Four-wing Saltbush (*Atriplex canescens*) Seed and Seedling Consumption by Granivorous Rodents

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On the Ground

- Four-wing saltbush is an important browse species for wildlife and domestic livestock and has been reported to provide as much as 11.4% to 13.6% crude protein.
- Granivorous rodents are important in the ecology of plant communities as well as the management practices that occur in those communities.
- In any land management practice that involves seeding in restoration or rehabilitation efforts, land managers must be cognizant of the role that biotic and abiotic factors ultimately have on the success and failures of these efforts. Abiotic factors such as poor seed germination or lack of proper amount and periodicity of precipitation are more well understood than biotic factors such as seed and seedling predation by granivorous rodents.
- Granivorous rodents in this study consumed as much as 55% and 99% of the four-wing saltbush seed and seedlings, respectively.
- Understanding the possible effects of rodent behavior with four-wing saltbush seed and seedlings should help resource managers in their planning and implementation of future rehabilitation/restoration efforts.

Keywords: seed predation, seedling predation, saltbush, granivorous rodents.

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Four-wing saltbush (*Atriplex canescens* [Pursh] Nutt.), native to western North America, extends from Canada to Mexico and from the Great Plains to the Pacific Coast.¹ Shrubby species of *Atriplex* are in the family Chenopodiaceae, which contains other important shrubs such as winter fat (*Krascheninnikovia lanata* Pursh), and often dominate landscapes in many arid and semi-arid regions, particularly in habitats that combine high soil salinity with aridity.¹ Four-wing saltbush is an important browse species for wildlife and livestock² and has been reported to provide as much as 11.4 % to 13.6% crude protein.³ The use of four-wing saltbush in restoration and land rehabilitation plantings is well documented²,⁴–⁸ and increasingly popular.

Granivorous rodents are important in the ecology of plant communities and the management practices that occur in those communities.⁹–¹³ Granivorous rodents exhibit two types of seed-caching behavior: They cache some seeds in larders deep within their burrows, referred to as “larder hoarding,” and they cache some seeds in shallow depressions they dig throughout their home range, referred to as “scatter hoarding.”¹⁴ Larder hoard caches are buried at depths that may allow germination but are most often too deep to sprout,¹⁵ whereas scatter hoard caches that are not recovered are buried at depths that often promote germination and therefore have been found to be an important mechanism for the recruitment of various range plants.¹²,¹³,¹⁶–¹⁹ In any land management practice that involves seeding in restoration or rehabilitation efforts, land managers must be cognizant of the role that biotic and abiotic factors ultimately have on the success and failures of these efforts.²⁰ Four-wing saltbush has been reported to experience variable success in seeding efforts,²¹,²² with abiotic factors such as poor seed germination or lack of proper amount and periodicity of precipitation being fairly well understood. Biotic factors such as seed and seedling predation by granivorous rodents are less understood. Long-land and Bateman¹⁸ reported that the rodents in their study seldom cached four-wing saltbush seed, and it has also been reported that rodents damage young four-wing saltbush plants.²³,²⁴ This study was initiated to address 1) the harvest, consumption, and caching of four-wing saltbush seed, and 2) the possible consumption of four-wing saltbush seedlings by granivorous rodents. We hypothesized that granivorous rodents in this study would harvest, consume, and cache a portion of the four-wing saltbush seed with which they interacted. We also hypothesized that four-wing saltbush seedlings would be consumed by granivorous rodents in this study.