Modelling framework for invasive pests: Emerald ash borer as a case study

Vincent A. Keenan[1 2 3], Adam Kleczkowski[1], Glenn Marion[2]

[1] University of Strathclyde [2] BioSS

v.keenan@strath.ac.uk @vakeenan https://sumsay.wordpress.com/

Plant Health Centre[3] Scotland's Centre of Expertise

Scottish Government Riaghaltas na h-Alba gov.scot

Introduction

Aim: to develop a general framework for modelling suitability and spread of potentially invasive pests of Scotland:

1. Determining if Scotland is environmentally suitable for a given pest
2. Developing a spread model to identify how quickly spread could occur from different establishment sites

We used Emerald ash borer (EAB) as a case study and show early results predicting UK-wide suitability using data from EAB's native range and locations where EAB has already invaded (US, Russia).

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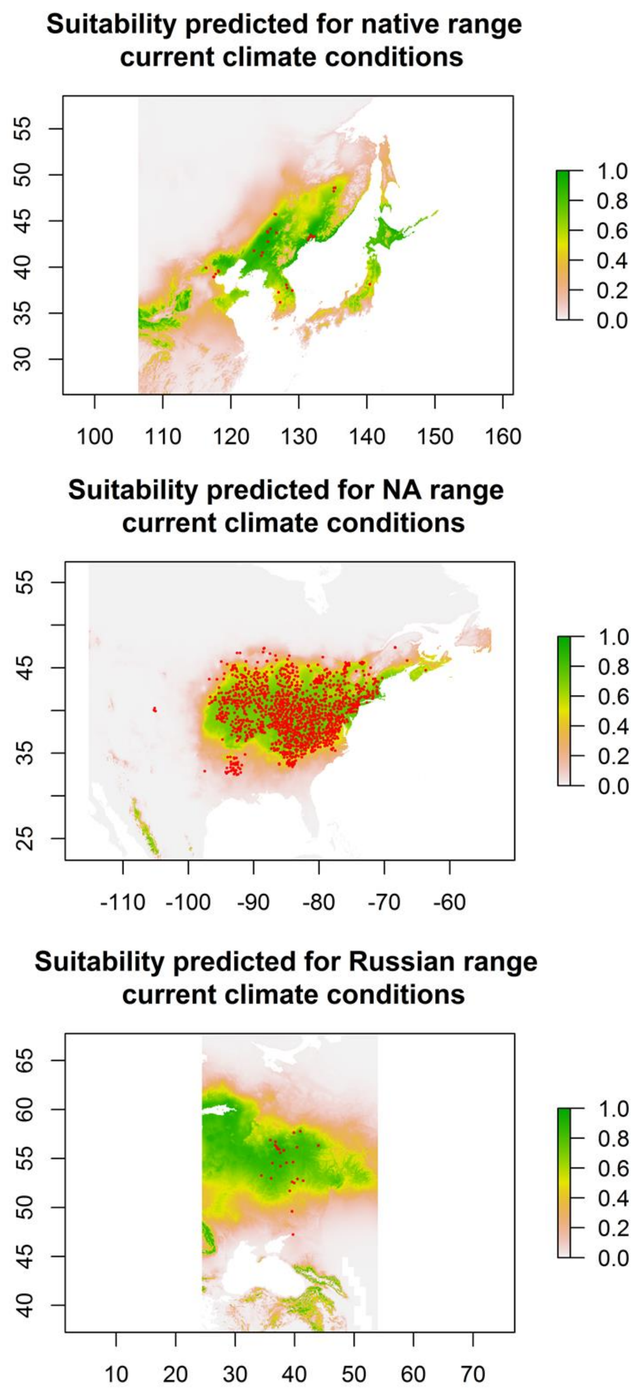
Objectives

- Develop modelling framework to predict invasive pest spread in Scotland
- Test methods on EAB
- Provide a policy brief on risk posed to Scotland by EAB
- Use methods to predict the spread risk of other invasive pest species

Initial results

- Projections from each range of suitability for EAB using climate variables (Annual temp & Annual precipitation) from correlative model.
- Suitability (grey/brown=unsuitable; yellow/green=suitable) defined as the predicted probability of presence given species location (red dots) and climate variables.



Key messages

- Native areas can be used to assess climate related suitability but data limited
- Predicted suitability maps suggest Scotland's climate not a limiting factor for Emerald ash borer – the host Common ash is.
- Data from invasive fronts must be treated with caution e.g. too early in the invasion of Western Russia to draw conclusions
- Next steps: develop a spread model make to make better use of invasive front data and establish areas of high risk where surveillance can be focused