

OAK DECLINE—WHAT WE KNOW TODAY AND WHAT TO DO ABOUT IT

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Abstract—Oak decline was the focus of the last Oak Symposium in 2002. Since then, in the Ozark Highlands and considering the red oak group alone, more than 60 percent of the forest has been severely impacted by oak decline. This is a synthesis of our past 15 years of research into oak decline. Our methods included inventories and/or modeling at seedling, forest stand, landscape, and regional scales. Within 1 year of decline onset, a stand scale study showed the number of standing dead northern red oak (*Quercus rubra* L.) trees increased by 55 percent (P -value = 0.029). Within the Ozark Highlands, 3.6 million ha of the red oak group [(*Quercus* Section *Lobatae*): includes northern red oak (*Q. rubra* L.), black oak (*Q. velutina* Lam.), scarlet oak (*Q. coccinea* Muenchh.), blackjack oak (*Q. marilandica* Munchh.) and southern red oak (*Q. falcata* Michx.)], 0.4 million ha of white oak (e.g., *Quercus alba* L., *Quercus stellata*) and 0.28 million ha of non-oak group forests had severe decline between 2006 to 2010. While model simulations across a 0.43-million ha area of the Ozark National Forest through the next century predict reduction of potential oak decline sites from 45 percent to 20 percent if historic fire frequencies are re-established. However, simulations by harvesting alone resulted in only a 3-percent reduction of high risk sites over doing nothing. Based on the combined results of these studies, our recommendations to reduce the impact of oak decline within oak decline susceptible forests include managing physiological age of susceptible trees, favoring decline resistant species, and prescribed fire.

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