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Multiple environmental factors determine species coexistence patterns across spatial scales. Among the most important factors are variations in soil characteristics and disturbance regimes. Moreover, in desert environments, it has been found that dominant plants have important effects on small-scale patterns of resources that can also affect coexistence of other species. The aim of this study was to evaluate the importance of these factors on species composition on multiple scales at a desert grassland-shrubland ecotone. It has been found that interspaces in stands of the dominant grass species, *Bouteloua eriopoda*, are small because of the comparatively small size of the individual plants and their regular spacing, which leads to a low abundance of subdominant species. By contrast, the shrub, *Larrea tridentata*, is exhibiting an aggregated pattern on the landscape level that results in more variable sized interspaces, where other species can dominate. In a year with abundant rainfall, mainly annual species take advantage of the resource space in the interspaces, whereas perennials are associated with the dominant plants. These results were used to generate hypotheses concerning the mechanisms determining landscape-scale vegetation dynamics at this ecotone.