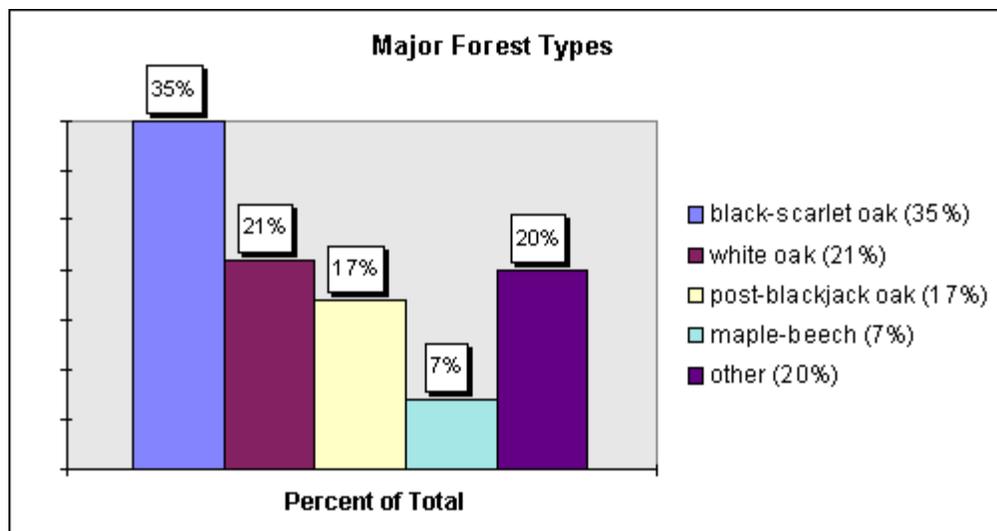


## The Resource

Missouri is about one-third forested. There are over 14 million acres of forest land, an increase of 5% since 1989. Missouri is well known for its oak-hickory forests. The 1999 forest inventory estimated that almost three-fourths of the timberland in Missouri is dominated by oaks, hickories and associated species. In addition to the recreation and wildlife benefits these forests provide, the latest statistics indicate the value of forest products produced annually exceeds \$4 billion. There are over 2,500 firms employing more than 30,000 people with a payroll of over \$500 million per year. In 1997, 733 million board feet were cut, 90% was oak, with a stumpage value of over \$100 million.



## Special Issues

**Drought** - The drought patterns that existed during the past couple of years have eased in some sections of Missouri. Precipitation levels in 2001 tended to be average or above average in northern and western sections of the state. However, many other areas have not recovered from past drought effects. Precipitation levels tended to be below average in southern and southeastern sections of the state, areas that had some of the most severe drought levels in recent years.

February 2001 was the wettest February on record for the state as a whole. This was followed by below average precipitation in March and April for much of the state, particularly in southern Missouri. June and July were wetter than normal in most areas and particularly in western Missouri. Precipitation was adequate to maintain foliage color throughout the summer in most parts of the state. No widespread foliar scorch was observed as in past years.

Nevertheless, the effects of drought-related stress in trees, particularly in red oaks, are becoming more obvious across southern Missouri with wood borer damage and evidence of oak decline becoming more common. Increased activity has been reported for several wood

borers including the red oak borer (*Enaphalodes rufulus*), carpenterworms (*Prionoxystus sp.*), twolined chestnut borer (*Agrilus bilineatus*), prionus root borers (*Prionus sp.*), and a variety of other Cerambycid and Buprestid borers.

**Oak Decline** - Oak decline reports in Missouri increased in 2001, especially in stands with a large red oak component that is advanced in age, growing in shallow, rocky soils, and occurring on upper slopes. *Armillaria* root rot, *Hypoxylon* canker, red oak borers, and carpenterworms are commonly associated with these oak decline stands. The oak decline situation in Missouri is not as serious as that occurring in Arkansas. However, all of the factors causing severe oak decline in Arkansas are presently at work throughout much of the Ozark Highlands in southern Missouri. The potential exists for widespread oak mortality in Missouri to reach levels in the next few years that will have a major impact on forest and wildlife resources.

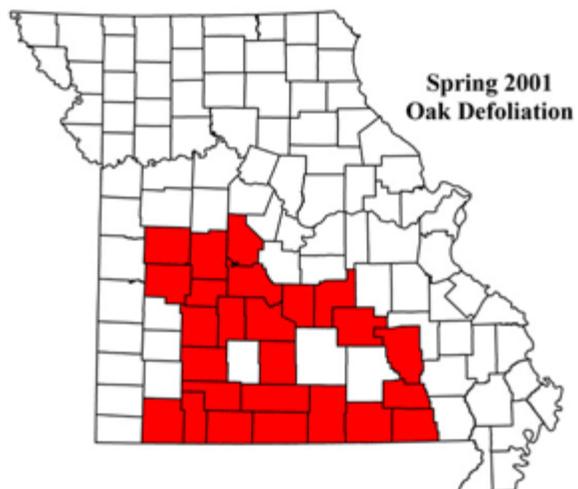
**Oak Wilt** - There were 12 confirmed cases of oak wilt caused by *Ceratocystis fagacearum*. These positives were collected from the following counties: Platt, Clay, Jackson, Howard, Boone, Audrain, Callaway, Marion, Montgomery, Lincoln, St. Charles, and St. Louis. There were five positives recovered from pin oak, three from shingle oak, and four from northern red oak. Oak wilt mats or pads were observed in at least one FIA (Forest Inventory & Analysis) plot located in Howard County.



**White Pine Decline** - White pines 20-30 years of age continued to have wilt-like stress associated with sunken bark on the main stems. The cause could not be attributed to a single fungal agent on 10 trees sampled randomly across Missouri, but may be related to xylem cavitation which results from transpiration-induced water stress during prolonged drought exposure.

**Fire Blight** - Fire blight reports were high through June and July over much of Missouri. The increase was likely due to a severe hail storm that centered in mid-Missouri. 'Bradford' pear, a normally tolerant tree, had many reports of tip dieback, though most trees recovered by the end of the growing season.

**Spring Defoliators** - Several oak defoliators caused scattered damage across southern and western Missouri during May 2001. The common oak moth (*Phoberia atomaria*), a Noctuid "looper," caused defoliation primarily on post oaks in two tiers of counties along the southern edge of the state. A complex of several defoliator species was active in west central Missouri causing defoliation to a variety of oaks.



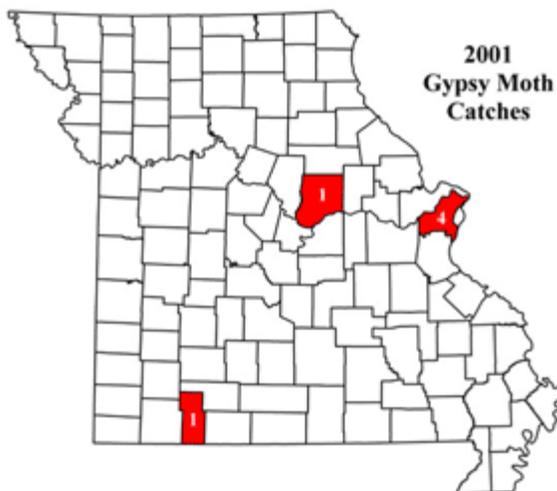
**Summer Defoliators** - Defoliation by the variable oakleaf caterpillar (*Lochmaeus manteo*) was reduced in 2001 compared to the past few years. One small pocket of heavy defoliation by this insect (less than 2,000 acres) was observed in late summer in southern Iron

County, approximately 50 miles east of where defoliation occurred in Texas and Dent Counties in 1999 and 2000. Oak defoliation by grasshoppers was also observed in mid- to late summer in several scattered stands in southeastern Missouri.

**Jumping Oak Gall** - Foliar damage from the jumping oak gall wasp (*Neuroterus sp.*) was minimal in 2001. Very light infestations were observed in a handful of forest stands, primarily in eastern Missouri. This low damage level represents a sharp decrease from the widespread foliar damage that occurred in eastern Missouri during 1998-2000.

**Horned and Gouty Oak Galls** - Heavy branch galling by the horned oak gall wasp (*Callirhytis cornigera*), and possibly also the gouty oak gall wasp (*C. quercuspunctata*), were observed on individual shingle oaks and other species of oaks throughout central and eastern Missouri in 2001. Heavy damage by these galls can cause significant branch dieback, and in severe cases tree mortality, if populations repeatedly attack the same trees over several years.

**Gypsy Moth** - The Missouri Cooperative Gypsy Moth Survey continued its annual effort to detect the presence of gypsy moths by placing and monitoring approximately 12,000 traps throughout the state in 2001. A total of six moths were captured statewide, including four moths from St. Louis County, one from Stone County, and one from Callaway County. Captures in the first two counties represent the same general areas where moths have been caught for the past several years in the St. Louis urban area and the popular recreation area of Branson and Table Rock Lake in southwestern Missouri, respectively. Large volumes of interstate traffic traveling to those areas provide opportunity for gypsy moths to repeatedly hitchhike into the state.



In spite of repeated moth captures in some areas, there are no known populations of gypsy moths in Missouri at this time. Sites where gypsy moths have been captured are surveyed with an increased trap density in the following year. In most cases, survey results in the vicinity of past captures have been negative within one or two years following the original capture. Despite these favorable past results, the risk of gypsy moths establishing in Missouri continues to increase as infested areas in nearby states expand. Statewide gypsy moth monitoring efforts will continue annually in Missouri.

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**Updated: December 2001**