

Non-native species are threatening vulnerable Svalbard plant life, study warns

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Alkhornet bird cliffs. Naturally occurring nutrient-rich soil can be found directly below the bird cliffs, and researchers are monitoring whether non-native plants have spread there. Credit: Kristine Bakke Westergaard, NTNU

New, non-native plant species are constantly being found in Svalbard, and researchers are working to ascertain what threat these species pose to the native plants.

So far, the Arctic has managed to avoid one of the most serious threats to biodiversity on Earth. This is also true for Svalbard, but things could change very quickly, and the researchers want to find out how to counteract this threat.

"Increased [human activity](#) heightens the risk of new plant species being introduced. And [climate change](#) increases the risk of invasive species establishing themselves," says Kristine Bakke Westergaard.

Westergaard is an associate professor at the Department of Natural History, which is part of the NTNU University Museum.

No checks on arrival to Svalbard

New species can outcompete the plants already present in Svalbard. Non-native species are spreading across large parts of the globe and can disrupt the established balance between species in a certain area.

Human activity is to blame for the spread of new, non-native species to new areas. Upon arrival in Svalbard, visitors are not checked to see if they are carrying any biological stowaways. For example, no one checks whether air passengers or cruise tourists have contaminated shoes, or whether imported soil contains seeds.

On the other side of the globe in Antarctica, there are much stricter requirements and checks to prevent these types of unwanted introductions. The lack of biosecurity routines in Svalbard worries researchers.

A warmer climate supports new species

Currently, only the hardiest species are able to survive in Svalbard. However, the archipelago has become much warmer in recent years, enabling more species to establish themselves.

"We have developed models to map 27 non-native plant species and their potential to find new habitats and suitable climates in Svalbard," says James Speed, a professor at NTNU's Department of Natural History. The paper is [published](#) in the journal *NeoBiota*.

Currently, all of these unwanted species are only found in the inhabited parts of Svalbard. The researchers mapped which areas of Svalbard have the optimal combination of temperature and precipitation for these species, both now and in the future.

"In relation to the current climate, we have identified three species that have particularly high potential to find new habitats in Svalbard. If they manage to spread to these areas, they could pose a threat," says James Speed.

The three species that could spread the most are:

- Tufted hairgrass (*Deschampsia cespitosa*)
- A species of meadow buttercup (*Ranunculus subborealis* subsp. *villosus*)
- Alpine saw-wort (*Saussurea alpina*)

All areas of Svalbard could be at risk

The models show that almost all areas of Svalbard will develop a suitable climate for many of these non-[native plants](#). The uninhabited islands of

Edgeøya and Barentsøya in the east, as well as the island of Bjørnøya with its manned meteorological station in the south, are most at risk. However, things can change quickly.

"In the future, as the climate warms up, most of the non-native species we investigated have the potential to spread throughout Svalbard. Many of the species that do not belong in Svalbard may be able to spread over a much wider area than they are currently able to do," says Westergaard.

Factors other than temperature and climate also play a role in preventing [new species](#) from spreading. Among other things, limited access to nutrient-rich soil has kept their prevalence to a minimum. This, however, also seems to be changing.

Urgent intervention required

The researchers believe environmental authorities must act quickly if they are to limit and prevent these invasive non-native species from spreading beyond the areas where they are already found.

In addition, authorities must prioritize preventing new [non-native species](#) from spreading to Svalbard before the threat to the Arctic ecosystem becomes too great and unmanageable.

The study is part of the Biodiversa project ASICS (ASsessing and mitigating the effects of climate change and biological Invasions on the spatial redistribution of biodiversity in Cold environmentS).

More information: James D. M. Speed et al, The potential area of occupancy of non-native plants across a warming high-Arctic archipelago: Implications for strategic biosecurity management, *NeoBiota* (2024). [DOI: 10.3897/neobiota.93.114854](https://doi.org/10.3897/neobiota.93.114854)

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