

# The grass is always greener

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(Photo: Creative Commons Wikipedia)

(PhysOrg.com) -- Recent study of grasslands shows that species variety more important to ecosystem services than previously thought.

As biodiversity declines worldwide, there is concern that this will lead to declines in the services that ecosystems provide for people, such as food production, [carbon storage](#), and [water purification](#). But until now it has been unclear, whether just a few or in fact a large number of the [species](#) in an ecosystem are needed to provide [ecosystem services](#).

By combining data from 17 of the largest and longest-running biodiversity experiments, scientists from universities across [North America](#) and Europe have found that previous studies have underestimated the importance of biodiversity for maintaining multiple

ecosystem services across many years and places.

“Most previous studies considered only the number of species needed to provide one service under one set of environmental conditions,” says Prof. Michel Loreau from McGill University’s biology department who supervised the study. “These studies found that many species appeared redundant. That is, it appeared that the extinction of many species would not affect the functioning of the ecosystem because other species could compensate for their loss.”

Now, by looking at grassland plant species, investigators have found that most of the studied species were important at least once for the maintenance of ecosystem services, because different sets of species were important during different years, at different places, for different services, and under different global change (e.g., climate or land-use change) scenarios. Furthermore, the species needed to provide one service during multiple years were not the same as those needed to provide multiple services during one year. “This means that biodiversity is even more important for maintaining ecosystem services than was previously thought,” says Dr. Forest Isbell, the lead author and investigator of this study. “Our results indicate that many species are needed to maintain ecosystem services at multiple times and places in a changing world, and that species are less redundant than was previously thought.”

The scientists involved in the study also offer recommendations for using these results to prioritize conservation efforts and predict consequences of species extinctions. “It is nice to know which groups of species promoted ecosystem functioning under hundreds of sets of environmental conditions,” says Isbell, “because this will allow us to determine whether some species often provide ecosystem services under [environmental conditions](#) that are currently common, or under conditions that will become increasingly common in the future.” But Michel

Loreau, of McGill, adds a cautionary note: “We should be careful when making predictions. The uncertainty over future environmental changes means that conserving as much biodiversity as possible could be a good precautionary approach.”

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**More information:** To read the study in *Nature*:  
[www.nature.com/nature/journal/...ull/nature10282.html](http://www.nature.com/nature/journal/full/nature10282.html)

Provided by McGill University

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