



ECOLOGICAL REFERENCE CONDITIONS

PERSPECTIVES IN COLLABORATIVE RESTORATION OF DRY FOREST LANDSCAPES

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Forest collaboratives are groups of stakeholders with different perspectives on the management of natural resources. The particular stakeholders vary, but often include forest industry, environmental organizations, local governments, and watershed councils. Together, they develop landscape-level recommendations to the landowner (typically the U.S. Forest Service or other public land management agencies) to advance ecologically sound management and restoration of local forests and watersheds. A key initial task is to identify a shared vision for restoration, but doing so can be complex and challenging. For example, stakeholders commonly have different perspectives on the identification and use of ecological reference conditions in planning restoration and monitoring its success.

This study examined stakeholder perspectives on reference conditions among collaboratives engaged in the restoration of dry, fire-adapted forest landscapes managed by the U.S. Forest Service. In particular, the authors examined social perspectives that influenced the determination of ecological reference conditions. They interviewed stakeholders associated with six collaborative groups from different geographic, biophysical, and social contexts in the western United States. All groups were funded by the federal Collaborative Forest Landscape Restoration Program (CFLRP).



KEY FINDINGS

- Recognition of the perceived benefits and limitations of ecological reference conditions is critical in the design and evaluation of collaborative restoration initiatives.
- Historical conditions were the predominant type of reference used by all collaboratives.
- Collaborative groups are adopting strategies to realize the benefits and address the limitations of reference conditions.

The Northwest Fire Science Consortium is a regional fire science delivery system for disseminating knowledge and tools, and a venue for increasing researcher understanding of the needs of practitioners.



RESULTS

Interviews with 86 collaborative stakeholders and U.S Forest Service staff revealed a variety of approaches to identifying ecological reference conditions based on historical, contemporary, or future conditions. Of these, historical reference conditions were most commonly used.

Historical references:

Historical references describe forest conditions prior to European settlement or to more recent grazing, logging, and fire exclusion. Historical references have been criticized as reinforcing a view that ecological systems are static or in equilibrium. Nevertheless, most respondents identified benefits of historical references, including:

- Provide scientifically defensible targets for restoration
- Suggest ecological conditions that are resilient to disturbance
- Facilitate collaborative discourse and foster a common vision among stakeholders
- Facilitate social learning and comprehension of ecological information by providing a mental image or visual representation of forest structure

Respondents also identified limitations and challenges of historical reference conditions:

- Possible conflict with other social values including public wildfire-safety and wildlife habitat
- Overemphasis on past relative to current or future conditions
- Perceived to represent an arbitrary or narrow choice of historical timeframes

Contemporary references:

Contemporary references are based on characteristics of nearby forests that have not been harvested or grazed, and/or in which fire regimes have been minimally altered or restored. Where available, contemporary references provide valuable information about the current ecological potential of forests. However, most respondents reported that contemporary reference information is limited or difficult to find, or represents a narrower or a different set of ecological conditions than the focal ecosystem.

Future references:

Future (or projected) reference conditions recognize that restoration efforts occur in the context of a future changing environment. Future conditions are acknowledged as an important justification for restoration, although most collaborative stakeholders were wary of the uncertainty and risk inherent in projecting future conditions. One collaborative group effectively used nearby sites representing warmer, drier environments as references for future conditions in the focal ecosystem.

MANAGEMENT IMPLICATIONS

Setting appropriate reference conditions for restoration is a fundamental challenge, and social perspectives on reference conditions are complex. Most interviewed stakeholders recognized both benefits and limitations of various approaches to reference information. Historical references continue to play an important role in forest restoration, despite ongoing debates about their limitations. To promote discourse, facilitate project planning, and address the limitations of reference conditions, collaboratives are adopting strategies that (1) integrate multiple methods, types, and sources of reference information; (2) identify reference periods that are analogous to current or projected future climates; (3) balance science-based targets with other social values in restoration planning; and (4) foster scientific engagement through shared learning about historical conditions.



MORE INFORMATION

This brief is based on the following article:

Urgenson, L.S., Nelson, C.R., Haugo, R.D., Halpern, C.B., Bakker, J.D., Ryan, C.M., Waltz, A.E.M., Belote, R.T. & Alvarado, E. 2017. Social perspectives on the use of reference conditions in restoration of fire-adapted forest landscapes. *Restoration Ecology*. <https://doi.org/10.1111/rec.12640>

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