



Ecological Restoration Institute



Fact Sheet: Conserving Rare Plants in National Parks and Protected Areas July 2012

Ecological
Restoration
Institute

Survey of Monitoring and Management Activities for Conserving Rare Plants in National Parks and Protected Areas (Arizona and Nevada)

Introduction

Plant species are typically rare due to human activities such as habitat destruction, overharvesting, and introduction of exotic species. These specialized habitat requirements restrict the species to small portions of the landscape or combinations of both (Kruckeberg and Rabinowitz 1985). Protected areas such as national parks frequently are refugia for rare species. However, even when protected from wholesale habitat destruction due to construction or land development, habitat in these protected areas is threatened by many of the same factors such as climate change, fire-regime disruption, and exotic species encroachment (Falk et al. 1996). Monitoring rare species is essential for understanding status and trends of their populations and whether further research or active management intervention is needed to protect populations from threats. This study focused on monitoring and management activities being undertaken to conserve rare plant species. The purpose was to synthesize the status of monitoring and management actions ongoing in the states of Arizona and Nevada aimed at conserving populations of rare plant species. To accomplish this, land managers responsible for managing rare plant populations were surveyed, and their responses on activities being undertaken on lands overseen by these managers were compiled.



Sclerocactus sileri (Siler fishhook cactus). Photo by Wendi Hodgson.

Survey Findings

- The amount of land managed by respondents was 32 million acres in Arizona and 59 million acres in Nevada (53% of public lands in Arizona and greater than 80% in Nevada).
- Employees assigned to work with rare plants on public lands often divide their time between invasive plant management, revegetation, and ecological restoration, to name a few; and less frequently spend time on wildlife and hazardous waste management issues.
- Seventy-one percent of respondents spend greater than 50% of their time working on rare plant issues, but 24% reported spending less than 10% of their time working with rare plants, due to competing priorities.
- Forty-three percent of survey respondents believe that currently implemented monitoring strategies and conservation measures are inadequate for protecting all of the rare plants at a given site, and 34% believe they are sufficient. The reasons most often cited for inadequate monitoring were lack of available personnel (53%) and insufficient funding (34%).
- Some type of rare plant monitoring is being conducted in 69% of the protected areas. The most commonly reported methods are inventories and monitoring that account for presence or absence of rare species (29%), followed by demographic or phenologic studies (24%), monitoring for abundance (22%), and mapping (4%).
- Management actions can include both passive activities such as protection of habitat or safeguarding from disturbance, as well as active operations, such as eradicating weeds or building fences. Thirty-four percent of respondents reported that passive management is the primary strategy used.

The Ecological Restoration Institute is dedicated to reversing declines in the condition of forested communities throughout the Intermountain West, particularly those affected by severe wildfires and insect outbreaks. Our efforts focus on science-based research of ecological and socio-economic matters related to restoration as well as support for on-the-ground treatments, outreach, and education.

Ecological Restoration Institute, P.O. Box 15017, Flagstaff, AZ 86011, 928/523-7182, FAX 928/523-0296, www.eri.nau.edu

- The most widely performed rare plant conservation and management efforts include mitigation to replace habitat lost to construction as well as building fences to protect plants from trampling by animals or humans (both listed at 31%). Invasive plant eradication is conducted by 20% of respondents. Reintroduction and transplant measures for rare plants are carried out by 14% of land managers, and closure to off-road vehicles (ORVs) was reported by 9%.
- Eighty-one percent of management actions are being monitored in some form, although at times only rarely or infrequently. In the majority of cases (61%), a decline was not detected in the rare species being monitored. Declines over time have been noted in eight species. Management actions, such as fence construction, increases in the size of buffer zones, and prevention of disturbance, have been undertaken to attempt to reverse declines in five of these species, and the decline appears to have been reversed in three species.
- Attempts to establish species on unoccupied but seemingly suitable habitat was reported by 11% of managers. Four respondents attempted to actively establish five rare plant species at unoccupied sites, and two more have plans to do so. Of the five species, two were successfully established at new sites and three of the attempts were unsuccessful.

Management Implications

The four greatest threats to rare plants across Arizona and Nevada noted by respondents of the survey are herbivory and trampling by animals, invasive exotic plant species, ORV use, and fire suppression or fire regime disruption (Table 1). The impacts of these threats on rare plants are often easily observable. In some cases they may be reversible, or at least manageable to some degree, if funding is available. On the other hand, effects of climate change (listed as a threat by 9%) are not as easily observed or managed and therefore may be under the radar for many of the respondents; and therefore could pose a much greater threat than it would appear based on these survey results. While many land management agencies have expended efforts to inventory and monitor rare plant resources, some state and federal land managers still have little to no idea of the rare plants that exist on the land they manage. This is due mainly to the vast amount of public land in these two states, insufficient training in plant identification, and a shortage of human and financial resources to carry out monitoring efforts. With 43% of managers believing that current strategies are insufficient for protecting rare plants coupled with more than 17 threats to rare plants identified in these two states, the data suggest that active management of rare plant populations could be investigated in more situations than currently practiced.

Threat	%
Herbivory and/or trampling by animals	51
Exotic plant species	49
Off-road vehicle (ORV) use	26
Fire suppression or fire regime disruption	20
Tree encroachment	11
Global climate change	9
Drought	9
Unmanaged recreation (non ORV)	9
Hydrologic regime disruption	9
Illegal border activity and border patrol impacts	9
Fire regime disruption from exotic plant species	6
Mineral exploration	3
Overharvesting (ethnobotanical)	3
Landscape fragmentation	3
Insect outbreaks	3
Erosion	3
Urbanization	3

Table 1. Threats to rare species noted by land managers in Arizona and Nevada. Percentages given were the proportion of respondents who listed each threat.

References

Falk, D.A., Millar, C.I., and Olwell, M. (Eds.). 1996. Restoring diversity: strategies for reintroduction of endangered plants. Washington, D.C.: Island Press.

Kruckeberg, A.R., and Rabinowitz, D. 1985. Biological aspects of endemism in higher plants. *Annual Review of Ecology and Systematics* 16, pp. 447-479.

This Fact Sheet summarizes information from the following publication:
 Springer, J.D., Abella, S.R., and DeKoker, T.R. 2011. A Survey of Monitoring and Management Activities for Conserving Rare Plants in National Parks and Protected Areas, Arizona and Nevada, USA. In: *Advances in Environmental Research*. Volume 8, Edited by Justin A. Daniels. Nova Science Publishers, pp. 307-317.

Contacts

Judy Springer, Judy.Springer@nau.edu
 Dr. Scott Abella, Scott.Abella@unlv.edu