

# Which habitats are at greatest risk from plant pests and pathogens?



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## Introduction

Non-native plant pests and pathogens (called pests throughout) can have a devastating impact on plant populations.

A decline in one plant species can have cascading effects on associated biodiversity and ecosystem functioning.

The impact of plant pests on natural habitats is rarely considered.

Knowledge of which habitats are at greatest risk from plant pests is critical to target resources and aid managers in targeting surveillance for pests.

### Aim

To compare two methods to identify which habitats are at greatest risk from plant pests:

1. habitats known to host the greatest number of pests that are most likely to establish;
2. habitats with low species diversity and hence low resilience.

## Methods

### Method 1: Habitats known to host the greatest number of pests

We used the Defra Plant Health Risk Register (PHRR) to produce a list of pests hosted by wild plant genera. We linked this list to the UK's National Vegetation Classification to produce lists of the pests potentially hosted in each habitat.

### Method 2: Habitats with low resilience

Habitats with low species diversity (the number of plant species present) are suggested to have low resilience as there are fewer plant species present which can substitute for another one if a particular plant species is lost or declines due to a pest.

We calculated the average number of plant species (excluding bryophytes and lichens) that occur in each habitat at more than 25% cover using data in the UK's National Vegetation Classification.



### Acknowledgements

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The work built on work done through the Plant Health Centre with NatureScot

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## Results

### Method 1: Habitats known to host the greatest number of pests

- 916 pests listed in the PHRR could be hosted by genera that occur in UK habitats at more than 25% cover. Most of these pests are not currently present.
- 91 of these pests have a high likelihood of establishing in the UK.
- Woodlands have the potential to host the greatest number of pests and aquatic habitats the fewest, suggesting that woodlands are at greatest risk.

### Method 2: Habitats with low resilience

- Salt Marsh, Swamps and Fens, and Heathlands may have low resilience due to the low species diversity. Thus, the impact of pests on these habitats may be greatest.
- Woodlands and Mesotrophic Grasslands have a greater diversity of plant species meaning that some species may be able to substitute for each other if a species declines due to a pest. Thus, the impact of a plant pest on these habitats might be lower.

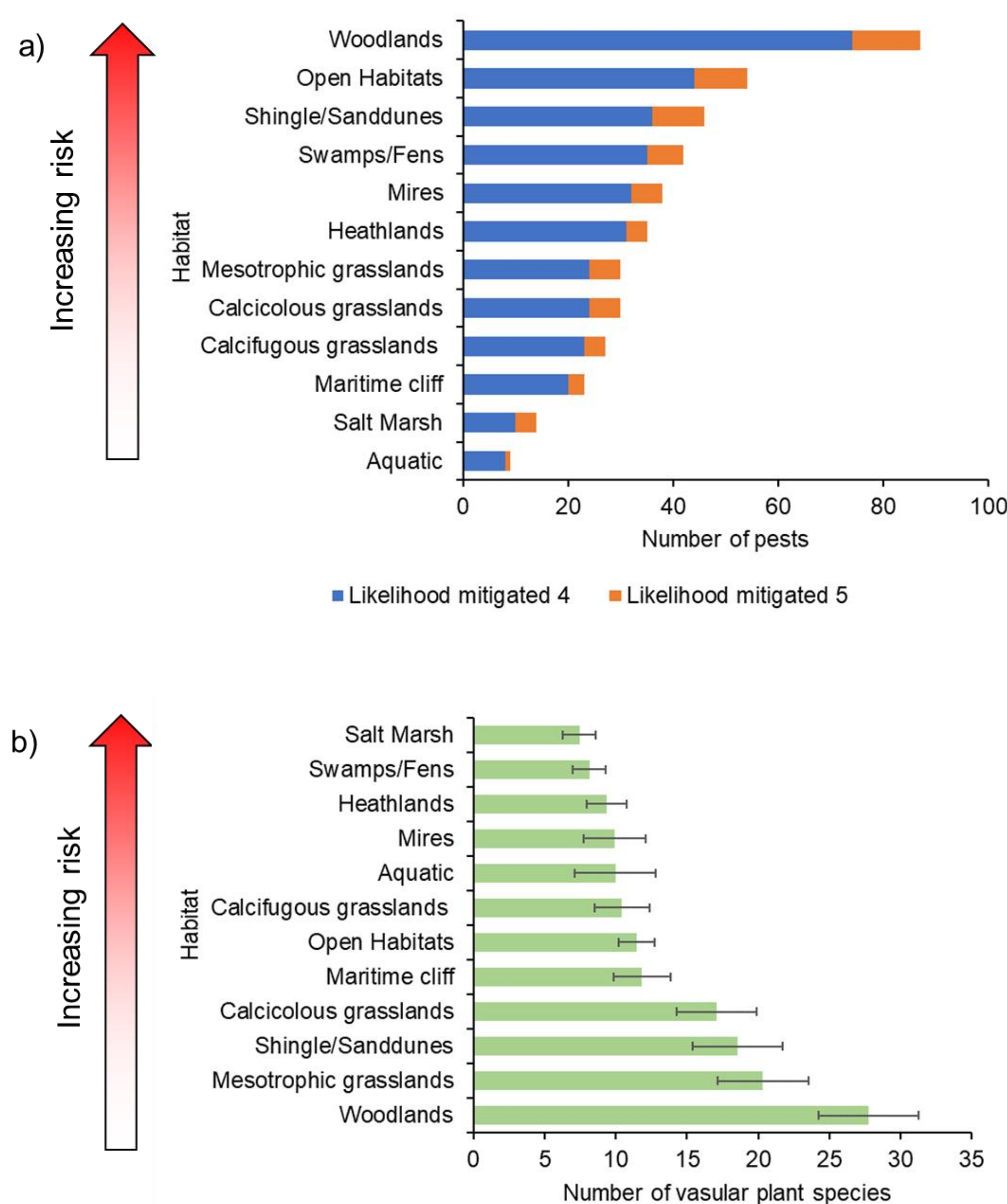


Figure 1: Prioritization of habitats at risk from plant pests.

a) Method 1: Habitats known to host the greatest number of pests most likely to be established (likelihood of establishment taking into account action for mitigation of 4 or 5) as listed in the Defra Plant Health Risk Register.

b) Method 2: Habitats with the lowest resilience, here defined as those with the lowest number of vascular plants occurring at >25% cover.

## Conclusions

The two methods tested to rank the risks to habitats gave very different results.

Method 1 has two disadvantages:

- It focusing on known pests and ignores the potential of unknown pests.
- The PHRR focusses on pests to agricultural, horticultural and forestry species, when used to consider natural habitats, this prior focus biases the results.

Method 2 is not reliant on a list of known pests and takes account of the wider resilience of the system.

Method 2 may be a better way to prioritise surveillance for pests in natural habitats.

### References

Plant Health Risk Register: <https://planthealthportal.defra.gov.uk/pests-and-diseases/uk-plant-health-risk-register/>  
National Vegetation Classification: <https://jncc.gov.uk/our-work/nvc/#nvc-types-floristic-tables-nvc-floristic-tables>



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