

## *Betula alleghaniensis* / *Ribes glandulosum* / *Polypodium appalachianum* Forest

COMMON NAME Yellow Birch / Skunk-currant / Appalachian Rockcap Fern Forest  
SYNONYM Southern Appalachian Boulderfield Forest (Currant and Rockcap Fern Type)  
PHYSIOGNOMIC CLASS Forest (I)  
PHYSIOGNOMIC SUBCLASS Deciduous forest (I.B)  
PHYSIOGNOMIC GROUP Cold-deciduous forest (I.B.2)  
PHYSIOGNOMIC SUBGROUP Natural/Semi-natural (I.B.2.N)  
FORMATION Lowland or submontane cold-deciduous forest (I.B.2.N.a)

ALLIANCE *Betula alleghaniensis* - *Fagus grandifolia* - *Aesculus flava* Forest Alliance

CLASSIFICATION CONFIDENCE LEVEL 1

USFWS WETLAND SYSTEM Upland

### RANGE

#### **Globally**

This community is known from the high elevation regions of the Blue Ridge from West Virginia south to eastern Tennessee and western North Carolina and may extend into the adjacent Ridge and Valley and Appalachian Plateau provinces.

#### **Great Smoky Mountains National Park**

This community was sampled on the Mount Le Conte quadrangle and was not found on the Cades Cove quadrangle. It is likely in other areas of the Park and should be sought on steep slopes and boulderfields at elevations over 5000 feet, particularly in areas adjacent to spruce (*Picea rubens*) and fir (*Abies fraseri*) forests. On the Mount Le Conte quadrangle, this community was sampled on the north slope of Mount Le Conte, on the Rainbow Falls Trail, at 5300 feet elevation.

### ENVIRONMENTAL DESCRIPTION

#### **Globally**

This community occurs in a cool, humid climate, on steep, boulder-strewn slopes, northwest- to northeast-facing, middle to upper concave slopes, or in saddles between ridges, at elevations of 1370 to 1600 meters (4500-5300 feet). Seepage areas are common, producing wet microhabitats with unique species assemblages. High winds and ice storms periodically affect these forests.

#### **Great Smoky Mountains National Park**

This community is found on steep, north-facing, periglacial boulderfields, above 5000 feet elevation. Disturbance by ice and wind is common.

### MOST ABUNDANT SPECIES

#### **Globally**

<u>Stratum</u>	<u>Species</u>
Tree canopy	<i>Betula alleghaniensis</i>
Tall shrub	<i>Acer spicatum</i>
Short shrub	<i>Ribes glandulosum</i>

#### **Great Smoky Mountains National Park**

<u>Stratum</u>	<u>Species</u>
Tree canopy	<i>Betula alleghaniensis</i>
Tall shrub	<i>Acer spicatum</i> , <i>Hydrangea arborescens</i> , <i>Viburnum lantanoides</i>
Short shrub	<i>Ribes glandulosum</i>
Herbaceous	<i>Aster chlorolepis</i> , <i>Dryopteris campyloptera</i>
Nonvascular	mosses
Epiphytes	<i>Polypodium appalachianum</i>

### CHARACTERISTIC SPECIES

#### **Globally**

*Betula alleghaniensis*, *Ribes glandulosum*, *Polypodium appalachianum*

#### **Great Smoky Mountains National Park**

*Betula alleghaniensis*, *Diervilla sessilifolia*, *Dryopteris campyloptera*, *Ribes glandulosum*, *Rugelia nudicaulis*, *Streptopus amplexifolius*, *Sorbus americana*

## VEGETATION DESCRIPTION

### **Globally**

This community is distinguished by a closed to somewhat open canopy dominated by *Betula alleghaniensis*, occurring over angular rocks (0.25 to > 1 m diameter) covered by thin soil, lichens, mosses or vines. The rocks may be almost totally covered by moss. *Betula alleghaniensis* in the canopy are often stunted and gnarled, with roots that may have grown to encircle the boulders. Tree density is typically less than that of the surrounding forests. Other species that may form a minor canopy component include *Tilia americana* var. *heterophylla*, *Aesculus flava*, *Picea rubens*, *Sambucus racemosa* var. *pubens*, or *Quercus rubra*. Tree windthrow is common, leaving patches of exposed mineral soil and gaps in the canopy. The shrub density is typically high but may vary between occurrences. Herbaceous cover is generally sparse because of thin, rocky soil.

Characteristic species in both the herb and shrub strata include *Acer spicatum*, *Acer pensylvanicum*, *Aster acuminatus*, *Ilex montana*, *Vaccinium erythrocarpum*, *Amelanchier arborea* var. *austromontana*, *Ribes glandulosum*, *Oxalis montana*, *Aster chlorolepis*, *Aconitum reclinatum*, *Carex aestivalis*, *Hylocomium splendens*, *Circaea alpina*, *Lonicera canadensis*, *Claytonia caroliniana*, *Cystopteris protrusa*, and *Dryopteris marginalis*. Seepage areas are common, producing wet microhabitats with unique species assemblages (*Chelone lyonii*, *Chrysosplenium americanum*, *Circaea alpina*, *Rudbeckia laciniata*, *Impatiens pallida*, and *Monarda didyma*).

### **Great Smoky Mountains National Park**

This forest has a canopy strongly dominated by *Betula alleghaniensis*. Canopy trees are often stunted and gnarled, with roots that may have grown to encircle the boulders. Tree windthrow is common, leaving patches of exposed mineral soil and gaps in the canopy. Other species in the canopy and subcanopy can include *Aesculus flava*, *Prunus pensylvanica*, *Sorbus americana*, *Acer spicatum*, and *Picea rubens*. The shrub stratum is dominated by *Acer spicatum*, *Hydrangea arborescens*, *Viburnum lantanoides*, and *Ribes glandulosum*. Other shrubs include *Sambucus racemosa* var. *pubens*, *Diervilla sessilifolia*, *Lonicera canadensis*, *Vaccinium erythrocarpum*, *Ribes rotundifolium*, and *Rubus canadensis*. Herbs and mosses cover the rocks and boulders. Characteristic herbaceous species include *Aster chlorolepis*, *Dryopteris campyloptera*, *Cimicifuga americana*, *Clintonia borealis*, *Cystopteris protrusa*, *Cardamine clematitidis*, *Huperzia lucidula*, *Rugelia nudicaulis*, *Streptopus amplexifolius*, and *Polypodium appalachianum*.

## OTHER NOTEWORTHY SPECIES

CONSERVATION RANK                      G3

## RANK JUSTIFICATION

This community is scattered throughout the high mountains but fairly uncommon. Unlike many other forest types in the southern Appalachians, this community has not historically been a threatened by logging because of the stunted nature of the trees and the inaccessibility, to loggers, of boulderfields.

DATABASE CODE                              C EGL006124

## COMMENTS

### **Globally**

On less extreme sites, generally at lower elevations in the Blue Ridge and adjacent montane ecoregions, a similar boulderfield forest is *Betula alleghaniensis* / *Acer spicatum* / *Hydrangea arborescens* - *Ribes cynosbati* / *Dryopteris marginalis* Forest (CEGL004982). Similar *Betula alleghaniensis*-dominated forests occur on glaciated rocky slopes in the upper mid-Atlantic and in the northeastern United States. The *Betula alleghaniensis*-dominated periglacial boulderfields of the southern Appalachian Mountains are distinguished from the northern forests by the occurrence of southern Appalachian endemic species, better developed shrub layers, and slightly less species diversity.

### **Great Smoky Mountains National Park**

Examples of this community in the Great Smoky Mountains National Park are compositionally similar to *Betula alleghaniensis* / *Acer spicatum* / *Hydrangea arborescens* - *Ribes cynosbati* / *Dryopteris marginalis* Forest (CEGL004982). In the Park, this latter community is distinguished by occurring below 5000 feet elevation, having a somewhat more diverse canopy, and by lacking many of the high elevation species such as *Abies fraseri*, *Dryopteris campyloptera*, *Ribes glandulosum*, *Rugelia nudicaulis*, *Streptopus amplexifolius*, *Prunus pensylvanica*, and *Sorbus americana*. This community is surrounded by forests dominated by *Picea rubens* and *Betula alleghaniensis*.

## REFERENCES

Chafin and Jones 1989, Dellinger 1992, Golden 1981, King and Stupka 1950, Pittillo and Smathers 1979, Rawinski 1992, Schafale and Weakley 1990, Stamper 1976, Wharton 1978, Wood 1975