This is a close-up of acacia ants crawling on the branches of a bullhorn acacia tree. The big, red objects on the right are thorns. The big thorns reminded people of the horns on a bull, so people gave the trees the name "bullhorn acacia."

The Ant and the Acacia

When we think about species in an ecosystem, we're often thinking in terms of food webs that show what eats what. In a food web, you can see relationships like predation (when one species eats another) and competition (when two species are both trying to get the same resource, such as food). In these relationships, it seems like what is good for one species is bad for the other. If a predator population increases, its prey population is likely to decrease. However, not all relationships in ecosystems are like this: in some cases, two species interact in ways that are good for both species. One example is the bullhorn acacia tree and the acacia ant.

Bullhorn acacia trees and acacia ants have a kind of relationship called mutualism that helps both species survive. All organisms need certain things to stay alive; things like food and a place to live. In some cases, organisms get what they need through mutualistic relationships with other species. Mutualism provides both species with something they need. Ecosystems are full of mutualistic relationships like the one between bullhorn acacia trees and acacia ants.

Bullhorn acacia trees are thorny trees that grow in Central America. With no damage to themselves, these trees provide everything

acacia ants need to survive: water, a complete diet, and shelter inside their big, hollow thorns—the ants can chew through a spot at the bottom of a thorn and move right in to raise their young.

At the same time, acacia ants act as bodyguards against other animals that might want to eat bullhorn acacia trees. If another animal tries to eat the tree they call home, the ants attack the animal and their bodies release a bad-smelling chemical. This relationship ensures that the ants have food and a place to live, and the acacia tree is protected from organisms that might destroy it.

Mutualism is helpful to both species—which means both species would be harmed if the population of one species decreased. Say the bullhorn acacia trees were wiped out by a tree disease. In that case, the acacia ants would have to find other sources of food and shelter, and there's no guarantee they'd find either one. The acacia ant population would decrease.

Just as acacia ants would be harmed if bullhorn acacia trees disappeared, the trees would be harmed if the ants disappeared. In that case, the acacias wouldn't be able to rely on the protection the ants provide. Animals might eat most of the leaves of the acacia trees, making it harder for the acacias to make food for themselves through photosynthesis. Without enough food, the acacias would have trouble reproducing and the population of acacia trees would shrink. Acacia ants need bullhorn acacia trees, and bullhorn acacia trees need acacia ants.