

# How to include 'ecosystem engineers' in our conservation plans

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A river–forest ecosystem in Northern California, USA within the historic range of American beaver. Including ecosystem engineers in restoration and management decisions may lead to better outcomes for ecosystem functioning. Credit: Understory

In ecosystems, all species interact with each other and their environment. However, some species have a much greater influence than others. Certain plants or animals are able to greatly modify their landscape through just their mere presence. This makes them part of the group known as "ecosystem engineers."

One of the best known examples of an ecosystem engineer is the beaver. By building dams, beavers change the flow of rivers and transform [terrestrial ecosystems](#) into wetlands. This leads to a whole cascade of processes and the arrival of new animals.

Although the individual cases of ecosystem engineers helping biodiversity are well documented, the mechanisms at work are not yet well understood. Scientists from UNIL have developed a guide for predicting and measuring the influence of species on [ecosystems](#) under different conditions. The aim of the guide is to include "ecosystem engineers" in the process of biodiversity conservation and ecosystem maintenance. The team's review is published in *Functional Ecology*.

To establish this framework, the scientists proceeded in several stages. First, knowledge and literature about the known ecosystem engineers was collected. Next, the team developed a comprehensive framework to model and quantify the effects of the [species](#). Finally, a procedure for including these natural regulators as much as possible in the field was created.

Gianalberto Losapio is the lead author of the study and a researcher at the faculty of Geosciences and Environment at UNIL. He is also affiliated with the University of Milan. He said, "This guide is intended to help specialists and communities ask themselves the right questions when setting up conservation programs. For example: What is the goal? What are the characteristics of the terrain, as well as the spatial context?"

The guide also provides tools to assess the impact of the actions carried out so that they can be adapted if necessary. "Some [restoration projects](#) end up being abandoned because [introduced species](#) cannot survive," adds Losapio. "We believe a comprehensive approach is more likely to succeed."

**More information:** Gianalberto Losapio et al, Monitoring and modelling the effects of ecosystem engineers on ecosystem functioning, *Functional Ecology* (2023). [DOI: 10.1111/1365-2435.14315](https://doi.org/10.1111/1365-2435.14315)

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