

Science for Environment Policy

A new method for evaluating threats to soil biodiversity

Little is known about the organisms that live within soil, although they play a vital role in the biological processes that support life on Earth. In a recent study, researchers calculated the relative risk of pressures caused by human activity on soil biodiversity in the EU, showing that intensive land use has the greatest impact.

There is a lack of baseline data regarding [soil](#) biodiversity, which means that it is almost impossible to determine what impact pressures such as [climate change](#), [agricultural intensification](#) or soil erosion are having on soil species. However, the little evidence that does exist, for example from studies of mushroom species, suggests that the current rapid rate of extinction of species living above the ground is mirrored below ground.

Some EU Member States, including Ireland, UK, Germany, the Netherlands, France, Italy and Portugal have begun some monitoring of soil biodiversity, but these are small steps and there is a need for more comprehensive data worldwide. The authors of this paper developed a model, which they tested using data from Europe, to determine where soil biodiversity is under most pressure, and which human-induced factors contribute the most.

The authors supplied 20 experts from the Soil Biodiversity Working Group of the European Commission with a list of 12 potential threats to soil biodiversity. For each threat, the experts were given data that gave an indication of the extent of its impact on soil. They were then asked to rank the threats in order of likely severity of impact on soil biodiversity.

The authors used a mathematical model to quantify the relative severity of each threat, based on the experts' analysis. The top three most severe threats emerged as intensive exploitation of land, decline in the organic material found in soil, and habitat disruption.

Further analysis using mapping software demonstrated that soil biodiversity is under threat in 56% of EU territory. Of the area studied, 15% was classed as under high, very high or extremely high threat.

The authors point out certain limitations of their model, for example, the omission of climate change as a pressure, since the impacts of climate change on soil biodiversity are not yet well enough understood. They further recommend that the model be applied more widely in order to refine it as a tool for assessing threats to soil biodiversity.

Overall, the authors conclude that the results of this study will help to inform policy, in terms of minimising identified threats, and highlighting the areas where resources, research and monitoring are urgently needed to protect soil biodiversity.



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