## Aim

This study aimed at answering:

- How is a specialized insect affected by the distribution and quality of its host plant in the surrounding landscape?

The knowledge is valuable for conservation management of rare species.

## Implications for conservation

- Preserve sites with abundant host plants
- Low to moderate grazing to promote large host plants
- Taking both local and landscape scales into account is crucial for successful conservation


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# Importance of habitat quality and landscape factors for a specialized shield bug on a rare host plant


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## Background

A major threat to global biodiversity today is fragmentation and loss of natural habitat. This leads to smaller habitat areas that are more isolated from each other and makes life hard for species living there.

Many insect species are especially vulnerable because they often have very specific requirements and cannot move long distances.

The distribution of a species can be influenced by factors at both local and landscape scales, but knowledge about how different spatial scales affect species is often lacking.

### The species in this study

*Canthophorus impressus* is a shield bug that in Sweden only lives on the perennial plant *Thesium alpinum*. Habitat requirements of the bug are largely unknown.

*Thesium alpinum* is mainly found in unfertilized pastures and meadows and its distribution is fragmented due to large area reduction of these types of grasslands during the last century.

Both species are red listed as near threatened in Sweden.

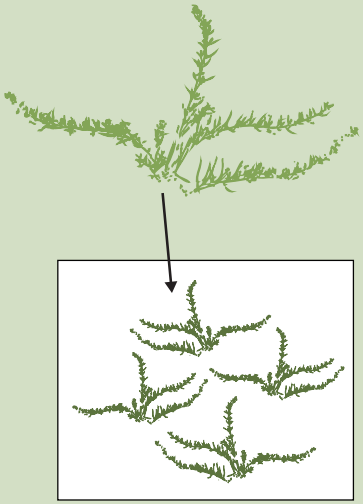
## A study at three spatial scales

The field work was carried out in the provinces of Östergötland and Småland, throughout most of *T. alpinum*'s range in Sweden. Habitat characteristics were recorded at three spatial scales.

### Plant scale

Individual host plants:

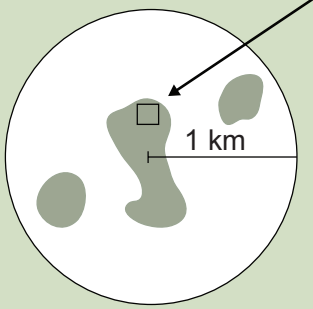
- summed length of branches
- cover of bare ground
- vegetation height
- sun exposure
- aspect and inclination of slope
- number of plants in 1 m radius circle



### Patch scale

Groups of host plants:

- number of plants



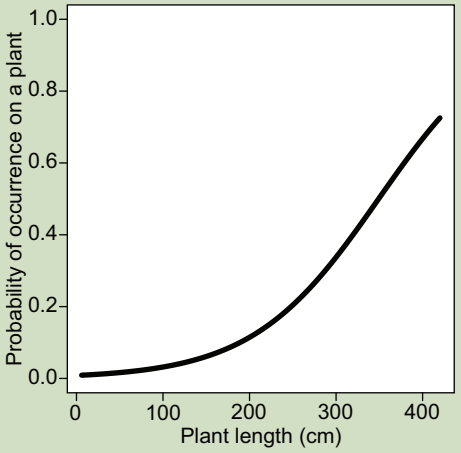

### Landscape scale

Circular areas of 3 km$^2$:

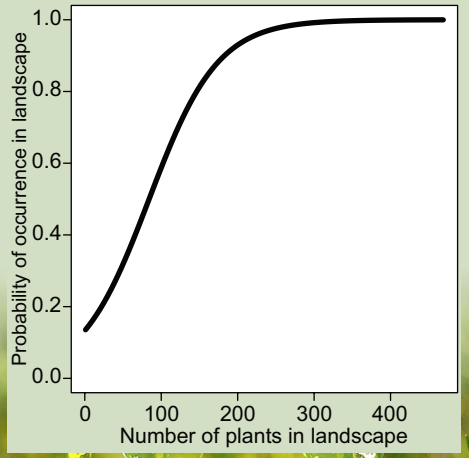
- number of plants
- number of patches
- area of grasslands

## What does the bug need?

- The most important factor for distribution and abundance of the shield bug was large host plants.
- The bug preferred plants standing in south-facing slopes, with high sun exposure and cover of bare ground. This reflects a need for warm conditions.
- At the landscape scale, abundant host plants was important, however the spatial distribution of the plants did not matter.




Host plant with summed branch length of 350 cm was needed for 50% chance of bug presence.




In a landscape, 85 host plants were needed for 50% chance of bug presence.