

Protocol Development Summary

Protocol: Distribution and abundance of rare plant species and communities (Rare plants)

Parks Where Protocol will be Implemented: EBLA, MORA, NOCA, OLYM

Justification/Issues being addressed: Rare species and communities are important components of each park's vegetation resources. Several species in the network are endemic or near endemic to one park. Changes in vegetation communities resulting from global climate change, disturbance, wildlife populations, or human use may impact the distribution and abundance of these species. Some of these species occur in very limited distribution very close to high visitor use and facilities. Because many of the species are at their geographical limits of distribution or in limited climatic zones, shifts resulting from global climate change can lead to loss or expansion of these species.

Specific Monitoring Questions and Objectives to be Addressed by the Protocol:
How does the frequency and abundance of each endemic or nearly endemic rare plant species and each rare species at its geographical limit change through time?

Are endemic rare plant species increasing or decreasing in population size, geographical extent, and fecundity?

Basic Approach:

Initial inventories will be completed to determine the locations and abundance of known endemic species or species of particular interest for each park. Baseline GIS-based habitat and location maps will be completed and include areas of known populations as well as areas surveyed but lacking in populations. Repeat surveys will be completed in two consecutive years every five years in 10 percent of the populations of each species in order to establish trends. In the remaining populations, repeat surveys will be conducted every 5 years. Repeat surveys will focus on distribution and persistence.

Abundance and condition/fecundity of species or populations would be determined for endemic species. Specific methods for monitoring are selected based on life history, distributions/density, and accessibility of the individual species. The method currently in use for *Castilleja cryptantha* at Mount Rainier National Park is plot based. Plots are 1m wide and as long as necessary to obtain 100 individuals per plot. The location of each individual will be marked using aluminum tags and will be noted by the x (width) and y locations. The height of the individual, number of flowering stems, and height of flowering stems will be noted. Initial surveys will be completed in years 1 – 5 to determine population trends. Continued monitoring will be based on the trend – decreasing populations will be monitored annually, increasing or steady populations will be monitored every 3rd year.

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Development Schedule, Budget, and Expected Interim Products:

A draft protocol will be completed in fall of 2005, and ready for peer review by October/November 2005.

Interim products include: inventories of rare species, coordinated data provided to the state natural heritage program, trend analysis.