at 3,280 feet, being the highest. The lowest elevations are found in the southeastern portions of the county, at about 700 feet, along the Green River.

Polk County lies within the Green and Pacolet River drainages. Drainage patterns typically conform to a northwest to northeast direction; however, some western portions of the county do drain from southwest to northeast. Figure 2 shows the geomorphic regions of Polk County.

CLIMATE

Polk County is located in the Isothermal Belt of North Carolina and, as a result, experiences a milder climate than some areas of the surrounding region. Precipitation is ample, with a yearly average of approximately 58 inches. The average winter daytime temperature is 48.2 degrees Fahrenheit while the average summer daytime temperature is 84.5 degrees Fahrenheit.

GEOLOGY

Figure 3 shows the geologic map of Polk County illustrating the six major rock types that have been mapped in Polk County: Migmatitic Granitic Gneiss, Biotite Gneiss and Shist, Mica Shist, Garnet - Mica Shist, Porphyroblastic Gneiss, and Inequigranular Biotite Gneiss. Small inclusions

of amphibolite, a type of metamorphic mafic rock, have been documented in Polk County. Mafic rocks weather to form rich soils that are higher in pH than is typical for the region and, as a result, often support rare plant species and unusual natural community types.

Broadly speaking, areas in the eastern section of Polk County contain more felsic rocks which give rise to soils that are acidic in nature (although even here, there are sites such as Pea Ridge and White Oak Creek that have some soils that are very base-rich inclusions within the overall landscape). In contrast, western sections of the county appear to harbor more mafic rocks that produce soils with the higher pH values.

LAND USE

The majority of Polk County is in private ownership and consists of forested tracts, farms, fields, and some municipal areas. Large sections of public land are administered as Game Lands by the NC Wildlife Resources Commission and provide access to hunting, hiking, fishing, and other recreational pursuits. Logging does not appear to be a major concern at this time, although increasing residential development presents numerous conservation challenges, particularly in ecologically sensitive sites such as wetlands and certain ridgetop plant communities. Several areas are owned by or are under conservation easement with Conserving Carolina, Upstate Forever, and Saluda Community Land Trust, local land trust and conservation organizations. Figure 4 shows public and private conservation lands of Polk County.

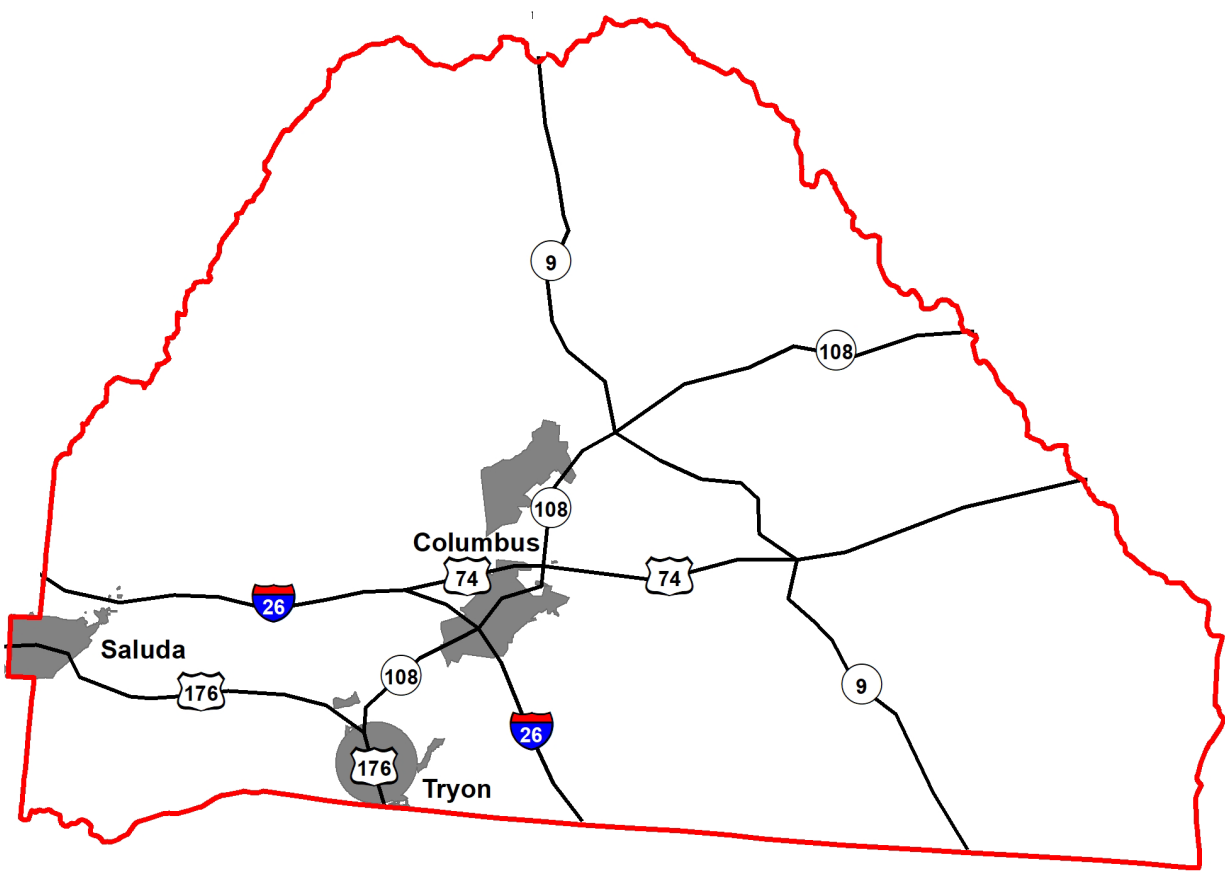


Figure 1. Municipalities and Roads of Polk County, North Carolina.

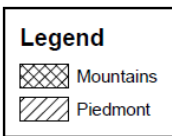
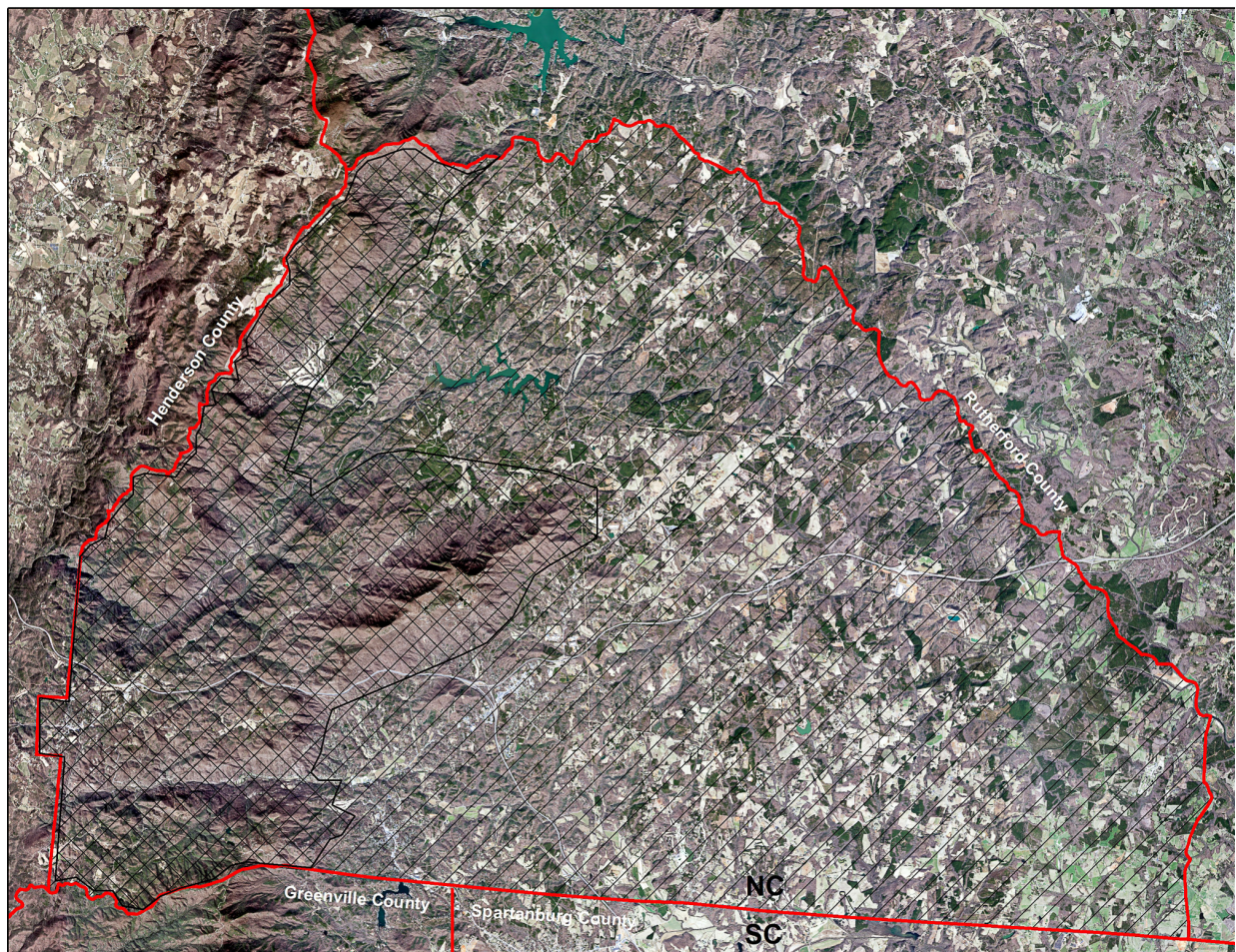


Figure 2. Aerial Image and Physiographical Map of Polk County, North Carolina.

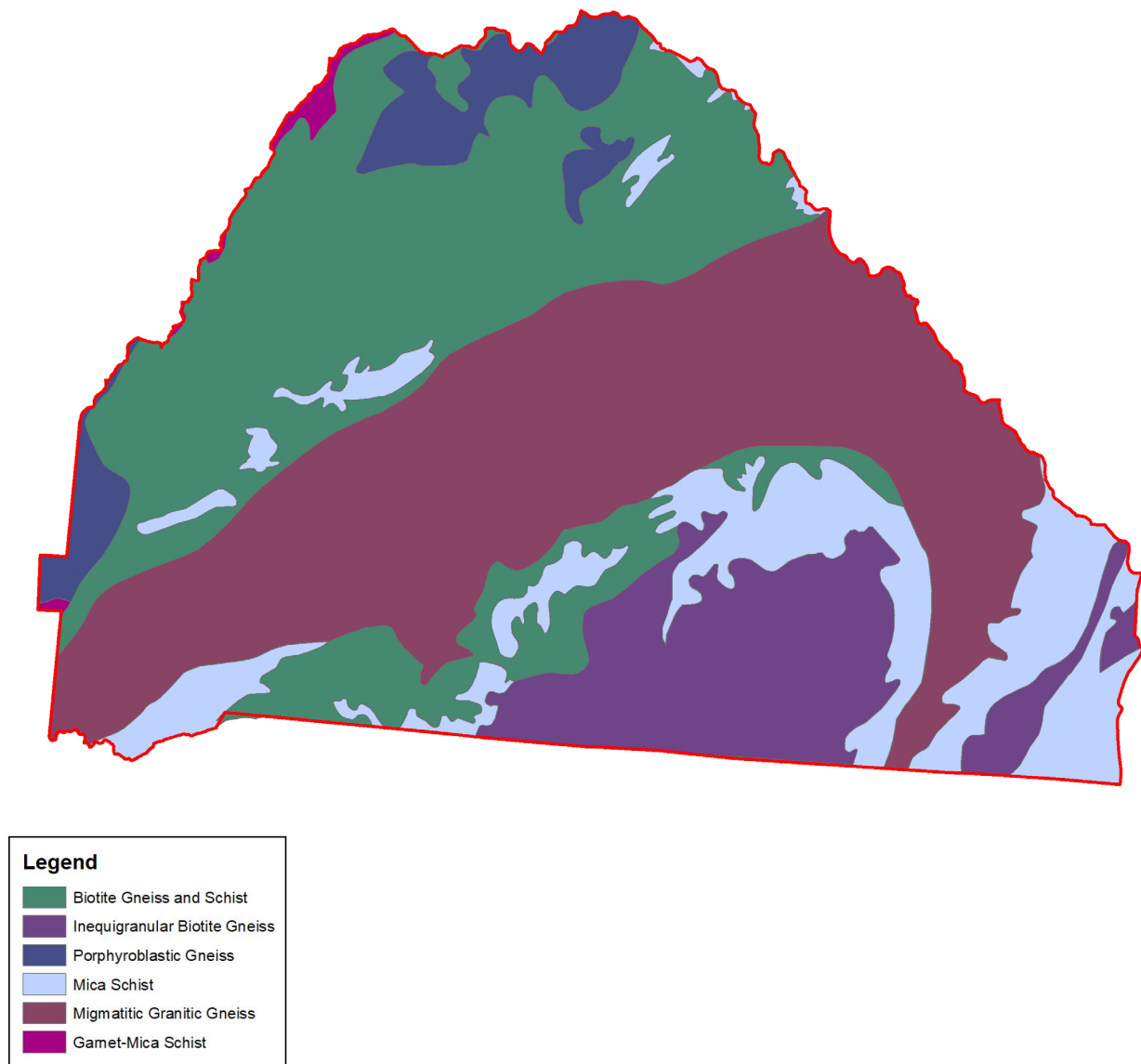


Figure 3. Geologic Map of Polk County, North Carolina.

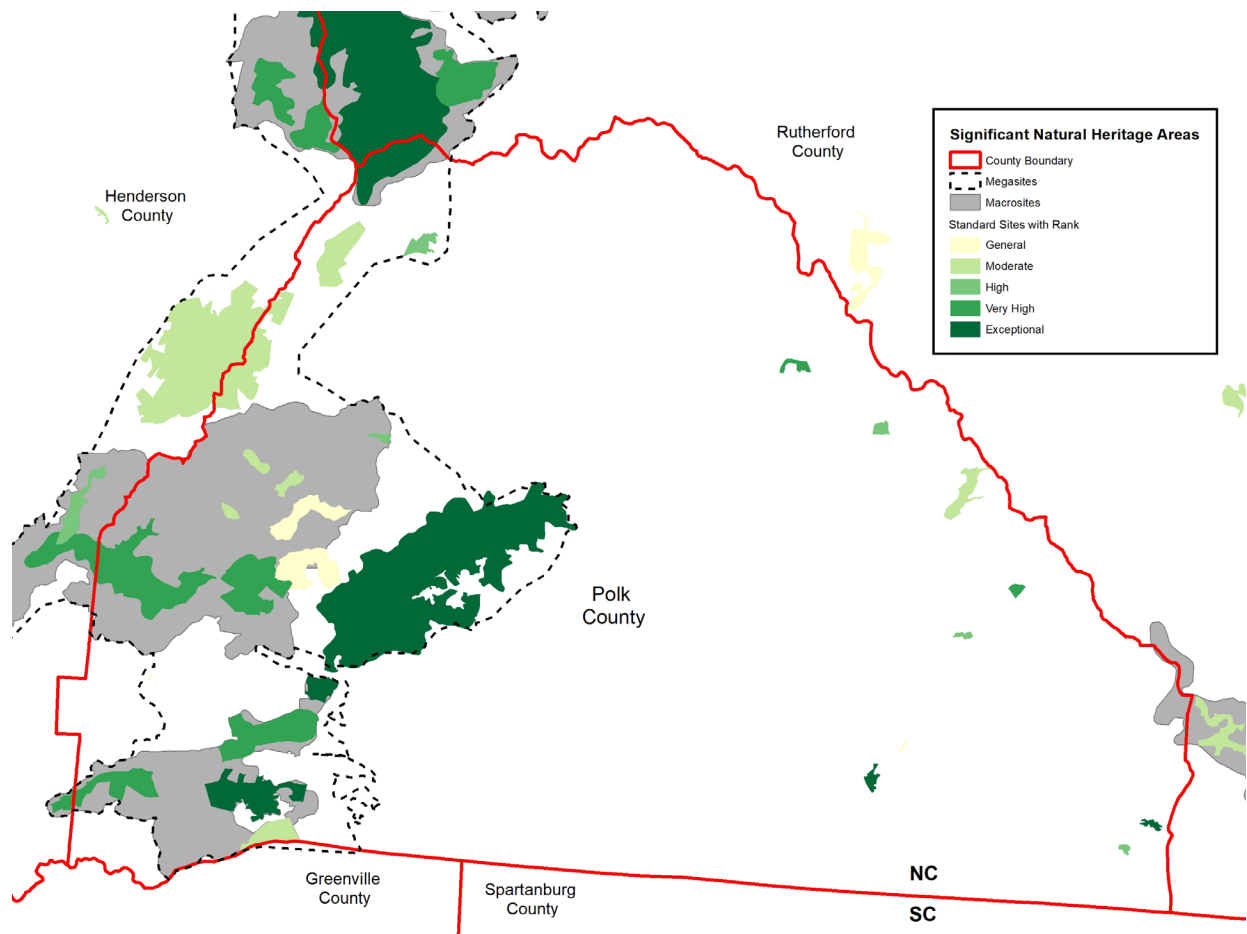


Figure 4. Significant Natural Heritage Areas of Polk County, North Carolina.

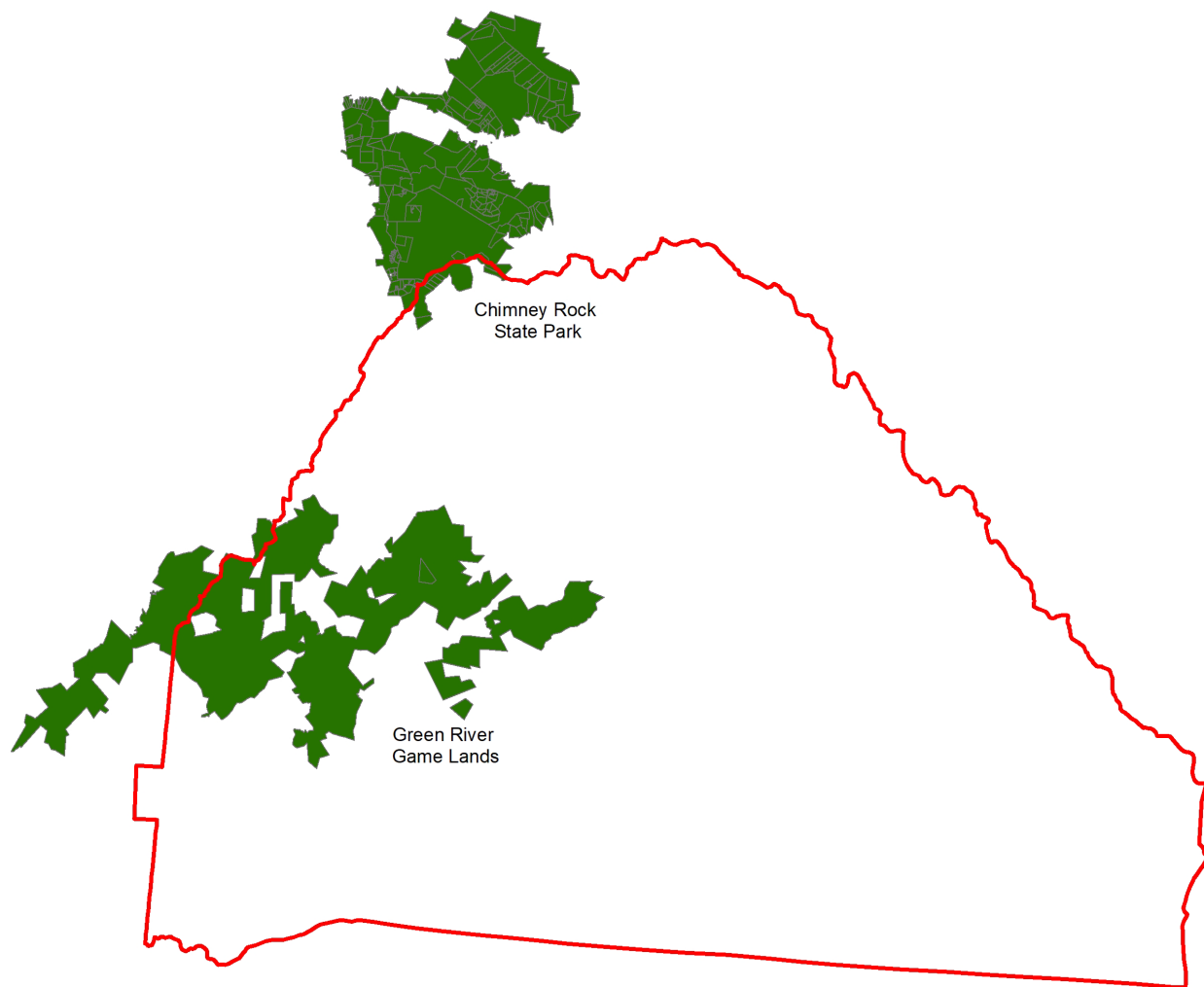


Figure 5. Public Conservation Lands of Polk County, North Carolina.

THE BIODIVERSITY OF POLK COUNTY

For the purposes of the present study, the definition of a natural community is that which is employed in Schafale's *Guide to the Natural Communities of North Carolina (Fourth Approximation)*, which states that a natural community is: "...a distinct and reoccurring assemblage of populations of plants, animals, bacteria, and fungi naturally associated with each other and their physical environment." Thus, we may see that the definition of the community is not solely dependent upon vegetation alone but includes an array of characteristics that in turn are influenced by hydrology, aspect, soils, pH, disturbance history, and other factors.

Thirty-four distinct natural community types were identified as a result of field investigations undertaken during this survey, descriptions of which are outlined, below.

Table 1. Ecological grouping of natural community types occurring in Polk County, North Carolina with state and global ranks.

ECOLOGICAL GROUPING	RANK	
	STATE	GLOBAL
Mountain Cove Forests		
Rich Cove Forest (Montane Intermediate Subtype)	S4	G4
Rich Cove Forest (Montane Rich Subtype)	S3	G3G4
Rich Cove Forest (Foothills Intermediate Subtype)	S3	G4?
Rich Cove Forest (Foothills Rich Subtype)	S2	G2G3
Acidic Cove Forest (Typic Subtype)	S4	G5
Canada Hemlock Forest (Typic Subtype)	S1S2	G3G4
Piedmont and Coastal Plain Mesic Forests		
Mesic Mixed Hardwood Forest (Piedmont Subtype)	S4	G3G4
Basic Mesic Forest (Piedmont Subtype)	S3S4	G3G4
Piedmont/Coastal Plain Heath Bluff	S3	G3
Mountain Dry Coniferous Woodlands		
Pine-Oak/Heath (Typic Subtype)	S3	G3
Low Mountain Pine Forest (Shortleaf Pine Subtype)	S2	G2G3
Low Mountain Pine Forest (Montane Pine Subtype)	S2?	G3G4
Mountain Oak Forests		
Chestnut Oak Forest (Dry Heath Subtype)	S5	G5
Chestnut Oak Forest (Herb Subtype)	S4	G4G5
Montane Oak-Hickory Forest (Acidic Subtype)	S4S5	G4G5
Montane Oak-Hickory Forest (Basic Subtype)	S3	G3
Low Montane Red Oak Forest	S4?	G4?
Piedmont and Coastal Plain Oak Forests		
Dry-Mesic Oak-Hickory Forest (Piedmont Subtype)	S4	G4G5
Low Elevation Cliffs and Rock Outcrops		
Low Elevation Rocky Summit (Acidic Subtype)	S2	G3?
Low Elevation Rocky Summit (Basic Subtype)	S1	G1
Montane Cliff (Acidic Herb Subtype)	S3	G3G4
Montane Cliff (Mafic Subtype)	S3	G3
Piedmont and Mountain Glades and Barrens		
Low Elevation Basic Glade (Montane Subtype)	S2	G2
Piedmont and Mountain Floodplains		
Montane Alluvial Forest (Large River Subtype)	S1	G2

Piedmont Alluvial Forest	S4	G4
Piedmont Headwater Stream Forest (Typic Subtype)	S3S4	G3G4
Piedmont Levee Forest (Typic Subtype)	S3S4	G3G4
Floodplain Pool	S2	G3
Rocky Bar and Shore (Alder-Yellowroot Subtype)	S3	G3G4
Piedmont/Mountain Semi-permanent Impoundment (Piedmont Marsh Subtype)	S4	G4?
Piedmont/Mountain Semi-permanent Impoundment (Shrub Subtype)	S4	G4
Upland Seepages and Spray Cliffs		
Spray Cliff	S2	G2
Low Elevation Seep (Typic Subtype)	S3	G3?
Low Elevation Seep (Piedmont/Mountain Springhead Subtype)	S1	G2

*See page 41 for full description of rank codes for natural communities.

NATURAL COMMUNITY DESCRIPTIONS

Rich Cove Forest (Montane Intermediate Subtype)

Typically found on north-facing slopes at mid to upper elevations (in Polk County) with a canopy consisting of White Oak (*Quercus alba*), Northern Red Oak (*Quercus rubra*), Tulip Poplar (*Liriodendron tulipifera*), White Basswood (*Tilia americana* var. *heterophylla*), Red Elm (*Ulmus rubra*), Mockernut Hickory (*Carya tomentosa*), Bitternut Hickory (*Carya cordiformis*), Sweet Birch (*Betula lenta*), Cucumber Magnolia (*Magnolia acuminata*), and White Ash (*Fraxinus americana*). The shrub layer may be moderate, with Spicebush (*Lindera benzoin*), Sweetshrub (*Calycanthus floridus*), Snowy Hydrangea (*Hydrangea radiata*), Alternate-leaf Dogwood (*Cornus alternifolia*), Carolina Silverbell (*Halesia tetraptera*), and Hairy Mock-orange (*Philadelphus hirsutus*). Herbaceous diversity is quite high (although lacking the most calciphilic species of richer sites). Typical of this community are Pennywort (*Obolaria virginica*), Green Violet (*Hybanthus concolor*), Yellow Mandarin (*Prosartes lanuginosa*), Lowland Bladder Fern (*Cystopteris protrusa*), Spring Beauty (*Claytonia virginica*), Appalachian False Goatsbeard (*Astilbe biternata*), Showy Orchis (*Galearis spectabilis*), Northern Maidenhair Fern (*Adiantum pedatum*), and Common Jack-in-the-pulpit (*Arisaema triphyllum* ssp. *triphyllum*).

Rich Cove Forest (Montane Rich Subtype)

Botanically diverse and, in our area, confined to middle and higher elevational slopes on the richest soils. Canopy dominants may include Northern Red Oak (*Quercus rubra*), White Oak (*Quercus alba*), Tulip Poplar (*Liriodendron tulipifera*), Yellow Buckeye (*Aesculus flava*), White Basswood (*Tilia americana* var. *heterophylla*), White Ash (*Fraxinus americana*), Red Elm (*Ulmus rubra*), Bitternut Hickory (*Carya cordiformis*), Northern Hackberry (*Celtis occidentalis*), Fraser Magnolia (*Magnolia fraseri*), Cucumber Magnolia (*Magnolia acuminata* var. *acuminata*), Red Mulberry (*Morus rubra*), Common Silverbell (*Halesia tetraptera* var. *tetraptera*), and Sweet Birch (*Betula lenta* var. *lenta*). Shrub diversity is high, with Spicebush (*Lindera benzoin*), Pawpaw (*Asimina triloba*), Sweetshrub (*Calycanthus floridus*), Alternate-leaved Dogwood (*Cornus alternifolia*), Fringetree (*Chionanthus virginicus*), Strawberry-bush (*Euonymus americanus*), Bigleaf Snowbell (*Styrax grandifolius*), and Mapleleaf Viburnum (*Viburnum acerifolium*). Vines include Dutchman's Pipe (*Isotrema macrophyllum*), Virginia Creeper (*Parthenocissus quinquefolia*), Moonseed (*Menispermum canadense*), and Grape (*Vitis* spp.). Herbaceous diversity is very high with typical species being Blue Cohosh (*Caulophyllum thalictroides*), Sweet White Trillium (*Trillium simile*), Seersucker Sedge (*Carex plantaginea*), American Ginseng (*Panax quinquefolius*), Black Cohosh (*Actaea racemosa*), Bland Sweet Cicely (*Osmorhiza claytonii*), Green Violet (*Hybanthus concolor*), Appalachian False Goatsbeard (*Astilbe biternata*), Early Meadow-rue (*Thalictrum dioicum*), Solomon's Seal (*Polygonatum biflorum*), American Alumroot (*Heuchera americana*), Zigzag Goldenrod (*Solidago flexicaulis*), Showy Orchis (*Galearis spectabilis*), Mapleleaf Waterleaf (*Hydrophyllum canadense*), Large-flowered Trillium (*Trillium grandiflorum*), Pennywort (*Obolaria virginica*), and Mountain Anemone (*Anemone lancifolia*).

Rich Cove Forest (Foothills Intermediate Subtype)

Mid-elevation north-facing slopes in the western and northern portions of the county contain several examples of this community type. The canopy is typically dominated by Tulip Poplar (*Liriodendron tulipifera*), Yellow Buckeye (*Aesculus flava*), Northern Red Oak (*Quercus rubra*), White Ash (*Fraxinus americana*), White Basswood (*Tilia americana* var. *heterophylla*), Common Silverbell (*Halesia tetraptera* var. *tetraptera*), and Cucumber Magnolia (*Magnolia acuminata*). Shrubs present often include Spicebush (*Lindera benzoin*), Mapleleaf Viburnum (*Viburnum acerifolium*), Scentless Mock-orange (*Philadelphus inodorus*), Sweetshrub (*Calycanthus floridus*), and American Witch-hazel (*Hamamelis virginiana* var. *virginiana*). Woody vines consist of Grape (*Vitis* spp.), Common Greenbrier (*Smilax rotundifolia*), and Poison Ivy (*Toxicodendron radicans*). The herbaceous layer is often very lush and diverse and includes Rattlesnake Fern (*Botrychium virginianum*), Northern Maidenhair Fern (*Adiantum pedatum*), Christmas Fern (*Polystichum acrostichoides*), Glade Fern (*Homalosorus pycnocarpus*), Silvery Glade Fern (*Deparia acrostichoides*), Blue Cohosh (*Caulophyllum thalictroides*), Jack-in-the-pulpit (*Arisaema triphyllum*), Black Cohosh (*Actaea racemosa*), American Ginseng (*Panax quinquefolius*), Broad-leaf Coreopsis (*Coreopsis latifolia*), Virginia Snakeroot (*Endodeca serpentaria*), Yellow Mandarin (*Prosartes lanuginosa*), Zigzag Spiderwort (*Tradescantia subaspera*), Large Yellow Lady's-Slipper (*Cypripedium parviflorum* var. *pubescens*), Common White Snakeroot (*Ageratina altissima* var. *altissima*), Upland Boneset (*Eupatorium sessilifolium* var. *sessilifolium*), Whorled Wild Yam (*Dioscorea quaternata*), Bosc's Witchgrass (*Dichanthelium boscii*), Bloodroot (*Sanguinaria canadensis*), Puttyroot (*Aplectrum hyemale*), Eastern Longleaf Bluet (*Houstonia longifolia* var. *compacta*), and Wood Nettle (*Laportea canadensis*).

Rich Cove Forest (Foothills Rich Subtype)

A community type that is found at lower elevations on sheltered or north-facing slopes with richer soil series. Canopy dominants in these communities may include White Basswood (*Tilia americana* var. *heterophylla*), Yellow Buckeye (*Aesculus flava*), Tulip Poplar (*Liriodendron tulipifera*), White Ash (*Fraxinus americana*), Bitternut Hickory (*Carya cordiformis*), and Red Elm (*Ulmus rubra*). Examples of shrubs present are Spicebush (*Lindera benzoin*) and Pawpaw (*Asimina triloba*). Common woody vines are Grape (*Vitis* spp.) and Poison Ivy (*Toxicodendron radicans*). The herbaceous layer may be quite diverse in some areas with Tall White Violet (*Viola canadensis* var. *canadensis*), Blue Cohosh (*Caulophyllum thalictroides*), Northern Maidenhair Fern (*Adiantum pedatum*), Jack-in-the-pulpit (*Arisaema triphyllum*), Common Wild Ginger (*Asarum canadense*), Puttyroot (*Aplectrum hyemale*), Yellow Mandarin (*Prosartes lanuginosa*), Wake-robin Trillium (*Trillium erectum*), Large-flowered Trillium (*Trillium grandiflorum*), Mapleleaf Waterleaf (*Hydrophyllum canadense*), Walking Fern (*Asplenium rhizophyllum*), and Wild Columbine (*Aquilegia canadensis*).

Acidic Cove Forest (Typic Subtype)

Frequently encountered on upper to mid-elevational sites with sheltered aspect. Typical canopy dominants include Northern Red Oak (*Quercus rubra*), Black Oak (*Quercus velutina*), Tulip Poplar (*Liriodendron tulipifera*), Sweet Birch (*Betula lenta*), Mockernut Hickory (*Carya tomentosa*), Sourwood (*Oxydendrum arboreum*), Persimmon (*Diospyros virginiana*), Red Maple (*Acer rubrum* var. *rubrum*), Flowering Dogwood (*Cornus florida*), and Cucumber Magnolia (*Magnolia acuminata* var. *acuminata*). Eastern Hemlock (*Tsuga canadensis*) is present in low numbers, if at all. Commonly encountered shrubs include Rosebay Rhododendron (*Rhododendron maximum*), Mountain Doghobble (*Leucothoe fontanesiana*), and Piedmont Rhododendron (*Rhododendron minus*). Woody vine diversity is moderate with Grape (*Vitis* spp.), Poison Ivy (*Toxicodendron radicans*), Common Greenbrier (*Smilax rotundifolia*), and Virginia Creeper (*Parthenocissus quinquefolia*). Herbaceous density is variable, including Downy Rattlesnake Plantain (*Goodyera pubescens*), Little Brown Jug (*Hexastylis arifolia* var. *arifolia*), Christmas Fern (*Polystichum acrostichoides*), Crane-fly Orchid (*Tipularia discolor*), Rattlesnake Weed (*Hieracium venosum*), Dwarf Crested Iris (*Iris cristata*), Catesby's Trillium (*Trillium catesbaei*), and Bearcorn (*Conopholis americana*). The absence of species characteristic of more base-rich soils is diagnostic.

Canada Hemlock Forest (Typic Subtype)

In our region, this community is found in deep gorges and on north-facing slopes above streams and rivers with mesic soils and a canopy dominated by Eastern Hemlock (*Tsuga canadensis*). Most sites now contain abundant dead snags of once mature trees due to the Hemlock Woolly Adelgid (*Adelges tsugae*). Tulip Poplar (*Liriodendron tulipifera*), Sweet Birch (*Betula lenta*), Northern Red Oak (*Quercus rubra*), and Fraser Magnolia (*Magnolia fraseri*) appear to be filling in the canopy gaps created by the dying Hemlocks. The shrub layer is dominated by Rosebay Rhododendron (*Rhododendron maximum*), Mountain Doghobble (*Leucothoe fontanesiana*), and Mountain Sweet-pepperbush (*Clethra acuminata*). Grape (*Vitis* spp.) are often the only woody vines present. The herb layer is sparse but will often include Little Brown Jug (*Hexastylis arifolia* var. *arifolia*), Downy Rattlesnake Plantain (*Goodyera pubescens*), and Christmas Fern (*Polystichum acrostichoides*).

Mesic Mixed Hardwood Forest (Piedmont Subtype)

One of the region's more common community types, found on north-facing mid to lower slopes with mesic acidic soils. Canopy dominants include American Beech (*Fagus grandifolia*), Tulip Poplar (*Liriodendron tulipifera*), White Oak (*Quercus alba*), Northern Red Oak (*Quercus rubra*), Black Oak (*Quercus velutina*), Sourwood (*Oxydendrum arboreum*), and Flowering Dogwood (*Cornus florida*). Shrub diversity is moderate, with Sweetshrub (*Calycanthus floridus* var. *floridus*), Alternate-leaf Dogwood (*Cornus alternifolia*), American Strawberry Bush (*Euonymus americanus*), Mountain Doghobble (*Leucothoe fontanesiana*). Eastern Poison Ivy (*Toxicodendron*

radicans ssp. *radicans*) and Summer Grape (*Vitis aestivalis* var. *aestivalis*) are commonly encountered vines. Typical species found in the herb layer are Dwarf Crested Iris (*Iris cristata*), Common Golden Alexanders (*Zizia aurea*), Catesby's Trillium (*Trillium catesbaei*), Christmas Fern (*Polystichum acrostichoides*), Carolina Woodrush (*Luzula acuminata* var. *carolinae*), Bearcorn (*Conopholis americana*), Beechdrops (*Epifagus virginiana*), Little Brown Jug (*Hexastylis arifolia* var. *arifolia*), Windflower (*Thalictrum thalictroides*), Cranefly Orchid (*Tipularia discolor*), Ebony Spleenwort (*Asplenium platyneuron*), and Southern Lady Fern (*Athyrium asplenoides*).

Basic Mesic Forest (Piedmont Subtype)

Found on north-facing or sheltered slopes with base-rich soils. Canopy dominants include Northern Red Oak (*Quercus rubra*), White Oak (*Quercus alba*), Tulip Poplar (*Liriodendron tulipifera*), American Beech (*Fagus grandifolia*), and White Basswood (*Tilia americana* var. *heterophylla*). Commonly encountered shrubs in this community are Spicebush (*Lindera benzoin* var. *benzoin*), Pawpaw (*Asimina triloba*), Painted Buckeye (*Aesculus sylvatica*), and Maple-leaf Viburnum (*Viburnum acerifolium*). The herb layer is often quite diverse with species such as Green Violet (*Hybanthus concolor*), Eastern Columbine (*Aquilegia canadensis*), Little Sweet Betsy Trillium (*Trillium cuneatum*), Northern Maidenhair Fern (*Adiantum pedatum*), American Ginseng (*Panax quinquefolius*), Bloodroot (*Sanguinaria canadensis*), Dutchman's Britches (*Dicentra cucullaria*), Wild Ginger (*Asarum canadense*), Puttyroot (*Aplecrum hyemale*), and Jack-in-the-pulpit (*Arisaema triphyllum*).

Piedmont/Coastal Plain Heath Bluff

In our region, this community type occurs on cool north-facing bluffs with American Beech (*Fagus grandifolia*) and a shrub layer consisting of dense thickets of Mountain Laurel (*Kalmia latifolia*) with lesser numbers of Dryland Blueberry (*Vaccinium pallidum*), Horse Sugar (*Symplocos tinctoria*), and Dwarf Pawpaw (*Asimina parviflora*). Herbaceous species diversity is fairly low, but does include Galax (*Galax urceolata*), Inidan Pipes (*Monotropa uniflora*), Catesby's Trillium (*Trillium catesbaei*), Virginia Goat's Rue (*Tephrosia virginiana*), Green Needlegrass (*Piptochaetium avenaceum*), and Bracken (*Pteridium latiusculum*).

Pine-Oak/Heath (Typic Subtype)

In our area, typically found on mid-elevation dry ridgetops with southerly aspects that lack extensive canopy cover and with a dense shrub layer mostly consisting of Ericads. Chestnut Oak (*Quercus montana*) is usually present along with Table Mountain Pine (*Pinus pungens*), Virginia Pine (*Pinus virginiana*), and Shortleaf Pine (*Pinus echinata*). Ericaceous shrubs are abundant, with Mountain Laurel (*Kalmia latifolia*) and Dryland Blueberry (*Vaccinium pallidum*) being common associates. Galax (*Galax urceolata*), Broomsedge (*Andropogon virginicus* var. *virginicus*), and

Virginia Goat's Rue (*Tephrosia virginiana*) are frequently encountered members of the sparse herbaceous community.

Low Mountain Pine Forest (Shortleaf Pine Subtype)

Found on moderate slopes and xeric ridgetops with acidic soils. The canopy is predominantly Shortleaf Pine (*Pinus echinata*), with lesser numbers of Virginia Pine (*Pinus virginiana*), Chestnut Oak (*Quercus montana*), Scarlet Oak (*Quercus coccinea*), Sweet Pignut Hickory (*Carya ovalis*), Sand Hickory (*Carya pallida*), Mockernut Hickory (*Carya tomentosa*), Red Maple (*Acer rubrum*), Sassafras (*Sassafras albidum*), and Persimmon (*Diospyros virginiana*). Shrubs present include Mountain Laurel (*Kalmia latifolia*) and Dryland Blueberry (*Vaccinium pallidum*). Vines are not numerous but one may encounter scattered individuals of Common Greenbrier (*Smilax rotundifolia*) and Whiteleaf Greenbrier (*Smilax glauca*). Herbaceous diversity is sparse and may include Spiked Hoarypea (*Tephrosia spicata*), Pink Lady's Slipper (*Cypripedium acaule*), Biltmore Carrionflower (*Smilax biltmoreana*), Small Heartleaf Ginger (*Hexastylis minor*), Blackseed Needlegrass (*Piptochaetium avenaceum*), and Common Running-cedar (*Diphasiastrum digitatum*).

Low Mountain Pine Forest (Montane Pine Subtype)

Lower to mid-slopes with dry soils, often with southern or south-west facing aspect. Pines present are those more typical of higher elevations, including Virginia Pine (*Pinus virginiana*), Pitch Pine (*Pinus rigida*), and Table Mountain Pine (*Pinus pungens*), and Oaks that are tolerant of fairly xeric conditions. Dryland Blueberry (*Vaccinium pallidum*) and Black Huckleberry (*Gaylussacia baccata*) are common shrubs present in the understory. Trailing Arbutus (*Epigaea repens*), Partridgeberry (*Mitchella repens*), and Wintergreen (*Gaultheria procumbens*) are occasional species in the relatively sparse herb layer.

Chestnut Oak Forest (Dry Heath Subtype)

Found on dry ridgetops at moderate elevations. As the name suggests, the canopy is heavily dominated by Chestnut Oak (*Quercus montana*) with lesser amounts of Scarlet Oak (*Quercus coccinea*), Black Oak (*Quercus velutina*), Virginia Pine (*Pinus virginiana*), Shortleaf Pine (*Pinus echinata*), Mockernut Hickory (*Carya tomentosa*), Sand Hickory (*Carya pallida*), Red Maple (*Acer rubrum* var. *rubrum*), Black Gum (*Nyssa sylvatica*), Persimmon (*Diospyros virginiana*), Sourwood (*Oxydendrum arboreum*), and Flowering Dogwood (*Cornus florida*). White Oak (*Quercus alba*) is essentially absent. The shrub layer is dense, well developed, and dominated by Ericads. Typical shrub species are Mountain Laurel (*Kalmia latifolia*), Sassafras (*Sassafras albidum*), Dryland Blueberry (*Vaccinium pallidum*), Dwarf Pawpaw (*Asimina parviflora*), Sweetleaf (*Symplocos tinctoria*), and Trailing Arbutus (*Epigaea repens*). Woody vines are mostly Greenbriers (*Smilax* spp.). Herbaceous diversity is relatively low but may include Spotted

Wintergreen (*Chimaphila maculata*), Partridgeberry (*Mitchella repens*), Biltmore Carrionflower (*Smilax biltmoreana*), Black Snakeroot (*Sanicula canadensis* var. *canadensis*), Poverty Oatgrass (*Danthonia spicata*), Broomsedge (*Andropogon virginicus* var. *virginicus*), Galax (*Galax urceolata*), and Wintergreen (*Gaultheria procumbens*).

Chestnut Oak Forest (Herb Subtype)

Communities on dry ridges and slopes that are dominated by Chestnut Oak (*Quercus montana*) but lack a dense shrub layer (although ericaceous shrubs will typically be present in some numbers). Herbaceous species may include Bearded Shorthusk (*Brachyelytrum erectum*), Poverty Oat Grass (*Danthonia spicata*), Downy Danthonia (*Danthonia sericea*), White Milkweed (*Asclepias variegata*), Biltmore Carrion Flower (*Smilax biltmoreana*), Virginia Goat's Rue (*Tephrosia virginiana*), Birdsfoot Violet (*Viola pedata* var. *pedata*), and Curtiss' Milkwort (*Polygala curtissii*).

Montane Oak-Hickory Forest (Acidic Subtype)

Montane Oak-Hickory Forest (Acidic Subtype) is found on the summit and some sections of north-facing slopes. The canopy is dominated by Chestnut Oak (*Quercus montana*), White Oak (*Quercus alba*), Northern Red Oak (*Quercus rubra*), Black Oak (*Quercus velutina*), Red Maple (*Acer rubrum*), Black Cherry (*Prunus serotina*), Black Locust (*Robinia pseudoacacia*), Mockernut Hickory (*Carya tomentosa*), Black Gum (*Nyssa sylvatica*), Sassafras (*Sassafras albidum*), and Tulip Poplar (*Liriodendron tulipifera*). The shrub layer is almost exclusively ericaceous, with Mountain Laurel (*Kalmia latifolia*) and Dryland Blueberry (*Vaccinium pallidum*) being the most abundant. The herbaceous layer is quite depauperate but does include Common White Snakeroot (*Ageratina altissima* var. *altissima*), Virginia Goat's Rue (*Tephrosia virginiana*), Bracken Fern (*Pteridium latiusculum*), and Green Needlegrass (*Piptochaetium avenaceum*).

Montane Oak-Hickory Forest (Basic Subtype)

A frequently encountered community type in the central and western portions of Polk County. Typical canopy dominants are White Oak (*Quercus alba*), Black Oak (*Quercus velutina*), Northern Red Oak (*Quercus rubra*), Chestnut Oak (*Quercus montana*), Sand Hickory (*Carya pallida*), Shagbark Hickory (*Carya ovata*), Mockernut Hickory (*Carya tomentosa*), Tulip Poplar (*Liriodendron tulipifera*), White Ash (*Fraxinus americana*), and Red Elm (*Ulmus rubra*). The shrub layer has moderate diversity and may include Mapleleaf Viburnum (*Viburnum acerifolium*), American Witch-Hazel (*Hamamelis virginiana* var. *virginiana*), Mountain Indigo-bush (*Amorpha glabra*), and Dryland Blueberry (*Vaccinium pallidum*). Several species of woody vines occur, including Common Greenbrier (*Smilax rotundifolia*), Poison Ivy (*Toxicodendron radicans*), Trumpet Creeper (*Campsis radicans*), and Virginia Creeper (*Parthenocissus quinquefolia*). Commonly encountered herbs are Black Cohosh (*Actaea racemosa*), Mountain Bunchflower

(*Veratrum parviflorum*), Appalachian Oak-leach (*Aureolaria laevigata*), American Lovage (*Ligusticum canadense*), Bloodroot (*Sanguinaria canadensis*), Common Shorthusk (*Brachyelytrum erectum*), Yellow Pimpernel (*Taenidia integerrima*), Eastern Flowering Spurge (*Euphorbia corollata*), and Nettleleaf Noseburn (*Tragia urticifolia*). This is also the preferred habitat of the endangered White Irisette (*Sisyrinchium dichotomum*).

Low Montane Red Oak Forest

Occurring on lower to mid-elevational slopes, often north or northwest-facing, and on mesic soils. Northern Red Oak (*Quercus rubra*) predominates with lesser amounts of species such as Black Oak (*Quercus velutina*), Chestnut Oak (*Quercus montana*), Sassafras (*Sassafras albidum*), Black Gum (*Nyssa sylvatica*), Pignut Hickory (*Carya glabra*), Flowering Dogwood (*Cornus florida*), Persimmon (*Diospyros virginiana*), and Tulip Poplar (*Liriodendron tulipifera*). A defining characteristic of this community type is the absence of White Oak (*Quercus alba*). Shrub diversity is moderate, with Sweetshrub (*Calycanthus floridus*), American Witch-Hazel (*Hamamelis virginiana* var. *virginiana*), Piedmont Rhododendron (*Rhododendron minus*), Strawberry-bush (*Euonymus americanus*), Mapleleaf Viburnum (*Viburnum acerifolium*), Alternate-leaf Dogwood (*Cornus alternifolia*), and Snowy Hydrangea (*Hydrangea radiata*). Heaths are not abundant in the community. The herbaceous layer is moderately diverse and may include Bearcorn (*Conopholis americana*), Downy Rattlesnake Plantain (*Goodyera pubescens*), Christmas Fern (*Polystichum acrostichoides*), Northern Maidenhair Fern (*Adiantum pedatum*), Rattlesnake Fern (*Botrypus virginianus*), and Virginia Snakeroot (*Endodeca serpentaria*).

Dry-Mesic Oak-Hickory Forest (Piedmont Subtype)

A commonly encountered community in our area that occurs on upper and mid-slopes with dry-mesic soils. Canopy species commonly encountered include White Oak (*Quercus alba*), Northern Red Oak (*Quercus rubra*), Black Oak (*Quercus velutina*), Mockernut Hickory (*Carya tomentosa*), Pignut Hickory (*Carya glabra*), Red Maple (*Acer rubrum* var. *rubrum*), Tulip Poplar (*Liriodendron tulipifera*), and American Holly (*Ilex opaca* var. *opaca*). Shrubs frequently encountered are Mountain Laurel (*Kalmia latifolia*), Dryland Blueberry (*Vaccinium pallidum*), and Black Huckleberry (*Gaylussacia baccata*). Woody vines are predominantly Grape (*Vitis* spp.), Common Greenbrier (*Smilax rotundifolia*), and Poison Ivy (*Toxicodendron radicans*). Herbs are typically sparse, but include Downy Rattlesnake Plantain (*Goodyera pubescens*), Crane-fly Orchid (*Tipularia discolor*), Naked Tick-trefoil (*Hylodesmum nudiflorum*), Indian Pipes (*Monotropa uniflora*), Pinesap (*Hypopitys monotropa*), and Common White Snakeroot (*Ageratina altissima* var. *altissima*).

Low Elevation Rocky Summit (Acidic Subtype)

The Low Elevation Rocky Summit (Acidic Subtype) occurs on felsic rocks, often where the terrain is very steep. Tree species that may be found here are Scarlet Oak (*Quercus coccinea*), Chestnut Oak (*Quercus montana*), Mockernut Hickory (*Carya tomentosa*), Sand Hickory (*Carya pallida*), Persimmon (*Diospyros virginiana*), Black Gum (*Nyssa sylvatica*), Virginia Pine (*Pinus virginiana*), and Sourwood (*Oxydendrum arboreum*). Shrubs present include Mountain Laurel (*Kalmia latifolia*), Black Huckleberry (*Gaylussacia baccata*), and Dryland Blueberry (*Vaccinium pallidum*). The herbaceous layer is not very diverse, but may include Spotted Wintergreen (*Chimaphila maculata*), Broomsedge (*Andropogon virginicus* var. *virginicus*), Southern Harebell (*Campanula divaricata*), Virginia Goat's Rue (*Tephrosia virginiana*), American Dittany (*Cunila origanoides*), Hairy Common Toadflax (*Nuttallanthus canadensis*), and Alumroot (*Heuchera villosa*). This community type may be observed on Tryon Peak.

Low Elevation Rocky Summit (Basic Subtype)

Found on exposed rock faces, boulders, and outcrops consisting of rocks that weather to form base-rich soils. Trees and shrubs, although present, are not numerous. The herbaceous layer is not diverse but does include species that are typically indicative of higher pH soils such as Hairy Lipfern (*Myriopteris lanosa*), American Alumroot (*Heuchera americana*), Lowland Bladder Fern (*Cystopteris protrusa*), Early Saxifrage (*Micranthes virginensis*), and Rock Spikemoss (*Bryodesma rupestre*).

Montane Cliff (Acidic Herb Subtype)

Bare, exposed, vertical rock faces that are often partially or wholly inaccessible and composed of felsic rocks supporting acidophilic plant species. A limited flora is found on these sites with typical associates such as Eastern Red Cedar (*Juniperus virginiana* var. *virginiana*), Rock Spikemoss (*Bryodesma rupestre*), Mapleleaf Alumroot (*Heuchera villosa* var. *villosa*), Poverty Oatgrass (*Danthonia spicata*), Mountain Spleenwort (*Asplenium montanum*), and occasionally the rare Bradley's Spleenwort (*Asplenium bradleyi*).

Montane Cliff (Mafic Subtype)

Wildcat Spur in western Polk County harbors an example of this uncommon community type. Areas of open rock (some inaccessible) with few trees occur on these outcrops. Scattered individuals of Red Elm (*Ulmus rubra*) and Winged Elm (*Ulmus alata*) are sometimes encountered. Shrubs characteristic of this habitat include Hairy Mock-orange (*Philadelphus hirsutus*), Fragrant Sumac (*Rhus aromatica*), Wafer-ash (*Ptelea trifoliata*), and Smooth Hydrangea (*Hydrangea arborescens*). Woody vines that are often encountered are Yellow Honeysuckle (*Lonicera flava*), Poison Ivy (*Toxicodendron radicans*), and Trumpet Creeper (*Campsis radicans*). Notable herbaceous species are Woolly Lipfern (*Myriopteris tomentosa*), Walking Fern (*Asplenium*

rhizophyllum), American Alumroot (*Heuchera americana*), and Wild Columbine (*Aquilegia canadensis*), all of which are typically indicative of base-rich substrates.

Low Elevation Basic Glade (Montane Subtype)

This globally-rare community type may be found on the south-facing slopes of Tryon Peak. Sites typically have extensive areas of bare rock, such as amphibolite, or other base-rich rock types. Trees are typically not numerous, but may include Chestnut Oak (*Quercus montana*), Northern Red Oak (*Quercus rubra*), and Virginia Pine (*Pinus virginiana*). Typical shrubs are Eastern Red Cedar (*Juniperus virginiana*) and Hairy Mock-orange (*Philadelphus hirsutus*). Areas of shallow soil mats in glade-like openings have a herbaceous flora characteristic of this community type, such as Divided-leaf Ragwort (*Packera millefolium*), Early Saxifrage (*Micranthes virginiensis*), Michaux's Saxifrage (*Hydatia petiolaris*), Allegheny Live-forever (*Hylotelephium telephioides*), Biltmore Sedge (*Carex biltmoreana*), River Oats (*Chasmanthium latifolium*), Rock Spikemoss (*Bryodesma rupestre*), Broomsedge (*Andropogon virginicus* var. *virginicus*), and Appalachian Cliff Fern (*Woodsia appalachiana*).

Montane Alluvial Forest (Large River Subtype)

Floodplain areas of the Green River contain examples of Montane Alluvial Forest (Large River Subtype). The canopy typically consists of Sycamore (*Platanus occidentalis* var. *occidentalis*), Tulip Poplar (*Liriodendron tulipifera*), Green Ash (*Fraxinus pennsylvanica*), Black Walnut (*Juglans nigra*), River Birch (*Betula nigra*), Sweetgum (*Liquidambar styraciflua*), and Sugarberry (*Celtis laevigata*). Spicebush (*Lindera benzoin*), Sweetshrub (*Calycanthus floridus*), American Hazelnut (*Corylus americana*), and Tag Alder (*Alnus serrulata*) are commonly encountered shrubs. Poison Ivy (*Toxicodendron radicans*) is often abundant and can reach large sizes. The herbaceous community often includes River Oats (*Chasmanthium latifolium*), Virginia Bugleweed (*Lycopus virginicus*), Common Woodreed (*Cinna arundinacea*), Sensitive Fern (*Onoclea sensibilis* var. *sensibilis*), Yellow Fumitory (*Corydalis flavula*), Greater Bladder Sedge (*Carex intumescens* var. *intumescens*), and New York Ironweed (*Vernonia noveboracensis*).

Piedmont Alluvial Forest

Narrow floodplains that experience some amounts of flooding produce the Piedmont Alluvial Forest community type. Typical canopy species are Sycamore (*Platanus occidentalis*), River Birch (*Betula nigra*), Sugarberry (*Celtis laevigata*), Tulip Poplar (*Liriodendron tulipifera*), Red Maple (*Acer rubrum*), Sweet Gum (*Liquidambar styraciflua*), and Green Ash (*Fraxinus pennsylvanica*). The shrub layer contains characteristic species such as Spicebush (*Lindera benzoin*), Pawpaw (*Asimina triloba*), Buttonbush (*Cephalanthus occidentalis*), Yellowroot (*Xanthorhiza simplicissima*), and Tag Alder (*Alnus serrulata*). Vines may be abundant and include Trumpet Creeper (*Campsis radicans*), Cross-vine (*Bignonia capreolata*), Catbrier (*Smilax bona-nox*),

Round-leaved Catbrier (*Smilax rotundifolia*), Posion Ivy (*Toxicodendron radicans*), and Virginia Creeper (*Parthenocissus quinquefolia*). Herbaceous diversity is typically modest with Sweet Betsy (*Trillium cuneatum*), Jack-in-the-pulpit (*Arisaema triphyllum*), Northern Maidenhair Fern (*Adiantum pedatum*), Yellow Fumitory (*Corydalis flavula*), Lyon's Turtlehead (*Chelone lyonii*), Christmas Fern (*Polystichum acrostichoides*), and Southern Lady Fern (*Athyrium asplenoides*). Examples of this community are found throughout the mid and lower elevations of the county.

Piedmont Headwater Stream Forest (Typic Subtype)

Apparently confined to a number of sites clustered in the eastern parts of Polk County (but possibly occurring elsewhere), the Piedmont Headwater Stream Forest community type is found at toe of slope and lower areas along streamside flats that may occasionally experience some flooding. Characteristic woody species include Tulip Poplar (*Liriodendron tulipifera*), White Oak (*Quercus alba*), American Beech (*Fagus grandifolia*), Sweetgum (*Liquidambar styraciflua*), and Pawpaw (*Asimina triloba*). A variety of upland herbaceous species may occur in this community and, in our area, frequently encountered herbs are New York Fern (*Parathelypteris noveboracensis*), Indian Cucumber Root (*Medeola virginiana*), Foamflower (*Tiarella wherryi*), Shining Clubmoss (*Huperzia lucidula*), Cutleaf Grapefern (*Sceptridium dissectum*), and Black Cohosh (*Actaea racemosa*).

Piedmont Levee Forest (Typic Subtype)

Scattered throughout the lower elevations of Polk County, with representative canopy species such as Sycamore (*Platanus occidentalis*), Green Ash (*Fraxinus pennsylvanica*), River Birch (*Betula nigra*), Sugarberry (*Celtis laevigata*), and Sweetgum (*Liquidambar styraciflua*) and occurring on natural levee deposits and floodplains. Shrubs may be diverse, including Spicebush (*Lindera benzoin* var. *benzoin*), Sweetshrub (*Calycanthus floridus*), American Hazelnut (*Corylus americana*), Strawberry-bush (*Euonymus americanus*), American Witch-hazel (*Hamamelis virginiana*), Scentless Mock-orange (*Philadelphus inodorus*), and occasionally the uncommon Leatherwood (*Dirca palustris*). Herbs often present are Black Cohosh (*Actaea racemosa*), Northern Maidenhair Fern (*Adiantum pedatum*), Christmas Fern (*Polystichum acrostichoides*), Pennywort (*Obolaria virginica*), Puttyroot (*Aplectrum hyemale*), Rattlesnake Fern (*Botrypus virginianus*), Cutleaf Toothwort (*Cardamine concatenata*), American Alumroot (*Heuchera americana*), River Oats (*Chasmanthium latifolium*), and Common Woodreed (*Cinna arundinacea*).

Floodplain Pool

Although not large in size, these communities contain significant areas of ponded water for extended periods and they provide critical breeding sites for local populations of many amphibian species. Often shaded by nearby canopy trees, hydrophytic vegetation is not numerous or diverse

in the pools but does include species such as Green Arrow-arum (*Peltandra virginica*), False Nettle (*Boehmeria cylindrica*), Leathery Rush (*Juncus coriaceus*), and various species of *Carex*. Examples of Floodplain pools may be seen along the banks of Hughes Creek.

Piedmont/Mountain Semi-permanent Impoundment (Piedmont Marsh Subtype)

These sites owe their existence to Beaver activity that results in the creation of wetlands with sizeable amounts of emergent vegetation such as Green Arrow-arum (*Peltandra virginica*), Mild Waterpepper (*Persicaria hydropiperoides*), Broadleaf Arrowhead (*Sagittaria latifolia*), Three-way Sedge (*Dulichium arundinaceum* var. *arundinaceum*), Fringed Sedge (*Carex crinita*), Awlfruit Sedge (*Carex stipata*), Shallow Sedge (*Carex lurida*), White Cutgrass (*Leersia virginica*), American Bur-reed (*Sparganium americanum*), and Swamp Rose-mallow (*Hibiscus moscheutos*). These communities are important breeding sites for many species of amphibians as well as birds.

Piedmont/Mountain Semi-permanent Impoundment (Shrub Subtype)

Known from a single site near White Oak Creek. Confined to relatively flat areas that are permanently wet and saturated, with the occurrence of at least some shallow, standing water throughout the year. Dominant tree species may include Trident Red Maple (*Acer rubrum* var. *trilobum*), Black Willow (*Salix nigra*), Green Ash (*Fraxinus pennsylvanica*), Sycamore (*Platanus occidentalis*), and River Birch (*Betula nigra*). Shrubs and small saplings predominate with Buttonbush (*Cephalanthus occidentalis*), Tag Alder (*Alnus serrulata*), and species of *Viburnum* being abundant. Sedges (*Carex* spp.) and grasses may occur in openings but are not very numerous, as the herbaceous layer is not well-developed.

Rocky Bar and Shore (Alder–Yellowroot Subtype)

In our area, occurring within sections of the Green River Gorge, these sites feature rocky bars and scour areas that are relatively canopy free. Tag Alder (*Alnus serrulata*) and Yellowroot (*Xanthorhiza simplicissima*) being the dominant woody shrubs, occasionally with Virginia Sweetspire (*Itea virginica*). Sedges are usually present, including Rough Sedge (*Carex scabrata*) and occasionally the rare Cherokee Sedge (*Carex cherokeensis*). Other herbaceous species may include Brook Saxifrage (*Boykinia aconitifolia*) and Carolina Tassel-rue (*Trautvetteria caroliniensis* var. *caroliniensis*).

Spray Cliff

An example of this rare community type may be seen at Shunkawauken falls. The falls feature a vertical rock face that is constantly wet from seepage emanating from above. Woody species include Tag Alder (*Alnus serrulata*). Soil pockets adjacent to the cliff face support a population of

Biltmore Sedge (*Caex biltmoreana*). Other herbaceous species that occur in the immediate vicinity of the falls are Mountain Meadow-rue (*Thalictrum clavatum*), Carolina Tassel-rue (*Trautvetteria caroliniensis* var. *caroliniensis*), Golden Saxifrage (*Chrysosplenium americanum*), and Bigleaf Grass-of-Parnassus (*Parnassia grandifolia*). Perennially wet rock surfaces are covered with many bryophytes, such as *Plagiochila* spp.

Low Elevation Seep (Typic Subtype)

Scattered throughout the southern portions of the county. Infrequently encountered at toe of slope and adjacent wet streamside flats. This community has abundant seepage with saturated, mucky soils. Typically dominated by Trident Red Maple (*Acer rubrum* var. *triloba*), Possumhaw Viburnum (*Viburnum nudum* var. *nudum*), Tag Alder (*Alnus serrulata*), Yellowroot (*Xanthorhiza simplicissima*), and Virginia Sweetspires (*Itea virginica*). Netted Chain Fern (*Lorinseria aereolata*), Soft Rush (*Juncus effusus*), Fringed Sedge (*Carex crinita* var. *crinita*), Fescue Sedge (*Carex festucacea*), and other *Carex* spp. are numerous.

Low Elevation Seep (Piedmont/Mountain Springhead Subtype)

A rare community type that in Polk County appears to be confined to mid and toe of slope situations in the eastern parts of the county. Coastal Plain disjuncts of various species are always present. Canopy dominants include Trident Red Maple (*Acer rubrum* var. *trilobum*), Tulip Poplar (*Liriodendron tulipifera*), and Swamp Tupelo (*Nyssa biflora*). Commonly encountered shrubs in this community type are Possumhaw Viburnum (*Viburnum nudum*), Virginia Sweetspire (*Itea virginica*), Tag Alder (*Alnus serrulata*), Red Chokeberry (*Photinia pyrifolia*), and Hairy Highbush Blueberry (*Vaccinium fuscum*). Vines may be quite abundant, with Laurel Greenbrier (*Smilax laurifolia*), Common Greenbrier (*Smilax rotundifolia*), Grape (*Vitis* spp.), and Virginia Creeper (*Parthenocissus quinquefolia*). Netted Chain Fern (*Lorinseria areolata*), Cinnamon Fern (*Osmundastrum cinnamomeum*), American Royal Fern (*Osmunda spectabilis*), Viscid Hedgehyssop (*Gratiola viscidula*), White Edge Sedge (*Carex debilis*), Bristly-stalked Sedge (*Carex leptalea*), Leathery Rush (*Juncus coriaceus*), False Nettle (*Boehmeria cylindrica*), and Virginia Bugleweed (*Lycopus virginicus*) are frequently encountered. Patches of *Sphagnum* moss may also be present. New Hope Low Elevation Seep, Sandy Springs Church Low Elevation Seep, and the *Magnolia virginiana* site near Columbus are good examples of this community. Additional sites may occur in eastern Polk County and should be purposefully searched for if landowner permission can be obtained.

FLORA AND FAUNA

Polk County's rich floral and faunal communities result from a variety of factors, including sharp changes in elevation from the Piedmont to the Blue Ridge Escarpment, favorable climatic conditions created by the Isothermal Belt region, abundant precipitation, diverse rock types with resulting outcrops and micro-habitats, and its overall geographic location in proximity to regions with piedmont, montane, and coastal influences. In addition, the county even includes flora with Ozarkian affinities, such as Ozark Bunchflower (*Melanthium woodii*) and Arkansas Horsemint (*Monarda punctata* var. *arkansana*). The disjunct presence of Scarlet Kingsnake (*Lampropeltis elapsoides*), from areas far to the east and south of the region, speaks to longstanding Coastal Plain influences within the county.

Polk County is also unique in North Carolina for being the only known site for Allegheny Spurge (*Pachysandra procumbens*) within the entire state. As well, the Federally and State Endangered White Irisette (*Sisyrinchium dichotomum*) finds its global center of abundance here. Until recently, Whorled Horsebalm's (*Collinsonia verticillata*) only known North Carolina sites were confined to Polk County, where it occurs in several scattered localities.

Of the 127 Rare and Watch-List plant species in Polk County (an impressive list in itself for any county, let alone one that is so small in area), 45 have State Status as Threatened, Endangered, or Vulnerable, and 13 have Federal Status. Polk County is also the only known site of occurrence for Bigleaf Scurfpea (*Orbexilum macrophyllum*) which was collected twice in the late nineteenth century on White Oak Mountain and has not been seen since, in spite of repeated attempts to relocate it.

As would be expected, the forested communities at the higher elevations of western Polk County contain flora characteristic of the montane regions to the north and west of the area. As one goes lower in elevation, from west to east, piedmont-influenced community types emerge and predominate, occasionally with numerous species more characteristic of the Coastal Plain such as Climbing Hydrangea (*Decumaria barbara*), Sweetbay Magnolia (*Magnolia virginiana*), Laurel Greenbrier (*Smilax laurifolia*), Poison Sumac (*Toxicodendron vernix*), and Swamp Tupelo (*Nyssa biflora*).

The presence of no less than thirty-four distinct natural community types is also a testament to the incredible biodiversity to be found within the borders of Polk County. As such, Polk County deserves its recognition as a unique and highly valued component of North Carolina's rich natural heritage.

Table 2. Rare plant species documented from Polk County, North Carolina.

SCIENTIFIC NAME COMMON NAME	STATUS		RANK	
	NC	US	NC	GLOBAL
VASCULAR PLANTS				
<i>Aconitum reclinatum</i> Trailing Wolfsbane	SR-T	-	S3	G3
<i>Agastache nepetoides</i> Yellow Giant-hyssop	SR-P	-	S1	G5
<i>Anemone berlandieri</i> Southern Anemone	E	-	S2	G4?
<i>Asplenium bradleyi</i> Bradley's Spleenwort	SR-P	-	S2	G4
<i>Asplenium pinnatifidum</i> Lobed Spleenwort	SR-P	-	S2	G4
<i>Buchnera americana</i> American Bluehearts	E	-	S1	G5?
<i>Cardamine clematitis</i> Mountain Bittercress	SR-T	-	S1	G3
<i>Carex amplisquama</i> Fort Mountain Sedge	SR-T	FSC	S2	G5T3
<i>Carex cherokeensis</i> Cherokee Sedge	E	-	S1	G4G5
<i>Carex pedunculata</i> var. <i>pedunculata</i> Longstalk Sedge	SC-V	-	S2	G5
<i>Carex radfordii</i> Radford's Sedge	T	FSC	S1	G3
<i>Carex vestita</i> Velvet Sedge	SR-P	-	S1	G5
<i>Celastrus scandens</i> American Bittersweet	E	-	S2?	G5

<i>Chelone cuthbertii</i> Cuthbert's Turtlehead	SC-V	-	S3?	G3
<i>Chelone obliqua</i> Red Turtlehead	SR-T	-	S2	G4
<i>Collinsonia tuberosa</i> Piedmont Horsebalm	SC-V	-	S1	G3G4
<i>Collinsonia verticillata</i> Whorled Horsebalm	SC-V	-	S2	G3G4
<i>Corallorhiza wisteriana</i> Spring Coralroot	SR-O	-	S1S2	G5
<i>Cuscuta coryli</i> Hazel Dodder	SR-T	-	S1?	G5?
<i>Dicentra eximia</i> Bleeding Heart	SR-P	-	S3	G4
<i>Echinacea pallida</i> Pale Coneflower	SR-D	-	S1	G4
<i>Eurybia spectabilis</i> Showy Aster	SR-O	-	S2?	G5
<i>Fleischmannia incarnata</i> Pink Thoroughwort	T	-	S2	G5
<i>Fothergilla major</i> Large Witch-alder	SR-T	-	S3	G3
<i>Hackelia virginiana</i> Virginia Stickseed	SR-P	-	S2	G5
<i>Helianthus laevigatus</i> Smooth Sunflower	SC-V	-	S3	G4
<i>Hexalectris spicata</i> Crested Coralroot	SR-P	-	S2	G5
<i>Hexastylis naniflora</i> Dwarf-flowered Heartleaf	T	T	S3	G3
<i>Hexastylis rhombiformis</i> French Broad Heartleaf	SR-L	FSC	S3	G3
<i>Huperzia porophila</i> Rock Fir-clubmoss	SR-P	-	S2	G4

<i>Hydrastis canadensis</i> Goldenseal	SR-O	-	S3	G3G4
<i>Ilex longipes</i> Georgia Holly	SR-P	-	S1	G5
<i>Liatris aspera</i> Rough Blazing-star	T	-	S1	G4G5
<i>Liatris helleri</i> Heller's Blazing-star	T	T	S2	G2Q
<i>Liatris microcephala</i> Small-head Blazing-star	SC-V	-	S1	G3G4
<i>Liatris turgida</i> Shale-barren Blazing-star	SR-T	-	S1S2	G3
<i>Lilium philadelphicum</i> var. <i>philadelphicum</i> Wood Lily	E	-	S2	G5T4T5
<i>Lysimachia fraseri</i> Fraser's Loosestrife	E	FSC	S3	G3
<i>Lysimachia tonsa</i> Southern Loosestrife	SR-P	-	S2	G4
<i>Marshallia grandiflora</i> Large-flowered Barbara's Buttons	SC-H	FSC	SH	G3
<i>Matelea decipiens</i> Glade Milkvine	SR-P	-	S3	G5
<i>Melanthium woodii</i> Ozark Bunchflower	T	-	S1	G5
<i>Monotropsis odorata</i> Sweet Pinesap	SC-V	-	S3	G3
<i>Muhlenbergia sobolifera</i> Rock Muhly	SC-V	-	S2	G5
<i>Orbexilum macrophyllum</i> Bigleaf Scurfpea	SC-H	FSC	SX	GX
<i>Pachysandra procumbens</i> Allegheny Spurge	E	-	S1	G4G5
<i>Packera millefolium</i> Divided-leaf Ragwort	T	FSC	S2	G3

<i>Parnassia grandifolia</i> Large Leaf Grass of Parnassus	T	FSC	S2	G3
<i>Parthenocissus vitacea</i> Woodbine	SR-P	-	S1	G5
<i>Poa palustris</i> Swamp Bluegrass	SR-P	-	S1	G5
<i>Primula meadia</i> Eastern Shooting-star	T	-	S2S3	G5
<i>Quercus prinoides</i> Dwarf Chinquapin Oak	E	-	S1	G5
<i>Sisyrinchium dichotomum</i> White Irisette	E	E	S2	G2
<i>Smilax lasioneura</i> Blue Ridge Carrion-flower	SR-P	-	S1	G5
<i>Solidago ulmifolia</i> Elm-leaf Goldenrod	SR-D	-	S1?	G5
<i>Symphyotrichum laeve</i> Smooth Blue Aster	SR-P	-	S1S2	G5
<i>Thalictrum macrostylum</i> Small-leaved Meadowrue	SR-T	-	S2	G3G4
<i>Thermopsis fraxinifolia</i> Ash-leaved Golden-banner	SC-V	-	S2?	G3?
<i>Thermopsis mollis</i> Appalachian Golden-banner	SC-V	-	S2	G3G4
<i>Tradescantia virginiana</i> Virginia Spiderwort	T	-	S1	G5
<i>Trillium flexipes</i> Bent White Trillium	SC-H	-	S1	G5
<i>Trillium simile</i> Sweet White Trillium	T	-	S2	G3
<i>Vandenboschia boschiana</i> Appalachian Filmy-fern	E	-	S1	G4
<i>Verbesina walteri</i> Walter's Crownbeard	SR-T	-	S1	G4

<i>Woodsia appalachiana</i> Appalachian Cliff Fern	SR-P	-	S2	G4
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MOSSES

<i>Entodon sullivantii</i> Sullivant's Entodon	SR-O	-	S2	G3G4
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<i>Hygrohypnum closteri</i> Closter's Brook-hypnum	SR-T	-	S1	G3
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<i>Oxyrrhynchium pringlei</i> Pringle's Water Feather Moss	SR-D	-	S1	G2G3
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LIVERWORTS

<i>Lejeunea cavifolia</i> A Liverwort	SR-P	-	S1	G5
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<i>Mannia californica</i> A Liverwort	SR-T	-	S1	G3?
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LICHENS

<i>Canoparmelia amabilis</i> Worthy Shield Lichen	SC-V	FSC	S1	G1
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Table 3. Watch List plant species documented from Polk County, North Carolina.

SCIENTIFIC NAME COMMON NAME	STATUS		RANK	
	NC	US	NC	GLOBAL
VASCULAR PLANTS				
<i>Baptisia albescens</i> Thin-pod White Wild Indigo	W1	-	S3	G4
<i>Boykinia aconitifolia</i> Brook Saxifrage	W7	-	S3	G4
<i>Carex biltmoreana</i> Biltmore Sedge	W1	-	S3	G3
<i>Carex bromoides</i> ssp. <i>montana</i> Blue Ridge Brome Sedge	W7	-	S3?	G5T3?
<i>Carex festucacea</i> Fescue Sedge	W7	-	S2?	G5
<i>Celtis occidentalis</i> Mountain Hackberry	W7	-	S2	G5
<i>Chasmanthium sessiliflorum</i> var. <i>sessiliflorum</i> Longleaf Spikegrass	W1	-	S2S3	G5T5
<i>Chrysosplenium americanum</i> Golden Saxifrage	W1	-	S3	G5
<i>Cleistesiopsis bifaria</i> Small Spreading Pogonia	W1	-	S3	G4?
<i>Comptonia peregrina</i> Sweet-fern	W1	-	S3	G5
<i>Corallorhiza odontorhiza</i> Autumn Coralroot	W1	-	S4?	G5
<i>Coreopsis latifolia</i> Broadleaf Coreopsis	W1	-	S3	G3
<i>Coreopsis pubescens</i> var. <i>robusta</i> Blue Ridge Coreopsis	W7	-	S2?	G5?T3T5

<i>Cystopteris bulbifera</i> Bulblet Bladder Fern	W7	-	S1S2	G5
<i>Dirca palustris</i> Leatherwood	W1	-	S3	G4
<i>Euonymus atropurpureus</i> var. <i>atropurpureus</i> Eastern Wahoo	W7	-	S2	G5T5
<i>Eutrochium maculatum</i> var. <i>maculatum</i> Spotted Joe-pye Weed	W7	-	S3?	G5T5
<i>Fallopia cristata</i> Crested Climbing Buckwheat	W7	-	S2?	G5T5
<i>Frangula caroliniana</i> Carolina Buckthorn	W1	-	S3	G5
<i>Gentiana clausa</i> Closed Gentian	W7	-	S3?	G5
<i>Goodyera repens</i> Lesser Rattlesnake Orchid	W1	-	S2S3	G5
<i>Heuchera parviflora</i> var. <i>parviflora</i> Grotto Alumroot	W1	-	S3	G4T4
<i>Hydrangea cinerea</i> Ashy Hydrangea	W7	-	S2	G4
<i>Isotria verticillata</i> Large Whorled Pogonia	W1	-	S2S3	G5
<i>Juglans cinerea</i> Butternut	W5	FSC	S2S3	G4
<i>Liatris scariosa</i> var. <i>scariosa</i> New England Blazing-star	W7	-	S2	G5?TNR
<i>Lathyrus venosus</i> Smooth Peavine	W1	-	S3	G5
<i>Lonicera flava</i> Yellow Honeysuckle	W1	-	S3	G5
<i>Magnolia virginiana</i> Sweetbay Magnolia	W6	-	S5	G5
<i>Micranthes careyana</i> Carey Saxifrage	W1	-	S3	G3

<i>Monarda punctata</i> var. <i>arkansana</i> Arkansas Horsemint	W7	-	S1?	G5TNR
<i>Onosmodium virginianum</i> Virginia Marbleseed	W1	-	S3	G4
<i>Panax quinquefolius</i> American Ginseng	W1	-	S3S4	G3G4
<i>Panax trifolius</i> Dwarf Ginseng	W1	-	S3	G5
<i>Philadelphus hirsutus</i> Hairy Mock-orange	W1	-	S2	G5
<i>Philadelphus inodorus</i> Scentless Mock-orange	W1	-	S3	G4G5
<i>Populus grandidentata</i> Bigtooth Aspen	W7	-	S2	G5
<i>Prunus nigra</i> Canada Plum	W7	-	SH	G4G5
<i>Ptelea trifoliata</i> Wafer-ash	W1	-	S3	G5
<i>Quercus muehlenbergii</i> Chinquapin Oak	W1	-	S2	G5
<i>Scutellaria ovata</i> ssp. <i>ovata</i> var. <i>ovata</i> Heartleaf Skullcap	W7	-	S1	G5TNR
<i>Scutellaria serrata</i> Showy Skullcap	W1	-	S2S3	G4G5
<i>Sideroxylon lycioides</i> Buckthorn Bumelia	W1	-	S2S3	G5
<i>Smilax laurifolia</i> Laurel Greenbrier	W6	-	S5	G5
<i>Stellaria alsine</i> Longstalk Starwort	W1	-	S3?	G5
<i>Stellaria corei</i> Core's Starwort	W1	-	S3	G4
<i>Trillium rugelii</i> Southern Nodding Trillium	W1	-	S3	G3

<i>Triosteum aurantiacum</i> var. <i>aurantiacum</i> Early Horse Gentian	W7	-	S2	G5T5
<i>Triphora trianthophoros</i> var. <i>trianthophoros</i> Three Birds Orchid	W1	-	S2S3	G3G4T3T4
<i>Tsuga canadensis</i> Eastern Hemlock	W5	-	S4S5	G5
<i>Tsuga caroliniana</i> Carolina Hemlock	W5	FSC	S3	G3
<i>Viola tripartita</i> Three-parted Violet	W7	-	S2?	G5

MOSSES

<i>Amphidium mougeotii</i> Mougeot's Yoke Moss	W7	-	S2?	G5
<i>Brachythecium oedipodium</i> Sprawling Grass Moss	W7	-	S2?	G5
<i>Grimmia olneyi</i> A Beard Moss	W7	-	S2?	G3G5

LIVERWORTS

<i>Frullania plana</i> A Liverwort	W7	-	S1	G4
<i>Plagiochila undata</i> A Liverwort	W7	-	S2	G4G5

Table 4. Rare animal species documented from Polk County, North Carolina.

SCIENTIFIC NAME COMMON NAME	STATUS		RANK	
	NC	US	NC	GLOBAL
MAMMALS				
<i>Myotis septentrionalis</i> Northern Long-eared Bat	SR	T-4(d)	S2	G1G2
<i>Perimyotis subflavus</i> Tricolored Bat	SR	-	S3	G2G3
<i>Spilogale putorius</i> Eastern Spotted Skunk	SR-G	-	S2	G4
BIRDS				
<i>Setophaga cerulea</i> Cerulean Warbler	SC	FSC	S2B	G4
REPTILES				
<i>Crotalus horridus</i> Timber Rattlesnake	SC	-	S3	G4
<i>Glyptemys muhlenbergii</i> Bog Turtle	T	T(S/A)	S2	G3
<i>Plestiodon anthracinus</i> Coal Skink	SR	-	S2S3	G5
AMPHIBIANS				
<i>Ambystoma talpoideum</i> Mole Salamander	SC	-	S2S3	G5
<i>Aneides aeneus</i> Green Salamander	E	FSC	S2S3	G3G4
<i>Hemidactylium scutatum</i> Four-toed Salamander	SC	-	S3	G5

FRESHWATER FISHES

<i>Carpiodes</i> sp. cf. <i>cyprinus</i> Carolina Carpsucker	SR	-	S2	GNR
<i>Etheostoma thalassinum</i> Seagreen Darter	SR	-	S3	G4

MOLLUSKS: FRESHWATER BIVALVES

<i>Strophitus undulates</i> Creeper	T	-	S3	G5
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ARACHNIDS

<i>Nesticus brimleyi</i> a Cave Cobweb Spider	SR	-	S1?	G1G2
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CRUSTACEANS

<i>Cambarus johni</i> Carolina Foothills Crayfish	SR	FSC	S3	G3
<i>Cambarus lenati</i> Broad River Stream Crayfish	SR	-	S2	G2
<i>Cambarus spicatus</i> Broad River Spiny Crayfish	SC	FSC	S2	G3

INSECTS: MAYFLIES

<i>Asioplax dolani</i> a Mayfly	SR	-	S2	G4
<i>Cercobrachys etowah</i> a Caenid Mayfly	SR	-	S2	G4

INSECTS: BUTTERFLIES

<i>Amblyscirtes reversa</i> Reversed Roadside-Skipper	SR	-	S3	G3G4
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<i>Autochton cellus</i> Golden Banded-Skipper	SR	-	S2	G4
<i>Callophrys irus</i> Frosted Elfin	SR	-	S2	G3
<i>Celastrina nigra</i> Dusky Azure	SR	-	S2	G4
<i>Euphydryas phaeton</i> Baltimore Checkerspot	SR	-	S2	G4
<i>Megathymus cofaqui</i> Cofaqui Giant-Skipper	SR	-	S1	G3G4
<i>Papilio cresphontes</i> Giant Swallowtail	SR	-	S2S3	G5
<i>Pontia protodice</i> Checkered White	SR	-	S1S2	G5
<i>Pyrgus wyandot</i> Appalachian Grizzled Skipper	SR	FSC	S1	G1G2Q
<i>Satyrium edwardsii</i> Edwards' Hairstreak	SR	-	S2	G5

Table 5. Watch List animal species documented from Polk County, North Carolina.

SCIENTIFIC NAME COMMON NAME	STATUS		RANK	
	NC	US	NC	GLOBAL
MAMMALS				
<i>Lasiurus cinereus</i> Hoary Bat	W2	-	S3S4	G3G4
<i>Neotoma floridana haematoreia</i> Southern Appalachian Eastern Woodrat	W2	-	S3S4	G5T4Q
<i>Sciurus niger</i> Eastern Fox Squirrel	W2	-	S3	G5
<i>Sorex hoyi</i> American Pygmy Shrew	W2	-	S3	G5
BIRDS				
<i>Antrostomus carolinensis</i> Chuck-will's-widow	W1	-	S5B	G5
REPTILES				
<i>Cemophora coccinea</i> Scarlet Snake	W1,W5	-	S3	G5
<i>Lampropeltis elapsoides</i> Scarlet Kingsnake	W1,W5	-	S3	G5
<i>Lampropeltis triangulum</i> Milk Snake	W2	-	S3	G5
<i>Virginia valeriae</i> Smooth Earthsnake	W2	-	S3	G5
FRESHWATER FISHES				
<i>Cyprinella labrosa</i> Thicklip Chub	W5	-	S3	G4

<i>Cyprinella zanema</i> Santee Chub	W5	-	S3	G4
<i>Notropis rubricroceus</i> Saffron Shiner	W5	-	S3	G4G5

MOLLUSKS: FRESHWATER AND TERRESTRIAL GASTROPODS

<i>Triodopsis vulgata</i> Dished Threetooth	W2	-	S3?	G5
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ARACHNIDS

<i>Vaejovis carolinianus</i> Southern Unstriped Scorpion	W2,W3	-	S2?	G5
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INSECTS: DRAGONFLIES AND DAMSELFLIES

<i>Gomphus rogersi</i> Sable Clubtail	W2	-	S2S3	G4
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INSECTS: BUTTERFLIES

<i>Celastrina neglectamajor</i> Appalachian Azure	W2	-	S3S4	G4
<i>Hesperia metea</i> Cobweb Skipper	W2	-	S3	G4
<i>Speyeria diana</i> Diana Fritillary	W2	-	S3S4	G3G4

INSECTS: MOTHS

<i>Catocala amestris</i> Three-staff Underwing	W3	-	SU	G4
<i>Gabara pulverosalis</i> an Erebid Moth	W3	-	S3?	G4

INSECTS: GRASSHOPPERS AND KATYDIDS

<i>Melanoplus hubbelli</i>	W3	-	SU	G4
Hubbell's Melanoplus				

EXPLANATION OF RANK CODES FOR NATURAL COMMUNITIES

Natural Heritage Programs and the NatureServe Network have developed a consistent method for evaluating the relative imperilment of species and ecological communities. Status and rank codes for natural community types are derived from the Natural Heritage Database (2015). An S or G rank involving two numbers indicates uncertainty of rank. For instance, a G2G3 rank indicates that the community appears to warrant either a G2 or a G3 ranking, but existing data do not allow that determination to be made. Number of occurrences is given as a general guide. Ranks also depend on other factors that affect vulnerability, including extent of occurrences, range, trends, and threats.

N.C. RANK

RANK	DEFINITION
S1	Critically imperiled in North Carolina because of extreme rarity or because of some factor making it especially vulnerable to extirpation from the state. Typically 1-5 occurrences and/or less than 2,000 acres occupied in the state.
S2	Imperiled in North Carolina because of rarity or because of some factor making it very vulnerable to extirpation from the state. Typically 6-20 occurrences and/or 2,000-10,000 acres occupied in the state.
S3	Rare or uncommon in North Carolina. Typically 21-100 occurrences and/or 10,000-50,000 acres occupied in the state.
S4	Apparently secure in the state.
S5	Demonstrably secure in the state.
S_?	Rank uncertain.

GLOBAL RANK

RANK	DEFINITION
G1	Critically imperiled globally because of extreme rarity or because of some factor making it especially vulnerable to extinction throughout its range. Typically 5 or fewer occurrences and/or less than 2,000 acres occupied globally.
G2	Imperiled globally because of rarity or because of some factor making it very vulnerable to extinction throughout its range. Typically 6-20 occurrences and/or 2,000-10,000 acres occupied globally.
G3	Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range or because of other factors making it vulnerable to extinction throughout its range. Typically 21-100 occurrences and/or 10,000-50,000 acres occupied globally.
G4	Apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery.
G5	Demonstrably secure globally, though it may be quite rare in parts, especially at the periphery.
G_?	Uncertain rank.
G_Q	Questionable taxonomy that may reduce conservation priority. Distinctiveness of this entity as a type or subtype at the current level is questionable.

EXPLANATION OF STATUS AND RANK CODES FOR PLANTS

Status Codes

In North Carolina, Endangered, Threatened, and Special Concern species have legally protected status through the North Carolina Plant Conservation Program (NCPCP). The Natural Heritage Program maintains computerized records and GIS map files on Significantly Rare species, as well as species considered extirpated in the state.

United States Status is designated by the U.S. Fish and Wildlife Service (USFWS) and the U.S. National Marine Fisheries Service (USNMFS) in accordance with the U.S. Endangered Species Act of 1973 (USESA), as amended. Plants and plant varieties, (including fungi and lichens), animal species and subspecies, and vertebrate populations are considered for Endangered or Threatened status according to the criteria established under the USESA. Proposals and determinations to add taxa or populations to the Lists of Endangered and Threatened Wildlife and plants are published in the Federal Register. Additionally, the USFWS and the USNMFS periodically publish a Notice of Review or Notice of Reclassification in the Federal Register that presents an updated list of plant and animal taxa that are regarded as candidates or proposed for possible addition to the Lists of Endangered and Threatened Wildlife and Plants. Contact the Asheville or Raleigh Ecological Services Field Offices for more information.

N.C. STATUS – PLANTS

N.C. STATUS CODE	STATUS	DEFINITION
E	Endangered	Any native or once-native species of higher taxon of plant whose continued existence as a viable component of the state's flora is determined to be in jeopardy or any species of plant determined to be an Endangered species pursuant to the Endangered Species Act. (GS19B-106:202.12.)
T	Threatened	Any native or once-native resident species of plant which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range, or one that is designated as a Threatened species pursuant to the Endangered Species Act. (GS19B-106:202.12.)
SC-V	Special Concern-Vulnerable	Any species or higher taxon of plant which is likely to become a threatened species within the foreseeable future. (NCAC 02 NCAC 48F .0401.)
SC-H	Special Concern-Historical	Any species or higher taxon of plant that occurred in North Carolina at one time, but for which all known populations are currently considered to be either historical or extirpated. (NCAC 02 NCAC 48F .0401)

SR	Significantly Rare	This is a NCNHP designation. Any species which has not been listed by the NCPCP as an Endangered, Threatened, or Special Concern species, but which exists in the state (or recently occurred in the state) in small numbers (generally 1-100 statewide populations) and has been determined by the NCNHP to need monitoring. Significantly Rare species include species of historical occurrence with some likelihood of rediscovery in the state and species substantially reduced in numbers by habitat destruction, direct exploitation, or disease. Species considered extirpated in the state, with little likelihood of rediscovery, are given no N.C. status (unless already listed by the NCWRC or NCPCP as E, T, or SC).
SR-L	Significantly Rare-Limited	The range of the species is limited to North Carolina and adjacent states (endemic or near endemic). These are species that may have 20-50 populations in North Carolina, but fewer than 100 populations rangewide. The preponderance of their distribution is in North Carolina and their fate depends largely on conservation here.
SR-T	Significantly Rare-Throughout	The species is rare throughout its range (fewer than 100 populations total).
SR-D	Significantly Rare-Disjunct	The species is disjunct to North Carolina from a main range in a different part of the country or world.
SR-P	Significantly Rare-Peripheral	The species is at the periphery of its range in North Carolina. These species are generally more common somewhere else in their ranges, occurring in North Carolina peripherally to their main ranges, mostly in habitats that are unusual in North Carolina.
SR-O	Significantly Rare-Other	The range of the species is sporadic or cannot be described by the other Significantly Rare categories.
WL	Watch List	This is an NCNHP designation for any other species believed to be rare and of conservation concern in the state but not warranting active monitoring at this time.

U.S. STATUS – PLANTS

U.S. STATUS CODE	STATUS	DEFINITION
E	Endangered	A taxon that is in danger of extinction throughout all or a significant portion of its range (Public Law 93-205 87 Stat. 884).
T	Threatened	A taxon that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range (Public Law 93-205 87 Stat. 884).
C	Candidate	Taxa for which the USFWS has on file enough substantial information on biological vulnerability and threat(s) to support proposals to list them as endangered or threatened. Proposed rules have not yet been issued because this action is precluded at present by other listing activity. Development and publication of proposed rules on these taxa are anticipated. The USFWS encourages state and other federal agencies as well as other affected parties to give consideration to these taxa in environmental planning [Federal Register, 5 December 1996 Volume 61(235):64481]. Taxa formerly considered “Category 1” are now considered “Candidate.”

FSC	Federal Species of Concern	Those species that appear to be in decline or otherwise in need of conservation and are under consideration for listing or for which there is insufficient information to support listing at this time. Subsumed under the term FSC are all species petitioned by outside parties and other selected focal species identified in USFWS strategic plans, state Wildlife Action Plans, or Natural Heritage Program Lists.
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Ranking System

Natural Heritage Programs and the NatureServe Network have developed a consistent method for evaluating the relative imperilment of both species and ecological communities. These assessments led to the designation of a conservation status rank. These ranks provide an estimate of extinction risk. Conservation rank values have been assigned over the past 30 years by the NCNHP, NatureServe, and a large number of collaborators in government agencies, universities, natural history museums, botanical gardens, and other conservation organizations. This information has been developed primarily to help in guiding conservation and informing environmental planning and management.

Conservation ranks are either state (S) or global (G) and are based on a one-to-five scale, ranging from critically imperiled (S1 or G1) to demonstrably secure (S5 or G5). These assessments are based on the best available information, considering a variety of factors such as abundance, distribution, population trends, and threats. Global ranks apply to the status of a species throughout its range. The system is widely used by nationwide agencies and organizations, as the best available scientific and objective assessment of a species' rarity throughout its range.

A rank involving two numbers indicates uncertainty of rank. For example, an S2S3 or a G2G3 rank indicates that the species may be S2 or S3 (or G2 or G3), but that existing data do not allow that determination to be made.

N.C. RANK – PLANTS

N.C. RANK	NUMBER OF EXTANT POPULATIONS	DESIGNATION	DESCRIPTION
S1	1-5	Critically Imperiled	Critically imperiled due to extreme rarity or some factor(s) making it especially vulnerable to extirpation (local extinction) from the state. Typically 5 or fewer occurrences or very few remaining individuals (<1,000).
S2	6-20	Imperiled	Imperiled due to rarity or some factor(s) making it very vulnerable to extirpation from the state. Typically 6 to 20 occurrences or few remaining individuals (1,000 to 3,000).
S3	21-100	Vulnerable	Vulnerable to extinction either because rare or uncommon, found only in a restricted range (even if abundant at some locations), or due to other factors making it vulnerable to extirpation. Typically 21 to 100 occurrences or between 3,000 to 10,000 individuals.

S4	101-1,000	Apparently Secure	Apparently secure and widespread, usually with more than 100 occurrences and more than 10,000 individuals.
S5	1,001+	Secure	Common, widespread, and abundant. Essentially ineradicable under present conditions. Typically with considerably more than 100 occurrences and more than 10,000 individuals.
SH	0?	Historical	Of historical occurrence, with some expectation that it may be rediscovered. Its presence may not have been verified in the past 20 years. Upon verification of an extant occurrence, SH-ranked elements would typically receive an S1 rank. Note: an element is not automatically assigned an SH (or SX) rank if it has not been verified in the past 20 years; some effort must have been made to locate or relocate occurrences.
SX	0	Presumed Extirpated	Believed to be extirpated. Has not been located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
SU	Unknown	Unrankable	Currently unrankable due to lack of information or substantially conflicting information about status or trends. More information is needed.
SNR	Unknown	Not Ranked	Statewide rank not yet assessed.
SNA	N/A	Not Applicable	A conservation status rank is not applicable because the element is not a suitable target for conservation for one of these reasons: <ul style="list-style-type: none"> • Hybrid – an interspecific hybrid without conservation value; • Exotic Origin – not native to North Carolina; • Accidental/Nonregular – outside usual range and not regularly found in North Carolina;
			<ul style="list-style-type: none"> • Not Confidently Present – never documented as present in NC; • Synonym – the taxon is not recognized by the NCNHP.
S_?	---	Uncertain	Denotes inexact or uncertain numeric rank.

GLOBAL STATUS - PLANTS

GLOBAL RANK	NUMBER OF EXTANT POPULATIONS	DESIGNATION	DESCRIPTION
G1	1-5	Critically Imperiled	Critically imperiled globally because of extreme rarity or because of some factor(s) making it especially vulnerable to extinction. Typically five or fewer occurrences or very few remaining individuals (<1,000) or acres (<2,000) or linear miles (<10).
G2	6-20	Imperiled	Imperiled globally because of rarity or because of some factor(s) making it very vulnerable to extinction. Typically 6 to 20 occurrences or few remaining individuals (1,000 to 3,000) or acres (2,000 to 10,000) or linear miles (10 to 50).
G3	21-100	Vulnerable	Vulnerable globally either because very rare throughout its range, found only in a restricted range (even if abundant at some locations), or other factors making it vulnerable to extinction. Typically 21 to 100 occurrences or between 3,000 and 10,000 individuals.
G4	101-1,000	Apparently Secure	Uncommon but not rare (although it may be rare in parts of its range, particularly on the periphery) and usually widespread. Apparently not vulnerable in most of its range, but possibly cause for long-term concern. Typically more than 100 occurrences and more than 10,000 individuals.
G5	1,001+	Secure	Common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery). Not vulnerable in most of its range. Typically with considerably more than 100 occurrences and more than 10,000 individuals.
GH	0?	Historical	Known only from historical occurrences, but with some expectation that it may be rediscovered. May still be extant; further searching is needed.
GX	0	Presumed Extinct	Believed to be extinct throughout its range (e.g., passenger pigeon) with virtually no likelihood that it will be rediscovered. Not located despite intensive searches of historical sites and other appropriate habitat.
GU	Unknown	Unrankable	Currently unrankable due to lack of information or due to substantially conflicting information about status or trends; need more information.
GNR	Unknown	Not Ranked	Global rank not yet assessed.
G_T_	---	Subspecies or Variety Rank	The rank of a taxonomic subspecies or variety. As an example, G4T1 would apply to a subspecies of a species with an overall rank of G4, but the subspecies warranting a rank of G1.
G_?	---	Uncertain	Denotes inexact or uncertain numeric rank.

G_Q	---	Questionable Taxonomy	Taxonomic classification that may reduce conservation priority. Distinctiveness of this entity as a taxon at the current level is questionable. Resolution of this uncertainty may result in change from a species to a subspecies or inclusion of this taxon in another taxon, with the resulting element having a lower-priority conservation status rank.
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EXPLANATION OF STATUS AND RANK CODES FOR ANIMALS

Status Codes

In North Carolina, Endangered, Threatened, and Special Concern species have legally protected status through the North Carolina Wildlife Resources Commission (NCWRC). The Natural Heritage Program maintains computerized records and GIS map files on Significantly Rare species, as well as species considered extirpated in the state.

United States Status is designated by the U.S. Fish and Wildlife Service (USFWS) and the U.S. National Marine Fisheries Service (USNMFS) in accordance with the U.S. Endangered Species Act of 1973 (USESA), as amended. Plants and plant varieties, (including fungi and lichens), animal species and subspecies, and vertebrate populations are considered for Endangered or Threatened status according to the criteria established under the USESA. Proposals and determinations to add taxa or populations to the Lists of Endangered and Threatened Wildlife and plants are published in the Federal Register.

Additionally, the USFWS and the USNMFS periodically publish a Notice of Review or Notice of Reclassification in the Federal Register that presents an updated list of plant and animal taxa that are regarded as candidates or proposed for possible addition to the Lists of Endangered and Threatened Wildlife and Plants. Contact the Asheville or Raleigh Ecological Services Field Offices for more information.

N.C. STATUS – ANIMALS

N.C. STATUS CODE	STATUS	DEFINITION
E	Endangered	Any native or once-native species of wild animal whose continued existence as a viable component of the state's fauna is determined to be in jeopardy or any species of wild animal determined to be an Endangered species pursuant to the Endangered Species Act. (G.S. 113-25.)
T	Threatened	Any native or once-native species of wild animal which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range, or one that is designated as a Threatened species pursuant to the Endangered Species Act. (G.S. 113-25.)

N.C. STATUS CODE	STATUS	DEFINITION
SC	Special Concern	Any species of wild animal native or once-native to North Carolina which is determined by the NCWRC to require monitoring but which may be taken under regulations adopted under the provisions of the Article. (G.S.113-25)
SR	Significantly Rare	This is a NCNHP designation. Any species which has not been listed as an Endangered, Threatened, or Special Concern species, but which exists in the state (or recently occurred in the state) in small numbers (generally 1-100 statewide populations) and has been determined by the NCNHP to need monitoring. Significantly Rare species include species of historical occurrence with some likelihood of rediscovery in the state and species substantially reduced in numbers by habitat destruction, direct exploitation, or disease. Species considered extirpated in the state, with little likelihood of rediscovery, are given no N.C. status (unless already listed by the NCWRC or NCPCP as E, T, or SC).
SR-G	---	Species is a game animal or a furbearer, and therefore (by law) cannot be listed for state protection as E, T, or SC.
WL	Watch List	This is an NCNHP designation for any other species believed to be rare and of conservation concern in the state but not warranting active monitoring at this time.

U.S. STATUS – ANIMALS

U.S. STATUS CODE	STATUS	DEFINITION
E	Endangered	A taxon that is in danger of extinction throughout all or a significant portion of its range (Public Law 93-205 87 Stat. 884).
T	Threatened	A taxon that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range (Public Law 93-205 87 Stat. 884).
C	Candidate	Taxa for which the USFWS has on file enough substantial information on biological vulnerability and threat(s) to support proposals to list them as endangered or threatened. Proposed rules have not yet been issued because this action is precluded at present by other listing activity. Development and publication of proposed rules on these taxa are anticipated. The USFWS encourages state and other federal agencies as well as other affected parties to give consideration to these taxa in environmental planning (Federal Register, 28 February 1996). Taxa formerly considered “Category 1” are now considered “Candidate.”
FSC	Federal Species of Concern	Those species that appear to be in decline or otherwise in need of conservation and are under consideration for listing or for which there is insufficient information to support listing at this time. Subsumed under the term FSC are all species petitioned by outside parties and other selected focal species identified in USFWS strategic plans, state Wildlife Action Plans, or Natural Heritage Program Lists.

BGPA	Bald and Golden Eagle Protection Act	In the 9 July 2007 Federal Register (72:37346-37372), the bald eagle was declared recovered and removed (delisted) from the Federal List of Threatened and Endangered Wildlife. After delisting, the Bald and Golden Eagle Protection Act (Eagle Act)(16U.S.C. 668-668d) becomes the primary law protecting bald eagles. The Eagle Act prohibits take of bald and golden eagles and provides a statutory definition of “take” that includes “disturb.” The USFWS has developed National Bald Eagle Management Guidelines to provide guidance to land managers, landowners, and others as to how to avoid disturbing bald eagles. For additional information please see http://www.fws.gov/migratorybirds/baldeagle.htm .
EXP	Experimental Population	A taxon listed as experimental (either essential or nonessential). Experimental, nonessential populations of endangered species (e.g., red wolf) are treated as threatened species on public land, for consultation purposes, and a species proposed for listing on private land.
P_	Proposed	Species proposed in the Federal Register as a status different from its current federal status.
T (S/A)	Threatened due to Similarity of Appearance	Section 4 (e) of the USESA authorizes the treatment of a species (subspecies or population segment) as endangered or threatened even though it is not otherwise listed as endangered or threatened if (a) the species so closely resembles in appearance an endangered or threatened species that enforcement personnel would have substantial difficulty in differentiating between the listed and unlisted species, (b) the effect of this substantial difficulty is an additional threat to an endangered or threatened species, and (c) such treatment of an unlisted species will substantially facilitate the enforcement and further the policy of the USESA [Federal Register 4 November 1997, Volume 62(213):59605-59623].
T-4(d)	Threatened with a 4(d) Rule	Section 4(d) of the ESA allows special regulations for threatened species that modify normal ESA protections when it is determined that such a modification is necessary and advisable to provide for the conservation of that species. A 4d rule is specific to the particular plant or animal for which it was created. For additional information, see http://www.fws.gov/midwest/endangered/mammals/nlba/ .

Ranking System

Natural Heritage Programs and the NatureServe Network have developed a consistent method for evaluating the relative imperilment of both species and ecological communities. These assessments led to the designation of a conservation status rank. These ranks provide an estimate of extinction risk. Conservation rank values have been assigned over the past 30 years by the NCNHP, NatureServe, and a large number of collaborators in government agencies, universities, natural history museums, botanical gardens, and other conservation organizations. This information has been developed primarily to help in guiding conservation and informing environmental planning and management.

Conservation ranks are either state (S) or global (G) and are based on a one-to-five scale, ranging from critically imperiled (S1 or G1) to demonstrably secure (S5 or G5). These assessments are

based on the best available information, considering a variety of factors such as abundance, distribution, population trends, and threats. Global ranks apply to the status of a species throughout its range. The system is widely used by nationwide agencies and organizations, as the best available scientific and objective assessment of a species' rarity throughout its range.

A rank involving two numbers indicates uncertainty of rank. For example, an S2S3 or a G2G3 rank indicates that the species may be S2 or S3 (or G2 or G3), but that existing data do not allow that determination to be made.

N.C. RANK – ANIMALS

N.C. RANK	NUMBER OF EXTANT OCCURRENCES	DESIGNATION	DESCRIPTION
S1	1-5	Critically Imperiled	Critically imperiled due to extreme rarity or some factor(s) making it especially vulnerable to extirpation (local extinction) from the state. Typically 5 or fewer occurrences or very few remaining individuals (<1,000).
S2	6-20	Imperiled	Imperiled due to rarity or some factor(s) making it very vulnerable to extirpation from the state. Typically 6 to 20 occurrences or few remaining individuals (1,000 to 3,000).
S3	21-100	Vulnerable	Vulnerable to extinction either because rare or uncommon, found only in a restricted range (even if abundant at some locations), or due to other factors making it vulnerable to extirpation. Typically 21 to 100 occurrences or between 3,000 to 10,000 individuals.
S4	101-1,000	Apparently Secure	Apparently secure and widespread, usually with more than 100 occurrences and more than 10,000 individuals.
S5	1,001+	Secure	Common, widespread, and abundant. Essentially ineradicable under present conditions. Typically with considerably more than 100 occurrences and more than 10,000 individuals.
SH	0?	Historical	Of historical occurrence, with some expectation that it may be rediscovered. Its presence may not have been verified in the past 20 years. Upon verification of an extant occurrence, SH-ranked elements would typically receive an S1 rank. Note: an element is not automatically assigned an SH (or SX) rank if it has not been verified in the past 20 years; some effort must have been made to locate or relocate occurrences.

SX	0	Presumed Extirpated	Believed to be extirpated. Has not been located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
SU	Unknown	Unrankable	Currently unrankable due to lack of information or substantially conflicting information about status or trends. More information is needed.
SNR	Unknown	Not Ranked	Statewide rank not yet assessed.
SNA	N/A	Not Applicable	A conservation status rank is not applicable because the element is not a suitable target for conservation for one of these reasons: <ul style="list-style-type: none"> • Hybrid – an interspecific hybrid without conservation value; • Exotic Origin – not native to North Carolina; • Accidental/Nonregular – outside usual range and not regularly found in North Carolina; • Not Confidently Present – never documented as present in NC; • Synonym – the taxon is not recognized by the NCNHP.
S_B	1-?	Breeding	Rank of the breeding population in the state. Used for migratory species only. Ex: Bachman's sparrow (<i>Peucaea aestivalis</i>) is S3B,S2N).
S_N	1-?	Nonbreeding	Rank of the nonbreeding population in the state. Used for migratory species only. Ex: Bachman's sparrow.
S_?	---	Uncertain	Denotes inexact or uncertain numeric rank.

GLOBAL RANK – ANIMALS

GLOBAL RANK	NUMBER OF EXTANT POPULATIONS	DESIGNATION	DESCRIPTION
G1	1-5	Critically Imperiled	Critically imperiled globally because of extreme rarity or because of some factor(s) making it especially vulnerable to extinction. Typically five or fewer occurrences or very few remaining individuals (<1,000) or acres (<2,000) or linear miles (<10).
G2	6-20	Imperiled	Imperiled globally because of rarity or because of some factor(s) making it very vulnerable to extinction. Typically 6 to 20 occurrences or few remaining individuals (1,000 to 3,000) or acres (2,000 to 10,000) or linear miles (10 to 50).

G3	21-100	Vulnerable	Vulnerable globally either because very rare throughout its range, found only in a restricted range (even if abundant at some locations), or other factors making it vulnerable to extinction. Typically 21 to 100 occurrences or between 3,000 and 10,000 individuals.
G4	101-1,000	Apparently Secure	Uncommon but not rare (although it may be rare in parts of its range, particularly on the periphery) and usually widespread. Apparently not vulnerable in most of its range, but possibly cause for long-term concern. Typically more than 100 occurrences and more than 10,000 individuals.
G5	1,001+	Secure	Common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery). Not vulnerable in most of its range. Typically with considerably more than 100 occurrences and more than 10,000 individuals.
GH	0?	Historical	Known only from historical occurrences, but with some expectation that it may be rediscovered. May still be extant; further searching is needed.
GX	0	Presumed Extinct	Believed to be extinct throughout its range (e.g., passenger pigeon) with virtually no likelihood that it will be rediscovered. Not located despite intensive searches of historical sites and other appropriate habitat.
GU	Unknown	Unrankable	Currently unrankable due to lack of information or due to substantially conflicting information about status or trends; need more information.
GNR	Unknown	Not Ranked	Global rank not yet assessed.
G_T_	---	Subspecies or Variety Rank	As an example, G4T1 would apply to a subspecies of a species with an overall rank of G4, but the subspecies warranting a rank of G1.
G_?	---	Uncertain	Denotes inexact or uncertain numeric rank.
G_Q	---	Questionable Taxonomy	Taxonomic classification that may reduce conservation priority. Distinctiveness of this entity as a taxon at the current level is questionable. Resolution of this uncertainty may result in change from a species to a subspecies or inclusion of this taxon in another taxon, with the resulting element having a lower-priority conservation status rank.

PROTECTION PRIORITIES

Polk County is most fortunate that many of its most significant natural areas already enjoy some form of protection. However, there are some highly important sites that are not currently under any form of management or protection. Three of the most pressing examples are discussed, below.

Top priority should be given to the acquisition and/or protection of the few known examples of Low Elevation Seep (Piedmont/Mountain Springhead Subtype) sites known in Polk County. At the present time, this globally rare community type is known from fewer than 20 localities worldwide. Potential threats to these sites include outright destruction, altered hydrology, and the encroachment of non-native invasive plant species, particularly Chinese Privet (*Ligustrum sinense*). Partnerships should be sought with landowners whose properties harbor these rare and unique areas.

Immediate attention should also be given to the sensitive plant communities that are being affected by development on ridgetop forests and rock outcrops in places like White Oak Mountain, Tryon Peak, and elsewhere. Where possible, development should be limited on these fragile sites, many of which contain rare plant species as well as globally rare community types.

Another sensitive area with many natural heritage attributes is Hughes Creek. Development along the margins of the creek should be actively discouraged, as this is a relatively pristine area that harbors a great diversity of both aquatic and terrestrial flora and fauna along its entire length. If development does occur on this site, adequate and substantial buffers should be put in place in order to help mitigate any potential environmental impacts caused by construction or human habitation.

AREAS FOR FURTHER STUDY

Although Polk County has a long history of biological investigation, there still remain sizeable areas of private property that have not been surveyed adequately due to failure to obtain landowner permission. Other habitats worthy of investigation are railroad and powerline right-of-ways (ROWs) that may contain 'prairie' remnant flora. A list of suggested areas for further study is provided below.

Southeastern Polk County. Southeastern Polk County contains a clustering of globally rare and unusual non-alluvial wetlands. These wetlands contain regionally rare and disjunct vascular flora, many of Coastal Plain affinity. None of these sites have any formal protection. Additional and as yet undiscovered examples of these communities may very well be found in this region of the county. Targeted and purposeful searches should be made to locate any further examples and, if possible, these should be purchased for protection or placed under some form of conservation easement.

North Pacolet River Valley. Floristically very rich and well-known but, with some nearly inaccessible cliffs of mafic rock, upper portions of this area need to be examined carefully and systematically for base-loving ferns and other species with affinities for such rock outcrop communities. In addition, this area has the highest number of reports for the regionally rare Scarlet Kingsnake (*Lampropeltis elapsoides*). It would be valuable to know the extent and numbers of the population of this highly secretive species in Polk County.

Bog Turtle Surveys. As a result of the present study, Bog Turtles have been located within Polk County. As a consequence, low elevation seeps and other cool, spring-fed habitats should receive attention to determine if there are other populations in Polk County. Searches for this species would be most profitably done in early spring and early fall when these turtles are more active and easier to detect.

Railroad sites and Powerline ROWs for *Echinacea pallida*. The occurrence of Pale Coneflower (*Echinacea pallida*) along a railroad embankment in Tryon is perhaps not entirely surprising given the proximity of existing and former sites in adjacent Rutherford County. Survey efforts should be made along railroad embankments and powerline ROWs in the lower elevations of the county, particularly in areas of mafic soils. Additional interesting species may also be found, including American Bluehearts (*Buchnera americana*), not seen since a collection by Donald Peattie in the Tryon region in the 1920s.

Animal Surveys. County inventories are typically heavily weighted in favor of botanical exploration for various reasons, not the least of which is the relative ease of surveying for plants. However, a great deal remains to be learned about the animal diversity in the county, both vertebrate and invertebrate. Butterflies are fairly well known, but even with these, records are relatively sparse for Polk County; other insect groups have hardly been investigated at all. Mammalian surveys, with a focus perhaps on Southern Appalachian Eastern Woodrat (*Neotoma floridana haematoreia*), Eastern Spotted Skunk (*Spilogale putorius*), and Bat species, would likely yield interesting results. The county offers great potential for faunal investigation.

BIOLOGICAL SURVEYS AND ENDANGERED SPECIES LAWS

Obtaining landowner permission to survey a potential site is an integral part of biological inventories carried out by the North Carolina Natural Heritage Program. On occasion, permission to survey on private lands is not granted due to the misconception that if significant natural areas or rare species are found residing there, it will result in limited land use and restrictions to the landowner. When this occurs, it limits the ability for good biological and scientific information to be obtained. Also, the landowners who might possess a biologically significant natural community or rare species on their land does not learn about conservation options and tax incentives available to them. On the lands where landowners grant permission for a biological survey, if significant natural communities and/or rare species are found, if the landowners wish, they may be put in contact with appropriate conservation organizations, or made aware of other management or protection options.

The reality is that landowners have very little reason to have concerns about the presence of significant natural areas or rare species that might be located on their land. Below is a summary of the federal and state endangered species laws relative to private landowners. It was prepared by Mark A. Cantrell of the U.S. Fish and Wildlife Service and Kenneth Bridle, PhD of the Piedmont Land Conservancy in Greensboro, North Carolina. It is presented to help dispel concerns landowners may have about rare species and to provide clarification on potential land-use restrictions.

FEDERAL LAW

1. The Endangered Species Act (ESA) protects only plants and animals that are federally listed as Endangered or Threatened. Since federally listed species are by definition very rare, the likelihood of their occurring on a given tract of private land is generally very small.
2. The ESA does not protect federally listed animal species from the potentially harmful actions of private landowners. Because this might lead to restrictions on their use of land, Congress, the U.S. Fish and Wildlife Service (USFWS), and a variety of partners have worked to develop flexible tools for resolving conflicts. These tools include Section 10 permits, such as habitat conservation plans, safe harbor agreements, and candidate conservation agreements. Federal funds are also available to assist landowners in the management and conservation of listed and candidate species on their lands.
3. Engaging in trade in a federally listed species without a permit is illegal for both plants and animals. “Taking” (i.e., harassing, harming, pursuing, hunting, killing, and trapping) or illegally possessing federally listed animals is a violation of the ESA. Removing, digging up, cutting, damaging, or destroying a federally listed plant on public land, or on private land without the landowner’s permission, is illegal.
4. Through the habitat conservation planning process, the USFWS may issue a permit so that private landowners can lawfully “take” a federally listed animal species if it is “incidental to and not the purpose of carrying out otherwise lawful activities.” These permits are available as long as

the landowner implements an approved conservation plan for the species, and the “taking” does not jeopardize the continued existence of the species. A private landowner is not required to prepare a conservation plan for the “taking” of federally listed plant species as long as the activity does not involve federal funding or permitting.

5. Under the ESA, private developers can obtain permits to legally harm or even kill federally listed species on their property provided that they show attempts were made to minimize their impact on the species in other ways.

6. The existence of a federally listed plant species on private land legally has no effect on the landowner unless a project requires a federal permit or uses federal funds and will clearly result in the taking of a listed plant species. Landowners, individuals, and agencies are prohibited from taking endangered animals without authorization, whether the action is private or federally funded.

7. When critical habitat is designed for federally listed species, it applies only to federal actions and not to non-federal actions of private landowners.

STATE LAW

1. North Carolina endangered species laws apply to species listed by the state as Endangered or Threatened.

2. The plant and animal endangered species laws are modeled after the ESA, in that it prohibits illegal trafficking or poaching of listed species.

3. The state endangered animal species law states “no rule may be adopted that restricts the use or development of private property.”

4. The state endangered plant species law specifically states “the incidental disturbance of protected plants during agricultural, forestry, or development operations is not illegal as the plants are not collected for sale or commercial use.

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SITE DESCRIPTIONS

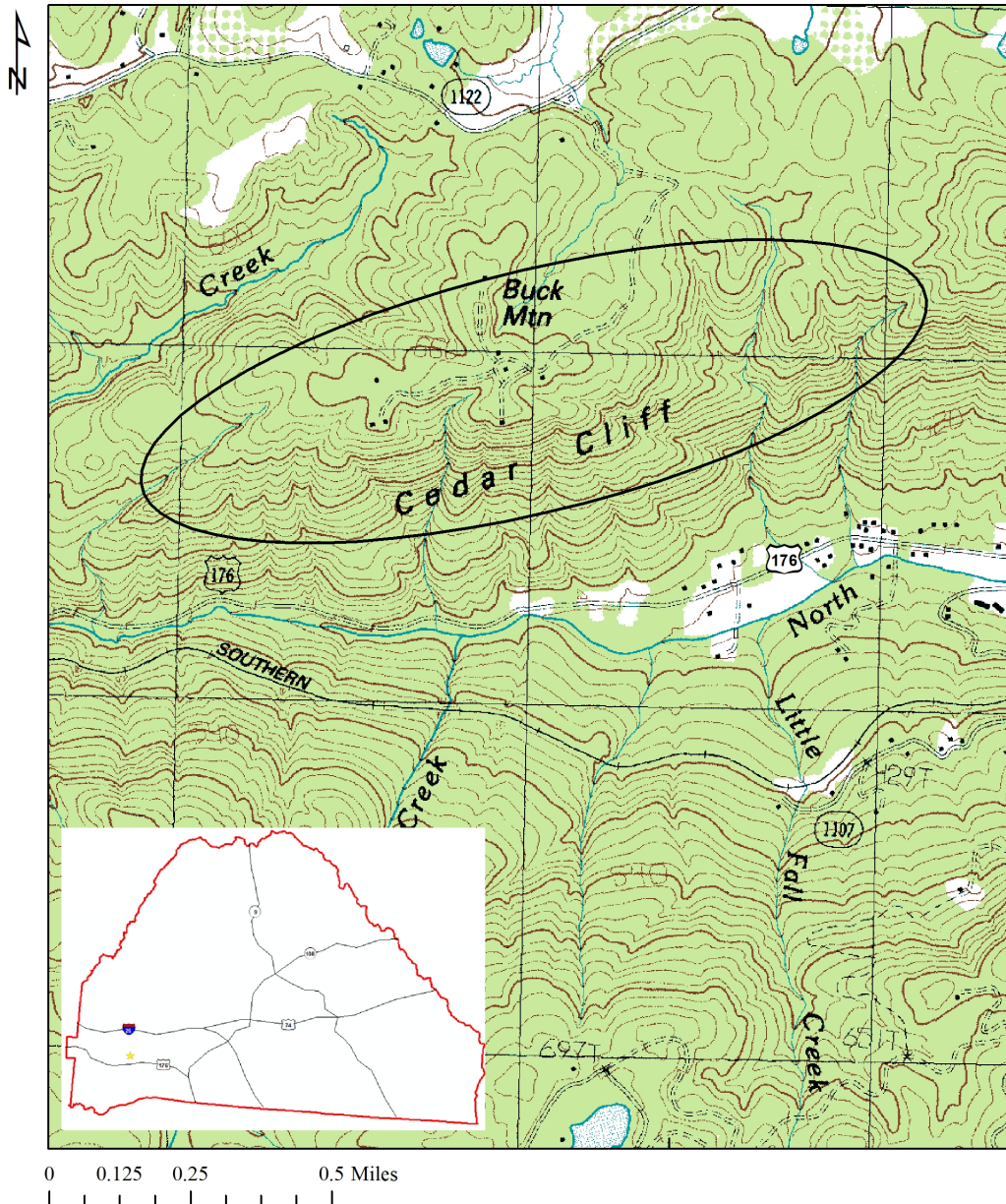
Polk County Natural Areas Inventory

Buck Mountain/Cedar Cliff

Saluda Quad

Significant Natural Heritage Area

Prepared by Pam Torlina - 7/2017



Polk County Natural Areas Inventory
Buck Mountain/Cedar Cliff
Significant Natural Area

Site Significance: State

Size: 280 acres

Quadrangle: Saluda

Ownership: Private/Conserving
Carolina

SIGNIFICANT FEATURES: Several significantly rare vascular plants occur here, chief amongst which is French Broad Heartleaf (*Hexastylis rhombiformis*), a species which is endemic to the southern Blue Ridge in North and South Carolina. South-facing rocky slopes may provide important hibernacula for Timber Rattlesnakes (*Crotalus horridus*). The rarely encountered Mottled Duskywing (a species of butterfly) has been observed in upland woods at this site.

LANDSCAPE RELATIONSHIPS: Approximately 3 miles northwest of Tryon, NC.

SITE DESCRIPTION: Upper slopes and summits approximate the Chestnut Oak Forest (Herb Subtype) community. Canopy species include Chestnut Oak (*Quercus montana*) – dominant, Scarlet Oak (*Quercus coccinea*), Post Oak (*Quercus stellata*), Black Oak (*Quercus velutina*), Mockernut Hickory (*Carya tomentosa*), Sand Hickory (*Carya pallida*), Sourwood (*Oxydendrum arboreum*), Red Maple (*Acer rubrum*), and Virginia Pine (*Pinus virginiana*). Shrubs present are Dryland Blueberry (*Vaccinium pallidum*), Southern Dwarf Huckleberry (*Gaylussacia dumosa*), Black Huckleberry (*Gaylussacia baccata*), Mountain Laurel (*Kalmia latifolia*), and New Jersey Tea (*Ceanothus americanus*). Herbaceous diversity is moderate, with Bearded Shorthusk (*Brachyelytrum erectum*), Poverty Oat Grass (*Danthonia spicata*), Downy Danthonia (*Danthonia sericea*), White Milkweed (*Asclepias variegata*), Biltmore Carrion Flower (*Smilax biltmoreana*), Virginia Goat's Rue (*Tephrosia virginiana*), Birdsfoot Violet (*Viola pedata* var. *pedata*), and Curtiss' Milkwort (*Polygala curtissii*). The rarely encountered One-spotted Tiger Beetle (*Cylindera unipunctata*), was observed here in good numbers.

Mid to upper slopes display large amounts of exposed rock faces (some sheer), boulders, cliffs, and overhangs. Rocks weathering here create soils of an evidently more basic nature, based upon observed flora, that define this as Low Elevation Rocky Summit (Basic Subtype). Virginia Pine (*Pinus virginiana*), Chestnut Oak (*Quercus montana*), Red Cedar (*Juniperus virginiana*), and Mockernut Hickory (*Carya tomentosa*), occur throughout. Shrubs include Hoptree (*Ptelea trifoliata*), Hairy Mock-orange (*Philadelphus hirsutus*), Deerberry (*Vaccinium stamineum* var. *stamineum*), and Fragrant Sumac (*Rhus aromatica* var. *aromatica*). Vines include Virginia Creeper (*Parthenocissus quinquefolia*), Yellow Honeysuckle (*Lonicera flava*), and Midwestern Carrion

Flower (*Smilax lasioneura*). Herbaceous species characteristic of open rock outcrops comprise Hairy Lipfern (*Myriopteris lanosa*), American Alumroot (*Heuchera americana*), Lowland Bladder Fern (*Cystopteris protrusa*), Early Saxifrage (*Micranthes virginensis*), and Rock Spikemoss (*Bryodesma rupestre*).

Dry-Mesic Oak-Hickory Forest (Piedmont Subtype) occupies the lower slopes and ravines at the base of rock outcrops. Prominent tree species found here are White Oak (*Quercus alba*), Northern Red Oak (*Quercus rubra*), Black Oak (*Quercus velutina*), Mockernut Hickory (*Carya tomentosa*), Pignut Hickory (*Carya glabra*), Red Maple (*Acer rubrum*), Tulip Poplar (*Liriodendron tulipifera*), Sourwood (*Oxydendrum arboreum*), Flowering Dogwood (*Cornus florida*), and Persimmon (*Diospyros virginiana*). The shrub layer includes Mountain Laurel (*Kalmia latifolia*), Blackhaw (*Viburnum prunifolium*), Strawberry Bush (*Euonymus americanus*), American Witch-hazel (*Hamamelis virginiana* var. *virginiana*), Sweetshrub (*Calycanthus floridus*), and Dryland Blueberry (*Vaccinium pallidum*). Herbaceous diversity is moderate, and differences between aspect and soil moisture may be marked. More mesic sites feature Catesby's Trillium (*Trillium catesbaei*), Christmas Fern (*Polystichum acrostichoides*), Bearcorn (*Conopholis americana*), Heartleaf Golden Alexanders (*Zizia aptera*), Spring Beauty (*Claytonia virginica*), Round-lobed Hepatica (*Anemone americana*), Carolina Woodrush (*Luzula acuminata* var. *carolinae*), Windflower (*Thalictrum thalictroides*), and Downy Rattlesnake Plantain (*Goodyera pubescens*). Populations of French Broad Heartleaf (*Hexastylis rhombiformis*) are scattered throughout this site in somewhat open situations, with thinner canopy coverage.

MANAGEMENT AND PROTECTION: Eastern portions of this site are contained within the Normam Wilder Forest tract, owned by Conserving Carolina.

NATURAL COMMUNITIES: Low Elevation Rocky Summit (Basic Subtype), Chestnut Oak Forest (Herb Subtype), Dry-Mesic Oak-Hickory Forest (Piedmont Subtype).

RARE PLANTS: Grotto Alumroot (*Heuchera parviflora* var. *parviflora*), French Broad Heartleaf (*Hexastylis rhombiformis*), Blue Ridge Ragwort (*Packera millefolium*), American Ginseng (*Panax quinquefolius*), Shooting-star (*Primula meadia*), Midwestern Carrion Flower (*Smilax lasioneura*), Ash-leaved Golden-banner (*Thermopsis fraxinifolia*). Watch List – Yellow Honeysuckle (*Lonicera flava*), Hairy Mock-orange (*Philadelphus hirsutus*), Hoptree (*Ptelea trifoliata*).

RARE ANIMALS: Timber Rattlesnake (*Crotalus horridus*), Mottled Duskywing (*Erynnis martialis*).

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Campbell, D. 2016. Site Survey Report: Buck Mountain/Cedar Cliff, Tryon. Pacolet Area Conservancy, Tryon, N.C.

Peattie, D.C. 1928-1931. Flora of the Tryon Region. Journal of the Elisha Mitchell Scientific Society. 44: 95-125, 141-229; 45: 59-100, 245-290; 46: 129-160.

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Primula meadia by Keith Bradley

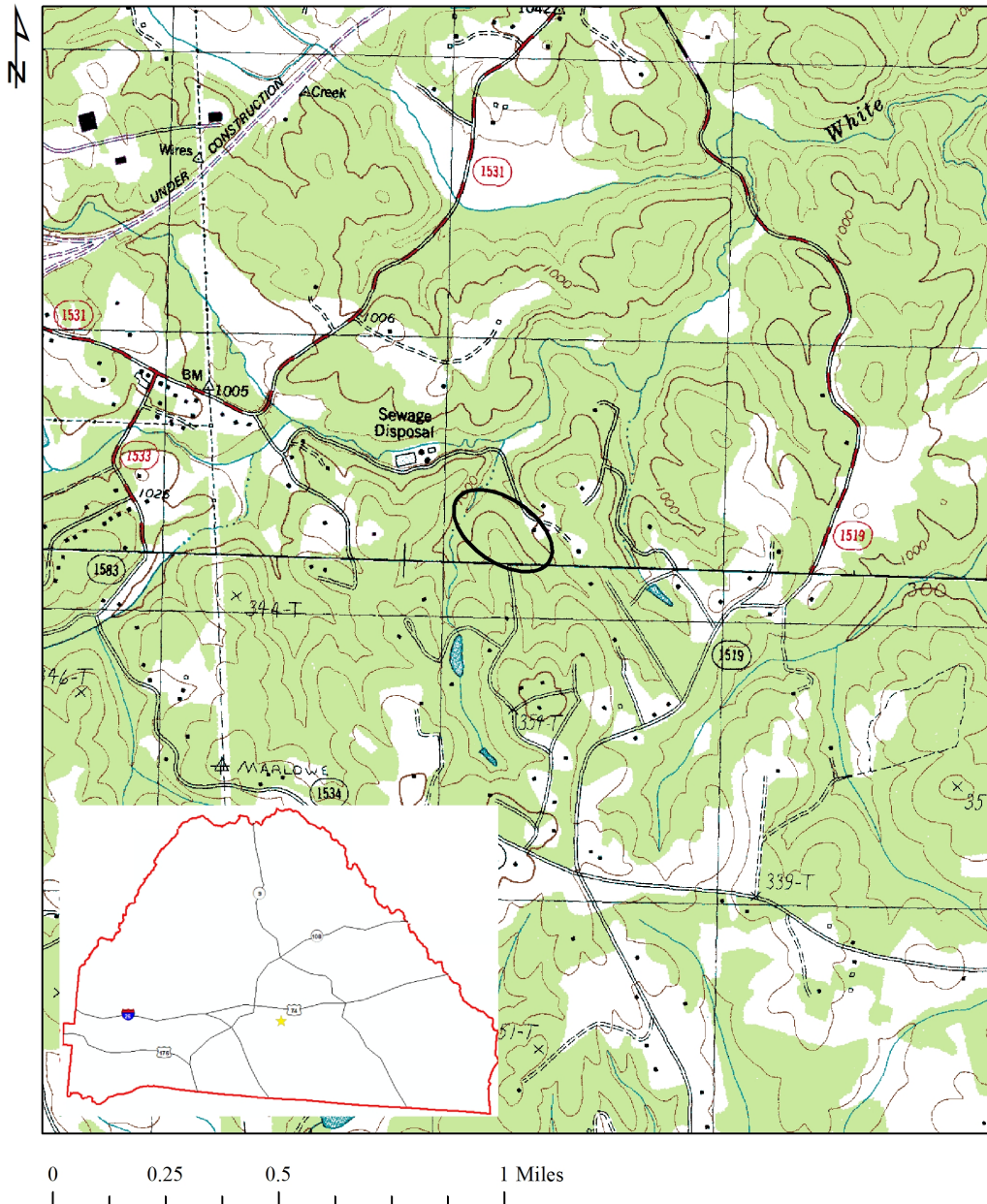
Polk County Natural Areas Inventory

Columbus Rare Plant Site

Landrum Quad

Significant Natural Heritage Area

Prepared by Pam Torlina - 4/2018



Polk County Natural Areas Inventory
Columbus Rare Plant Site
Significant Natural Area

Site Significance: Regional

Size: 14.5

Quadrangle: Landrum

Ownership: Private

SIGNIFICANT FEATURES: This site is significant as it represents the first documented occurrence of Carolina Hemlock (*Tsuga caroliniana*), a Federal Species of Concern in Polk County, along with a newly discovered population of Dwarf-flowered Heartleaf (*Hexastylis naniflora*), a Federal and State Threatened species. Plant community types present are Low Mountain Pine Forest (Montane Pine Subtype) and Low Elevation Seep (Typic Subtype). Two rare plant species and one rare animal species are found here.

LANDSCAPE RELATIONSHIPS: This site is located in the eastern portion of Columbus, within a residential development that is surrounded by farmland and rolling hills, most of which are largely forested, dissected by several small streams.

SITE DESCRIPTION: The Low Elevation Pine Forest consists of low to moderate slopes that trend from dry-mesic to approaching xeric on the higher ridges, dominated by Pines and Oaks. Tree species include Chestnut Oak (*Quercus montana*), Scarlet Oak (*Quercus coccinea*), Black Oak (*Quercus velutina*), White Oak (*Quercus alba*), Black Gum (*Nyssa sylvatica*), Mockernut Hickory (*Carya tomentosa*), American Holly (*Ilex opaca*), and Virginia Pine (*Pinus virginiana*). Scattered stands and individuals of Carolina Hemlock (*Tsuga caroliniana*), are found on mid to lower slopes. Ericaceous shrubs are common and include Mountain Laurel (*Kalmia latifolia*), Black Huckleberry (*Gaylussacia baccata*), and Dryland Blueberry (*Vaccinium pallidum*). Additional understory species are Sweetleaf (*Symplocos tinctoria*), and Dwarf Pawpaw (*Asimina parviflora*). Forest edges have patches of New Jersey Tea, (*Ceanothus americanus*). The herbaceous layer is not well-developed, with Curlyleaf Yucca (*Yucca filamentosa*), Galax (*Galax urceolata*), Yellow Wild Indigo (*Baptisia tinctoria*), and Spotted Wintergreen (*Chimaphila maculata*) occurring sparsely throughout.

A Low Elevation Seep is found at the toe of a slope and adjacent to an unnamed tributary. The area surrounding the seep is a closed canopy mostly consisting of Red Maple (*Acer rubrum* var. *trilobum*), River Birch (*Betula nigra*), and White Oak (*Quercus alba*). Small patches of the Federally and State Threatened Dwarf Heartleaf (*Hexastylis naniflora*) grow around the seepage area with New York Fern (*Parathelypteris noveboracensis*), Virginia Snakeroot (*Endodeca serpentaria*), Broad Beech Fern (*Phegopteris hexagonoptera*), Shining Clubmoss (*Huperzia lucidulum*), Christmas Fern (*Polystichum acrostichoides*), Crane Fly Orchid (*Tipularia discolor*),

and Rattlesnake Plantain Orchid (*Goodyera pubescens*). Within the seep itself, mucky soils support Netted Chain Fern (*Lorinseria areolata*), American Royal Fern (*Osmunda spectabilis*), Virginia Sweetspires (*Itea virginica*), Greater Bladder Sedge (*Carex intumescens* var. *intumescens*), Shallow Sedge (*Carex lurida*), Club-spur Orchid (*Platanthera clavellata*), Yellowroot (*Xanthorhiza simplicissima*), and Possumhaw (*Viburnum nudum* var. *nudum*). Soils here are mapped as Pacolet-Bethlehem Complex (Ultisols).

MANAGEMENT AND PROTECTION: The owners of this site have been made aware of its botanical significance, and have no current plans to disturb the area.

NATURAL COMMUNITIES: Low Mountain Pine Forest (Montane Pine Subtype), Low Elevation Seep (Typic Subtype).

RARE PLANTS: Carolina Hemlock (*Tsuga caroliniana*), Dwarf-flowered Heartleaf (*Hexastylis naniflora*).

RARE ANIMALS: Mottled Duskywing (*Erynnis martialis*).

REFERENCES:

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Hexastylis naniflora by William S. Moye

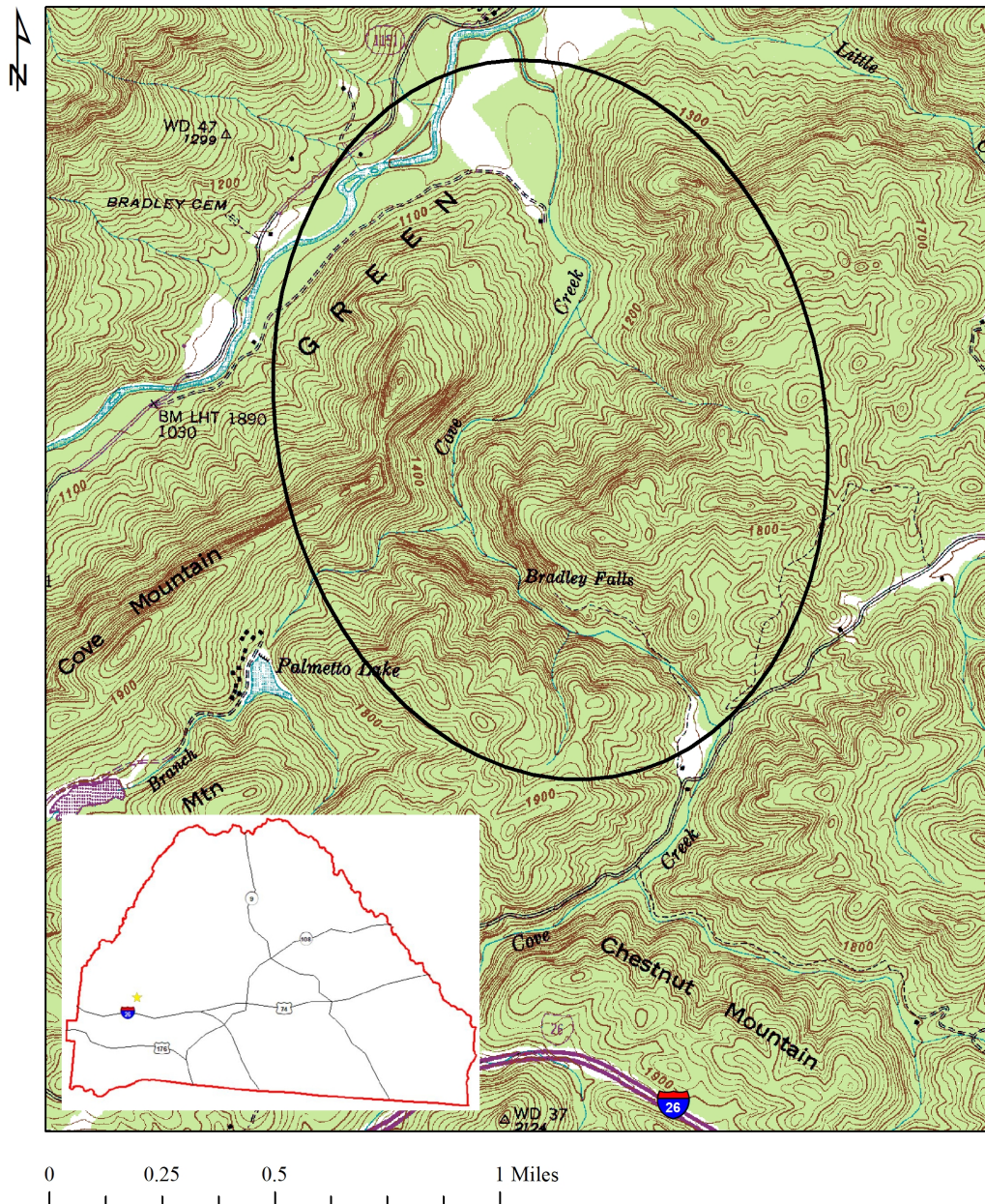
Polk County Natural Areas Inventory

Cove Creek/Bradley Falls

Clifffield Mountain Quad

Significant Natural Heritage Area

Prepared by Pam Torlina - 4/2018



Polk County Natural Areas Inventory

Cove Creek/Bradley Falls

Significant Natural Area

Site Significance: State

Size: ca. 980 acres

Quadrangle: Clifffield Mountain

Ownership: State of NC

SIGNIFICANT FEATURES: The presence of many rare vascular plant species, including large numbers of the globally rare French Broad Heartleaf (*Hexastylis rhombiformis*), as well as several rare and Watch List animal species, make this site one of high significance. In addition, the relatively large size and quality of the natural communities found here is noteworthy.

LANDSCAPE RELATIONSHIPS: South of the Green River in western Polk County, along SR 1151.

SITE DESCRIPTION: Acidic Cove Forest (Typic Subtype), covers large areas of this tract in coves and other areas of sheltered aspect. Canopy dominants include Northern Red Oak (*Quercus rubra*), Black Oak (*Quercus velutina*), Tulip Poplar (*Liriodendron tulipifera*), Sweet Birch (*Betula lenta*), Mockernut Hickory (*Carya tomentosa*), Sourwood (*Oxydendrum arboreum*), Persimmon (*Diospyros virginiana*), Red Maple (*Acer rubrum* var. *rubrum*), Flowering Dogwood (*Cornus florida*), and Cucumber Magnolia (*Magnolia acuminata* var. *acuminata*). Eastern Hemlock (*Tsuga canadensis*) is present, but now mostly as large dead snags, and a few young trees that are succumbing to the Hemlock Woolly Adelgid (*Adelges tsugae*). Shrubs occurring here are American Witch-hazel (*Hamamelis virginiana* var. *virginiana*), Rosebay Rhododendron (*Rhododendron maximum*), Mountain Doghobble (*Leucothoe fontanesiana*), Strawberry-bush (*Euonymus americanus*), Piedmont Rhododendron (*Rhododendron minus*) – among rock outcrops, Mapleleaf Viburnum (*Viburnum acerifolium*), and Beaked Hazel (*Corylus cornuta*). Woody vine diversity is moderate with Grape (*Vitis* spp.), Poison Ivy (*Toxicodendron radicans*), Common Greenbrier (*Smilax rotundifolia*), and Virginia Creeper (*Parthenocissus quinquefolia*). Herbaceous density is variable, including Downy Rattlesnake Plantain (*Goodyera pubescens*), Little Brown Jug (*Hexastylis arifolia* var. *arifolia*), French Broad Heartleaf (*Hexastylis rhombiformis*), Christmas Fern (*Polystichum acrostichoides*), Crane-fly Orchid (*Tipularia discolor*), Rattlesnake Weed (*Hieracium venosum*), Dwarf Crested Iris (*Iris cristata*), Kidneyleaf Twayblade (*Listera smallii*), Catesby's Trillium (*Trillium catesbaei*), and Bearcorn (*Conopholis americana*).

Upper ridgetops contain examples of Chestnut Oak Forest (Dry Heath Subtype). The canopy here is heavily dominated Chestnut Oak (*Quercus montana*) with lesser amounts of Scarlet Oak (*Quercus coccinea*), Black Oak (*Quercus velutina*), Virginia Pine (*Pinus virginiana*), Shortleaf

Pine (*Pinus echinata*), Mockernut Hickory (*Carya tomentosa*), Sand Hickory (*Carya pallida*), Red Maple (*Acer rubrum* var. *rubrum*), Black Gum (*Nyssa sylvatica*), Persimmon (*Diospyros virginiana*), Sourwood (*Oxydendrum arboreum*), Dwarf Pawpaw (*Asimina parviflora*), and Flowering Dogwood (*Cornus florida*). Shrubs present include Mountain Laurel (*Kalmia latifolia*), Sassafras (*Sassafras albidum*), Dryland Blueberry (*Vaccinium pallidum*), Sweetleaf (*Symplocos tinctoria*), Trailing Arbutus (*Epigaea repens*), and Buffalo-nut (*Pyrularia pubera*). Woody vines are mostly Greenbriers (*Smilax* spp.). Herbaceous diversity is relatively low with Spotted Wintergreen (*Chimaphila maculata*), Partridgeberry (*Mitchella repens*), Biltmore Carrionflower (*Smilax biltmoreana*), Black Snakeroot (*Sanicula canadensis* var. *canadensis*), Poverty Oatgrass (*Danthonia spicata*), Broomsedge (*Andropogon virginicus* var. *virginicus*), Galax (*Galax urceolata*), and Heartleaf Ginger (*Hexastylis heterophylla*).

Mid and upper slopes throughout this site contain Dry-Mesic Oak--Hickory Forest (Piedmont Subtype). Canopy species commonly encountered include White Oak (*Quercus alba*), Northern Red Oak (*Quercus rubra*), Chestnut Oak (*Quercus montana*), Mockernut Hickory (*Carya tomentosa*), Pignut Hickory (*Carya glabra*), Red Maple (*Acer rubrum* var. *rubrum*), Tulip Poplar (*Liriodendron tulipifera*), American Holly (*Ilex opaca* var. *opaca*), Shortleaf Pine (*Pinus echinata*), Black Gum (*Nyssa sylvatica*), and Sourwood (*Oxydendrum arboreum*). Commonly encountered shrubs are Mountain Laurel (*Kalmia latifolia*), Dryland Blueberry (*Vaccinium pallidum*), and Black Huckleberry (*Gaylussacia baccata*). Woody vines are predominantly Grape (*Vitis* spp.), Common Greenbrier (*Smilax rotundifolia*), and Poison Ivy (*Toxicodendron radicans*). Herbs are typically sparse, but include Downy Rattlesnake Plantain (*Goodyera pubescens*), Crane-fly Orchid (*Tipularia discolor*), French Broad Heartleaf (*Hexastylis rhombiformis*), Indian Pipes (*Monotropa uniflora*), Pinesap (*Hypopitys monotropa*), and Common White Snakeroot (*Ageratina altissima* var. *altissima*).

Deep gorges and north-facing slopes above streams and rivers contain remnant Eastern Hemlock Forest (Typic subtype). Once dominated by Eastern Hemlock (*Tsuga canadensis*), these areas have been ravaged in recent years by the Hemlock Woolly Adelgid (*Adelges tsugae*), an insect native to eastern Asia. Most sites now only contain abundant dead snags of once mature trees; some smaller specimens may occasionally be seen. Tulip Poplar (*Liriodendron tulipifera*), Sweet Birch (*Betula lenta*), Northern Red Oak (*Quercus rubra*), and Fraser Magnolia (*Magnolia fraseri*), appear to be filling in the canopy gaps created by the dying Hemlocks. The shrub layer is dominated by Rosebay Rhododendron (*Rhododendron maximum*), Mountain Doghobble (*Leucothoe fontanesiana*), and Mountain Sweet-pepperbush (*Clethra acuminata*). Grape (*Vitis* spp.) are often the only woody vines present. The herb layer is sparse, but Little Brown Jug (*Hexastylis arifolia* var. *arifolia*), Downy Rattlesnake Plantain (*Goodyera pubescens*), and Christmas Fern (*Polystichum acrostichoides*) occur here.

Rich Cove Forest (Foothills Rich Subtype), may be found in sheltered areas with richer soil series. Canopy dominants in these communities include White Basswood (*Tilia americana* var. *heterophylla*), Yellow Buckeye (*Aesculus flava*), Tulip Poplar (*Liriodendron tulipifera*), White Ash (*Fraxinus americana*), Bitternut Hickory (*Carya cordiformis*), and Red Elm (*Ulmus rubra*). Individuals of Fraser Magnolia (*Magnolia fraseri*), are occasionally encountered. Examples of shrubs present are Spicebush (*Lindera benzoin*), Pawpaw (*Asimina triloba*), and the uncommon Leatherwood (*Dirca palustris*). Woody vines are Grape (*Vitis* spp.) and Poison Ivy (*Toxicodendron radicans*). The herbaceous layer may be quite diverse in some areas, with Tall

White Violet (*Viola canadensis* var. *canadensis*), Blue Cohosh (*Caulophyllum thalictroides*), Northern Maidenhair Fern (*Adiantum pedatum*), Jack-in-the-pulpit (*Arisaema triphyllum*), Common Wild Ginger (*Asarum canadense*), Puttyroot (*Aplectrum hyemale*), Yellow Mandarin (*Prosartes lanuginosa*), Wake-robin (*Trillium erectum*), Large-flowered Trillium (*Trillium grandiflorum*), and Mapleleaf Waterleaf (*Hydrophyllum canadense*).

MANAGEMENT AND PROTECTION: This site is under management of the NC Wildlife Resources Commission.

NATURAL COMMUNITIES: Acidic Cove Forest (Typic Subtype), Eastern Hemlock Forest (Typic Subtype), Chestnut Oak Forest (Dry Heath Subtype), Dry-Mesic Oak--Hickory Forest (Piedmont Subtype), Rich Cove Forest (Foothills Rich Subtype).

RARE PLANTS: Radford's Sedge (*Carex radfordii*), Whorled Horsebalm (*Collinsonia verticillata*), Broadleaf Coreopsis (*Coreopsis latifolia*), French Broad Heartleaf (*Hexastylis rhombiformis*), Walter's Crownbeard (*Verbesina walteri*), Watch List – Leatherwood (*Dirca palustris*), Littleleaf Alumroot (*Heuchera parviflora*), American Ginseng (*Panax quinquefolius*), Scentless Mock-orange (*Philadelphus inodorus*), Hoptree (*Ptelea trifoliata*).

RARE ANIMALS: Timber Rattlesnake (*Crotalus horridus*), Cerulean Warbler (*Dendroica cerulea*), Coal Skink (*Plestiodon anthracinus*), Diana Fritillary (*Speyeria diana*), Eastern Spotted Skunk (*Spilogale putorius*).

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Carex radfordii by Keith Bradley

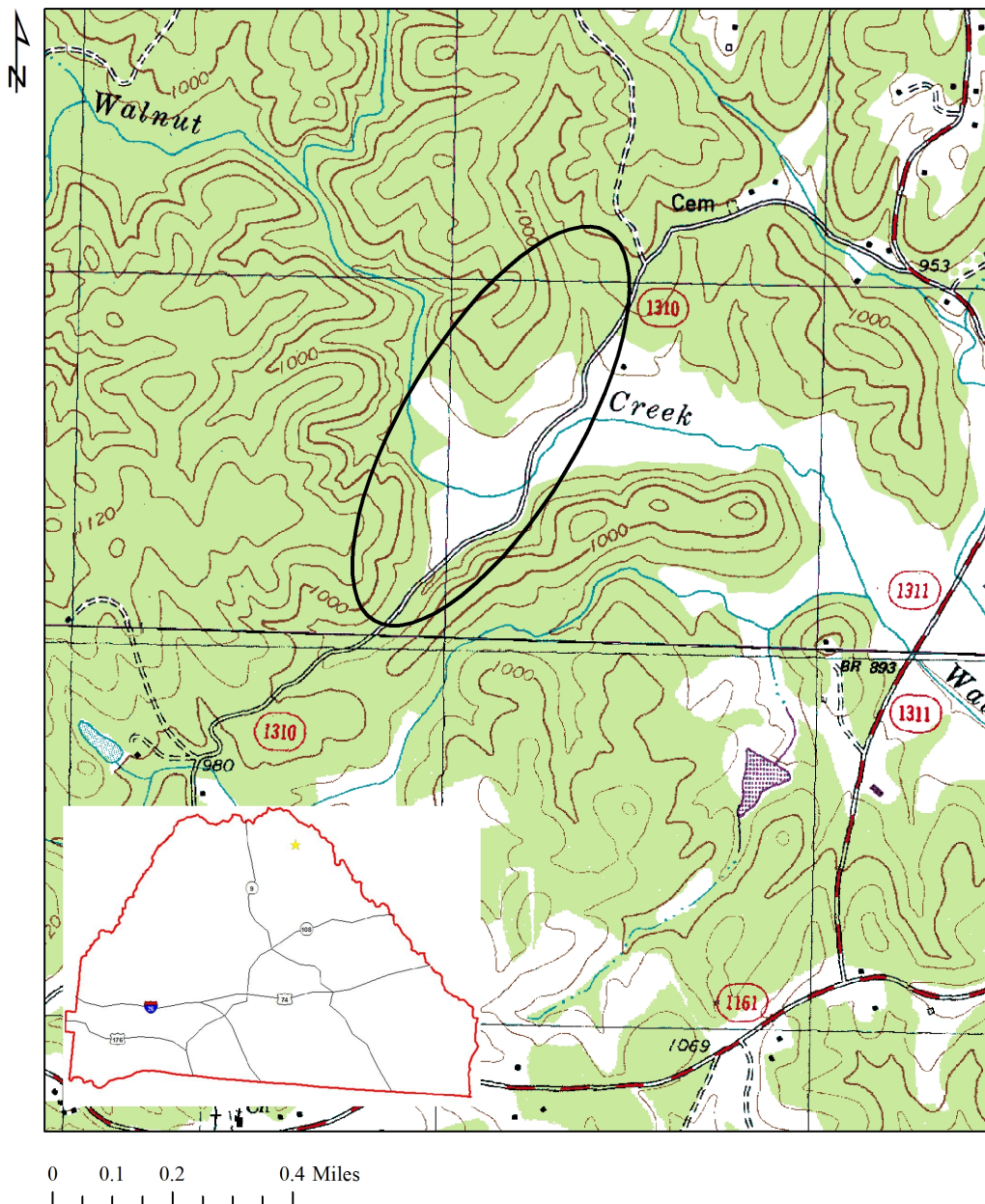
Polk County Natural Areas Inventory

Edgerton Road Tract

Lake Lure Quad

Significant Natural Heritage Area

Prepared by Pam Torlina - 10/2017



Polk County Natural Areas Inventory

Edgerton Road Tract

Significant Natural Area

Site Significance: Regional

Size: 88 acres

Quadrangle: Lake Lure

Ownership: Private

SIGNIFICANT FEATURES: This area contains high quality north-facing, rich slopes with a very diverse flora. Velvet Sedge (*Carex vestita*), previously considered extirpated from North Carolina, occurs here at its only known site in the state. Six rare plant species and one Watch List animal species occur at this site.

LANDSCAPE RELATIONSHIPS: North-east facing slopes, surrounding tableland, and streamside flats on the eastern bank of Walnut Creek, situated to the north side of Edgerton Road.

SITE DESCRIPTION: Rich alluvial flats along Walnut Creek with adjacent cove-like elements on north and northeast facing slopes with a correspondingly cooler microclimate, above the creek. Flora of these lower areas of rich soils contain a great diversity of herbaceous and woody species alike. Canopy species here include White Basswood (*Tilia americana* var. *heterophylla*), White Oak (*Quercus alba*), Tulip Poplar (*Liriodendron tulipifera*), Northern Red Oak (*Quercus rubra*), and Red Maple (*Acer rubrum* var. *rubrum*). Butternut (*Juglans cinerea*), from whence Walnut Creek received its name i.e. ‘White Walnut’, occurs at this site now only as dead trunks and snags, a victim of the now widespread Butternut Canker Disease. The understory consists of Pawpaw (*Asimina triloba*), Sweetshrub (*Calycanthus floridus*), Maple-leaf Viburnum (*Viburnum acerifolium*), Spicebush (*Lindera benzoin*), American Witch-hazel (*Hamamelis virginiana* var. *virginiana*), and Wild Hydrangea (*Hydrangea arborescens*). Herbaceous species diversity is high, and includes Crested Iris (*Iris cristata*), American Ginseng (*Panax quinquefolius*), Christmas Fern (*Polystichum acrostichoides*), Black Cohosh (*Actaea racemosa*), Horsebalm (*Collinsonia canadensis*), Showy Orchis (*Galearis spectabilis*), Mountain Golden-Alexanders (*Zizia trifoliata*), Appalachian Blue Monkshood (*Aconitum uncinatum*), One-flowered Cancer-root (*Orobanche uniflora*), Catesby’s Trillium (*Trillium catesbaei*), Puttyroot (*Aplectrum hyemale*), Woodland Muhly (*Muhlenbergia sylvatica*), Spring Beauty (*Claytonia virginica*), American Alumroot (*Heuchera americana*), Bearcorn (*Conopholis americana*), Sharp-lobed Hepatica (*Anemome acutiloba*), Carolina Milkvine (*Matelea caroliniensis*), and Wild Comfrey (*Cynoglossum virginianum* var. *virginianum*).

Flats immediately adjacent to Walnut Creek contain a small population of Velvet Sedge (*Carex vestita*), previously considered extinct in North Carolina and at the periphery of its range. Here, at

its only known location in the state, it grows precariously near eroding creek banks, under large Pawpaw trees.

Areas upslope contain drier soils of an evidently more acidic nature. The intact areas of forest type here would best be described as a Dry-Mesic Oak-Hickory Forest; at least in its original state. Prominent tree species include White Oak (*Quercus alba*), Southern Red Oak (*Quercus falcata*), Scarlet Oak (*Quercus coccinea*), Tulip Poplar (*Liriodendron tulipifera*), Mockernut Hickory (*Carya tomentosa*), and Virginia Pine (*Pinus virginiana*). Herbaceous diversity is moderate, with Striped Gentian (*Gentiana villosa*), Bracken (*Pteridium latiusculum*), Splitbeard Bluestem (*Andropogon ternarius* var. *ternarius*), Broomsedge (*Andropogon virginicus* var. *virginicus*), Little Bluestem (*Schizachyrium scoparium* var. *scoparium*), Claspig Milkweed (*Asclepias amplexicaulis*), Butterfly Milkweed (*Asclepias tuberosa*), Rose-pink (*Sabatia angularis*), Blue-eyed Grass (*Sisyrinchium mucronatum*), and Whorled Milkwort (*Polygala verticillata*). The landscape history at this location is one of previous clearing and disturbance; some areas are quite intact and harbor significant species, including Sweet Pinesap (*Monotropsis odorata*), Nestronia (*Nestronia umbellula*), and Virginia Marbleseed (*Lithospermum virginianum*), whereas other areas are more depauperate and weedy.

MANAGEMENT AND PROTECTION: A portion of this site is currently protected by a conservation easement held by Conserving Carolina.

NATURAL COMMUNITIES: Rich Cove Forest (Foothills Intermediate Subtype), Dry-Mesic Oak-Hickory Forest (Piedmont Subtype).

RARE PLANTS: Sweet Pinesap (*Monotropsis odorata*), Virginia Marbleseed (*Lithospermum virginianum*), Nestronia (*Nestronia umbellula*), Velvet Sedge (*Carex vestita*), Watch List – Appalachian Blue Monkshood (*Aconitum uncinatum*), American Ginseng (*Panax quinquefolius*).

RARE ANIMALS: Watch List – Diana Fritillary (*Speyeria diana*).

REFERENCES:

Campbell, D. 2013. Site Survey Report: Edgerton Road Tract. Pacolet Area Conservancy, Tryon, N.C.

Ratcliffe, J. et al. 2016. Natural Heritage Program List of Rare Animal Species of North Carolina. North Carolina Natural Heritage Program N.C. Department of Natural and Cultural Resources Raleigh, N.C. 27699-1651.

Schafale, M. 2012. Guide to the Natural Communities of North Carolina (Fourth Approximation). North Carolina Natural Heritage Program, Department of Environment and Natural Resources, Raleigh, N.C.



Lithospermum virginianum by William S. Moye

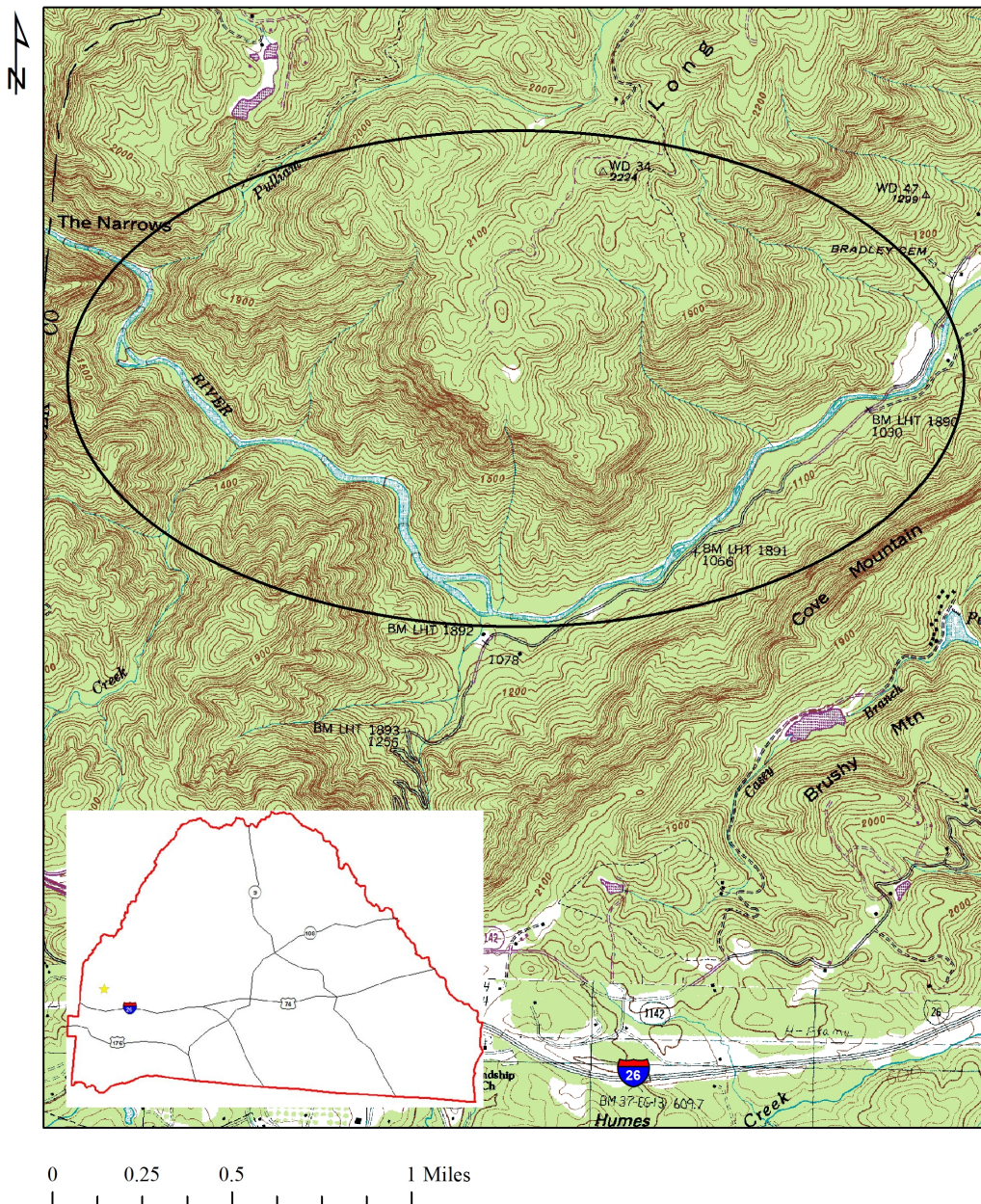
Polk County Natural Areas Inventory

Green River Gorge

Clifffield Mountain Quad

Significant Natural Heritage Area

Prepared by Pam Torlina - 4/2018



Polk County Natural Areas Inventory

Green River Gorge

Significant Natural Area

Site Significance: State

Size: ca. 1200 acres

Quadrangle: Clifffield Mountain

Ownership: State of N.C.

SIGNIFICANT FEATURES: This site derives significance from the considerable number of highly-ranked rare plant and animal species found here. As well, several natural communities of very high quality occur in large, undisturbed, contiguous tracts.

LANDSCAPE RELATIONSHIPS: Western Polk County, approximately 3 miles Northeast of Saluda.

SITE DESCRIPTION: Ravines and gorges throughout this site contain Eastern Hemlock Forest (Typic Subtype), now mostly as dead and dying remnants, due to attacks from the Hemlock Woolly Adelgid (*Adelges tsugae*). As a result, snags of Hemlock trees are common in these communities. Tulip Poplar (*Liriodendron tulipifera*), Sweet Birch (*Betula lenta*), Northern Red Oak (*Quercus rubra*), and Fraser Magnolia (*Magnolia fraseri*), appear to be filling in the canopy gaps created by the dying Hemlocks. The shrub layer is dominated by Rosebay Rhododendron (*Rhododendron maximum*), Mountain Doghobble (*Leucothoe fontanesiana*), Smooth Hydrangea (*Hydrangea arborescens*), Common Silverbell (*Halesia tetraptera* var. *tetraptera*), Mountain Sweet-pepperbush (*Clethra acuminata*), and Sweetshrub (*Calycanthus floridus*). Muscadine (*Muscadina rotundifolia* var. *rotundifolia*) and Common Greenbrier (*Smilax rotundifolia*) are the most frequently encountered woody vines. The herbaceous layer is not diverse, but does include Christmas Fern (*Polystichum acrostichoides*), Little Brown Jug (*Hexastylis arifolia* var. *arifolia*), Shining Clubmoss (*Huperzia lucidula*), Common Foamflower (*Tiarella wherryi*), and Downy Rattlesnake Plantain (*Goodyera pubescens*).

Good quality examples of Chestnut Oak Forest (Dry Heath Subtype) occur on xeric upper slopes and dry ridges. Dominant canopy species include Chestnut Oak (*Quercus montana*), Scarlet Oak (*Quercus coccinea*), Shortleaf Pine (*Pinus echinata*) and Table Mountain Pine (*Pinus pungens*). Also present, but in lesser numbers are Sourwood (*Oxydendrum arboreum*), Red Maple (*Acer rubrum* var. *rubrum*), and Black Gum (*Nyssa sylvatica*). The shrub layer may be quite dense in some places, with a preponderance of ericaceous shrubs such as Mountain Laurel (*Kalmia latifolia*), Piedmont Rhododendron (*Rhododendron minus*), Dryland Blueberry (*Vaccinium pallidum*), and Black Huckleberry (*Gaylussacia baccata*). A relatively depauperate herb layer

contains Galax (*Galax urceolata*), Green Needlegrass (*Piptochaetium avenaceum*), Sweet Pinesap (*Monotropis odorata*), and Pennsylvania Sedge (*Carex pennsylvanica*).

Floodplain areas of the Green River contain examples of Montane Alluvial Forest (Large River Subtype). The canopy consists of Sycamore (*Platanus occidentalis* var. *occidentalis*), Tulip Poplar (*Liriodendron tulipifera*), Green Ash (*Fraxinus pennsylvanica*), Black Walnut (*Juglans nigra*), River Birch (*Betula nigra*), Sweet Gum (*Liquidambar styraciflua*), and Sugarberry (*Celtis laevigata*). The shrub layer includes Spicebush (*Lindera benzoin*), Sweetshrub (*Calycanthus floridus*), American Hazelnut (*Corylus americana*), and Tag Alder (*Alnus serrulata*). Poison Ivy (*Toxicodendron radicans*) and Japanese Honeysuckle (*Lonicera japonica*) are the most abundant woody vines. The herbaceous community is fairly well developed, with River Oats (*Chasmanthium latifolium*), Virginia Bugleweed (*Lycopus virginicus*), Common Woodreed (*Cinna arundinacea*), Sensitive Fern (*Onoclea sensibilis* var. *sensibilis*), Yellow Fumitory (*Corydalis flavula*), Greater Bladder Sedge (*Carex intumescens* var. *intumescens*), and New York Ironweed (*Vernonia noveboracensis*).

Montane Cliff (Acidic Herb Subtype) occurs throughout where there are large areas of bare, exposed rock surfaces, some of which are nearly vertical and essentially inaccessible. As a result, detailed botanical survey in this community type is difficult or impossible. However, some of the vascular plant species noted are Eastern Red Cedar (*Juniperus virginiana* var. *virginiana*), Rock Spikemoss (*Bryodesma rupestre*), Mapleleaf Alumroot (*Heuchera villosa* var. *villosa*), Poverty Oatgrass (*Danthonia spicata*), and Bradley's Spleenwort (*Asplenium bradleyi*).

Extensive areas of Montane Oak--Hickory Forest (Acidic Subtype) are found predominantly on mid-slope areas. Canopy dominants are White Oak (*Quercus alba*), Chestnut Oak (*Quercus montana*), Northern Red Oak (*Quercus rubra*), Black Oak (*Quercus velutina*), Mockernut Hickory (*Carya tomentosa*), Pignut Hickory (*Carya glabra*), Red Maple (*Acer rubrum* var. *rubrum*), Persimmon (*Diospyros virginiana*), Virginia Pine (*Pinus virginiana*), Shortleaf Pine (*Pinus echinata*), and White Pine (*Pinus strobus*). Fraser Magnolia (*Magnolia fraseri*) is also occasionally encountered. Mountain Laurel (*Kalmia latifolia*) may be dense in some places. Herbs present include Green Needlegrass (*Piptochaetium avenaceum*), Broomsedge (*Andropogon virginicus* var. *virginicus*), Virginia Goat's Rue (*Tephrosia virginiana*), Small Spreading Pogonia (*Cleistesiosopsis bifaria*), Yellow Wild Indigo (*Baptisia tinctoria*), Upland Dwarf Iris (*Iris verna* var. *smalliana*), White Milkweed (*Asclepias variegata*), and Fire-pink (*Silene virginica* var. *virginica*).

Rich Cove Forest (Foothills Rich Subtype), may be found in sheltered coves and north-facing slopes. Canopy dominants in these communities include Northern Red Oak (*Quercus rubra*), White Basswood (*Tilia americana* var. *heterophylla*), Sugar Maple (*Acer saccharum*), Yellow Buckeye (*Aesculus flava*), Tulip Poplar (*Liriodendron tulipifera*), White Ash (*Fraxinus americana*), Bitternut Hickory (*Carya cordiformis*), Cucumber Magnolia (*Magnolia acuminata* var. *acuminata*), and Red Elm (*Ulmus rubra*). Shrubs present are Pawpaw (*Asimina triloba*), Spicebush (*Lindera benzoin*), Sweetshrub (*Calycanthus floridus*), Strawberry-bush (*Euonymus americanus*), and Smooth Hydrangea (*Hydrangea arborescens*). The herbaceous layer is lush and diverse with Mapleleaf Waterleaf (*Hydrophyllum canadense*), Blue Cohosh (*Caulophyllum thalictroides*), Tall White Violet (*Viola canadensis* var. *canadensis*), Marginal Wood-fern (*Dryopteris marginalis*), Northern Maidenhair Fern (*Adiantum pedatum*), Lowland Bladder Fern (*Cystopteris protrusa*), Jack-in-the-pulpit (*Arisaema triphyllum*), Common Wild Ginger (*Asarum canadense*), Yellow Mandarin (*Prosartes lanuginosa*), Puttyroot (*Aplectrum hyemale*), Wake-

robin (*Trillium erectum*), Large-flowered Trillium (*Trillium grandiflorum*), Fernleaf Phacelia (*Phacelia bipinnatifida*), and Appalachian False Goatsbeard (*Astilbe biternata*).

Riverside sites with rocky bars and scour areas consist of the Rocky Bar and Shore (Alder-Yellowroot Subtype) community. These sites are relatively canopy free, with Tag Alder (*Alnus serrulata*) and Yellowroot (*Xanthorhiza simplicissima*) being the dominant woody shrubs, along with lesser numbers of Virginia Sweetspire (*Itea virginica*) and Rosebay Rhododendron (*Rhododendron maximum*). *Carex* spp. may be numerous, including Rough Sedge (*Carex scabrata*) and Cherokee Sedge (*Carex cherokeensis*). Additional interesting herbaceous species found here are Brook Saxifrage (*Boykinia aconitifolia*) and Carolina Tassel-rue (*Trautvetteria caroliniensis* var. *caroliniensis*).

MANAGEMENT AND PROTECTION: Owned by the state of North Carolina and managed as a part of the Green River Game Lands.

NATURAL COMMUNITIES: Eastern Hemlock Forest (Typic Subtype), Chestnut Oak Forest (Dry Heath Subtype), Montane Alluvial Forest (Large River Subtype), Montane Cliff (Acidic Herb Subtype), Montane Oak--Hickory Forest (Acidic Subtype), Rich Cove Forest (Foothills Intermediate Subtype), Rocky Bar and Shore (Alder-Yellowroot Subtype).

RARE PLANTS: Bradley's Spleenwort (*Asplenium bradleyi*), Cherokee Sedge (*Carex cherokeensis*), Longstalk Sedge (*Carex pedunculata* var. *pedunculata*), Whorled Horsebalm (*Collinsonia verticillata*), Broadleaf Coreopsis (*Coreopsis latifolia*), Showy Aster (*Eurybia spectabilis*), French Broad Heartleaf (*Hexastylis rhombiformis*), Closter's Brook-hypnum (*Hygrohypnum closteri*), Rough Blazing-star (*Liatris aspera*), Sweet Pinesap (*Monotropsis odorata*), Pringle's Water Feather Moss (*Oxyrrhynchium pringlei*), Kelsey's Locust (*Robinia hispida* var. *kelseyi*), Appalachian Golden-banner (*Thermopsis mollis*), Sweet White Trillium (*Trillium simile*), Watch List – Brook Saxifrage (*Boykinia aconitifolia*), Blue Ridge Brome Sedge (*Carex bromoides* ssp. *montana*), Small Spreading Pogonia (*Cleistosiopsis bifaria*), Sweet-fern (*Comptonia peregrina*), Autumn Coral-root (*Corallorhiza odontorhiza*), Leatherwood (*Dirca palustris*), Littleleaf Alumroot (*Heuchera parviflora*), Butternut (*Juglans cinerea*), American Ginseng (*Panax quinquefolius*), Scentless Mock-orange (*Philadelphus inodorus*), Hoptree (*Ptelea trifoliata*), Three Birds Orchid (*Triphora trianthophoros* var. *trianthophoros*).

RARE ANIMALS: Timber Rattlesnake (*Crotalus horridus*), Watch List – Southern Appalachian Eastern Woodrat (*Neotoma floridana haematoreia*), Diana Fritillary (*Speyeria diana*).

COMMENTS: The Green River Gorge has a wilderness aspect that makes it popular with outdoor enthusiasts who flock to the area in large numbers to enjoy its scenic beauty. Further biological study would likely reveal greater numbers of rare and Watch List plant and animal species.

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- Schafale, M. 2012. Guide to the Natural Communities of North Carolina (Fourth Approximation). North Carolina Natural Heritage Program, Department of Environment and Natural Resources, Raleigh, N.C.



Boykinia aconitifolia by David Campbell

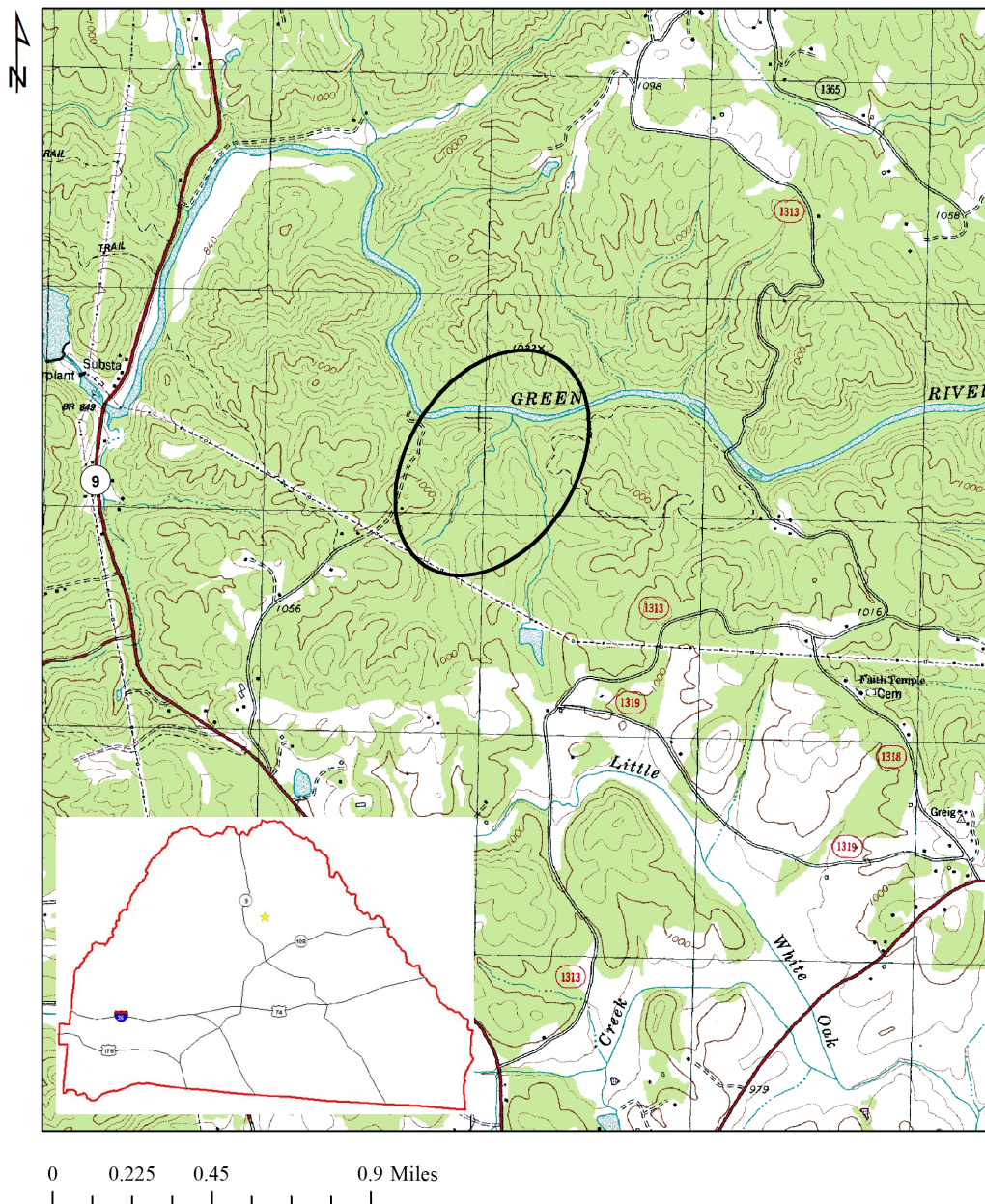
Polk County Natural Areas Inventory

Green River Rare Plant Site

Mill Spring Quad

Significant Natural Heritage Area

Prepared by Pam Torlina - 4/2018



Polk County Natural Areas Inventory
Green River Rare Plant Site
Significant Natural Area

Site Significance: State

Size: 90 acres

Quadrangle: Mill Spring

Ownership: Private

SIGNIFICANT FEATURES: This site derives significance from the presence of several populations of Allegheny Spurge (*Pachysandra procumbens*), which is only known to occur in North Carolina along the Green River and its tributaries in Polk County. As well, several other rare and Watch List plants occur here. Golden-banded Skipper (*Autochton cellus*), a very rarely encountered and enigmatic butterfly species, was also observed along bottomland habitats adjacent to the Green River.

LANDSCAPE RELATIONSHIPS: This tract, located in Mill Spring, lies within the Green River drainage. The tract comprises two separate parcels dissected by the Green River, the larger of the two parcels, approximately 75 acres, lies on the south bank of the Green River, and the smaller of the two parcels, approximately 15 acres, is to be found on the northern bank of the Green River.

SITE DESCRIPTION: A good quality example of the Piedmont Alluvial Forest is found here along both banks of the Green River. Typical canopy species are Sycamore (*Platanus occidentalis*), River Birch (*Betula nigra*), Sugarberry (*Celtis laevigata*), Tulip Poplar (*Liriodendron tulipifera*), Red Maple (*Acer rubrum*), Sweet Gum (*Liquidambar styraciflua*), and Green Ash (*Fraxinus pennsylvanica*). Present, but less abundant, are American Beech (*Fagus grandifolia*), Northern Red Oak (*Quercus rubra*), American Hornbeam (*Carpinus caroliniana*), White Oak (*Quercus alba*), Persimmon (*Diospyros virginiana*), and Red Mulberry (*Morus rubra*). The shrub layer contains characteristic species such as Spicebush (*Lindera benzoin*), Pawpaw (*Asimina triloba*), Buttonbush (*Cephalanthus occidentalis*), Yellowroot (*Xanthorhiza simplicissima*), Tag Alder (*Alnus serrulata*), Flowering Dogwood (*Cornus florida*), Silky Dogwood (*Cornus amomum*), and Elderberry (*Sambucus nigra* ssp. *canadensis*). Vines are abundant and include Trumpet Creeper (*Campsis radicans*), Cross-vine (*Bignonia capreolata*), Catbrier (*Smilax bona-nox*), Round-leaved Catbrier (*Smilax rotundifolia*), Posion Ivy (*Toxicodendron radicans*), and Virginia Creeper (*Parthenocissus quinquefolia*). Rich alluvial soils support a correspondingly diverse herbaceous community. Representative species are Little Sweet Betsy Trillium (*Trillium cuneatum*), Jack-in-the-pulpit (*Arisaema triphyllum*), Yellow Fumitory (*Corydalis flavula*), Lyon's Turtlehead (*Chelone lyonii*), Club-spur Orchid (*Platanthera clavellata*), Wild Kidney Bean (*Phaseolus polystachios*), Allegheny Spurge (*Pachysandra procumbens*), Northern Maidenhair Fern (*Adiantum pedatum*), Christmas Fern (*Polystichum*

acrostichoides), Southern Lady Fern (*Athyrium asplenoides*), and Meadow Spikemoss (*Lycopodioides apodum*).

Moving upslope from the bottomlands, the vegetation community transitions to a Mesic Mixed Hardwood Forest (Piedmont Subtype). American Beech (*Fagus grandifolia*) and Northern Red Oak (*Quercus rubra*) become more abundant, along with Black Oak (*Quercus velutina*), White Oak (*Quercus alba*), Mockernut Hickory (*Carya tomentosa*), Cucumber Magnolia (*Magnolia acuminata* var. *acuminata*), White Basswood (*Tilia americana* var. *heterophylla*), Red Maple (*Acer rubrum*), and American Holly (*Ilex opaca*). The shrub layer contains Sweetshrub (*Calycanthus floridus*), Strawberry-bush (*Euonymus americanus*), American Witch-hazel (*Hamamelis virginiana*), Spicebush (*Lindera benzoin*), American Hazelnut (*Corylus americana*), and Possumhaw (*Ilex decidua* var. *decidua*). Herbaceous species include Showy Orchis (*Galearis spectabilis*), Crane-fly Orchid (*Tipularia discolor*), Beechdrops (*Epifagus virginiana*), Broad Beech Fern (*Phegopteris hexagonoptera*), Bearcorn (*Conopholis americana*), Indian Cucumber-root (*Medeola virginiana*), Pinesap (*Hypopitys monotropa*), Round-lobed Hepatica (*Anemone americana*), May-apple (*Podophyllum peltatum*), and Rattlesnake Fern (*Botrypus virginianus*).

The highest elevations of the ridgetops and slopes contain examples of Southern Mountain Pine-Oak Forest, where conditions range from relatively dry to quite xeric. Canopy species consist of Shortleaf Pine (*Pinus echinata*), Virginia Pine (*Pinus virginiana*), Scarlet Oak (*Quercus coccinea*), Post Oak (*Quercus stellata*), and Sourwood (*Oxydendrum arboreum*). Shrubs that occur are mainly heaths, including Dryland Blueberry (*Vaccinium pallidum*), Black Huckleberry (*Gaylussacia baccata*), and Mountain Laurel (*Kalmia latifolia*). Vines are scarce, with scattered individuals of Whiteleaf Greenbrier (*Smilax glauca*) found sporadically. Herbaceous diversity is fairly low, and consists of species typical of this community type such as Virginia Goat's Rue (*Tephrosia virginiana*), White Milkweed (*Asclepias variegata*), Fern-leaf False-foxglove (*Aureolaria pedicularia*), Bracken (*Pteridium latiusculum*), Broomsedge (*Andropogon virginicus* var. *virginicus*), Smaller Spreading Pogonia (*Cleistesiosis bifaria*), and Whorled Milkwort (*Polygala verticillata*).

MANAGEMENT AND PROTECTION: This site currently enjoys protection under a conservation easement with Conserving Carolina.

NATURAL COMMUNITIES: Piedmont Alluvial Forest, Mesic Mixed Hardwood Forest (Piedmont Subtype), Southern Mountain Pine-Oak Forest.

RARE PLANTS: Allegheny Spurge (*Pachysandra procumbens*), Dwarf-flower Heartleaf (*Hexastylis naniflora*), Whorled Horsebalm (*Collinsonia verticillata*), Scentless Mock-orange (*Philadelphus inodorus*), Goldenseal (*Hydrastis canadensis*), American Ginseng (*Panax quinquefolius*), Carolina Buckthorn (*Frangula caroliniana*), Smaller Spreading Pogonia (*Cleistesiosis bifaria*), Watch List – Little Sweet Betsy Trillium (*Trillium cuneatum*).

RARE ANIMALS: Golden-banded Skipper (*Autochton cellus*), Diana Fritillary (*Speyeria diana*).

REFERENCES:

Campbell, D. 2015. Site Survey Report: Green River Rare Plant Site. Pacolet Area Conservancy, Tryon, N.C.

Ratcliffe, J. et. al. 2016. Natural Heritage Program List of Rare Animal Species of North Carolina. North Carolina Natural Heritage Program N.C. Department of Natural and Cultural Resources Raleigh, N.C. 27699-1651.

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Pachysandra procumbens by David Campbell

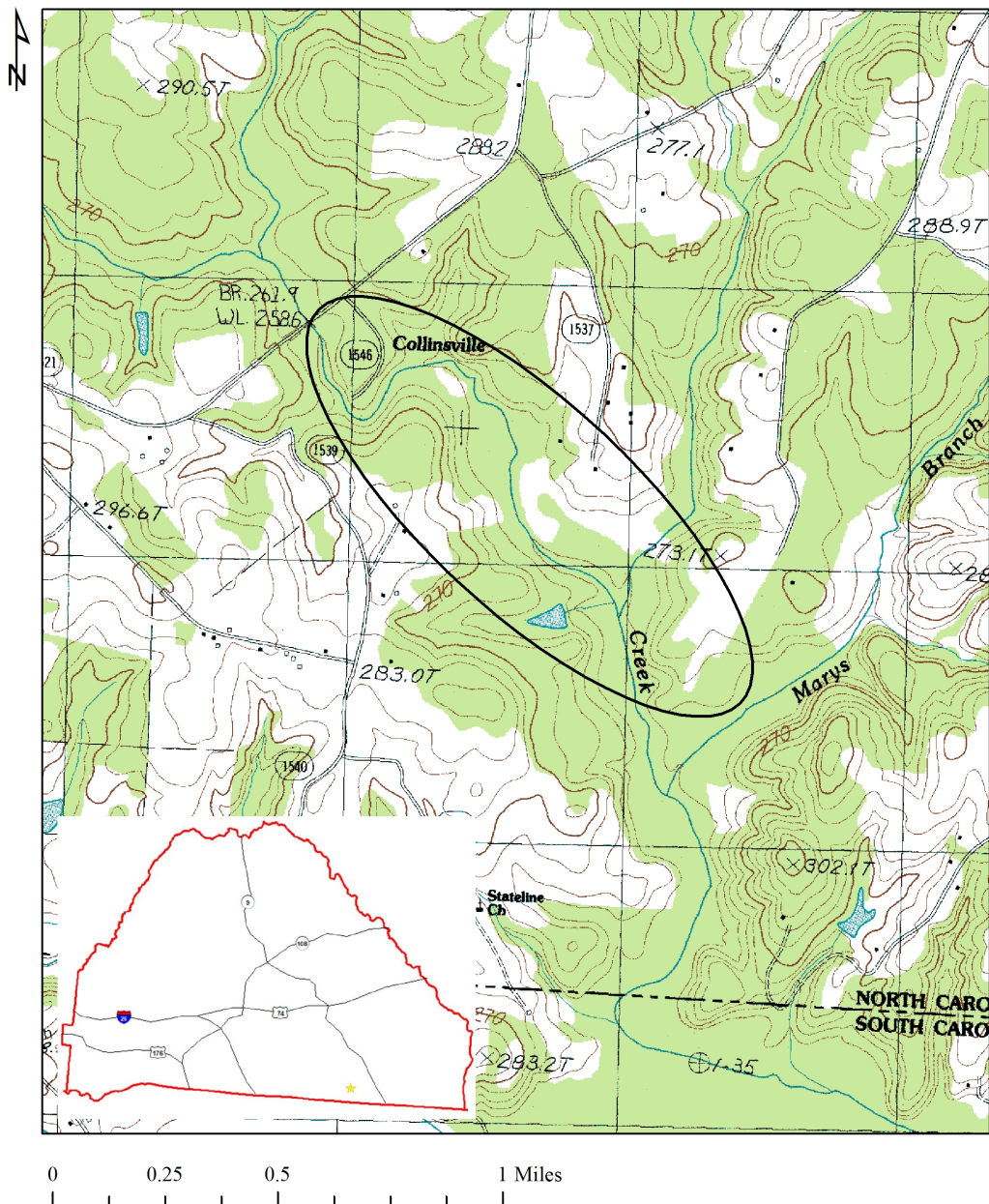
Polk County Natural Areas Inventory

Hughes Creek

Fingerville West Quad

Significant Natural Heritage Area

Prepared by Pam Torlina - 4/2018



Polk County Natural Areas Inventory

Hughes Creek

Significant Natural Area

Site Significance: Regional

Size: 131 acres

Quadrangle: Fingerville West

Ownership: Private

SIGNIFICANT FEATURES: A large, contiguous, and high quality natural area with remarkable species assemblages. Nesting Prothonotary Warbler (*Protonotaria citrea*) – a rare breeder this far west in North Carolina, American River Otter (*Lutra canadensis laticauda*) – regionally rare, Least Bittern (*Ixobrychus exilis*), and numerous rare vascular plants, including Hazel Dodder (*Cuscuta coryli*), False Hop Sedge (*Carex lupuliformis*).

LANDSCAPE RELATIONSHIPS: East of Columbus and Tryon, flowing into South Carolina where it enters the Pacolet River. Landscape is largely rural and wooded, with scattered residential development.

SITE DESCRIPTION: A mosaic of several distinctive plant communities occur here due to elevational, soil, and hydrologic factors. As a result, there is a high level of vegetative and faunal diversity, making this one of Polk County's most significant natural areas.

Adjacent to Hughes Creek, and along nearby upper slopes is found a good quality example of the Piedmont Heath Bluff community type. Several individuals of very mature Virginia Pine (*Pinus virginiana*), co-occur with Shortleaf Pine (*Pinus echinata*), American Beech (*Fagus grandifolia*), Mockernut Hickory (*Carya tomentosa*), and Sourwood (*Oxydendrum arboreum*). The shrub layer consists of dense thickets of Mountain Laurel (*Kalmia latifolia*) that predominate, with lesser numbers of Dryland Blueberry (*Vaccinium pallidum*), Horse Sugar (*Symplocos tinctoria*), and Dwarf Pawpaw (*Asimina parviflora*). Herbaceous species diversity is modest, but does include Galax (*Galax urceolata*), Inidan Pipes (*Monotropa uniflora*), Catesby's Trillium (*Trillium catesbaei*), Virginia Goat's Rue (*Tephrosia virginiana*), Green Needlegrass (*Piptochaetium avenaceum*), and Bracken (*Pteridium latiusculum*). Vines consist almost exclusively of Common Greenbrier (*Smilax rotundifolia*). Slightly downslope, a small area of seepage contains a sizeable population of Dwarf-flowered Heartleaf (*Hexastylis naniflora*), with Virginia Sweetspires (*Itea virginica*), and Small Green Wood Orchid (*Platanthera clavellata*) all growing in close association.

Mid-slope areas approximate the conditions of a Mesic Mixed hardwood Forest (Piedmont Subtype), with broad-leaved trees such as White Oak (*Quercus alba*), Northern Red Oak (*Quercus*

rubra), American Beech (*Fagus grandifolia*), Cucumber Magnolia (*Magnolia acuminata* var. *acuminata*), White Ash (*Fraxinus americana*), Red Elm (*Ulmus rubra*), and Tulip Poplar (*Liriodendron tulipifera*). Painted Buckeye (*Aesculus sylvatica*), Carolina Buckthorn (*Frangula caroliniana*), and Fringetree (*Chionanthus virginica*) are commonly encountered in the understory. The herbaceous layer has elements of both the upper and lower plant communities found here, with the addition of Autumn Coral-root (*Corallorhiza odontorhiza*), Crane-fly Orchid (*Tipularia discolor*), Broad Beech Fern (*Phegopteris hexagonoptera*), and Green Violet (*Hybanthus concolor*). During one site visit, female Diana Fritillary butterflies (*Speyeria diana*) were observed ovipositing on Tall White Violet (*Viola canadensis* var. *canadensis*) late in the afternoon.

Piedmont Levee Forest (Typic Subtype) is the dominant plant community throughout this site, with representative canopy species such as Sycamore (*Platanus occidentalis*), Green Ash (*Fraxinus pennsylvanica*), River Birch (*Betula nigra*), Sugarberry (*Celtis laevigata*), and Sweetgum (*Liquidambar styraciflua*). Also present, but in lesser numbers, are Tulip Poplar (*Liriodendron tulipifera*), Red Mulberry (*Morus rubra*), Pawpaw (*Asimina triloba*), and Red Maple (*Acer rubrum*). Additionally of note, were several examples of apparently healthy Butternut (*Juglans cinerea*). Shrubs are diverse, including Spicebush (*Lindera benzoin* var. *benzoin*), Sweetshrub (*Calycanthus floridus*), American Hazelnut (*Corylus americana*), Strawberry-bush (*Euonymus americanus*), American Witch-hazel (*Hamamelis virginiana*), Scentless Mock-orange (*Philadelphus inodorus*), and the uncommon Leatherwood (*Dirca palustris*). Herbaceous diversity is high, comprising species such as Black Cohosh (*Actaea racemosa*), Northern Maidenhair Fern (*Adiantum pedatum*), Christmas Fern (*Polystichum acrostichoides*), Pennywort (*Obolaria virginica*), Puttyroot (*Aplectrum hyemale*), Rattlesnake Fern (*Botrypus virginianus*), Cutleaf Toothwort (*Cardamine concatenata*), American Alumroot (*Heuchera americana*), River Oats (*Chasmanthium latifolium*), Common Woodreed (*Cinna arundinacea*), Hollow-stem Joe Pye Weed (*Eutrochium fistulosum*), Cardinal Lobelia (*Lobelia cardinalis*), and Fire-pink (*Silene virginica*). Small, saturated areas of seepage discharge, along the edges of Hughes Creek contain characteristic species such as Tag Alder (*Alnus serrulata*), Yellowroot (*Xanthorhiza simplicissima*), American Royal Fern (*Osmunda regalis*), Carolina Tassel-rue (*Trautvetteria caroliniensis* var. *caroliniensis*), White Turtlehead (*Chelone glabra*), and various species of Peat Mosses (*Sphagnum* spp.). An apparently large and vigorous population of Queen Snakes (*Regina septemvittata*), may be commonly seen along streambanks and emergent woody debris.

Well-developed examples of the Floodplain Pool community type are found along the banks of Hughes Creek, and contain significant areas of ponded water that provide critical breeding sites for local populations of several amphibian species. During one site visit, many hundreds of recently transformed juvenile Cope's Gray Treefrogs (*Hyla chrysochelis*) were observed in and around these flooded areas. Additional Anurans present are Northern Cricket Frog (*Acris crepitans*) and Fowler's Toad (*Anaxyrus fowleri*). One individual of Eastern Narrow-mouthed Toad (*Gastrophryne carolinensis*) was found under woody debris- an unexpected addition to the herpetofauna of Polk County; although populations of this species are found in nearby areas of South Carolina. Hydrophytic vegetation is not numerous or diverse in the pools, but does include examples of Green Arrow-arum (*Peltandra virginica*), False Nettle (*Boehmeria cylindrica*), Leathery Rush (*Juncus coriaceus*), and the uncommon Mitchell's Sedge (*Carex mitchelliana*).

Downstream, Beaver activity has led to the creation of a Piedmont/Mountain Semi-permanent Impoundment (Marsh Subtype), resulting in a sizeable wetland with emergent vegetation including

Green Arrow-arum (*Peltandra virginica*), Mild Waterpepper (*Persicaria hydropiperoides*), Broadleaf Arrowhead (*Sagittaria latifolia*), Three-way Sedge (*Dulichium arundinaceum* var. *arundinaceum*), Fringed Sedge (*Carex crinita*), Awlfruit Sedge (*Carex stipata*), Shallow Sedge (*Carex lurida*), White Cutgrass (*Leersia virginica*), American Bur-reed (*Sparganium americanum*), and Swamp Rose-mallow (*Hibiscus moscheutos*). Several specimens of the significantly rare False Hop Sedge (*Carex lupuliformis*) were also noted during this investigation. Shrubs are infrequent, with Buttonbush (*Cephalanthus occidentalis*), Silky Dogwood (*Cornus amomum*), and Common Elderberry (*Sambucus nigra* ssp. *canadensis*) occurring throughout as scattered individuals. Standing dead snags here are numerous and provide nesting sites for Prothonotary Warblers (*Protonotaria citrea*). Faunistically interesting species found here are Northern Watersnake (*Nerodia sipedon*), Dion Skipper (*Euphyes dion*), and Least Bittern (*Ixobrychus exilis*).

MANAGEMENT AND PROTECTION: Portions of this area have protection under conservation easement with Conserving Carolina.

NATURAL COMMUNITIES: Mesic Mixed hardwood Forest (Piedmont Subtype), Piedmont Heath Bluff, Floodplain Pool, Piedmont/Mountain Semi-permanent Impoundment (Marsh Subtype), Piedmont Levee Forest (Typic Subtype).

RARE PLANTS: Dwarf-flowered Heartleaf (*Hexastylis naniflora*), False Hop Sedge (*Carex lupuliformis*), Hazel Dodder (*Cuscuta coryli*), Watch List – Carolina Buckthorn (*Frangula caroliniana*), Scentless Mock-orange (*Philadelphus inodorus*), Butternut (*Juglans cinerea*), Crested Climbing Buckwheat (*Fallopia cristata*), Leatherwood (*Dirca palustris*), Autumn Coral-root (*Corallorhiza odontorhiza*), Small Spreading Pogonia (*Cleisteslopsis bifaria*), Mitchell's Sedge (*Carex mitchelliana*), Fescue Sedge (*Carex festucacea*).

RARE ANIMALS: Diana Fritillary (*Speyeria diana*), Least Bittern (*Ixobrychus exilis*).

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Carex lupuliformis by Keith Bradley

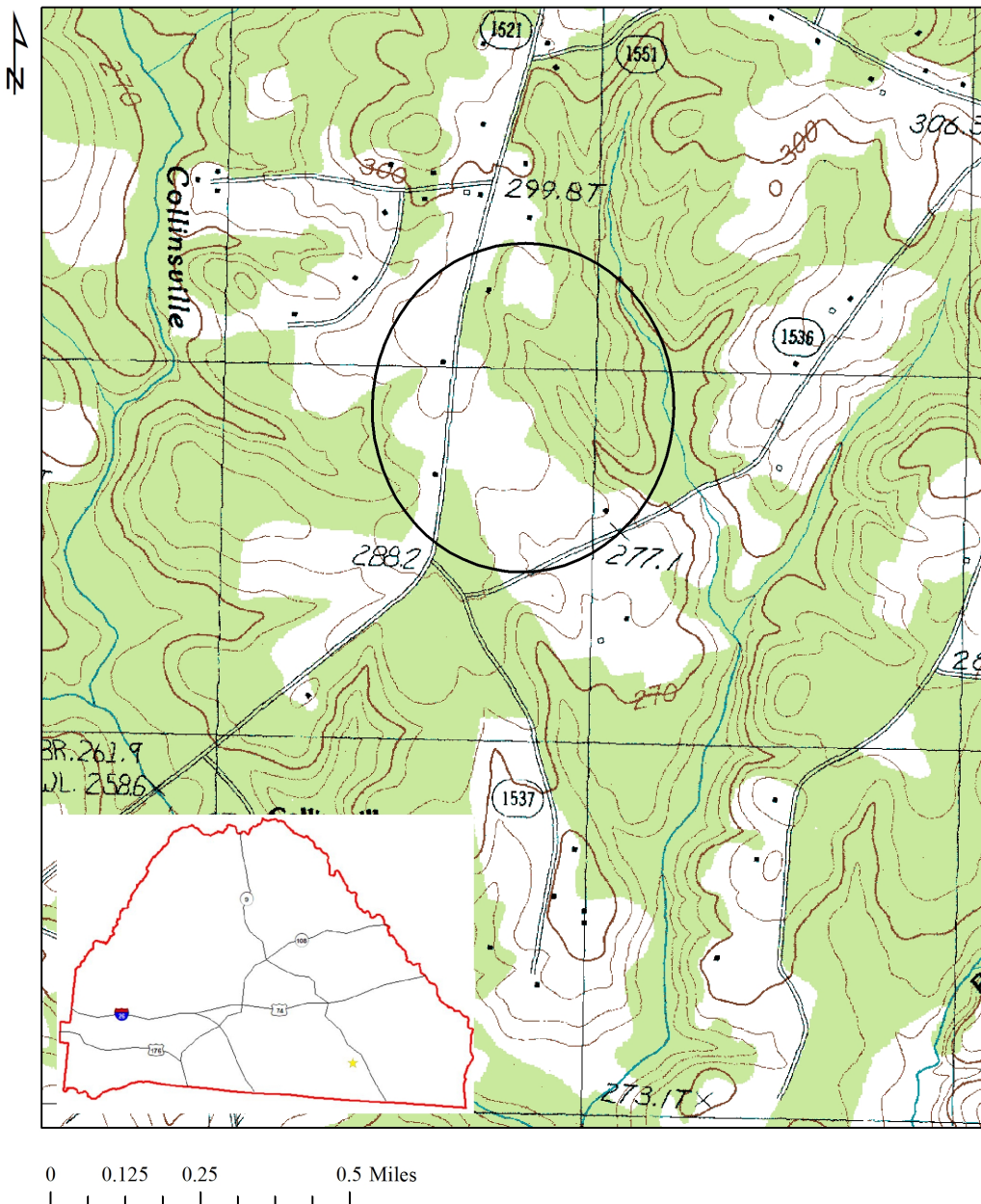
Polk County Natural Areas Inventory

Kross Keys Low Elevation Seep

Fingerville West Quad

Significant Natural Heritage Area

Prepared by Pam Torlina - 4/2018



Polk County Natural Areas Inventory
Kross Keys Low Elevation Seep
Significant Natural Area

Site Significance: State

Size: 120 acres

Quadrangle: Fingerville West

Ownership: Private

SIGNIFICANT FEATURES: Polk County's largest population of the Federally Threatened Dwarf-flowered Heartleaf (*Hexastylis naniflora*) occurs here, as well as the county's largest known population of Nestronia (*Nestronia umbellula*) – a Federal Species of Concern. There are also a number of regionally rare vascular plant taxa present. In addition, the Low Elevation Seep (Piedmont/Mountain Springhead Subtype) is a globally rare community type with a designated rank of G2.

LANDSCAPE RELATIONSHIPS: 1.5 miles southeast of Sandy Plains, and south of SR-1551, near the Rutherford county line.

SITE DESCRIPTION: Hillside seepage draining through porous Pacolet soils has given rise to an unusual plant community here, the Low Elevation Seep (Piedmont/Mountain Springhead Subtype). As noted by Rayner (1994), the unusual topography and hydrology give this site a unique aspect that is not typical of other 'hillside seepage bogs'. Rayner proposed that this might, in fact, constitute a new community type. Subsequently, based on the work of Seymour (2011) and Schafale (2012), the characteristics of this site seem to fit into the present classification used here. Tree species present include Tulip Poplar (*Liriodendron tulipifera*), White Oak (*Quercus alba*), Northern Red Oak (*Quercus rubra*), Green Ash (*Fraxinus pennsylvanica*), Blackgum (*Nyssa sylvatica*), Swamp Tupelo (*Nyssa biflora*), American Holly (*Ilex opaca*), and Red Maple (*Acer rubrum* var. *trilobum*). Shrub diversity is moderate with Possumhaw Viburnum (*Viburnum nudum*), Virginia Sweetspires (*Itea virginica*), Spicebush (*Lindera benzoin*), Hairy Highbush Blueberry (*Vaccinium fuscum*), Sweet Azalea (*Rhododendron arborescens*), Red Chokeberry (*Aronia arbutifolia*), and the regionally rare Poison Sumac (*Toxicodendron vernix*). Woody vines are represented by Laurel Greenbrier (*Smilax laurifolia*), Poison Ivy (*Toxicodendron radicans*), Trumpet Creeper (*Campsis radicans*), Virginia Creeper (*Parthenocissus quinquefolia*), and Climbing Hydrangea (*Decumaria barabara*) – also regionally uncommon. Herbaceous diversity includes species such as Soapwort Gentian (*Gentiana saponaria*), Cowbane (*Oxypolis rigidior*), Viscid Hedge-hyssop (*Gratiola viscidula*), Mecardonia (*Mecardonia acuminata* var. *acuminata*), Hairy Umbrella-sedge (*Fuirena squarrosa*), Southern Lobelia (*Lobelia amoena*), Appalachian Quillwort (*Isoetes appalachiana*), Bristly-stalked Sedge (*Carex leptalea*), Appalachian Little Brown Jug (*Hexastylis arifolia* var. *arifolia*), Netted Chain Fern (*Lorinseria areolata*), Cinnamon Fern (*Osmundastrum cinnamomeum*), and Sphagnum (*Sphagnum* spp.).

A good example of the Dry-Mesic Oak-Hickory Forest (Piedmont Subtype), comprises the uplands surrounding areas of seepage. Dominant tree species here include Northern Red Oak (*Quercus rubra*), White Oak (*Quercus alba*), Black Oak (*Quercus velutina*), Mockernut Hickory (*Carya tomentosa*), Pignut Hickory (*Carya glabra*), Persimmon (*Diospyros virginiana*), Flowering Dogwood (*Cornus florida*), Red Maple (*Acer rubrum* var. *rubrum*), Tulip Poplar (*Liriodendron tulipifera*), Sourwood (*Oxydendrum arboreum*), Virginia Pine (*Pinus virginiana*), and Shortleaf Pine (*Pinus echinata*). Shrubs present are Dwarf Pawpaw (*Asimina parviflora*), Beaked Hazelnut (*Corylus cornuta* var. *cornuta*), Blackhaw (*Viburnum prunifolium*), Dryland Blueberry (*Vaccinium pallidum*), Strawberry-bush (*Euonymus americanus*), Creeping St. Andrew's Cross (*Hypericum stragulum*), and a vigorous population of Nestronia (*Nestronia umbellula*). Herbaceous diversity is low, but representative species include Naked Tick-trefoil (*Hylodesmum nudiflorum*), Rattlesnake Weed (*Hieracium venosum*), Whorled Coreopsis (*Coreopsis major* var. *rigida*), Ebony Spleenwort (*Asplenium platyneuron*), Crane-fly Orchid (*Tipularia discolor*), and Common Running-cedar (*Diphasiastrum digitatum*).

MANAGEMENT AND PROTECTION: This site does not have any management or protection at this time. If possible, efforts should be made to control the spread of Japanese Honeysuckle (*Lonicera japonica*) and Chinese Privet (*Ligustrum sinense*) in the seepage areas.

NATURAL COMMUNITIES: Low Elevation Seep (Piedmont/Mountain Springhead Subtype), Dry-Mesic Oak-Hickory Forest (Piedmont Subtype).

RARE PLANTS: Leatherwood (*Dirca palustris*), Dwarf-flowered Heartleaf (*Hexastylis naniflora*), Nestronia (*Nestronia umbellula*), Watch List (Regionally Rare) – Laurel Greenbrier (*Smilax laurifolia*), Poison Sumac (*Toxicodendron vernix*).

RARE ANIMALS: None noted, although the habitat here would be appropriate for Four-toed Salamander (*Hemidactylium scutatum*); purposeful searches should be made to ascertain if it is present.

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Weakley, A.S., and M.P. Schafale. 1994. Non-alluvial wetlands of the southern Blue Ridge: diversity in a threatened ecosystem. *Water, Air and Soil Pollution* 77: 359-383. [Also published in Trettin, C.C., W.M. Aust, and J. Wisniewski. 1995. *Wetlands of the interior southeastern United States*. Kluwer Academic Publishers, Dordrecht, The Netherlands].



Toxicodendron vernix by William S. Moye

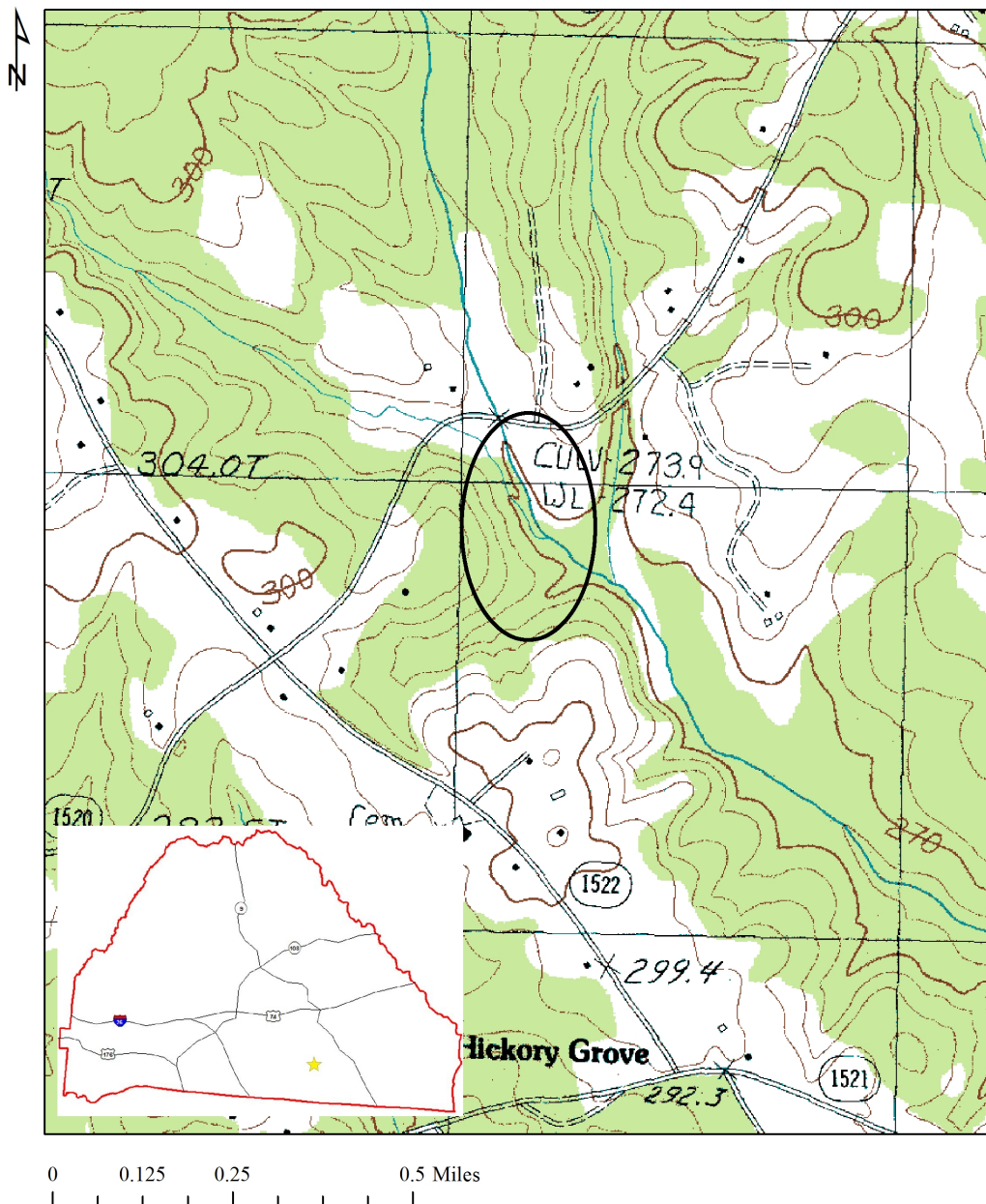
Polk County Natural Areas Inventory

Landrum Road Bog Turtle Site

Fingerville West Quad

Significant Natural Heritage Area

Prepared by Pam Torlina - 10/2017



Polk County Natural Areas Inventory
Landrum Road Bog Turtle Site
Significant Natural Area

Site Significance: Regional

Size: 28 acres

Quadrangle: Fingerville West

Ownership: Private

SIGNIFICANT FEATURES: This site is significant as it represents the first known occurrence of Bog Turtles (*Glyptemys muhlenbergii*) in Polk County. Bog Turtles are threatened throughout their entire range, so the discovery of a previously unknown population is a noteworthy event.

LANDSCAPE RELATIONSHIPS: Situated along SR-1520, approximately 2 miles southwest of Highway 9. A relatively flat peneplain, dominated by woodlots and small streams, within the outer boundaries of the city of Columbus.

SITE DESCRIPTION: A good representation of the Low Elevation Seep (Typic Subtype) is found in an area at the toe of slope on the east side of Hughes Creek, and adjacent streamside flats. Areas of seepage with open canopy dominated by Red Maple (*Acer rubrum* var. *triloba*), with an understory consisting largely of Possumhaw (*Viburnum nudum* var. *nudum*), Tag Alder (*Alnus serrulata*), Yellowroot (*Xanthorhiza simplicissima*), and Virginia Sweetspires (*Itea virginica*). The herbaceous community includes Netted Chain Fern (*Lorinseria aereolata*), Soft Rush (*Juncus effusus*), Fringed Sedge (*Carex crinita* var. *crinita*), Fescue Sedge (*Carex festucacea*), and other *Carex* spp. Streamside flats are largely covered in New York Fern (*Parathelypteris noveboracensis*). Occasional specimens of Club-spur Orchid (*Platanthera clavellata*) may be found within seepage and on the streamside flats.

A nice example of the Mesic Mixed Hardwood Forest (Piedmont Subtype), is found on slopes and bottomlands on both sides of Hughes Creek. Large numbers of American Beech (*Fagus grandifolia*), occur here with some mature individuals reaching impressive sizes. Other tree species present include White Oak (*Quercus alba*), American Holly (*Ilex opaca*), Northern Red Oak (*Quercus rubra*), Sweetgum (*Liquidambar styraciflua*), and Mockernut Hickory (*Carya tomentosa*). Shrub diversity is moderate, consisting of Sweetshrub (*Calycanthus floridus*), Beaked Hazelnut (*Corylus cornuta* var. *cornuta*), PawPaw (*Asimina triloba*), and Fringetree (*Chionanthus virginicus*). Herbs include Appalachian Little Brown Jug (*Hexastylis arifolia* var. *ruthii*), Crane-fly Orchid (*Tipularia discolor*), Virginia Snakeroot (*Endodeca serpentaria*), Downy Rattlesnake Plantain (*Goodyera pubescens*), Common Foamflower (*Tiarella wherryi*), Christmas Fern (*Polystichum acrostichoides*), Broad Beech Fern (*Phegopteris hexagonoptera*), Beechdrops (*Epifagus virginiana*), and Eastern Woodland Sedge (*Carex blanda*).

MANAGEMENT AND PROTECTION: This site enjoys no formal protection. However, the owners are aware of its biological significance, and are familiar with Bog Turtles as a threatened species. At present, they have no plans to further develop this property.

NATURAL COMMUNITIES: Low Elevation Seep (Typic Subtype), Mesic Mixed Hardwood Forest (Piedmont Subtype).

RARE PLANTS: Watch List – Fescue Sedge (*Carex festucacea*).

RARE ANIMALS: Bog Turtle (*Glyptemys muhlenbergii*).

COMMENTS: Several specimens of the Harvester (*Feniseca tarquinius*) were observed near Beech trees infested with Woolly Aphids, the food source of this butterfly species' caterpillars.

Three interesting and infrequently encountered saproxylic insect species were seen on mature Beech – *Criorhina verbosa* and *Sphiximorpha willsitoni*, two Hoverflies that are remarkable mimics of stinging Hymenoptera that are dependent on large, mature hardwood trees for oviposition sites. In addition, the scarab beetle *Gnorimella maculosa* was observed investigating rotholes several feet up the trunk of a large Beech, likely for the purposes of oviposition as well. Detailed investigation of this woodland would likely reveal other dead-wood dependent (saproxylic) insect species, several of which are becoming scarce and are not being adequately tracked.

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Glyptemys muhlenbergii by David Campbell

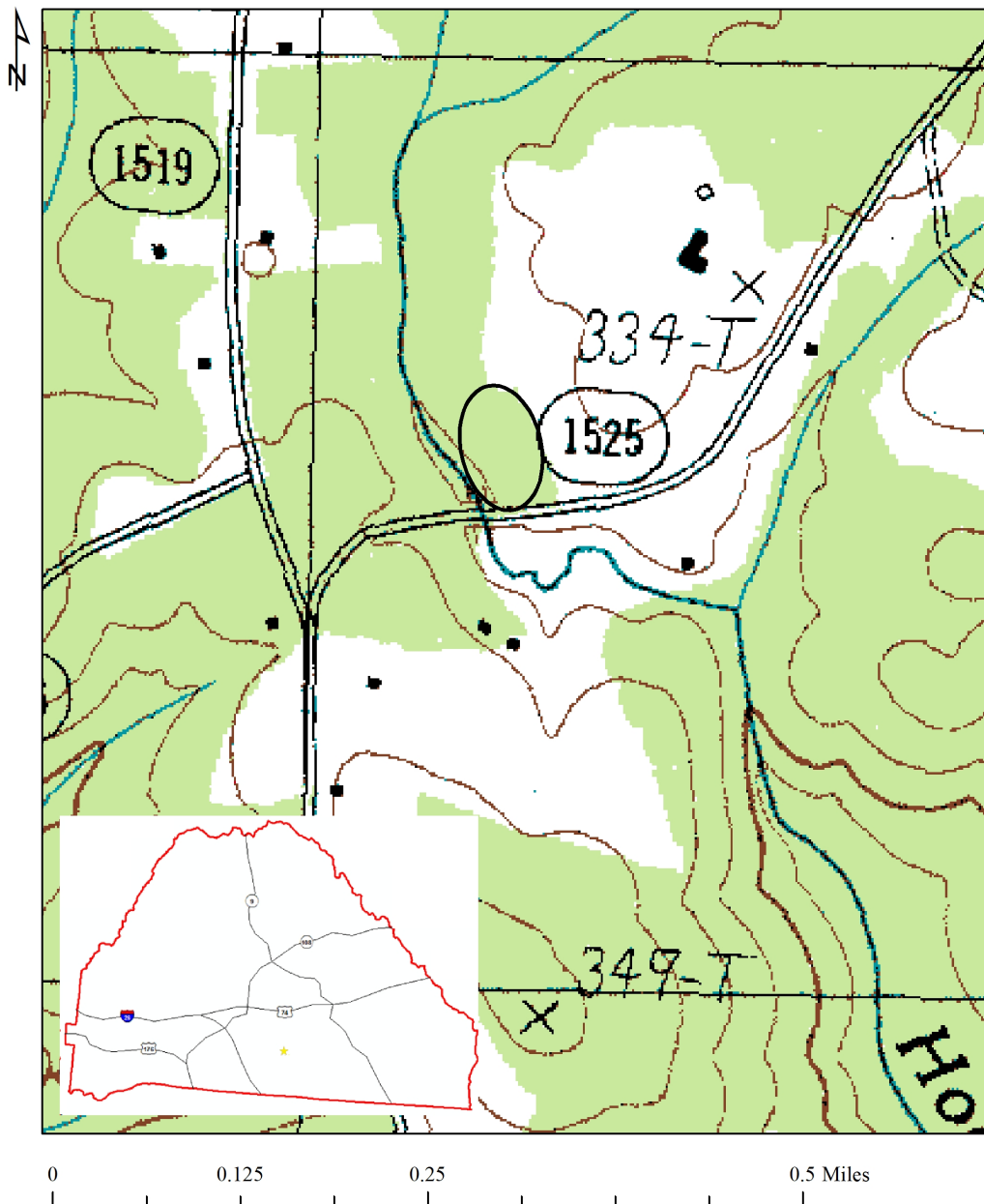
Polk County Natural Areas Inventory

Magnolia virginiana Site near Columbus

Landrum Quad

Significant Natural Heritage Area

Prepared by Pam Torlina - 7/2017



Polk County Natural Areas Inventory
***Magnolia virginiana* Site near Columbus**
Significant Natural Area

Site Significance: Regional

Size: 2 acres

Quadrangle: Landrum

Ownership: Private

SIGNIFICANT FEATURES: This site contains several regionally rare plant species that are largely disjunct from the Coastal Plain, including a sizeable population of Sweetbay Magnolia (*Magnolia virginiana*). The unusual assemblage of species, along with the resident hydrology, are consistent with characteristics of the rare Low Elevation Seep (Piedmont/Mountain Springhead Subtype) as defined by Schafale (2012). This site has four Regionally Rare plant species, and is a globally rare community type.

LANDSCAPE RELATIONSHIPS: Located on the outskirts of the town of Columbus, this site is a wooded ravine that has a small creek flowing through a forested bottomland with several streamside terraces, surrounded on three sides by residential development, and on its fourth side by a county road (Red Fox Road). Adjacent areas are largely agricultural, dotted with small woodlots.

SITE DESCRIPTION: This small, but highly unusual site, is bisected by a stream with adjacent bottomlands and slopes containing a remarkable assemblage of vascular plants that are largely Coastal Plain in their affinities.

Upland areas adjacent to streamside terraces are dominated by Tulip Poplar (*Liriodendron tulipifera*), Red Maple (*Acer rubrum* var. *rubrum*), White Oak (*Quercus alba*), and Sweetgum (*Liquidambar styraciflua*). Seepage discharge at the toe of slope has created mucky flats with Possumhaw (*Viburnum nudum* var. *nudum*), Poison Ivy (*Toxicodendron radicans*), Virginia Creeper (*Parthenocissus quinquefolia*), Nettle Chain Fern (*Lorinseria areolata*), Sensitive Fern (*Onoclea sensibilis*), Cinnamon Fern (*Osmundastrum cinnamomeum*), and Virginia Sweetspires (*Itea virginica*). Round-leaved Catbrier (*Smilax rotundifolia*) forms impenetrable thickets throughout. In scattered, sunny openings occur small patches of Sphagnum (*Sphagnum* spp.) and Bristle-stalked Sedge (*Carex leptalea*). This property is remarkable due to the occurrence of Sweetbay Magnolia (*Magnolia virginiana*), a species very far to the west of its normal distribution. Additional Regionally Rare disjunct species of the Coastal Plain include: Laurel-leaved Catbrier (*Smilax laurifolia*), Swamp Tupelo (*Nyssa biflora*), and Climbing Hydrangea (*Decumaria barbara*).

MANAGEMENT AND PROTECTION: This site currently has no formal protection. However, given the unique plant community present here, efforts should be made to put this area under a conservation easement or other form of protection, if possible.

NATURAL COMMUNITIES: Low Elevation Seep (Piedmont/Mountain Springhead Subtype).

RARE PLANTS: Regionally Rare – Sweetbay (*Magnolia virginiana*), Climbing Hydrangea (*Decumaria barbara*), Laurel Greenbrier (*Smilax laurifolia*), Swamp Tupelo (*Nyssa biflora*).

RARE ANIMALS: None noted.

REFERENCES:

Campbell, D. 2015. Site Survey Report: Columbus *Magnolia virginiana* site. Pacolet Area Conservancy, Tryon, N.C.

Schafale, M. 2012. Guide to the Natural Communities of North Carolina (Fourth Approximation). North Carolina Natural Heritage Program, Department of Environment and Natural Resources, Raleigh, N.C.



Magnolia virginiana by David Campbell

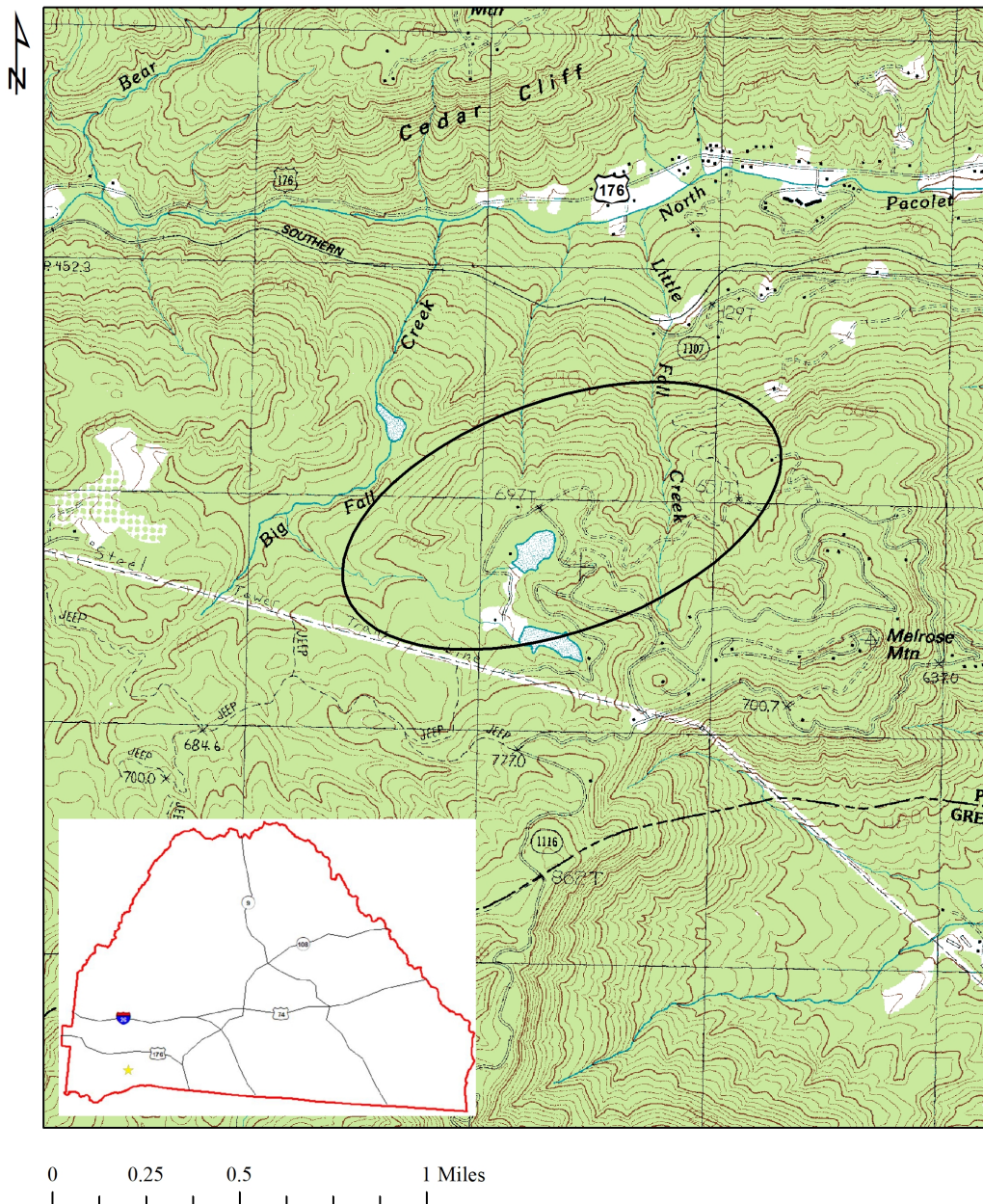
Polk County Natural Areas Inventory

Melrose Mountain

Saluda Quad

Significant Natural Heritage Area

Prepared by Pam Torlina - 4/2018



Polk County Natural Areas Inventory

Melrose Mountain

Significant Natural Area

Site Significance: State

Size: ca. 150 acres

Quadrangle: Saluda

Ownership: Private

SIGNIFICANT FEATURES: This site derives significance from the presence of many rare and Watch List vascular plant species, chief amongst which is a sizeable population of the Federally Endangered White Irisette (*Sisyrinchium dichotomum*). In addition, a relatively intact and good quality Rich Cove Forest community type occurs here.

LANDSCAPE RELATIONSHIPS: Approximately 2 miles Northwest of Tryon, in southwestern Polk County.

SITE DESCRIPTION: North-facing upper and mid slopes (some quite steep), contain a nice example of Rich Cove Forest (Montane Rich Subtype). Canopy dominants include Northern Red Oak (*Quercus rubra*), White Oak (*Quercus alba*), Tulip Poplar (*Liriodendron tulipifera*), Yellow Buckeye (*Aesculus flava*), White Basswood (*Tilia americana* var. *heterophylla*), White Ash (*Fraxinus americana*), Red Elm (*Ulmus rubra*), Bitternut Hickory (*Carya cordiformis*), Northern Hackberry (*Celtis occidentalis*), Fraser Magnolia (*Magnolia fraseri*), Cucumber Magnolia (*Magnolia acuminata* var. *acuminata*), Red Mulberry (*Morus rubra*), Common Silverbell (*Halesia tetraptera* var. *tetraptera*), and Sweet Birch (*Betula lenta* var. *lenta*). Shrub diversity is high, with Spicebush (*Lindera benzoin*), Pawpaw (*Asimina triloba*), Sweetshrub (*Calycanthus floridus*), Alternate-leaved Dogwood (*Cornus alternifolia*), Fringetree (*Chionanthus virginicus*), Strawberry-bush (*Euonymus americanus*), Bigleaf Snowbell (*Styrax grandifolius*), and Mapleleaf Viburnum (*Viburnum acerifolium*). Dutchman's Pipe (*Isotrema macrophyllum*), Virginia Creeper (*Parthenocissus quinquefolia*), Moonseed (*Menispermum canadense*), Grape (*Vitis* spp.), and Northern Leatherflower (*Clematis viorna*) are vines that occur throughout the site. Herbaceous species include Blue Cohosh (*Caulophyllum thalictroides*), Sweet White Trillium (*Trillium simile*), Seersucker Sedge (*Carex plantaginea*), American Ginseng (*Panax quinquefolius*), Black Cohosh (*Actaea racemosa*), Bland Sweet Cicely (*Osmorhiza claytonii*), Green Violet (*Hybanthus concolor*), Appalachian False Goatsbeard (*Astilbe biternata*), Early Meadow-rue (*Thalictrum dioicum*), Solomon's Seal (*Polygonatum biflorum*), American Alumroot (*Heuchera americana*), Zigzag Goldenrod (*Solidago flexicaulis*), Showy Orchis (*Galearis spectabilis*), Mapleleaf Waterleaf (*Hydrophyllum canadense*), Large-flowered Trillium (*Trillium grandiflorum*), Pennywort (*Obolaria virginica*), and Mountain Anemone (*Anemone lancifolia*).

On drier sites, and those with a more southerly aspect, Montane Oak–Hickory Forest (Basic Subtype) exists. Less diverse than Rich Cove Forest, tree species here include White Oak (*Quercus alba*), Black Oak (*Quercus velutina*), Northern Red Oak (*Quercus rubra*), Chestnut Oak (*Quercus montana*), Mockernut Hickory (*Carya tomentosa*), Sand Hickory (*Carya pallida*), Persimmon (*Diospyros virginiana*), Black Gum (*Nyssa sylvatica*), Sassafras (*Sassafras albidum*), and White Ash (*Fraxinus americana*). Shrubs present are American Witch-Hazel (*Hamamelis virginiana* var. *virginiana*), Hairy Mock-orange (*Philadelphus hirsutus*) in rockier areas, Beaked Hazel-nut (*Corylus cornuta* var. *cornuta*), Blackhaw (*Viburnum prunifolium*), Downy Serviceberry (*Amelanchier arborea*), Mountain Indigo-bush (*Amorpha glabra*), and Creeping St. Andrew's Cross (*Hypericum stragulum*). Woody vines include Poison Ivy (*Toxicodendron radicans*), Whiteleaf Greenbrier (*Smilax glauca*), Sawleaf Greenbrier (*Smilax bona-nox*), Grape (*Vitis* spp.), Virginia Creeper (*Parthenocissus quinquefolia*). Examples of herbaceous species encountered here are Jack-in-the-pulpit (*Arisaema triphyllum*), Mayapple (*Podophyllum peltatum*), Curtis' Goldenrod (*Solidago curtisii*), Woodland Agrimony (*Agrimonia rostellata*), Giant Chickweed (*Stellaria pubera*), Appalachian Sedge (*Carex appalachica*), and Marginal Wood-fern (*Dryopteris marginalis*).

MANAGEMENT AND PROTECTION: This site currently has no formal protection. Continued residential development could be a threat to sensitive plant communities here.

NATURAL COMMUNITIES: Rich Cove Forest (Montane Rich Subtype), Montane Oak–Hickory Forest (Basic Subtype).

RARE PLANTS: Broadleaf Coreopsis (*Coreopsis latifolia*), Large Witch-alder (*Fothergilla major*), Divided-leaf Ragwort (*Packera millefolium*), White Irisette (*Sisyrinchium dichotomum*), Ash-leaved Golden-banner (*Thermopsis fraxinifolia*), Sweet White Trillium (*Trillium simile*), Biltmore Sedge (*Carex biltmoreana*), Whiteleaf Sunflower (*Helianthus glaucophyllus*), Watch List – Hairy Mock-orange (*Philadelphus hirsutus*), Scentless Mock-orange (*Philadelphus inodorus*), Heartleaf Skullcap (*Scutellaria ovata* ssp. *ovata* var. *ovata*), American Ginseng (*Panax quinquefolius*), Hoptree (*Ptelea trifoliata*), Little Sweet Betsy Trillium (*Trillium cuneatum*), Southern Nodding Trillium (*Trillium rugelii*), Early Horse Gentian (*Triosteum aurantiacum* var. *aurantiacum*).

RARE ANIMALS: Diana Fritillary (*Speyeria diana*), Watch List – Appalachian Azure (*Celastrina neglectamajor*).

COMMENTS: There is a specimen of Heller's Blazing-star (*Liatris helleri*) at the University of Chapel Hill Herbarium, specimen number NCU00036921, that was collected on Melrose Mountain October 14, 1936 by Donald Peattie. This species was not relocated at this site during the present study.

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Fothergilla major by William S. Moye

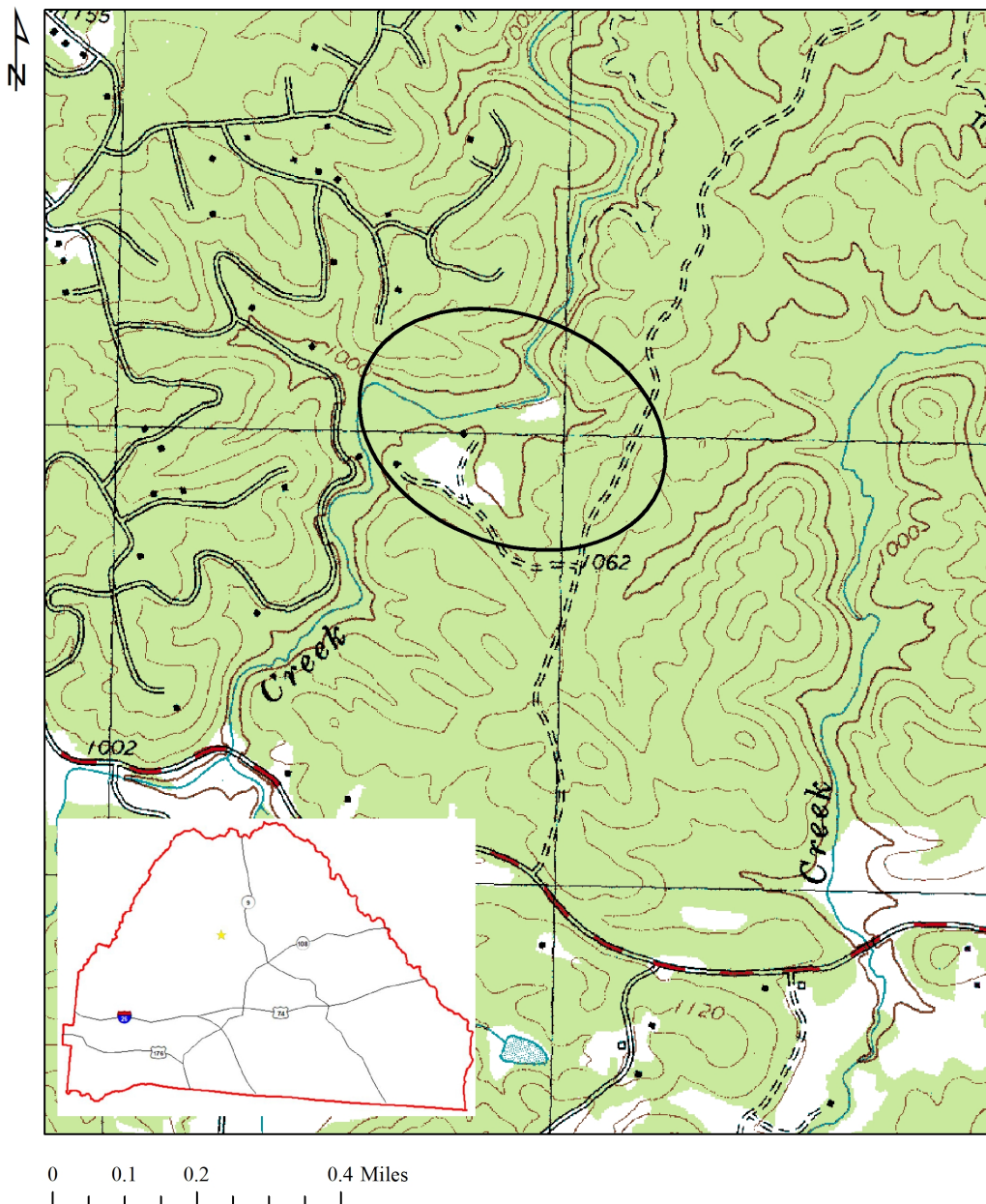
Polk County Natural Areas Inventory

Mill Spring Slopes and Ridges

Mill Spring Quad

Significant Natural Heritage Area

Prepared by Pam Torlina - 4/2018



Polk County Natural Areas Inventory
Mill Spring Slopes and Ridges
Significant Natural Area

Site Significance: Regional

Size: 70 acres

Quadrangle: Mill Spring

Ownership: Private

SIGNIFICANT FEATURES: This area is significant due to its relatively large size and intact state, with a minimum history of disturbance. As well, the presence of vernal pools being utilized as breeding sites by two species of Ambystomatid Salamanders (one significantly rare), is notable. Eight rare species of vascular plants have been documented here, including the very infrequently encountered Dwarf Chinquapin Oak (*Quercus prinoides*).

LANDSCAPE RELATIONSHIPS: A large wooded tract bisected by Ostin Creek, situated approximately 2 miles southeast of Lake Adger.

SITE DESCRIPTION: Moderate slopes with acidic soils give rise to dry/xeric ridgetops of Low Mountain Pine Forest (Shortleaf Pine Subtype). The canopy here is dominated by Chestnut Oak (*Quercus montana*), Scarlet Oak (*Quercus coccinea*), Sweet Pignut Hickory (*Carya ovalis*), Sand Hickory (*Carya pallida*), Mockernut Hickory (*Carya tomentosa*), Red Maple (*Acer rubrum*), Sassafras (*Sassafras albidum*), Persimmon (*Diospyros virginiana*), Shortleaf Pine (*Pinus echinata*), and Virginia Pine (*Pinus virginiana*). Shrubs present include Mountain Laurel (*Kalmia latifolia*), Dryland Blueberry (*Vaccinium pallidum*), American Witch-hazel (*Hamamelis virginiana* var. *virginiana*), Beaked Hazelnut (*Corylus cornuta* var. *cornuta*), Blackhaw (*Viburnum prunifolium*), Dwarf Pawpaw (*Asimina parviflora*), Sweetleaf (*Symplocos tinctoria*), Common Chinquapin (*Castanea pumila*), Trailing Arbutus (*Epigaea repens*), and Dwarf Chinquapin Oak (*Quercus prinoides*). Vines are not numerous but one may encounter scattered individuals of Common Greenbrier (*Smilax rotundifolia*), and Whiteleaf Greenbrier (*Smilax glauca*). The herbaceous layer diversity is sparse, with Spiked Hoarypea (*Tephrosia spicata*), Pink Lady's Slipper (*Cypripedium acaule*), Biltmore Carrionflower (*Smilax biltmoreana*), Small Heartleaf Ginger (*Hexastylis minor*), Blackseed Needlegrass (*Piptochaetium avenaceum*), and Common Running-cedar (*Diphasiastrum digitatum*).

Mid to lower slopes are occupied by Mesic Mixed Hardwood Forest (Piedmont Subtype), one of the commonest community types in the region as a whole. Canopy dominants include American Beech (*Fagus grandifolia*), Tulip Poplar (*Liriodendron tulipifera*), White Oak (*Quercus alba*), Northern Red Oak (*Quercus rubra*), Black Oak (*Quercus velutina*), Sourwood (*Oxydendrum arboreum*), Flowering Dogwood (*Cornus florida*), Cucumber Magnolia (*Magnolia acuminata*), Fringetree (*Chionanthus virginicus*), Mockernut Hickory (*Carya tomentosa*), Red Mulberry

(*Morus rubra*), Black Cherry (*Prunus serotina*), Eastern Hemlock (*Tsuga canadensis*), and Persimmon (*Diospyros virginiana*). Shrub diversity is moderate with Spicebush (*Lindera benzoin* var. *benzoin*), Pawpaw (*Asimina triloba*), Sweetshrub (*Calycanthus floridus* var. *floridus*), Alternate-leaf Dogwood (*Cornus alternifolia*), American Strawberry Bush (*Euonymus americanus*), Mountain Doghobble (*Leucothoe fontanesiana*) – lower slopes, Rosebay Rhododendron (*Rhododendron maximum*) and Scentless Mock-orange (*Philadelphus inodorus*). Eastern Poison-ivy (*Toxicodendron radicans* ssp. *radicans*), and Summer Grape (*Vitis aestivalis* var. *aestivalis*) are commonly encountered vines. The herb layer consists of Dwarf Crested Iris (*Iris cristata*), Common Golden Alexanders (*Zizia aurea*), Catesby's Trillium (*Trillium catesbaei*), Christmas Fern (*Polystichum acrostichoides*), Carolina Woodrush (*Luzula acuminata* var. *carolinae*), Bloodroot (*Sanguinaria canadensis*), Bearcorn (*Conopholis americana*), One-flowered Cancer-root (*Aphyllon uniflorum*), Beechdrops (*Epifagus virginiana*), Little Brown Jugs (*Hexastylis arifolia* var. *arifolia*), Windflower (*Thalictrum thalictroides*), Crane-fly Orchid (*Tipularia discolor*), Ebony Spleenwort (*Asplenium platyneuron*), Southern Lady Fern (*Athyrium asplenoides*), Lyon's Turtlehead (*Chelone lyonii*) – lower slopes in seepage, Pennywort (*Obolaria virginica*), Rattlesnake Fern (*Botrypus virginianus*), Virginia Snakeroot (*Endodeca serpentaria*), and Showy Orchis (*Galearis spectabilis*).

As elsewhere along Ostin Creek, there are small inclusions that approximate the conditions of a Piedmont Alluvial Forest. Surficial geology renders these areas scattered, uneven, and of relatively small size. Typical trees found here are Sycamore (*Platanus occidentalis*), River Birch (*Betula nigra*), Green Ash (*Fraxinus pennsylvanica*), Southern Hackberry (*Celtis laevigata*), Sweetgum (*Liquidambar styraciflua*), and Tulip Poplar (*Liriodendron tulipifera*). *Vitis* spp. are abundant, as are Trumpet Creeper (*Campsis radicans*) and Crossvine (*Bignonia capreolata*). Occasional examples of Moonseed (*Menispermum canadense*) occur at the toe of slopes. Spicebush (*Lindera benzoin* var. *benzoin*) is the dominant shrub here, along with occasional examples of Black Elderberry (*Sambucus nigra* ssp. *canadensis*), Yellowroot (*Xanthorhiza simplicissima*), and Bladdernut (*Staphylea trifolia*). Examples of Jack-in-the-pulpit (*Arisaema triphyllum*), some of great size, are found in these pockets of alluvium along the banks of the creek.

MANAGEMENT AND PROTECTION: This site currently has no formal protection.

NATURAL COMMUNITIES: Low Mountain Pine Forest (Shortleaf Pine Subtype), Mesic Mixed Hardwood Forest (Piedmont Subtype), Piedmont Alluvial Forest.

RARE PLANTS: Dwarf Chinquapin Oak (*Quercus prinoides*), Appalachian Golden-banner (*Thermopsis mollis*), Watch List – Small Spreading Pogonia (*Cleistodiopsis bifaria*), Autumn Coral-root (*Corallorhiza odontorhiza*), Leatherwood (*Dirca palustris*), Scentless Mock-orange (*Philadelphus inodorus*), Showy Skullcap (*Scutellaria serrata*), Longstalk Starwort (*Stellaria alsine*).

RARE ANIMALS: Mole Salamander (*Ambystoma talpoideum*), Diana Fritillary (*Speyeria diana*), Checkered White (*Pontia protodice*), Watch List – Eastern Whip-poor-will (*Antrostomus vociferus*).

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Cleistesiosis bifaria by David Campbell

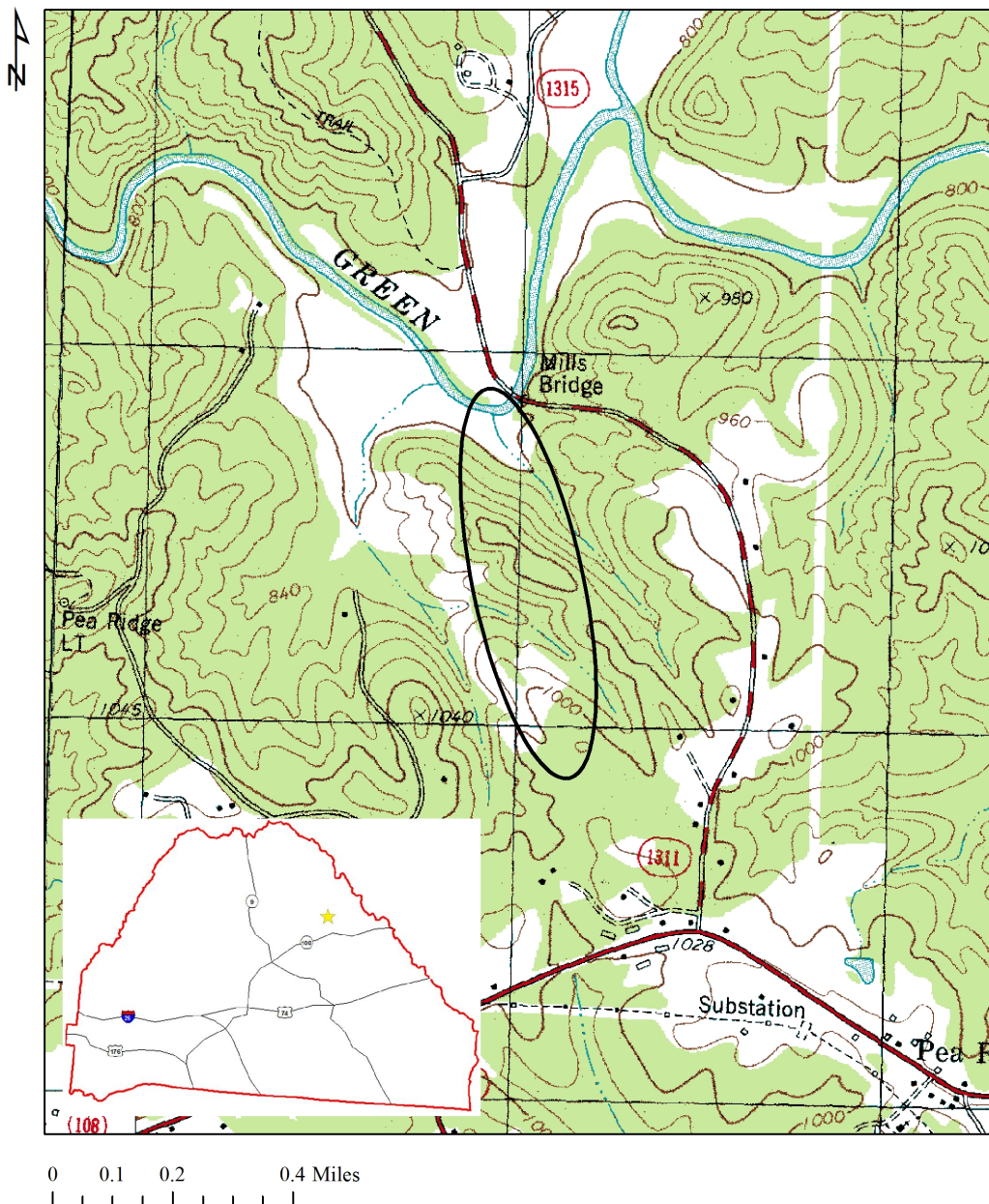
Polk County Natural Areas Inventory

Mills Bridge Area Rare Plant Site

Pea Ridge Quad

Significant Natural Heritage Area

Prepared by Pam Torlina - 10/2017



Polk County Natural Areas Inventory
Mills Bridge Area Rare Plant Site
Significant Natural Area

Site Significance: Regional

Size: 49 acres

Quadrangle: Pea Ridge

Ownership: Private

SIGNIFICANT FEATURES: This site is significant for the presence of a population of the rare Allegheny Spurge (*Pachysandra procumbens*), a species which is only known to occur in North Carolina within Polk County, along the Green River. This site also harbors a good example of the uncommon Basic Mesic Forest (Piedmont Subtype). Three rare vascular plant species, eight Watch List vascular plant species, and one Watch List animal species occur here.

LANDSCAPE RELATIONSHIPS: Wooded slopes above the south bank of the Green River, along SR-1311, approximately two miles northeast of Mill Spring.

SITE DESCRIPTION: Basic-mesic Forest on north-facing slopes above the Green River. Canopy trees include Tulip Poplar (*Liriodendron tulipifera*), Northern Red Oak (*Quercus rubra*), White Oak (*Quercus alba*), Red Elm (*Ulmus rubra*), American Basswood (*Tilia americana* var. *heterophylla*), American Beech (*Fagus grandifolia*), Butternut (*Jugans cinerea*), Red Mulberry (*Morus rubra*), and Mockernut Hickory (*Carya tomentosa*). Spicebush (*Lindera benzoin*) Sweetshrub (*Calycanthus floridus*), American Hazelnut (*Corylus americana*), and Smooth Hydrangea (*Hydrangea arborescens*) are commonly encountered shrubs. Yellow Fumitory (*Corydalis flavula*), Northern Maidenhair Fern (*Adiantum pedatum*), Dutchman's Breeches (*Dicentra cucullaria*), Puttyroot (*Aplectrum hyemale*), Roundleaf Ragwort (*Packera obovata*), Lyon's Turtlehead (*Chelone lyonii*), Cutleaf Toothwort (*Cardamine concatenata*), Mayapple (*Podophyllum peltatum*), Southern Lady Fern (*Athyrium asplenoides*), American Alumroot (*Heuchera americana*), White Baneberry (*Actaea pachypoda*), Christmas Fern (*Polystichum acrostichoides*), Pennsylvania Sedge (*Carex pennsylvanica*), Bloodroot (*Sanguinaria canadensis*), Carolina Woodrush (*Luzula acuminata* var. *carolinae*), Common Shorthusk (*Brachyelytrum erectum*), Sharp-lobed Hepatica (*Anemone acutiloba*), Little Sweet Betsy Trillium (*Trillium cuneatum*), Tall Scouring-rush (*Equisetum hyemale* ssp. *affine*), American Hog-peanut (*Amphicarpa bracteata*), Wild Comfrey (*Cynoglossum virginianum* var. *virginianum*), and Black Cohosh (*Actaea racemosa*).

MANAGEMENT AND PROTECTION: This site currently has no formal protection.

NATURAL COMMUNITIES: Basic Mesic Forest (Piedmont Subtype). This represents a relatively intact and high quality example of this community type.

RARE PLANTS: Allegheny Spurge (*Pachysandra procumbens*), Whorled Horsebalm (*Collinsonia verticillata*), Pink Thoroughwort (*Fleischmannia incarnata*), Watch List – Butternut (*Juglans cinerea*), American Ginseng (*Panax quinquefolius*), Green Violet (*Hybanthus concolor*), Leatherwood (*Dirca palustris*), Little Sweet Betsy Trillium (*Trillium cuneatum*), Orange-fruited Horse-gentian (*Triosteum aurantiacum* var. *aurantiacum*), Chinquapin Oak (*Quercus muehlenbergii*), Hoptree (*Ptelea trifoliata*).

RARE ANIMALS: Smooth Earthsnake (*Virginia valeriae*).

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Fleischmannia incarnata by David Campbell

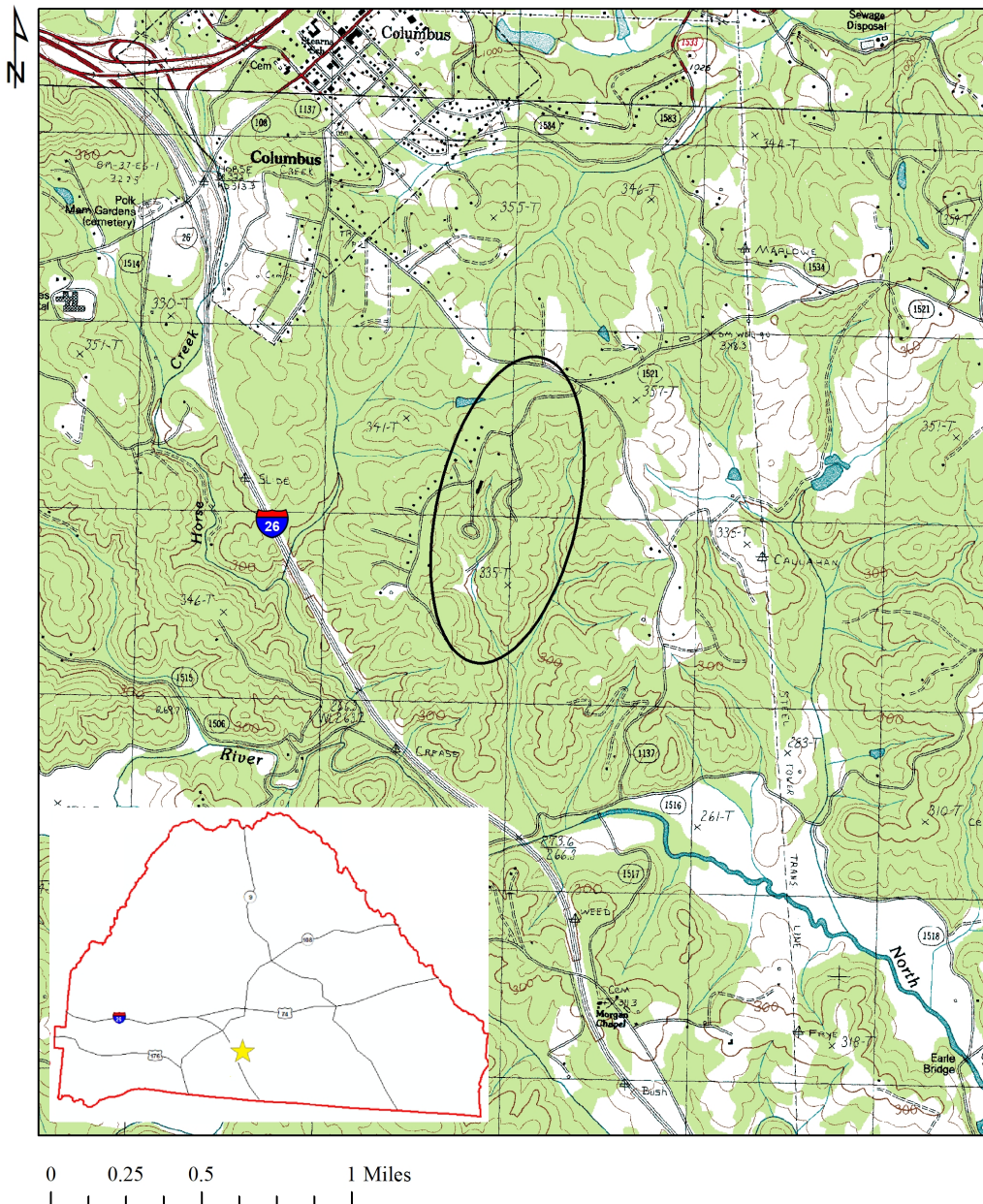
Polk County Natural Areas Inventory

Morgan Chapel Rare Plant Site

Landrum Quad

Significant Natural Heritage Area

Prepared by Pam Torlina - 8/2017



Polk County Natural Areas Inventory
Morgan Chapel Rare Plant Site
Significant Natural Area

Site Significance: Regional

Size: 80 acres

Quadrangle: Landrum

Ownership: Private

SIGNIFICANT FEATURES: This site has a mature, high quality example of the Low Mountain Pine Forest (Montane Pine Subtype), with many large individuals of Virginia Pine (*Pinus virginiana*). The occurrence of King's Hairstreak (*Satyrrium kingi*) here is unusual, and far west of previously known colonies; this constitutes the first record of this rare butterfly species for Polk County. This site contains three rare plant species, one Watch List plant species, and one Watch List animal species, in addition to an active Great Blue Heron (*Ardea herodias*) rookery.

LANDSCAPE RELATIONSHIPS: A heavily wooded tract within the town limits of Tryon, this site is surrounded on all sides by residential development and belongs to the Morgan Chapel Home Owners Association. Lake Lanier lies approximately one mile to the south.

SITE DESCRIPTION: The Low Mountain Pine Forest community here occurs on moderate dry-mesic to xeric slopes and ridgetops underlain by acidic soils. Tree species include Virginia Pine (*Pinus virginiana*) – with some very large specimens being present, Chestnut Oak (*Quercus montana*), White Oak (*Quercus alba*), Scarlet Oak (*Quercus coccinea*), Black Oak (*Quercus velutina*), Mockernut Hickory (*Carya tomentosa*), Pignut Hickory (*Carya glabra*), Sassafras (*Sassafras albidum*), Black Gum (*Nyssa sylvatica*), Red Maple (*Acer rubrum* var. *rubrum*), and Sourwood (*Oxydendrum arboreum*). Common shrubs are Mountain Laurel (*Kalmia latifolia*), Blackhaw (*Viburnum prunifolium*), Farkleberry (*Vaccinium arboreum*), Dwarf Pawpaw (*Asimina parviflora*), Black Huckleberry (*Gaylussacia baccata*), and Dryland Blueberry (*Vaccinium pallidum*). Sweetleaf (*Symplocos tinctoria*), the hostplant for the rare King's Hairstreak butterfly, is abundant at this site. The herbaceous layer is sparse, with Spotted Wintergreen (*Chimaphila maculata*), Appalachian Little Brown Jug (*Hexastylis arifolia* var. *ruthii*), Common Running Cedar (*Diphasiastrum digitatum*), and Blackseed Needlegrass (*Piptochaetium avenaceum*). Sweet Pinesap (*Monotropsis odorata*) grows in widely scattered groups in the deep pine needle duff under Virginia Pine (*Pinus virginiana*) and Mountain Laurel (*Kalmia latifolia*).

Lower slopes give rise to pockets of Dry-Mesic Oak-Hickory Forest where White Oak (*Quercus alba*) and Mockernut Hickory (*Carya tomentosa*) become more prevalent. Sweetleaf (*Symplocos tinctoria*) is still common, but not nearly as abundant as on the upper, drier slopes. Northern Red Oak (*Quercus rubra*) also occurs as scattered (though often quite large) individuals. Shrubs which typically favor somewhat more mesic conditions, such as American Witch-hazel (*Hamamelis*

virginiana var. *virginiana*), Fringe-tree (*Chionanthus virginicus*), and Sweetshrub (*Calycanthus floridus*) occur sporadically here.

A small example of the Piedmont Headwater Stream Forest community type is found at toe of slopes and lower areas near streamside flats. Characteristic woody species at this site include Tulip Poplar (*Liriodendron tulipifera*), White Oak (*Quercus alba*), American Beech (*Fagus grandifolia*), Sweetgum (*Liquidambar styraciflua*), Pawpaw (*Asimina triloba*), and large numbers of Sweetleaf (*Symplocos tinctoria*). Damp flats adjacent to an unnamed tributary are almost completely covered in New York Fern (*Parathelypteris noveboracensis*). Additional members of the herbaceous layer are Indian Cucumber Root (*Medeola virginiana*), Foamflower (*Tiarella wherryi*), Shining Clubmoss (*Huperzia lucidula*), Cutleaf Grapefern (*Sceptridium dissectum*), and Black Cohosh (*Actaea racemosa*).

MANAGEMENT AND PROTECTION: This site is protected as a greenspace by the surrounding residential community, which owns it.

NATURAL COMMUNITIES: Low Mountain Pine Forest (Montane Pine Subtype), Piedmont Headwater Stream Forest (Typic Subtype), Dry-Mesic Oak-Hickory Forest (Piedmont Subtype).

RARE PLANTS: Sweet Pinesap (*Monotropsis odorata*), Appalachian Golden-banner (*Thermopsis mollis*), Smooth Sunflower (*Helianthus laevigatus*). Watch List – Large Whorled Pogonia (*Isotria verticillata*).

RARE ANIMALS: Watch List – King’s Hairstreak (*Satyrium kingi*).

REFERENCES:

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Monotropsis odorata by David Campbell

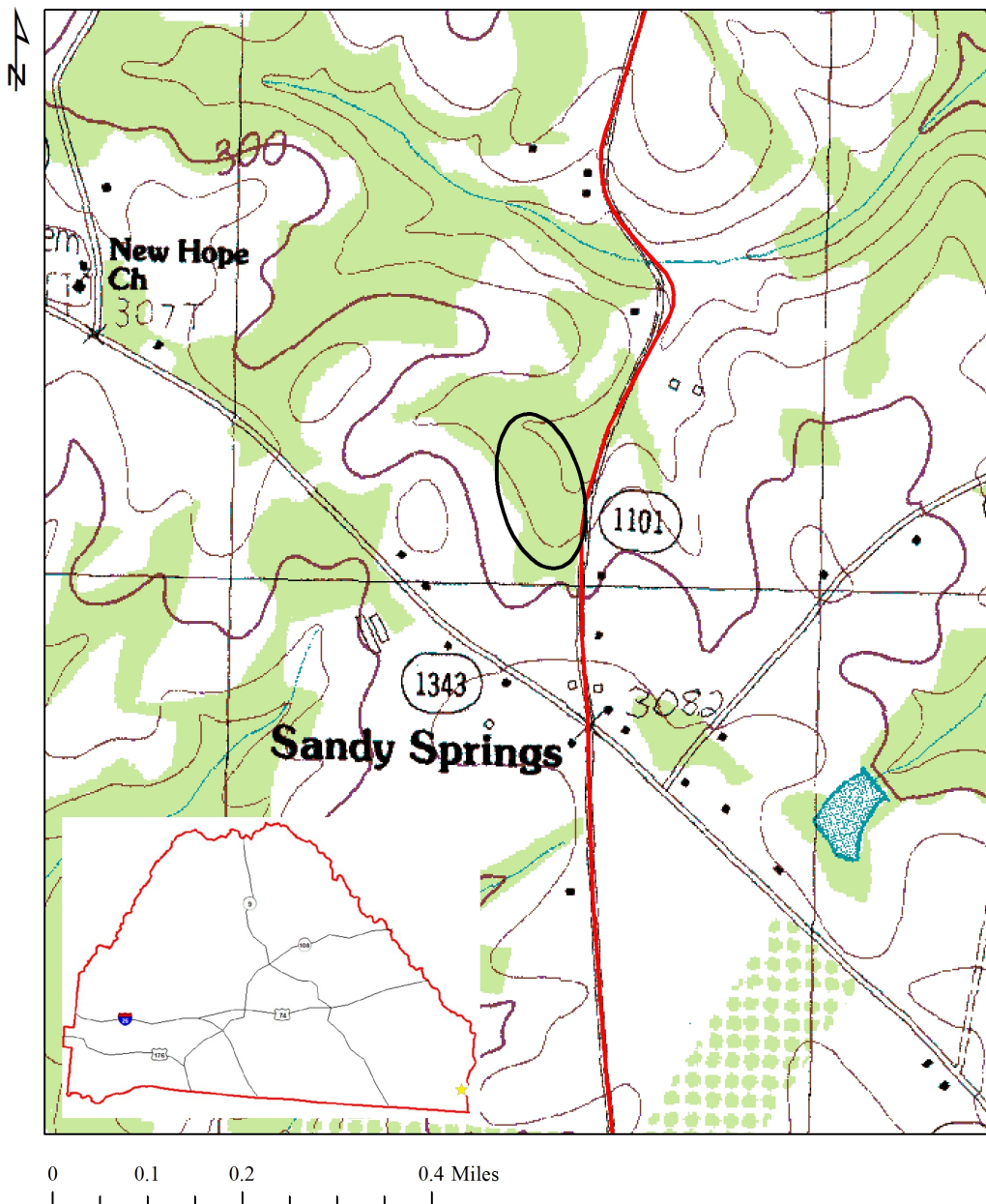
Polk County Natural Areas Inventory

New Hope Low Elevation Seep

Fingerville East Quad

Significant Natural Heritage Area

Prepared by Pam Torlina - 4/2018



Polk County Natural Areas Inventory
New Hope Low Elevation Seep
Significant Natural Area

Site Significance: State

Size: 6 acres

Quadrangle: Fingerville East

Ownership: Private

SIGNIFICANT FEATURES: A population of the Federally Threatened Dwarf-flowered Heartleaf (*Hexastylis naniflora*) occurs at this site, as well as two Regionally Rare Watch List vascular plant species. In addition, Polk County's only known occurrence of Cuthbert's Turtlehead (*Chelone cuthbertii*), a significantly rare species range-wide, is found here. This site also derives significance as a non-alluvial wetland with a distinctive flora with Coastal Plain affinities; all such communities are rare in this region and deserve recognition and protection.

LANDSCAPE RELATIONSHIPS: Southeastern Polk County, near the Rutherford County line; ca. ¾ mile NNW from Sandy Springs as per Rayner (1994).

SITE DESCRIPTION: Canopy dominants are Red Maple (*Acer rubrum* var. *trilobum*), Tulip Poplar (*Liriodendron tulipifera*), Sweetgum (*Liquidambar styraciflua*), and Swamp Tupelo (*Nyssa biflora*). Shrubs present include Possumhaw Viburnum (*Viburnum nudum*), Virginia Sweetspire (*Itea virginica*), Tag Alder (*Alnus serrulata*), Poison Sumac (*Toxicodendron vernix*), Red Chokeberry (*Photinia pyrifolia*), and Hairy Highbush Blueberry (*Vaccinium fuscatum*). Numerous vines are present, with Laurel Greenbrier (*Smilax laurifolia*), Common Greenbrier (*Smilax rotundifolia*), Grape (*Vitis* spp.), Virginia Creeper (*Parthenocissus quinquefolia*), and Climbing Hydrangea (*Decumaria barbara*). The herbaceous diversity is moderate with Netted Chain Fern (*Lorinseria areolata*), Cinnamon Fern (*Osmundastrum cinnamomeum*), American Royal Fern (*Osmunda spectabilis*), Viscid Hedge-hyssop (*Gratiola viscidula*), Common Axillflower (*Mecardonia acuminata* var. *acuminata*), Dwarf-flowered Heartleaf (*Hexastylis naniflora*), White Edge Sedge (*Carex debilis*), Bristly-stalked Sedge (*Carex leptalea*), Leathery Rush (*Juncus coriaceus*), False Nettle (*Boehmeria cylindrica*), Virginia Bugleweed (*Lycopus virginicus*), and Tubercled Orchid (*Platanthera flava* var. *flava*). Hummocks with *Sphagnum* spp. occur throughout.

MANAGEMENT AND PROTECTION: This site currently has no protection. Removal of the encroaching invasive species Chinese Privet (*Ligustrum sinense*) and Japanese Honeysuckle (*Lonicera japonica*) is advisable.

NATURAL COMMUNITIES: Low Elevation Seep (Piedmont/Mountain Springhead Subtype).

RARE PLANTS: Cuthbert's Turtlehead (*Chelone cuthbertii*), Dwarf-flowered Heartleaf (*Hexastylis naniflora*), Tubercled Orchid (*Platanthera flava* var. *flava*), Watch List – Laurel Greenbrier (*Smilax laurifolia*), Regionally Rare – Poison Sumac (*Toxicodendron vernix*).

RARE ANIMALS: Although not currently tracked, good numbers of two rare and declining species of Bumblebee were observed nectaring here on blossoms; Yellow Bumblebee (*Bombus fervidus*) and Black and Gold Bumblebee (*Bombus auricomus*). Many species of native Bumblebee are suffering large contractions throughout their range.

COMMENTS: The floristics of this site bear a striking degree of resemblance to the other low elevation seeps that are clustered in this part of Polk County. In his report, Rayner (1994) characterized these communities as possibly being unique and bearing a resemblance to the Piedmont Seepage Forest of South Carolina, as described by Nelson (1986). Subsequent work by Seymour (2011) and Schafale (2012) has resulted in this type of rare plant community being designated as Low Elevation Seep (Piedmont/Mountain Springhead Subtype).

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Chelone cuthbertii by William S. Moye

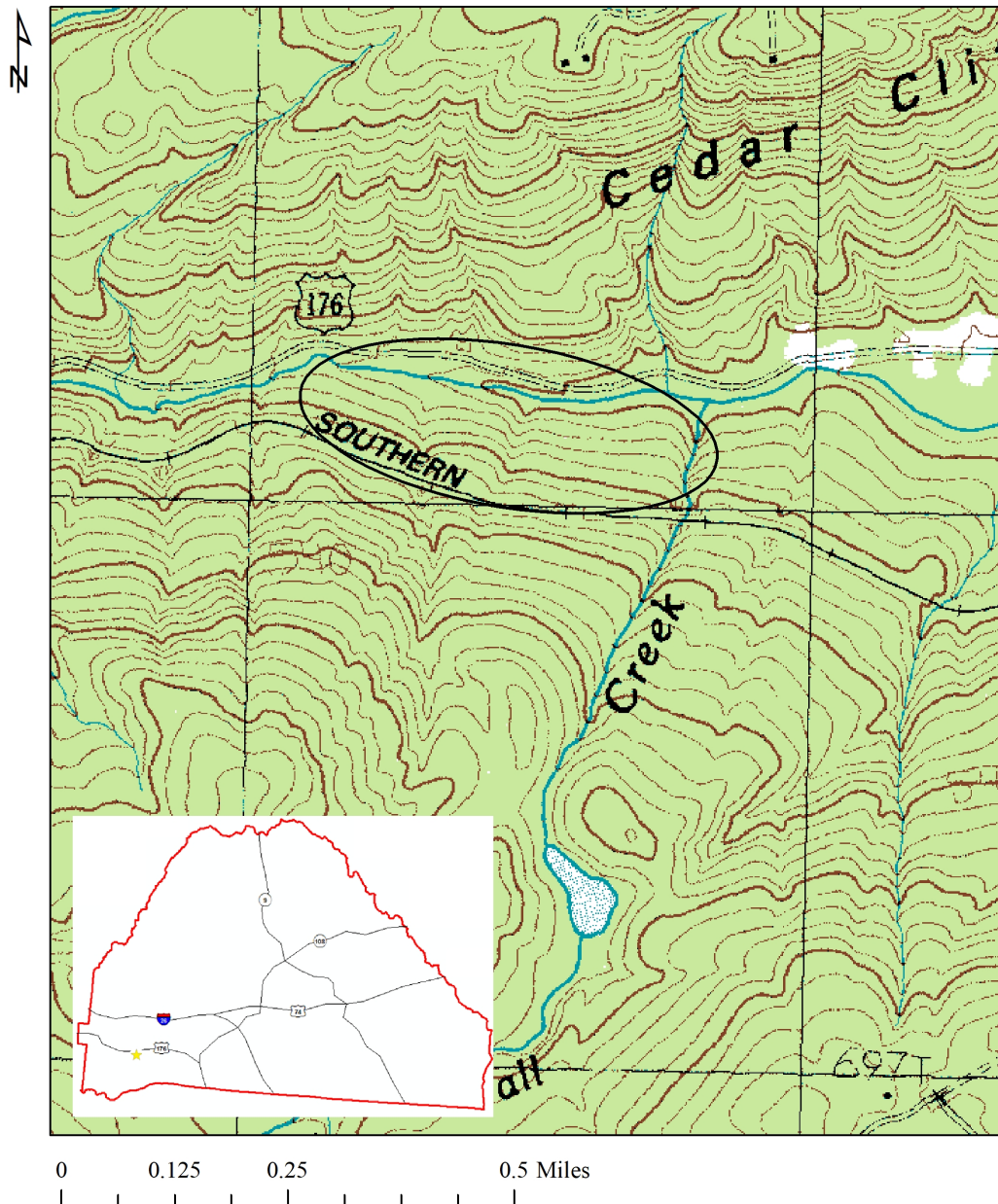
Polk County Natural Areas Inventory

North Pacolet River Rare Plant Site (North Pacolet River Valley)

Significant Natural Heritage Area

Saluda Quad

Prepared by Pam Torlina - 7/2017



Polk County Natural Areas Inventory
North Pacolet River Rare Plant Site
(North Pacolet River Valley)
Significant Natural Area

Site Significance: State

Size: 40 acres

Quadrangle: Saluda

Ownership: Conserving
Carolina

SIGNIFICANT FEATURES: This site contains an excellent and extremely diverse example of the Rich Cove Forest (Foothills Rich Subtype) community. In addition, this tract harbors a very large population of Sweet White Trillium (*Trillium simile*), numbering many thousands of individuals, rendering it one of the largest populations of this species known anywhere. This site contains six rare plant species, three Watch List plant species, and two Watch List animal species.

LANDSCAPE RELATIONSHIPS: This site is located near Tryon along the banks of the North Pacolet River (and adjacent slopes) at the bottom of the North Pacolet Valley, and falls within the North Pacolet River Macrosite.

SITE DESCRIPTION: Gentle to moderate slopes above the North Pacolet River containing rich soils derived from mafic rocks. Several small streams and other topographical features have created small coves. Seepage is abundant. Several very large boulders and associated crevices, are scattered throughout the area.

The Rich Cove Forest here has a canopy that includes Tulip Poplar (*Liriodendron tulipifera*), White Oak (*Quercus alba*), Northern Red Oak (*Quercus rubra*), Red Elm (*Ulmus rubra*), Red Maple (*Acer rubrum* var. *rubrum*), American Beech (*Fagus grandifolia*), Mockernut Hickory (*Carya tomentosa*), Red Mulberry (*Morus rubra*), White Basswood (*Tilia americana* var. *heterophylla*), and Fraser Magnolia (*Magnolia fraseri*). The understory is quite dense, and dominant species are Spicebush (*Lindera benzoin*), Pawpaw (*Asimina triloba*), Snowy Hydrangea (*Hydrangea radiata*), Carolina Silver Bell (*Halesia tetraptera*), Painted Buckeye (*Aesculus sylvatica*), and American Witch-hazel (*Hamamelis virginiana* var. *virginiana*). Woody vines present are Virginia Creeper (*Parthenocissus quinquefolia*), Poison Ivy (*Toxicodendron radicans*), Blue Ridge Carrion-flower (*Smilax lasioneura*), and Trumpet Creeper (*Campsis radicans*). The herbaceous layer here is very lush and diverse with a great many species present, including Blue Cohosh (*Caulophyllum thalictroides*), Dutchman's Breeches (*Dicentra cucullaria*), Squirrel Corn (*Dicentra canadensis*), Fernleaf Phacelia (*Phacelia bipinnatifida*), Bluntleaf Waterleaf (*Hydrophyllum caandense*), Little Sweet Betsy Trillium (*Trillium cuneatum*), White Trillium

(*Trillium grandiflorum*), Sweet White Trillium (*Trillium simile*), Green Violet (*Hybanthus concolor*), Ginseng (*Panax quinquefolius*), Black Cohosh (*Actaea racemosa*), Spring Beauty (*Claytonia virginica*), Trout Lily (*Erythronium umbilicatum*), Solomon's Seal (*Polygonatum biflorum*), Bloodroot (*Sanguinaria canadensis*), Yellow Mandarin (*Prosartes lanuginosa*), False Solomon's Seal (*Maianthemum racemosum* ssp. *racemosum*), Bearcorn (*Conopholis americana*), Beechdrops (*Epifagus virginiana*), Plantainleaf Sedge (*Carex plantaginea*), Mountain Golden-Alexanders (*Zizia trifoliata*), Wild Ginger (*Asarum acuminatum*), Lowland Bladder Fern (*Cystopteris protrusa*), Christmas Fern (*Polystichum acrostichoides*), Marginal Shield Fern (*Dryopteris marginalis*), Early Saxifrage (*Micranthes virginensis*), Walking Fern (*Asplenium rhizophyllum*), Hairy Sweet Cicely (*Osmorhiza claytonii*), and Puttyroot (*Aplectrum hyemale*). Small streams and seepage contain Lyon's Turtlehead (*Chelone lyonii*), Branch Lettuce (*Micranthes micranthidifolia*), and Eastern Rough Sedge (*Carex scabrata*). The display of Spring Ephemerals here is outstanding.

MANAGEMENT AND PROTECTION: This site enjoys protection under the auspices of the Conserving Carolina and NC DEQ as a dedicated nature preserve. Vehicular traffic along forested pathways is prohibited and has been largely eliminated due to the installation of large boulders at the entrance where parking is located. Several areas contain patches of invasive plant species such as Multiflora Rose (*Rosa multiflora*), English Ivy (*Hedera helix*), Periwinkle (*Vinca minor*), Wineberry (*Rubus phoenicolasius*), Princess Tree (*Paulownia tomentosa*), and Tree-of-heaven (*Ailanthus altissima*); efforts should be made to control and eliminate these species. Confining foot traffic to the existing, well-marked trails will help to eliminate trampling, particularly of Spring Ephemeral flora.

NATURAL COMMUNITIES: Rich Cove Forest (Foothills Rich Subtype).

RARE PLANTS: Bleeding Heart (*Dicentra eximia*), Blue Ridge Carrion-flower (*Smilax lasioneura*), Early Horse Gentian (*Triosteum aurantiacum* var. *aurantiacum*), Ginseng (*Panax quinquefolius*), Sweet White Trillium (*Trillium simile*), Whorled Horsebalm (*Collinsonia verticillata*), Watch List – Eastern Hemlock (*Tsuga canadensis*), Green Violet (*Hybanthus concolor*), Little Sweet Betsy Trillium (*Trillium cuneatum*).

RARE ANIMALS: Broad River Spiny Crayfish (*Cambarus spicatus*), Watch List – Diana Fritillary (*Speyeria diana*), Scarlet Kingsnake (*Lampropeltis elapsoides*).

COMMENTS: The very rarely seen saproxylic Hoverfly, *Callicera erratica* (Diptera: Syrphidae), has been observed at this site ovipositing in damp rot holes of American Beech (*Fagus grandifolia*). Several European congeners are considered to be threatened or endangered. The currently untracked Wild Ginger (*Asarum acuminatum*), exists here in good numbers. Although considered by Whittemore et al. (1997), to be a synonym of (*Asarum canadense*), this obviously

differing species appears to be a bit of a mystery in the region; its distribution in our area is discussed by Weakley (2015).

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Dicentra eximia by William S. Moye

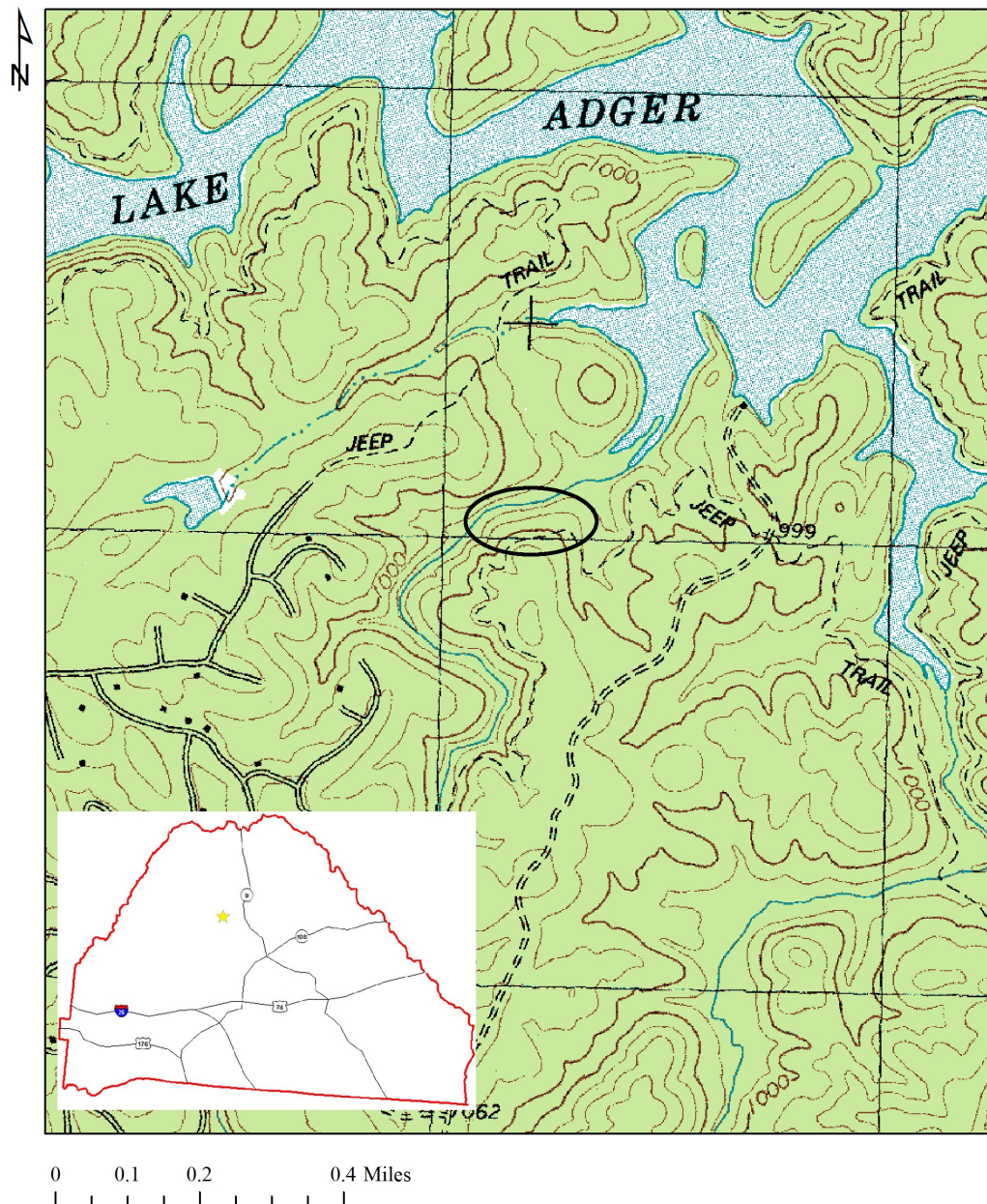
Polk County Natural Areas Inventory

Ostin Creek Alluvial Flats and Adjacent Slopes at Lake Adger

Mill Spring Quad

Significant Natural Heritage Area

Prepared by Pam Torlina - 10/2017



Polk County Natural Areas Inventory
Ostin Creek Alluvial Flats and Adjacent Slopes at
Lake Adger
Significant Natural Area

Site Significance: Regional

Size: 5 acres

Quadrangle: Mill Spring

Ownership: Private

SIGNIFICANT FEATURES: This site is significant for the presence of a good quality example of the Piedmont Alluvial Forest Type, with an interesting mixture of plant species that usually favor circumneutral soils, as well as some acidophilic species also. In addition, this site has a population of *Yucca* sp. allied to *Yucca filamentosa*, but differing from *Y. filamentosa* in several respects both morphologically and ecologically. Studies are ongoing to determine the taxonomic status of the Yuccas present along Ostin Creek, and other sites within Polk County and neighboring areas of the South Mountain region. Two rare plant species and two rare animal species have been recorded on this tract.

LANDSCAPE RELATIONSHIPS: This area along Ostin Creek drains into Lake Adger, immediately to the east.

SITE DESCRIPTION: A good quality example of the Piedmont Alluvial Forest Type occurs here along both banks and lower slopes of Ostin Creek. Tree species present that are typical of piedmont alluvial forests include: Sweetgum (*Liquidambar styraciflua*), Tulip Poplar (*Liriodendron tulipifera*), Sycamore (*Platanus occidentalis*), River Birch (*Betula nigra*), Green Ash (*Fraxinus pennsylvanica*), and Sugarberry (*Celtis laevigata*). Red Elm (*Ulmus rubra*) is also present slightly higher upslope, along with American Beech (*Fagus grandifolia*). The understory is composed of several species characteristic of base rich soils, such as Bladdernut (*Staphylea trifolia*), Spicebush (*Lindera benzoin*), and Moonseed (*Menispermum canadense*). Immediately adjacent to Ostin Creek are pockets of Rosebay Rhododendron (*Rhododendron maximum*), Yellowroot (*Xanthorhiza simplicissima*), and Mountain Doghobble (*Leucothoe fontanesiana*). Herbaceous diversity is moderate, and includes New York Fern (*Parathelypteris noveboracensis*), Virginia Snakeroot (*Endodeca serpentaria*), Showy Orchis (*Galearis spectabilis*), Southern Nodding Trillium (*Trillium rugelii*), Green Dragon (*Arisaema dracontium*), Jack-in-the-pulpit (*Arisaema triphyllum*), Appalachian Little Brown Jug (*Hexastylis arifolia* var. *ruthii*), Ebony Spleenwort (*Asplenium platyneuron*), and Yellow Fumitory (*Corydalis flavula*).

Upper slopes have fair quality examples of the Low Mountain Pine Forest (Montane Pine Subtype) dominated by Virginia Pine (*Pinus virginiana*) and Oaks tolerant of xeric conditions. Dryland

Blueberry (*Vaccinium pallidum*) and Black Huckleberry (*Gaylussacia baccata*) are common shrubs present in the understory. Trailing Arbutus (*Epigaea repens*), Partridge Berry (*Mitchella repens*), and Wintergreen (*Gaultheria procumbens*) are occasional. Appalachian Small Spreading Pogonia (*Cleistosiopsis bifaria*) occurs as scattered individuals in sunny glades and disturbed areas under powerlines. Yellow Fringed Orchid (*Platanthera ciliaris*) grows in a very small area of acidic seepage on west-facing slopes.

MANAGEMENT AND PROTECTION: This site is under management of the local home owners' association, which plans to keep it intact as a greenspace.

NATURAL COMMUNITIES: Piedmont Alluvial Forest, Low Mountain Pine Forest (Montane Pine Subtype).

RARE PLANTS: Appalachian Small Spreading Pogonia (*Cleistosiopsis bifaria*), Glade Milkvine (*Matelea decipiens*), Watch List – Southern Nodding Trillium (*Trillium rugelii*).

RARE ANIMALS: Carolina Foothills Crayfish (*Cambarus johnei*), Watch List – Scarlet Snake (*Cemophora coccinea*), Cobweb Skipper (*Hesperia metea*).

REFERENCES:

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Matelea decipiens by Willam S. Moye

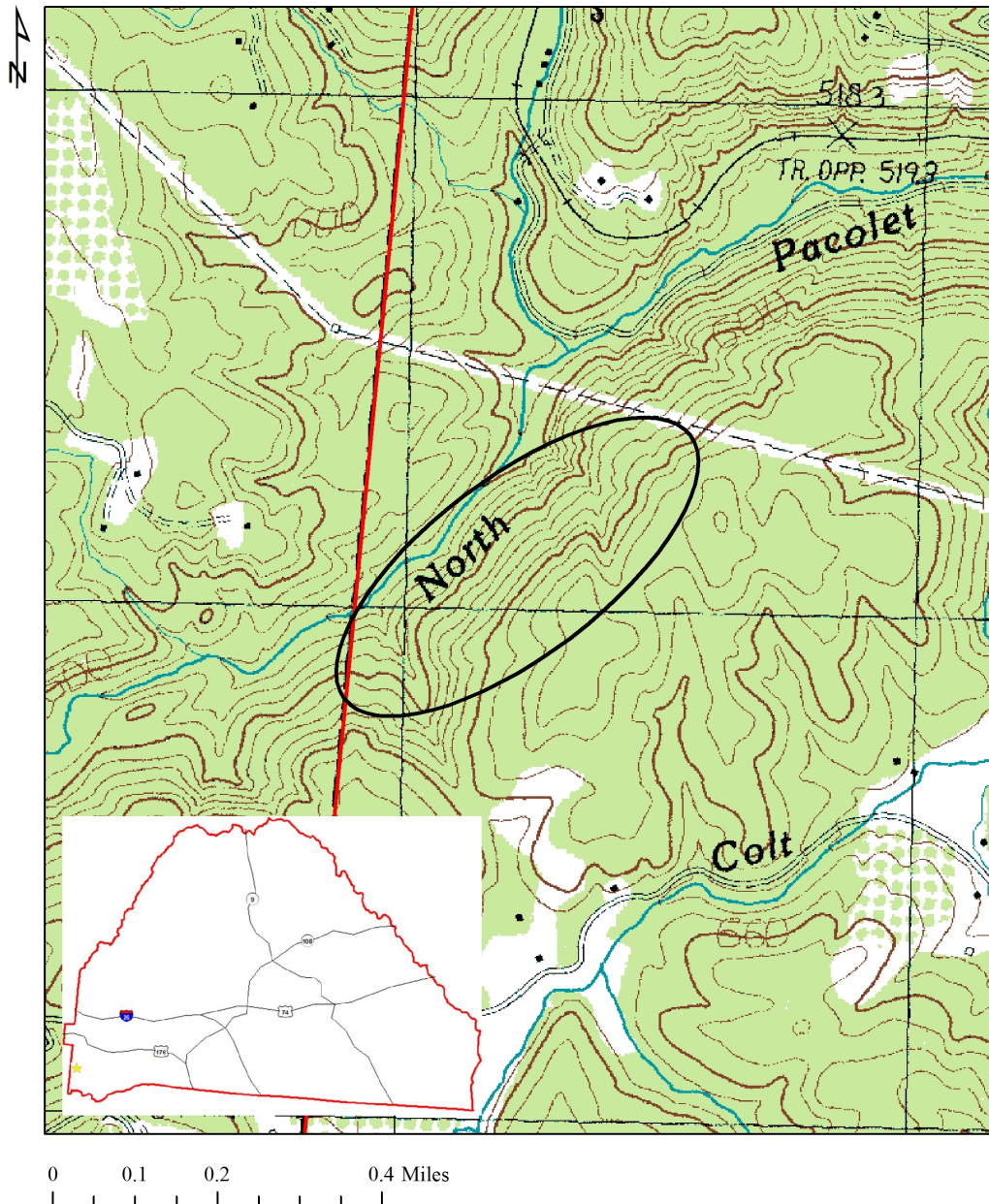
Polk County Natural Areas Inventory

Pacolet Falls Rare Plant Site

Saluda Quad

Significant Natural Heritage Area

Prepared by Pam Torlina - 4/2018



Polk County Natural Areas Inventory
Pacolet Falls Rare Plant Site
Significant Natural Area

Site Significance: Regional

Size: 45 acres

Quadrangle: Saluda

Ownership: Private

SIGNIFICANT FEATURES: This site is significant for the presence of North Carolina's only known extant population of Bent Trillium (*Trillium flexipes*). As well, this site contains ten other rare vascular plant species, and one rare animal species. The forest here is an excellent example of the Rich Cove Forest (Montane Rich Subtype) and has a very high degree of plant diversity.

LANDSCAPE RELATIONSHIPS: This site is located along the southern bank of the North Pacolet River, directly adjacent to Pacolet Falls, on the Henderson County line.

SITE DESCRIPTION: Rich Cove Forest community type situated on heavily forested, rich, north-east trending slopes adjacent to the North Pacolet River. Tree species are numerous and include: Yellow Buckeye (*Aesculus flava*), White Oak (*Quercus alba*), Northern Red Oak (*Quercus rubra*), Sugar Maple (*Acer saccharum*), American Beech (*Fagus grandifolia*), Bitternut Hickory (*Carya cordiformis*), White Basswood (*Tilia americana* var. *heterophylla*), Fraser Magnolia (*Magnolia fraseri*), Cucumber Magnolia (*Magnolia acuminata* var. *acuminata*), Red Elm (*Ulmus rubra*), and White Ash (*Fraxinus americana*). Shrub diversity is also high with Alternatleaf Dogwood (*Cornus alternifolia*), Beaked Hazelnut (*Corylus cornuta* var. *cornuta*), American Witch-hazel (*Hamamelis virginiana*), Sweetshrub (*Calycanthus floridus*), Pawpaw (*Asimina triloba*), American Strawberry Bush (*Euonymus americanus*), Spicebush (*Lindera benzoin* var. *benzoin*), Buffalo Nut (*Pyrularia pubera*), and Silverleaf Hydrangea (*Hydrangea radiata*). Common woody vines here are Moonseed (*Menispermum canadense*), Whiteleaf Greenbrier (*Smilax glauca*), Summer Grape (*Vitis aestivalis*), and Virginia Creeper (*Parthenocissus quinquefolia*). The herbaceous layer is outstanding, a sampling of which includes Eastern Columbine (*Aquilegia canadensis*), Showy Orchis (*Galearis spectabilis*), Jack-in-the-pulpit (*Arisaema triphyllum*), American Ginseng (*Panax quinquefolius*), Dwarf Ginseng (*Panax trifolius*), Tall White Violet (*Viola canadensis* var. *canadensis*), Horsebalm (*Collinsonia canadensis*), Little Sweet Betsy Trillium (*Trillium cuneatum*), Sweet White Trillium (*Trillium simile*), Bent Trillium (*Trillium flexipes*), Large-flowered Trillium (*Trillium grandiflorum*), Broad-leaved Waterleaf (*Hydrophyllum canadense*), Trout Lily (*Erythronium umbilicatum* ssp. *umbilicatum*), Blue Cohosh (*Caulophyllum thalictroides*), Black Cohosh (*Actaea racemosa*), Northern Maidenhair Fern (*Adiantum pedatum*), Wild Ginger (*Asarum canadense*), Intermediate Wood-fern (*Dryopteris intermedia*), Manhart's Sedge (*Carex manhartii*), and Speckled Wood-Lily (*Clintonia umbellata*). The display of Spring Ephemerals here is exceptional.

On a high bluff with exposed rock, there is a small but very distinctive inclusion of Acidic Cove Forest. The area is covered largely in Rosebay Rhododendron (*Rhododendron maximum*) with some Eastern Hemlock (*Tsuga canadensis*). Galax (*Galax urceolata*) is an abundant groundcover. At the edges of this area, Catesby's Trillium (*Trillium catesbaei*) and French Broad Heartleaf (*Hexastylis rhombiformis*) grow close to one another.

MANAGEMENT AND PROTECTION: This site is protected by conservation easement held by Conserving Carolina.

NATURAL COMMUNITIES: Rich Cove Forest (Montane Rich Subtype), Acidic Cove Forest (Typic Subtype).

RARE PLANTS: Bent Trillium (*Trillium flexipes*), Sweet White Trillium (*Trillium simile*), Mountain Bittercress (*Cardamine clematitis*), French Broad Heartleaf (*Hexastylis rhombiformis*), American Bittersweet (*Celastrus scandens*), Rock Muhly (*Muhlenbergia sobolifera*), Watch List – American Ginseng (*Panax quinquefolius*), Dwarf Ginseng (*Panax trifolius*), Manhart's Sedge (*Carex manhartii*), Little Sweet Betsy Trillium (*Trillium cuneatum*), Green Violet (*Hybanthus concolor*).

RARE ANIMALS: Watch List – Appalachian Azure (*Celastrina neglectamajor*).

REFERENCES:

Campbell, D. 2016. Site Survey Report: Pacolet Falls Rare Plant Site. Pacolet Area Conservancy, Tryon, N.C.

Ratcliffe, J. et al. 2016. Natural Heritage Program List of Rare Animal Species of North Carolina. North Carolina Natural Heritage Program N.C. Department of Natural and Cultural Resources Raleigh, N.C. 27699-1651.

Schafale, M. 2012. Guide to the Natural Communities of North Carolina (Fourth Approximation). North Carolina Natural Heritage Program, Department of Environment and Natural Resources, Raleigh, N.C.



Trillium flexipes by David Campbell

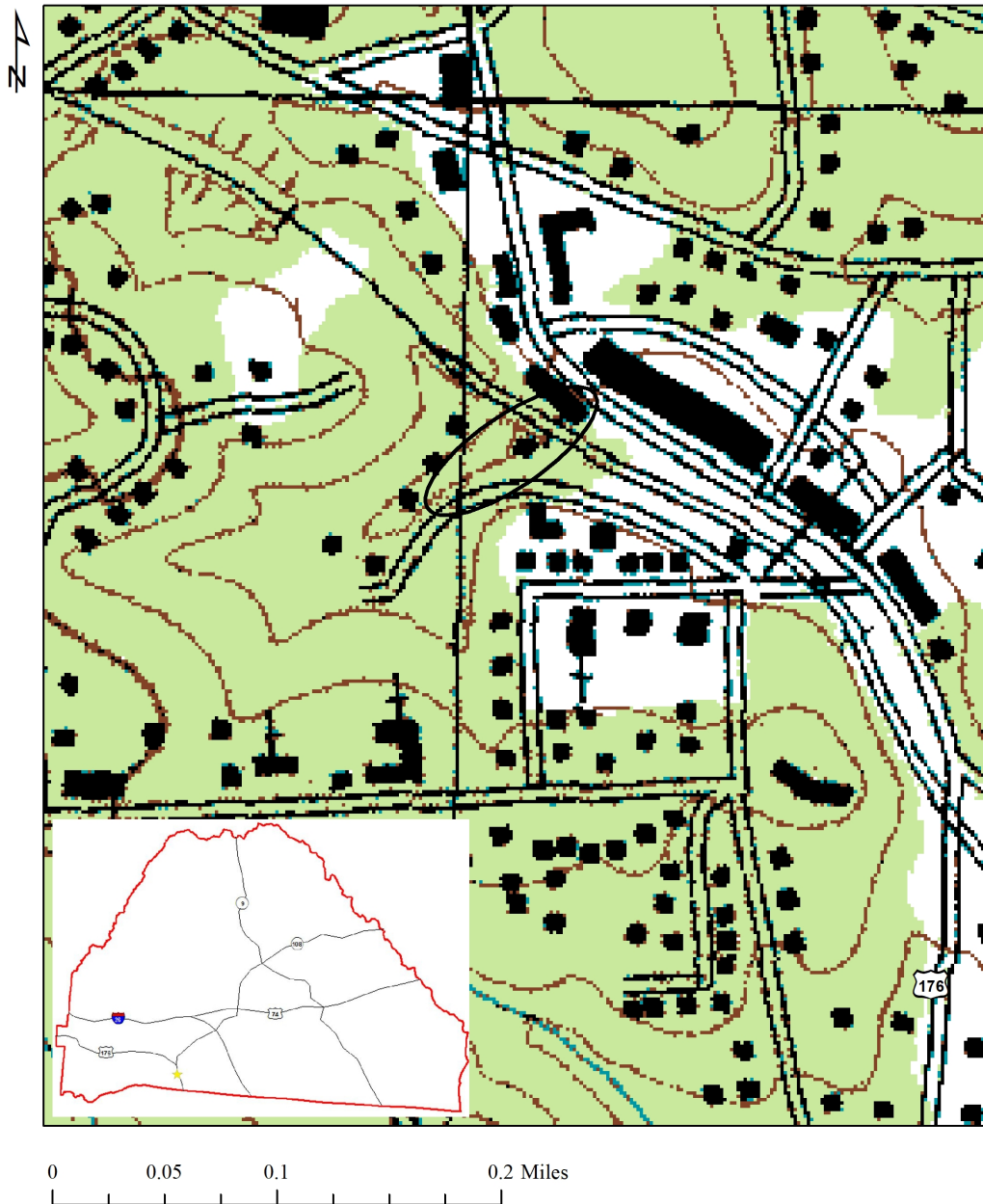
Polk County Natural Areas Inventory

Pale Purple Coneflower Site, Tryon

Landrum Quad

Significant Natural Heritage Area

Prepared by Pam Torlina - 4/2018



Polk County Natural Areas Inventory
Pale Purple Coneflower Site, Tryon
Significant Natural Area

Site Significance: State

Size: 1 acre

Quadrangle: Landrum

Ownership: Private

SIGNIFICANT FEATURES: This site derives its significance from the presence of a population of Pale Purple Coneflower (*Echinacea pallida*), a very rare species within North Carolina that is disjunct from its main range to the west of the Blue Ridge.

LANDSCAPE RELATIONSHIPS: Railway tracks and adjacent embankments within the city limits of Tryon.

SITE DESCRIPTION: Although much of this area is disturbed, with high numbers of invasive plant species, including Kudzu (*Pueraria montana* var. *lobata*), there are also small remnants of native vegetation with prairie affinities. Of note are Big Bluestem Grass (*Andropogon gerardii*), Little Bluestem Grass (*Schizachyrium scoparium* var. *scoparium*), and Indian Grass (*Sorghastrum nutans*).

MANAGEMENT AND PROTECTION: This site currently enjoys no formal protection. Future removal of invasive plant species here should be accomplished using mechanical means, instead of herbicides, in order to protect native vascular plants.

NATURAL COMMUNITIES: This site, in its current configuration, does not correspond to any known natural community type. However, given the geology, soil type, and remnant flora present, the original habitat here was likely some form of mafic glade.

RARE PLANTS: Pale Purple Coneflower (*Echinacea pallida*).

RARE ANIMALS: None seen.

COMMENTS: Despite its occurrence within the city limits of Tryon along railway tracks, this site has been included in this county inventory due to the remnant ‘prairie’ flora present and the proximity of verified natural populations of *E. pallida* in adjacent Rutherford County, as well as the historical collection of voucher specimens from nearby McDowell County (1950s and earlier). In addition, *E. pallida* is not a species that appears to readily escape cultivation and has fairly specific soil requirements. This population is close to Peattie’s historical collection sites for *Castilleja coccinea* and *Buchnera americana* (approximately one mile), both of which may be said to occur in prairie-like conditions that are favored by Pale Purple Coneflower. Railway rights-of-way are also well documented as refugia for remnant prairie and meadow flora.

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- Weakley, A. S. 2015. Flora of the Southern and Mid-Atlantic States Working Draft of 21 May 2015, University of North Carolina at Chapel Hill.



Echinacea pallida by David Campbell

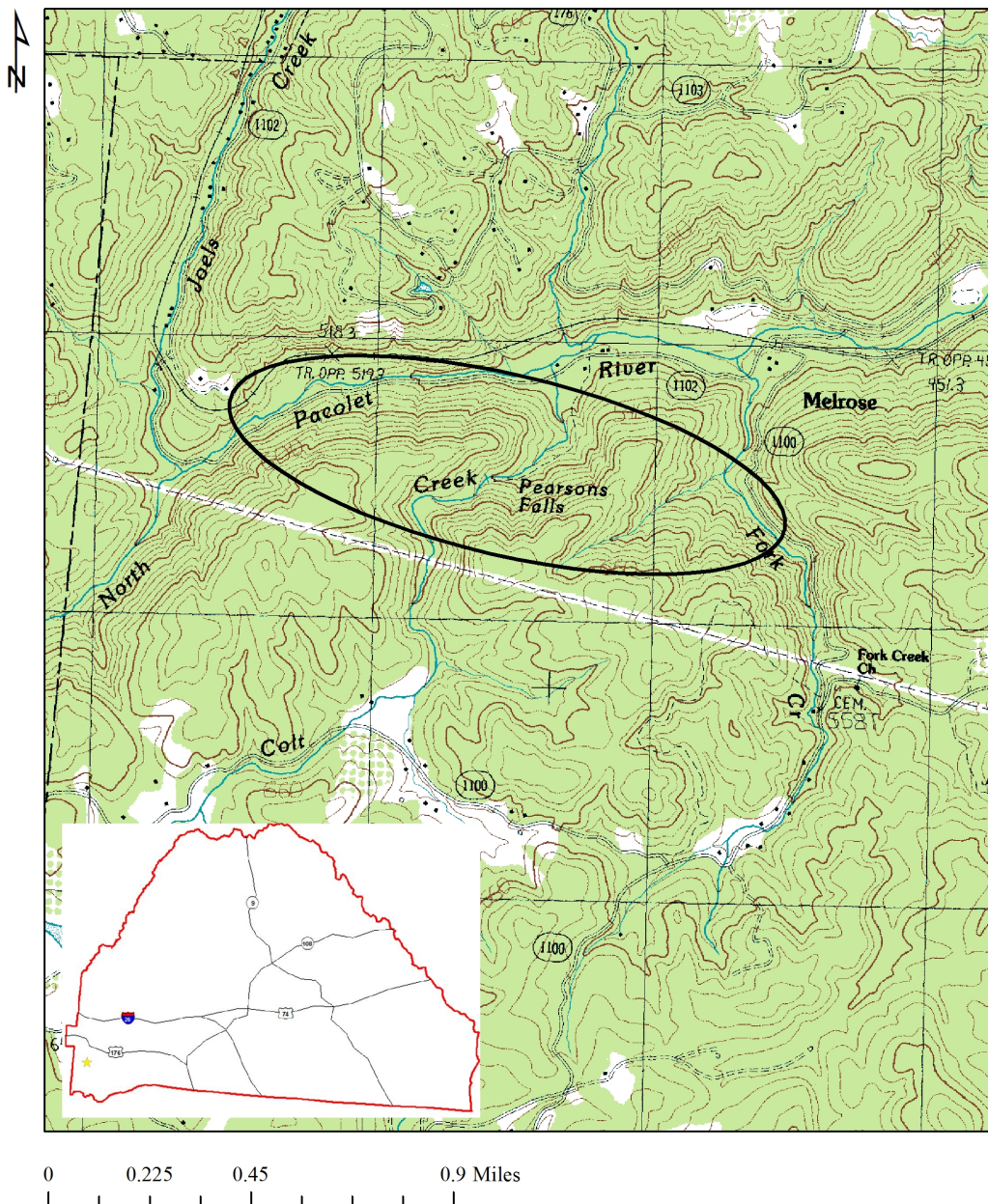
Polk County Natural Areas Inventory

Pearson's Falls Glen

Saluda Quad

Significant Natural Heritage Area

Prepared by Pam Torlina - 4/2018



Polk County Natural Areas Inventory

Pearson's Falls Glen

Significant Natural Area

Site Significance: State

Size: 250 acres

Quadrangle: Saluda

Ownership: Private

SIGNIFICANT FEATURES: This site is significant due to the high-quality Rich Cove Forest that is fully protected, containing several rare and Watch List vascular plant species. The occurrence here of Wild Ginger (*Asarum acuminatum*) marks this as one of the handful of sites thus far verified in North Carolina for this enigmatic (and as yet untracked) species. The display of Spring Ephemeral flora here is very noteworthy.

LANDSCAPE RELATIONSHIPS: South and southeast of the North Pacolet River, south of SR-1102 and west of SR-1100.

SITE DESCRIPTION: The predominant community type here consists of Rich Cove Forest (Foothills Rich Subtype). Tree species present are numerous, and include Tulip Poplar (*Liriodendron tulipifera*), White Ash (*Fraxinus americana*), White Basswood (*Tilia americana* var. *heterophylla*), White Oak (*Quercus alba*), Northern Red Oak (*Quercus rubra*), Yellow Buckeye (*Aesculus flava*), Sweet Birch (*Bethula lenta*), American Beech (*Fagus grandifolia*), Sugar Maple (*Acer saccharum*), American Hop-hornbeam (*Ostrya virginiana*), Cucumber Magnolia (*Magnolia acuminata* var. *acuminata*), Fraser Magnolia (*Magnolia fraseri*), Ironwood (*Carpinus caroliniana*), Red Elm (*Ulmus rubra*), and Red Mulberry (*Morus rubra*). The shrub layer includes Spicebush (*Lindera benzoin*), Snowy Hydrangea (*Hydrangea radiata*), Pawpaw (*Asimina triloba*), Carolina Silver Bell (*Halesia tetraptera*), Strawberry-bush (*Euonymus americanus*), American Witch-hazel (*Hamamelis virginiana* var. *virginiana*), and Georgia Holly (*Ilex longipes*). Woody vines present are Virginia Creeper (*Parthenocissus quinquefolia*), Common Greenbrier (*Smilax rotundifolia*), Saw Greenbrier (*Smilax bona-nox*), and Poison Ivy (*Toxicodendron radicans*). The herb layer here is outstanding and very diverse, with large numbers of Spring Ephemeral species. Herbaceous species present include Dutchman's Breeches (*Dicentra cucullaria*), Fernleaf Phacelia (*Phacelia bipinnatifida*), Little Sweet Betsy Trillium (*Trillium cuneatum*), Sweet White Trillium (*Trillium simile*), Bluntleaf Waterleaf (*Hydrophyllum caandense*), Green Violet (*Hybanthus concolor*), Blue Cohosh (*Caulophyllum thalictroides*), American Ginseng (*Panax quinquefolius*), Black Cohosh (*Actaea racemosa*), Broadleaf Coreopsis (*Coreopsis latifolia*), Spring Beauty (*Claytonia virginica*), Trout Lily (*Erythronium umbilicatum*), Bloodroot (*Sanguinaria canadensis*), Eastern Columbine (*Aquilegia canadensis*), Yellow Mandarin (*Prosartes lanuginosa*), False Solomon's Seal (*Maianthemum racemosum* ssp. *racemosum*), Solomon's Seal

(*Polygonatum biflorum*), Wild Ginger (*Asarum acuminatum*), Hairy Sweet Cicely (*Osmorhiza claytonii*), Early Saxifrage (*Micranthes virginensis*), Christmas Fern (*Polystichum acrostichoides*), Marginal Shield Fern (*Dryopteris marginalis*), Lowland Bladder Fern (*Cystopteris protrusa*), Walking Fern (*Asplenium rhizophyllum*), and Northern Maidenhair Fern (*Adiantum pedatum*). Small inclusions of rock ledges with seepage also contain characteristic species such as Carolina Tassel-rue (*Trautvetteria caroliniensis* var. *caroliniensis*), Mountain Meadow-rue (*Thalictrum clavatum*), and Golden Saxifrage (*Chrysosplenium americanum*).

MANAGEMENT AND PROTECTION: Owned and managed by the Tryon Garden Club.

NATURAL COMMUNITIES: Rich Cove Forest (Foothills Rich Subtype).

RARE PLANTS: Broadleaf Coreopsis (*Coreopsis latifolia*), Georgia Holly (*Ilex longipes*), Sweet White Trillium (*Trillium simile*), Watch List – Golden Saxifrage (*Chrysosplenium americanum*), American Ginseng (*Panax quinquefolius*), Little Sweet Betsy Trillium (*Trillium cuneatum*), Three Birds Orchid (*Triphora trianthophoros* var. *trianthophoros*).

RARE ANIMALS: None Noted.

COMMENTS: Pearson's Falls has been an area of botanical interest for well over a century, enjoying wide renown for its natural beauty and spectacular displays of Spring flora.

REFERENCES:

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- Ratcliffe, J. et. al. 2016. Natural Heritage Program List of Rare Animal Species of North Carolina. North Carolina Natural Heritage Program N.C. Department of Natural and Cultural Resources Raleigh, N.C. 27699-1651.

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Stupka, A. 1972. Evaluation of Pearson's Falls Glen, Polk County, N.C. for eligibility for registered National Natural Landmark designation. National Park Service, U.S. Dept. of the Interior, Washington.



Trillium simile by David Campbell

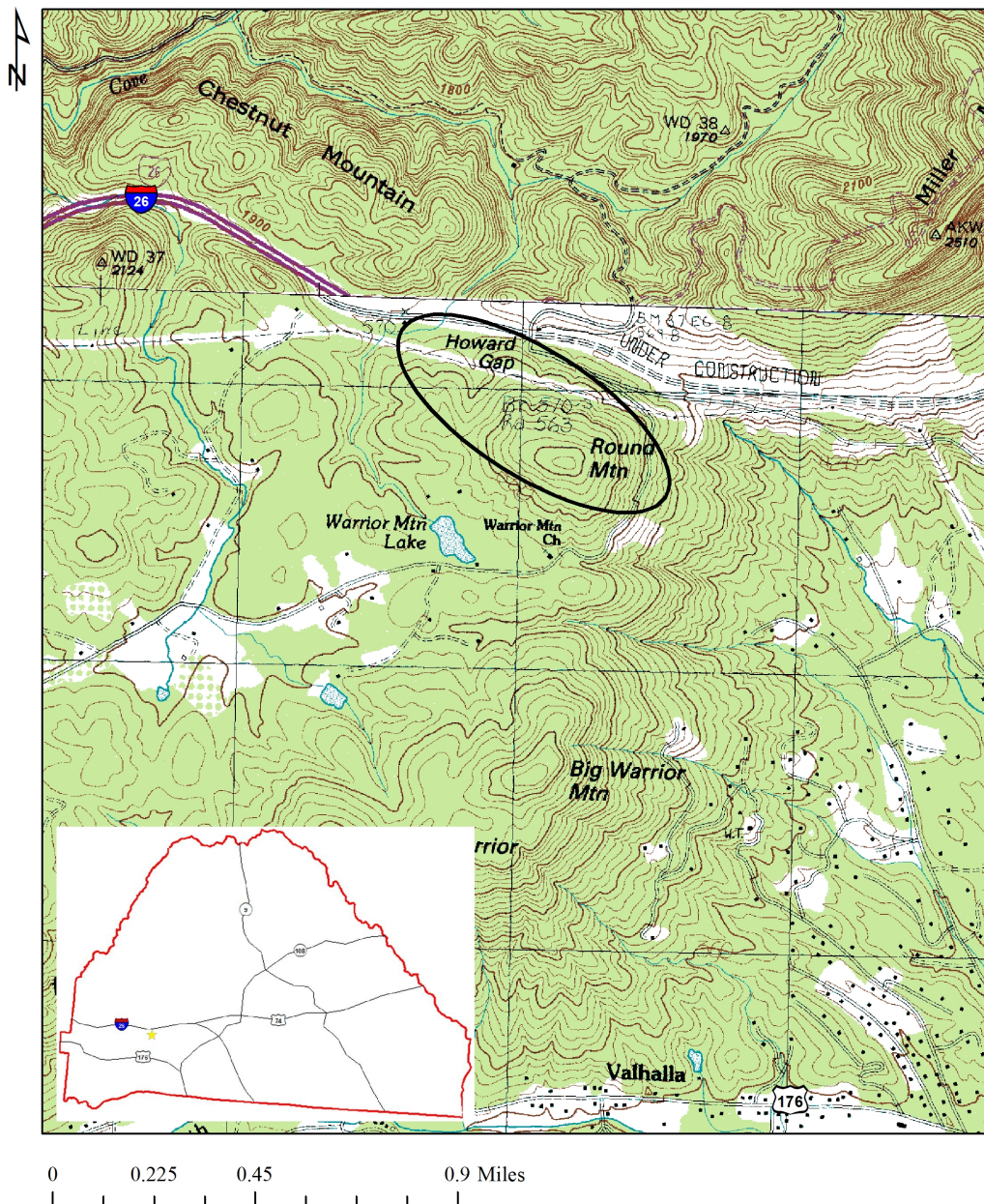
Polk County Natural Areas Inventory

Round Mountain

Saluda Quad

Significant Natural Heritage Area

Prepared by Pam Torlina - 10/2017



Polk County Natural Areas Inventory

Round Mountain

Significant Natural Area

Site Significance: State

Size: 55 acres

Quadrangle: Saluda

Ownership: Saluda
Community
Land Trust

SIGNIFICANT FEATURES: A high quality example of the Rich Cove Forest (Montane Intermediate Subtype) occurs here. This current investigation revealed that this site also harbors North Carolina's only known population of Thicket Creeper (*Parthenocissus inserta*), disjunct several hundred miles from the nearest populations in Virginia, making this the southernmost known occurrence of Thicket Creeper in eastern North America. This site is also significant due to the presence of eleven rare plant species and two rare animal species.

LANDSCAPE RELATIONSHIPS: North east of Saluda, Just south of Highway NC-74, adjacent to Warrior Mountain Lake, on Howard Gap Road.

SITE DESCRIPTION: A very fine example of the Rich Cove Forest (Montane Intermediate Subtype) community, with steep slopes and a canopy consisting of White Oak (*Quercus alba*), Northern Red Oak (*Quercus rubra*), Tulip Poplar (*Liriodendron tulipifera*), White Basswood (*Tilia americana* var. *heterophylla*), Red Elm (*Ulmus rubra*), Mockernut Hickory (*Carya tomentosa*), Bitternut Hickory (*Carya cordiformis*), Sweet Birch (*Betula lenta*), Cucumber Magnolia (*Magnolia acuminata*), and White Ash (*Fraxinus americana*). The understory includes large amounts of Spicebush (*Lindera benzoin*), Sweetshrub (*Calycanthus floridus*), Snowy Hydrangea (*Hydrangea radiata*), Alternate-leaf Dogwood (*Cornus alternifolia*), Carolina Silver Bell (*Halesia tetraptera*), and Hairy Mock-orange (*Philadelphus hirsutus*). Woody vines that are unusual here are Midwestern Carrionflower (*Smilax lasioneura*) and Thicket Creeper (*Parthenocissus inserta*). As would be expected given the richness of this site, herbaceous diversity is quite high with Pennywort (*Obolaria virginica*), Green Violet (*Hybanthus concolor*), Little Sweet Betsy Trillium (*Trillium cuneatum*), Broadleaf Coreopsis (*Coreopsis latifolia*), Yellow Mandarin (*Prosartes lanuginosa*), Lowland Bladder Fern (*Cystopteris protrusa*), Spring Beauty (*Claytonia virginica*), Appalachian False Goatsbeard (*Astilbe biternata*), Showy Orchis (*Galearis spectabilis*), Northern Maidenhair Fern (*Adiantum pedatum*), Tuberous Horsebalm (*Collinsonia tuberosa*), Common Jack-in-the-pulpit (*Arisaema triphyllum* ssp. *triphyllum*), Common Shorthusk (*Brachyelytrum erectum*), American Ginseng (*Panax quinquefolius*), False Sunflower (*Heliopsis helianthoides* var. *helianthoides*), Puttyroot (*Aplectrum hyemale*), Late

Black Cohosh (*Actaea podocarpa*), Broad Beech Fern (*Phegopteris hexagonoptera*), Eastern Goatsbeard (*Aruncus dioicus* var. *dioicus*). Maximum elevation here is 2,418 feet.

MANAGEMENT AND PROTECTION: This site is owned and protected by Saluda Community Land Trust.

NATURAL COMMUNITIES: Rich Cove Forest (Montane Intermediate Subtype).

RARE PLANTS: Wister's Coralroot (*Corallorhiza wisteriana*), Walter's Wingstem (*Verbesina walteri*), Thicket Creeper (*Parthenocissus inserta*), Tuberous Horsebalm (*Collinsonia tuberosa*), Midwestern Carrionflower (*Smilax lasioneura*), Watch List – Hairy Mock-orange (*Philadelphus hirsutus*), American Ginseng (*Panax quinquefolius*), Green Violet (*Hybanthus concolor*), Showy Skullcap (*Scutellaria serrata*), Broadleaf Coreopsis (*Coreopsis latifolia*), Little Sweet Betsy Trillium (*Trillium cuneatum*).

RARE ANIMALS: Cerulean Warbler (*Setophaga cerulea*), Dusky Azure (*Celastrina nigra*), Watch List – Diana Fritillary (*Speyeria diana*).

REFERENCES:

Campbell, D. 2015. Site Survey Report: Round Mountain. Pacolet Area Conservancy, Tryon, N.C.

Ratcliffe, J. et al. 2016. Natural Heritage Program List of Rare Animal Species of North Carolina. North Carolina Natural Heritage Program N.C. Department of Natural and Cultural Resources Raleigh, N.C. 27699-1651.

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Parthenocissus inserta by David Campbell

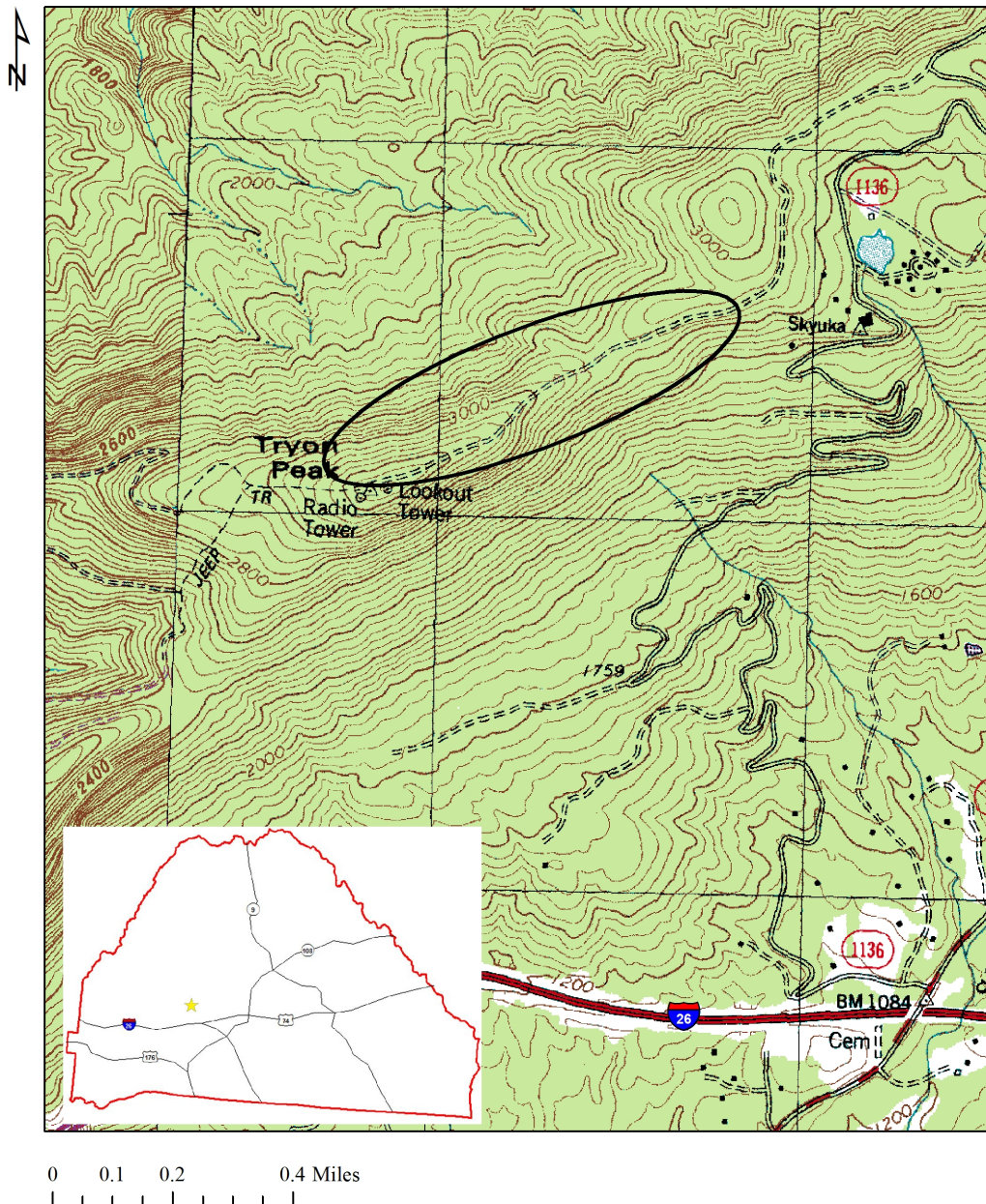
Polk County Natural Areas Inventory

Saddle East of Tryon Peak

Mill Spring Quad

Significant Natural Heritage Area

Prepared by Pam Torlina - 10/2017



Polk County Natural Areas Inventory

Saddle East of Tryon Peak

Significant Natural Area

Site Significance: State

Size: 37 acres

Quadrangle: Mill Spring

Ownership: Private

SIGNIFICANT FEATURES: This site is significant for the presence of the state's only known population of Ozark Bunchflower (*Melanthium woodii*), a species which, as its name suggests is disjunct from the heart of its range to the west of the Blue Ridge Mountains. In addition, this site contains an excellent and mature example of the Montane Oak-Hickory Forest (Basic Subtype), as well as five species of rare vascular plants.

LANDSCAPE RELATIONSHIPS: East and north-east facing slopes approximately five hundred feet below Tryon peak itself.

SITE DESCRIPTION: Rich-mesic, steep, ridgetop forest with characteristics consistent with that of a Basic Oak-Hickory Forest community. The canopy here is closed, with some very large and mature trees present. Several small mafic rock outcrops are scattered just below the ridge itself. Small areas of seepage are found in several areas, where Interrupted Fern (*Osmunda claytoniana* var. *claytoniana*) may be encountered. Dominant tree species include Northern Red Oak (*Quercus rubra*), Chestnut Oak (*Quercus montana*), White Oak (*Quercus alba*), White Basswood (*Tilia americana* var. *heterophylla*), Mockernut Hickory (*Carya tomentosa*), Red Elm (*Ulmus rubra*), American Beech (*Fagus grandifolia*), and Yellow Buckeye (*Aesculus flava*). Woody species of the understory are numerous, such as Maple-leaf Viburnum (*Viburnum acerifolium*), Sweet Shrub (*Calycanthus floridus*), Pawpaw (*Asimina triloba*), Appalachian Mock-orange (*Philadelphus inodorus*), Spicebush (*Lindera benzoin*), and American Witch-hazel (*Hamamelis virginiana* var. *virginiana*). Woody vines here are relatively sparse but do include the rare Midwestern Carrionflower (*Smilax lasioneura*). The herbaceous layer is diverse, containing Catesby's Trillium (*Trillium catesbaei*), Bloodroot (*Sanguinaria canadensis*), Yellow Mandarin (*Prosartes lanuginosa*), Maidenhair Fern (*Adiantum pedatum*), Marginal Wood-fern (*Dryopteris marginalis*), Christmas Fern (*Polystichum acrostichoides*), Closed Gentian (*Gentiana clausa*), Interrupted Fern (*Osmunda claytoniana* var. *claytoniana*), Indian Cucumber-root (*Medeola virginiana*), Pink Turtlehead (*Chelone lyonii*), Pennywort (*Obolaria virginica*), Wake-robin (*Trillium erectum*), and Bearcorn (*Conopholis americana*). A small population of Large Yellow Lady's-slipper (*Cypripedium parviflorum* var. *pubescens*) makes an appearance on rich slopes just below the ridgetop. Most significantly, North Carolina's only known population of Ozark Bunchflower (*Melanthium woodii*) flourishes here, numbering approximately 40 individuals. Flowering is sporadic with distinctive, dark maroon colored flowers being borne on racemes, typically in July.

MANAGEMENT AND PROTECTION: This site is protected by conservation easement held by Conserving Carolina.

NATURAL COMMUNITIES: Montane Oak-Hickory Forest (Basic Subtype).

RARE PLANTS: Ozark Bunchflower (*Melanthium woodii*), Midwestern Carrionflower (*Smilax lasioneura*), Watch List – Appalachian Mock-orange (*Philadelphus inodorus*), Large Yellow Lady's Slipper (*Cypripedium parviflorum* var. *pubescens*), Closed Gentian (*Gentiana clausa*).

RARE ANIMALS: Watch List – Diana Fritillary (*Speyeria diana*).

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Melanthium woodii by David Campbell

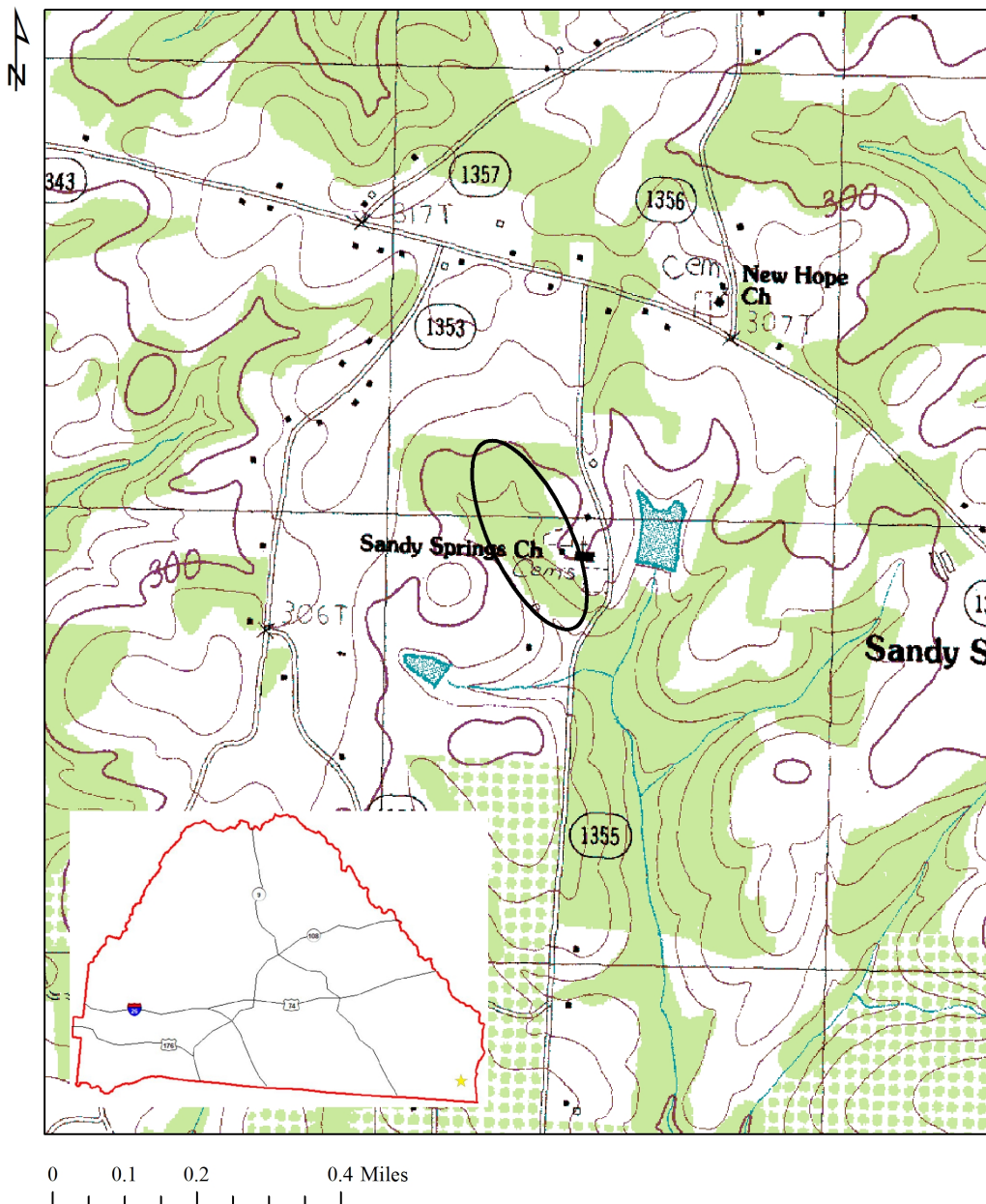
Polk County Natural Areas Inventory

Sandy Springs Church Low Elevation Seep

Fingerville East Quad

Significant Natural Heritage Area

Prepared by Pam Torlina - 4/2018



Polk County Natural Areas Inventory
Sandy Springs Church Low Elevation Seep
Significant Natural Area

Site Significance: State

Size: 15 acres

Quadrangle: Fingerville East

Ownership: Private

SIGNIFICANT FEATURES: A population of the Federally Threatened Dwarf-flowered Heartleaf (*Hexastylis naniflora*) occurs here, as well as two Regionally Rare Watch List vascular plant species. As stated by Rayner (1994), this site comprises the largest community of its type currently known in Polk County. This site also derives significance as a non-alluvial wetland with a distinctive flora with Coastal Plain affinities; all such communities are rare in this region and deserve recognition and protection.

LANDSCAPE RELATIONSHIPS: Southeastern Polk County; approximately one mile W 10 N from Sandy Springs, at the junction of SR-1343 and SR-1101, as per Rayner (1994).

SITE DESCRIPTION: Canopy dominants are Red Maple (*Acer rubrum* var. *trilobum*), Green Ash (*Acer pennsylvanica*), Tulip Poplar (*Liriodendron tulipifera*), Sweetgum (*Liquidambar styraciflua*), Swamp Tupelo (*Nyssa biflora*), and American Holly (*Ilex opaca*). Shrubs present include Possumhaw Viburnum (*Viburnum nudum*), Virginia Sweetspire (*Itea virginica*), Tag Alder (*Alnus serrulata*), Poison Sumac (*Toxicodendron vernix*), Red Chokeberry (*Photinia pyrifolia*), and Swamp Azalea (*Rhododendron viscosum*). Numerous vines are present, with Laurel Greenbrier (*Smilax laurifolia*), regionally unusual Coral Greenbrier (*Smilax walteri*), Common Greenbrier (*Smilax rotundifolia*), Grape (*Vitis* spp.), Virginia Creeper (*Parthenocissus quinquefolia*), and Trumpet Creeper (*Campsis radicans*). The herbaceous diversity is moderate with Notted Chain Fern (*Lorinseria areolata*), Cinnamon Fern (*Osmundastrum cinnamomeum*), American Royal Fern (*Osmunda spectabilis*), Appalachian Quillwort (*Isoetes appalachiana*), Soapwort Gentian (*Gentiana Saponaria*), Dwarf-flowered Heartleaf (*Hexastylis naniflora*), White Edge Sedge (*Carex debilis*), Shallow Sedge (*Carex lurida*), Leathery Rush (*Juncus coriaceus*), Small Green Wood Orchid (*Platanthera clavellata*), False Nettle (*Boehmeria cylindrica*), Virginia Bugleweed (*Lycopus virginicus*), and Hairy Umbrella Sedge (*Fuirena squarrosa*). Hummocks with *Sphagnum* spp. common here also.

MANAGEMENT AND PROTECTION: This site currently has no protection. Weedy invasive species such as English Ivy (*Hedera helix*) and Chinese Privet (*Ligustrum sinense*) are encroaching along and within the edges of this site and should be removed if possible.

NATURAL COMMUNITIES: Low Elevation Seep (Piedmont/Mountain Springhead Subtype).

RARE PLANTS: Dwarf-flowered Heartleaf (*Hexastylis naniflora*), Watch List – Laurel Greenbrier (*Smilax laurifolia*), Regionally Rare – Poison Sumac (*Toxicodendron vernix*).

RARE ANIMALS: None Noted.

COMMENTS: The floristics of this site bear a striking degree of resemblance to the other low elevation seeps that are clustered in this part of Polk County. In his report, Rayner (1994) characterized these communities as possibly being unique and bearing a resemblance to the Piedmont Seepage Forest of South Carolina, as described by Nelson (1986). Subsequent work by Seymour (2011) and Schafale (2012) has resulted in this type of rare plant community being designated as Low Elevation Seep (Piedmont/Mountain Springhead Subtype).

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Smilax laurifolia by William S. Moye

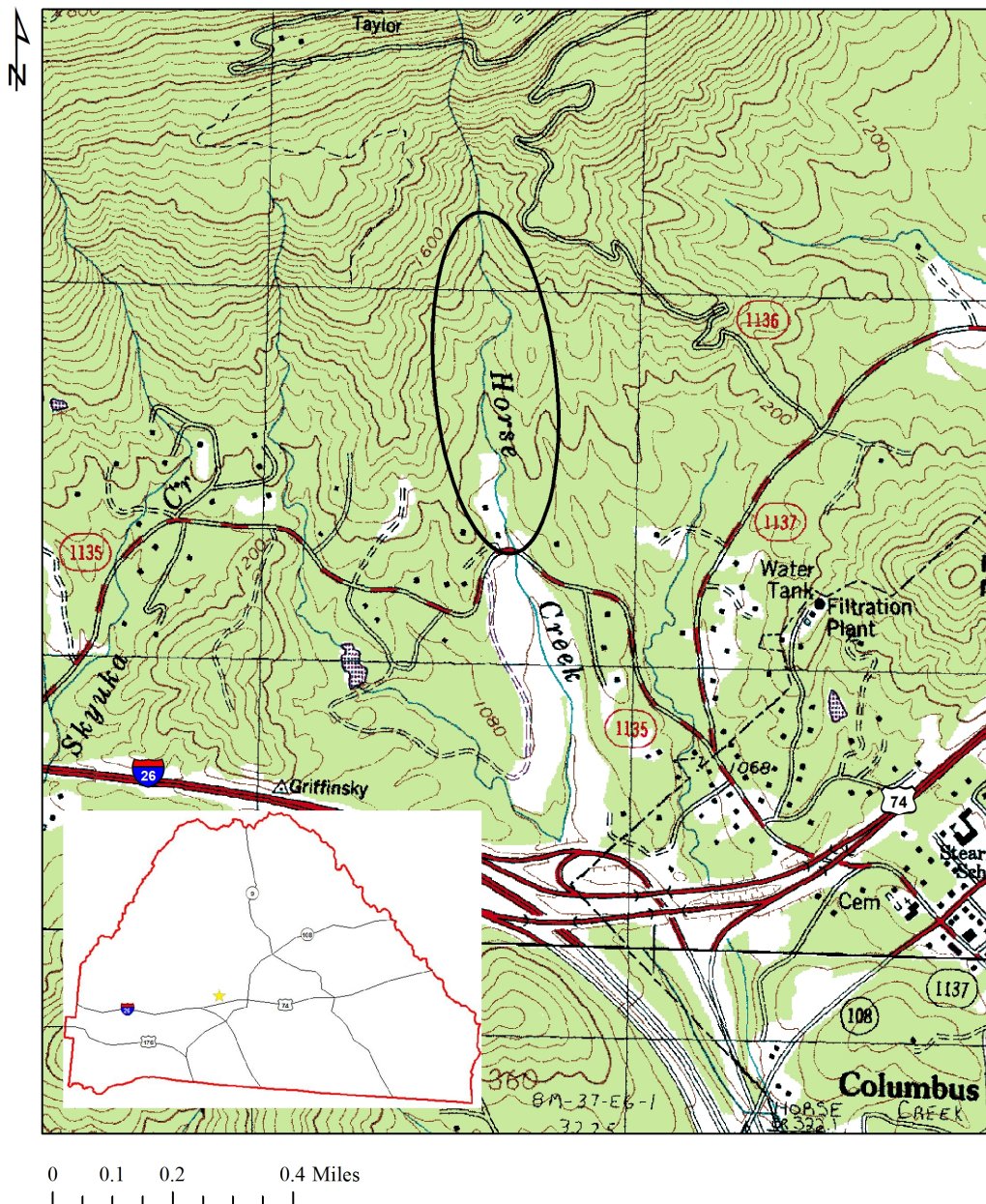
Polk County Natural Areas Inventory

Shunkawauken Falls Area

Mill Spring Quad

Significant Natural Heritage Area

Prepared by Pam Torlina - 10/2017



Polk County Natural Areas Inventory

Shunkawauken Falls Area

Significant Natural Area

Site Significance: Regional

Size: 55 acres

Quadrangle: Mill Spring

Ownership: Private

SIGNIFICANT FEATURES: This site derives its significance from the large numbers of rare plant species present, as well as high quality examples of three community types: Montane Cliff (Mafic Subtype), Eastern Hemlock Forest (Typic Subtype), and Spray Cliff.

LANDSCAPE RELATIONSHIPS: Shunkawauken Falls (and associated Horse Creek) occurs on southwest-facing upper slopes of White Oak Mountain, along SR-1136, approximately 2 miles north of Columbus.

SITE DESCRIPTION: Areas around and above the falls generally conform to the description of the Montane Cliff (Mafic Subtype) community, with White Oak (*Quercus alba*), Chestnut Oak (*Quercus montana*), Mockernut Hickory (*Carya tomentosa*), Eastern Red Cedar (*Juniperus virginiana*), White Ash (*Fraxinus americana*), and Northern Hackberry (*Celtis occidentalis*) comprising most of the semi-open canopy. Interesting shrubs here include Appalachian Mock-orange (*Philadelphus inodorus*), Wafer Ash (*Ptelea trifoliata*), and Fragrant Sumac (*Rhus aromatica*). Poison Ivy (*Toxicodendron radicans*) and Virginia Creeper (*Parthenocissus quinquefolius*) are common vines. Herbaceous species diversity is moderate, species of note are Mountain Oatgrass (*Danthonia compressa*), Nettleleaf Noseburn (*Tragia urticifolia*), Veiny Hawkweed (*Hieracium venosum*), and Whorled Milkweed (*Asclepias verticillata*).

The falls themselves provide an impressive display, with constant water flow saturating the vertical rock surfaces giving rise to a Spray Cliff community. Woody species are few but do include Tag Alder (*Alnus serrulata*). Soil pockets adjacent to the cliff face support a population of Biltmore Sedge (*Carex biltmoreana*). Other herbaceous species that occur in the immediate vicinity of the falls are Mountain Meadow-rue (*Thalictrum clavatum*), Carolina Tassel-rue (*Trautvetteria caroliniensis* var. *caroliniensis*), Golden Saxifrage (*Chrysosplenium americanum*), and Bigleaf Grass-of-Parnassus (*Parnassia grandifolia*). Perennially wet rock surfaces are covered with many bryophytes, such as *Plagiochila* spp.

Horse Creek descends many hundreds of feet, through a narrow steep-sided ravine, in what was formerly a fair quality Eastern Hemlock Forest, but now almost all of the Hemlocks are dead as a result of damage caused by Hemlock Woolly Adelgid (*Adelges tsugea*). The loss of the Hemlocks from the canopy has resulted in a drier and warmer microclimate in several areas of the ravine, which will no doubt change the composition of this plant community over time; possibly favoring

the colonization by invasives from the roadway above. However, many rare plant species are still to be found along the rich forested slopes, including Carolina Buckthorn (*Frangula caroliniana*) and Bog Chickweed (*Stellaria alsine*). Some parts of this ravine are dangerous to traverse and are essentially unreachable due to the topography.

MANAGEMENT AND PROTECTION: This site currently has no formal protection. However, the nature of the topography (i.e. steepness of slopes and inaccessibility of most of the area) should ensure its continued preservation. If possible, efforts should be made to control the spread of Japanese Honeysuckle (*Lonicera japonica*) at this site.

NATURAL COMMUNITIES: Montane Cliff (Mafic Subtype), Eastern Hemlock Forest (Typic Subtype), Spray Cliff.

RARE PLANTS: Bigleaf Grass-of-Parnassus (*Parnassia grandifolia*), Early Horse Gentian (*Triosteum aurantiacum* var. *aurantiacum*), Whorled Horsebalm (*Collinsonia verticillata*), Watch List – Biltmore Sedge (*Carex biltmoreana*), American Ginseng (*Panax quinquefolius*), Green Violet (*Hybanthus concolor*), Cave Alumroot (*Heuchera parviflora* var. *parviflora*), Golden Saxifrage (*Chrysosplenium americanum*), Bulblet Bladder Fern (*Cystopteris bulbifera*), Appalachian Mock-orange (*Philadelphus inodorus*), Wafer Ash (*Ptelea trifoliata*), Large Yellow Lady's Slipper (*Cypripedium parviflorum* var. *pubescens*), Carolina Buckthorn (*Frangula caroliniana*), Bog Chickweed (*Stellaria alsine*), Core's Starwort (*Stellaria corei*), Leatherwood (*Dirca palustris*), Northern Hackberry (*Celtis occidentalis*).

RARE ANIMALS: Timber Rattlesnake (*Crotalus horridus*), Watch List – Diana Fritillary (*Speyeria diana*).

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Parnassia grandifolia by William S. Moye

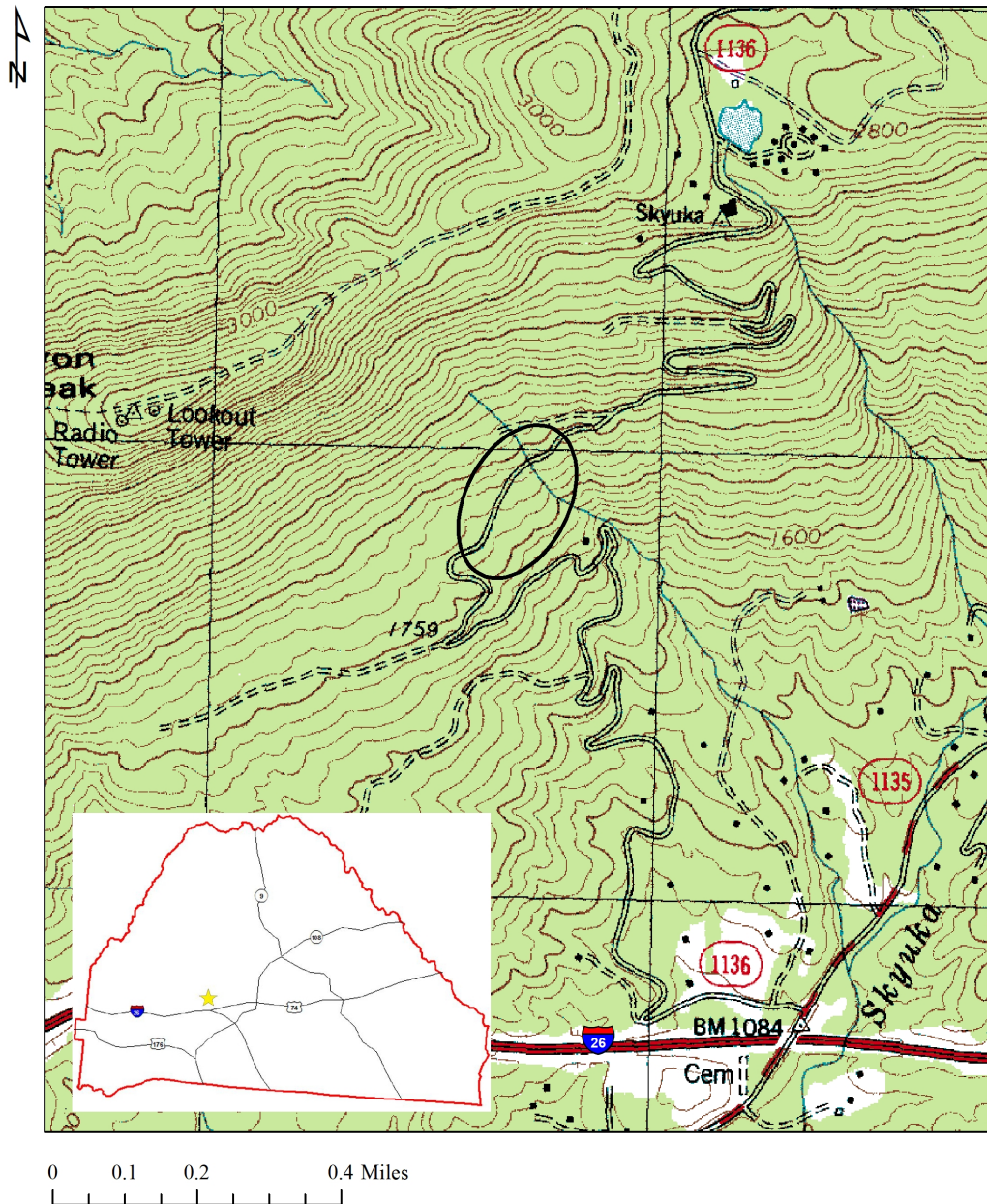
Polk County Natural Areas Inventory

Skyuka Mountain Road Sites

Mill Spring Quad

Significant Natural Heritage Area

Prepared by Pam Torlina - 10/2017



Polk County Natural Areas Inventory
Skyuka Mountain Road Sites
Significant Natural Area

Site Significance: Regional

Size: 15

Quadrangle: Mill Spring

Ownership: Private

SIGNIFICANT FEATURES: Several areas of good quality examples of the Montane Oak-Hickory Forest (Basic Subtype), as well as the presence of several rare plant species, including the Federally Endangered White Irisette (*Sisyrinchium dichotomum*).

LANDSCAPE RELATIONSHIPS: Winding road ascending the base of the south/southwest side of White Oak Mountain, from Columbus.

SITE DESCRIPTION: Sunny roadside sites on lower to mid slopes of White Oak Mountain passing through dry-mesic Oak-Hickory forest with thin to moderate canopy coverage. Dominant tree species are White Oak (*Quercus alba*), Northern Red Oak (*Quercus rubra*), Chestnut Oak (*Quercus montana*), Red Elm (*Ulmus rubra*), and White Ash (*Fraxinus americana*), with occasional specimens of Northern Hackberry (*Celtis occidentalis*). The understory may be sparse to quite dense, with Sweetshrub (*Calycantus floridus*), Pawpaw (*Asimina triloba*), American Witch-hazel (*Hamamelis virginiana* var. *virginiana*), Spicebush (*Lindera benzoin*), and Appalachian Mock-orange (*Philadelphus inodorus*) predominating depending upon aspect and hydrology. Small mafic cliff faces also have occasional specimens of Hoptree (*Ptelea trifoliata*), Hairy Mock-orange (*Philadelphus hirsutus*), and Yellow Honeysuckle (*Lonicera flava*). Herbaceous species are numerous with regionally unusual species such as Nettleleaf Noseburn (*Tragia urticifolia*) and Yellow Pimpernel (*Taenidia integerrima*), both of which prefer the circumneutral soils found here. Most significantly, the Globally Rare (Federally and State Endangered) White Irisette (*Sisyrinchium dichotomum*) has several scattered occurrences along this road.

MANAGEMENT AND PROTECTION: Some areas have protection as conservation easements, while others do not. Threats from excessive mowing and herbicide use could be potential issues, particularly where White Irisette (*Sisyrinchium dichotomum*) occurs close to roadside edges and ditches.

NATURAL COMMUNITIES: Montane Oak-Hickory Forest (Basic Subtype).

RARE PLANTS: Midwestern Carrionflower (*Smilax lasioneura*), Yellow Honeysuckle (*Lonicera flava*), Globally Rare – White Irisette (*Sisyrinchium dichotomum*), Watch List – Northern Hackberry (*Celtis occidentalis*), Hoptree (*Ptelea trifoliata*), Appalachian Mock-orange (*Philadelphus inodorus*), Hairy Mock-orange (*Philadelphus hirsutus*).

RARE ANIMALS: Giant Swallowtail (*Papilio cresphontes*).

COMMENTS: On two separate occasions, Giant Swallowtails were observed in fairly close proximity to this species' hostplant, Hoptree (*Ptelea trifoliata*). Despite repeated searching, no ovae or larvae of this butterfly were found. However, there are many areas of the mountain that are not readily accessible, and it is conceivable that this species potentially breeds here in low numbers.

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Lonicera flava by William S. Moye

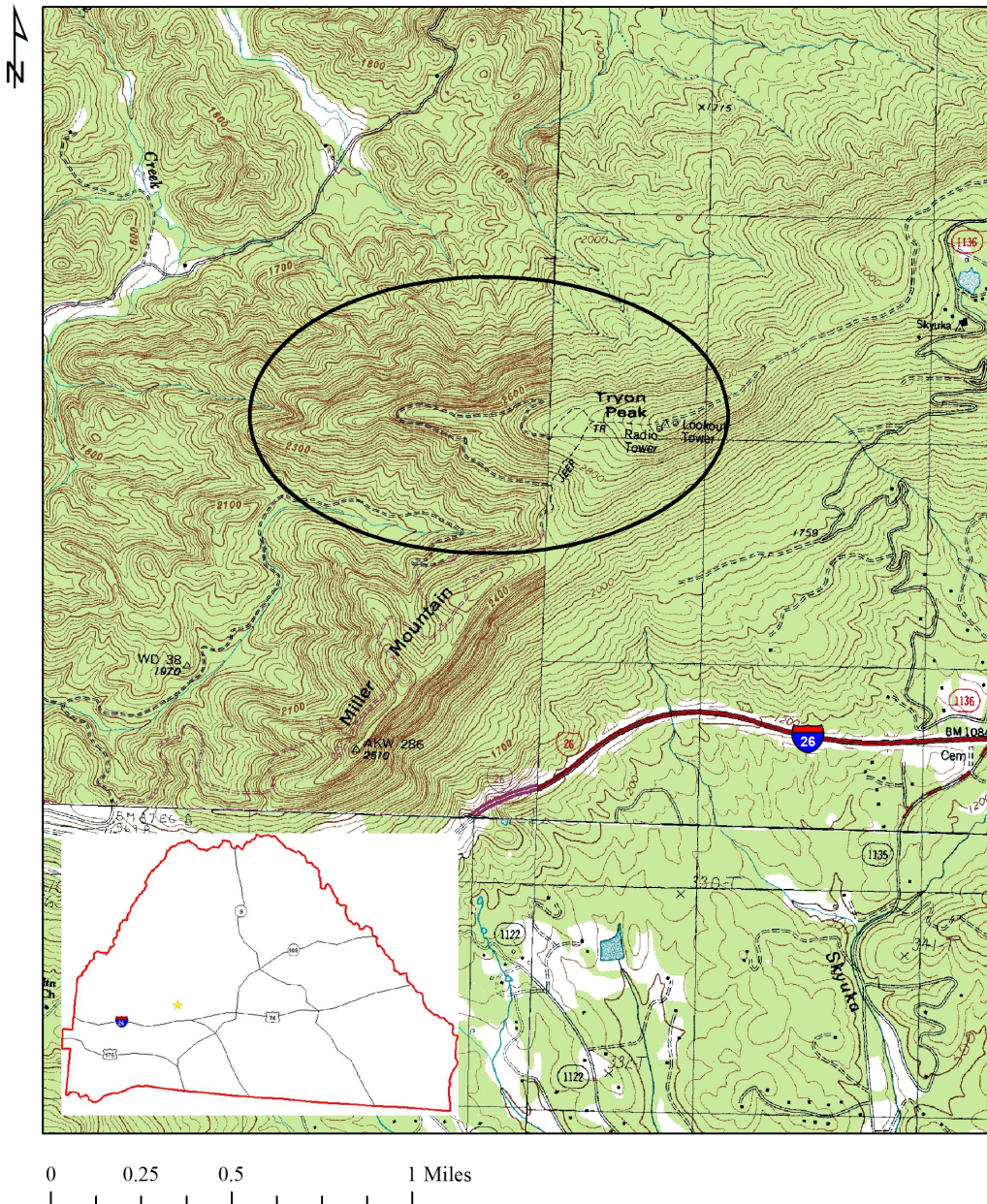
Polk County Natural Areas Inventory

Tryon Peak

Mill Spring Quad

Significant Natural Heritage Area

Prepared by Pam Torlina - 4/2018



Polk County Natural Areas Inventory

Tryon Peak

Significant Natural Area

Site Significance: National

Size: ca. 520 acres

Quadrangle: Mill Spring Quads

Ownership: Private

SIGNIFICANT FEATURES: A very impressive list of rare and Watch List vascular plant and animal species, in addition to some excellent examples of natural community types, ranks Tryon Peak as perhaps Polk County's most highly significant natural area.

LANDSCAPE RELATIONSHIPS: Approximately 3 miles northwest of Columbus and west of White Oak Mountain.

SITE DESCRIPTION: South-facing slopes of Tryon Peak harbor a Low Elevation Basic Glade (Montane Subtype) plant community. There are extensive areas of bare rock (likely amphibolite) with essentially no disturbance having taken place due to the inaccessibility of most of the site. Trees here are not numerous and are confined to areas of deeper soils where cracks in the rock occur, these include Chestnut Oak (*Quercus montana*), Northern Red Oak (*Quercus rubra*), and Virginia Pine (*Pinus virginiana*). Shrub diversity is limited, with Eastern Red Cedar (*Juniperus virginiana*) and Hairy Mock-orange (*Philadelphus hirsutus*) being the most numerous examples. Areas of shallow soil mats in glade-like openings have flora characteristic of this community type, such as Divided-leaf Ragwort (*Packera millefolium*), Early Saxifrage (*Micranthes virginiensis*), Michaux's Saxifrage (*Hydatia petiolaris*), Allegheny Live-forever (*Hylotelphium telephioides*), Biltmore Sedge (*Carex biltmoreana*), River Oats (*Chasmanthium latifolium*), Rock Spikemoss (*Bryodesma rupestre*), Broomsedge (*Andropogon virginicus* var. *virginicus*), and Appalachian Cliff Fern (*Woodsia appalachiana*).

Ridgetop areas contain small inclusions of Low Elevation Rocky Summit (Acidic Subtype), often where the terrain is very steep. Tree species occurring here are Scarlet Oak (*Quercus coccinea*), Chestnut Oak (*Quercus montana*), Mockernut Hickory (*Carya tomentosa*), Sand Hickory (*Carya pallida*), Persimmon (*Diospyros virginiana*), Black Gum (*Nyssa sylvatica*), Virginia Pine (*Pinus virginiana*), and Sourwood (*Oxydendrum arboreum*). Shrubs present include Mountain Laurel (*Kalmia latifolia*), Black Huckleberry (*Gaylussacia baccata*), and Dryland Blueberry (*Vaccinium pallidum*). Poison Oak (*Toxicodendron pubescens*), somewhat disjunct from areas to the east, may be seen on rock outcrops here. Common Greenbrier (*Smilax rotundifolia*) appears to be one of the few woody vines in this community. The herbaceous layer is not very diverse but does include Spotted Wintergreen (*Chimaphila maculata*), Broomsedge (*Andropogon virginicus* var. *virginicus*), Southern Harebell (*Campanula divaricata*), Virginia Goat's Rue (*Tephrosia*

virginiana), American Dittany (*Cunila origanoides*), Hairy Common Toadflax (*Nuttallanthus canadensis*), and Alumroot (*Heuchera villosa*).

North and north-west facing slopes feature large tracts of Low Montane Red Oak Forest, with some areas quite mature in age and of excellent quality. Canopy dominants here are Northern Red Oak (*Quercus rubra*), Black Oak (*Quercus velutina*), Chestnut Oak (*Quercus montana*), Sassafras (*Sassafras albidum*), Black Gum (*Nyssa sylvatica*), Pignut Hickory (*Carya glabra*), Flowering Dogwood (*Cornus florida*), Persimmon (*Diospyros virginiana*), and Tulip Poplar (*Liriodendron tulipifera*). Occasional stump sprouts of American Chestnut (*Castanea dentata*), are sometimes encountered. Conspicuous by its (almost) total absence is White Oak (*Quercus alba*). Shrub diversity is moderate, with Sweetshrub (*Calycanthus floridus*), American Witch-Hazel (*Hamamelis virginiana* var. *virginiana*), Piedmont Rhododendron (*Rhododendron minus*), Strawberry-bush (*Euonymus americanus*), Mapleleaf Viburnum (*Viburnum acerifolium*), Alternate-leaf Dogwood (*Cornus alternifolia*), and Snowy Hydrangea (*Hydrangea radiata*). The herbaceous layer is relatively diverse and includes Bearcorn (*Conopholis americana*), Broad-leaf Coreopsis (*Coreopsis latifolia*), Downy Rattlesnake Plantain (*Goodyera pubescens*), Christmas Fern (*Polystichum acrostichoides*), Northern Maidenhair Fern (*Adiantum pedatum*), Rattlesnake Fern (*Botrypus virginianus*), Black Cohosh (*Actaea racemosa*), Common White Snakeroot (*Ageratina altissima* var. *altissima*), Yellow Mandarin (*Prosartes lanuginosa*), Pennywort (*Obolaria virginica*), and Virginia Snakeroot (*Endodeca serpentaria*).

Montane Oak-Hickory Forest (Acidic Subtype) is found on the summit and some sections of north-facing slopes. The canopy is dominated by Chestnut Oak (*Quercus montana*), White Oak (*Quercus alba*), Northern Red Oak (*Quercus rubra*), Black Oak (*Quercus velutina*), Red Maple (*Acer rubrum*), Black Cherry (*Prunus serotina*), Black Locust (*Robinia pseudoacacia*), Mockernut Hickory (*Carya tomentosa*), Black Gum (*Nyssa sylvatica*), Sassafras (*Sassafras albidum*), and Tulip Poplar (*Liriodendron tulipifera*). The shrub layer is almost exclusively ericaceous, with Mountain Laurel (*Kalmia latifolia*) and Dryland Blueberry (*Vaccinium pallidum*) being the most abundant. The herbaceous layer is quite depauperate but does include Common White Snakeroot (*Ageratina altissima* var. *altissima*), Virginia Goat's Rue (*Tephrosia virginiana*), Bracken (*Pteridium latiusculum*), and Green Needlegrass (*Piptochaetium avenaceum*).

Scattered on dry ridgelines with southerly aspects are examples of Pine-Oak/Heath (Typic Subtype). Chestnut Oak (*Quercus montana*), is the dominant tree species here along with Table Mountain Pine (*Pinus pungens*), Virginia Pine (*Pinus virginiana*), and Shortleaf Pine (*Pinus echinata*). Ericaceous shrubs dominate, with Mountain Laurel (*Kalmia latifolia*) and Dryland Blueberry (*Vaccinium pallidum*) growing densely. Galax (*Galax urceolata*) and Broomsedge (*Andropogon virginicus* var. *virginicus*) occur in the herb layer throughout.

Rich Cove Forest (Foothills Intermediate Subtype) is found along several north-facing slopes. The canopy here is dominated by Tulip Poplar (*Liriodendron tulipifera*), Yellow Buckeye (*Aesculus flava*), Northern Red Oak (*Quercus rubra*), White Ash (*Fraxinus americana*), White Basswood (*Tilia americana* var. *heterophylla*), Common Silverbell (*Halesia tetraptera* var. *tetraptera*), Cucumber Magnolia (*Magnolia acuminata*), Shagbark Hickory (*Carya ovata*), and Black Gum (*Nyssa sylvatica*). Shrubs present include Spicebush (*Lindera benzoin*), Mapleleaf Viburnum (*Viburnum acerifolium*), Scentless Mock-orange (*Philadelphus inodorus*), Sweetshrub (*Calycanthus floridus*), and American Witch-hazel (*Hamamelis virginiana* var. *virginiana*).

Woody vines consist of Grape (*Vitis* spp.), Common Greenbrier (*Smilax rotundifolia*), Smooth Honeysuckle (*Lonicera dioica*), and Poison Ivy (*Toxicodendron radicans*). The herbaceous layer here is both lush and diverse, a sampling of which includes Rattlesnake Fern (*Botrychium virginianum*), Northern Maidenhair Fern (*Adiantum pedatum*), Christmas Fern (*Polystichum acrostichoides*), Glade Fern (*Homalosorus pycnocarpos*), Silvery Glade Fern (*Deparia acrostichoides*), Blue Cohosh (*Caulophyllum thalictroides*), Jack-in the-pulpit (*Arisaema triphyllum*), Black Cohosh (*Actaea racemosa*), American Ginseng (*Panax quinquefolius*), Broad-leaf Coreopsis (*Coreopsis latifolia*), Virginia Snakeroot (*Endodeca serpentaria*), Yellow Mandarin (*Prosartes lanuginosa*), Zigzag Spiderwort (*Tradescantia subaspera*), Large Yellow Lady's Slipper (*Cypripedium parviflorum* var. *pubescens*), Common White Snakeroot (*Ageratina altissima* var. *altissima*), Upland Boneset (*Eupatorium sessilifolium* var. *sessilifolium*), Whorled Wild Yam (*Dioscorea quaternata*), Bosc's Witchgrass (*Dichanthelium boscii*), Bloodroot (*Sanguinaria canadensis*), Puttyroot (*Aplectrum hyemale*), Eastern Longleaf Bluet (*Houstonia longifolia* var. *compacta*), and Wood Nettle (*Laportea canadensis*).

MANAGEMENT AND PROTECTION: Continued residential development may impact sensitive plant communities, as well as introduce weedy non-native species. Some areas of this site are protected by conservation easement with Conserving Carolina or protected by the state of North Carolina as the Green River Game Lands. Efforts should be made to minimize any development throughout this site.

NATURAL COMMUNITIES: Low Elevation Basic Glade (Montane Subtype), Low Elevation Rocky Summit (Acidic Subtype), Low Montane Red Oak Forest, Montane Oak--Hickory Forest (Acidic Subtype), Pine-Oak/Heath (Typic Subtype), Rich Cove Forest (Foothills Intermediate Subtype).

RARE PLANTS: Biltmore Sedge (*Carex biltmoreana*), Whorled Horsebalm (*Collinsonia verticillata*), Broadleaf Coreopsis (*Coreopsis latifolia*), Pink Thoroughwort (*Fleischmannia incarnata*), Virginia Stickseed (*Hackelia virginiana*), Littleleaf Alumroot (*Heuchera parviflora*), Fraser's Loosestrife (*Lysimachia fraseri*), Southern Loosestrife (*Lysimachia tonsa*), Divided-leaf Ragwort (*Packera millefolium*), White Irisette (*Sisyrinchium dichotomum*), Blue Ridge Carrion Flower (*Smilax lasioneura*), Sweet White Trillium (*Trillium simile*), Walter's Crownbeard (*Verbesina walteri*), Allegheny Cliff Fern (*Woodsia scopulina*), Watch List – Mountain Hackberry (*Celtis occidentalis*), Large Yellow Lady's Slipper (*Cypripedium parviflorum* var. *pubescens*), Leatherwood (*Dirca palustris*), Virginia Marbleseed (*Lithospermum virginianum*), Yellow Honeysuckle (*Lonicera flava*), American Ginseng (*Panax quinquefolius*), Hairy Mock-orange (*Philadelphus hirsutus*), Scentless Mock-orange (*Philadelphus inodorus*), Hoptree (*Ptelea trifoliata*), Heartleaf Skullcap (*Scutellaria ovata* ssp. *ovata* var. *ovata*).

RARE ANIMALS: Timber Rattlesnake (*Crotalus horridus*), Cerulean Warbler (*Dendroica cerulea*), Cofaqui Giant-skipper (*Megathymus cofaqui cofaqui*) – likely extirpated from this site

due to habitat loss, Diana Fritillary (*Speyeria diana*), Watch List – Appalachian Azure (*Celastrina neglectamajor*).

COMMENTS: Tryon Peak has been recognized as an area of outstanding botanical interest and significance since the nineteenth century. Generations of Botanists have made pilgrimages to study and appreciate its spectacular display of floral diversity.

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Packera millefolium by William S. Moye

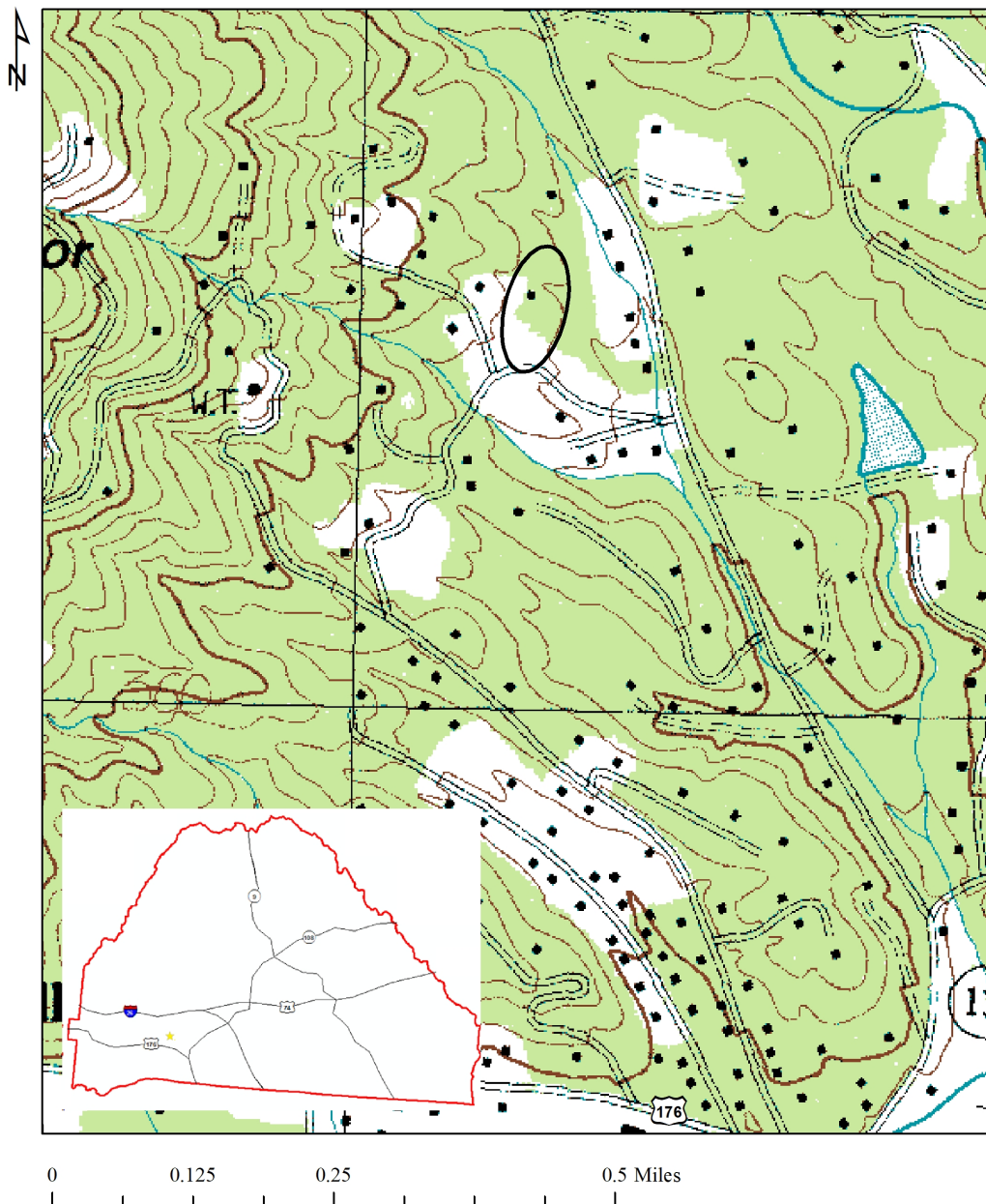
Polk County Natural Areas Inventory

Tryon Rare Plant Site (North Pacolet River Valley)

Saluda Quad

Significant Natural Heritage Area

Prepared by Pam Torlina - 4/2018



Polk County Natural Areas Inventory

Tryon Rare Plant Site (North Pacolet River Valley)

Significant Natural Area

Site Significance: Regional

Size: 2.5 acres

Quadrangle: Saluda

Ownership: Private

SIGNIFICANT FEATURES: This site contains a fragmented example of the Mesic Mixed Hardwood Forest (Piedmont Subtype), with three significantly rare plant taxa, including a small reproducing population of Butternut (*Juglans cinerea*), a rapidly declining species due to the spread of Butternut Canker Disease which is caused by the fungus *Sirococcus clavigignenti-juglandacearum*.

LANDSCAPE RELATIONSHIPS: This small tract is part of the North Pacolet River Macrosite, and is contained within the city limits of Tryon, along an unnamed tributary of the North Pacolet River.

SITE DESCRIPTION: A wooded and partially residential area within the city limits of Tryon that consists of mixed-mesophytic slopes and streamside flats dominated by broad-leaved deciduous tree and shrub species including White Oak (*Quercus alba*), Pawpaw (*Asimina triloba*), Tulip Poplar (*Liriodendron tulipifera*), Red Maple (*Acer rubrum* var. *rubrum*), and Sweetshrub (*Calycanthus floridus*). Herbaceous diversity is moderate, with Christmas Fern (*Polystichum acrostichoides*), Black Cohosh (*Actaea racemosa*), Common Starwort (*Stellaria pubera*), Eastern Woodland Sedge (*Carex blanda*), Eastern Rough Sedge (*Carex scabrata*), Tarheel Sedge (*Carex austrocaroliniana*), and Fibrousroot Sedge (*Carex communis*) being present. Although this site has large areas covered by English Ivy (*Hedera helix*) and Periwinkle (*Vinca minor*) (both exotic and highly invasive species), the rare plants here are managing to hold their own, and at present, do not appear to be suffering adverse effects from competition with the invasives. The presence of a large and healthy population of Walter's Wingstem (*Verbesina walteri*) along alluvial flats, as well as a Piedmont location for reproducing Butternut (*Juglans cinerea*), marks this as an important and significant site, in spite of the history of recent disturbance in the area. In addition, several individuals of the very rare Whorled Horsebalm (*Collinsonia verticillata*) are flourishing here on hillsides above an unnamed tributary of the North Pacolet River. Soil series mapped on this site include Ostin Sandy Loam (entisols) and Tate-Greenlee Complex (ultisols).

MANAGEMENT AND PROTECTION: The current owners of this property are aware of its botanical significance, and are taking active measures to protect and enhance this site, including the removal, where required, of English Ivy (*Hedera helix*) and Periwinkle (*Vinca minor*).

NATURAL COMMUNITIES: Mesic Mixed Hardwood Forest (Piedmont Subtype).

RARE PLANTS: Whorled Horsebalm (*Collinsonia verticillata*), Walter's Wingtem (*Verbesina walteri*), Watch List – Butternut (*Juglans cinerea*).

RARE ANIMALS: None noted.

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Collinsonia verticillata by Pam Torlina

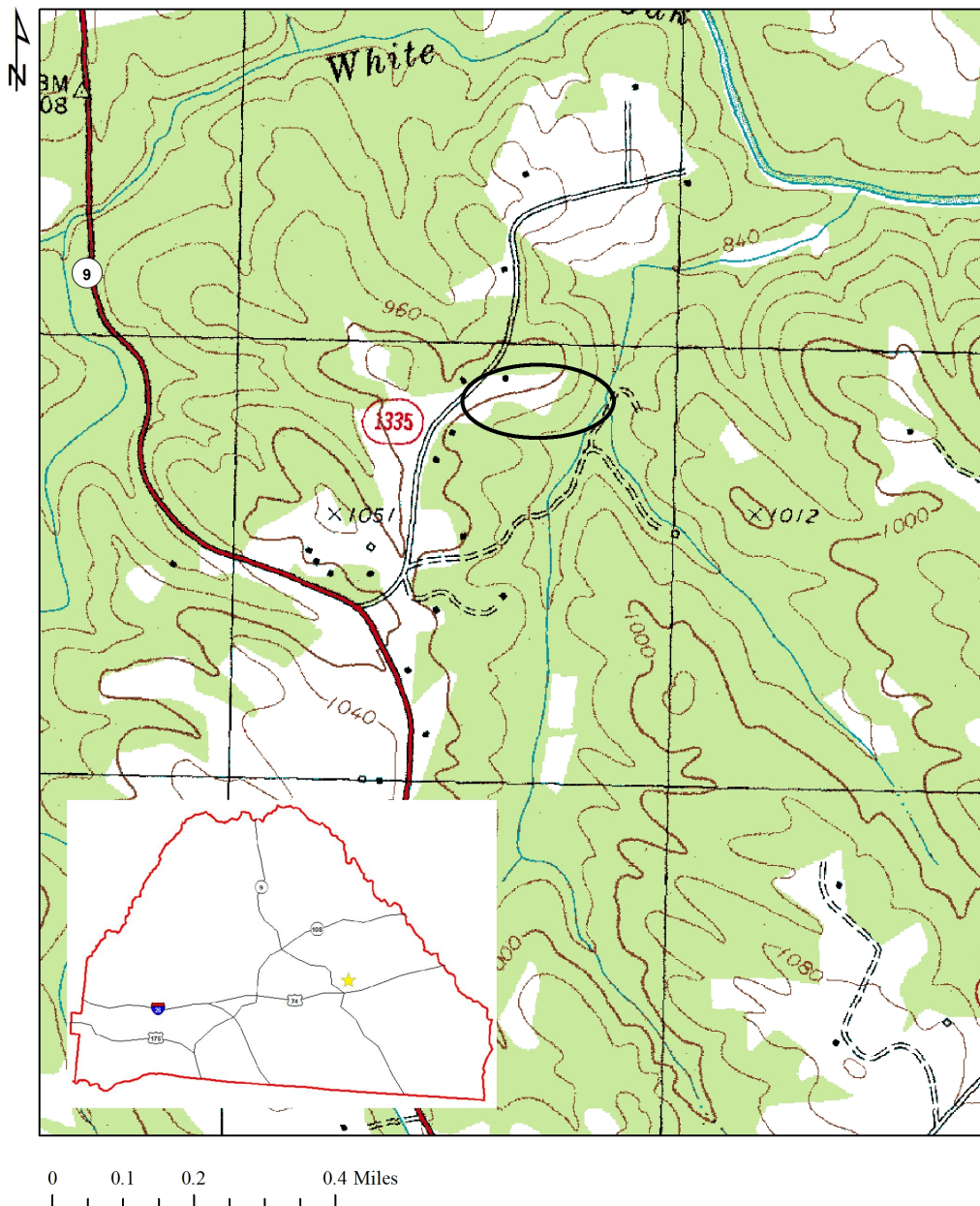
Polk County Natural Areas Inventory

White Oak Creek and Bluffs

Pea Ridge Quad

Significant Natural Heritage Area

Prepared by Pam Torlina - 4/2018



Polk County Natural Areas Inventory
White Oak Creek and Bluffs
Significant Natural Area

Site Significance: Regional

Size: 7 acres

Quadrangle: Pea Ridge

Ownership: Private

SIGNIFICANT FEATURES: This site is significant because of the number of rare plant species that occur in a relatively small area (including the State and Federally Threatened Dwarf-flowered Heartleaf) and for the Coastal Plain disjuncts that are found here. In addition, this site has a population of *Yucca* sp. allied to *Yucca filamentosa* but differing from *Y. filamentosa* in several respects, both morphologically and ecologically. Studies are ongoing to determine the taxonomic status of the *Yuccas* present along White Oak Creek and other sites within Polk County and neighboring areas of the South Mountain region.

LANDSCAPE RELATIONSHIPS: Approximately .5 miles south of Highway 74 and slightly east of Highway 9, on ridges above and adjacent to White Oak Creek.

SITE DESCRIPTION: Steep slopes and bluffs above White Oak Creek dominated by a dry-mesic to xeric ridgetop Chestnut Oak community type with heath species in the understory. Soils on upper slopes are acidic, dry, and well-draining. The canopy consists largely of Virginia Pine (*Pinus virginiana*), Chestnut Oak (*Quercus montana*), Scarlet Oak (*Quercus coccinea*), White Oak (*Quercus alba*), Black Gum (*Nyssa sylvatica*), Sassafras (*Sassafras albidum*), Sourwood (*Oxydendrum arboreum*), and Persimmon (*Diospyros virginiana*), with Blackjack Oak (*Quercus marilandica*) occurring in the driest areas. Shrubs are typical of dry 'Pine-Oak-Heath' community types, with Dryland Blueberry (*Vaccinium pallidum*), Black Huckleberry (*Gaylussacia baccata*), and Mountain Laurel (*Kalmia latifolia*) predominating. On the uppermost slopes of the driest sites, Poison Oak (*Toxicodendron pubescens*), a species typical of regions more to the east of Polk County, grows in association with Blackjack Oak.

A seepage area at the toe of one slope harbors characteristic species such as Possumhaw (*Viburnum nudum* var. *nudum*), Netted Chain Fern (*Lorinseria areolata*), Virginia Bugleweed (*Lycopus virginicus*), Club-spur Orchid (*Platanthera clavellata*), False Nettle (*Boehmeria cylindrica*), and Smooth Highbush Blueberry (*Vaccinium corymbosum*). Higher areas surrounding the seep contain Dwarf-flowered Heartleaf (*Hexastylis naniflora*), Christmas Fern (*Polystichum acrostichoides*), and Soapwort Gentian (*Gentiana saponaria*). Unusually, Swamp Chestnut Oak (*Quercus michauxii*) occurs as a solitary individual on this site, somewhat to the west of its normal distribution. Two Coastal Plain disjuncts make an appearance here – Climbing Hydrangea (*Decumaria barbara*) festoons many trees in and around this seep, as well as along White Oak

Creek itself, and one small area of the creek features a stand of American Snowbell (*Styrax americanus*), far west of where it is normally found. The property owners have indicated that Wahoo (*Euonymus atropurpureus* var. *atropurpureus*) was once found near this locality. However, intensive searches did not reveal its continued presence here at this time.

Slightly upslope from White Oak Creek (opposite bank) is a small example of the Low Mountain Pine Forest (Montane Pine Subtype). Here occur good numbers of Virginia Pine (*Pinus virginiana*) with a very few Shortleaf Pine (*Pinus echinata*) intermixed. In addition, there are several specimens of Carolina Hemlock (*Tsuga caroliniana*) growing in close proximity to Eastern Hemlock (*Tsuga canadensis*) in a slightly more mesic area of the community. Large areas of this tract are covered in Common Running-cedar (*Diphasiastrum digitatum*). Sweet Pinesap (*Monotropsis odorata*) makes a fragrant early spring appearance here in thick duff under Virginia Pine (*Pinus virginiana*).

MANAGEMENT AND PROTECTION: This site currently has no formal protection, but the property owners are well aware of its natural significance and plan no disturbance or development.

NATURAL COMMUNITIES: Chestnut Oak Forest (Dry Heath Subtype), Low Elevation Seep (Piedmont/Mountain Springhead Subtype), Low Mountain Pine Forest (Montane Pine Subtype).

RARE PLANTS: Sweet Pinesap (*Monotropsis odorata*), Carolina Hemlock (*Tsuga caroliniana*), Dwarf-flowered Heartleaf (*Hexastylis naniflora*), Regionally Rare – Climbing Hydrangea (*Decumaria barbara*), American Snowbell (*Styrax americanus*).

RARE ANIMALS: Eastern Spotted Skunk (*Spilogale putorius*), Watch List – Diana Fritillary (*Speyeria diana*), Historic – Eastern Fox Squirrel (*Sciurus niger*).

COMMENTS: This property has been in possession of the owners for many generations. As a result, they are extremely familiar with the floral and faunal changes that have taken place here over time. They report that Fox Squirrel (*Sciurus niger*) was known from this region in the early part of the twentieth century but they have not seen any in many decades. Changing land usage patterns likely contributed to the loss of this species in the area.

REFERENCES:

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Decumaria barbara by Keith Bradley

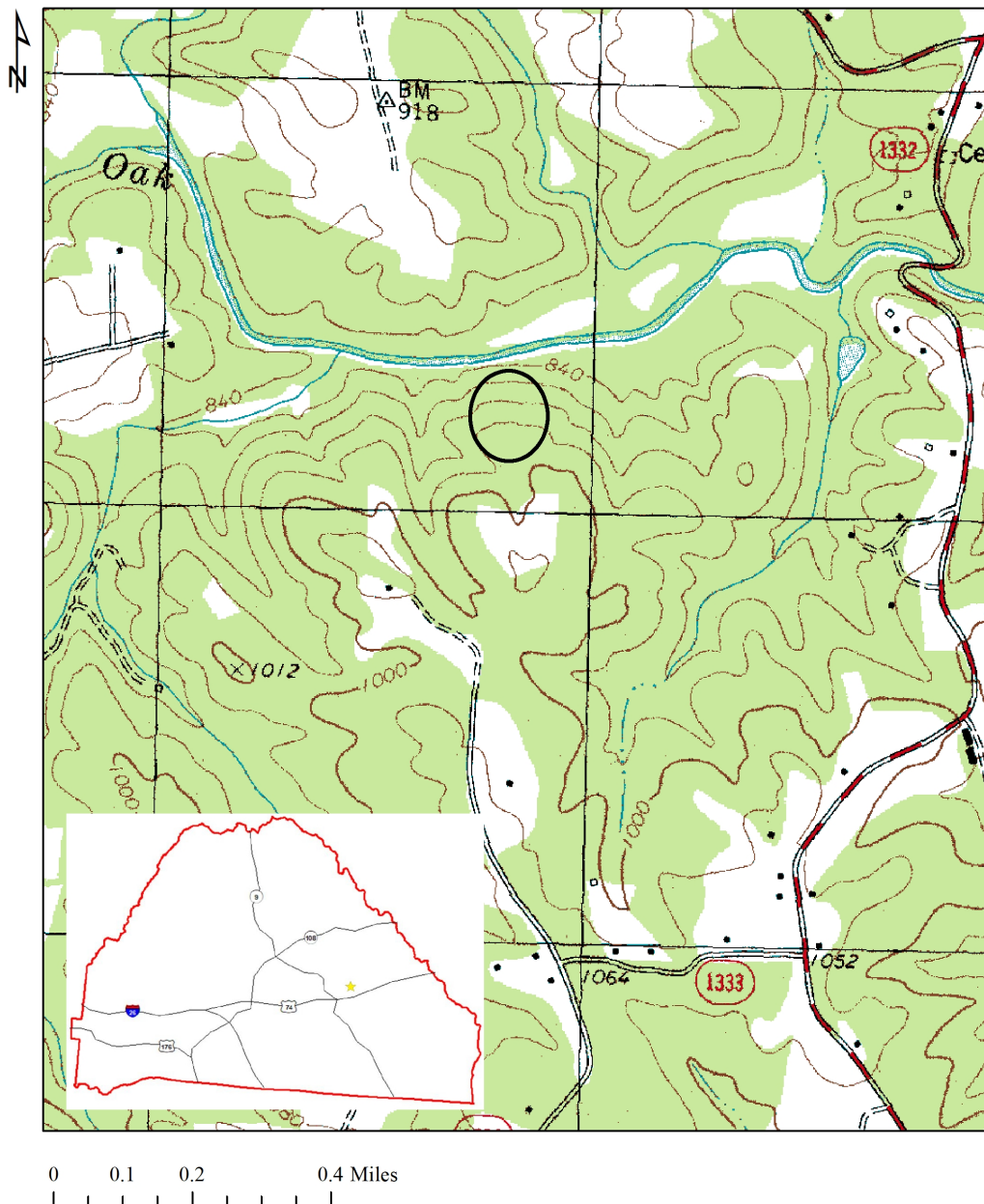
Polk County Natural Areas Inventory

White Oak Creek Gymnosperm Community

Pea Ridge Quad

Significant Natural Heritage Area

Prepared by Pam Torlina - 4/2018



Polk County Natural Areas Inventory
White Oak Creek Gymnosperm Community
Significant Natural Area

Site Significance: Regional

Size: ca. 5 acres

Quadrangle: Pea Ridge

Ownership: Private

SIGNIFICANT FEATURES: This site is very unusual for the occurrence of an almost pure community of several species of Gymnosperms that are not often found growing together in the same locality with some range and elevational disjunctions among the species composition also.

LANDSCAPE RELATIONSHIPS: Approximately 2.5 miles south of Highway 74 and 1.5 miles east of Highway 9, on a low bluff above White Oak Creek.

SITE DESCRIPTION: While surveying tracts in the White Oak Creek region of eastern Polk County, an apparently native stand of Loblolly Pine (*Pinus taeda*) was found occurring on bluffs and slopes at elevations between 950-1070 feet. The bluff itself is several hundred feet above White Oak Creek and is strongly north-facing. Measurements were taken of *P. taeda* here with 24" dbh and with several others in the 21" dbh range. Large stumps and fallen trunks of senescent *P. taeda* attest to their long presence at this site. Also growing here are many younger *P. taeda* of various sizes from seedlings to 6", 9", and 14" dbh. Found with the *P. taeda* were mature White Pine (*Pinus strobus*) over 21" dbh and some very large Virginia Pine (*Pinus virginiana*) of great age. The understory consisted mostly of *Pinus* spp. seedlings/saplings with some individuals of Dwarf Pawpaw (*Asimina parviflora*), Sweetleaf (*Symplocos tinctoria*), and Hill Cane (*Arundinaria appalachiana*). Just over the summit of the bluff (approximately 300 feet) are south/southwest facing slopes that have mature Table Mountain Pine (*Pinus pungens*) at a very low elevation of 930 feet. Interspersed with the Table Mountain Pine are some Shortleaf Pine (*Pinus echinata*) and more very large Virginia Pine (*Pinus virginiana*). Mixed in with all of the above are scattered individuals of Eastern Hemlock (*Tsuga canadensis*) and Carolina Hemlock (*Tsuga caroliniana*).

The landowners have had family at this site for over a century and they are adamant that no disturbance has taken place here during that time. The diversity and density of coniferous tree species in such a relatively small area is very odd.

MANAGEMENT AND PROTECTION: This site has no formal protection at this time.

NATURAL COMMUNITIES: Possibly a new designation required; does not appear to fit any existing community type description. A good descriptor might be ‘Low Elevation Gymnosperm Bluff.’

RARE PLANTS: Watch List – Carolina Hemlock (*Tsuga caroliniana*).

RARE ANIMALS: Timber Rattlesnake (*Crotalus horridus*), Watch List – Diana Fritillary (*Speyeria diana*).

COMMENTS: Loblolly Pine (*Pinus taeda*) has not been considered as a native species this far west in North Carolina, so its (possible?) naturally occurring presence here is unexpected. There is no sign of any historical disturbance at this site. Loblolly Pine has been documented (again possibly native) in nearby South Carolina. Given the broad range of age classes of the trees, the overall quality of the site, and the topographic position, this community appears to be highly unusual. Photographs and a site description were forwarded to Dr. James Matthews (UNCC), Michael Schafale (NCNHP), and Dr. Alan Weakley (UNC) and none of them could recall having personally encountered nor heard of a vegetation community such as this.

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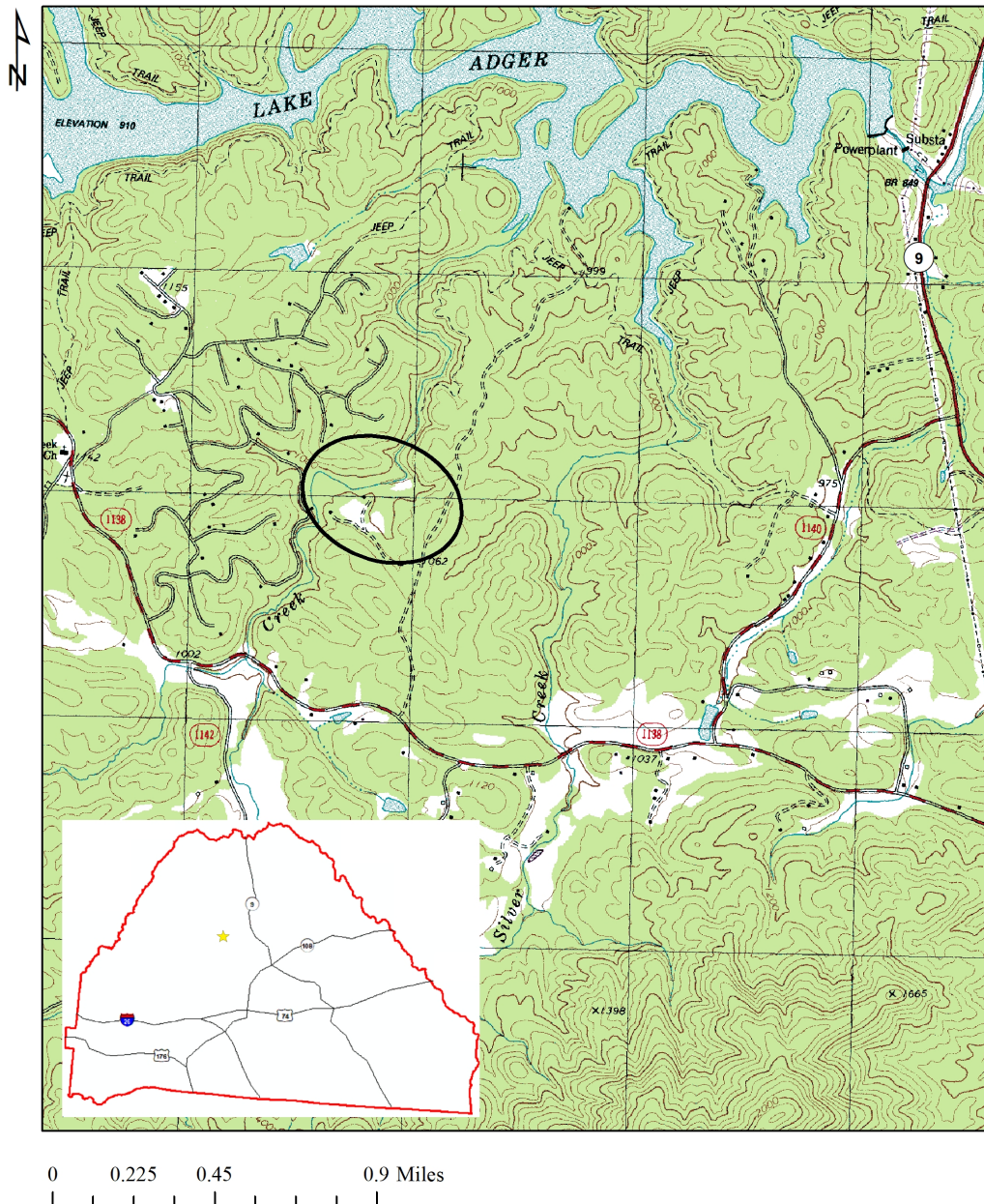
Schafale, M. 2015. Personal Communication.

Weakley, A. 2015. Personal Communication.



Pinus pungens by William S. Moye

Polk County Natural Areas Inventory
White Oak Creek Non-alluvial Wetland and Slopes
Mill Spring Quad
Significant Natural Heritage Area
Prepared by Pam Torlina - 4/2018



Polk County Natural Areas Inventory

White Oak Creek Non-alluvial Wetland and Slopes

Significant Natural Area

Site Significance: Regional

Size: ca. 70 acres

Quadrangle: Mill Spring

Ownership: Private

SIGNIFICANT FEATURES: This site derives its significance from the presence of the largest known non-alluvial wetland in Polk County – a major breeding ground for several species of anurans as well as Spotted Salamanders (*Ambystoma maculatum*) and possibly other Ambystomatids. As well, there is the occurrence of at least six rare vascular plant taxa – including the very rare Wahoo (*Euonymus atropurpureus*). In addition, there is a population of the significantly rare Coal Skink (*Plestiodon anthracinus*) on wooded slopes surrounding the wetland areas.

LANDSCAPE RELATIONSHIPS: Approximately 1.5 miles southeast of the Tryon International Equestrian Center on the south side of SR 1005 near the junction of SR 1005 and SR 1326, adjacent to White Oak Creek.

SITE DESCRIPTION: As noted by Rayner (1994), this site is unusual for the juxtaposition of three distinct and diverse community types. Using our current system of community classification, Schafale (2012), these are: Basic Mesic Forest (Piedmont Subtype), Low Elevation Seep (Piedmont/Mountain Springhead Subtype), Piedmont/Mountain Semi-permanent Impoundment (Shrub Subtype).

Wooded uplands comprising Basic Mesic Forest (Piedmont Subtype) surround the lower wetland area on three sides. Canopy dominants include Northern Red Oak (*Quercus rubra*), White Oak (*Quercus alba*), Tulip Poplar (*Liriodendron tulipifera*), Mockernut Hickory (*Carya tomentosa*), American Beech (*Fagus grandifolia*), Red Maple (*Acer rubrum* var. *rubrum*), Sweetgum (*Liquidambar styraciflua*), and White Basswood (*Tillia americana* var. *heterophylla*). Shrubs present are Spicebush (*Lindera benzoin* var. *benzoin*) – very numerous, Pawpaw (*Asimina triloba*), Painted Buckeye (*Aesculus sylvatica*), Wahoo (*Euonymus atropurpureus*), and Maple-leaf Viburnum (*Viburnum acerifolium*). Vines are not numerous, but include Whiteleaf Greenbrier (*Smilax glauca*), Poison Ivy (*Toxicodendron radicans*), Crossvine (*Bignonia capreolata*), and Grape (*Vitis* spp.). The herb layer is diverse with Green Violet (*Hybanthus concolor*), Eastern Columbine (*Aquilegia canadensis*), Little Sweet Betsy Trillium (*Trillium cuneatum*), Northern Maidenhair Fern (*Adiantum pedatum*), American Ginseng (*Panax quinquefolius*), Bloodroot (*Sanguinaria canadensis*), Dutchman's Britches (*Dicentra cucullaria*), Wild Ginger (*Asarum canadense*), Puttyroot (*Aplecrum hyemale*), and Jack-in-the-pulpit (*Arisaema triphyllum*).

Several small areas of Low Elevation Seep (Piedmont/Mountain Springhead Subtype) are found on lower slopes immediately adjacent to and draining into the wetland area. Characteristic species here include Virginia Sweetspires (*Itea virginica*), Possumhaw Viburnum (*Viburnum nudum*), American Royal Fern (*Osmunda regalis*), Laurel Greenbrier (*Smilax laurifolia*), and Poison Sumac (*Toxicodendron vernix*), with the latter two species being Coastal Plain disjuncts.

The flat area below the slopes is occupied by the Piedmont/Mountain Semi-permanent Impoundment (Shrub Subtype) community. The topography of the uplands around this site, as well as the seepage draining from surrounding slopes, is likely the reason that this area exists in its present state. The central area of this wetland (approximately 10 acres) appears to be permanently wet and saturated, with the occurrence of at least some shallow, standing water throughout the year. The dominant tree species here are Trident Red Maple (*Acer rubrum* var. *trilobum*), Black Willow (*Salix nigra*), Green Ash (*Fraxinus pennsylvanica*), Sycamore (*Platanus occidentalis*), and River Birch (*Betula nigra*). Buttonbush (*Cephalanthus occidentalis*) is the most abundant shrub here, also occurring with lesser numbers of Tag Alder (*Alnus serrulata*). A diverse area of Sedges (*Carex* spp.) and grasses are found scattered throughout and are most abundant in sunny openings. As noted by Rayner (1994), Chinese Privet (*Ligustrum sinense*) is a very serious invasive at this site and is rapidly encroaching throughout – control measures will be needed to ensure the integrity of this wetland area if it is to survive intact in the future. During a site visit in March, large numbers of Spotted Salamander (*Ambystoma maculatum*) egg masses were observed here; numerous Chorus frogs (*Pseudacris* sp.) were also heard calling, indicating this to be a critical amphibian breeding locality.

MANAGEMENT AND PROTECTION: Land-clearing and residential development are potential issues on the slopes above and surrounding these wetlands. Since the original site inspection from the early 1990s by Douglas Rayner, this area has been subdivided into several parcels, making potential management and protection more problematic. This site currently has no formal protection.

NATURAL COMMUNITIES: Basic Mesic Forest (Piedmont Subtype), Low Elevation Seep (Piedmont/Mountain Springhead Subtype), Piedmont/Mountain Semi-permanent Impoundment (Shrub Subtype).

RARE PLANTS: Wahoo (*Euonymus atropurpureus*), Watch List – American Ginseng (*Panax quinquefolius*), Southern Nodding Trillium (*Trillium rugelii*), Little Sweet Betsy Trillium (*Trillium cuneatum*), Regionally Rare – Laurel Greenbrier (*Smilax laurifolia*), Poison Sumac (*Toxicodendron vernix*).

RARE ANIMALS: Coal Skink (*Plestiodon anthracinus*).

REFERENCES:

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Trillium cuneatum by David Campbell

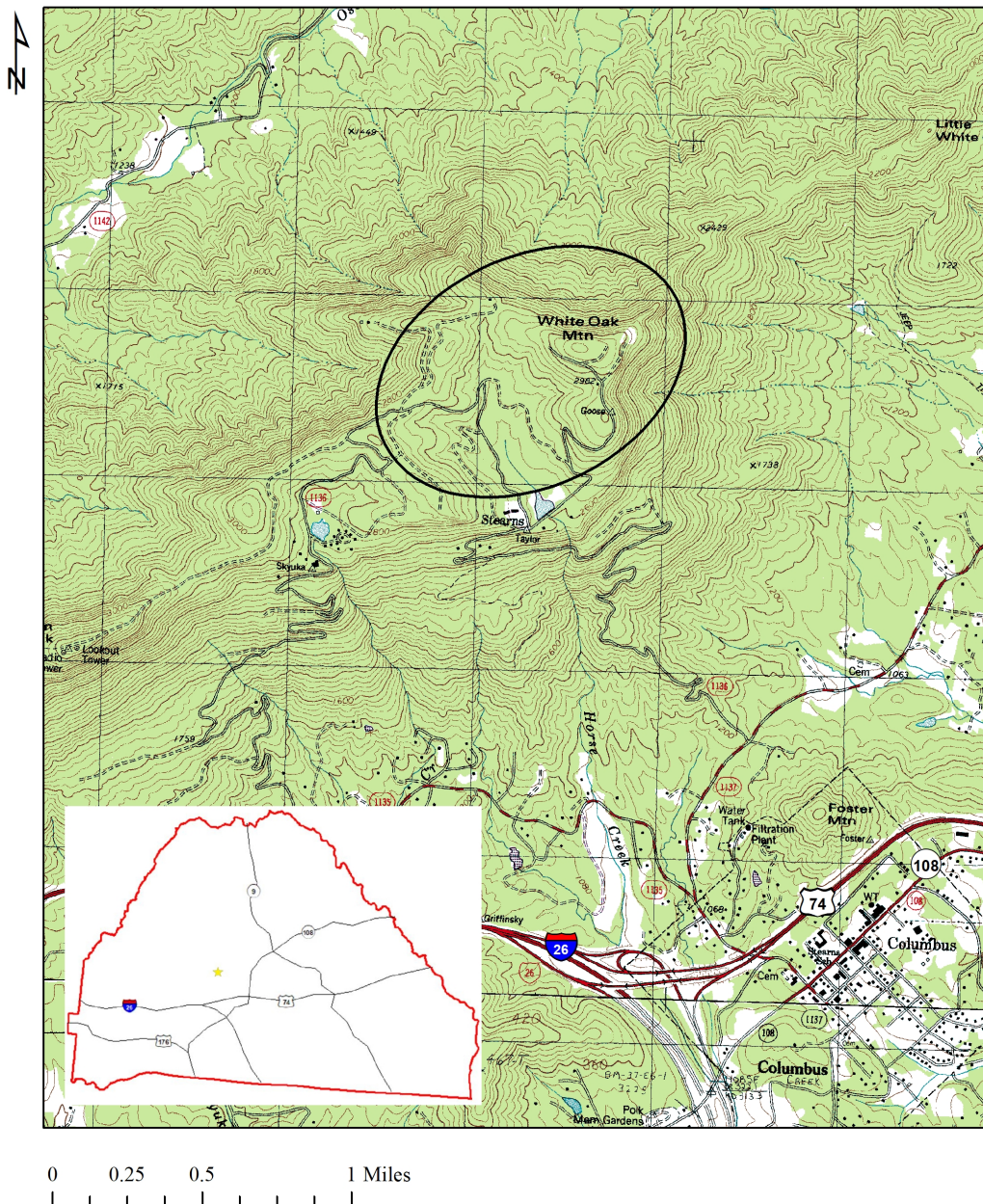
Polk County Natural Areas Inventory

White Oak Mountain

Mill Spring Quad

Significant Natural Heritage Area

Prepared by Pam Torlina - 4/2018



Polk County Natural Areas Inventory

White Oak Mountain

Significant Natural Area

Site Significance: National

Size: ca. 250 acres

Quadrangle: Mill Spring

Ownership: Private

SIGNIFICANT FEATURES: This site is significant due to the presence of large numbers of the Federally and State Endangered White Irisette (*Sisyrinchium dichotomum*). In addition, many other rare and Watch List vascular plants occur here. Forested tracts, especially on steeper slopes, are of high quality and relatively intact.

LANDSCAPE RELATIONSHIPS: Approximately two miles north and west of Columbus and east of Tryon Peak.

SITE DESCRIPTION: Not all portions of White Oak Mountain harbor significant natural communities due to previous and ongoing residential development. However, there are sites contained within this area that do contain high quality natural communities. As a result of underlying geologic features, soil conditions, and topography there is a large degree of heterogeneity (and resulting diversity) that make classifying some areas to community type difficult, as noted by Rayner (1994). Eastern portions of this site contain varying amounts of rich rock outcrops.

Areas with a south and east-facing aspect approximate the conditions found in the Montane Oak–Hickory Forest (Basic Subtype) community. Trees present here include White Oak (*Quercus alba*), Northern Red Oak (*Quercus rubra*), Scarlet Oak (*Quercus coccinea*), Black Oak (*Quercus velutina*), Chestnut Oak (*Quercus montana*), Northern Hackberry (*Celtis occidentalis*) – in rocky areas, Tulip Poplar (*Liriodendron tulipifera*), Mockernut Hickory (*Carya tomentosa*), Bitternut Hickory (*Carya cordiformis*), Pignut Hickory (*Carya glabra*), Sassafras (*Sassafras albidum*), Black Locust (*Robinia pseudoacacia*), Black Gum (*Nyssa sylvatica*), Sourwood (*Oxydendrum arboreum*), Flowering Dogwood (*Cornus florida*), and Red Maple (*Acer rubrum*). Shrubs comprise American Witch-hazel (*Hamamelis virginiana* var. *virginiana*), Hairy Mock-orange (*Philadelphus hirsutus*) and in rockier areas, Hoptree (*Ptelea trifoliata*), Mountain Indigo-bush (*Amorpha glabra*), Blackhaw (*Viburnum prunifolium*), Downy Serviceberry (*Amelanchier arborea*), Dryland Blueberry (*Vaccinium pallidum*), Common Deerberry (*Vaccinium stamineum* var. *stamineum*), Curlyleaf Yucca (*Yucca filamentosa*), and Creeping St. Andrew's Cross (*Hypericum stragulum*). Woody vines include Poison Ivy (*Toxicodendron radicans*), Whiteleaf Greenbrier (*Smilax glauca*), Sawleaf Greenbrier (*Smilax bona-nox*), and Virginia Creeper (*Parthenocissus quinquefolia*). Herbaceous diversity is variable, with Cliff Saxifrage (*Hydatoca*

petiolaris), False Solomon's Seal (*Smilacina racemosa*), Melic Grass (*Melica mutica*), Muhlenberg's Sedge (*Carex muhlenbergii*), Smooth Beardtongue (*Penstemon laevigatus*), Spiked Lobelia (*Lobelia spicata* var. *spicata*), Hairy Lipfern (*Myriopteris lanosa*), Woolly Lipfern (*Myriopteris tomentosa*), Rock Spikemoss (*Bryodesma rupestre*), Roundleaf Ragwort (*Packera obovata*), Mountain Dwarf-dandelion (*Krigia montana*), Lanceleaf Coreopsis (*Coreopsis lanceolata*), Fire-pink (*Silene virginica* var. *virginica*), White Irisette (*Sisyrinchium dichotomum*), Appalachian Mountain-mint (*Pycnanthemum montanum*), White Vervain (*Verbena urticifolia*), Speckled Goldenrod (*Solidago sphacelata*), Carolina Spinypod (*Matelea carolinensis*), and Black Cohosh (*Actaea racemosa*).

More mesic and sheltered areas, on typically (although not exclusively) north-facing slopes, are covered in Rich Cove Forest (Foothills Rich Subtype). The heterogenous nature of the vegetation found here is similar to other parts of White Oak Mountain. Ravines are rocky and may contain some small areas of seepage. Slopes can be very steep, with some sites extremely hard to access. Trees found in this community include White Oak (*Quercus alba*), Northern Red Oak (*Quercus rubra*), Pignut Hickory (*Carya glabra*), Yellow Buckeye (*Aesculus flava*), Red Elm (*Ulmus rubra*), Black Locust (*Robinia pseudoacacia*), Tulip Poplar (*Liriodendron tulipifera*), White Ash (*Fraxinus americana*), White Basswood (*Tilia americana* var. *heterophylla*), Redbud (*Cercis canadensis*), Black Walnut (*Juglans nigra*), and Flowering Dogwood (*Cornus florida*). Shrubs present are Spicebush (*Lindera benzoin*), Sweetshrub (*Calycanthus floridus*), American Witch-hazel (*Hamamelis virginiana* var. *virginiana*), Snowy Hydrangea (*Hydrangea radiata*), Pawpaw (*Asimina triloba*), and Hairy Mock-orange (*Philadelphus hirsutus*). *Vitis* spp. are abundant, as is Poison Ivy (*Toxicodendron radicans*). The herb layer is lush, particularly in the spring, and includes Bloodroot (*Sanguinaria canadensis*), Spring Beauty (*Claytonia virginica*), Little Sweet Betsy Trillium (*Trillium cuneatum*), Trout Lily (*Erythronium umbilicatum* ssp. *umbilicatum*), Green Violet (*Hybanthus concolor*), Seersucker Sedge (*Carex plantaginea*), Tall White Violet (*Viola canadensis* var. *canadensis*), Squirrel Corn (*Dicentra canadensis*), Blue Cohosh (*Caulophyllum thalictroides*), Fernleaf Phacelia (*Phacelia bipinnatifida*), and Black Cohosh (*Actaea racemosa*).

MANAGEMENT AND PROTECTION: Some areas of White Oak Mountain currently have protection by the state of North Carolina as the Green River Game Lands (north-facing slopes). Development (if any), should be done to minimize impact to remaining high-quality plant communities.

NATURAL COMMUNITIES: Montane Oak–Hickory Forest (Basic Subtype), Rich Cove Forest (Foothills Rich Subtype).

RARE PLANTS: Broadleaf Coreopsis (*Coreopsis latifolia*), Divided-leaf Ragwort (*Packera millefolium*), White Irisette (*Sisyrinchium dichotomum*), Allegheny Cliff Fern (*Woodsia scopulina*), Southern Loosestrife (*Lysimachia tonsa*), Ash-leaved Golden-banner (*Thermopsis fraxinifolia*), Whiteleaf Sunflower (*Helianthus glaucophyllus*), Watch List – Yellow Honeysuckle (*Lonicera flava*), Hairy Mock-orange (*Philadelphus hirsutus*), Scentless Mock-orange

(*Philadelphus inodorus*), Littleleaf Alumroot (*Heuchera parviflora*), Hoptree (*Ptelea trifoliata*), Little Sweet Betsy Trillium (*Trillium cuneatum*).

RARE ANIMALS: Cerulean Warbler (*Dendroica cerulea*).

COMMENTS: White Oak Mountain was the probable collection site of Bigleaf Scurfpea (*Orbexilum macrophyllum*) in 1897 and 1899 by Edward C. Townsend. Despite repeated searches, this species has not been seen since its discovery in the latter part of the nineteenth century.

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Sisyrinchium dichotomum by William S. Moye

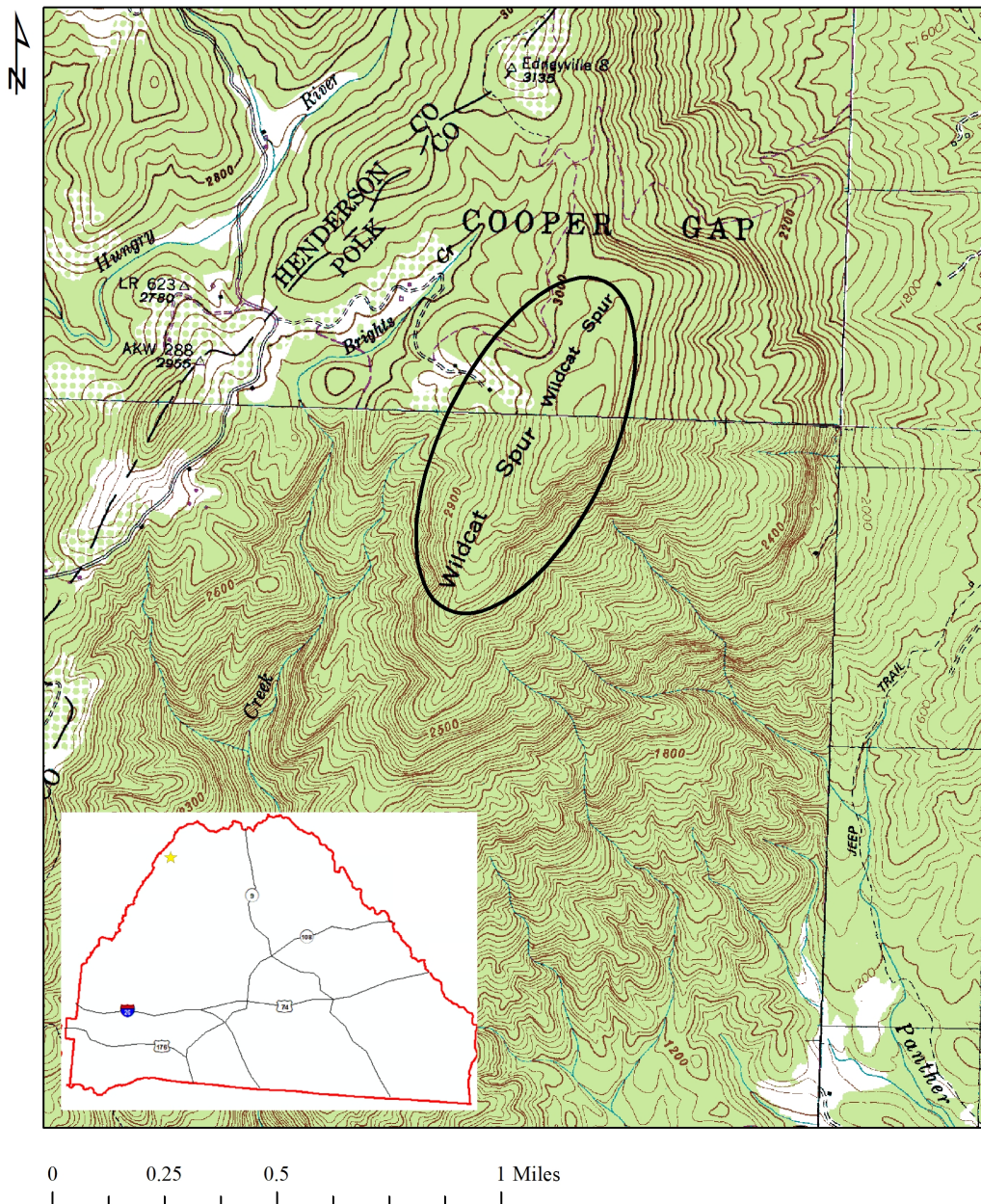
Polk County Natural Areas Inventory

Wildcat Spur

Clifffield Mountain Quad

Significant Natural Heritage Area

Prepared by Pam Torlina - 4/2018



Polk County Natural Areas Inventory

Wildcat Spur

Significant Natural Area

Site Significance: State

Size: ca. 120 acres

Quadrangle: Clifffield Mountain

Ownership: Private

SIGNIFICANT FEATURES: The presence of populations of Appalachian Cliff Fern (*Woodsia appalachiana*) – very rare east of the Blue Ridge, the Federally Endangered White Irisette (*Sisyrinchium dichotomum*), and several other rare and Watch List plant species makes this area quite significant. In addition, the relative quality and integrity of the overall site is very good.

LANDSCAPE RELATIONSHIPS: Cooper Gap, in northwestern Polk County, near the Henderson County line.

SITE DESCRIPTION: The majority of the site here is composed of Montane Oak-Hickory Forest (Basic Subtype) occurring on moderate to gentle slopes. There are, however, some small areas that are somewhat more heterogenous in terms of community composition, possibly due to a previous disturbance regime that took place decades ago (possibly also, areas of felsic rock inclusions leading to more acidic soil conditions in small, discrete areas). Canopy dominants are White Oak (*Quercus alba*), Black Oak (*Quercus velutina*), Northern Red Oak (*Quercus rubra*), Chestnut Oak (*Quercus montana*), Sand Hickory (*Carya pallida*), Shagbark Hickory (*Carya ovata*), Mockernut Hickory (*Carya tomentosa*), Tulip Poplar (*Liriodendron tulipifera*), White Ash (*Fraxinus americana*), and Red Elm (*Ulmus rubra*). The shrub layer has moderate diversity and includes Spicebush (*Lindera benzoin*), Carolina Holly (*Ilex ambigua*), Sweetshrub (*Calycanthus floridus*), Pawpaw (*Asimina triloba*), Mapleleaf Viburnum (*Viburnum acerifolium*), American Witch-hazel (*Hamamelis virginiana* var. *virginiana*), Mountain Indigo-bush (*Amorpha glabra*), and Dryland Blueberry (*Vaccinium pallidum*). Several species of woody vines occur, including Common Greenbrier (*Smilax rotundifolia*), Poison Ivy (*Toxicodendron radicans*), Trumpet Creeper (*Campsis radicans*), and Virginia Creeper (*Parthenocissus quinquefolia*). Herbs present include Black Cohosh (*Actaea racemosa*), Mountain Bunchflower (*Veratrum parviflorum*), Interrupted Fern (*Osmunda claytoniana*), Appalachian Oak-leach (*Aureolaria laevigata*), American Lovage (*Ligusticum canadense*), Northern Maidenhair Fern (*Adiantum pedatum*), Lowland Bladder Fern (*Cystopteris protrusa*), Bloodroot (*Sanguinaria canadensis*), Common Shorthusk (*Brachyelytrum erectum*), Tall White Violet (*Viola canadensis*), Yellow Pimpernel (*Taenidia integerrima*), Eastern Flowering Spurge (*Euphorbia corollata*), Nettleleaf Noseburn (*Tragia urticifolia*), White Irisette (*Sisyrinchium dichotomum*), Smooth Peavine (*Lathyrus venosus*), Naked Tick-trefoil (*Hylodesmum nudiflorum*), and Downy Rattlesnake Plantain (*Goodyera pubescens*).

Areas of open rock (some inaccessible) conform to the description of the Montane Cliff (Basic Subtype) community. Few trees occur on the outcrops but scattered individuals of Red Elm (*Ulmus rubra*) and Winged Elm (*Ulmus alata*) are occasionally encountered. Shrubs characteristic of this habitat include Hairy Mock-orange (*Philadelphus hirsutus*), Fragrant Sumac (*Rhus aromatica*), Wafer-ash (*Ptelea trifoliata*), and Smooth Hydrangea (*Hydrangea arborescens*). Woody vines present are Yellow Honeysuckle (*Lonicera flava*), Poison Ivy (*Toxicodendron radicans*), and Trumpet Creeper (*Campsis radicans*). Notable herbaceous species are Woolly Lipfern (*Myriopteris tomentosa*), Walking Fern (*Asplenium rhizophyllum*), American Alumroot (*Heuchera americana*), Wild Columbine (*Aquilegia canadensis*), and Whorled Milkweed (*Asclepias verticillata*).

MANAGEMENT AND PROTECTION: This site currently has no formal protection.

NATURAL COMMUNITIES: Montane Oak-Hickory Forest (Basic Subtype), Montane Cliff (Basic Subtype).

RARE PLANTS: Divided-leaf Ragwort (*Packera millefolium*), White Irisette (*Sisyrinchium dichotomum*), Blue Ridge Carrion-flower (*Smilax lasioneura*), Ash-leaved Golden-banner (*Thermopsis fraxinifolia*), Appalachian Cliff Fern (*Woodsia appalachiana*), Watch List – Sweet Fern (*Comptonia peregrina*), Smooth Peavine (*Lathyrus venosus*), New England Blazing-star (*Liatris scariosa* var. *scariosa*), Yellow Honeysuckle (*Lonicera flava*), Hairy Mock-orange (*Philadelphus hirsutus*), Wafer-ash (*Ptelea trifoliata*), Heartleaf Skullcap (*Scutellaria ovata* ssp. *ovata* var. *ovata*), Carolina Hemlock (*Tsuga caroliniana*).

RARE ANIMALS: None Noted.

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Thermopsis fraxinifolia by William S. Moye

Appendix 1. Breeding bird species of Polk County, North Carolina.

Great Blue Heron (*Ardea herodias*)
Green Heron (*Butorides virescens*)
Canada Goose (*Branta canadensis*)
Wood Duck (*Aix sponsa*)
Mallard (*Anas platyrhynchos*)
Common Merganser (*Mergus merganser*)
Black Vulture (*Coragyps atratus*)
Turkey Vulture (*Cathartes aura*)
Osprey (*Pandion haliaetus*)
Sharp-shinned Hawk (*Accipiter striatus*)
Coopers Hawk (*Accipiter cooperii*)
Red-shouldered Hawk (*Buteo lineatus*)
Broad-winged Hawk (*Buteo platypterus*)
Red-tailed Hawk (*Buteo jamaicensis*)
Bald Eagle (*Haliaeetus leucocephalus*)
Wild Turkey (*Meleagris gallopavo*)
Ruffed Grouse (*Bonasa umbellus*)
Killdeer (*Charadrius vociferous*)
Wilson's Snipe (*Gallinago delicata*)
Rock Pigeon (*Columba livia*)
Mourning Dove (*Zenaida macroura*)
Eurasian Collared Dove (*Streptopelia decaocto*)
Yellow-billed Cuckoo (*Coccyzus americanus*)
Barn Owl (*Tyto alba*)
Eastern Screech Owl (*Megascops asio*)
Great Horned Owl (*Bubo virginianus*)
Barred Owl (*Strix varia*)
Chuck-will's-widow (*Antrostomus carolinensis*)
Eastern Whip-poor-will (*Antrostomus vociferous*)
Chimney Swift (*Chaetura pelagica*)
Ruby-throated Hummingbird (*Archilochus colubris*)
Belted Kingfisher (*Megaceryle alcyon*)
Red-headed Woodpecker (*Melanerpes erythrocephalus*)
Red-bellied Woodpecker (*Melanerpes carolinus*)
Downy Woodpecker (*Picoides pubescens*)
Hairy Woodpecker (*Picoides villosus*)
Northern Flicker (*Colaptes auratus*)
Pileated Woodpecker (*Dryocopus pileatus*)
Eastern Wood-Pewee (*Contopus virens*)
Acadian Flycatcher (*Empidonax virescens*)
Eastern Phoebe (*Sayornis phoebe*)
Great Crested Flycatcher (*Myiarchus crinitus*)
White-eyed Vireo (*Vireo griseus*)
Red-eyed Vireo (*Vireo olivaceus*)

Blue-headed Vireo (*Vireo solitarius*)
 Blue Jay (*Cyanocitta cristata*)
 American Crow (*Corvus brachyrhynchos*)
 Barn Swallow (*Hirundo rustica*)
 Northern Rough-winged Swallow (*Stelgidopteryx serripennis*)
 Tree Swallow (*Tachycineta bicolor*)
 Purple Martin (*Progne subis*)
 Carolina Chickadee (*Parus carolinensis*)
 Tufted Titmouse (*Parus bicolor*)
 White-breasted Nuthatch (*Sitta carolinensis*)
 Brown-headed Nuthatch (*Sitta pusilla*)
 Carolina Wren (*Thryothorus ludovicianus*)
 Blue-gray Gnatcatcher (*Poliophtila caerulea*)
 Eastern Bluebird (*Sialia sialis*)
 Wood Thrush (*Hylocichla mustelina*)
 American Robin (*Turdus migratorius*)
 Gray Catbird (*Dumetella carolinensis*)
 Northern Mockingbird (*Mimus polyglottos*)
 Brown Thrasher (*Toxostoma rufum*)
 Cedar Waxwing (*Bombycilla cedrorum*)
 European Starling (*Sturnus vulgaris*)
 Black-throated Blue Warbler (*Setophaga caerulescens*)
 Cerulean Warbler (*Setophaga cerulea*)
 Black-throated Green Warbler (*Setophaga virens*)
 Pine Warbler (*Setophaga pinus*)
 Prairie Warbler (*Setophaga discolor*)
 Black and White Warbler (*Mniotilta varia*)
 American Redstart (*Setophaga ruticilla*)
 Prothonotary Warbler (*Protonotaria citrea*)
 Worm-eating Warbler (*Helmitheros vermivorum*)
 Common Yellowthroat (*Geothlypis trichas*)
 Louisiana Waterthrush (*Parkesia motacilla*)
 Ovenbird (*Seiurus aurocapilla*)
 Swainson's Warbler (*Limnothlypis swainsonii*)
 Hooded Warbler (*Setophaga citrina*)
 Scarlet Tanager (*Piranga olivacea*)
 Summer Tanager (*Piranga rubra*)
 Indigo Bunting (*Passerina cyanea*)
 Northern Cardinal (*Cardinalis cardinalis*)
 Eastern Towhee (*Pipilo erythrophthalmus*)
 Chipping Sparrow (*Spizella passerina*)
 Field Sparrow (*Spizella pusilla*)
 Grasshopper Sparrow (*Ammodramus savannarum*)
 Song Sparrow (*Melospiza melodia*)
 Eastern Meadowlark (*Sturnella magna*)
 Red-winged Blackbird (*Agelaius phoeniceus*)

Common Grackle (*Quiscalus quiscula*)
Brown-headed Cowbird (*Molothrus ater*)
House Sparrow (*Passer domesticus*)
American Goldfinch (*Carduelis tristis*)
House Finch (*Carpodacus mexicanus*)

Appendix 2. Butterfly species reported from Polk County, North Carolina.

Pipevine Swallowtail (*Battus philenor*)
Zebra Swallowtail (*Eurytides marcellus*)
Black Swallowtail (*Papilio polyxenes*)
Giant Swallowtail (*Papilio cresphontes*)
Eastern Tiger Swallowtail (*Papilio glaucus*)
Spicebush Swallowtail (*Papilio troilus*)
Checkered White (*Pontia protodice*)
West Virginia White (*Pieris virginiensis*)
Cabbage White (*Pieris rapae*)
Falcate Orangetip (*Anthocharis midea*)
Clouded Sulphur (*Colias philodice*)
Orange Sulphur (*Colias eurytheme*)
Southern Dogface (*Zerene cesonia*)
Cloudless Sulphur (*Phoebis sennae*)
Barred Yellow (*Eurema daira*)
Little Yellow (*Pyrisitia lisa*)
Sleepy Orange (*Abaeis nicippe*)
Harvester (*Feniseca tarquinius*)
American Copper (*Lycaena phlaeas*)
Great Purple Hairstreak (*Atlides halesus*)
Coral Hairstreak (*Satyrium titus*)
Edwards' Hairstreak (*Satyrium edwardsii*)
Banded Hairstreak (*Satyrium calanus*)
King's Hairstreak (*Satyrium kingi*)
Brown Elfin (*Callophrys augustinus*)
Frosted Elfin (*Callophrys irus*) * Record is many decades old
Henry's Elfin (*Callophrys henrici*)
Eastern Pine Elfin (*Callophrys niphon*)
Juniper Hairstreak (*Callophrys gryneus*)
White-M Hairstreak (*Parrhasius m-album*)
Gray Hairstreak (*Strymon melinus*)
Red-banded Hairstreak (*Calycopis cecrops*)
Eastern Tailed-Blue (*Cupido comyntas*)
Spring Azure (*Celastrina ladon*)
Summer Azure (*Celastrina neglecta*)
Dusky Azure (*Celastrina nigra*)
American Snout (*Libytheana carinenta*)
Gulf Fritillary (*Agraulis vanilla*)
Variegated Fritillary (*Euptoieta claudia*)
Diana Fritillary (*Speyeria diana*)
Great Spangled Fritillary (*Speyeria cybele*)
Silvery Checkerspot (*Chlosyne nycteis*)
Pearl Crescent (*Phyciodes tharos*)
Baltimore Checkerspot (*Euphydryas phaeton*) *Record obscure
Question Mark (*Polygonia interrogationis*)

Eastern Comma (*Polygonia comma*)
 Mourning Cloak (*Nymphalis antiopa*)
 American Lady (*Vanessa virginiensis*)
 Painted Lady (*Vanessa cardui*)
 Red Admiral (*Vanessa atalanta*)
 Common Buckeye (*Junonia coenia*)
 Red-spotted Purple (*Limenitis arthemis astyanax*)
 Viceroy (*Limenitis archippus*)
 Hackberry Emperor (*Asterocampa celtis*)
 Tawny Emperor (*Asterocampa clyton*)
 Southern Pearly-eye (*Lethe portlandia*)
 Northern Pearly-eye (*Lethe anthedon*)
 Creole Pearly-eye (*Lethe creola*)
 Appalachian Brown (*Lethe appalachia*)
 Gemmed Satyr (*Cyllopsis gemma*)
 Carolina Satyr (*Hermeuptychia sosybius*)
 Little Wood-Satyr (*Megisto cymela*)
 Common Wood-Nymph (*Cercyonis pegala*)
 Monarch (*Danaus plexippus*)
 Silver-spotted Skipper (*Epargyreus clarus*)
 Long-tailed Skipper (*Urbanus proteus*)
 Golden Banded-Skipper (*Autochton cellus*)
 Hoary Edge (*Achalarus lyciades*)
 Southern Cloudywing (*Thorybes bathyllus*)
 Northern Cloudywing (*Thorybes pylades*)
 Hayhurst's Scallopwing (*Staphylus hayhurstii*)
 Dreamy Duskywing (*Erynnis icelus*)
 Sleepy Duskywing (*Erynnis brizo*)
 Juvenal's Duskywing (*Erynnis juvenalis*)
 Horace's Duskywing (*Erynnis horatius*)
 Mottled Duskywing (*Erynnis martialis*)
 Zarucco Duskywing (*Erynnis zarucco*)
 Wild Indigo Duskywing (*Erynnis baptisiae*)
 Grizzled Skipper (*Pyrgus centaureae*)
 Common Checkered-Skipper (*Pyrgus communis*)
 Common Sootywing (*Pholisora catullus*)
 Swarthy Skipper (*Nastra lherminier*)
 Clouded Skipper (*Lerema accius*)
 Least Skipper (*Ancyloxypha numitor*)
 Fiery Skipper (*Hylephila phyleus*)
 Cobweb Skipper (*Hesperia metea*)
 Peck's Skipper (*Polites peckius*)
 Tawny-edged Skipper (*Polites themistocles*)
 Crossline Skipper (*Polites origenes*)
 Southern Broken-dash (*Wallengrenia otho*)
 Little Glassywing (*Pompeius verna*)

Sachem (*Atalopedes campestris*)
Delaware Skipper (*Anatrytone logan*)
Zabulon Skipper (*Poanes zabulon*)
Dion Skipper (*Euphyes dion*)
Dun Skipper (*Euphyes vestris*)
Dusted Skipper (*Atrytonopsis hianna*)
Pepper and Salt Skipper (*Amblyscirtes hegon*)
Lace-winged Roadside-Skipper (*Amblyscirtes aesculapius*)
Reversed Roadside-Skipper (*Amblyscirtes reversa*)
Common Roadside-Skipper (*Amblyscirtes vialis*)
Eufala Skipper (*Lerodea eufala*)
Ocola Skipper (*Panoquina ocola*)
Cofaqui Giant-Skipper (*Megathymus cofaqui*) * Likely extirpated in Polk County

Appendix 3. Significant Natural Heritage Areas (standard sites) of Polk County, North Carolina.

Rank Codes:

A = National Significance

B = State Significance

C = Regional Significance

D = County Significance

SITES	RANK
1. Alexanders Ford	D
2. Big Level Natural Area	D
3. Camp Bethlehem Rich Woods	B
4. Cedar Cliff/Warrior Mountain	B
5. Chimneytop Oak Forest	C
6. Clifffield Mounatin/Upper Hungry River	C
7. Cooper Gap/Wildcat Spur	C
8. Cove Creek/Bradley Falls Natural Area	B
9. Green River Gorge	B
10. Green River Plantation Basic Forest	B
11. Green River Rich Slopes	B
12. Kross Keys Natural Area	B
13. Laurel Branch Ravines and Slopes	C
14. Laurel Branch Rich Woods	D
15. Little Cove Creek	B
16. Little Warrior Mountain Cave	B
17. Melrose Mounatin	B
18. Melrose Mountain North	C
19. Mill Creek Forest and Seep	B
20. Mills Bridge Natural Area	C
21. New Hope Springhead Swamp	B
22. Pearsons Falls Glen/Pacolet River Bluffs	B
23. Rotten Creek Headwater Slopes	C
24. Round Mountain	C
25. Sandy Springs Church Springhead Swamp	B
26. Tryon Reservoir/Twin Lakes/Big Falls Creek Natural Area	C
27. Walnut Flats	C
28. White Oak Creek Non-alluvial Wetland	C
29. White Oak Mountain/Tryon Peak	A
30. Worlds Edge/Sugarloaf Mountain	A

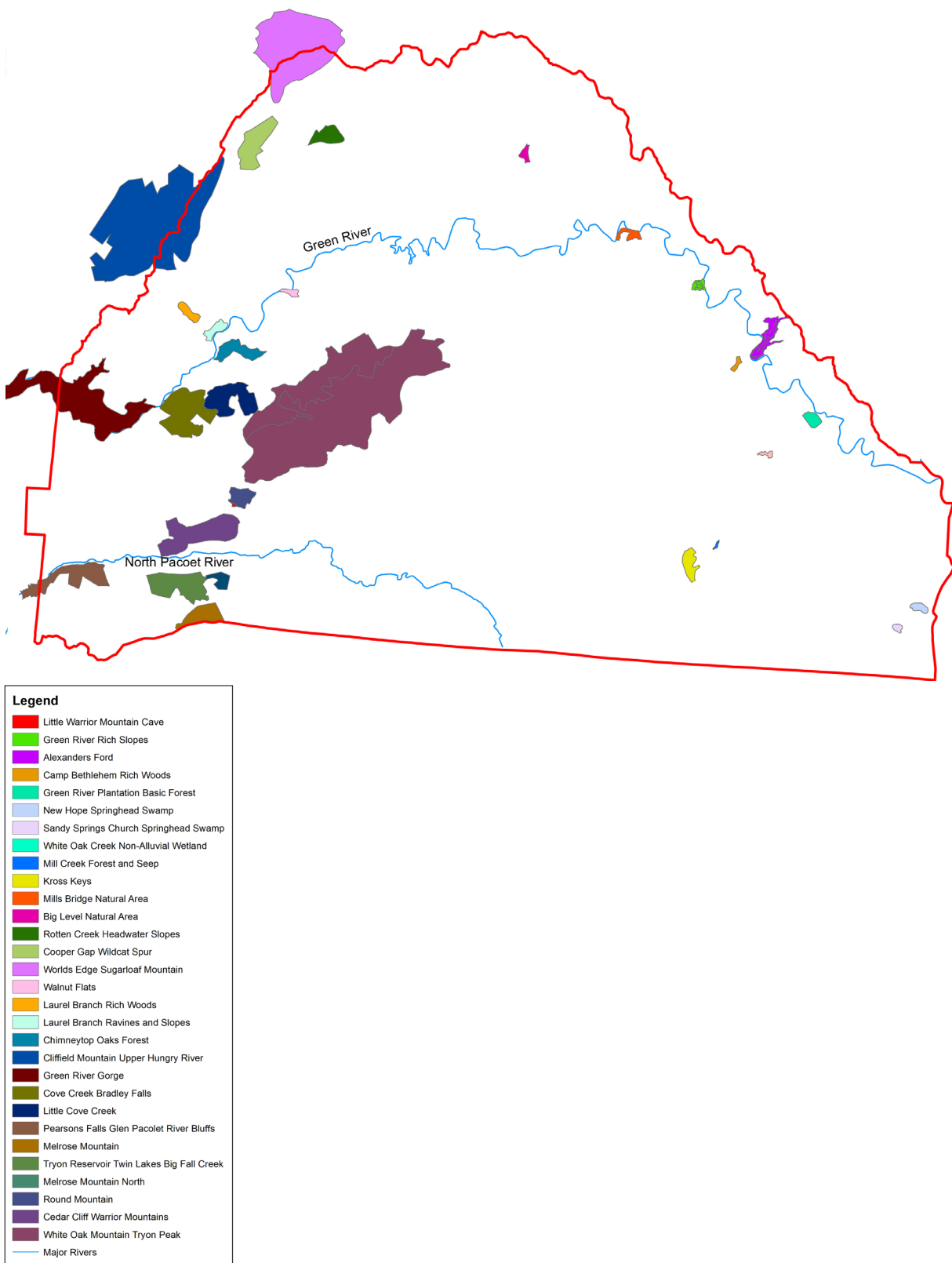


Figure 6. Significant Natural Heritage Areas (standard sites) of Polk County, North Carolina.