

About the Cover

The lesser long-nosed bat, *Leptonycteris yerbabuenae*, on the cover is feeding on nectar in a flower of a saguaro cactus, *Carnegiea gigantea*. Saguaro flowers open only at night, emitting a sweet melon-like odor that attracts the bats. As a bat feeds on the nectar, pollen of the saguaro flower collects on its fur. This pollen will be carried to other saguaro flowers, pollinating them as the bat feeds. Lesser long-nosed bats also feed on the fruits of saguaro cactus and spread the seeds contained in their feces, dispersing the offspring of the cactus in the process. This is an example of a mutually beneficial relationship between bat and cactus. The bat provides ecological services to the cactus in the form of pollination and seed dispersal and in return the bat receives food in the form of nectar and fruit, completing an evolutionary pact between the species.

Winter temperatures limit the northern distributions of both lesser long-nosed bats and saguaro cactus. Saguaros find their northern limits in the deserts of southern Arizona, where they can survive the mild winters. Lesser long-nosed bats are more widely distributed across the southwestern United States, occurring in the southern parts of Arizona, California, and New Mexico, where they feed on other cactus and agaves. However, the winter temperatures in these areas would be lethal to them so they migrate south, where they are found from western Mexico as far south as Central America.

Studies of the relationships between organisms and their environments, both physical and biological, such as the mutualistic relationship between the lesser long-nosed bat and saguaro cactus, are central to the science we call ecology. This book was written to provide a conceptual foundation that will prepare the reader to appreciate the intricate connections weaving all organisms and their environments into a vast web of ecological interactions.

