

## Summary

Species demography is impacted by trade-offs between life history traits and in turn these traits limit vital rates. Understanding how life history traits interact with demography is challenged by the many interacting forces that constrain them. These forces include vital rates, trade-offs and the environment and act both at the within and between species levels. In this thesis demographic traits and life history trade-offs are examined at the between- and within-species levels to determine how a species life-history traits can influence its demography. In chapters I and III we aim to identify costs of reproduction within two individual species; one short-lived and the other long-lived. The concept of “costs of reproduction” in life-history theory manifests itself as a trade-off between current reproductive effort and subsequent rates of growth, survival, or fecundity. However, within-population studies of costs of reproduction have rarely been successful in identifying them. Results from our study show the extremely long-lived herb, *Borderea pyrenacia*, has sex differences in its costs of reproduction and age-trajectories of reproductive effort, where we observed age-related increases in reproductive value. For the short-lived species *Plantago lanceolata*, we investigated the impacts of manipulated rates of reproduction on subsequent rates of fecundity and survival in a natural population. Despite careful implementation of experimental treatments, we found no effect of experimentally reduced reproduction on growth and survival. In chapter II we examine the ubiquity and strength of reproduction-growth trade-offs across a wide range of species, representing a diverse range of growth forms and ecoregions. Our results suggest that the occurrence and strength of reproduction-growth trade-offs are dependent on ecoregion, but independent of phylogeny. Such insights at the between- and within-species levels suggest that it is the interplay between the species vital rates and environment that has more of an impact on life-history traits.