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**STATEMENT OF SCOTT SIMON
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THE NATURE CONSERVANCY
Before the Subcommittee on Forestry, Conservation, and Rural Revitalization
Committee on Agriculture, Nutrition and Forestry
United States Senate**

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I. Introduction

Madam Chairwoman, and members of the sub-committee, my name is Scott Simon, and I am the Director of Conservation for the Arkansas chapter of The Nature Conservancy. Attending with me is Joe Fox, Director of Protection and Forestry for the Arkansas Chapter. We appreciate the opportunity to appear before this committee and share The Nature Conservancy's views and experiences regarding the oak decline in the Ozark Mountains. I will describe the Conservancy's interest in the Ozark Mountains, our views on the causes of the current oak decline, long-term effects, and long-term solutions.

The Nature Conservancy is an international, non-profit organization dedicated to the conservation of biological diversity. Our mission is to preserve the plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive. The Conservancy has more than 1.1 million individual members and 1,900 corporate sponsors. We currently have programs in all 50 states and in 27 countries. To date we have protected more than 12 million acres in the 50 states and abroad, and have helped local partner organizations preserve millions of acres in other nations. The Conservancy itself owns and manages more than 1,340 preserves throughout the United States – the largest private system of nature sanctuaries in the world. The major premise underlying our work is that successful conservation requires protecting and managing suitable habitats while ensuring that human needs are integrated with conservation. Although our work is largely accomplished through private action, we have an ongoing record of successful partnerships for conservation with many federal, state, and local governmental agencies.

II. Ecological Significance of the Ozark Mountains

The Ozark Highlands are one of the centers of biodiversity in the United States. This system of oak woodlands, forests, and savannas is the largest contiguous remnant in the United States. Over 150 species of animals and plants are only found from the Ozark Mountains and no where else on earth. In the southern Ozarks, the Boston Mountains are the watershed for half a dozen

rivers considered globally significant aquatic resources because of their diverse suite of aquatic animals.

For several thousand years prior to European settlement of the region, middle North America was influenced by Native American practices, including frequent woodland fires set for a variety of purposes. In the Ozarks, such fires usually occurred during the late summer and early fall, but could burn at any time of year. These practices have been well documented by numerous historic, anthropological, and ecological studies.

Reflecting on nearly eight decades of observing changes in the landscape of the Interior highlands, Joseph Mudd wrote in 1888:

“Annually, after this rank growth of vegetation had become frosted, dead, and dry, the Indians set fire to it and burned it from the entire surface of the country. When this annual burning ceased, the germs of underbrush and young timber began to grow...”

Thus, the landscape encountered by the early settlers had a long history of being shaped by, and even dependent upon, periodic fires. These fires played a major role in shaping the vegetation of the Ozarks. The prevailing timber type over large portions of the region was open, often park-like, oak woodlands. Here, trees were thinly scattered, allowing free passage between them. Sufficient light reached the ground to allow the growth of a rich mix of wildflowers and grasses. The periodic fires in these timbers were generally of low intensity because of the lack of accumulated heavy fuels. These fires generally removed most of the brush and young woody growth while leaving most of the larger trees.

Henry Rowe Schoolcraft, who traveled extensively throughout the Missouri and Arkansas Ozarks during the early 1800's, described these woodlands:

“A succession of hills of moderate elevation, covered chiefly by oaks and without underbrush. A tall thick, and rank growth of wild grass covers the whole country, in which the oaks are standing interspersed, like fruit trees in some well-cultivated orchard, and giving to the scenery the most novel, pleasing, and picturesque appearance.”

This general theme of open timbers in the uplands, with well spaced trees, little underbrush, and a well developed and grassy ground cover is repeated in hundreds of accounts by the earliest European travelers in midcontinental North America. The similarities among these accounts are striking, even though the individual writers come from a variety of eras, nationalities, and educational and social backgrounds. This information is also supported by other studies, including analyses of tree data from original Government Land Surveys and ongoing fire history research on the Ozark National Forest.

To this ecosystem, fire is as essential an ecological process as rainfall. Regular ground layer fires are the predominant ecological process that created and maintained the open woodland and savanna structure and its associated prominent and diverse ground cover of grasses and wildflowers.

III. Changes to the Ozark Oak Ecosystem and Causes of Oak Decline

Forest health issues in the Ozarks are similar to changes occurring in other forests throughout the country. There is a common theme of fire suppression leading to increased woodland densities, shifts in species dominance and increased fuel loads. This increased tree density often results in large-scale mortality or catastrophic disturbance, such as the red oak borer outbreak or high-intensity wildfires like those we have witnessed in the western United States this year. Similar increased fuel loads are a threat to Ozark woodlands. The increased fuel from increased stem density and dead trees is a significant wildfire risk. Wildfires with these fuel loads are significantly more intense than the system is adapted to, resulting in even greater tree mortality, and greater threat to private property.

Fire Suppression and Woodland Densification

Approximately 80-100 years ago, the woodlands of the Ozarks were heavily cut and the fire regime was drastically altered. As a result, the woodlands that grew back were much denser than had occurred previously. Historically, Ozark woodlands were estimated to average 18-30 trees per acre. Steep slopes and riparian areas had up to 50 trees per acre. Current densities in much of the region average 300 – 1000 stems per acre – a staggering increase over the pre-settlement stocking density.

The increased stem density and corresponding increases in brush density results in severe shading that produces declines in ground layer vegetation and changes in species composition. This deep shade often results in a bare expanse of leaf litter, with virtually no oak regeneration. To germinate and survive, oak acorns need full sunlight, the kind provided by an open woodland stand. In a closed stand with little sunlight reaching the forest floor, oak germination, regeneration and recruitment decline significantly.

Although oaks do not germinate in shade, many other trees like maples, ashes, elms, and black gums germinate prolifically. These shade tolerant species are not as adapted to fire, but increase rapidly in the modern fire-suppressed landscape. Over time, as the overstory of oaks dies from old age, they are replaced by this new forest type of maples, ashes, and black gums, changing the site conditions and impacting all the species of plants and animals that are part of the system.

Drought, Insects, and Ecosystem Stress

Droughts and native insects like the red oak borer have been part of Ozark oak ecosystems for millennia. These forces have historically thinned woodlands in synergy with fire. Because in modern woodlands many more trees are competing for the same amount of nutrients and water, the current dense forest system is under stress. The trees are mature, but not near the end of their lives. Just as stressed humans get sick, stressed trees die before their time. Healthy white oaks will live 250-300 years. Healthy red oaks will live 120-150 years. Because the forest is so dense, competition for resources, such as water, light, and nutrients, is intense. Where previously a single tree competed for necessary resources, there may now be a dozen or more

trees, each needing as much water, nutrients and light as the original plant. This results in entire stands of stressed, vulnerable trees.

Recent droughts have been within the historical range of variation. Records indicate that more severe droughts lasting up to ten years have occurred in recent history without extensive oak mortality. The current over stocked forest may appear healthy during non-drought years, but is nevertheless stressed. During the slightest dry period, trees become vulnerable to insects and diseases, and as a result, large numbers of trees die. These outbreaks are not a result of drought, but rather the symptoms of a stressed ecosystem incapable of sustaining itself under altered conditions. The cause is an unnaturally dense forest. An ecosystem in a healthy state with a lower tree density would better withstand these disturbances and replace itself. Before our eyes, many areas of the Ozarks are shifting from majestic oak woodlands to overstocked stands of maples, ashes, and other tree species. The resultant shade tolerant woodlands themselves may not be sustainable over time, and may further degrade.

IV. Impacts of Changes on Biodiversity

Nothing in the post-glacial record suggests that Ozark woodlands have been previously impacted by changes of this magnitude or rapidity. These changes, and their impacts to soil, water, and other habitat conditions, may be occurring too fast for many of the species to adapt. Of particular concern are the those species adapted to the Ozark's oak ecosystem and found no where else in the world.

The animal life of an ecosystem is dependent on the plant communities. Fire-maintained oak woodlands provide superlative habitat for deer, turkey, quail, bear, and the expanding Buffalo River elk population. Acorns and ground cover plants provide the best food source for many wildlife species. If the plants change, the animals change. Changes from an oak ecosystem to another woodland type will be associated with changes in both types and numbers of animals.

V. Solutions

The knowledge exists to restore the health and sustainability of Ozark oak systems. To maintain an oak ecosystem in the Ozarks requires restoration of a safe and ecologically appropriate fire regime. This can be accomplished through a management program that includes periodic prescribed burns. In the short-term, it requires thinning the woodlands through prescribed burns and/or mechanical treatments to a more sustainable density on hundreds of thousands of acres. With the restoration of a woodland density adapted to local climactic conditions, the resultant healthy ecosystem will have increased resiliency to insects, drought, wildfires, and other stresses.

The Ozark National Forest, The Nature Conservancy, the Arkansas Game and Fish Commission, Arkansas Natural Heritage Commission, and the Missouri Department of Conservation have for many years been utilizing prescribed fire and ecological thinning at a small scale with positive results. Unfortunately, these projects are not at a scale sufficiently large to restore ecosystem health. Many recent Forest Service projects have been proposed in collaboration with Arkansas Game and Fish Commission and The Nature Conservancy at a scale that would restore the

ecosystem, such as the 54,100 acre project in the Bayou Ranger District of the Ozark National Forest. Existing projects should become a federal funding priority, administrative blockages for ecosystem restoration should be eliminated, and additional projects should be initiated.

VI. Conclusion

It is clear that current woodland conditions and trends in large areas of the Ozarks threaten the economic and ecological integrity of a unique resource. A major factor in the current large-scale oak decline is the result of decades of fire suppression, and its associated impacts. This has resulted in unsustainably high stocking rates, reduced stand vigor and resiliency, and compositional shifts that simultaneously degrade system biodiversity and threaten the continued existence of an oak dominated landscape and its associated wildlife and other benefits. As a society, we have the technology and knowledge to reverse the situation. The Nature Conservancy strongly supports the restoration of Ozark oak systems through the use of prescribed fire and mechanical thinnings. Although there are many needs facing public lands, sustainable stewardship must be the priority. All other uses flow from this.

Thank you for the opportunity to present The Nature Conservancy's views. We are happy to answer any questions you may have.

Attachment (1): "Restoring Forest Ecosystem Health in the Wildland/Urban Interface on the Bayou Ranger District" Proposal from the Bayou Ranger District, Ozark National Forest