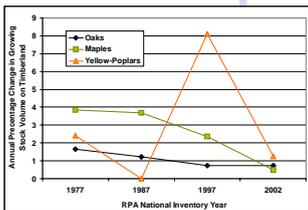


## Are Oaks Declining in the United States?

### Oak Resources Over Past 40 Years

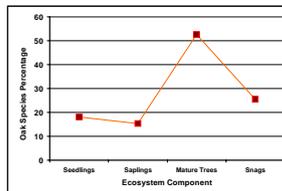
Based on data from the USDA Forest Services' RPA database (2002), oaks occupy approximately 120 million acres of forestland across the US.



Trends in Oak and non-Oak Species Total Volume on Timberland since 1963

### Oak Forest Ecosystem Component Curves

In oak forests, the proportion of oaks relative to non-oak species for 4 ecosystem components (seedlings, saplings, mature trees, snags) indicates that oaks only dominate the latter ecosystem components of mature trees and snags while only occupying approximately 15% of all saplings.



Ecosystem Component Curves for Oaks Forests across the country

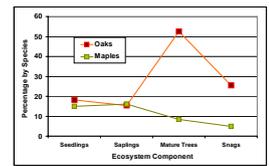
Christopher W. Woodall<sup>1</sup>,  
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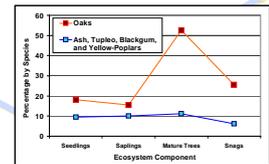
What tree species are expanding in oak forests? The following species appear to be firmly establishing regeneration and saplings throughout the east:

*Maples have nearly as many seedlings and saplings as oak species in oak forest types*



Ecosystem Component Curves for Maples and Oaks in Oak Forests

*Ash, Tupelo, Blackgum, and Yellow-Poplars although they have less seedlings and saplings than oaks in oak forests, they are just examples of numerous eastern hardwood tree species firmly established in oak forests*



Ecosystem Component Curves for Oaks and for Ash, Tupelo, Blackgum, and Yellow-Poplars in Oak Forests

Therefore, oaks species may not be perpetuating themselves in oak forests indicating their possible future decline.

### Assessing the Total Oak Resource: Ecosystem Component Curves

Merely examining the total volume of oak forests does not describe the dynamics of oak forests. Oaks occur in multiple size and condition classes: regeneration, saplings, mature trees (sawtimber-sized), and standing dead trees (snags). By estimating the number of oaks and non-oak tree species in oak forests by ecosystem component provides insight into patterns of oak forest development over time.



Snags



Seedlings



Mature



Saplings

### Sapling/Snag Ratios as an Indicator of Oak Decline



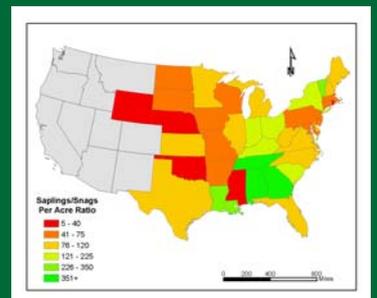
Relative amount of oak snags per unit area in oak forests



Relative amount of oak saplings per unit area in oak forests

Oak snags, indicating recent mortality, are prevalent in PA, MS, and hardwood regions west of the Mississippi River, while oak saplings are prevalent in central hardwood regions up into the Allegheny plateau.

A high ratio of oak saplings to oak snags can indicate areas where oak regeneration is relatively successful. A low ratio indicates low oak regeneration success relative to mortality. Central hardwood regions west of the Mississippi River and mid-Atlantic forests have some of the lowest ratios while areas of the Ohio River valley and southeastern US have some of the highest ratios.



Ratio of oak saplings to oak snags in oak forests