

10/01/01 Update

OAK MORTALITY STUDY AND ACTION PLAN

OZARK HIGHLANDS REGION

Ozark-St. Francis National Forest, Mark Twain National Forest, Ouachita National Forest,
Missouri Department of Conservation and Arkansas Forestry Commission

INTRODUCTION

The USDA Forest Service predicts that oak decline will impact over a million acres of red oaks in the Ozark Highlands by the end of calendar year 2001. Heavy oak mortality is occurring throughout Arkansas and Missouri.

Oak decline is a syndrome caused by predisposing, initiating, and contributing factors which together result in decline and mortality of oaks, particularly red oaks. This phenomenon has been studied and described in the past in many upland hardwood areas of the eastern U.S. It is a natural and recurring phenomenon involving a complex set of circumstances, none of which can be addressed alone to stop tree decline to any great extent.

Factors such as high proportion of red oaks, advanced age, ridge and upper slope topography, rocky soils, and low site index, set the stage for decline. Factors such as drought, flooding, and defoliation add additional stresses to the trees. Secondary agents (insects and pathogens) that attack the highly stressed and declining trees lead to tree mortality. These secondary agents may include two-lined chestnut borer, Armillaria root rot, red oak borer, Hypoxylon canker, white oak borer, and carpenterworm. In the current episode of oak decline, we have experienced several years of drought and the secondary agent is an unprecedented population of red oak borer.

Red oaks are extremely important in the Ozark Highlands. Ecologically, the red oaks are a significant mast producer for wildlife. Economically, the red oaks are the most desirable hardwood species and are used frequently for furniture, flooring, and other building materials. Widespread loss of red oaks could severely damage the social fabric of the Ozark Highlands through job losses, reduced game populations, and scenic quality.

An interagency task force comprised of the Ozark-St. Francis National Forests, Mark Twain National Forest, Missouri Department of Conservation, Northeastern Area (USDA Forest Service), Region 8 Forest Health Protection (USDA Forest Service) and the Southern Research Station (USDA Forest Service) developed this Action Plan to reduce both the immediate and future threats to the forest ecosystem and associated communities of the Ozark Highlands.

The Action Plan consists of five components:

1. Public safety;
2. Public Awareness;
3. Inventory and assessment;
4. Management strategies for prevention, suppression, and restoration;
5. Research.

A Planning Team (PT) will be established by September 1, 2001, to develop specific strategies to implement this Action Plan. The PT will be comprised of scientists and specialists from the agencies being affected by the current mortality. As the PT moves forward, each component of the Action Plan will be analyzed in depth. Specific activities, timeframes and costs will be determined and documented in implementation plans. This Action Plan and future implementation plans will be the foundation for multi-agency, multi-landowner and multi-state programs.

PUBLIC SAFETY

Public safety is our most important objective. Specific actions may include:

- Monitoring of developed recreation areas on public lands for dead or dying trees that pose a threat to public safety and remedies to remove them.
- Identification of roadside hazard trees on public lands and remedies to remove them.
- Identify hazard trees along trail systems and prioritize the removal efforts.
- Provide safety awareness through oak decline/red oak borer interpretive signs.
- Provide hunters with information alerting them to look for dead trees before locating their camps.
- Contact highway departments, utility companies, and other special use permittees informing them of the red oak mortality issue and the need to remove dead trees.
- Hazardous fuel reduction activities.

Initial cost estimates for hazard removal and safety awareness is \$1,390,000 dollars for fiscal year 2002. These costs are expected to increase for at least 4 years. Costs for hazard tree removal in recreation areas and on trail systems is difficult to estimate until inventories are conducted. The PT will prepare a status report by October 19, 2001, documenting the ongoing efforts to provide for public safety in the areas where dead or dying trees exist.

PUBLIC AWARENESS

The causes and effects of oak mortality are not well understood by the public. Public awareness of the extent of this mortality is lacking due to the fact that red oaks are dying while other tree species are still living. The visual effects of oak mortality are not as great as with ice damage, tornados, or catastrophic wildfire. Information products and communication tools that explain what is occurring on all lands affected by the current oak decline and red oak borer episode are needed. As research activities begin to provide information and management strategies are developed, mechanisms for

communicating this new information should be in place and utilized. A comprehensive public communication and awareness plan will be developed and may include:

- A revision of the oak mortality brochure developed in Arkansas in 1999.
- Tours conducted to increase awareness and build support for management actions.
- Develop a Power Point presentation for use at civic organizations and other meetings.
- An edition of State conservation magazines devoted to oak mortality and the importance of the oak ecosystem.
- A citizen/scientist forum on oak decline sponsored by a multi-agency task force.
- An Upland Oak Symposium sponsored by the Arkansas Wildlife Federation and the Southern Research Station with published proceedings.

Initial cost estimates for the public awareness and communication activities are \$150,000 dollars during fiscal year 2002. After the communication mechanisms are in place, future year funding needs will decrease. The PT will develop a comprehensive communication plan, an implementation plan, and specific funding needs by September 14, 2001.

INVENTORY AND ASSESSMENT

Preliminary surveys have estimated 400,000 acres of severely impacted areas in the Ozark Highlands. The Ozark-St Francis National Forest has estimated 300,000 acres with more than 50% of the oak trees dead or dying. The Mark Twain National Forest has estimated 50,000 acres of severe oak decline. Aerial surveys are starting for state, private, and other federal lands. Impact estimates will increase as more land is surveyed and as symptoms progress through the season.

Better information is needed on the distribution and extent of the existing decline and mortality. The use of several inventory techniques may help obtain this precise inventory on a large scale. The following inventory techniques will be explored to determine their utility and effectiveness.

- Satellite remote sensing.
- Aerial sketch mapping that is attributed and digitized.
- Aerial photo missions over specific areas using color infrared; interpretation of results.
- Field inventories to validate findings from above; analysis of forest health monitoring plots; FIA plot intensification; compartment examination.

An initial cost estimate for this large-scale inventory is \$2,000,000 dollars in fiscal year 2002 and reduced costs during fiscal 2003 – 2005. A PT implementation plan outlining specific inventory and assessment projects and required funding will be completed by September 14, 2001. All large-scale inventory and assessment projects will be coordinated by Forest Health.

MANAGEMENT STRATEGIES

Management strategies will be based on the goal of improving health of the forest ecosystems. The implementation of the strategies will result in different management activities depending on

landowner objectives and the stand-specific conditions. Two broad strategies are proposed here: “Suppression and prevention” and “restoration”.

Site-specific projects must be based on accurate inventory data and scientifically sound treatment prescriptions. Actions have been proposed on several stands on the National Forests where sufficient inventory data and clear purpose and need statements have been prepared. As additional inventory data, management options, and research results become available, additional site-specific projects will be proposed, prioritized and implemented.

Salvage of oak mortality is a potential tool for the management strategies. However, the current situation with extremely high red oak borer populations has severely degraded the lumber quality. Galleries by the red oak borer (up to 600/tree) have made the logs unsuitable for most commercial products including pallets. Little demand for oak chips exists in Arkansas or Missouri, which leaves firewood as the primary market for infested trees. Salvage of infested trees within a year after attack may be feasible for the sawtimber market, as the larvae have not bored into the wood. Research is needed to determine the rate of degradation and to develop salvage guides.

Suppression and Prevention

Few suppression or prevention treatments are available for the current oak decline problem in the Ozark Highlands. Attempts to manage the secondary pest populations (e.g. red oak borer) do not address the true cause of this oak decline cycle. Effective treatments may exist to reduce the risk of mortality in certain forest stands exhibiting high hazard for oak decline (old, over-stocked, poor site, etc).

The following management strategies and management activities may be explored for risk reduction in high hazard stands:

- Risk ratings to identify the stands with high risk of oak decline, but currently with low incidence of oak decline.
- Project proposals may be developed for reducing the risk of oak decline in high hazard stands on the Mark Twain, Ozark-St. Francis and Ouachita National Forests. Commercial timber sales will be utilized where feasible during fiscal years 2002- 2005.
- Recommendations on appropriate risk reduction activities for private landowners provided by the Missouri Department of Conservation, the Arkansas Forestry Commission and private landowners. Financial assistance programs may be utilized to help private landowners with activities that do not generate offsetting income.
- Risk reduction activities implemented on State lands by the Missouri Department of Conservation and the Arkansas Forestry Commission.
- Technology development.

Prior to implementation of management actions, administrative processes necessary for compliance with federal laws including the National Environmental Policy Act (NEPA) and the Endangered Species Act (ESA) will take place where required. As permitted by regulation, a request for alternative arrangements from the Council on Environmental Quality may be prepared for project proposals if the criteria for nomination have been met. A request for exemption from stay during the

administrative appeal process may be prepared for project proposals if the criteria for exemption have been met.

Restoration:

For most forested stands with significant oak decline, management should focus on the long-term health of the ecosystem. Assessment of the residual stand and advanced regeneration is needed to make sound management decisions. If the residual stand and regeneration is suitable for the landowners objectives, no management action is necessary. However, if the residual stand and/or advanced regeneration does not meet landowner objectives, various management activities should be considered to change the species composition to better attain their objectives. A variety of management activities may be implemented including:

- Silviculturists from the National Forests, the Southern and North Central Research Stations, and the Missouri Department of Conservation have partnership to develop silvicultural prescriptions to promote restoration objectives.
- Project proposals developed to restore healthy oak ecosystems.
- A prescribed burning program focused in the next few years on those areas with red oak mortality. In stands that have advanced regeneration of red oaks in the understory, prescribed fire may be utilized to improve ecosystem health.
- Planting of nursery grown red oak seedlings increased over the next five years.
- Silvicultural treatments utilized on State managed lands in Missouri to increase species diversity and improve ecosystem health.
- Recommendations of appropriate restoration activities for private landowners provided by the Missouri Department of Conservation, the Arkansas Forestry Commission and private landowners. Financial assistance programs may be utilized to help private landowners with activities that do not generate offsetting income.
- Technology development.

Conclusion for Management Strategies

Initial cost estimates for management strategies that meet objectives of risk reduction and restoration of healthy oak ecosystems are \$ 8,200,000 dollars in fiscal year 2002. These costs are expected to continue for the next 4 years.

Based on results of the inventory and assessment projects and the interagency silviculturist partnership mentioned above, the PT will prepare a management strategy that focuses on high priority risk reduction and restoration opportunities in the Ozark Highlands. Due to uncertainties on timing and amounts of funding that will be received for inventory and assessment projects, the timing of results from inventory and assessment work can not be predicted. Since the management strategy will rely on these inventory results, a specific date for completion of the management strategy cannot be estimated. The management strategy will be completed within three weeks after the inventory and assessment projects are completed and findings are documented.

Following development of the management strategy, each individual land management agency will prepare a detailed implementation plan that will include specific projects necessary to meet management strategy. The PT will assist the land management agencies in developing the detailed

implementation plan. The agencies implementation plans should be completed within 2 months following the development of the management strategy.

RESEARCH

Because of the severity of this oak mortality, research on oak decline, the red oak borer, oak-hickory stand dynamics, and oak regeneration may be necessary to support forest management activities in the Ozark highlands region. Both the Southern Research Station (SRS) and the North Central Research Station (NCRS) have studies underway in oak ecosystems of the Ozark Mountains in Arkansas and Missouri, but additional work may be needed.

The Southern Research Station and Forest Health Protection – Region 8 consulted with 20 scientists in Arkansas, Missouri, and surrounding states to identify research needs. They identified the following needs:

- Develop methods to assess the risk of future oak mortality in stands to allow time for preemptive forest management to reduce future oak mortality.
- Develop silvicultural prescriptions to reduce potential oak mortality in high-risk stands and to rehabilitate the forests already affected.
- Determine the economic impacts of red oak mortality and methods to mitigate economic losses—speed of degradation, utilization of infested material, and visual quality (visitor concerns).
- Increase knowledge on the biology of the red oak borer and other contributing mortality agents.
- Determine ecological effects of oak mortality in the Ozark highlands, including impacts on threatened, endangered, and sensitive species, other plant and animal populations, and ecosystem and landscape processes such as fire.

It would be prohibitively expensive to fund the research these scientists wished for. Existing research efforts by the SRS and NCRS on oak ecosystems and silviculture, however, provide a valuable base and could be expanded to address high priority needs from the list above. New research funding of \$300K annually for 4 years would enable Station scientists to address these highest priorities. This new funding is above and beyond the FY02 President's Budget for Forest Service Research and Development (FS R&D). These funds would be administered by the SRS and NCRS for Forest Service research and development as well as cooperative research with Universities and other State and Federal agencies.

TIMELINE FOR PLANNING TEAM PRODUCTS

<p>Planning Team named -</p> <ul style="list-style-type: none"> - In-depth analysis of action plan components; - Preparation of implementation plans; - Status reports. 	<p>Accomplished</p>
<p>Public Safety/Hazard removal -</p> <ul style="list-style-type: none"> - Status reports on agency efforts. 	<p>Ongoing, work planning, Working w/ counties,</p>
<p>PT Bi-weekly status reports -</p> <ul style="list-style-type: none"> - Comprehensive status reports on action plan Implementation. 	<p>Ongoing</p>
<p>Inventory and assessment implementation strategy -</p> <ul style="list-style-type: none"> - Specific inventory projects developed; - Funding requirements and timeframes. 	<p>Accomplished</p>
<p>Public communication and awareness plan -</p> <ul style="list-style-type: none"> - Comprehensive and detailed plan; - Specific public awareness mechanisms planned; - Funding requirements and timelines established. 	<p>Accomplished</p>
<p>Safety status report -</p> <ul style="list-style-type: none"> - Status report on hazard reduction efforts. 	<p>Oct. 19, 2001</p>
<p>Research status report -</p> <ul style="list-style-type: none"> - Status report on funding availability and research Activities. 	<p>Oct. 19, 2001</p>
<p>Management strategy -</p> <ul style="list-style-type: none"> - Opportunities for risk reduction and restoration In the Ozark Highlands. 	<p>3 weeks post inventory</p>
<p>Implementation plan for management activity -</p> <ul style="list-style-type: none"> - Agency specific plans; - Includes specific projects and purpose and need Statements. 	<p>2 months post strategy</p>

