

McGarry, Melanie (1998). "A Comparison of Stand Characteristics, Age Distributions, and Histories of Two Rare Pitch Pine (*Pinus rigida*) Community Types at the Bates Morse Mountain Conservation Area". Honors Theses.

Forest stands are usually described using species composition, tree size, and density. This approach can characterize the stand at a given point in time, but does not reveal the ages of the trees, their growth histories, the effects of recent climate patterns, or the natural disturbance regime of the area.

Dendroecology uses tree ring data to add the dimension of time. This study of two different pitch pine (*Pinus rigida*) stands at the Bates Morse Mountain Conservation Area uses traditional measures (diameter at breast height, density) in conjunction with tree-ring data. In Maine, *P. rigida* reaches its northernmost border, occupying inland sand deposits, coastal dunes, and outcrops of exposed bedrock. Morse Mountain's Pitch Pine Dune Semi-Forest and Pitch Pine Woodland are two of the rarest forest types in Maine, and so play a critical role in the state's biodiversity. *Pinus rigida* has traditionally been considered a species associated with disturbance, notably fire. However, different disturbances and edaphic conditions also favor its growth, which is most likely the case at Morse Mountain. The dune site, located on stabilized dunes about 100 meters inland from the beach foredune, is predominantly *P. rigida*, with no evidence of *P. rigida* recruitment. Canopy and subcanopy trees at the dune site are relatively young (mean age 37.7 years, oldest tree 64 years), but large (mean dbh 14.8 cm). In contrast, the woodland site is exclusively *P. rigida*, there are three times as many trees, and the trees are older (mean age 61.4 years, oldest tree possibly >250 years), but much smaller (mean dbh 8.6 cm). The dune site has less variation in age, suggesting that most of the trees were recruited around the same time, which contrasts the outcrop site, in which there is more variation in age. These two forest types differ conspicuously in density, age, size, and history. Inferences are made about stand recruitment and mortality, growth rates, history, change over time, and possible futures; information valuable for conservation management planning. It is not known whether these sites will persist in the future without frequent disturbance, or if natural or anthropogenic intervention is needed to promote *P. rigida* recruitment.