

## Hemlock Resources in Great Smoky Mountains National Park

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### Abstract

Great Smoky Mountains National Park (GRSM), an International Biosphere Reserve and World Heritage Site, encompasses 525,000 acres of the Blue Ridge Mountains of western North Carolina and eastern Tennessee. Of the more than 100 native tree species in forest types ranging from southern yellow pines to Fraser fir, eastern hemlock, *Tsuga canadensis* (L.) Carr, is the only species of hemlock known within the park. Hemlock is a dominant species in at least five of the twelve vegetation types in GRSM, and it is an associate in most of the others.

The extent of the hemlock resource in the Smokies is difficult to measure due to terrain and accessibility, but historical records and recent surveys have provided insight as to how much hemlock was here, how much exists now, and what size and age classes can be found. European settlement and commercial logging had a large impact on the park's forests. At least 18 commercial logging companies were active on lands that became the park. The Champion Fiber Company harvested 33 million board feet of hemlock in Smokemont, North Carolina between 1920 to 1925. The Little River Lumber Company reported that during 1903 to 1939 hemlock accounted for more than 50% of the logs cut. Lambert (1961) estimated that the hemlock harvest from the Little River watershed totaled one billion board feet before cutting stopped.

Based on archival records and aerial photo interpretation, Pyle (1985) concluded that 20% of the park was "relatively undisturbed." This is the basis for determining areas that may not have been cut; however, field checking for verification is essential. A 1994 study verified 726 acres of old growth hemlock in the park. Johnson (1995) estimated 3,820 acres of hemlock-dominated forest in the park, most of which is uncut forest with trees 400 to 500 years old. Nearly 2,150 acres of that total has been field checked. Among hemlock dominated forest in the Cataloochee Valley area of the park, Knebel (1999) concluded that hemlock density and basal area in 20 (0.1 hectare) vegetation monitoring plots declined between 1935 and 1998. The plots included areas of old growth hemlock. Part of the decline may be attributed to fire. However, there was no indication that hemlock distribution in the park was declining.

Jenkins and White (2002) reported that hemlock density was increasing in 86 long-term vegetation monitoring plots in the western area of the park among acid cove, typic cove, alluvial, and pine-oak forest types between the monitoring periods of 1977 to 1979 and 1995 to 2000. This increase was attributed to fire suppression across those forest types. Shriner (personal communication, ) related that among 4,000 vegetation points established for determination of vegetation type within bird habitat, hemlock was the second most common tree species tallied.

## Keywords:

Eastern hemlock, disturbance history, old growth.

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