

# Study finds saving lonely species is important for the environment

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Endemic eucalyptus found on Tasmania has evolved to live in a variety of conditions that exist from sea level to tree line. These include hot, cold, wet and dry habitats. Credit: Joe Bailey

The lemur, Javan rhino and Santa Cruz kangaroo rat are all lonesome animals. As endemic species, they live in habitats restricted to a particular area due to climate change, urban development or other occurrences.

Endemic species are often endangered, and a University of Tennessee, Knoxville, study finds that saving them is more important to biodiversity than previously thought.

Joe Bailey, associate professor in the Department of Ecology and Evolutionary Biology, and his colleagues from the University of Tasmania in Australia looked at endemic eucalyptus found in Tasmania. They discovered that these [rare species](#) have developed unique characteristics to survive, and that these characteristics may also impact the survival of its neighbors in the ecosystem.

The findings are published in the academic journal *Plos One*.

Using experimental forestry trials where plants were taken from the wild and replanted in a single location, the researchers investigated whether the evolution of endemic species was an important process that altered species interactions. The study is one of the first to compare the functions of endemic and nonendemics in an experimental setting.

The team discovered that these eucalypts have evolved traits that allow them to persist in harsh conditions where many other species can't. These traits include thick leaves that stay on the tree a long time. Much as we conserve money when times are tight, this growth strategy allows these plants to minimize the resources they invest in leaves. The leaves also lack nutrition and are hard to digest, making them unappealing to most herbivores. Variation in such characteristics can impact the entire ecosystem.

"Because endemic species' [genes](#) and traits are different relative to nonendemic species, the web of interactions those genes support is also different," said Bailey. "Therefore, the losses of those genes from ecosystems will likely ripple through and hurt the species interactions they create."

For example, the change in the eucalyptus leaves can negatively impact the specialist herbivores that adapted to the plants by negatively affecting their ability to find food and thus survive.

The study results contribute to a growing body of research that shows genes in plants can have direct and indirect effects on other species in the ecosystem. This has important implications for the conservation of biodiversity, as the loss of endemics as a group might also represent the loss of novel ecological interactions. These results are particularly important in the context of [climate change](#).

"In the midst of a biodiversity crisis where species extinction rates are a hundred to a thousand times greater than the natural rate of extinction, understanding the biology of rare and endemic species is a priority rather than a pursuit of novelty," said Bailey, who added that endemic species act also as a repository for rare genes.

Preventing the extinction of such species should be a priority of the scientific community and the general public who enjoy nature, noted Bailey.

**More information:** Gorman CE, Potts BM, Schweitzer JA, Bailey JK (2014) Shifts in Species Interactions Due to the Evolution of Functional Differences between Endemics and Non-Endemics: An Endemic Syndrome Hypothesis. *PLoS ONE* 9(10): e111190. [DOI: 10.1371/journal.pone.0111190](#)

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