

# Natural Area Inventory of the Orchard Hollow Property

Prepared for the Great Smoky Mountains Institute at Tremont



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## Purpose and Introduction

The Great Smoky Mountains Institute at Tremont contracted Joe Pye Ecological Consulting to complete a natural area inventory of a tract of land in Orchard Hollow in Townsend, Tennessee. The tract was acquired for outdoor education programs, and Tremont seeks information on the botanical, zoological, and natural community features of the property. Joe Pye Ecological spent four days on the property in April and May of 2019 compiling biological observations and assessing the property from an ecological perspective. The results of the inventory are detailed herein.

The Orchard Hollow property is located approximately 1.5 miles east/southeast of Townsend, on the northern boundary of the Great Smoky Mountains National Park (Figure 1). Elevations range from approximately 1,200 – 1,800 feet above sea level, and slopes range from less than 2–4° on the northern edge of the tract and in flat stream valleys to 36° degrees on the steep northeast flank of Fall Ridge. Moderately steep slopes (25–30°) characterize most of the tract. Two principal tributaries to the Little River flow through the property: Fall Branch and Rush Branch. Both streams

originate just above the property between 2,200 – 2,300' elevation on the north face of Chestnut Top Lead in the national park.

Orchard Hollow is situated on the edge of the Southern Metasedimentary Mountains Ecoregion, an area of interconnected ecosystems associated with the Great Smoky Mountains and the western Blue Ridge. The northern edge of Orchard Hollow lies within the Limestone Valley and Coves Ecoregion, a small area of calcareous geology of limited extent on the western edge of the Smokies that includes Cades Cove and Tuckaleechee Cove. The tract is underlain by several different geologic formations that span the western edge of the Blue Ridge (Figure 2). Metcalf Phyllite is mapped for the southern 2/3 of the property and is described as chlorite-sericite phyllite with strongly sheared/laminated metasilstone. The northern 1/3 of the Orchard Hollow property is dissected by a band of Blockhouse Shale, a finely laminated calcareous rock that contains localized beds of calcareous sandstone and limestone at its base. The northernmost edge is mapped as alluvium that extends up to 40' above floodplains and transitions to boulder debris on slopes. The southeastern most corner of the property is mapped as Cades Sandstone, a medium- to coarse-grained metasandstone and metagraywacke interbedded with metasilstone and slate.

Soils of the tract correspond to several well-drained to excessively well-drained series of colluvial origin. The bulk of the property, including the steep southern portion, are mapped as lithosols – unconsolidated residuum of weathered rock and rock fragments on steep rolling terrain. Ramsey slaty silt loam makes up the bulk of Orchard Hollow tract and a large part of the mountainous terrain of Blount County. The Ramsey series is derived from weathered sandstone and acidic slate and is typically shallow in depth. Dandridge silt loam and Dandridge shaley silt clay loam soils are mapped on the north-facing slope of Fall Ridge, roughly corresponding to the location of the Blockhouse Shale formation. The Dandridge series is residuum of calcareous shale and is shallow and slatey with occasional exposures of bedrock. The northern edge of the tract is mapped as Allen silt loam of varying steepness, a red-yellow podzol formed from leaching of the top soil layers and formation of an underlying illuvial zone. Allen soil series are colluvial soils of mountain foothills derived from slates. A small pocket of soil of alluvial origin – Barbourville silt loam – is mapped in the northeast corner of the tract. Originally derived from slates, the Barbourville soil is found on footslopes, benches, and intermittent drainages.

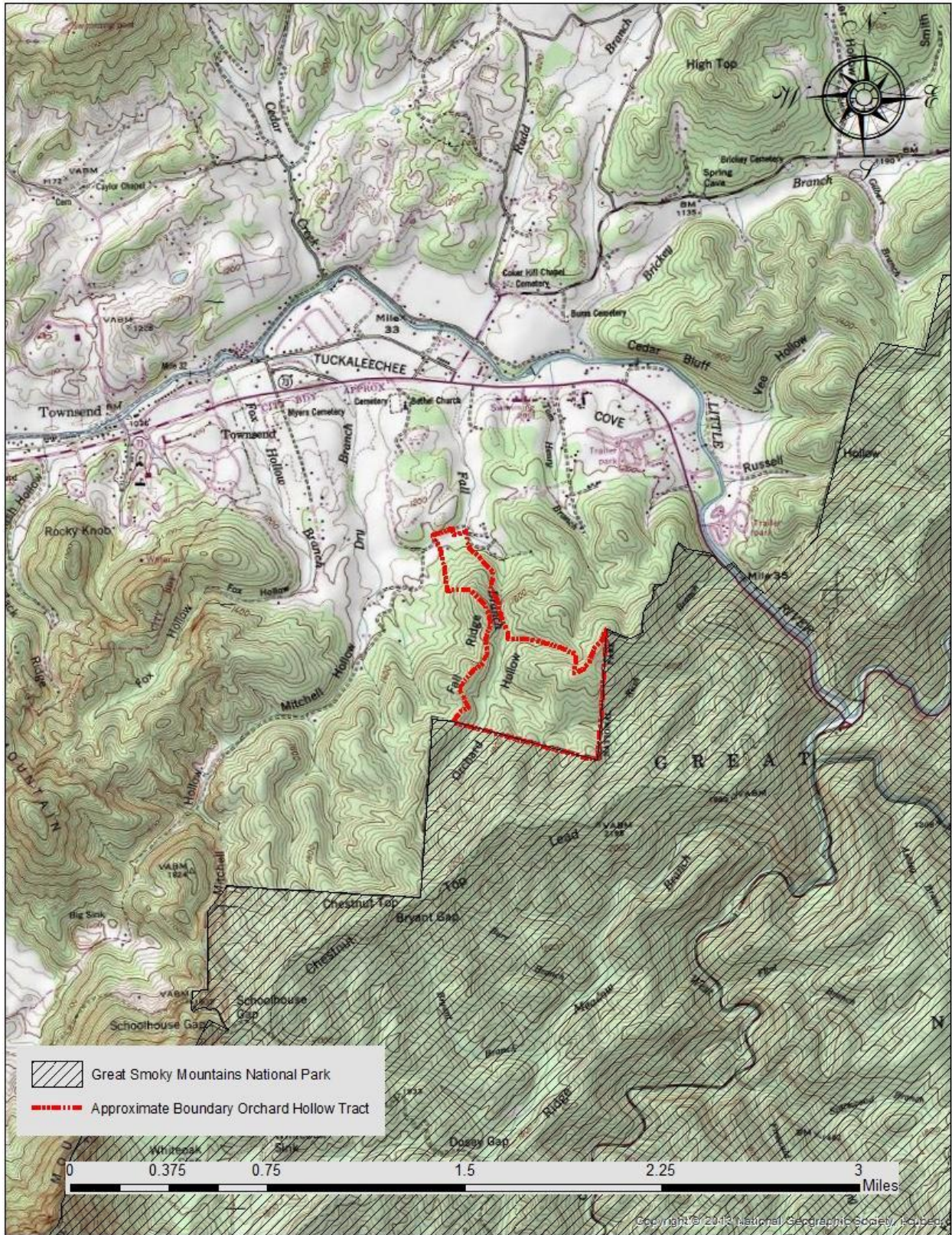


Figure 1. Vicinity Map - Orchard Hollow Tract

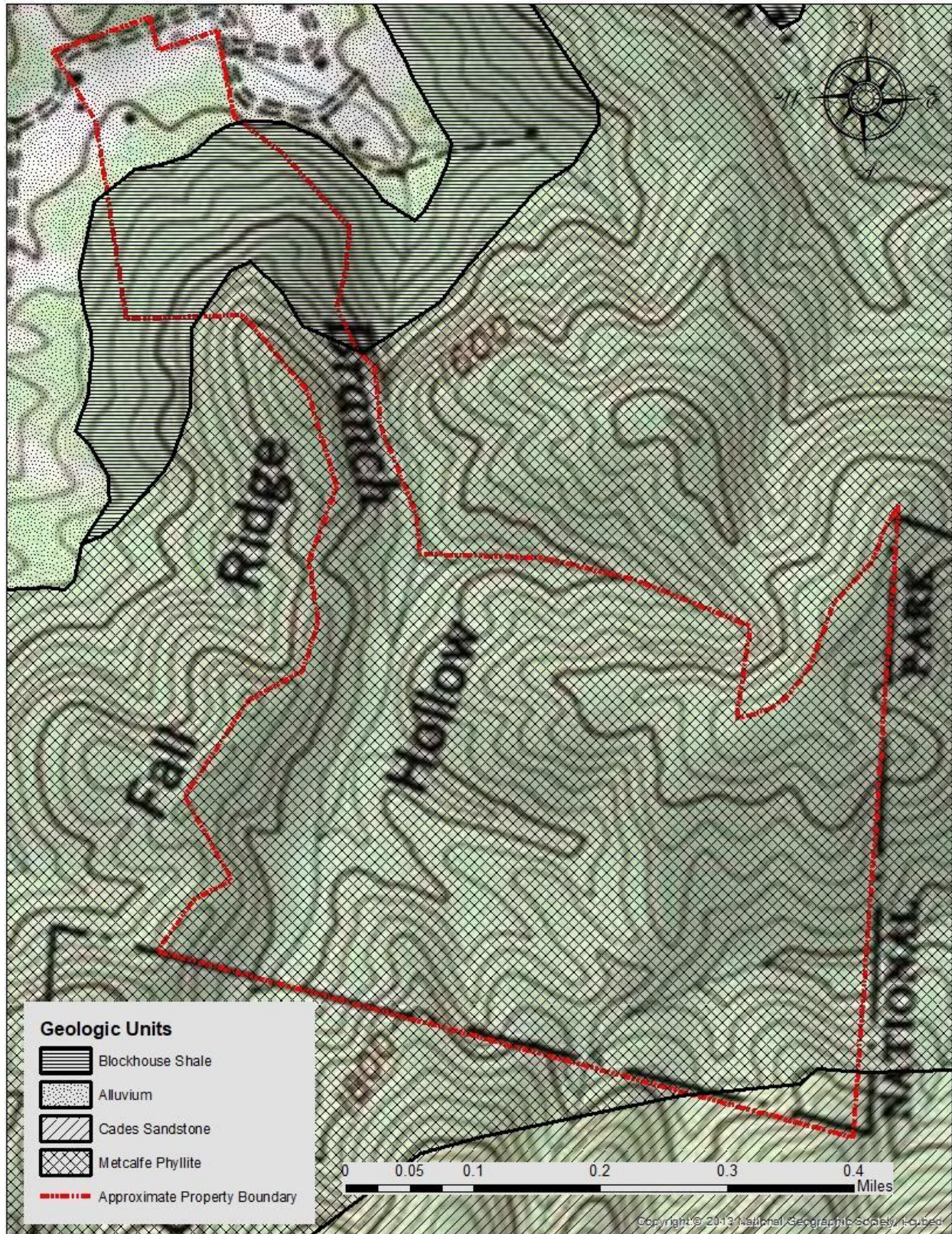


Figure 2. Geological Units of Orchard Hollow Tract

The property is primarily in mature forested condition, covered with a mix of oak-hickory, mesic cove, pine forest, and a patch of rare montane alluvial forest. Some of the area shows evidence of past logging or clearing in the form of old roads, haul tracks, cut stumps, and dominance of white pine (*Pinus strobus*) in the landscape. The northern section of the property was settled and cleared, possibly for grazing or farming, and young forest and fields now characterize this area. The Orchard Hollow tract shares a mile of border with the Great Smoky Mountains National Park along its south/southeast edge and elsewhere lies adjacent to private property. Fall Ridge forms a steep wall along the western property edge, while Fall Branch drops steeply off along the tract's northeast eastern boundary. Residential land use borders the tract's northeastern corner, where Fall Branch's floodplain broadens out and becomes less steep. Over a mile of perennial streams flow through the Orchard Hollow tract, including Fall Branch, Rush Branch, and their tributaries. All the streams have their origin in the national park or are headwaters stream that emerge on the property. All streams are in healthy condition with little sign visible of impairment.

### **Methods**

Prior to conducting field inventory, Joe Pye Ecological collected a set of geospatial data for landscape analysis and to help guide survey priorities. Data was acquired from Tremont Institute and the National Park Service's Integrated Resource Management Application (IRMA) Portal. Relevant data layers used to develop a survey plan include aerial imagery, Landsat 8 color infrared imagery, LIDAR-derived canopy structure data, digital elevation model-derived elevation contours, and geospatial soil, geology, and vegetation data. Analysis of this dataset helps the surveyor develop an initial impression of natural communities present on the tract and potential areas high biodiversity or unique ecosystems. Examples include rock outcrops, wetlands, old-growth forest, steep mountain coves, and early-successional or disturbed forest patches.

Field surveys were carried out at two intervals in the spring, a prime season for observing the greatest amount of species of plants and animals. This period includes the growing season for spring ephemeral wildflowers, migration and breeding season for songbirds, and an active period for amphibians, some of the key taxa groups for the region and focal points for this inventory. Field visits were made during daylight hours on April 24-25 and May 23-24, 2019.

Priority areas from the geospatial analysis were targeted and qualitatively surveyed for readily-observable taxa, including vascular plants, birds, herpetofauna, and showy invertebrates. Presence of certain wildlife species was inferred through tracks and scat and reports from Tremont staff. Birds were primarily identified by song and occasional visual observation. Salamanders and the few other amphibians and reptiles encountered were found by flipping cover objects, such as rocks, logs, and moss mats. Invertebrates were casually encountered and noted while traversing the property. Priority areas were surveyed until no additional species were encountered. Species of note and unidentified specimens were photographed, and their location recorded with GPS. Unidentified plants were collected, and specimens were later identified using a variety of references and dichotomous keys. Data layers showing the location of natural communities, non-native invasive plants, and other noteworthy features are provided in a geospatial database separate from this report.

Natural communities were mapped by taking field observations and notes on vegetation at multiple points across the tract. Observation points were mapped with GPS, and canopy composition, vegetation structure, and shrub and herb assemblages were characterized at each point. GPS points

are also used to record continuity of community types, transitions between them, and the location of discreet features, such as outcrops and seeps. The array of points is then superimposed on the above-mentioned geospatial data layers to produce polygons that reasonably approximate the pattern of forest communities and patch habitats across the landscape. Community types were broadly grouped into categories for mapping and to develop plant lists. These categories were synonymized with the National Vegetation Classification (NVC), and references are made to the corresponding NVC associations in the Natural Community section.

### Summary of Inventory Results

The Orchard Hollow tract is representative of a low montane environment in the western Blue Ridge. The property is botanically diverse and supports several features of natural significance. The tract is home to slightly over 300 vascular plants, including at least 7 orchids, 13 species of ferns, and countless wildflowers. Several plant species present on the tract are highlighted either because of their showy nature, their infrequent occurrence, or association with specific habitat. Some of the showy wildflower species are found in the cove forest, including Indian pink (*Spigelia marilandica*), sweet white trillium (*Trillium simile*), and spotted mandarin (*Prosartes maculatum*). An uncommon plant species for the area, hairy mock orange (*Philadelphus hirsutus*), grows in the outcrops on Fall Ridge. A fire-adapted orchid, small spreading pogonia (*Cleistes bifaria*), occurs in Low Mountain Pine Forest under thick cover on the slopes above Fall Branch. Though recently deceased, a 30' tall American chestnut (*Castanea dentata*) measuring 6" in diameter stands on the slopes of Fall Ridge and is the largest of its species found on the tract.

Other highlighted species include Carolina buckthorn (*Frangula caroliniana*), hairy blueberry (*Vaccinium hirsutum*), southern black haw (*Viburnum rufidulum*), southern adder's tongue (*Ophioglossum vulgatum*), pink lady's-slipper (*Cypripedium acaule*), pennywort (*Obolaria virginica*), and Virginia wingstem (*Verbesina virginica*).

Orchard Hollow contains a mosaic of foothill natural communities and good quality examples of several forest types, including relatively rare Montane Alluvial Forest. Principal communities include xeric Low Mountain Pine Forest, Rich Cove Forest with a diverse herb layer, Acidic Cove with dense ericaceous understory, and mature stands of Chestnut Oak Forest on upper slopes. Large areas of semi-natural white pine forest also occur in Orchard Hollow. Several natural community occurrences are significant because of their condition or extent, such as the high-quality Low Mountain Pine Forest on the knoll in the southeastern corner of the tract and the mature stand of Chestnut Oak Forest on the steep eastern side of Fall Ridge. The gentle upper floodplain of Fall Branch supports a relatively uncommon community: Montane Alluvial Forest, which includes an unusual patch dominated by sweet gum (*Liquidambar styraciflua*). Several smaller patch communities create diversity on the property and break up the continuity of the forest, such as a multi-channel seepage complex on Fall Branch, the only wetlands present, and areas of small rock outcrops scattered in several sections of the property.

The tract is diverse in terms of wildlife, and despite limited sampling techniques, a number of animal species were noted. The tract has relatively high diversity of herpetofauna given its generally dry nature. Five species of salamanders, two frogs, one snake, and one turtle were observed on the property during casual surveys. Seeps, springs, and small streams provide ample habitat for amphibians, while open, xeric pine forest provides good foraging habitat for snakes. Abundant

habitat exists for breeding birds, and more than a dozen migratory species were observed, including wood thrush (*Hylocichla mustelina*), which is a priority species for conservation.

As a note of ecological importance, despite the infestation of hemlock woolly adelgid, Canada hemlock (*Tsuga canadensis*) is still a prominent species in Orchard Hollow and many viable trees persist. Hemlock frequently occurs in the understory and often in the canopy, and many small-medium trees are candidates for treatment. The density of living hemlock and the actions of Tremont Institute to save the species are helping to guarantee a future for this conifer on the tract.

The property contains over a mile of high-quality perennial streams in two separate watersheds. Both principal streams that flow through the tract originate in the national park and are in undisturbed condition. Additionally, several headwater streams to Fall Branch and Rush Branch originate on the Orchard Hollow tract. Acquisition of the property ensures the protection of Rush Branch, the entirety of which flows through the Great Smoky Mountains National Park (GSMNP) or privately conserved land.

### Flora

Over three hundred species of vascular plants were identified growing on the Orchard Hollow tract, including many species of trees, shrubs, wildflowers, grasses, and ferns (Table 3). The most botanically diverse community was Rich Cove Forest, containing over half of the species known from the tract. Ruderal areas, roadsides, fields, and edges also had very high plant diversity. Acidic Cove Forest and rock outcrops were the least diverse communities, supporting less than two dozen species each. Several species of interest that are uncommon, particularly showy, or associated with special habitats are present on the property and are highlighted in this report. Many of these species are considered uncommon or rare in the Great Smoky Mountains National Park.

#### American Chestnut (*Castanea dentata*)

American chestnut is a functionally extinct species in the wild, though trees continue to stump-sprout from persistent rootstock. Large surviving trees are rarely found still producing viable fruit in the wild in east Tennessee and the Cumberland Plateau. This species was observed occasionally in dry oak-hickory and pine forest on the Orchard Branch tract. A lone, tall chestnut that had just recently succumbed was observed on the steep east-facing slopes of Fall Ridge. The dead stem measured 6" in diameter and was estimated to be 30' high. New sprouts were emerging from the base when observed in May 2019.



#### Small Spreading-Pogonia (*Cleistis bifaria* or *Cleistesiosis bifaria*)





This orchid is described as growing in moist to fairly-dry meadows and on dry ridgetops under pines (where seasonally moist). It is distributed in the central and Southern Appalachians from West Virginia south and west to Georgia and Alabama and occurs occasionally in the Tennessee Blue Ridge. *Cleistos* species seem to benefit from fire, often reappearing and flowering following burns. Small-spreading pogonia is considered scarce at low elevations in the Great Smoky Mountains National Park. A single non-flowering small spreading pogonia was seen in Low Mountain Pine Forest with a dense shrub layer on the east side of Fall Branch. The presence of this fire-adapted orchid suggests that fire may play a role in the ecology of the Orchard Hollow tract.

#### Pink Lady's-Slipper (*Cypripedium acaule*)

Pink lady's-slipper orchid is one of the most recognized and iconic eastern wildflowers, growing from Canada south to Georgia and west to Tennessee. Pink lady's-slipper is rare in the state outside of east Tennessee. It grows in dry – mesic acidic forests and woodlands, especially under pines. Pink lady's-slipper is not rare and occurs on the Orchard Hollow tract in several locations typically in pine or dry oak forest.

#### Carolina Buckthorn (*Frangula caroliniana*)

Carolina buckthorn is a woody species of dry to moist barrens, woodlands, and forests over mafic and calcareous rock. It is native of the southeast from southwestern Virginia west to Missouri and south to Florida and Texas. While it is a fairly-common shrub across most of Tennessee, it is scarce in the Great Smoky Mountains National Park and becomes infrequent east of the Blue Ridge. Two seedlings of Carolina buckthorn were growing around the outcrops and in the rich forest on the north-face of Fall Ridge.



Carolina buckthorn

#### Pennywort (*Obolaria virginica*)

Pennywort is another herb that, while not rare, is easily overlooked. Its small size, distinctive foliage, and whorl of flowers make it unique in the forest. Pennywort grows in nutrient-rich, moist to dry forests from New



Jersey south to Florida and Louisiana. It is considered frequent in east Tennessee but only occasional at low elevations in the Great Smoky Mountains National Park. On the Orchard Hollow tract, one pennywort plant was growing in a small patch of Rich Cove Forest at the head of a tributary to Fall Branch. Because of its early spring ephemeral nature, it should be sought out in April and early May.

#### Southern Adder's Tongue Fern (*Ophioglossum vulgatum*)

While not necessarily rare, southern adder's tongue is an easily overlooked species of fern and is infrequently encountered. Also referred to as *Ophioglossum pycnostichum*, adder's-tongue fern occurs in bottomland forests and moist loamy soils of successional forests and old fields from New Jersey south to Florida and Mexico. Southern adder's-tongue fern is considered scarce at low elevations in the Great Smoky Mountains National Park. The plants were found on the edge of the disturbed forest on the northern section of the property.

#### Hairy Mock-Orange (*Philadelphus hirsutus*)

Hairy mock-orange is a shrub of calcareous outcrops, bluffs, and rich rocky woods. It is found in the Appalachians from northern Alabama through much of Tennessee and western North Carolina. Hairy mock-orange is considered common in east Tennessee but is scarce at low elevations in the neighboring national park. A single plant was observed in vegetative condition in the outcrop on the east flank of Fall Ridge.



Hairy mock-orange

#### Spotted Mandarin (*Prosartes maculata*)



Spotted mandarin is described from nutrient-rich deciduous forest, especially cove forests. It occurs throughout the southeast and is common in east Tennessee but has a fragmented distribution elsewhere and is considered rare or uncommon in parts of its range. It is most distinctive for its spotted petals and white, ciliate fruit, which distinguish it from its more common congener yellow mandarin (*P. lanuginosa*).

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### Indian Pink (*Spigelia marilandica*)

Indian pink is one of the showiest wildflowers on the Orchard Hollow property, where it grows primarily in Rich Cove Forest and rich oak-hickory. Indian pink is described as occurring in woodlands and forest, usually with circumneutral soils from western NC and SC south and west to Florida and Texas. Indian pink is relatively common in most of Tennessee but is at the eastern edge of its range in the Blue Ridge and is infrequently seen in the Great Smoky Mountains National Park.



### Sweet White Trillium (*Trillium simile*)

Sweet white trillium is endemic to the Southern Appalachians, where it is found on rich slopes and covers over mafic or calcareous rock. Sweet white trillium is known from NC, SC, north Georgia,



and several counties in east Tennessee, and is observable nearby in the national park in suitable habitat. This species grows in a small, rich outcrop above the slopes of Rush Branch, surrounded by early-successional cove forest.

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Hairy Blueberry (*Vaccinium hirsutum*)

This species of blueberry is endemic to a small area of the Southern Appalachians in north Georgia, east Tennessee, and western North Carolina. Its habitat is mountain slopes and ridges in mixed pine and dry oak forests. Hairy blueberry is considered to occur infrequently in the Tennessee Blue Ridge and Great Smoky Mountains National Park. It is distinctive for its fuzzy leaves, stems, and even hairy edible fruits! Hairy blueberry was observed in disturbed successional forest on the north-facing slope of Fall Ridge close to the edge of the fields.



Hairy blueberry

White Crownbeard (*Verbesina virginica*)

White crownbeard or frostweed is a tall composite of moist to dry forests over mafic or calcareous rock that grows from North Carolina west to Kansas and south to Florida and Texas. It is not a listed species and occurs occasionally in east Tennessee but is considered rare at low elevations in the Great Smoky Mountains National Park. White crownbeard was observed growing scattered in the field on the north edge of the Orchard Hollow property.



Southern Black Haw (*Viburnum rufidulum*)

Southern black haw is a common shrub across much of the southeast and Tennessee, where it grows in dry-mesic woodlands and forests especially over mafic substrates. Despite its widespread frequency, this species is uncommon in the Blue Ridge and considered rare at low elevations in the Great Smoky Mountains National Park.



Southern black haw

## Natural Communities

The Orchard Hollow tract contains an exceptional suite of natural communities for low elevations in the western Blue Ridge and surrounding foothills (Table 1). Communities range from xeric to very mesic at the extremes, though much of the tract is relatively dry and mesic zones are restricted to coves, the alluvial flat on Fall Branch, and seepage areas. Dry oak and pine forest cover much of the landscape with white pine (*Pinus strobus*), pitch pine (*P. rigida*), and chestnut oak (*Quercus montana*) as dominant species. Coves and valleys support rhododendron-dominated Acidic Cove Forest or Rich Cove Forest with diverse herbaceous layer. The gentle upper reach of Fall Branch contains a sizable patch of Montane Alluvial Forest and includes an area dominated by sweet gum. A large seepage complex also occurs in the alluvial flat on Fall Branch, and small outcrops are scattered across the tract, principally on Fall Ridge and the pine knoll on the eastern side of the property. Because of recent past disturbance, the northern section of the property is difficult to classify and is referred to as Early Successional Forest and Grassy Fields.

Community	Acres	National Vegetation Classification (NVC) Analog	NVC CEGL Code
Acidic Cove Forest	16	Southern Appalachian Acidic Cove Forest (Typic Type)	007543
Acidic Outcrops and Cliffs	<1	Appalachian Felsic Cliff	004980
Chestnut Oak Forest	22	Appalachian Montane Oak - Hickory Forest (Chestnut Oak Type), Chestnut Oak Forest (Mesic Slope Heath Type), Chestnut Oak Forest (Subxeric Ridge Type)	007267 , 006286 , 006271
Early Successional Forest & Grassy Fields	8	Ruderal Eastern White Pine Forest, Appalachian Ruderal Hardwood Forest, Ruderal Virginia Pine Forest, Cultivated Grassland	007944 , 007219 , 002591 , 004048
Low Elevation Seep	<1	Southern Appalachian Wet Seepage Meadow	008438
Low Mountain Pine Forest	36	Appalachian Low-Elevation Mixed Pine / Blue Ridge Blueberry Forest, Blue Ridge Table Mountain Pine - Pitch Pine Woodland (Typic Type)	007119 , 007097
Montane Oak-Hickory Forest	7	Appalachian Montane Oak - Hickory Forest (Typic Acidic Type)	007230
Montane Alluvial Forest	10	Appalachian Montane Alluvial Forest, Montane Sweetgum Alluvial Flat	004691 , 007880
Rich Cove Forest	16	Southern Appalachian Rich Cove Forest (Typic Type)	007710
White Pine Forest	33	Southern Appalachian White Pine Forest, Appalachian White Pine - Mesic Oak Forest, Appalachian White Pine - Subxeric Oak Forest	007100 , 007517

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Table 1. Natural Communities and Corresponding National Vegetation Classification Types

**Acidic Cove Forest** occurs along streams, coves, and lower slopes above Fall Branch. White pine (*Pinus strobus*), red maple (*Acer rubrum*), tulip poplar (*Liriodendron tulipifera*), black birch (*Betula lenta*), Fraser magnolia (*Magnolia fraseri*), and eastern hemlock (*Tsuga canadensis*) are the dominant canopy species, though hemlock has been heavily affected by the hemlock woolly adelgid. Rosebay rhododendron (*Rhododendron maximum*) and mountain doghobble (*Leucothoe fontanesiana*) form a dense shrub layer along with other infrequent species such as sweetshrub (*Calycanthus floridus*) and mountain pepperbush (*Clethra acuminata*). The herb layer is sparse with the exception of evergreen species like Christmas fern (*Polystichum acrostichoides*) and occasional rich cove herbs. Acidic Cove transitions to White Pine Forest as well as Montane Alluvial Forest around the flat on Fall Branch. Approximately 16 acres of Acidic Cove Forest are mapped on the Orchard Hollow Tract.



**Acidic Outcrops and Cliffs** are present throughout the Orchard Hollow tract. Most of the outcrops are individually small, though a complex made up of several outcrops and small cliffs occurs on the north tip of Fall Ridge. Outcrops tend to be acidic and sterile, though they consistently support bryophytes and lichens and have small grottoes that provide habitat for invertebrates and small mammals. A typical suite of rock-loving plants is associated with the outcrops, including downy alumroot (*Heuchera villosa*), American alumroot (*H. americana*), deerberry (*Vaccinium stamineum*), southern harebell (*Campanula divaricata*), rock polypody (*Polypodium virginianum*), marginal woodfern (*Dryopteris marginalis*), ebony spleenwort (*Asplenium platyneuron*), and maidenhair spleenwort (*A. trichomanes*). The presence of certain highlighted plants in outcrops, such as sweet white trillium (*Trillium simile*) and hairy mock-orange (*Philadelphus hirsutus*), is suggestive of a higher pH status at those specific sites.



Acidic Outcrop

**Chestnut Oak Forest** is the principal oak-dominated community on the tract, extending over 22 acres on upper slopes and ridges. Canopy species include chestnut oak (*Quercus montana*), red oak (*Q. rubra*), scarlet oak (*Q. coccinea*), white pine, black gum (*Nyssa sylvatica*), and red maple. Sourwood (*Oxydendrum arboreum*) is common in the understory. Though chestnut oak is consistently dominant, the shrub and herb layer vary significantly across forest types, and several



variations of this community are recognized with corresponding National Vegetation Classification associations. Chestnut Oak Forest is one of the more mature forest communities on the tract, and especially mature areas occur on the north-trending ridges above Rush Branch and the northeast flank of Fall Ridge, where oaks can reach 18 – 24” in diameter.

Chestnut Oak Forest with a dense shrub layer of mountain laurel (*Kalmia latifolia*) and buckberry (*Gaylussacia ursina*) occurs on drier slopes and ridges. The shrub layer is dominated by dense



Chestnut Oak Forest

ericaceous plants, typically mountain laurel and buckberry, but may also include rosebay rhododendron and blueberries (*Vaccinium* spp.). Herbs are sparse and include evergreen species, such as galax (*Galax urceolata*), rattlesnake plantain (*Goodyera pubescens*), and spotted wintergreen (*Chimaphila maculata*). Chestnut Oak Forest in humid settings, such as on steep mid-slopes above a riparian zone or near shaded outcrops, tends to have a simple shrub layer filled with rhododendron. Other occasional species include witch-hazel (*Hamamelis virginiana*), mountain laurel, Christmas fern, and galax. Another version of Chestnut Oak Forest has an open shrub layer with greater herbaceous development. This variety of chestnut oak forest occurs on upper slopes and ridges, particularly on the northeast flank of Fall Ridge. The canopy is dominated by chestnut oak along with scarlet oak, occasional black oak (*Quercus velutina*), hickories (*Carya* spp.), and pitch pine (*Pinus rigida*). Understory species include sassafras (*Sassafras albidum*), sourwood, and flowering dogwood (*Cornus florida*). The shrub layer is open but may contain scattered mountain laurel, buffalo nut (*Pyralia pubera*), wild hydrangea (*Hydrangea arborescens*), and strawberry bush (*Euonymus americana*). Herbs are sparse but fairly diverse and include Indian cucumber-root (*Medeola virginiana*), New York fern (*Thelypteris noveboracensis*), Solomon’s plume (*Maianthemum racemosum*), slender woodland sedge (*Carex digitalis*), witchgrasses (*Dichanthelium* spp.), short-husk grass (*Brachyelytrum erectum*), and devil’s bit (*Chamaelirium luteum*). Gray-bark grape (*Vitis cinerea*) is a common vine.

**Early Successional Forest** describes the patchwork of early-successional woodlands and thickets on the northern section of the property. The area was formerly cleared likely for agriculture, grazing, and settlement, and is now regenerating into a young forest except where still maintained open. Because of past land use, this area contains a high density of non-native invasive and ruderal species of plants. Nonetheless, the rich nature of the soils is apparent in the diversity and composition of native species that persist in this zone. The young forest is a mix of hardwood and conifer-dominated areas.

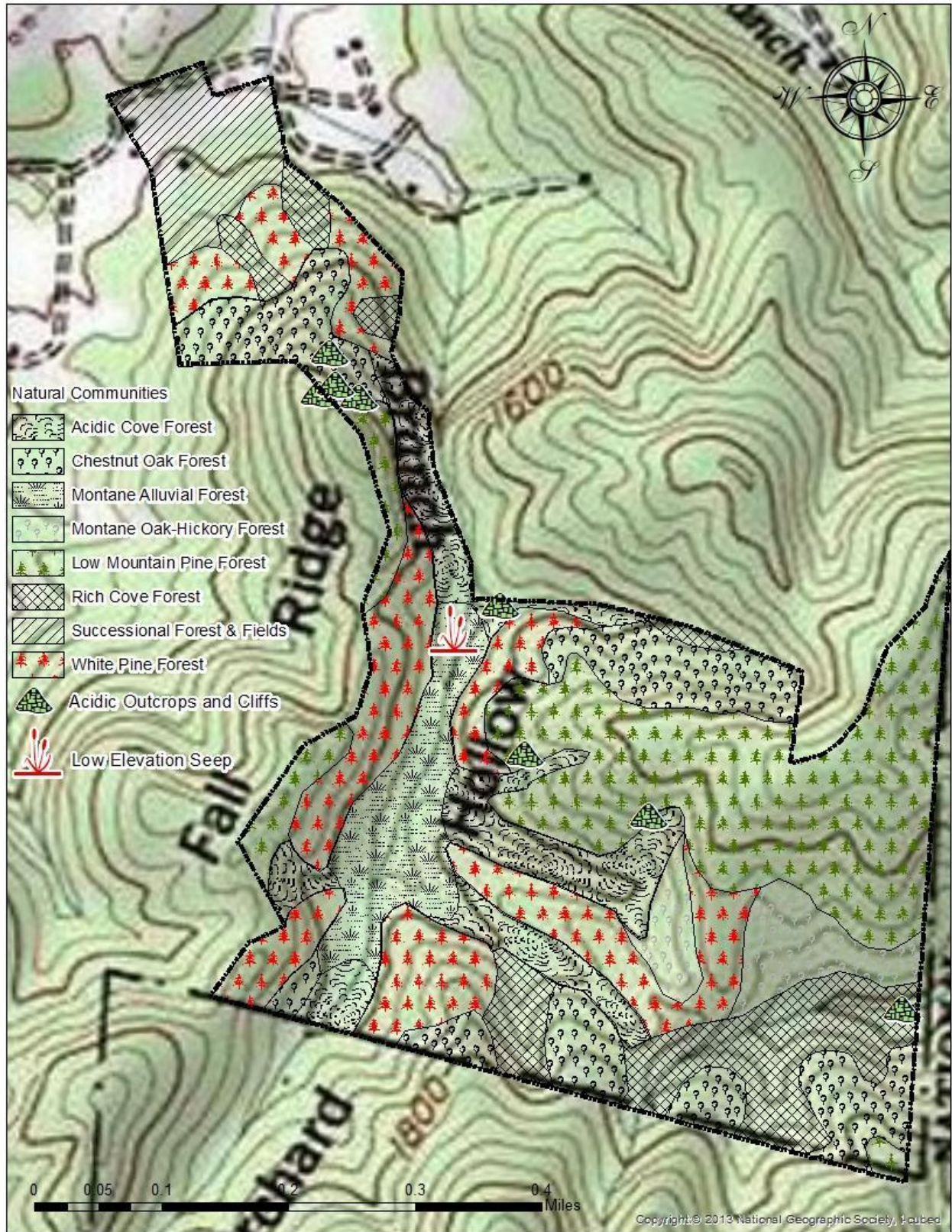


Figure 3. Natural Communities of Orchard Hollow Tract

The steeper slopes support a mix of Virginia pine, white pine, and hemlock. The hemlocks are generally quite healthy and will soon dominate patches of this forest if woolly adelgids are thwarted. Portions of the forest closer to the fields contain a mix of hardwoods, including tulip poplar, black walnut (*Juglans nigra*), box elder (*Acer negundo*), honey locust (*Gleditsia triacanthos*), sweetgum, red maple, southern red oak (*Quercus falcata*), and winged elm (*Ulmus alata*). Young conifers and eastern red cedar (*Juniperus virginiana*) are mixed in with the hardwoods, and large red cedars, likely planted, are present on the northwest edge of the property.

Several non-native species are firmly established in young forest on the northern edge of the tract: mimosa (*Albizzia julibrissin*), Bradford pear (*Pyrus calleryana*), princess tree (*Paulownia tomentosa*), autumn olive (*Elaeagnus umbellata*), Chinese privet (*Ligustrum sinense*), Oriental bittersweet (*Celastrus orbiculata*), Japanese honeysuckle (*Lonicera japonica*), and multiflora rose (*Rosa multiflora*). Ornamental introductions include Eglantine rose (*R. rubiginosa*) and Chinese chestnut (*Castanea mollissima*), which is planted on the edge of the property and is naturalizing in the woods nearby. Another ornamental plant, spotted deadnettle (*Lamium maculatum*), is acting as a noxious invader and is rapidly spreading along the northwest edge of the property. Despite the overall degradation of this portion of the property, the remnant native plant assemblage suggests that the area is quite rich and still supports rich cove species. An unusual fern, southern adder's tongue (*Ophioglossum vulgatum*), grows in the rich, disturbed woods... a typical environment for the species. Finally, several seepage areas flow through the young forest but are not well-developed and mostly covered with invasive and ruderal species.

**Grassy Fields** are maintained on the very northern edge of the property. A large field occurs along the northwest edge of the tract, and fields were expanded along the northern edge where brush-cutting recently took place. The fields are maintained open and free of tall woody vegetation, though young saplings and patches of blackberry (*Rubus argutus*) are common. The fields are comprised of a mix of grasses, tall forbs, and vines including tall fescue (*Lolium arundinaceum*), orchard grass (*Dactylis glomerata*), annual bluegrass (*Poa annua*), sweet vernal grass (*Anthoxanthum odorata*), wingstem (*Verbesina alternifolia*), Joe-pye-weed (*Eupatorium fistulosum*), heartleaf aster (*Symphotrichum cordifolium*), agrimony (*Agrimonia parviflora*), hog-peanut (*Amphicarpaea bracteata*), fleabane daisy (*Erigeron annuus*), corn salad (*Valerianella radiata*), dogbane (*Apocynum* sp.), and gray-bark grape (*Vitis cinerea*). White crownbeard (*Verbesina virginica*), one of the uncommon plants noted in the Flora section, grows in the fields on the northern edge of the Orchard Hollow tract.

The **Low Elevation Seep** complex on Fall Branch is embedded within the alluvial forest and is comprised of several connected, braided wetland channels that form parallel to Fall Branch and its tributaries. The seeps are small and narrow and are made up of fine, mucky sediment, cobbles and stones with shallow standing water. The seeps are shaded by the canopy of the surrounding alluvial flat. Shrubs occur in and around them, including spicebush (*Lindera benzoin*), winterberry (*Ilex verticillata*), and dense mountain doghobble and rhododendron. Wetland species of sedges and forbs dominate the small wetlands, such as bent sedge (*Carex styloflexa*), brome sedge (*C. bromoides* var. *bromoides*), drooping sedge (*C. prasina*), white turtlehead (*Chelone glabra*), soft rush (*Juncus effusus*), and water horehound (*Lycopus virginicus*). Tip-up mounds, large woody debris, and mats of moss are frequent in the seeps, though *Sphagnum* moss is not present. Several species of salamanders inhabit the seeps as well and are covered in the Wildlife section of this report. Additional smaller seeps occur in the headwater streams of Fall Branch and Rush Branch (Figure 4).

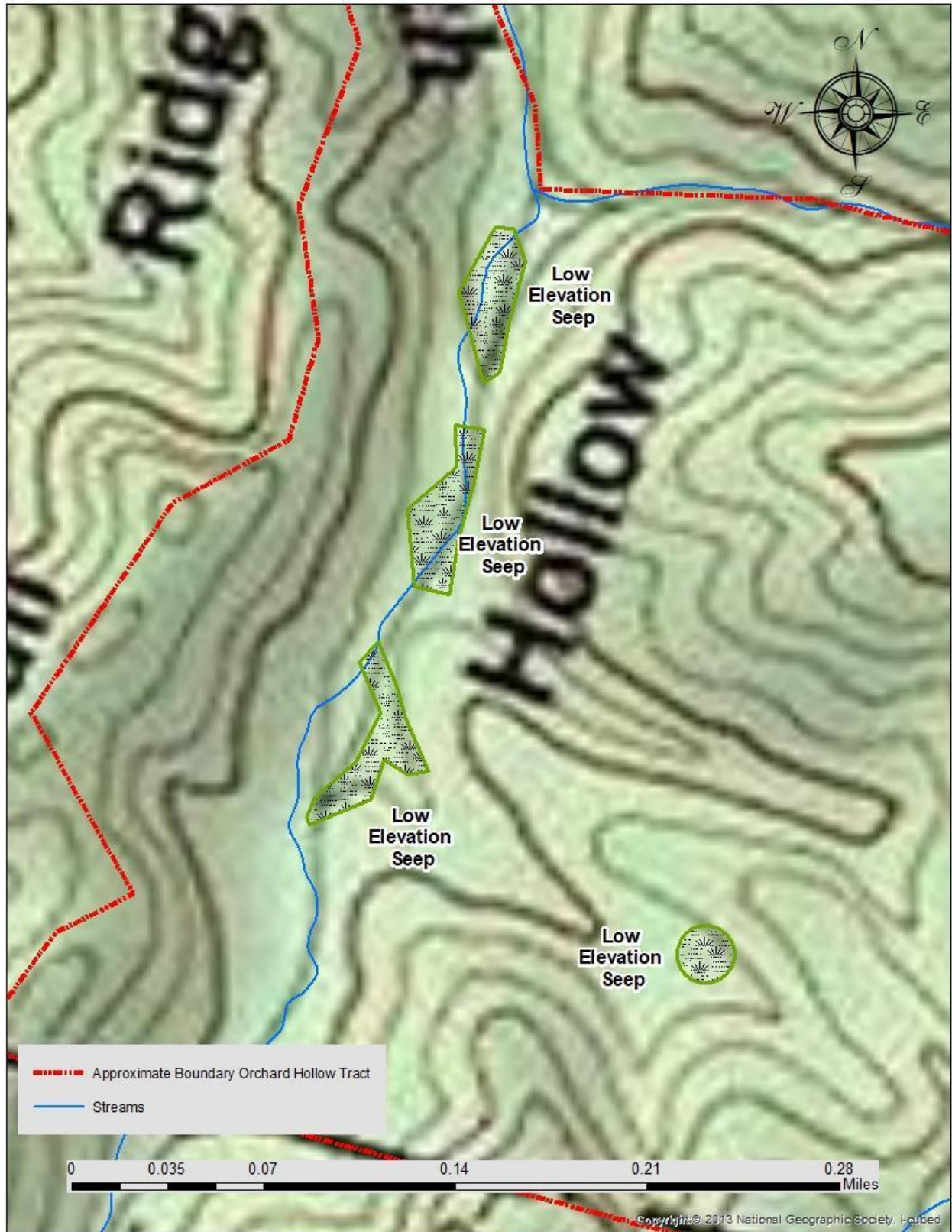
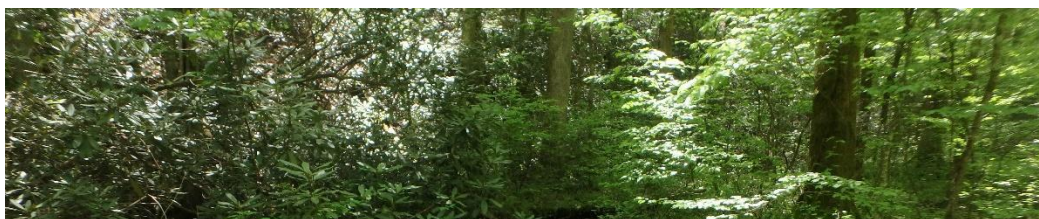


Figure 4. Approximate Boundary of Low Elevation Seeps



The quality and extent of the **Low Mountain Pine Forest** on the Orchard Hollow property is noteworthy. Approximately 36 acres of this forest type occur on the tract, and the knoll in the southeastern corner contains the largest block of contiguous pine forest. Low Mountain Pine Forest is characterized by a diversity of pine species including pitch pine (*Pinus rigida*), Virginia pine (*P. virginiana*), occasional Table Mountain (*P. pungens*), and shortleaf pine (*P. echinata*). Ubiquitous white pine and hardwoods such as chestnut oak, scarlet oak, and black gum may be present in the canopy as well. American holly and



### Low Elevation Seep

sourwood are common in the understory along with blackjack oak (*Quercus marilandica*), a low-growing oak of dry, poor soils. The shrub layer is comprised of dense mountain laurel, low-bush blueberry, black huckleberry (*Gaylussacia baccata*), chinquapin (*Castanea pumila*), Carolina holly (*Ilex ambigua*), and maleberry (*Lyonia ligustrina*). The herb layer is best developed in openings, where xeric and fire-adapted plants grow, including galax, bracken fern (*Pteridium aquilinum*), poverty oatgrass (*Danthonia spicata*), little bluestem (*Schizachyrium scoparium*), witchgrasses (*Dichanthelium* spp.), goat's rue (*Tephrosia virginiana*), wintergreen (*Gaultheria procumbens*), trailing arbutus (*Epigaea repens*), Carolina lily (*Lilium michauxii*), white-topped aster (*Sericocarpus asteroides*), and creeping aster (*Eurybia surculosa*). A fire-adapted orchid occurs in this community on the northwest flank of the pine knoll: small spreading pogonia (*Cleistis bifaria*). Low Mountain Pine Forest on exposed south-facing slopes has a semi-open canopy and low shrub layer, an excellent condition with greater overall diversity and potential habitat for wildlife such as timber rattlesnakes and other reptiles. Patches of pine forest on the north-trending ridges above Rush Branch resemble another variant of the community: **Blue Ridge Table Mountain Pine - Pitch Pine Woodland**. This community is characterized by pitch pine dominant in the canopy and a simplified shrub layer dominated by mountain laurel. The examples in Orchard Hollow lack Table Mountain pine. Low Mountain Pine Forest was heavily affected in the recent past by a southern pine bark beetle (*Dendroctonus frontalis*) infestation that killed many yellow pine trees.

Seven acres of **Montane Oak-Hickory Forest** were mapped on the Orchard Hollow property. This forest type is characterized by having white oak in the canopy along with black oak (*Quercus velutina*) and other oak species, pignut hickory (*Carya glabra*), and mockernut hickory (*Carya alba*). Sourwood, flowering dogwood, American holly (*Ilex opaca*), and witch hazel commonly occur in the understory. A dense shrub layer is comprised of mountain laurel, lowbush blueberry (*Vaccinium pallidum*), deerberry (*V. stamineum*), and Allegheny blackberry (*Rubus allegheniensis*). A number of typical forest ferns and forbs are found in the herb layer, including hay-scented fern (*Dennstaedtia punctilobula*), New York fern, Christmas fern, southern harebell (*Campanula divaricata*), devil's bit, spotted wintergreen, galax, bowman's root (*Gillenia trifoliata*), variable panicgrass (*Dichanthelium commutatum*), whorled loosestrife (*Lysimachia quadrifolia*), halberd-leaved violet (*Viola hastata*), and Solomon's plume. Patches of Montane Oak-Hickory Forest are present on gentle south-facing

slopes near the divide between Rush Branch and Fall Branch. Additional small patches are found in a mosaic with Chestnut Oak, Rich Cove, and White Pine Forest on the slopes of Fall Ridge.

**Montane Alluvial Forest** occurs in the gentle floodplain of Fall Branch before it steeply drops off. Fall Branch flows through the forested valley, and several tributaries and seepage channels are also present within the alluvial forest. This community is a mosaic of vegetation types, including one variant of alluvial forest that is considered uncommon in the Great Smoky Mountains National Park:

**Montane Sweetgum Alluvial Flat.** Canopy trees include tulip poplar, sycamore (*Platanus occidentalis*), yellow buckeye (*Aesculus flava*), and Fraser magnolia. Canada hemlock has dropped out of the canopy and is quickly being replaced by black birch. A portion of the alluvial flat contains frequent sweetgum (*Liquidambar styraciflua*), which is indicative of the rare community type mentioned above. The understory is comprised of

hornbeam (*Carpinus caroliniana*), flowering dogwood (*Cornus florida*), and silverbell (*Halesia tetraptera*). The shrub layer is variable with some herb-dominated pockets along the creek and in seeps. Much of the alluvial flat is dominated by shrubs of some sort, mostly rosebay rhododendron mountain doghobble with occasional buffalo nut (*Pyrularia pubera*), mountain pepperbush, buckberry, and wild hydrangea (*Hydrangea arborescens*). A diverse herb layer grows in openings along the creek and includes spotted geranium (*Geranium maculatum*), horsebalm (*Collinsonia canadensis*), silvery spleenwort (*Deparia acrostichoides*), marsh violet (*Viola cucullata*), bloodroot (*Sanguinaria canadensis*), Solomon's plume (*Maianthemum racemosum*), Catesby's trillium (*Trillium catesbaei*), and wood nettles (*Laportea canadensis*). The southern portion of the gentle floodplain on Fall Branch has sweet gum co-dominant in the canopy along with sycamore and white pine and best corresponds to Montane Sweetgum Alluvial Flat natural community. This portion of the floodplain has also many hemlock trees, and canopy gaps are frequent.



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There are indications that the floodplain was historically disturbed and possibly cleared, i.e. the roads and trails around its perimeter and the channel of Fall Branch, which looks as if it was altered or moved at some time in the past.

**Rich Cove Forest** with a diverse herbaceous layer is a prominent community in the southeastern corner of the tract adjacent to the Great Smoky Mountains National Park. Rich Cove Forest supports the greatest number of wildflowers and is home to several unique and uncommon plant species. Rush Branch and its north-facing tributary coves support the bulk of this diverse forest type, though pockets also occur along Fall Branch and one of its tributaries. Rich cove forms a mosaic with oak and white pine-dominated forest types on the north-face of Fall Ridge as well. The canopy is dominated by tulip poplar with a variety of other mesic species such as Canada hemlock, pignut

hickory (*Carya glabra*), bitternut hickory (*C. cordiformis*), sugar maple (*Acer saccharum*), basswood (*Tilia americana*), yellow buckeye, silverbell, and occasional black walnut (*Juglans nigra*). White ash (*Fraxinus americana*) was infrequently present in the canopy but has been killed by the emerald ash borer (*Agrilus planipennis*), and now only young saplings persist in the shrub layer. Understory species include striped maple (*Acer pensylvanicum*), red mulberry (*Morus rubra*), American holly, slippery elm (*Ulmus rubra*), and occasional hop-hornbeam (*Ostrya virginiana*). The shrub layer is moderately well-developed with spicebush, wild hydrangea, buffalo nut, strawberry bush (*Euonymus americana*), and alternate-leaf dogwood (*Cornus alternifolia*).

The most notable feature of Rich Cove Forest is the diverse herbaceous layer that it supports, and the examples on Rush Branch and Orchard Hollow are no exception. Besides many of the noteworthy species highlighted in the Flora section, a long list of wildflowers and ferns adapted to rich soils is present. Characteristic species include maidenhair fern (*Adiantum pedatum*), rattlesnake fern (*Botrychium virginianum*), broad beech fern (*Phegopteris hexagonoptera*), silvery spleenwort, black cohosh (*Actaea racemosa*), false goat's beard (*Astilbe biternata*), dwarf crested iris (*Iris cristata*), enchanter's nightshade (*Circaea canadensis*), yellow wakerobin (*Trillium luteum*), white beebalm (*Monarda clinopodia*), star chickweed (*Stellaria pubera*), white snakeroot (*Ageratina altissima*), and clustered black snakeroot (*Sanicula odorata*). Several orchid species, including showy orchis (*Galearis spectabilis*) and putty root (*Aplectrum hyemale*), also grow in Rich Cove Forest on the Orchard Hollow tract.

**White Pine Forest** is one of the most extensive communities on the Orchard Hollow tract, covering over 30 acres of sheltered slopes and gentle ridgelines. The canopy is dominated by medium - large white pine mixed with variable array of other tree species like pitch pine, Virginia pine, chestnut oak, and other hardwoods. The understory may contain sourwood, flowering dogwood, striped maple, and witch-hazel (*Hamamelis virginiana*). The shrub layer is comprised of mountain laurel, rosebay rhododendron, buckberry, buffalo nut, and blueberries (*Vaccinium* spp.). Vines, like greenbriar (*Smilax rotundifolia*) and grapes (*Vitis* spp.), are common. Open areas support a mesic herb layer with Christmas fern, hay-scented fern (*Dennstaedtia punctilobula*), New York fern, Indian cucumber-root (*Medeola virginiana*), galax, partridge berry (*Mitchella repens*), snakeroot (*Prenanthes* sp.), halberd-leaf violet (*Viola hastata*), and common blue violet (*V. rotundifolia*). Areas of white pine-dominated forest on the north face of Fall Ridge support a rich herb layer similar to the adjacent cove forest. While White Pine Forest naturally occurs in the region, it has also expanded in response to disturbance and clearing, and this probably the case for white pine-dominated forest on the Orchard Hollow tract. In particular, the extent of white pine-dominated forest has increased on the tract where yellow pine has been killed by the recent southern pine bark beetle (*Dendroctonus frontalis*) infestation.

### Fauna

Despite the cursory nature of animal surveys, a handful of wildlife and invertebrate species were detected, including some frogs and salamanders, birds, butterflies, and a few mammals (Table 2). Birds were the most readily detectable taxa group, observed primarily by ear. Other taxa groups were encountered incidentally during surveys or while flipping cover objects such as rocks and logs. Mammal species were identified based on tracks, scat, and reports of Tremont staff.

Abundant habitat exists for breeding birds on the Orchard Hollow tract, and 32 species were detected during mid and late spring surveys, including more than a dozen migratory species.



Common breeding birds on the property include Black-Throated Green Warbler (*Setophaga virens*), Northern Parula (*S. americana*), Scarlet Tanager (*Piranga olivacea*), and Wood Thrush (*Hylocichla mustelina*), which is considered a priority species for conservation by the Audubon Society. The Audubon Society considers many of the breeding bird species on the tract to be “climate threatened” species.

Several species are characteristic birds of Orchard Hollow, having been repeatedly observed in specific habitats on the property. Worm-Eating Warbler (*Helmitheros vermivorum*) is a frequent breeder in dry, shrubby oak forest on steep slopes. Hooded Warblers (*Setophaga citrina*) are ubiquitous in dense ericaceous shrubs such as rhododendron in coves and along streams. Two species associated with riparian areas are Acadian Flycatcher (*Empidonax virescens*) and Louisiana Waterthrush (*Parkesia motacilla*), both of which breed in the alluvial flat along Fall Branch. Birds of open habitats are more common in the heterogenous northern section of the property, for example Indigo Bunting (*Passerina cyanea*), Chipping Sparrow (*Spizella passerina*), and Field Sparrow (*Spizella pusilla*). Also heard occasionally calling in the vicinity of the Orchard Hollow tract were game species: ruffed grouse (*Bonasa umbellus*) and wild turkey (*Meleagris gallopavo*). Red-breasted nuthatch (*Sitta canadensis*), a species strongly associated with coniferous forests, was also heard on the tract. Two raptors, broad-wing hawk (*Buteo platypterus*) and red-shouldered hawk (*B. lineatus*) both occur on the property.

The tract has relatively high diversity of herpetofauna given its generally dry nature. Five species of salamanders, two frogs, one snake, and one turtle were observed on the property during casual surveys. Seeps, springs, and small streams provide ample habitat for salamanders on the tract. Seal salamander (*Desmognathus monticola*) was the most common species found, though blackbelly (*D. quadramaculatus*), spotted dusky (*D. conanti*), and Blue Ridge two-line salamander (*Eurycea wilderae*) were all present in seeps. The only terrestrial salamander encountered, southern redback (*Plethodon serratus*), was found under a log along a tributary to Fall Branch in Rich Cove Forest. Additional species are likely occur and will be found with continued searches. Of the frog species encountered, two hylids, spring peeper (*Pseudacris crucifer*) and Cope’s gray tree frog (*Hyla chrysoscelis*), were both heard on the northern edge of the property. A wood frog (*Lithobates sylvaticus*) was found crawling up the surveyor’s pant leg...the true meaning of an incidental wildlife observation! A box turtle (*Terrapene caroliniana*) was found transiting through Chestnut Oak Forest above a tributary to Fall Branch. Though only one snake, worm snake (*Carphophis amoenus*), was detected, excellent foraging/basking habitat for snakes and lizards is present in patches of low, dry shrubs on the pine knoll above Fall Branch.



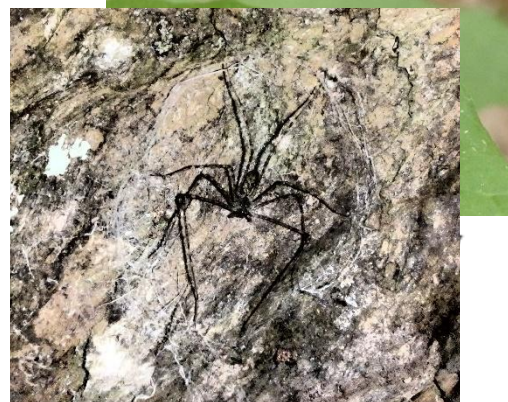
**Southern Redback  
Salamander**

Table 2. List of Fauna Observed on Orchard Hollow Tract

AMPHIBIANS AND REPTILES
<i>Carphophis amoenus</i> - Eastern Wormsnake
<i>Desmognathus conanti</i> - Spotted Dusky Salamander
<i>Desmognathus monticola</i> - Seal Salamander
<i>Desmognathus quadramaculatus</i> - Common Black-bellied Salamander
<i>Eurycea wilderae</i> - Blue Ridge Two-lined Salamander
<i>Hyla chrysoscelis</i> - Cope's Gray Treefrog
<i>Lithobates sylvaticus</i> - Wood Frog
<i>Plethodon serratus</i> - Southern Red-backed Salamander
<i>Pseudacris crucifer</i> - Spring Peeper
<i>Terrapene carolina</i> - Eastern Box Turtle
BIRDS
<i>Baeolophus bicolor</i> - Tufted Titmouse
<i>Bonasa umbellus</i> - Ruffed Grouse
<i>Buteo lineatus</i> - Red-shouldered Hawk
<i>Buteo platypterus</i> - Broad-winged Hawk
<i>Cardinalis cardinalis</i> - Northern Cardinal
<i>Coccyzus americanus</i> - Yellow-billed Cuckoo
<i>Contopus virens</i> - Eastern Wood-Pewee
<i>Cyanocitta cristata</i> - Blue Jay
<i>Dryocopus pileatus</i> - Pileated Woodpecker
<i>Empidonax virescens</i> - Acadian Flycatcher
<i>Helmitheros vermivorum</i> - Worm-eating Warbler
<i>Hylocichla mustelina</i> - Wood Thrush
<i>Melanerpes carolinus</i> - Red-bellied Woodpecker
<i>Meleagris gallopavo</i> - Wild Turkey
<i>Mniotilta varia</i> - Black-and-white Warbler
<i>Parkesia motacilla</i> - Louisiana Waterthrush
<i>Passerina cyanea</i> - Indigo Bunting
<i>Pipilo erythrophthalmus</i> - Eastern Towhee
<i>Piranga olivacea</i> - Scarlet Tanager
<i>Poecile carolinensis</i> - Carolina Chickadee
<i>Seiurus aurocapilla</i> - Ovenbird
<i>Setophaga americana</i> - Northern Parula
<i>Setophaga citrina</i> - Hooded Warbler
<i>Setophaga dominica</i> - Yellow-throated Warbler
<i>Setophaga virens</i> - Black-throated Green Warbler
<i>Sitta canadensis</i> - Red-breasted Nuthatch
<i>Spizella passerina</i> - Chipping Sparrow

Spizella pusilla - Field Sparrow
Thryothorus ludovicianus - Carolina Wren
Vireo olivaceus - Red-eyed Vireo
Vireo solitarius - Blue-headed Vireo
Zenaida macroura - Mourning Dove
INVERTEBRATES
Calopteryx maculata - Ebony Jewelwing
Celastrina ladon - Spring Azure
Erynnis juvenalis - Juvenal's Duskywing
Hypochilus coylei - A Lampshade Weaver
Limenitis arthemis - Red-spotted Purple
Megisto cymela - Little Wood-Satyr
Mesembrina sp. - Orange-Winged Fly
Narceus americanus - American Millipede
Necrophilia americana - American Carrion-Beetle
Nymphalis antiopa - Mourning Cloak
Papilio glaucus - Eastern Tiger Swallowtail
Pieris virginiensis - West Virginia White
Plathemis lydia - Common Whitetail
Sigmoria sp. - Cherry Millipede
Speyeria cybele - Great Spangled Fritillary
Thyris sepulchralis - Mournful Thyris
MAMMALS
Canis latrans - Coyote
Didelphis virginiana - Virginia Opossum
Lynx rufus - Bobcat
Procyon lotor - Common Raccoon
Sciurus carolinensis - Eastern Gray Squirrel
Ursus americanus - American Black Bear

More than a dozen invertebrate species were recorded during surveys on the property, a very small number given the potential for biodiversity that exists. Some of the species are regional indicator species for the Southern Appalachians. For example, the West



Virginia White (*Pieris virginiana*) is a butterfly species typical of more northern latitudes with a distribution that extends southward along the Southern Appalachians. Orange-winged flies

### Little Wood Satyr

### Lampshade Spider

(*Mesembrina* spp.) are restricted to mountain forests and are rarely found outside this region. Lampshade spiders (*Hypochilus pococki*), which were encountered in most rock outcrops in Orchard Hollow, are another example of a montane species with a restricted geographic range. Though abundant forested habitat and edges exists on the Orchard Hollow tract, the best open habitat for butterflies and odonates are the grassy fields on the northern edge of the property. Several species were observed foraging in the open meadow, including Eastern Tiger Swallowtail (*Papilio glauca*), Red-Spotted Purple (*Limenitis arthemis*), and Little Wood Satyr (*Megisto cymela*).

### Noteworthy Natural Features

Several noteworthy natural features merit attention from a curiosity standpoint, if not for conservation sake. An odd chestnut oak tree grows in a tributary to Fall Branch near the gap with Rush Branch. The tree is bent over and has unusually small leaves for this species, almost half the size of an ordinary chestnut oak. A specimen of the tree was collected and, besides leaf size, nothing else about the tree deviates from the characters of *Quercus montana*. It is not clear why this tree has such unusual morphology, though it could possibly be an environmentally induced adaptation resulting from the tree's stooped, bent position.

Another unusual feature is an isolated stream reach at the head of Rush Branch. One of the small tributary branches disappears into a sump hole and flows underground for several hundred feet before reappearing downslope. There are no obvious signs of disturbance in the small stream valley, and the unusual stream pattern appears to be natural.

As a note of ecological importance, Canada hemlock (*Tsuga canadensis*) is a prominent species across the tract, frequently occurring in the understory and often in the canopy. Despite infestation by the hemlock woolly adelgid (*Aldeges tsugae*), many small-medium trees have survived and have adequate crown health to justify treatment. Pockets of particularly high density occur on the northern portion of Orchard Hollow - on the northwest flank of Fall Ridge and the gentles slopes in the far northeastern corner of the tract. The density of living hemlock and the proactiveness of Tremont in treating viable trees have helped to guarantee a future for this important species on the Orchard Hollow tract.

## Human Features

Though not entirely within the purview of the present inventory, several anthropogenic features were noted on the tract that may warrant further attention from a trained archeologist or local historian. Some of these observations pertain to the most recent period of settlement, while others possibly relate to Native American habitation. An old outhouse is present on the northern end of the tract just inside the wood line from the open fields along the property edge. Old rusted metal barrels were found in at least three remote coves on the property, possibly signs of former moonshining or bear baiting activity. Though potentially of natural origin, strange “markings” were noted on a very old beech tree in Rush Branch. These “markings” were recorded given their suspicious appearance. Finally, two plant species frequently used by native people grow on the northern portion of the property around the fields and clearings: honey locust (*Gleditsia triacanthos*) and dogbane (*Apocynum* sp.). Though both plants are adventive and may be naturally growing on the tract, it is sometimes suggested that they represent ethnobotanical traces of Native American settlement.



Old metal barrel in woods...used as a still?

## Challenges to Conservation and Management Recommendations

Several threats to the ecological integrity of Orchard Hollow and its mosaic of natural communities were noted during surveys on the property. While these concerns have the potential to undermine the conservation values of the tract, they also present opportunities to improve and restore the resources present. Non-native invasive plants are particularly problematic on the disturbed northern section of the property, and some exotic plants are beginning to invade the more intact southern half of Orchard Hollow. In general, the disturbed northern portion of the tract presents a challenge of how to restore or maintain a sense of naturalness. Invasive exotic and ruderal vegetation dominate and young, overstocked forest covers much of the area. Portions of the Orchard Hollow tract show signs of fire adaptation, and suppression of natural fire has caused shrubs to encroach and has limited pine regeneration and the development of an herbaceous layer. The seepage wetland on Fall Branch is the most sensitive community on-site and should be protected accordingly. Finally, efforts to treat Canada hemlock are encouraged and should be expanded where possible to include white ash.

### Non-native Invasive Plants (NNIP)

NNIP species heavily encroach the northern section of the property and are spreading to intact portions of the tract. Species of concern include princess tree (*Paulownia tomentosa*), mimosa (*Albizia julibrissin*), and an ornamental invasives - spotted deadnettle (*Lamium maculatum*) and Eglantine rose (*Rosa rubiginosa*). Oriental bittersweet (*Celastrus orbiculatus*), Chinese privet (*Ligustrum sinense*), and Japanese honeysuckle (*Lonicera japonica*) have densely colonized formerly disturbed areas on the northern section of the property. To address these infestations, a strategy needs to be developed that will identify priority areas for treatment. Efforts can be categorized according to the threat posed by the infestation vs. the ease of treatment. Given the relatively intact nature of the southern half of the property, emphasis should likely be placed on maintaining this area invasive-free and controlling the few NNIP that have already established there. A GIS database of NNIP locations and other management concerns is provided with this inventory report.

### Disturbed Northern Section

The northern section of the property was highly disturbed in the past and is in relatively unnatural condition. This area was probably settled as indicated by the old outhouse and likely pastured and cleared until recently. Young successional vegetation made up of a mix of ruderal and NNIP species dominates this portion of the property. Non-native trees, shrubs, and vines form dense thickets in places. Despite the compromised nature of this area, native species persist, and areas of seepage are present as well. Ideally, a management plan should be developed for this disturbed northern zone. Possible strategies for management include control of NNIP, promotion of native species, restoration of a native plant community, or conversion to other habitat type such as warm season grass field or pollinator meadow.

### Fire Suppression

Significant portion of the property supports pine and oak forests that would benefit from periodic fire. Low Mountain Pine Forest is a natural community with many plant species particularly adapted to fire. This community also supports a unique habitat structure, i.e. low shrub layer, that is beneficial to wildlife and would expand with low-moderate intensity fire. Given recent concern about wildfire risk in the region, opportunities may exist to partner with the Great Smoky

Mountains National Park and other federal and state entities to pursue prescribed fire as management tool for the property. The prime location for prescribed fire is the pine knoll on the eastern edge of the property, an area that conveniently borders the national park.

#### Wetland Protection

The seepage complex on Fall Branch is significant in providing a distinct wetland habitat of considerable size and complexity. A host of plants and animals are found in this community that are not present elsewhere on the tract. Seepage wetlands are by nature sensitive environments, prone to invasion by NNIP species, hydrologic alteration, and disturbance from rooting feral hogs. Efforts should be made to minimize impacts to the wetland complex. Additional monitoring is recommended to identify additional species of conservation significance and any potential threats before they impact the wetlands.

#### Tree Pests - Hemlock Woolly Adelgid and Emerald Ash Borer

The Orchard Hollow tract supports a large population of Canada hemlock trees with many viable individuals persisting in the understory and even in the canopy. Tremont has been proactive in mapping and treating many of the trees already. A GIS database of principal hemlock locations was already provided to Tremont to support treatment efforts. Continued chemical treatment is encouraged, and introduction of predator beetles, e.g. *Laricobius* spp., could be considered for portions of the property where trees have not yet been chemically treated. White ash (*Fraxinus americana*) trees killed by the emerald ash borer (*Agrilus planipennis*) were noted on the tract. Though few additional surviving ash were observed, efforts to find and treat surviving trees could help locally safeguard this forest tree for a time.



## References

- Audubon Society. Guide to North American Birds. Website. <https://www.audubon.org/bird-guide>. Accessed June 2019.
- Brock, J.P. and K. Kaufman. 2003. Field Guide to the Butterflies of North America. Hillstar Editions L.C. Tuscon, AZ.
- Chester, E.W, S.E. Wofford, J. Shaw, D. Estes, and D.H. Webb. 2015. Guide to the Vascular Plants of Tennessee. University of Tennessee Press. Knoxville, TN.
- Conant, R. and J.T. Collins. 1998. A Field Guide to the Reptiles and Amphibians of Eastern and Central North America. Houghton Mifflin Company, New York, New York.
- Keith, R. and M. Hedin. 2012. Extreme mitochondrial population subdivision in southern Appalachian paleoendemic spiders (Araneae: Hypochilidae: Hypochilus), with implications for species delimitation. *The Journal of Arachnology*. 40(2):167-181.
- Kumar, J., J. Weiner, W.W. Hargrove, S.P. Norman, F.M. Hoffman, and D. Newcomb. 2015. Characterization and classification of vegetation canopy structure and distribution within the Great Smoky Mountains National Park using LiDAR. Proc. Intern. Conf. Data Mining (ICDM 2015)
- Madden, M., R. Welch, T. Jordan, P. Jackson, R. Seavey, and J. Seavey. 2004. Digital Vegetation Maps for the Great Smoky Mountains National Park – Final Report. University of Georgia. Athens, GA.
- National Park Service IRMA Portal (Integrated Resource Management Applications). Website. <https://irma.nps.gov>. Accessed June 2019.
- Omernik, J.M. 1987. Ecoregions of the conterminous United States. Map (scale 1:7,500,000). *Annals of the Association of American Geographers*. 77(1):118-125.
- Sibley, D.A. 2000. *The Sibley Guide to Birds*. Alfred A. Knopf, Inc. NY, NY.
- Southworth, S., A. Schultz, J.N. Aleinikoff, and A.J. Merschat. 2012. Geologic Map of the Great Smoky Mountains National Park Region, Tennessee and North Carolina: U.S. Geological Survey, Scientific Investigations Map SIM-2997, scale 1:100,000 (*GRI Source Map ID 75646*).
- Tilley, S.G and J.E. Huheey. 2001. Reptiles and Amphibians of the Smokies. Great Smoky Mountains Natural History Association. Gatlinburg, TN.
- USDA Soil Conservation Service. 1959. Soil Survey of Blount County, Tennessee. U.S. Government Printing Office. Washington, DC.
- United States National Vegetation Classification [USNVC]. 2017. United States National Vegetation Classification Database, V2.01. Federal Geographic Data Committee, Vegetation Subcommittee, Washington DC. [usnvc.org](https://usnvc.org). Accessed June 2019.
- Weakley, A.S. 2015. Flora of the Carolinas, Virginia, and Georgia: Working Draft of May 21, 2015. North Carolina Botanical Garden. University of North Carolina, Chapel Hill, NC.

White, P.S. 1982 The Flora of Great Smoky Mountains National Park: An Annotated Checklist of the Vascular Plants and a Review of Previous Floristic Work. Research/Resource Management Report SER-55. National Park Service. Revised 3/98 by John Boetsch, Don DeFoe, Bob Dellinger, Keith Langdon, and Janet Rock, National Park Service.

White, R.E. 1983. A Field Guide to the Beetles of North America. Houghton Mifflin Company. NY, NY.

Table 3. List of Vascular Plant Species for Orchard Hollow Tract

Species	Natural Community Codes								
	1	2	3	4	5	6	7	8	9
<i>Acer negundo</i> - boxelder									X
<i>Acer pensylvanicum</i> - striped maple		X	X	X		X			
<i>Acer rubrum</i> - red maple	X	X	X	X	X	X			X
<i>Acer saccharum</i> - sugar maple		X							
<i>Actaea racemosa</i> - black cohosh		X							
<i>Adiantum pedatum</i> - northern maidenhair		X							
<i>Aesculus flava</i> - yellow buckeye		X							
<i>Ageratina altissima</i> - white snakeroot		X							
<i>Agrimonia parviflora</i> - agrimony									X
<i>Albizia julibrissin</i> - mimosa		X							X
<i>Allium vineale</i> - wild garlic									X
<i>Ambrosia trifida</i> - great ragweed									X
<i>Amelanchier arborea</i> - common serviceberry			X	X	X				
<i>Amelanchier laevis</i> - Allegheny serviceberry			X	X	X	X			
<i>Amelanchier stolonifera</i> - running serviceberry					X				
<i>Amphicarpaea bracteata</i> - American hogpeanut		X	X						X
<i>Andropogon virginicus</i> - broomsedge					X				X
<i>Anemone quinquefolia</i> - wood anemone		X	X						
<i>Antennaria plantaginifolia</i> - plantain pussytoes			X						
<i>Antennaria solitaria</i> - solitary pussytoes			X						
<i>Anthoxanthum odoratum</i> - sweet vernalgrass									X
<i>Apios americana</i> - groundnut							X		
<i>Aplectrum hyemale</i> - putty root orchid		X							
<i>Apocynum</i> sp. - dogbane									X
<i>Aralia racemosa</i> - American spikenard		X						X	
<i>Aralia spinosa</i> - devil's walkingstick			X						X
<i>Arisaema triphyllum</i> - Jack in the pulpit		X		X			X		
<i>Asclepias exaltata</i> - poke milkweed		X							
<i>Asplenium platyneuron</i> - ebony spleenwort								X	X
<i>Asplenium trichomanes</i> - maidenhair spleenwort								X	
<i>Astilbe biternata</i> - false goat's beard		X							
<i>Athyrium asplenioides</i> - southern lady fern		X	X	X			X		
<i>Aureolaria laevigata</i> - entire-leaf false foxglove				X	X				
<i>Berberis bealei</i> - leatherleaf mahonia									X

Natural Community Codes: 1) Acidic Cove Forest, 2) Rich Cove Forest, 3) Montane Oak-Hickory Forest, 4) Chestnut Oak Forest, 5) Low Mountain Pine Forest, 6) White Pine Forest, 7) Low Elevation Seep, 8) Acidic Outcrops/Cliffs, 9) Early Successional Forest, Fields, and Roads



Cleistes bifaria - small spreading pogonia					X			
Clethra acuminata - mountain pepperbush	X	X						
Clintonia umbellulata – Clinton’s lily		X	X					
Collinsonia canadensis - horse balm		X	X					
Conopholis americana - American squawroot			X	X				
Cornus alternifolia – alternate-leaf dogwood		X	X	X				
Cornus florida – dogwood			X	X				
Crataegus viridis - green hawthorn		X						
Cryptotaenia canadensis - Canadian honewort		X				X	X	X
Cypripedium acaule - moccasin flower				X	X	X		
Dactylis glomerata - orchardgrass								X
Danthonia spicata - poverty oatgrass				X	X			X
Dennstaedtia punctilobula - hay-scented fern			X	X	X	X		
Deparia acrostichoides - silver false spleenwort		X						
Desmodium canescens - hoary tick-trefoil			X					X
Desmodium nudiflorum – naked-flower tick-trefoil			X	X				
Dichanthelium commutatum - variable panicgrass			X	X	X			
Dichanthelium latifolium - broadleaf rosette grass		X						
Dichanthelium sp. – panicgrass								X
Dioscorea villosa - wild yam		X	X	X				
Diospyros virginiana - common persimmon			X		X			X
Diphasiastrum digitatum - fan clubmoss								X
Dryopteris marginalis - marginal woodfern		X					X	
Duchesnea indica - Indian strawberry								X
Elaeagnus umbellata - autumn olive		X						X
Epifagus virginiana – beechdrops		X	X	X				
Epigaea repens - trailing arbutus			X	X	X			
Erigeron annuus - eastern daisy fleabane								X
Erigeron philadelphicus - Philadelphia fleabane								X
Erigeron pulchellus - robin's plantain		X						
Euonymus alata - winged burning bush								X
Euonymus americana - strawberry bush		X	X					
Eupatorium fistulosum – Joe-pye-weed								X
Eupatorium purpureum – sweet-scented Joe-pye-weed		X	X				X	
Eurybia divaricata – white wood aster			X	X				
Eurybia macrophylla - bigleaf aster			X	X				
Eurybia surculosa - creeping aster					X			
Fagus grandifolia - American beech		X	X	X				

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<i>Festuca subverticillata</i> - nodding fescue		X	X	X					
<i>Fragaria virginiana</i> - Virginia strawberry			X			X			X
<i>Frangula caroliniana</i> - Carolina buckthorn				X					
<i>Fraxinus americana</i> - white ash		X							
<i>Galax urceolata</i> - galax	X		X	X	X	X			
<i>Galearis spectabilis</i> - showy orchid		X							
<i>Galium triflorum</i> - bedstraw		X					X		X
<i>Gaultheria procumbens</i> - eastern teaberry			X	X	X	X			
<i>Gaylussacia baccata</i> - black huckleberry					X				
<i>Gaylussacia ursina</i> - bear huckleberry			X	X		X			
<i>Gentiana saponaria</i> - soapwort gentian									X
<i>Geranium maculatum</i> - spotted geranium		X					X		
<i>Geum canadense</i> - white avens						X			X
<i>Geum vernum</i> - spring avens									X
<i>Gleditsia triacanthos</i> - honey locust									X
<i>Goodyera pubescens</i> - downy rattlesnake plantain		X	X	X					
<i>Halesia tetraptera</i> - mountain silverbell		X	X						
<i>Hamamelis virginiana</i> - American witchhazel	X	X	X	X	X	X			
<i>Helianthus atrorubens</i> - purpledisk sunflower			X						X
<i>Heliopsis helianthoides</i> - smooth oxeye		X							
<i>Hemerocallis fulva</i> - orange daylily									X
<i>Hepatica acutiloba</i> - sharp-lobe hepatica		X						X	
<i>Heuchera americana</i> - American alumroot		X	X						
<i>Heuchera villosa</i> - hairy alumroot								X	
<i>Hieracium paniculatum</i> - Allegheny hawkweed			X	X					
<i>Hieracium scabrum</i> - rough hawkweed			X						
<i>Hieracium venosum</i> - rattlesnakeweed			X	X	X				
<i>Houstonia purpurea</i> - Venus' pride		X	X	X				X	
<i>Huperzia lucidula</i> - shining clubmoss		X							
<i>Hydrangea arborescens</i> - wild hydrangea		X	X				X	X	
<i>Hypericum stragulum</i> - St. Andrew's cross			X	X	X				X
<i>Hypoxis hirsuta</i> - yellow star grass				X	X				
<i>Ilex ambigua</i> - Carolina holly					X				
<i>Ilex opaca</i> - American holly		X	X			X	X		X
<i>Ilex verticillata</i> - common winterberry							X		
<i>Impatiens capensis</i> - jewelweed		X					X		
<i>Iris cristata</i> - dwarf crested iris		X							
<i>Juglans nigra</i> - black walnut		X							

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Juncus coriaceous - leathery rush								X
Juncus effusus - common rush						X		X
Juniperus virginiana - eastern redcedar								X
Kalmia latifolia - mountain laurel		X	X	X	X		X	
Lactuca floridana - woodland lettuce	X							
Lamium maculatum - spotted deadnettle	X							
Laportea canadensis - Canadian woodnettle	X					X		
Leersia virginica - Virginia cutgrass								X
Lespedeza cuneata - Chinese lespedeza								X
Leucothoe fontanesiana - highland doghobble	X				X	X		
Ligusticum canadense - Canadian licorice-root	X	X						
Ligustrum sinense - Chinese privet	X							X
Lilium michauxii - Carolina lily				X				
Lindera benzoin - northern spicebush	X					X		
Liquidambar styraciflua - sweetgum								X
Liriodendron tulipifera - tulip poplar	X	X	X	X		X		X
Lobelia cardinalis - cardinal flower						X		
Lolium arundinaceum - tall fescue								X
Lonicera japonica - Japanese honeysuckle	X				X			X
Lonicera maackii - Amur honeysuckle								X
Lycopus virginicus - Virginia water horehound						X		X
Lyonia ligustrina - maleberry		X	X	X				
Lysimachia quadrifolia - whorled yellow loosestrife		X	X	X	X			
Magnolia acuminata - cucumber-tree	X							
Magnolia fraseri- Fraser's magnolia	X	X	X	X	X	X		
Maianthemum racemosum - Solomon's plume		X	X	X		X		
Medeola virginiana - Indian cucumber		X	X	X		X		
Melanthium parviflorum - Appalachian bunchflower	X							
Microstegium vimineum - Japanese stiltgrass	X	X						X
Mimulus ringens - Allegheny monkeyflower						X		
Mitchella repens - partridgeberry	X	X	X	X	X	X	X	
Monarda clinopodia - white bergamot	X							
Morus rubra - red mulberry	X							
Nyssa sylvatica - black gum		X	X	X				
Obolaria virginica - pennywort	X							
Ophioglossum vulgatum - southern adder's-tongue								X
Osmorhiza claytonii - sweet cicely		X	X	X				X
Osmunda cinnamomea - cinnamon fern		X				X		

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<i>Ostrya virginiana</i> - hophornbeam		X							
<i>Oxalis grandis</i> - great yellow wood sorrel		X							
<i>Oxydendrum arboreum</i> - sourwood	X		X	X	X	X			
<i>Packera obovata</i> - roundleaf ragwort		X							
<i>Panicum anceps</i> - beaked panicgrass									X
<i>Parthenocissus quinquefolia</i> - Virginia creeper		X	X			X		X	X
<i>Passiflora lutea</i> - yellow passionflower			X						
<i>Paulownia tomentosa</i> - princess tree									X
<i>Persicaria virginianum</i> - jumpseed		X	X						
<i>Phegopteris hexagonoptera</i> - broad beech fern		X	X						
<i>Philadelphus hirsutus</i> - streambank mock orange								X	
<i>Phryma leptostachya</i> - American lopseed		X							
<i>Pilea pumila</i> - Canadian clearweed							X		
<i>Pinus echinata</i> - shortleaf pine					X				X
<i>Pinus pungens</i> - Table Mountain pine					X				
<i>Pinus rigida</i> - pitch pine				X	X				
<i>Pinus strobus</i> - eastern white pine	X	X	X	X	X	X		X	X
<i>Pinus virginiana</i> - Virginia pine					X	X			X
<i>Plantago major</i> - common plantain									X
<i>Platanthera clavellata</i> - small green wood orchid							X		
<i>Platanus occidentalis</i> - American sycamore		X							
<i>Poa annua</i> - annual bluegrass									X
<i>Polygonatum biflorum</i> - smooth Solomon's seal		X	X	X				X	
<i>Polypodium virginianum</i> - rock polypody								X	
<i>Populus alba</i> - white poplar									X
<i>Porteranthus trifoliatius</i> - Bowman's root			X						
<i>Potentilla canadensis</i> - dwarf cinquefoil			X	X	X	X			X
<i>Potentilla simplex</i> - common cinquefoil			X		X				X
<i>Prenanthes</i> sp. - rattlesnakeroot		X	X	X		X			
<i>Prosartes lanuginosum</i> - yellow mandarin		X							
<i>Prosartes maculatum</i> - spotted mandarin		X							
<i>Prunella vulgaris</i> - common selfheal									X
<i>Prunus serotina</i> - black cherry		X							X
<i>Pteridium aquilinum</i> - bracken fern					X				
<i>Pyrularia pubera</i> - buffalo nut			X	X		X			
<i>Pyrus calleryana</i> - Bradford pear									X
<i>Quercus alba</i> - white oak		X	X						
<i>Quercus coccinea</i> - scarlet oak			X	X	X				

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Quercus falcata - southern red oak			X						
Quercus marilandica - blackjack oak					X				
Quercus montana- chestnut oak			X	X	X	X			
Quercus rubra - northern red oak	X	X	X	X					
Quercus velutina - black oak			X	X	X	X			
Ranunculus recurvatus - hooked buttercup							X		
Rhododendron calendulaceum - flame azalea			X						
Rhododendron cumberlandense - Cumberland rhododendron			X						
Rhododendron maximum - great laurel	X		X	X	X	X	X	X	X
Robinia hispida - bristly locust					X				
Robinia pseudoacacia - black locust		X	X	X	X	X			X
Rosa multiflora - multiflora rose		X							X
Rosa rubiginosa - Eglantine rose		X							X
Rubus allegheniensis - Allegheny blackberry		X	X	X	X	X		X	X
Rubus argutus - sawtooth blackberry			X						X
Rubus cuneifolius - sand blackberry									X
Rubus flagellaris - northern dewberry					X				X
Ruellia sp. - wild petunia				X					
Rumex crispus - curly dock							X		X
Salvia lyrata - lyre-leaf sage									X
Sambucus canadensis - common elderberry							X		X
Sanguinaria canadensis - bloodroot		X							
Sanicula odorata - clustered blacksnakeroot		X							
Sanicula trifoliata - large-fruit blacksnakeroot		X	X						
Sassafras albidum - sassafras			X	X	X				
Schizachyrium scoparium - little bluestem					X				
Scirpus polyphyllus - leafy bulrush							X		X
Scleria oligantha - little-head nutrush					X				
Scutellaria incana - hoary skullcap		X							
Sedum ternatum - woodland stonecrop			X				X		
Sericocarpus asteroides - whitetop aster					X				
Sisyrinchium angustifolium - narrow-leaf blue-eyed grass		X							X
Smilax glauca - cat greenbrier		X	X	X	X	X			X
Smilax rotundifolia - roundleaf greenbrier		X	X	X	X	X		X	X
Smilax tamnoides - bristly greenbrier		X							X
Solidago arguta - Atlantic goldenrod			X	X		X			
Solidago curtisii - Curtis' goldenrod		X	X						
Solidago flaccidifolia - mountain goldenrod		X							

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<i>Solidago gigantea</i> - giant goldenrod										X
<i>Solidago odora</i> - anise-scented goldenrod				X						
<i>Spigelia marilandica</i> - Indian pink	X									
<i>Stachys nuttallii</i> - heartleaf hedgenettle	X									
<i>Stellaria media</i> - common chickweed	X									X
<i>Stellaria pubera</i> - star chickweed	X									
<i>Stenanthium gramineum</i> - eastern featherbells		X								
<i>Symphotrichum cordifolium</i> - heartleaf aster	X									X
<i>Symphotrichum lateriflorum</i> - calico aster	X	X	X							X
<i>Symphotrichum retroflexum</i> - rigid whitetop aster	X	X	X							X
<i>Taenidia integerrima</i> - yellow pimpernel	X									
<i>Thalictrum clavatum</i> - mountain meadow-rue								X		
<i>Thelypteris noveboracensis</i> - New York fern	X	X	X	X	X					
<i>Tiarella cordifolia</i> - heartleaf foamflower	X							X		
<i>Tilia americana</i> - American basswood	X									
<i>Tipularia discolor</i> - crane fly orchid	X	X								
<i>Toxicodendron radicans</i> - eastern poison ivy	X	X			X			X	X	X
<i>Trillium catesbaei</i> - bashful wakerobin	X	X								
<i>Trillium grandiflorum</i> - snow trillium	X									
<i>Trillium luteum</i> - yellow wakerobin	X									
<i>Trillium simile</i> - jeweled wakerobin									X	
<i>Trillium vaseyi</i> - sweet wakerobin	X									
<i>Tsuga canadensis</i> - eastern hemlock	X	X	X	X	X	X				X
<i>Ulmus alata</i> - winged elm										X
<i>Ulmus rubra</i> - slippery elm	X									
<i>Uvularia perfoliata</i> - perfoliate bellwort	X	X								
<i>Uvularia puberula</i> - mountain bellwort		X	X	X						
<i>Vaccinium hirsutum</i> - hairy lowbush blueberry		X								
<i>Vaccinium pallidum</i> - Blue Ridge blueberry		X	X	X	X					
<i>Vaccinium stamineum</i> - deerberry		X	X	X						
<i>Valerianella radiata</i> - beaked corn salad										X
<i>Verbesina alternifolia</i> - wingstem										X
<i>Verbesina virginica</i> - frostweed										X
<i>Viburnum acerifolium</i> - mapleleaf viburnum			X	X		X				
<i>Viburnum rufidulum</i> - southern black haw	X									
<i>Vinca minor</i> - common periwinkle	X									X
<i>Viola blanda</i> - sweet white violet	X	X						X		
<i>Viola cucullata</i> - marsh blue violet	X							X		

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Viola hastata – halberd-leaf yellow violet			X	X	X	X			
Viola pedata – bird-foot violet					X				
Viola pubescens - downy yellow violet		X							
Viola sororia - common blue violet		X	X	X		X			X
Vitis cinerea – gray-bark grape		X	X			X		X	
Vitis rotundifolia - muscadine		X	X	X					X
Youngia japonica – Asiatic hawkbeard									X

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