

RICH COVE FOREST (FOOTHILLS INTERMEDIATE SUBTYPE)

Concept: Rich Cove Forests are low to mid elevation mesophytic mountain and foothill forests with a diverse mix of trees and herbs that includes species of richer soils such as *Fraxinus americana*, *Tilia americana* var. *heterophylla*, *Magnolia acuminata*, *Prunus serotina*, and *Aesculus flava*, along with more widely tolerant mesophytic species. The Foothills Intermediate Subtype covers examples in the foothills and periphery of the Blue Ridge, generally below 2000 feet, lacking a significant component of high pH, rich-site flora. The herbaceous layer of this subtype is fairly diverse, much more diverse than that of Acidic Cove Forest, but is often not as dense as it is in the other subtypes.

Distinguishing Features: Rich Cove Forests are distinguished by having a diverse mix of mesophytic trees and a diverse mix of herbs, both of which include species of richer soils. They are distinguished from the Mesic Mixed Hardwood Forests and Basic Mesic Forests of the Piedmont by having a large component of montane flora; montane species may be present in Basic Mesic Forests but generally only a few species at a given site and at low density. *Fagus grandifolia* is almost always a major component of the Piedmont communities, and *Tilia americana* var. *heterophylla*, *Aesculus flava*, *Magnolia acuminata*, *Betula alleghaniensis*, and *Betula lenta* are indicators of Rich Cove Forest. Montane Alluvial Forest communities may share many species with Rich Cove Forests, but they can be distinguished by the presence of characteristic species of floodplains, such as *Platanus occidentalis*, *Betula nigra*, and *Acer negundo*. Montane Alluvial Forests also tend to have a different mix of species, often including more from a broad range of moisture tolerances.

The Foothills Intermediate Subtype is distinguished from the Montane subtypes most easily by location and elevation. There are a few species largely confined to lower elevations, such as *Liquidambar styraciflua*, which distinguish the Foothills Subtype. Otherwise it is distinguished by a generally lower diversity, with its flora being a subset of the characteristic species of the Montane Intermediate Subtype. The herb layer, though fairly diverse, is generally not dense as it is in the Montane Intermediate Subtype. The characteristic Rich Cove Forest herbs may be present only at low density. Among species usually absent from the Foothills Intermediate Subtype include *Acer saccharum*, *Acer pensylvanicum*, *Impatiens pallida*, *Polygonatum pubescens*, *Clintonia umbellulata*, and *Maianthemum canadense*.

The Foothills Intermediate Subtype is distinguished from the Foothills Rich Subtype by the absence of strongly calciphilic species, such as *Aquilegia canadensis*, *Trillium simile*, *Asplenium rhizophyllum*, and *Cystopteris protrusa*. Some species shared by the Montane Intermediate and Foothills Rich subtypes, such as *Laportea canadensis*, are also absent or scarce.

Synonyms: *Liriodendron tulipifera* - *Tilia americana* var. *heterophylla* - (*Aesculus flava*) / *Actaea racemosa* Forest (CEGL007291).

Ecological Systems: Southern and Central Appalachian Cove Forest (CES202.373).

Sites: Rich Cove Forests occur in sheltered mesic sites such as valley bottoms, ravines, lower slopes, and concave slopes. The Foothills Intermediate Subtype can occur on any geologic substrate, though it rarely occurs over mafic rocks.

Soils: The Foothills Intermediate Subtype occurs on a wide variety of soils. Occurrences are most often mapped as Typic Hapludults (Fannin, Cowee, Evard, Brasstown, Junaluska, Rion, Pacolet, and others), some are mapped as Typic Dystrudepts (Porters, Chestnut, Ashe) or Humic Dystrudepts (Tusquittee, Whiteoak). Soils are acidic but are presumed to be higher in pH, based saturation, and nutritive cations than those of Acidic Cove Forests and most drier forests, though lower than in the Foothills Rich Subtype.

Hydrology: Sites are well drained but mesic due to topographic sheltering, low slope position, and flow convergence. Most examples of the Foothills Subtype are in areas with drier climate than most of the Mountain Region.

Vegetation: The Foothills Intermediate Subtype forest is generally dominated by *Liriodendron tulipifera*, with a variety of other tree species abundant to scarce. *Fraxinus americana* and *Quercus rubra* are usually present. *Magnolia acuminata*, *Carya glabra*, *Prunus serotina*, *Carya cordiformis*, *Acer rubrum*, and even *Quercus montana* are frequent. *Tilia americana* var. *heterophylla* and *Aesculus flava* are frequent, but often sparse or only in the understory. *Fagus grandifolia* and *Magnolia acuminata* also often occur. The understory usually includes *Halesia tetraptera* and *Cornus florida*, as well as canopy species. The shrub layer is sparse to moderate. *Calycanthus floridus* and *Lindera benzoin* are usually present, and *Hydrangea arborescens* sometimes occurs. *Parthenocissus quinquefolia*, *Smilax rotundifolia*, and *Toxicodendron radicans* usually are present, along with small individuals of *Smilax glauca*. The herb layer is moderate to sparse in total cover and density. *Polystichum acrostichoides*, *Parathelypteris noveboracensis*, *Athyrium asplenoides*, *Eurybia divaricata*, or *Amphicarpaea bracteata* may dominate patches and be dense locally. Other high constancy species include *Actaea racemosa*, *Galium latifolium*, *Sanguinaria canadensis*, *Arisaema triphyllum*, *Botrypus virginianus*, *Dioscorea villosa*, *Maianthemum racemosum*, *Dichanthelium boscii*, *Endodeca serpentaria*, *Hylodesmum nudiflorum*, *Muhlenbergia tenuiflora*, *Phegopteris hexagonoptera*, *Prosartes lanuginosa*, *Tradescantia subaspera* and *Uvularia perfoliate*. Other frequent species include *Uvularia perfoliata*, *Adiantum pedatum*, *Caulophyllum thalictroides*, *Galium circaezans*, *Houstonia purpurea*, *Monarda clinopodia*, *Nabalus latissimus*, *Phryma leptostachya*, *Solidago curtisii*, *Stellaria pubera*, *Tiarella cordifolia*, *Trillium catesbaei*, *Viola canadensis*, *Viola sororia*, and *Galearis spectabilis*. Other characteristic species include *Arnoglossum reniforme*, *Circaea canadensis*, *Collinsonia canadensis*, *Galium triflorum*, *Iris cristata*, *Osmorhiza claytonia*, *Sanicula canadensis*, *Sanicula smallii*, and *Thalictrum dioicum*.

Range and Abundance: Ranked G4?, but perhaps better treated as G3G4. In North Carolina, the Foothills Intermediate Subtype is uncommon in the foothills ranges and in a few gorges and lower elevation areas in the Blue Ridge itself. Rich Cove Forest occupies a much smaller part of the landscape in these areas than in the higher mountains. The equivalent association is attributed to South Carolina, Georgia, and uncertainly to Tennessee. Because most of the acreage of low elevation fringe and foothills on the west and south are in other states, this association probably is more abundant outside of North Carolina.

Associations and Patterns: The Foothills Intermediate Subtype occurs as small to large patches. Patches generally are smaller than those of the Montane Intermediate Subtype, possibly because

the drier low elevation conditions require more topographic sheltering to support it. Acidic Cove Forest appears to also be more abundant in the foothills than Rich Cove Forest. Occurrences grade to various oak forests on drier slopes. They may grade to Acidic Cove Forest in other mesic areas. Small patches of Montane Cliff, Rich Montane Seep, or Low Elevation Seep may be embedded.

Variation: Two variants are recognized, based on the author's experience. Variation should also be sought between the eastern foothills and those occurrences on the west side of the Blue Ridge.

1. Typic Variant best fits the description above.
2. Acidic Transition Variant is less diverse and contains a smaller subset of characteristic Rich Cove Forest species. The canopy generally contains *Fraxinus americana*, *Magnolia acuminata*, or *Prunus serotina*, as well as species shared with Acidic Cove Forest, but it lacks most of the other characteristic species. The herb layer generally contains *Amphicarpaea bracteata*, *Brachyelytrum erectum*, *Phegopteris hexagonoptera*, *Dichantheium boscii*, or *Ageratina altissima*, along with the species shared with Acidic Cove Forest, but the herb layer lacks many other characteristic Rich Cove Forest species. This variant should only be recognized where it covers a significant area without being transitional between another variant and an adjacent community. It is scattered throughout the foothills but appears to be much less common than the Typic Variant. A comparable variant occurs in the Montane Intermediate Subtype.

Dynamics: Dynamics probably are similar to those of other Rich Cove Forests. Fire was more frequent at lower elevations, but, as in other cove forests, the sheltered moist sites where these communities occur reduce fire effects.

Comments: The foothills have generally been less studied than the core of the Blue Ridge, at least in North Carolina. Ulrey (2002) did not include these lower elevation areas in his broad analysis of mesic forests. The NVC description notes that the equivalent association was first distinguished in analysis of plot data in the Chattooga River basin and lists several species that distinguish it from higher elevation cove forests.

The cause of the distinction between Acidic Cove Forest and Rich Cove Forest is not well known. Acidic Cove Forest predominates more in the foothills and Blue Ridge escarpment than in the higher mountains. Occurrences of Rich Cove Forest may partly depend on underlying rock type, even where the rock is not distinctive enough to support the Foothills Rich Subtype.

Rare species:

References:

Ulrey, C.J. 2002. The relationship between soil fertility and the forests of the Southern Appalachian region. Ph.D. dissertation, North Carolina State University, Raleigh.