

The Scotia Science Symposium 2011

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On the 13th of July 2011, a symposium was held at the Australian Wildlife Conservancy's Scotia Sanctuary, in far western New South Wales. This symposium focused on research in a region that is fast becoming a hub for ecological and applied conservation studies. To the east of Scotia is the University of Ballarat's Nanya Station where Martin Westbrooke and his colleagues and students have focused on vegetation and reptile community dynamics. To the south of Scotia is the NSW Office of Environment and Heritage's Tarawi Nature Reserve where David Keith, Mark Tozer and colleagues have been conducting long-term work on the fire and grazing responses of vegetation and where research on malleefowl and long-term pest animal control is occurring. To the west of Scotia is the Danggali Conservation Park in South Australia. While at Scotia itself, Australian Wildlife Conservancy staff, collaborators and students are researching threatened species ecology, threatening processes, reintroduction biology, pest animal control techniques and ecosystem services in a system that includes Australia's largest fenced conservation area (8000 ha) that is free of rabbits, goats, cats and foxes and where locally extinct native species, such as bilbies, bridled nailtail wallabies, numbats, greater stick-nest rats, boodies and woylies have been reintroduced.

The size, status and intact nature of this mallee region, as well as the proximity of so many conservation land management organisations affords unprecedented opportunities for collaborative research on ecological and conservation issues in the semi-arid zone. The wide range of studies currently underway reflect the differing management priorities of these organisations within an overarching framework of common conservation goals. Furthermore, adjacent farmland in varying states of degradation provides ideal opportunities to investigate the effects of different herbivore assemblages along a gradient from farmland, through native vegetation grazed by domestic livestock and feral herbivores to intact native vegetation where introduced species have been eradicated.

Despite the wealth of research occurring in the region, interactions amongst researchers have been limited historically. The Scotia Science Symposium was designed to bring all the researchers working in this region together with land managers, increasing our combined understanding of the ecological processes and conservation management actions that are occurring within the ecosystem, as well as providing opportunities for developing future collaborative research projects.

The 42 attendees at the Scotia Science Symposium heard 20 talks on the full gamut of research occurring in the region. A selection of seven papers are published in this special issue of the Proceedings reporting on work underway in five different institutions. Westbrooke (2012) sets the scene with a post-European ecological history of the region, concluding that the late introduction of domestic livestock was a principal reason why the region retains its conservation value as an outstanding example of mallee ecosystems.

One of the characteristic environmental features of the region is its predominantly hot and dry climate punctuated by extreme rainfall events and fires. Westbrooke et al. (2012) explore the ecological legacies of one such event, the flood of Olary Creek in February 1997. Keith & Tozer (2012) also explore the role of climatic variability on responses of dune mallee to fire and grazing in a long-term landscape experiment. This work is part of an adaptive management strategy that compares the effects of alternative fire and grazing management treatments in years with differing climatic conditions.

Another striking feature of the region, in common with most other parts of Australia's arid zone, is the extinction of critical weight range mammals a century ago. Gibb (2012) considers the implications of this loss on the arthropod fauna, particularly through the roles of the mammals as predators, agents of soil disturbance, parasite hosts, competitors, mutualists and nutrient cyclers. Coggan (2012) considers implications of mammal

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reintroductions for ecosystem services such as nutrient cycling provided by native dung beetles, which potentially suffer a dearth of food and nesting material where a guild of mammals have been eliminated. Scotia Sanctuary is renowned as site of successful mammal reintroductions and offers an important opportunity to examine these interactions in an ecosystem that has a more complete representation of biota than the landscape at large. After establishment of a sustainable population of bridled nailtail wallabies within a larger predator exclusion fence, Hayward et al. (2012) describe the outcomes of a reintroduction experiment in which a sample of male animals were released outside the fence where predators had been controlled, but not excluded. Finally, Eldridge and Huang (2012) report a study of the ecological functions of soil disturbing invertebrates along the grazing gradient described above. They found that both domestic herbivores and re-introduced extinct mammals affected a range of ecosystem processes such as pedogenesis, soil movement and water infiltration.

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