

Global warming will heighten agriculture weed threat

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Working with computer models to predict the likely impact of climate change on invasive weed propagation, Dr. Farzin Shabani from Flinders University's Global Ecology Lab found a likely increase in areas of

habitat suitability for the majority of invasive weed species in European countries, parts of the US and Australia, posing a great potential danger to global biodiversity.

In predicting the impact of climate change on current and future global distributions of invasive [weed](#) species, Dr. Shabani also found that existing attempts to eradicate invasive populations are inadequate.

Dr. Shabani and an international team of researchers investigated 32 globally important Invasive Weed Species to assess whether climate alteration may lead to spatial changes in the overlapping of specific IWS globally.

"We aimed to evaluate the potential alterations—whether that be a gain, loss or static—in the number of potential ecoregion invasions by IWS, under climate change scenarios," says Dr. Shabani. "We utilised all possible greenhouse gas concentration to examine a range of possible outcomes."

The paper—Invasive weed species' threats to global biodiversity: Future scenarios of changes in the number of invasive species in a changing climate, by Farzin Shabani, Mohsen Ahmadi, Lalit Kumar, Samaneh Solhjoui-fard, Mahyat Shafapour Tehrani, Fariborz Shabani, Bahareh Kalantar and Atefeh Esmaeili—has been published in the journal Ecological Indicators (doi.org/10.1016/j.ecolind.2020.106436).

Initially, the researchers modelled the current climatic suitability of habitat for each of the weeds, identifying those with a common spatial range of suitability. They then modelled the suitability of all 32 species under the projected climate for 2050, incorporating different scenarios.

The final methodological step compared the extent of overlaps and alterations of weed habitats under the current and future projected

climates.

"Under future climatic conditions, our results mainly predicted decrease on a global scale, with reduced areas of habitat suitable for most Invasive Weed Species—but significantly this excluded European countries, northern Brazil, eastern US, and south-eastern Australia, which are all highly productive agricultural regions," says Dr. Shabani.

The study also revealed that Invasive Weed Species would most likely develop alterations in their [habitat](#) suitability in most parts of the world in the future.

"Even though our future projections indicate a decreasing rate in threats from invasive weeds in extensive areas across the world, the current distributions of many species still have a potential for expansion," says Dr. Shabani.

"Many of these invasive weeds pose a threat in [suitable habitats](#) under both current and future [climate](#) conditions."

Dr. Shabani is concerned that Invasive Weed Species are rarely mentioned in biodiversity policy documents, except to focus on a few high-profile species. "There are no comprehensive national invasive [species](#) statutory controls, which is our concern," he says. "We believe that a national framework is needed for prevention and early detection, along with a coherent policy framework, a robust monitoring framework, a fund for strategic research, and a national training and action program."

More information: Farzin Shabani et al. Invasive weed species' threats to global biodiversity: Future scenarios of changes in the number of invasive species in a changing climate, *Ecological Indicators* (2020). [DOI: 10.1016/j.ecolind.2020.106436](https://doi.org/10.1016/j.ecolind.2020.106436)

Provided by Flinders University

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