

NERC-funded CASE Studentship available at the University of Bristol, beginning October 2010

Predicting ecological and evolutionary responses to climate change: the impact of variation within species in pollination networks



Project supervisors:

Dr Jon Bridle and Prof Jane Memmott, University of Bristol, UK
Dr Lucy Rogers, Avon Wildlife Trust, UK (CASE Partner)

Rapid climate change and habitat fragmentation are expected to disrupt ecological interactions between species, even before extinctions due to direct loss of suitable habitat occur. Such disruptions are likely to have serious implications for the services that ecosystems provide for human health and agriculture. In particular, asynchronies are likely to develop in flowering phenology both between plant populations, and between these plants and their pollinators. These mismatches could substantially reduce both the spatial connectivity of populations, and the ecological resilience of plant-pollinator networks.

Attempts to predict such asynchronies assume that traits such as flowering times and flower morphology vary little in space and time within a species. However, recent studies of flower traits and emergence time within and between populations reveal very high levels of heritability, which could generate rapid evolutionary change in flower morphology and pollinator visitation.

This studentship will explore the likely impact of phenotypic variation and evolutionary change within and between sites of the cowslip species, *Primula veris*, and extrapolate these effects across Avon Wildlife Trust's reserve network in SW England, using ecological, quantitative genetic, and molecular genetic techniques, for which training will be provided. Field observations suggest large differences in flower morphology between sites, and in its bee pollinators, especially when individuals on neutral and calcareous grassland are compared. *P. veris* usually flowers for a short period at a site, and produces abundant seed that is typically dispersed close to the parental plant, so detectable neutral genetic differentiation is likely even at quite small spatial scales.

Wider significance: You will join two dynamic and highly research active groups at Bristol, which focus both on pollination and reproductive ecology, and on rates of evolutionary change. The CASE partner, the Avon Wildlife Trust has been among the first to adopt a "Living Landscape" approach to its conservation to maximise the capacity for species to adapt to habitat fragmentation and climate change. This will be one of the first studies to estimate genetic and ecological variation in life-history traits in a single species, and assess how a known network of distinct habitat reserves can maximise ecological resilience. Such studies will also inform the value of translocation programmes, which are being advocated by some practitioners as critical for conservation in a changing world.

Applicants should complete a University of Bristol application form, as well as a 2-page CV and covering letter. The closing date for applications (via the School of Biological Sciences website at the University of Bristol) is 15th April 2010, with interviews planned for early May.

Enquiries are welcome. Please contact either Dr Jon Bridle (jon.bridle@bristol.ac.uk), Prof Jane Memmott (Jane.Memmott@bristol.ac.uk), or Dr Lucy Rogers (lucyrogers@avonwildlifetrust.org.uk)