

SPRUCE BUDWORM RETURNS TO NORTHEAST

WITH THE BUDWORM LOOMING, WHAT DOES THE NORTHERN FOREST HAVE TO LOSE?

BY LLOYD IRLAND AND WILLIAM H. MCWILLIAMS

Spruce and balsam fir supply a wealth of timber and other benefits across the northern tier of the Northeastern United States. This article is the second

of a two-part series that provides an update on spruce and fir for the four Northern Forest states (Maine, New Hampshire, New York, and Vermont) using the latest Forest Inventory and Analysis (FIA) results (2012). Part 1 focused on the acreage of the "core" spruce/fir (S/F) type and prospective supply trends based on the age-class distribution (April 2014 issue). Here in Part 2, current FIA inventory volume is analyzed for spruce and fir across all forest types. The intent is to provide a profile of the spruce and fir inventory in view of impending outbreaks of spruce budworm, the most destructive agent affecting the northern spruce and fir resource.

Inventory Volume

Across all forest land, forest types, species, and tree classes, the four Northern Forest states contain just over one billion cords of wood. About two-thirds of this inventory is a mixture of hard maple, soft maple, and the catch-all of other hardwoods, mostly birch and aspen (Figure 1). Spruce, fir, pine, and hemlock account for about 90 percent of the softwood inventory with spruce and fir contributing one third of the softwood inventory even though this is concentrated across the northern tier of the region. Although lumped together

for fiber-based products, red spruce (56 percent) and balsam fir (40 percent) dominate the inventory, with white and black spruce comprising the rest.

For wood availability, FIA's timberland estimates represent the North's "working forest" after excluding very low productivity forest land and reserves. The spruce and fir inventory is split evenly between core S/F forest and the other types

(Table 1). Wood in other forest types will be processed in multispecies/product operations, likely using different equipment from that suited to the S/F type. Maine has 70 percent of the total inventory and 75 percent of the inventory in the core S/F type. Also, due to terrain, level of forest industry develop-

ment, and cutting history, Maine also has a lower stocking (average cords per acre) than the other states.

About 98 percent of the spruce and fir inventory is classified as "growing-stock" capable of producing a merchantable log (Table 2). Spruce and fir both grow well as associates in other forest types, often reaching optimum growth and yield in mixtures with other species. They are most commonly found as associates in northern hardwood (30 percent) and aspen/birch (10 percent) stands.

Eighty-five percent of the spruce and fir growing-stock inventory is controlled by private owners and their management



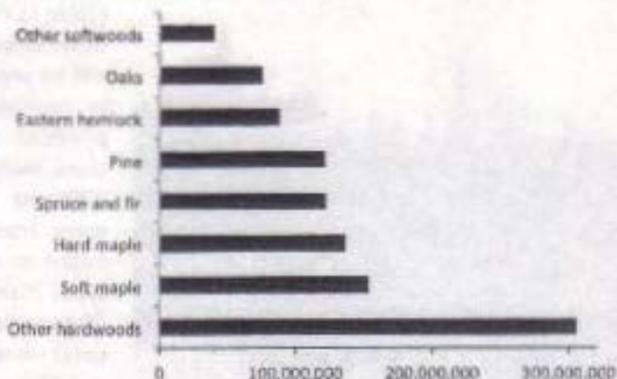
Northern Maine core S/F type. Photo by Lloyd Ireland.

Table 1. Volume of live spruce and fir trees (cords) on timberland for all types and the core S/F type by state, Northern Forest states, 2012.

State	All Types	Core S/F Type
Maine	74,258,454	39,463,083
New Hampshire	11,305,397	5,390,478
New York	9,274,899	3,845,377
Vermont	10,981,810	3,917,957
Total	105,820,559	52,616,896

decisions. Some background helps to understand wood availability and processing. In the past, forest statistics summarized all softwood of a certain quality above 9 inches in diameter as sawlogs and 5 to 9 inches as pulpwood. But in northern Maine and elsewhere today, tree-length logs larger than 5 inches on the butt, down to 2-3 inch tops, now go to sawmills; residual chips from the sawmill then go to a pulpmill. Tree-length wood at similar sizes moves to the few remaining dimension mills or northward to Canadian mills. In many areas, small sawmills buy "fitted logs," the traditional 16 footers, say, 9 inches and larger, and saw for a variety of local and regional markets. In general, such mills are not producing graded dimension stock.

Figure 1. Volume of live trees on forest land by species group, Northern Forest states, 2012.



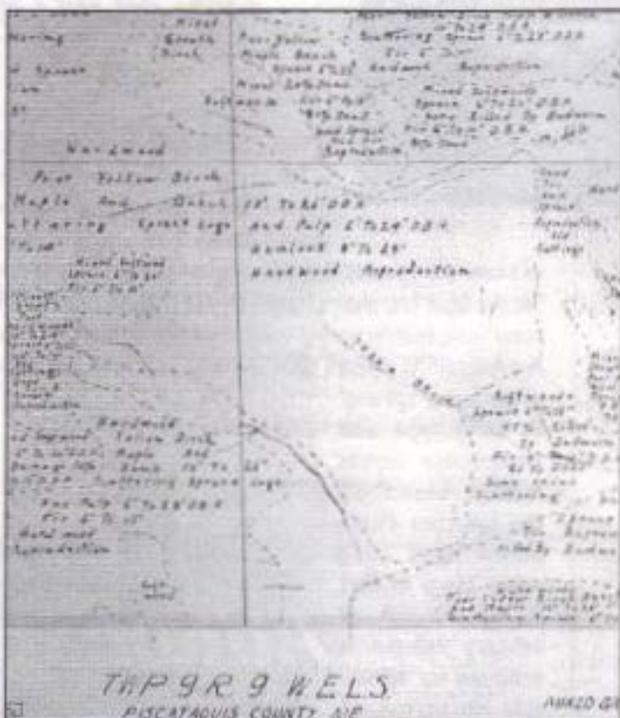
Inventory Change Components

Change in the inventory volume of spruce and fir depends on mortality, growth, and removals. Gross growth of timber includes the accretion in the volume of merchantable trees (5 inches in diameter and larger) plus the total volume of trees that reach merchantable size since the previous measurement. Mortality is the total merchantable volume of trees that died and is subtracted from gross growth to yield net growth. Most of the removal volume is harvest, but some timber is "removed" when forest land shifts to another land use.

Net growth can be compared to removals for an indication of resource sustainability and future inventory trends. For all owners, the growth-to-removals ratio for spruce and fir on forest land is 1.2 (Figure 2, following page). The ratio is 3.0 for public owners and 1.0 for private owners. This means that regionally, there is currently little room for expanding harvest on private land without diminishing the inventory.

Table 2. Volume of live spruce and fir trees (cords) on timberland by forest-type group and tree class, Northern Forest states, 2012.

Forest-type Group	Total Growing	Stock	Cull
W/R/Jack Pine	4,661,449	4,544,072	117,377
S/F	52,616,896	51,358,547	1,258,349
Upland Oak	982,510	951,180	31,329
N. Hardwoods	31,216,968	30,771,324	445,643
Aspen/Birch	10,140,435	10,006,393	134,042
Miscellaneous	6,202,301	6,063,871	138,430
Total	105,820,559	103,695,388	2,125,170

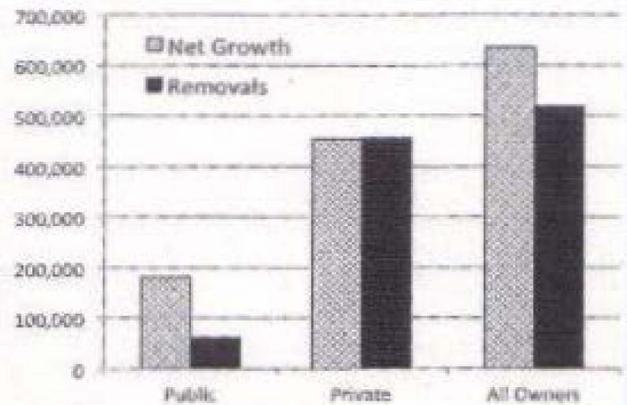


Vintage cruiser's map showing a portion of a town in Maine, once owned by International Paper Co. Photo by American Forest Management.

Outlook

As should be clear, the privately-owned inventory largely determines the future timber supply of spruce and fir. While there is limited room for expanded harvest now, an influx can be expected as stands in earlier stages of development grow into merchantability and economic maturity. All of this highlights the importance of wise policy and management decisions that will foster the development of this resource in view of expected spruce budworm outbreaks. The forestry community has been paying close attention to developments in Canada through meetings held by the Maine Forest Products Council (See materials at the Council's website: <http://maineforest.org/issues-information/mainesprucebudworm/>) and the New England Regional Conference on Forest Engineering. The Cooperative Forestry Research Unit (CFRU) of the University of Maine and cooperators are engaged in a com-

Figure 2. Volume of live trees on forest land by species group, Northern Forest states, 2012.



prehensive study to project future impacts, and to inform forest custodians (<http://www.umaine.edu/cfru/>). All things considered, CFRU is well-poised to address this issue. Anyone interested in spruce and fir timber will need to pay attention to up-to-date research results.

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For more information, comprehensive reports are available for Northern Forest states for previous years. Current results are available annually on the Northern Research Station, Forest Inventory and Analysis website: www.nrs.fs.fed.us/fia.

