# Woodland Flora Translocation Tool

### Project Proposal

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## Introduction

New woodland creation, planting rates,

on species poor former arable land

Our understanding of how the composition of traits within a community of organisms scales to constitute and influence ecosystem functioning (Chacón-Labella et al. 2022) is a developing field. As argued by Smith (2017), a proactive approach must be taken in ecosystem restoration. . . .

The assisted colonisation of newly planted woodlands is critically needed. This is particularly important for Ancient Woodland Indicator (AWI) species, which are generally observed to have very low dispersal rates, attributable to traits such as high seed weight (Kimberley et al. 2013) Examples include *Anemone nemorosa* which . . . ; *Hyacinthoides non-scripta* with observed

## Aims

In response the a R Shiny Chang et al. (2022) web application will developed. This application will act as a Decision Support Tool (DSS), aiding users to examine the suitability of a woodland plant translocation initiative in a standardised framework.

## Adherence to Regulation and Best Guidance

The . . .

- Decide whether a conservation translocation is appropriate
- Increase the chance of success and wider potential benefits
- Reduce the chance of failure and negative outcomes

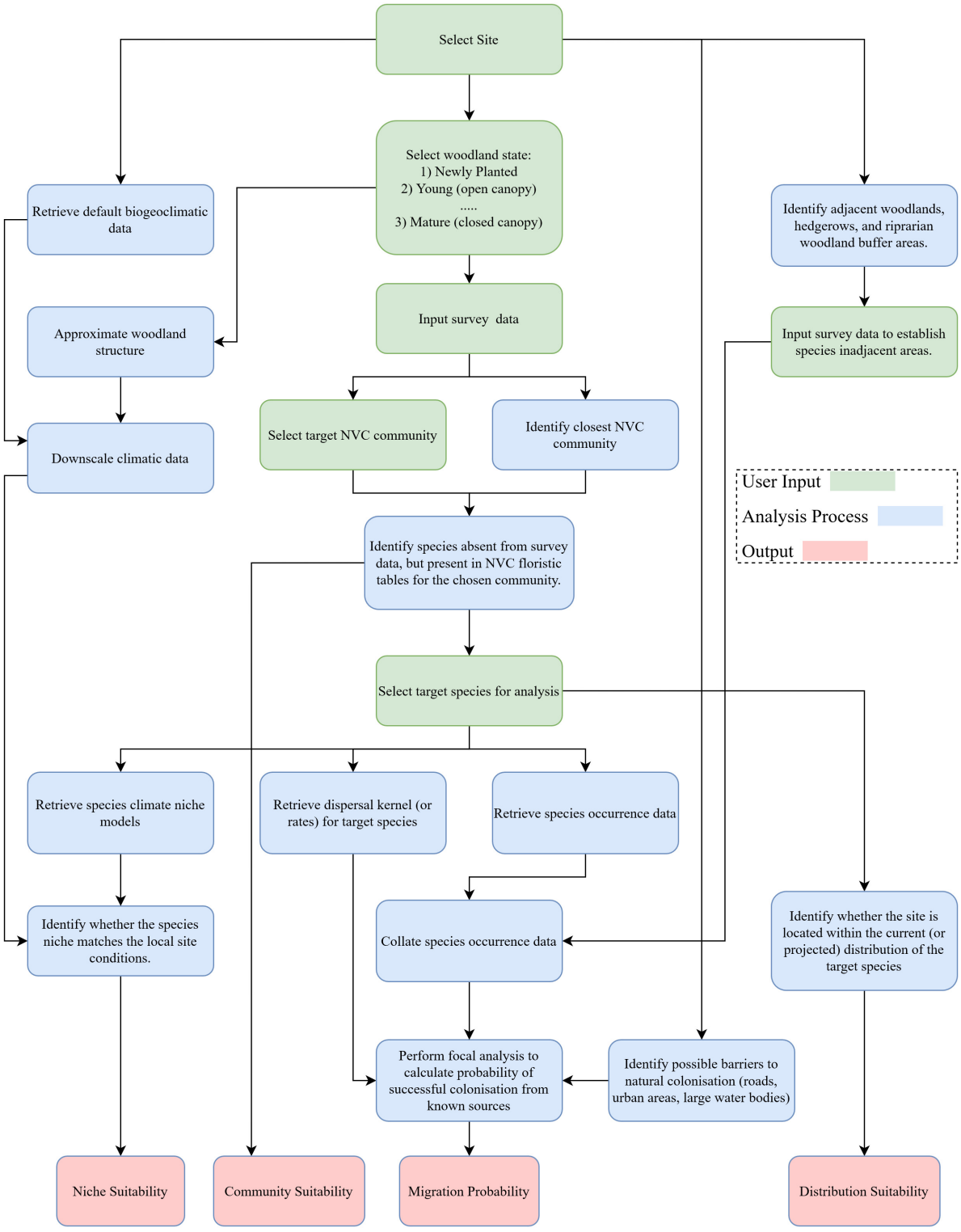
## Colonisation Criteria

Taking inspiration from the restoration diagnostic framework described in Vitis et al. (2022) the suitability of selected species for assisted migration are assessed against the following criteria:

- Colonisation Sources
  - Are there areas of Ancient Woodland within colonisation distance?
  - Are there areas of other woodland within colonisation distance?
  - If surveyed, is the selected species present in woodlands within colonisation distance?
- Genetic Factors
- Biotic Factors
  - B1 - Does the species require an animal vector for pollination?
- Abiotic Factors * Is the selected species suitable for the environmental niche on site?

- Landscape Features
  - Are there any physical barriers to colonisation?
- Planning and Land Management Factors
  - P6 - Is it likely that the selected species will be out-competed?

# Analysis Process



### Niche Suitability

To examine whether a selected species is suitable for the sites specific biogeoclimatic conditions, the Multi-MOVE plan species niche models (Henrys, Smart, et al. 2015; Henrys, Butler, et al. 2015; Smart et al. 2019) will be utilised in conjunction with baseline (1961-1990) climate data derived from . . . ; along with future climate projections obtained from the CHESS-SCAPE dataset (Robinson et al. 2022). These 1km resolution datasets will be down-scaled using the {microclimc} R package (Maclean and Klinges 2021).

Soils data will be obtained from . . .

Elevation, slope, and aspect data will be obtained from . . .

To account for the influence of woodland stage development on site conditions, and niche suitability the user will be able to stipulate a proportion of canopy cover. . . .

### Community Suitability

Worrell et al. (2021) recommends that a four-step process be undertaken to examine the necessity of woodland flora translocation, namely the examation of:

1. *Which species are already present in the target woodland?*
2. *Which plant species are already present in adjacent woodland and habitats?*
3. *Which species would naturally occur in the wood?*
4. *Which species are missing from the woodland and nearby linked habitats?*

### Migration Probability

To determine the probability that a species will successfully migrate from a nearby source (if present), the following steps will be taken:

#### Method A

1. Estimate the maximum yearly dispersal distance, with upper and lower bounds for selected species.
2. Identify barriers to migration (roads, urban areas, large water bodies etc)
3. Perform a

#### Method B

1. Parametrise a dispersal kernel for selected species.
2. Identify barriers to migration (roads, urban areas, large water bodies etc)
3. Perform a focal analysis.

### Distribution Suitability

To determine hether

## Analysis Results

### Species Suitability

The species will be recommended for translocation, or conservatively further investigation if it is:

1. Absent from the site.
2. Within the known distribution of the species.
3. Suitable to the sites local biogeoclimatic conditions, at a given stage of woodland development.
4. Estimated to be unlikely to naturally migrate to the site within a reasonable time frame.
5. Likely to have been historically present, or selected as a member of a target community.

### Ecological Impact

Following the suggestion in Smith (2017), the ecological impact of translocating a species must be considered, as such the user will also be presented with an interactive network diagram displaying the ecological network of the species under assessment.

# Appendix

### Project Personal

### Proposed Species

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