

San Diego Thornmint genetics: Information, application, and cautionary notes

Deborah L. Rogers, Center for Natural Lands Management

This first genetic study of San Diego thornmint (*Acanthomintha ilicifolia*) was designed to provide a preliminary investigation of the amount, nature, and distribution of genetic diversity in the species. Although a comprehensive study was both beyond the scope of the budget and better approached through informed sequential stages, the results of this study will provide sufficient information to develop preliminary guidance for genetically appropriate management and restoration. The genetic investigation was approached through two companion studies: (1) a rangewide laboratory study of population (occurrence) differentiation and (2) a common-garden study to assess adaptive variation in a subset of populations. The first study was based on a broad range (15) of sites throughout the extant (US) range and used an appropriate and low-risk methodology (isozyme analysis) to measure (selectively neutral) genetic diversity. Genetic diversity across the species and within populations was moderate. Isozyme banding patterns suggested that diploid, tetraploid, and hexaploid plants may be present in the San Diego thornmint collections. Populations of thornmint were highly genetically differentiated and there was evidence of gene flow decreasing as a function of geographic distance. In the common-garden study, many of the morphological and phenological traits measured showed differences among populations, suggesting differences in adaptive genetic variation. Further analysis is focused on determining the extent to which patterns from the two studies are consistent and more strongly suggestive of trends (e.g., longitudinal) that could inform restoration decisions.