

Forestry Recommendations for Maine's Changing Climate

Researchers have estimated that Maine's average temperatures will increase at least by 3.5° F by 2100 if we significantly reduce climate-warming emissions, and as much as 12.5° F if emissions are not reduced. By 2100 the optimum climate for spruce and fir will have shifted to north of the Canadian border, while the optimum climate for northern hardwoods such as sugar maple and yellow birch will retreat to the western mountains and northwestern highlands of Maine. The northern limit of optimum climate for oak, which is now best adapted to southwestern Maine, will shift north to the Canadian border. Trees that are outside of their optimum climate are likely to become stressed, with potential for increased rates of tree health decline and mortality due to insects and diseases. Disturbances, including harvests and other management actions, can be used to facilitate the response of vegetation types to climate change. The following general recommendations should be considered in developing harvest plans and other activities.



American beech (foreground), yellow birch, sugar maple, and red spruce may decline as the climate warms. Species whose range extends well to the south of Maine, such as red oak, white pine, and red maple, are well adapted to a warming climate.

Climate Change Forest Management Recommendations

- ✓ Consider the implications of management 100 years or more in the future.
- ✓ Because tree species ranges are likely to migrate north at one fifth to one tenth of the rate of climate change, manage for a diversity of tree species, including those such as white pine and red oak, which are adapted to a warmer climate. Other species to favor include white oak, shagbark hickory, and red maple.
- ✓ In areas currently characterized by cool-climate species such as spruce and fir, northern white cedar, or northern hardwoods, leave seed sources of pine, oak, hemlock and other warmer-climate species, if present.
- ✓ If warmer-climate species are absent, consider planting a few acorns or pine and hemlock seedlings after harvest to establish a future seed source that will facilitate the expansion of these populations. Planting blight-resistant American chestnut should also be considered.
- ✓ Landowners and managers can help mitigate climate change by sequestering carbon in soils, the forest floor, and in the canopy. Forest soil carbon loss can be minimized by avoiding clearcutting and other practices that heat the forest floor and increase oxidization of organic matter. Managing for older and larger trees will store more carbon on the stump. Conservation easements can ensure that the land is not converted to a carbon-consumptive use. While most often associated with private land, conservation easements can also be applied to public forest land to ensure that the land is not converted to other public uses.