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### Repository Citation

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Where Have All the Forests Gone? Long

Time Passing

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Abstract

White pine has been a significant element in our forests since the ice left 15,000 years ago. The Indian stone-age and colonial iron-age technologies made pine an important part of the economy. The need for forest regulations has provided a valuable commentary on the interaction between pine trees and people. New efforts are needed to meld technical and political processes in an information-age society.

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I was asked to place white pine in an historical perspective appropriate for such a modern day conference as this, I suppose because people need roots for mental sustenance just as much as white pine trees need them for water and nutrients. In addition, it seems to me that white pine has been a particularly significant element in New England's environment which has lent strength to the fabric of our region's culture.

In The Beginning

I chose to begin this historical survey at a point that will create a properly spacious feeling of grandeur - when our modern forests themselves began - with the last stand and gradual decay of the glacial ice about 15,000 years ago. Pollen evidence suggests that plants rather promptly covered the newly exposed landscape (Davis, 1958, 1983) and animals apparently followed so quickly that the paleo-Indian hunting people were in residence as much as 9,000 years ago, judging from the artifacts they left behind (Sammartino, 1981). Up to the time of contact with Europeans at least four recognizable Indian civilizations successively dominated New England. It's hard to know how these stone age folks interwove their lives with those of white pine. However, the paleontologists assure us that white pine was much more plentiful 5 to 8 thousand years ago during the hypsithermal. For a people heavily dependent on hunting this cannot fail to have affected their lifestyle. Whether they, in turn, affected the white pine is more speculative, but presumably man-made forest

could have been quite widespread under the warm, dry climatic conditions that then prevailed. So it seems safe to conjecture that this period was the one when the interaction between white pine and people really began in earnest.

However, forest vegetation soon changed again in response to climatic drift and white pine seems to have declined to something like its present abundance a couple of millenia ago. If our bogreading experts are right, it appears that this conference is about 8,000 years too late to deal with our largest pine population; that is already long gone. I am sure some futurists among us could say we are preparing for the next hypsithermal, while others will say, "Forget it, another glacier will slip down on us first".

A good deal of popular wisdom tells us some of the ways trees fitted into the daily lives of the Indians at the time of contact with Europeans. Although they did a lot of hunting and fishing, about half their food came from farming, mostly on some of the annually flooded intervalles (Cronon, 1983). Birch bark was used for cooking utensils, containers and canoes. Spruce roots and pitch were also used to join and seal the bark. Hogans were made from saplings covered with bark or skins. Maple produced sugar and oaks contributed a kind of flour, while other nuts and berries were welcome additions to their diet. It seems likely that white pine could have been easily worked with the primitive tools available to produce a variety of utensils and sturdy dugouts. Fish weirs were made from small saplings (Whitehill, 1959). This all seems reasonable but I haven't found too much carefully researched literature to document these uses.

The Colonists

Once we leave the prehistoric, however, the written word on white pine and people abounds. Early explorers were all struck by the richness of the New England forests. Many commented on the ease of getting through the woods near the southern New England coast, perhaps because of repeated Indian burning. Those who traveled inland, however, were more apt to think in terms of a "howling wilderness" and complain about the difficulty of getting through old blowdowns.

Modern thought suggests that these early arrivals saw much the same suite of trees that we see today, growing in the same environmental niches where they now thrive (Raup, 1964). After due allowance for changes in common names the species mentioned by the reliable observers generally bear out this conjecture (Whitney, 1793). Thus it seems likely that the vegetation zone map put out by the New England Society of American Foresters would look quite reasonable to these early travelers. Here we find the northern hardwoods separated from the central hardwoods. Significantly, for our purpose here today, white pine and hemlock are hyphenated appendages to each of these main species

assemblages.

Although there seems to have been considerable stability in the species mix found throughout the region, by way of contrast there has been great instability in the species which happen to dominate a given acre at any point in time. Local dominance seems to have been a function of how fires, storms or other cataclysms have impinged on existing stands of trees. Because white pine, like red maple, can exist on practically all sites, from the driest to the wettest, it is very opportunistic and able to exploit any bit of unused space in the sun. Thus the patch work of forest openings created by intermittent storm winds and fires in New England has provided plenty of places where white pine can gain a foothold throughout our hardwood forests. Research has shown that the Harvard Forest Pisgah tract, for instance, was covered with hardwoods which blew down in the early 1600's and then burned. This set the stage for white pine and hemlock to take over until they, in turn, were blown down in 1938, to be succeeded by a stand of northern hardwoods (Swan and Henry, 1967).

Pines can often dominate the dry outwash plains but on upland tills the bulk of our original white pine probably occurred as scattered individuals or small groups in a sea of hardwoods. Many of these pines became super-dominants whose great size caught the commercial eye of early visitors like John Smith, Raleigh Gilbert and George Popham (Malone, 1964).

That thoughts of commerce were not confined to the colonists is evident from the fact that as late as 1880 when Charles Sprague Sargent mapped the forests of the United States for the 10th Census, he classed all of New England as the Northern Pine Region (Sargent, 1884). That he recognized his own bias appears in a second map of vegetation on which he divided the region between the Coniferous Forest to the north and Deciduous Forest in the south. A truer picture was produced by Merriam in 1898 when he mapped natural vegetation to guide settlers in their selection of crops likely to prosper in the climate of a new land (Merriam, 1898). He showed the Boreal Region in northern New England, the Carolinian Zone (central hardwoods) in the south and the Transition Zone between. This general configuration has been recognized by most plant geographers ever since and is the basic framework for the SAF map of Natural Vegetation Zones (Westveld, 1956).

These then were the kinds of trees found by the first Europeans, in age-classes that were largely a patchwork set by catastrophes. The whole forested landscape must have seemed endless to people used to the crowded dimensions and severely rationed resources of Great Britain and the Continent. Their immediate needs were for food and shelter, and although the Indians had done fairly well with hunting, fishing and farming, the colonists had a hard time adapting old world methods to new world conditions. Their vision

of the good life was epitomized by the tidy agricultural landscapes and buildings of home and they set out to clear land and reproduce the culture they had left behind. In this context forests represented an opportunity to make, on this side of the ocean, a new kind of landscape, supporting a new kind of economy and a totally new kind of social order.

Although subsistence farming was the first order of business, a close second was keeping creditors back home placated. Without a continuing flow of goods and services from the home country the settlements would have failed. Fish and, to a limited extent, furs were available together with such wood products as clapboards and pipe staves. The white pine along the coast could be cut and split into the former, while white oak made excellent cooperage. These two, along with pot and pearl ash from the trees cleared to make farmland, became important items of international trade and of debt service.

#### Forest Regulations

That colonial success depended to some significant degree on careful use of their accessible trees is evident from the earliest recorded forest regulations. The popular myth about pioneers being fiercely independent individualists obscures the fact that the colonists were all too willing to regulate the minutest details of everyday life. It was commonplace for governments to set wages and prices in addition to dress and behavior codes. It is not surprising, therefore, to find that Plymouth in 1626 prohibited the export of any forest products without a license. Presumably this was to conserve nearby timber for local necessities. By 1658 the laws of Plymouth were expanded to insure that cut trees were promptly sawn or split into products, again to avert waste. Similar regulations, along with others aimed at controlling damage from forest burning, appeared in most of the colonies (Kinney, 1916).

As the trade in wood products became more important, various colonial laws set specifications designed to insure the good reputation of their wood products in world markets. Massachusetts set the length and quality of pipe staves for export in 1641, the size of a cord of wood in 1647, provided inspectors and specifications for shingles in 1695 and for clapboards in 1727. Town surveyors of wood and bark were authorized in 1710 and still function in some Massachusetts towns. These public regulations were generally aimed not at conserving natural resources but at promoting a more vigorous trade in wood products under the prevailing mercantilist theory that exports should be maximized, imports minimized, and the balance taken in gold. Echoes of this argument for both farm and forest exports continue to rattle through the eaves of legislative halls today.

Regulations to prevent local wood shortages

and consequent hardship, or to protect individual property rights by punishing timber trespass and preventing damage from careless burning, and efforts to promote honest trade--all being self-imposed by town or colonial governments--were received with resignation if not with enthusiasm. On the other hand regulations to preserve white pines suitable for masting the royal navy and to promote the production and export of naval stores to Great Britain were set by Parliament and this was another matter. In fact, the close connection between pine trees and sea power contributed a good deal to the irritation that finally led to rebellion against the crown (Albion, 1926).

The so-called "broad arrow policy" is probably the best known of the colonial forest regulations. In fact, it was built into the charter of The Province of Massachusetts in New England given by William and Mary in 1691. All pine trees 24 inches in diameter a foot above the ground, suitable for masts and not growing on private land, were reserved for Their Majesties' use. The value of keeping all these mast pines is suggested by the fact that the same charter gave to local inhabitants four fifths of all the gold, silver and other minerals they might find on public lands.

Later, in 1704 when needs were more urgent, Parliament voted bounties for any tar, pitch, rosin, turpentine, hemp, masts, yards and bowsprits imported from the American colonies into Great Britain. These subsidies continued in one form or another until terminated by the revolution. Thus the carrot and the stick were both used by the king's ministers in their desperate attempt to use New England pines to maintain the balance of European sea power. Incidentally, this was an effort fraught with difficulties our government officials concerned with stockpiling oil and uranium might easily understand.

The ineffectiveness of the "broad arrow policy" is a fascinating case study in the difficulties of long distance administration and of communicating the real facts of a situation to a self-deluded home government. It also throws light on the problems of enforcing an unpopular law and on the need to make suitable financial arrangements for contractors. As the daily news implies many of these problems still bedevil military policy and procurement programs. I recommend "Pine Trees and Politics" (Malone, 1964) to the recreational reader and "Forests and Sea Power" (Albion, 1926) to the more serious scholar.

White pine and oak also made the New England ship building industry possible, based primarily on trees near the coast until transportation improved. This was really the major use of wood that might be called "industrial" during the 200-year settlement period which began in 1620. In this era the largest consumption of wood was for domestic purposes as great quantities were needed to build and maintain farmsteads and villages. The old post and beam construction method made

good use of pine for overhead timbers, sheathing boards and shingles, together with chestnut for sills and oak for joists. In addition, vast quantities of hardwood were used to heat the drafty colonial dwellings.

All told, most of this wood came from local sources because overland transport with oxen or horses for much more than 15 miles was prohibitively expensive until the era of turnpikes and canals in the late 1700's and early 1800's. So dependent were the colonists on local wood that the Boston town meeting seriously considered moving off the peninsula because of the high cost of importing fuelwood. The situation was saved, however, by slooping wood from the tide-water rivers of Maine and the eventual appearance of coal.

#### Wood-Using Industries

As transportation improved, however, and the need for wood products continued to grow with the country, a real lumber industry sprang up in Maine. Again the deep penetration of the hinterland by rather sluggish rivers made river driving of pine and spruce logs feasible. Bangor became a brawling sawmilling town at the head of navigation and Maine loggers became famous as they exploited first the forests of Maine, then Pennsylvania, New York, the Lake States and the South and finally the West (Smith, 1974). All this became possible not so much because the technology of logging and milling had improved, but more because transportation was cheapened by rail, canal and the sea. This coupled with the policy of disposing of the public domain brought vast supplies of virgin timber to market in time to support continental settlement.

In central New England, meanwhile, a special event -- the decline of agriculture caused by competition from the rich soils being opened in the Middle West -- had a marked impact on the abundance and quality of white pine in the region. Throughout the Transition Hardwood-White Pine-Hemlock zone white pine was the primary pioneer species starting the old-field succession back toward hardwoods. By the turn of this century vast acreages of white pine were maturing on the land abandoned by Yankee farmers.

The pure stands of pine over upland tills were something new to the region and because the population of white pine weevils went right up along with the population of pines, sawlog quality was not very high. But the old-field stands made up in quantity what they lacked in quality, generally averaging a growth rate of about 400 to 500 board feet per acre per year, on a 60 to 70 year rotation. Such vast amounts of timber, readily accessible in a well settled countryside with an underemployed population, created industrial opportunities too good to pass up. A whole array of white pine industries ranging from heel shops, to

cooperage and box plants, to toy factories, to match manufactures sprang up in addition to sawmills. These white pine industries flourished well into the 1900's. The peak of pine lumbering came in 1909 and the container industry didn't falter until the mid-1920's when urban living changed shopping habits and wooden containers gave way to paper. Then, of course, came the 1938 hurricane and the Great Depression, a combination of disasters that marked "paid" to a great deal of New England's pine industry.

### The Past As Prologue

In recent years, spurred partly by the rising cost of transportation from the South and the West and partly by European export demand, the cut of regional timber has increased. However, if the dollar remains too strong some exports may slacken and competition from imports will increase. But in the long run these problems will be solved and there is likely to be greater need for the output of local wood-using industries.

If demand may eventually wax, what about the supply of local wood? There has historically been a preponderance of hardwoods in all parts of the region, and this situation seems likely to continue, barring some climatic change. Although there is still a good deal of old-field white pine maturing, farmland abandonment has largely ceased, so additions to coniferous forest land from this source have probably dried up. In many ways we seem to be returning to a situation much like that faced by the colonists -- a plethora of hardwoods with a scattering of pine and hemlock, except on the dry outwash plains where conifers dominate. Because this scenario shows pine and hemlock in the minority it will be useful to learn all we can about how these species have maintained themselves in the past on various forest sites.

A major lesson from the past is the fact that catastrophic events have played a central role in shaping our forests. In addition, both land use and wood utilization have fluctuated enormously in response to effective demand and to technological innovation. Also, when looking back, it is clear that the events that have had truly significant impacts on society have been largely unforeseen in any long run view of the future held by ordinary folks, business people, government officials, planners or divines. Because this is a permanent feature of reality, management plans of all kinds must be designed to cope with radical and unexpected change as a normal part of everyday life.

Fortunately, we are in a better position than ever before to collect and process information about forest resources in a timely fashion. However, it is clear that we have not discovered the companion techniques needed for wise consensus building to replace the slow processes used by our ancestors. I believe

that success in creating a new and more effective melding of political processes with modern views of biophysical and social reality will largely determine the future of New England's forests.

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United States  
Department of  
Agriculture

**Forest  
Service**

General  
Technical  
Report WO-51

# **Eastern White Pine: Today and Tomorrow**

## **Symposium Proceedings**

June 12-14, 1985  
Durham, New Hampshire

David T. Funk  
Proceedings Compiler

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