
Forecasting Terrestrial Food Webs and NCP in Climate and Land Use Changes

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Abstract

Ambitious biodiversity and environmental targets have been set at both international and regional levels, notably under the Convention on Biological Diversity's (CBD) post-2020 targets, and the European Union's Green Deal. In the NaturaConnect project, we aim at understanding how future climate and land use changes will impact vertebrate species and diversity while accounting for their trophic interactions and dispersal abilities, and how will this affect associated NCP like pest control. First, we harnessed biological data, climate scenarios and then mapped the European landscape changes required to ensure that land based environmental targets can be met under different socio-economic and climate change scenarios. Subsequently, we developed an innovative trophic species distribution model that incorporates trophic interactions between species. Using this model, we projected vertebrate trophic networks and associated metrics across Europe, considering a range of climate and land use change scenarios for the years 2050 and 2080. By implementing a range of plausible futures following three primary perspectives that capture people's relations to nature, we show how vertebrate species distributions, interactions, and overall local network properties could be maintained or threatened in function of different positive scenarios.

Keywords: Food webs, trophic species distribution models, nature contribution to people

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