

More than two centuries
of land use in New England,
as depicted in dioramas
at the Harvard Forest. The dates are
approximate for central Massachusetts;
further north the stages were
generally later.

The Yankee Forest

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ABSTRACT—The forests of central and southern New England have been successively shaped by exploitation, abandonment, and natural recovery. Now they are well stocked with mediocre trees, are predominantly in small tracts, and are threatened by heavy cutting for fuelwood and by further subdivision. Under social and economic policies adapted to the region, however, and with foresters contributing new ideas and practices, these stands can become a demonstration of multiple-use management on nonindustrial private holdings.

New England is a composite of our nation's past and its future, more so than any place in America. No other forested region on this continent has a richer historical heritage, or faces a more complex array of problems and opportunities. American forestry was born in the Yankee Forest. Today, demonstrating effective multiple-use management is its greatest challenge.

Though smaller than many states, New England presents varied images to visitor and Yankee alike. For some it is the epitome of modern megalopolis, an endless web of factories, cities, and suburbs from New York City to Boston. And, yet, over 80 percent of the region is forested—a remarkably complex woodland with six major forest types and some 30 principal tree species. Local stand variations are even more diverse, reflecting past agricultural practices, fires, hurricanes, and repeated waves of forest exploitation. As the home of over 12 million New Englanders, the Yankee Forest is a megalopolitan affair—an extremely important renewable natural resource providing diverse services and products to the nation.

For others, New England recalls a Grandma Moses scene of quiet villages set in a rural countryside—a vision of colonial America spared from the pressures of modern society. To the casual observer, the vision remains in much of central and northern New England. But behind the postcard images is a region struggling with every issue of contemporary land management.



Primeval forest, about 1700.

Ever-increasing recreation pressures on public lands by various user groups are intensifying conflicts at the same time that the demand for wood products grows steadily. High energy costs have created enormous new demands for fuelwood, and for locally produced construction lumber to offset costly wood imported from other regions. These trends threaten a new wave of forest exploitation as competition for land and fiber intensifies. Soaring land values and property taxes on private lands are encouraging fragmentation of holdings, complicating forest management. Resource agencies in the six states are attempting to coordinate the response of thousands of local towns and planning entities to growing environmental quality problems in a region where local control is a tradition. And all this when severe economic constraints have reduced or held constant the budgets and staffs of state natural-resource agencies.

New England may offer a nostalgic vision of the past for some, but for those who live here it is on the cutting edge of the future. For the nation—and the nation's foresters—it offers a glimpse of tomorrow.

Prologue

Shakespeare warned that "what's past is prologue"—a useful proverb for understanding the Yankee Forest. For to know the forest of today, one must examine the past and understand how history has shaped the constraints and opportunities which influence its future.

One must begin a few million years ago with the geologic forces that formed, and continue to form, the New England landscapes. Massive folding and uplift created the predominantly north-south trending valleys of the region, together with the Berkshire Hills of western Massachusetts, and the White and Green Mountains of New Hampshire and Vermont. Though reduced by the constant effects of erosion, New England is still a diminished expression of the complex ridge and valley topography that is so prominent further south in Pennsylvania.

At least four glaciers have slowly ground their way southward over the region, scouring off the old soils and stripping away tens of feet of bedrock. When this dirty ice melted, it left a thin mantle of till soils over the uplands, and filled in many of the



Clearing for a subsistence homestead, 1740.



Height of farm cultivation, 1830.

deep valleys with sand and gravel to further round and soften the bedrock contours. The glaciers pulverized these largely granitic rocks, producing generally coarse sandy soils with a low percentage of clay, the tiny particles of which are important as the cation exchange sites that make nutrients available to plants. Organic matter also performs this function and, without much clay, these soils depend heavily on organic matter to make nutrients available. Compared to some other regions, New England's soils have low inherent fertility even though they respond well to careful nutrient management. These facts have been central to the success or failure of agriculture and forestry.

Studies of bogs in the region have shown that forests reoccupied the land soon after the last glacier decayed. Trapped pollen traces a sequence from tundra to boreal forest, to a warmer cycle with pines, and then cooling some 2,500 years ago when the present complex of trees appeared.

At least four Indian cultures have been identified in the region, the earliest beginning soon after the ice disappeared. Although hunting and fishing were always important, agriculture furnished the bulk of the foods used by the last Indians to fully occupy southern New England. Inland, cleared fields were generally on the river plains where annual flooding and silting renewed soil nutrients. Along the coast or where anadromous fish were plentiful, they and kelp were used to add plant nutrients. It is thought by some that the more warlike nature of the northern Indians was due to lack of short-season crops, which made raids on the south for corn and slaves a convenient way of life.

The first European colonists were fishermen and traders who settled on the coast, and who probably agreed with William Bradford that the forest was "a hideous and desolate wilderness." The Indians near Plymouth had been wiped out by a European disease, and their abandoned fields influenced the Pilgrims to settle there. Indian corn, squash, beans, and organic farming were other elements borrowed from the Indians. Soon, imported cattle provided food for people and manure to nourish the crops, thus helping farmers to cope with inland soils. But Bradford's "desolate wilderness" restricted overland travel, spreading settlement first along the

coast and up the larger rivers, until roads could be cut through the forest.

Fish and forest products were early exports that helped pay off English investors, thus making a critical contribution to the financial success of early New England. One of the first public forest regulations was aimed at maintaining the quality and value of pipe staves for wine barrels. And, of course, the crown eventually reserved all white pines suitable for naval masts and spars growing on land not already expropriated.

In the post-Revolution years, Boston and many other port areas were becoming cities based on fishing and trading to service an ever-increasing hinterland population. Road building began in earnest as capital and knowledge accumulated, and agriculture started to expand from subsistence to commercial levels.

Advent of the Industrial Revolution strengthened these trends and started urbanization around water power developments, especially near the fall line from upland New England to the coastal lowlands. The early pattern of settlement along the coast and major north-south rivers was enlarged by the advent of industry based on water power. The resulting population nodes have been the source and site of growth and expansion in the region ever since.

Thus, the pattern of population density in New England today is the product of an interplay among bedrock topography, glacial modification, and the evolving cultural heritage and technology of the people who have humanized the small but hard working landscapes of New England. And the resulting competition for space near populous areas is a major factor in shaping forest land use today.

The Changing Landscape

As the region's population expanded in the eighteenth century, vast areas were cleared for farming. Three out of four acres were farmed in much of New England outside of northern Maine and the mountains. So fast did this clearing occur that in 1846 George B. Emerson lamented that "the new settler clears in a year more acres than he can cultivate in ten, and destroys at a single burning many a winter's fuel, which would be better kept in reserve for his grandchildren."



Abandonment of farms and invasion of white pine, 1850.



First crop of old-field pine, 1910.

By the third quarter of the eighteenth century there was every chance of a "timber famine" in the heavily farmed areas. Many towns had too little forest left to grow indefinitely the thousands of cords needed for fuelwood. In most places shortages didn't occur, however, because coal came in to fuel the cities and wood was sloped south from the tidewater rivers of Maine.

Moreover, the opening of the West brought cheap grain to the East, first via the Erie Canal, and later by the railroads. Yankees working their thin, poor, irregular, and stony soils could not compete well with farmers on the deep, rich, level, and stone-free soils of western New York and the Midwest. The result was that thousands of cleared acres became submarginal and were abandoned to trees. The forest reclaimed the fields so fast in the last half of the nineteenth century that enough old-field pine was soon available to support new industries in central New England by the early 1900s. During the same half-century, pine and spruce loggers worked over the state of Maine, clearing out the last of the old-growth forests there.

The white pine industry of the early twentieth century was fired by the need for wooden containers in a region heavily active in manufacturing and rail shipment of products. The old-field pine wasn't of very high quality, but it was adequate for most boxes. And while tight cooperage for food required clear stock, buckets and pails were short enough to be made from the knot-free internodes. The stands were easily accessible over the elaborate network of old farm roads, and there were an underemployed rural population, plenty of horses, and lots of Yankee ingenuity to support a thriving industry.

The system worked rather well until the mid-1920s, when city folk who shopped almost daily began to dominate retail markets. The need for smaller containers and the innovation of waxed papers and corrugated boxes created new competition for the wooden container industry. Declining markets pulled down pine prices even before the Great Depression, and then the 1938 hurricane swept away much of the growing stock of central New England. The wood-using industries in southern and central New England went into severe decline, and rural land went begging.

Thus, the Yankee Forest of today is a product of its turbulent past—a history written on the landscape. As

depicted in the dioramas that accompany this article, the lands have undergone continual change, shaped by man and nature in successive waves of exploitation, abandonment, and natural recovery.

The Forest Today

From the historical and pollen records, we judge that the Indians and colonists saw about the same tree species in New England that a visitor finds today. While the chestnut blight and Dutch elm disease have decimated those species, most tree species grow in the same niches they have occupied for several millenia. To be sure, the form and composition of individual stands vary with site characteristics, past land use, and natural catastrophes, but the map of vegetation zones (see p. 563 of this issue) could have been drawn by King Philip or Miles Standish.

The oaks and hickories of the central hardwoods extend northward from the Appalachians to dominate southern New England, while the spruce-fir and the birch, beech, and maple of the northern hardwoods occupy the north. In between they all mingle to form the rich transition hardwoods forest. Hemlock and white pine occur generally throughout the region.

The settlers found more large trees than one sees today, but the difference is surprisingly less than imagined by many romantics. New England is swept by tropical hurricanes every 75 to 100 years, and has been probably since the Ice Age. Under such conditions few large trees would escape for more than a few centuries at most, as suggested by the reports of early travelers of vast areas of blowdowns. Yet, the forests are remarkably stable in terms of the species that have been growing here for a very long time. Paradoxically, there has been great variation over time in the vegetation found on any particular acre, as different species in the mix have come to dominate a stand in response to natural catastrophes and land use. Although changes are thus influenced considerably by people and random natural events, the changes have been constrained within the limits of existing major types.

Thus, New England forests remain a rich mixture of many species, mostly of hardwoods with scattered softwoods—a mixture that will continue to be the raw materials with which the Yankee must live and work.

The uses actually made of these forests have been as



Advance-growth hardwoods, the second phase of succession, 1915.



The hardwoods reach cordwood size, 1930.

varied as the trees that grow there and the changing needs of the people who depend upon them. The early Yankee families drew on them when they needed firewood, furniture, cooperage, building materials, innumerable tools, tableware, clocks, and even food in the form of maple sugar and nuts. When the region was powered by water and wood, these forested watersheds were also the Yankee's basic energy resource. Later, they provided the raw materials of vigorous industries that produced matches, heels, toys, boxes, barrels, furniture, lumber, railroad ties, paper, and charcoal. They were, and remain, the habitat of diverse wildlife species and a recreational forest for millions of people. This working Yankee Forest was, and still is today, a people-forest. More so than any other in the nation, it is a multiple-use forest.

A Multiple-Use Forest

Recreation has long helped to shape the forest. In the last quarter of the nineteenth century, an "Old Home Week" movement sought to draw sons and daughters back from the city for a visit to their home towns. But the goal was far more than nostalgia. The hope was that rural decline might be countered if some of the more affluent would bring in revitalizing capital. City folks seeking climatic relief were welcome, and second homes early became an important part of rural society. Many mountain and lake areas also developed into major resort sites, with "summer folk" and tourists becoming a mainstay of the rural economy.

This invasion of city people, with a more romantic view of the countryside and different esthetic values than the natives, changed the look of the land. One of their most significant accomplishments was to support the passage of the Weeks Act of 1911, in order to establish the White and Green Mountain national forests. At a local level, state forest and park systems were set up in the twentieth century, together with town forests. Private land was developed for skiing, camping, and second homes. Citizen conservation organizations, like the Society for the Protection of New Hampshire Forests, were also founded in this era.

But the most radical changes were in landownership, as urbanites came increasingly to buy rural land, welcomed for the dollars they spent and the taxes they paid to support rural government—especially during the Great Depression. Since then recreational

values have grown continuously and are now powerfully shaping land use in the region.

The influence of nonindustrial owners is suggested by the fact that the Yankee Forest is largely a private forest, with some 75 percent owned by over a half-million individuals. Large company holdings dominate only in northern Maine. The average ownership is less than 50 acres and many, if not most, of these small owners don't consider wood production very important. As few as 12 percent of those in southern New England have ever harvested trees from their lands. Recreation, real estate speculation, and a variety of esthetic interests are the predominant reasons for ownership.

Recent studies indicate, however, that many small owners are willing to harvest wood, especially with lumber prices and the demand for fuelwood soaring. But most lack information about the potential of their woodlots or how to obtain financial or professional forestry assistance. Fear that careless logging will impair other values discourages many from seeking such assistance and from investing in forest management.

Rising land values and increasing property taxes continue to encourage speculative attitudes toward ownership, so that short-term carrying costs are often paid from other sources of income until holdings can be subdivided for resale or development. To discourage parcelization most states offer some type of special property tax treatment for forestlands, but participation has been low wherever owners have to relinquish the right to develop or subdivide on short notice. Few state forestry agencies have adequate budgets or staff to provide services for the potentially huge numbers of landowners needing assistance. Public foresters are fighting an uphill battle in most states, especially where they are within sub-units of large superagencies primarily concerned with environmental regulation and protection. Few have the resources to do an adequate job of long-range planning or to foster cooperative programs with industry, landowners, or local government. The result is a fragmentation of effort and virtually no attempt to coordinate state forest policies within the region.

From the perspective of commercial production, the Yankee Forest is in poor condition. Most stands are well stocked, but over 13 percent of the trees are classified as rough and rotten by the Forest Service, and

an even higher percentage is unsuited for quality products. Thus, the region's forests are producing only one-third to one-half of their potential in quality wood, with some estimates as low as one-tenth.

Yet, even though the Yankee Forest is producing below its potential, only about half of annual growth was being used by the region's forest industries in 1970. The situation is changing rapidly and it is not clear whether this "surplus" is in fact available under existing economic and social conditions. Demand for firewood is increasing rapidly, with a growing interest in wood as a fuel for large-scale electric generation. Wood imported from outside the region is used by many industries, but as energy and transportation costs increase locally produced fiber may be a far better alternative.

These alternatives are now possible because a large inventory of mature and near mature trees is available, thanks to successive waves of past land clearing, abandonment, regrowth, and clearcutting which produced land that private owners could buy at bargain prices—land held for amenity use without much cutting while the trees matured. Now, rising stumpage prices and higher carrying costs are stimulating increased harvesting. The brisk demand for firewood is also promoting closer utilization and cutting in young stands. However, "cutting" is not the equivalent of sound forest management. Without careful planning, based on a thoughtful weighing of alternatives in the light of experience, New England could again squander the future of its forests. As Carlyle warned, those who have no grasp of history are doomed to live it over again.

An Uncertain Future

Well, then, what about the future? Will New England continue to allow its forest landscapes to be shaped by changes in agriculture, exploitive logging, and uncontrolled land development? Or will there be a new commitment to designing land uses through planning and management?

Without enlightened multiple-use management, the future will surely be warped by powerful trends from the past. With urban landowners valuing forests primarily for amenity, recreational, and speculative uses, more lands will be divided into small tracts. This trend, coupled with rising interest rates, land values, and carrying costs will, in many cases, make management for timber economically impossible. And those unable to buy land will continue to press for expanded public ownership of recreation lands and for regulations to curtail harvesting on existing public lands.

As a result, forest industry in southern and central New England will remain small scale, with shallow financial resources and diminished interest in long-term management. High-grading will continue under the guise of selective cutting, with little investment in stand improvement for the future. Though most forestlands are well stocked with mediocre trees, a major shift to fuelwood harvesting by whole-tree, clearcutting methods could rapidly degrade both growing stock and amenity values. And, in reaction, a proliferation of state and town restrictions on logging, intended to protect local environments, could strangle those marginal firms that are already too plentiful among New England's industries.

But trend need not be destiny. With a comprehensive forest management strategy sensitive to the economic and social realities of the region, most contemporary problems in the Yankee Forest could be turned to advantages.

The rising demand for fuelwood presents a golden opportunity to make improvement cuttings and thinnings that can enhance wildlife habitats, amenity and land values, as well as increase the production of desirable sawtimber in the future. Achieving these gains will require major investments in forest management by landowners, state and local governments, and the development of new harvesting and utilization systems appropriate to the small scale of the region's woodlands. It will require, as well, the ingenuity to devise institutional arrangements to overcome the problems of small-scale holdings, and the enactment of tax incentives that attract private investment.

A critical organizational step will be to gain recognition of New England as a distinctive region. The future of the Yankee Forest must be shaped by the actions of local and state governments, cooperating with private industry, conservation groups, landowners, and citizens within the region: not by federal regulations or controls. It has to be that way. That's the level at which ecosystems, ownership patterns, and cultural values come into focus in sufficient detail to permit meaningful land-use decisions—especially in the small and diverse woodlands of New England. We need this new concept of federalism built on a working partnership among government, industry, and all interested segments of the public.

But it will not be an easy task in New England, where local independence is a venerable tradition. When freedom is combined with an equally old sense of enlightened self-interest, however, it may be the key to future *interdependence*—a recognition of common opportunities requiring planning and cooperation. It is this understanding of the institutional setting of forestry that is expressed in the theme of this year's SAF annual meeting in Boston: "Town Meeting Forestry."

Finally, the future will turn on the ability of the foresters of New England to enlarge their philosophy and to become more responsive to the people whose woods these are. They must offer the people of the region bold and ingenious policies and new practices meaningful in social and economic terms, and sensitive to the full range of values which motivate people to own and manage land. Forest management must be designed to enhance all of the values of the Yankee Forest, carefully integrating and balancing resource uses. Only then will multiple use become a reality on the ground, not merely a pleasant proverb preached but seldom practiced.

The Yankee Forest's most significant contribution to the nation could well be the demonstration of effective multiple use on small, private woodlands. For, nationwide, these lands are crucial to sustaining environmental quality in the more densely populated regions, and to meeting national wood needs. ■

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