

RED SPRUCE–FRASER FIR FOREST (BIRCH TRANSITION SHRUB SUBTYPE)

Concept: This subtype covers forests in the broad transition zone on open slopes, where Red Spruce–Fraser Fir Forest grades to Northern Hardwood Forest with a fairly even mix of *Betula alleghaniensis* and *Picea rubens*, and where a dense evergreen shrub layer is present. It is a lower elevation analogue of the Rhododendron Subtype. The shrub layer is usually *Rhododendron catawbiense* or *Rhododendron maximum*, but in the Smokies, *Leucothoe fontanesiana* may dominate.

Distinguishing Features: The Birch Transition Shrub Subtype is distinguished from most other subtypes by canopy composition, which includes more than 33 percent cover of *Betula alleghaniensis* and more than 33 percent cover of *Picea rubens* in a well-developed canopy. It is distinguished from the Birch Transition Herb Subtype by having a dense evergreen shrub layer rather than deciduous shrubs and herbs.

Synonyms: Synonyms: *Picea rubens* - (*Betula alleghaniensis*, *Aesculus flava*) / *Rhododendron (maximum, catawbiense)* Forest (CEGL004983).

Ecological Systems: Central and Southern Appalachian Spruce-Fir Forest (CES202.028).

Sites: Sharp ridge tops and convex slopes, generally 4500-5500 feet elevation, generally with shallow soils or associated with rock outcrops.

Soils: Soils are generally mapped as Inceptisols (Humadepts) of the Burton, Craggey, and Wayah series, but may represent inclusions of a shallower series.

Hydrology: As with other Spruce-Fir Forests, generally wet to mesic, sometimes saturated for long periods. However, the shallow soil is more prone to becoming dry in periods without rain or fog. Warmer temperatures and occurrence below the zone of maximum fog likely makes this community less wet than higher elevation subtypes.

Vegetation: A closed to open tree canopy is codominated by *Picea rubens* and *Betula alleghaniensis*. Other trees may include *Quercus rubra*, *Tsuga canadensis*, *Fagus grandifolia*, and *Acer rubrum*. The understory may also include *Amelanchier laevis*, *Acer spicatum*, and *Acer pensylvanicum*. The dense shrub layer is usually dominated by *Rhododendron maximum*, with *Rhododendron catawbiense* much less frequent. Deciduous shrubs such as *Viburnum lantanoides*, *Vaccinium erythrocarpum*, and *Ilex montana* may be present in small amounts. The herb layer is sparse. Species are those typical of other spruce-fir forests, such as *Dryopteris campyloptera*, *Dryopteris intermedia*, and *Oclemena acuminata*. *Polypodium appalachianum* may be abundant where rocks cover is high (Watson-Cook 2017, Crandall 1958).

Range and Abundance: Ranked G1?. This subtype was once thought confined to the Smokies, but it appears to be present in several other ranges. The association ranges into adjacent Tennessee and southern Virginia.

Associations and Patterns: Grades to the Birch Transition Herb Subtype on deeper soils and less exposed topography. May grade to other subtypes and to Northern Hardwood Forest.

Variation: No variants are recognized.

Dynamics: The dynamics of this subtype have not been specifically addressed as distinct from the widely studied higher elevation Herb Subtype. They likely are similar, but the warmer, less exposed environment allows greater competitiveness of *Betula*. These lower elevation sites are closer to areas that naturally burned regularly, but the abundance of fire-intolerant spruce suggests fire is not a significant influence. However, the ridge top locations may make them more susceptible to lightning.

Comments: The association corresponding to this subtype was created for vegetation in the Great Smoky Mountains. It is unclear if it occurs in any other parts of North Carolina. It may only questionably be distinct from the Low Rhododendron Subtype.

Rare species:

References:

Crandall 1958

Watson-Cook 2017