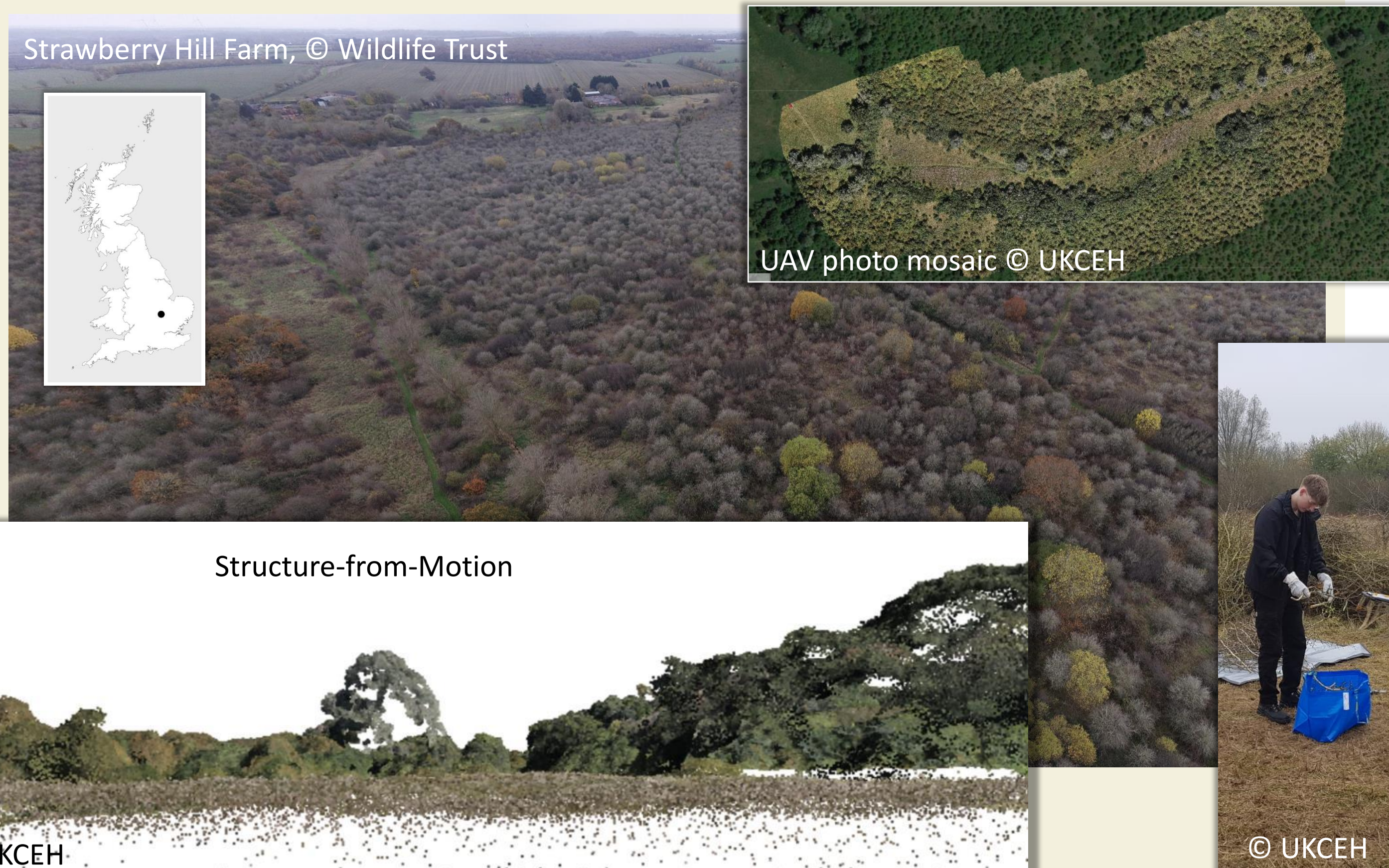




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1. Background



Monitoring habitat condition is increasingly important in light of the biodiversity crisis. Advances in UAV remote sensing (RS) and artificial intelligence are creating opportunities to complement field-based habitat monitoring or provide effective alternatives.

As part of MAMBO, an EU-funded project, we aim to develop generic workflows that can deliver crucial habitat condition metrics using affordable UAV RS.

Challenge: How to best measure and monitor shrub cover and biomass in grass-, wet-, and shrublands, capturing rewilding, habitat restoration efforts.

Aim: For hawthorn, develop a scalable workflow, processing affordable UAV imaging to generate maps of shrub clumps and biomass.

2. Approach

Use Case: Strawberry Hill is an 150ha nature reserve of ex-arable land in Bedfordshire, England. The site has been left to naturally rewild to grass- and shrubland for 35 years. Hawthorn is the dominant shrub species.

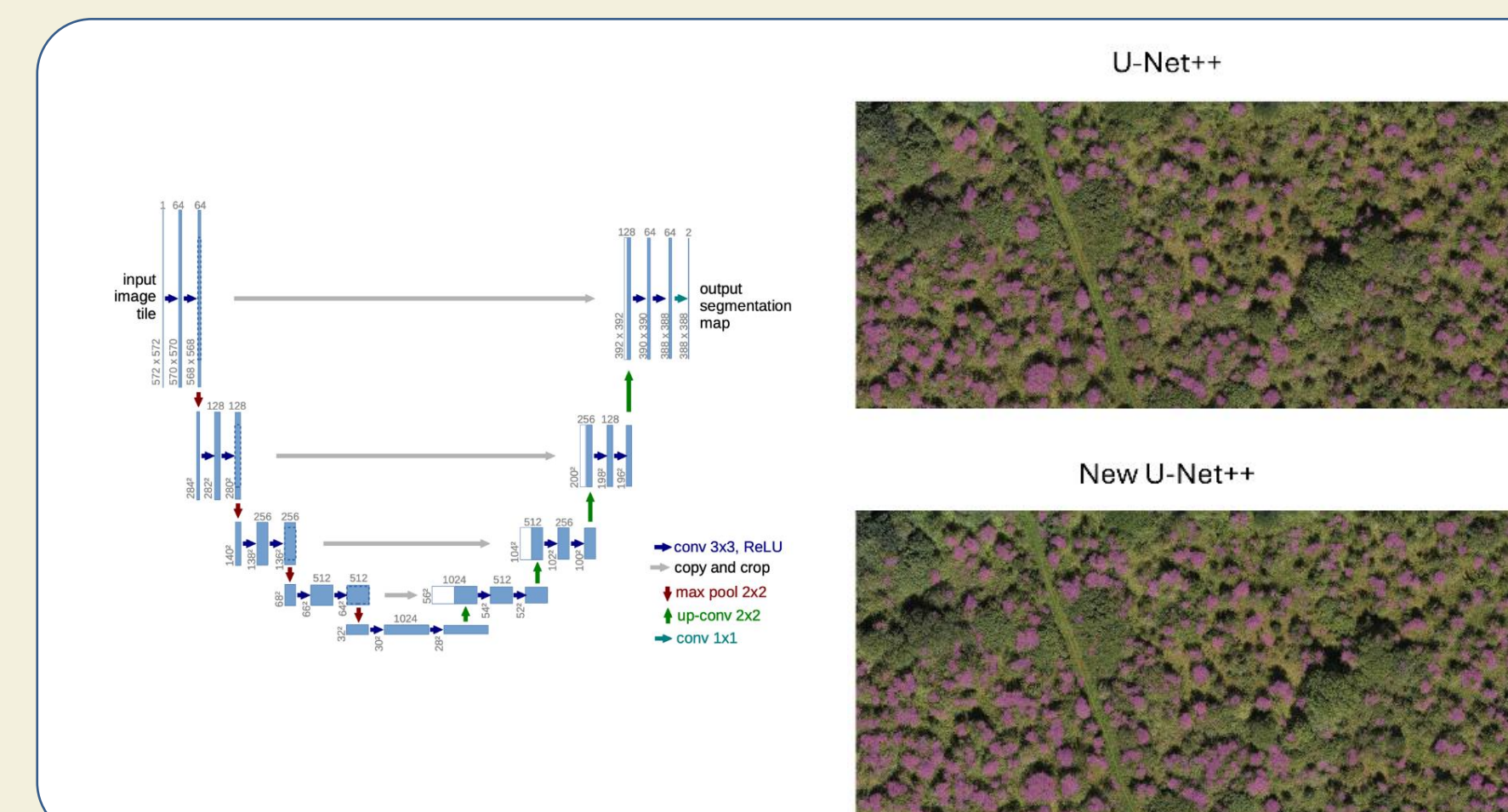
UAV Campaigns (Aug'23 & Apr'24)

- Photogrammetric camera

Field Campaigns (Aug'23, Jun'24 & Nov'25)

- Coordinates, Species, Height, Crown diameter of 30 Hawthorn, Blackthorn, Rose = 90 individuals
- Coordinates of 188 Hawthorn individuals
- Coordinates, Biomass of 82 Hawthorn individuals

A U-Net deep learning model to identify and map Hawthorn shrub individuals.



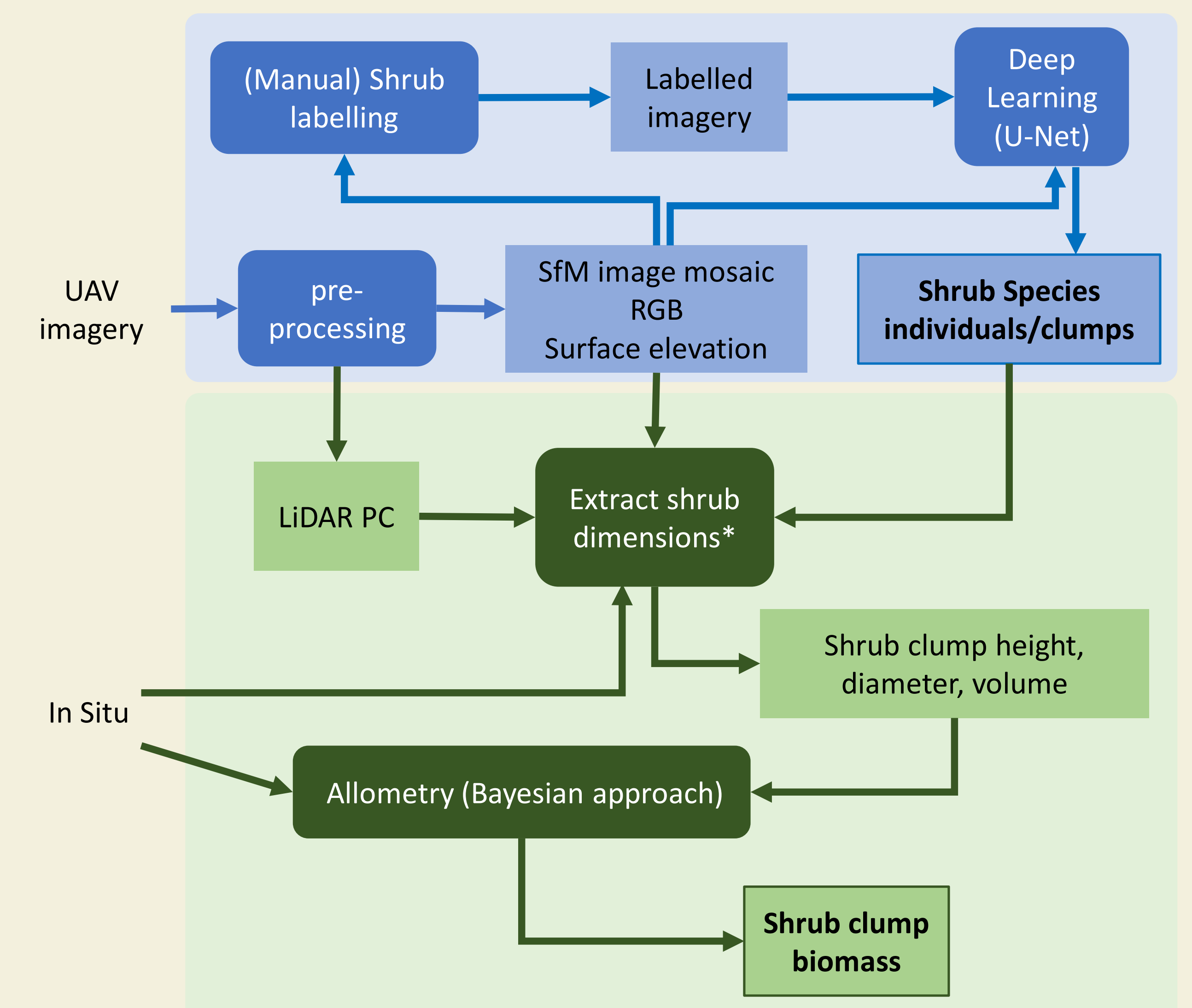
A Random forest model to calibrate shrub height extracted from Structure from Motion digital surface model with in-situ and LiDAR heights estimates.

Go check out Upcott et al. poster: Biomass allometry for shrubs at a UK rewilding site
Tue, 29 Apr, 16:15–18:00 (CEST)
Hall X1 | X1.62

An Allometric Model using Bayesian Theory to derive shrub biomass from shrub height and crown diameter

3. Proposed workflow

Software pipeline for UAV based mapping (species, cover, biomass)



***shrub height estimation pipeline**

