

LITERATURE SURVEY

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Need for Research Directed Toward Ecological Restoration

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1. Many restoration activities have been, and often continue to be, conducted without a sound scientific basis and conceptual framework, or are based on outdated concepts of how ecological systems function. To be effective, managers involved in restoration activities need to be taught the most up-to-date ecological information on landscape and ecosystem processes, and plant community and population dynamics. With this training, managers will be equipped with skills that allow them to make sound restoration decisions that are transportable from one system to another.

2. It is practically impossible to make a list of research priorities or needs for ecological restoration because individual restoration projects will involve different ecological processes, principles, and levels of organization. For each restoration project, it is imperative to clearly define the restoration goal at the outset. Goals might include the restoration of specific desired species, overall community composition, or ecosystem function. The level of organization (species, communities, ecosystems, or landscapes) targeted for restoration will indicate the ecological processes that are critical to the restoration effort. Different types of scientific information will be required depending on the restoration goal. For instance, restoration of specific species will depend on an understanding of the habitat requirements of the species of concern, its population dynamics, and competitive interactions with invasive exotics and other native species. Restoration of ecosystem function will require an integration of landscape-level dynamics (such as those associated with disturbances) with smaller-scale processes of soil ecology and invasive species biology.

3. The invasion of natural plant communities by exotic weeds is symptomatic of other ecosystem changes. A rigorous assessment of the possible factors contributing to the spread and success of invasive plants in ecosystems needs to be conducted prior to restoration. Once the contributing factors have been identified, a clearer picture of the necessary restoration activities is possible, and a range of restoration options can be developed.

4. The ecological effectiveness of restoration efforts needs to be evaluated over the long term.

5. Restoration projects should consider the social, cultural, historical, and ethical implications of the proposed restoration activities in addition to their ecological and management ramifications.

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