



Leader of the Bioknowledge ASRI with Assoc Prof Mike Schwarz

Research Interests

- conservation biology and the biology of insect-plant interactions
- evolution and ecology of ant-plant mutualisms
- conservation biology of invertebrates
- evolution and ecology of host plant selection by herbivores
- conservation biology of butterflies
- citizen science and community conservation

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Duncan’s research interests are in the general areas of conservation biology and the biology of insect-plant interactions.

Ants are a very important component of the Australian fauna and may have manifold effects on local ecosystems through their foraging and nest-building activities. According to one estimate, approximately 75% of plant species in the Australian flora show some kind of adaptation associated with ants. One way in which plants attract ants as mutualistic partners is through the provision of nectar rewards via specialised glands called extra-floral nectaries (EFNs).

With Dr. M.A. Whalen, Duncan has worked on variation in EFN structure within the endemic Australian plant genus *Adriana*. We are examining some of the ecological factors causing variation in the effectiveness of the mutualism between ants and *Adriana* over a wide geographic range. We have also examined the ant and herbivore faunas associated with several euphorb tree species in Papua New Guinea and northern Queensland.

Conservation biology research has concentrated on the effects of habitat disturbance on animal-plant interactions such as pollination and the use of invertebrate communities as 'bioindicators' of environmental change.

Student projects:

- effects of acid drainage from mine tailings dumps on stream invertebrates
- effects of grazing on mound springs
- effects of fire-trail formation on seed dispersal by plants
- effects of invasive ants on native invertebrate communities
- the invasion biology of Argentine ants
- conservation biology of a rare and endemic plant species
- conservation biology of butterflies
- vegetation health after managed flooding
- salt marsh health projects
- molecular systematics & conservation genetics of members of the plant family *Frankeniaceae*.

Research Collaborations and Consultancies

Duncan is actively involved in community conservation programs such as the Urban Forest Program and Butterfly Watch with Butterfly Conservation SA and the SA Museum.

- Conducting multidisciplinary collaborative research on Australia's biodiversity & landscapes
- Providing innovative interpretation of biodiversity research for a wide variety of end-users

