

THE HISTORY OF HARVARD FOREST

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The woods you drove past getting here look pretty much like lots of woods in central Massachusetts—and they are. Just woods. They cover almost two-thirds of Massachusetts. Perhaps mostly pine here, or hardwoods there, but it's been like that about as long as you can remember. Of course, you notice a change each fall as the hardwoods put on their marvelous display, drop their leaves, and stand like skeletons awaiting a new burst of life in the spring. Otherwise, the forest doesn't change much—or does it?

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In 1903, a young professor named Richard Fisher was hired to set up a school to teach the new science of forestry at Harvard. At first this school was based entirely in Cambridge. But then, in 1907 Harvard acquired over 2,000 acres of land in a small town in central Massachusetts. The school moved to Petersham. The Harvard Forest was born. The Forest provided an outdoor classroom to teach forestry, a lab where real-life experiments could be conducted, and a demonstration site to teach what the experiments revealed.

One of Professor Fisher's first projects aimed to demonstrate that the Forest could be self-sustaining—managed so that the annual growth of trees could equal the annual amount of timber cut for sale. In the early 1900s, the market for timber in Petersham was white pine boards for boxes. Harvard Forest included many white pine stands—stands which had invaded fields abandoned in the mid-1800s. All the elements for Fisher's project were in place.

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However, there were problems. He noticed that when the old field white pines were harvested, less desirable hardwoods that had started growing beneath them usually took over the stand. Even if they were cut along with the pines, the hardwoods sprouted from their stumps and grew quickly. The pines couldn't re-sprout and had to begin again from seed. Even cutting back the sprouting hardwoods wouldn't allow a new crop of pines to dominate on any but the driest soils.

What was wrong? Like all early foresters, Fisher's ideas were based on the European model of scientific forestry, or silviculture, where trees were grown like an agricultural crop. In Europe, centuries of settlement had reduced the forests so that trees had become scarce and very valuable. In America, with vast tracts of uncut forests, this much effort could not be justified.

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His growing awareness of the differences between European and American forests led Professor Fisher to the forefront of an even newer science—ecological forestry—management based on the natural development of forests rather than management to grow a single tree species in plantations. From this point on, he worked to understand how the

forest naturally grew so that more efficient management practices could be developed. The idea of the forest as more than just a crop of trees was also emerging.

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By the late 1920s, Professor Fisher had a clear idea of how our forests developed and wanted to share it widely. With the help of Dr. Ernest Stillman, a long-time friend and a philanthropist with a deep interest in forests and education, he found a way. Surrounding you is the result: twenty-three dioramas showing the dramatic changes in our landscape from pre-settlement forest through agricultural clearing, farm abandonment, and reforestation.

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Just as important, they illustrated the management lessons learned during those first 25 years. But Professor Fisher only saw half of the dioramas completed. In 1934, he died. He had overseen the establishment of Harvard Forest, developed a theory of ecological forest management, and expanded the Forest's educational role. We could now see forest changes beyond a single lifetime to a succession of changes over several lifetimes. After his death, the forestry school became part of the biology department. The dioramas received international acclaim. Our understanding of natural forest development now allowed the Harvard Forest to practice efficient management. Fisher's original goal of a sustainable annual harvest was finally within reach.

[BIRDS SINGING, WIND BLOWING]

On September 21, 1938, a hurricane swept up the east coast. Its center passed just west of Petersham. The Forest was exposed to its full fury. Wind gusts exceeded 130 miles per hour. Afterwards, 70 percent of our timber lay on the ground. Pines were most susceptible. The biggest and most valuable trees, the major capital of the Forest, suffered the greatest damage. Gone was any hope of achieving a sustainable annual harvest and self-sufficiency. The only hope was to salvage as much as possible. The federal government stepped in to buy the logs. Harvard Pond, like most ponds in the area, was used to store logs underwater—safe from decay and insect damage—until they could be sawn into lumber.

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The hurricane swept away more than just trees. It swept away the accepted idea that our forests developed from abandoned fields to pine to a relatively stable climax stage. Detailed ecological research has since shown that major natural disturbances occur every 100 to 150 years. Hurricanes, fires, ice storms, floods are all part of forest development. Our timeframe expanded once again. Ecological forest management now had to allow for changes beyond our control.

With much of the forest destroyed, we began looking more at the small-scale changes upon which all life depends, but which often go unnoticed. Dr. Hugh Raup, the Director following World War II, was an ecologist rather than a forester. Research shifted away

from silviculture and forest management. Forest economics, forest microbiology, forest soils, tree physiology, and tree architecture all became subjects of major research efforts.

As our focus changed, our tools and methods changed also. The ax and crosscut saw became a two-man chainsaw and then a small, powerful one-man one. The horse gave way to the crawler skidder. The planting tool, seedling box, and machete to weed out competing trees—once our most common tools—have disappeared along with our attempts to convert stands from one type to another. Today we more commonly use sophisticated instruments to measure differences in light intensity, moisture, or nutrients that might affect tree growth—either right in the field or from samples taken to the lab.

Harvard Forest has changed physically as well. Through gifts, 2,000 acres have grown to nearly 3,000. Our original building is still here—but now there's a whole complex—including labs, a computer facility, even a sawmill. Over 30 people work at Harvard Forest and many of them live in houses at the Forest. We are an important part of the town of Petersham. Although Harvard University no longer has a School of Forestry, Harvard Forest remains a research and teaching facility for the University.

As the Forest changed, so did the Fisher Museum. The story in the dioramas stops just before the hurricane. Exhibits on the second floor carry it forward. Self-guided nature trails tie this story to the forest outside. Conifer plantations remain from our early research. Stands dating to 1938 and damaged trees testify to the importance of the hurricane. Our concept of forest management has expanded to encompass many species and increasingly many uses. The miles of roads and trails provide recreation and scenic access in all seasons. As mobility and leisure have increased, so has the importance of the non-economic value of the Forest. Our educational efforts are also expanding. Programs for the public now share our time and teaching Harvard students and research. Students of all ages and many nations come to learn.

One reason people come: the records we have gathered and maintained since the Forest was established. Originally kept on handwritten sheets in our vault, they are being transferred to computer files where they can be used to generate computer maps and graphs.

These records provide the longest continuous history for any managed forest in the United States. And they were a major reason Harvard Forest was selected by the National Science Foundation in 1988 to be a Long-Term Ecological Research site—one of only 17 in the country. This research, centered at Harvard Forest, involves scientists from many institutions through the Northeast. Harvard Forest is becoming a regional center for environmental research, looking at the effects of “disturbance,” another word for sudden change on the forest. As part of these studies, deep in the woods away from local pollution, we are measuring atmospheric gases above, within, and beneath the treetops, and looking for changes over time.

To expand our concept of change on the forest even further, we are reconstructing the major vegetation changes since the last glaciation. As the climate warmed, species migrated north at different rates and from different directions. At this scale our forests are very dynamic. We can use this knowledge of past changes to predict future ones.

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Change in the forest. Why is that so important? It is becoming clear that we are accelerating some changes in our environment. Destruction of tropical rain forests, the greenhouse effect, and various types of pollution, coupled with a growing population, are placing us in peril. By recording the effects of these changes on the forest, we can begin to understand what the future holds for the environment and ultimately for ourselves.

As you leave the Fisher Museum and pass through the Forest, look again at the woods. They're constantly changing, in ways that are often hard to imagine. But thanks to Professor Fisher's vision and the continuing research at Harvard Forest, we're getting a better picture. A picture that makes you wonder what changes the next hundred years will bring in our forests.

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