Vulnerability of the rarest plants in the Great Basin of Nevada to climate change

Steve Caicco1, Fred Edwards2, and Janet Bair2

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Introduction

While rare plants occur at all elevations in the Great Basin of Nevada, nearly 80% of which are Nevada endemics, occur on valley floors often within an elevation range of several hundred feet (Figure 1). The number of taxa (n=15) found only on valley floors is nearly equal to that found only in higher habitats combined (n=15). Moreover, most higher elevation taxa occur through a thousand feet or more of elevation range. A similar pattern is seen in G2, G2G1, and T2 taxa (Figure 2), although even higher proportions of these taxa is found exclusively on the valley floors. Only 45% are Nevada endemics and some others have their primary range in other states. In addition to being more common, these taxa typically are found through a greater elevation range. Because of their generally broader distribution, fewer taxa are exclusive to the higher life zones. Variation in the actual elevation of the life zones across the state makes the species assessment more subjective and totals are given as ranges.

While monitoring is essential for determining the trend of these taxa, sufficient resources will not likely be available to adequately monitor all taxa. Growth of populations could affect plants at all elevations, rare taxa at the higher elevations most of the rarest plants (G1, G1G2, and T1), nearly 80% of which are Nevada endemics, occur on valley floors often within an elevation range of several hundred feet (Figure 1). The number of taxa (n=15) found only on valley floors is nearly equal to that found only in higher habitats combined (n=15). Moreover, most higher elevation taxa occur through a thousand feet or more of elevation range. Consistency in the actual elevation of the life zones across the state makes the species assessment more subjective and totals are given as ranges. 

In any one site, rare taxa at the higher elevations are unlikely to be able to move to more climatically suitable sites since most are adapted to specialized habitats that do not exist above the valley floors. We conclude, therefore, that rare plants at lowest elevations in the Great Basin of Nevada are the most vulnerable to climate change. In addition, those taxa in valley floors are also more susceptible to other stressors such as habitat modification or disturbance and invasive species.

Methods

Reported elevations for known populations of all G1, G2, T1 and T2 taxa (see Global Ranking System definitions to be below). The Great Basin of Nevada was compiled and summarized by taxa.

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