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Abstract

The State of the System and Steps Toward Resilience of Disturbance-dependent Oak Forests
Tricia G. Knoot, Lisa A. Schulte, John C. Tyndall and Brian J. Palik

Abstract:
Current ecological, economic, and social conditions present unique challenges to natural resource managers seeking to maintain the resilience of disturbance-dependent ecosystems, such as oak (Quercus spp.) forests. Oak-dominated ecosystems throughout the U.S. have historically been perpetuated through periodic disturbance, such as fire, but more recently show decline given shifting disturbance regimes associated with human land management decisions. We characterized the state of the social-ecological oak forest ecosystem in the midwestern U.S. through the perspectives of 32 natural resource professionals. Data from interviews with these change agents provided an integrative understanding of key system components, cross-scale interactions, dependencies, and feedbacks. Foremost, private landowner management decisions figured prominently in influencing oak regeneration success and were directly and indirectly shaped by a suite of interdependent ecological, e.g., deer herbivory, invasive shrub occurence; economic, e.g., the cost of oak regeneration

practices, the stumpage value of maple as compared to oak; and social forces, e.g., forestland parcelization, and personal relationships. Interviewees envisioned, and often preferred, a decline in oak dominance throughout the region, pointing to issues related to general landowner unwillingness to restore oak, the current trajectory of forest change, the threat of forest loss due to parcelization and housing development, and combination of ecological and social factors that decrease the economic feasibility of restoration efforts. However, a decline in oak dominance may result in ecological communities that have no compositional equivalent on record and may not offer a desirable endpoint. Increasing social support offers the potential to enhance system capacity to manage for oak.

land use
methodology: analysis, statistics
nature conservation: management, plan
Notes

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Acknowledgments
Literature cited
Appendix 1. Example interview questions, including potential probing questions to further clarify interviewees' responses.
Appendix 2. Examples of some of the main components, processes, thresholds, and uncertainties of the oak-social-ecological system, as described by regional natural resource professionals. These system features are categorized as either ecological or social/economic in nature and vary in the scale at which management and/or policy mechanisms are or could be used to address them. Example quotations are given to ilustrate each feature (pseudonyms are used to protect interviewees' identities).

conservation; oak forests; privately-owned lands; qualitative interviews; resilience; systems analysis

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