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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 occurrence; 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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Tartalom:

Introduction

Research approach

Study area: the Driftless Area of the Midwest

Qualitative Interviews

System Analysis

Results

The state and resilience of the oak-dominated social-ecological system

Category 1: The direct and indirect influence of ecological factors

Category 2: The inhibiting effect of macrolevel socioeconomic processes

Category 3: Personal relationships promote oak-appropriate decision making

Critical system thresholds, interactions, and uncertainties

Perceived system thresholds

Cross-scale interactions

System uncertainties

Preferred attributes of future forestland

Discussion

Resilience of oak social-ecological systems

Social capacity for adaptation and transformation

Conclusions

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 illustrate each feature (pseudonyms are used to protect interviewees' identities).

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

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