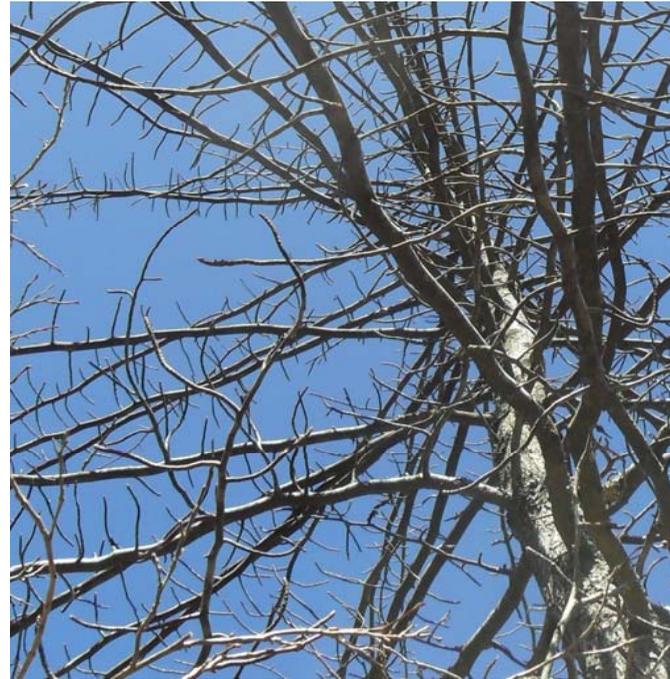


14) **FIRE:** This area is the eastern edge of a forest fire that burned 78 acres of Harvard Forest and a similar expanse of neighboring property in 1957. The fire was stopped at the swamp behind you. Since the fire, the forest has grown up substantially. It contains many “pioneer species”--such as white and gray birch trees--as well as red oak, red maple, beech, American chestnut and witch hazel.

The fire scars at the base of the red pines to your left are a reminder of the 1957 forest fire and the remarkable resilience of trees.

15) **HEMLOCK:** The evergreen tree on your right is a unique but threatened species in our forest. Eastern hemlocks are remarkable for their dense, shady canopies, providing winter shelter for deer, nesting sites for migrating warblers, and cold forest streams for trout. The hemlock woolly adelgid, an aphid-like insect accidentally introduced from Asia in the 1950s, arrived at the Harvard Forest in 2002 and many hemlock trees have begun to die as a result. But the forest will continue. In our region, where hemlocks are lost to the adelgid, young black birch trees follow.

16) **SWAMP:** As you follow the boardwalk, you will be walking through mixed swamp forest characterized by black gum trees, red spruce, hemlock, red maple and white pine. Some common shrubs include winterberry and highbush blueberry. Cinnamon fern, goldthread, and Sphagnum mosses cover the forest floor.



Sphagnum Moss



Cinnamon Fern



Goldthread

17) **BLACK GUM:** The black gum or tupelo tree (*Nyssa sylvatica*) is a long-lived deciduous tree typically confined to swamps, here at the northern limit of its range. Black gums are the oldest trees in the Northeast. Those surrounding you are over 300 years old. They're notable for their unusual 90-degree branching pattern and spectacular red foliage in autumn. Their scaly bark resembles alligator skin. The hard, heavy wood of the black gum tree has interlocking grain that is nearly impossible to split. Black gums—also known as beetlebung trees—were used during the colonial period to make mallet heads (“beetles”) and barrel stoppers (“bung”). A bit further along the trail and within reach of the boardwalk on the right hand side, is a large black gum that is over 420 years old—the oldest living tree at Harvard Forest.



## HARVARD FOREST HARVARD UNIVERSITY

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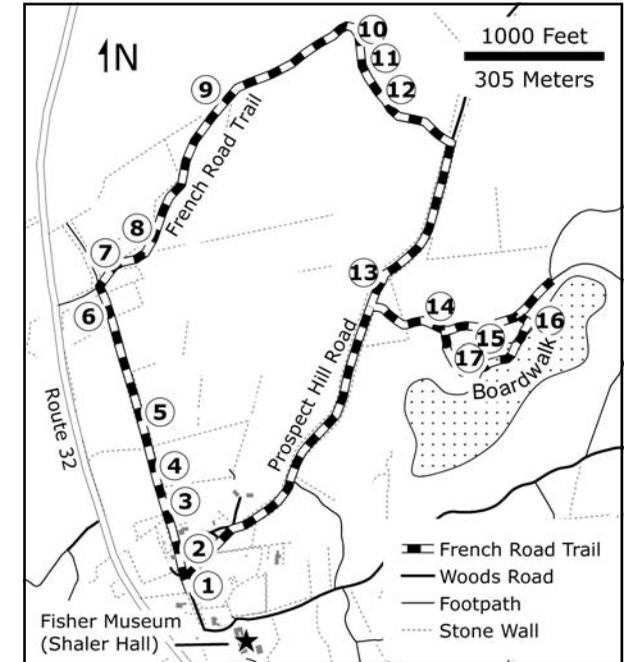
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# HARVARD FOREST FRENCH ROAD TRAIL



The French Road Trail is a 2.5-mile loop with 17 numbered stations at points of interest along the way. This pamphlet contains information corresponding to the numbered stations. From the Fisher Museum, walk north, parallel to Route 32 and follow the yellow arrows to stay on the trail.

*Please note:* Harvard Forest is one of the oldest and most intensively studied research forests in North America. Throughout your walk, you will see evidence of active research, such as flagging tape and tagged trees. Please help our study efforts by not disturbing this equipment.

You may also be interested in the quarter-mile Natural History Trail through John Sanderson’s farm (maps available) which begins behind the Fisher Museum.

1) **THEN AND NOW:** This stone wall marks a cropland border within a 50-acre farm established in 1763 by Jonathan and Molly Sanderson. Along this trail you will see many stone walls, most of them historically used to mark property boundaries and define the edges of pastures.

Today, the houses you see on either side of the road, including the original Sanderson farmhouse behind you (now called Community House), the Raup House to your left, and the Fisher House up the road, are dormitories for visiting students, scientists, and conference groups. A herd of cattle keeps the pastures clear of trees. In the pasture to your right, the Fisher Meteorological Station records continuous weather data, one of several hundred datasets publicly available on the Harvard Forest website.

2) **SUGAR MAPLES:** The sugar maple trees lining this road were historically used to produce maple syrup. Today they are part of a long-term research study of how sugar maples use and store energy throughout the year. Our research shows that when a sugar maple produces a high number of seeds in autumn, there is less sugar in its sap the following spring.

*NOTE:* To stay on the trail, continue up the hill, through the lawn between the Schoolhouse and the Fisher House. You will pass by the sugar house instead of turning right with the road.

3) **TREE DIVERSITY:** The trees surrounding this sign are typical of sites in this region that have reforested following two centuries of colonial agriculture. Oak, red maple, beech, birch, and other hardwood species have become prevalent. Shade-tolerant hemlock trees grow in the understory and white pines populate the sunny openings. Some white pines have multiple crooked trunks—the legacy of the white pine weevil, a native insect that was very active at the turn of the 20th century, on pines growing in the open sunlight of abandoned pastures.

4) **LAND-USE LEGACIES:** Every landscape has a story. Farming, logging, fire, and windstorms over the past several centuries have shaped the soil, plants, trees, and wildlife that exist here today. Different parts of the Harvard Forest have different human histories, as well, including cultivated fields, pasture, and woodlot. In the research area on the right hand side of the road, Harvard Forest scientists are tracking the long-term impacts of colonial farming on today's forest.

A legacy of the Great Hurricane of 1938 is also visible here: the large white pine with a curved trunk (to your right) was young when the hurricane tipped it, but the maturing tree has righted itself vertically as it has grown.

5) **DISTURBANCE:** Two types of forest “disturbance”—another word for sudden change in an ecosystem—are evident here. On both sides of the trail, snapped and uprooted trees show the footprint of a microburst storm ‘disturbance’ that blew through the forest in 2014. Eventually, the chaos of these uprooted trees will flatten to small mounds and dips on the forest floor.

On the right hand side of the road, a red pine plantation planted by Harvard Forest students in the 1920s was harvested in 2008 to allow native forest to regenerate. Because moose and deer are drawn to recently “disturbed” forests for food, we are studying how their presence shapes the regenerating tree community.

6) **EARTHWORMS:** The forest around you is dominated by sugar maple and white ash—an unusual forest type found on richer soils at the Harvard Forest. On the left side of the road is one of the few areas on our property that contains earthworms. Although welcome in gardens, earthworms are not native to this part of North America. They act as forest pests by simplifying the complex soil layers that many organisms depend on, and altering the flow of water through soil.

7) **COLONIAL REST STOP:** The stone foundation you see here is a remnant of the French Road Inn, built as a prosperous farmhouse in 1764 by Elisha Ward, brother of Artemas Ward, the first commander-in-chief of the American Revolution. The inn, purchased by Almond French in 1846, was well used by travelers, as it was located along the main road between Athol and Petersham. Historical accounts tell us that rows of hollowed out logs near the inn served as troughs for visiting cattle and horses.

8) **STREAM and STONEWORKS:** The stonework around this stream is rather mysterious. Water flow would have been insufficient for a mill.

Vernal pools, like the mossy, wet area behind the stonework, are seasonal pools that provide spring habitat for specific plants and animals, some of which are endangered. Because vernal pools are typically dry for part of the year, they do not support populations of fish. Without fish predation or competition, fairy shrimp, mole salamanders, and wood frogs all lay their eggs in vernal pools.

9) **SNAG:** Dying or dead trees that have not yet fallen are referred to as snags. The snags you see on both sides of the trail are important sources of food and shelter for many animals, including woodpeckers, owls, small mammals, and raccoons. Small round holes in a snag indicate feeding activity by smaller woodpeckers, while large rectangular holes are made by pileated woodpeckers, the largest woodpeckers in North America.

*NOTE:* At the fork ahead, stay right for the Harvard Forest trail.

10) **STRIPED MAPLE:** All along this stretch of road are striped maple trees (*Acer pensylvanicum*), a northern, understory species also known as moosewood or goosefoot maple. The greenish bark—more obvious in the young saplings—contains chloroplasts, which allow the tree to carry out photosynthesis even after the tree loses its leaves in the fall, and before new leaves grow in the spring.



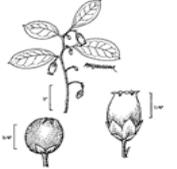
11) **FOREST PLANTS:** As you continue on the trail, take notice of the plants nearby. The following plants are often found in shady, moist areas.



Hobblebush  
(at waist height)



Partridgeberry  
(on forest floor)



Wintergreen  
(on forest floor)

12) **AMERICAN CHESTNUT:** The tree sapling with toothed leaves and multiple trunks in front of you (and several more on your left along the path) is an American chestnut (*Castanea dentata*). Before the American chestnut was devastated by the chestnut blight across its range in the early 1900s, it was an important tree in the Northeast for posts, lumber and fuel. Chestnuts were an important food source for many wildlife species including bears, deer, wild turkeys, and passenger pigeons, and people treasured their sweet, starchy taste. The blight can be detected on chestnut trees today as orange-red spores visible along cracks in the bark.

*NOTE:* Turn right at the gate to stay on the trail.

12) **PLANTATIONS:** It is common across Massachusetts to see large areas planted with one type of tree, like the red pine plantation to your right, planted in the late 1920s by Harvard Forest students. At that time, forestry was a relatively new science, and more emphasis was placed on planting and weeding to produce a single species, often a non-native conifer. Today in Massachusetts, forestry practices emphasize working with natural processes and native species. In 2007, we began logging our plantation forests to restore a diversity of native tree species to these sites.

*NOTE:* Continue on the main road to return to the Fisher Museum. Or, turn left to follow a short loop trail and boardwalk to explore stations 14 through 17. The loop will bring you back to this point.