

Plant Population and Community Dynamics in a Forest Landscape

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Abstract

This thesis explores some of the interactions between plant population and community processes that occur in a patchy dynamic landscape. Increasing habitat fragmentation is a global trend that is a threat to biodiversity, so the understanding of such processes is of great importance. The study took place in Thetford Forest, the largest plantation forest in lowland Britain.

Thetford Forest contributed a significant number of species to the regional pool, and was also a refuge for a number of plants of heath and arable field margins. Both rides and stands were important for the persistence of different species. Within stands, changes in species richness through the forestry cycle showed a burst of colonisation after felling and replanting of the tree crop, these colonists included a high proportion of annual species with long-distance dispersal mechanisms. However a number of species appeared to colonise stands without an apparent dispersal mechanism. We recorded seeds with a wide range of dispersal mechanisms in both macroherbivore faecal material and the buried seed pool of mature stands.

Open ground in recently replanted patches provided suitable habitat for annual species. However, such species varied in the extent of their occurrence in stands. *Senecio sylvaticus*, which had high fecundity and seeds with a pappus, colonised newly available stands rapidly, whereas *A. praecox*, which has only a short awn, colonised stands more slowly. *Vulpia* spp., which have long, rough awns, were shown to be at least partly dispersal limited in Thetford Forest.

A range of different strategies allowed species to persist in our study area. Regional persistence depended upon the movement of the species in the landscape, and the dynamics of subpopulations within individual patches. Dispersal was of great importance to many species, and the interaction between dispersal and regional population dynamics is deserving of further study.

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