

Survey of Disjunct Red Spruce (*Picea rubens*) Stands in the Rich Mountain and Alarka Laurel Basins, North Carolina

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In the southern Appalachians, disjunct populations of red spruce (*Picea rubens*) persist at low latitudes. These populations, at the southernmost end of their range, are likely the first stands to experience the impacts of climate change. This study aims to assess the health and recruitment of the Rich Mountain and Alarka Laurel spruce bog basins in Nantahala National Forest, North Carolina. We assessed red spruce and stand dynamics to provide baselines for future studies. Using five 10 m wide belt transects per basin, we conducted surveys of the overstory and spruce saplings and seedlings. We measured overstory and sapling red spruce diameter at breast height (DBH), the height of seedlings, and the health of all spruce. We recorded the DBH of all overstory species ≥ 10 cm. Red spruce was the dominant overstory species, representing an average of 25.6% of all measured overstory trees. Great rhododendron (*Rhododendron maximum*) and mountain laurel (*Kalmia latifolia*) were dominant in the shrub layer, limiting open sky exposure. Seedlings and saplings were present throughout the basins, accounting for 72.8% of red spruce. Overall, red spruce were healthy, with some variability between age categories. These two red spruce populations are currently stable with healthy trees and large seedling banks and appear to be not yet affected by climatic warming, despite the southern latitude and relatively low elevation.

Key Words: *Picea rubens*; recruitment rate; southern Appalachian Mountains; spruce bog; stand dynamics