

## ECOLOGY AND SILVICULTURE OF NORTHERN WHITE-CEDAR

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Northern white-cedar (*Thuja occidentalis* L.) is an important ecological and economic component of northern forest ecosystems throughout northern New England and eastern Canada. In addition to its commodity value as shingles, posts, boat-building lumber, and mulch, it is an important source of winter forage and habitat for white-tailed deer (*Odocoileus virginianus*). Despite its utility and value, there has been little research on the ecology and management of this species. Most studies of cedar have been conducted in the Lake States, where forest type, soil condition, climate, and disturbance history vary greatly from the forests of the Northeast. We have a limited ability to predict cedar growth in northeastern forests, especially in response to silvicultural treatments, and know little about its regeneration and early development.

Though foresters generally associate higher stem quality in cedar with upland seepage forests, these ideas have not been substantiated through data in any meaningful way. Cedar is often a minor component of mixed-species stands and is harvested opportunistically in the course of managing for more dominant species. Foresters interested in managing for cedar are handicapped by a lack of knowledge of cedar silviculture. Recruitment into sapling and pole stages is often problematic, and managers have expressed concern about the sustainability of the cedar resource. Further research into cedar ecology and response to silviculture is critical for sustainable management.

We propose to: 1) develop methods to predict stand- and tree-level growth of northern white-cedar in response to silvicultural treatment and site quality; 2) estimate rotation ages needed to attain various diameters; and 3) quantify sapling recruitment and growth patterns during early stand development. These objectives will be accomplished by conducting stem analysis on cedar trees in managed upland and wetland stands in central and northern Maine, and from a Maibec Industries millyard in Quebec, in order to assess age/size relationships and growth rates. These data will be supplemented by those collected on the USDA Forest Service silviculture experiment on the Penobscot Experimental Forest in central Maine, and in old-growth stands in the 5000-acre Big Reed Reserve in northern Maine.

We anticipate this study will provide data needed to improve our understanding of northern white-cedar ecology, and to develop effective management guidelines for cedar in the mixed-species northern forest.