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1. Background & Aims

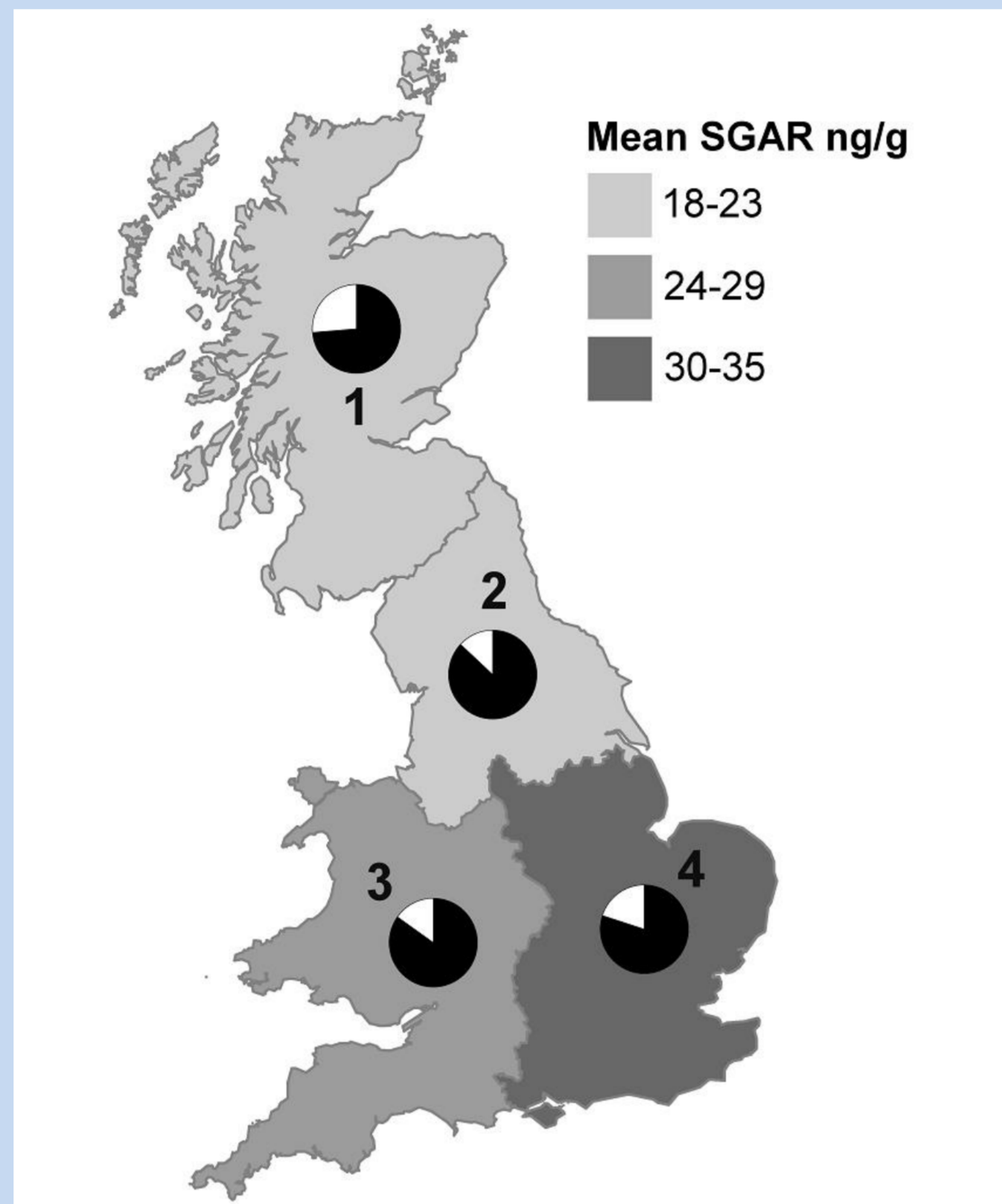
Second generation anticoagulant rodenticides (SGARs) are widely used to control rodents around the world. The SGAR trophic transfer pathway via rodents and their predators / scavengers appears widespread, but little is known of other pathways of SGAR contamination and their impacts in non-target wildlife. We present results of a published study characterising SGAR exposure in sparrowhawks and preliminary findings from a study evaluating population level impacts of related mortalities from that exposure.



Q1: What are the spatio-temporal trends in summed SGAR concentrations in sparrowhawks?

- Regional differences: Scotland < ΣSGARs than other regions.
- Strong evidence for increasing difenacoum residues.

Figure 1. The mean summed SGAR concentration in livers of sparrowhawks in four British regions. Circle charts within regions show the proportion of birds in each region with summed SGAR concentrations that were above (black) or below (white) the limit of detection.



Regional sample were: Scotland (1) = 58, Northern England (2) = 46, Western England & Wales (3) = 65 and Eastern England (4) = 90

Q2: What might be the population consequences arising from exposure to SGARs through lethal effects?

- Removing estimated SGAR mortalities of ≤2.5% did not result in different population estimates.
- Mortalities of 5% or more would result in divergence of predicted population and estimated actual population.

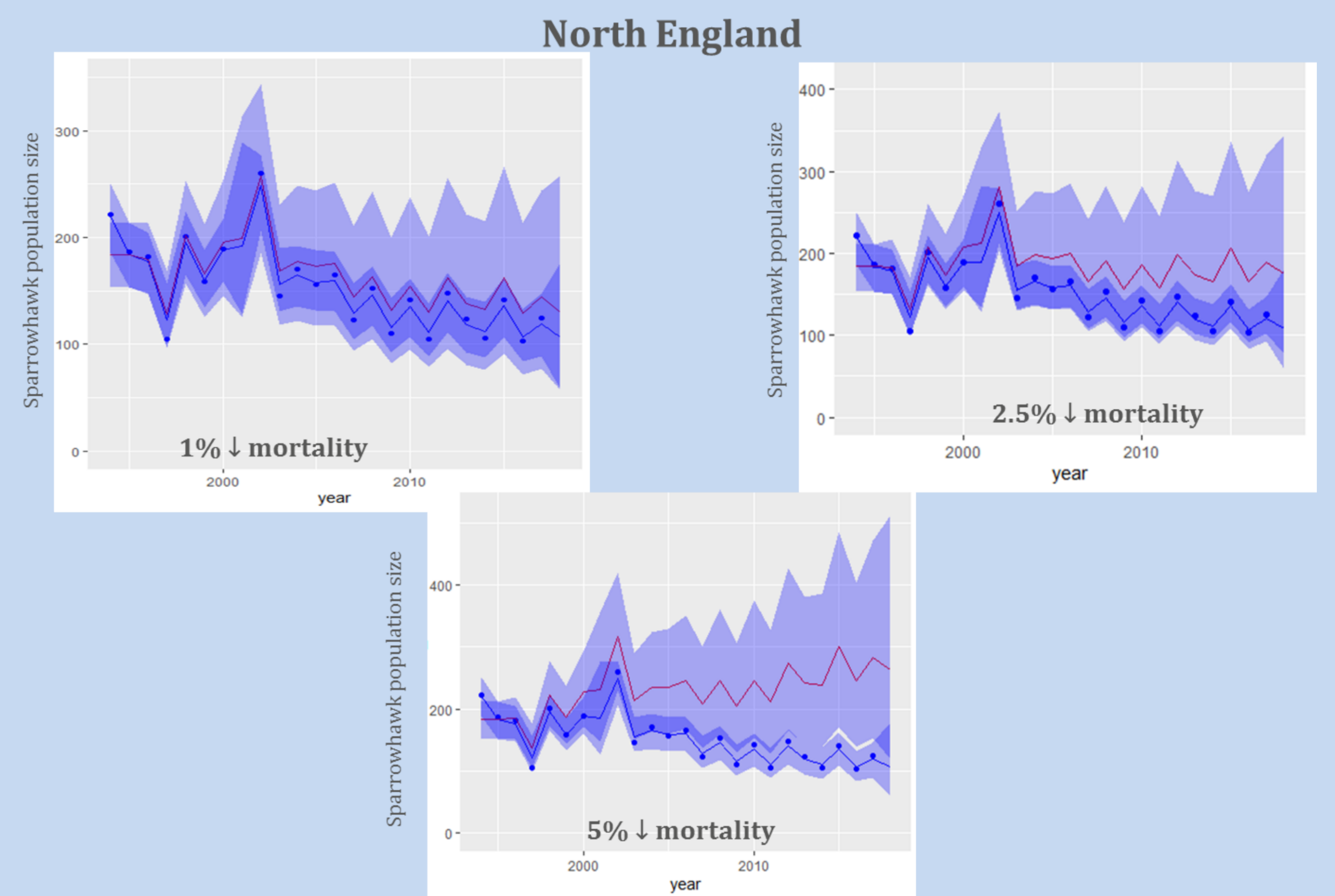


Figure 2. Sparrowhawk population in North England (dark blue line and shading) and predicted population with SGAR mortalities removed (red line and light blue shading).

2. Material Methods

- 259 sparrowhawks found dead or dying were collected from the Great Britain from 1995 to 2015
- Liver residues of 5 second generation anticoagulant rodenticides (SGARs; bromadiolone, difenacoum, brodifacoum, flocoumafen and difethialone) were determined by LCMS-MS analyses.
- Mortality rates due to SGAR exposure were predicted using 100 ng/g as an indicative threshold concentration to cause mortality.
- A population model (Fig. 3) was developed combining British Trust for Ornithology data on abundance of birds, mark-resighting of birds and nest records to model how sparrowhawk populations in four regions of Great Britain have changed over the last three decades.

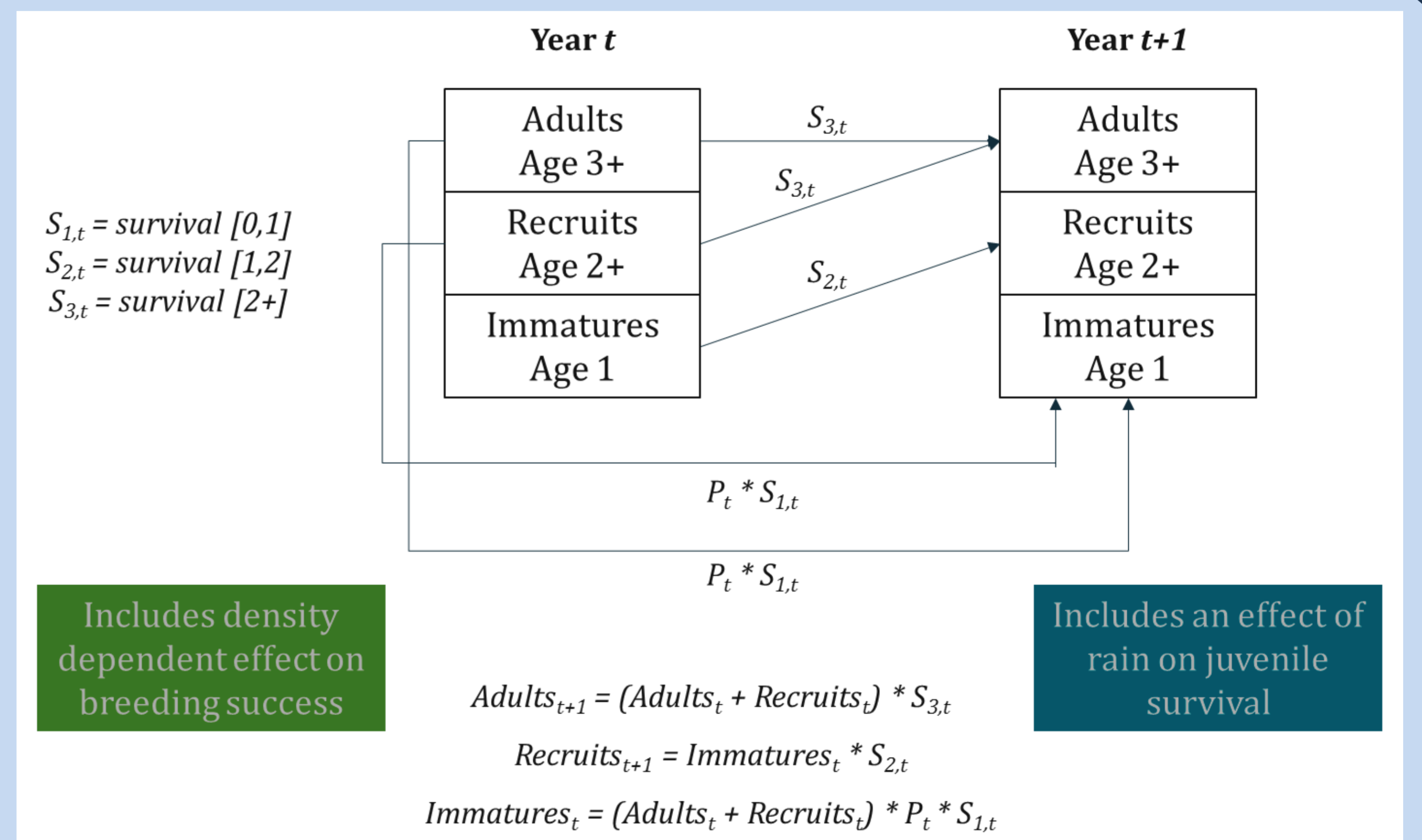


Figure 3. Schematic of population model used.

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