



*Brush cutting (above) followed by burning (below) reduces the vigor of shrub understory species, reduces litter (fuel), limits the spread of surface fire, and reduces the risk of crown fires in pine stands.*



National Park Service  
U.S. Department of the Interior



Cape Cod National Seashore

## Lombard-Paradise Hollow Fire Management Research Area



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Setting the Stage  
University of Massachusetts

The *Lombard-Paradise Hollow Fire Management Research Area* encompasses approximately 30 acres of land within Cape Cod National Seashore. Located west of Route 6 in South Truro, the research area is situated on top of a plateau between Paradise Hollow to the south and Lombard Hollow to the north.

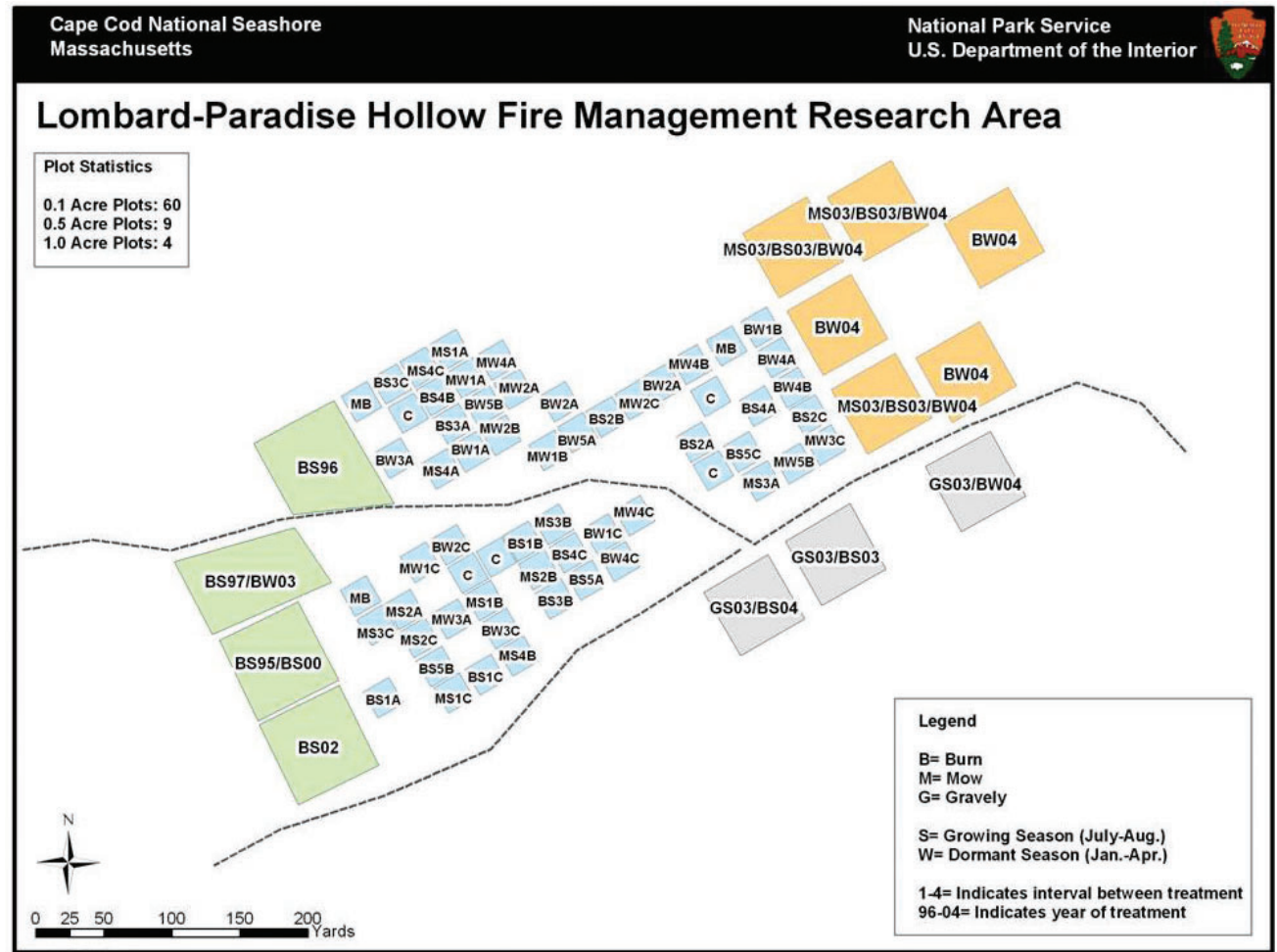
Periodic wildland fire helped create the fire-adapted pine-oak woodland vegetation type found throughout the Seashore and within the research area. The dominant canopy species are pitch pine (*Pinus rigida*) and white and black oaks (*Quercus alba* and *Q. velutina*), with scrub oak (*Q. ilicifolia*), huckleberry (*Gaylussacia baccata*), blueberries (*Vaccinium* spp.), and wintergreen (*Gaultheria procumbens*) in the understory.

Before the land was acquired by the National Park Service in 1961, it had been logged and grazed but not cultivated. Over the last 100 years the forest has experienced chronic gypsy moth defoliation and wildfire, which burned prior to the 1930's. Decades of fire suppression altered historic fire cycles and allowed wildland fuels to accumulate, again raising the threat of wildfires which could threaten structures within the Seashore boundaries.

In 1986, the National Park Service, in cooperation with the University of Massachusetts/Amherst, initiated applied research on the effectiveness of varying the season and frequency of treatments on forest composition, fuel loading, and fire behavior on sixty 0.1-acre plots. In 1995, larger 1-acre plots were established, and in 2003 nine additional 0.5-acre plots were created. Fuel treatments included prescribed burning and mowing (brush cutting).

The research conducted at Lombard-Paradise Hollow set the stage for large-scale fuel treatments to be conducted throughout the Seashore. The study helps fire managers develop treatment methods to decrease the chances of catastrophic wildfire within the Seashore.

Treatments have been evaluated with respect to their effectiveness in restoring and maintaining ecological integrity of fire-adapted ecosystems. The treatments have also provided training opportunities for wildland firefighters, as well as prescriptions for improving public safety in the wildland-urban interface.



Identifying markers are located at the southwest corner of each plot. There are three replicates of each treatment. The effects of the varying treatments and the effects of season and interval of treatment can be observed by comparing the results on individual plots.

#### Preliminary Results:

Results of the research indicate that burning during the spring and summer reduces fuel loads. Burning at 3-4 year intervals is the most cost efficient way to reduce fuels and prevent catastrophic wildfires. Oak saplings resprout vigorously after spring burns. Both mowing and burning in the dormant season encourage huckleberry and blueberry vegetation to grow, but hot fires are required to open up the canopy and allow light to reach the forest floor and encourage berry production. Summer burns conducted during drought conditions consume duff layers, kill most shrubs, and favor pine seedling establishment. Annual summer brush-cutting eliminates shrubs and reduces the amount of litter and dead wood that fuel wildfires. Combinations of mowing followed by burning, when applied in the summer, are effective methods of quickly reducing fuel loads and fire hazard. Research at this site is ongoing to better understand the long-term effects of disturbance on the pine-oak ecosystem.