

V Discussion

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The Edjudina—Menzies Study Area contains most of the landforms present in the Eastern Goldfields. This Study Area contains the only extensive tract of Undulating Plain dominated by *Maireana sedifolia* and without a eucalypt overstorey in the Eastern Goldfields. Also notable is the virtual absence of Calcareous Plain which are extensive both north and south of the Study Area.

The entire Edjudina—Menzies Study Area is situated north of the mulga-eucalypt line as defined by Beard (1980b) but retains affinities with the South-western Interzone. Those landforms dominated by *Acacia aneura* (mulga), a species typical of the Eremaean Botanical Province, retains an admixture of *Casuarina cristata* and *Eucalyptus* spp. which are well represented in the northern parts of the Kurnalpi—Kalgoorlie Study Area immediately to the south.

The most detailed vegetation map covering the Study Area (Beard 1975) was used extensively during the planning of field work and its reliability was assessed. Considering the broad scale (1:1,000,000) of mapping, Beard's map provides an adequate overview of vegetation structural types. However, detailed vegetation mosaics make mapping of plant communities difficult.

Grazing has had a significant impact over much of the Study Area. There are no historical accounts of the original state of the vegetation, but although man has not modified large areas by the cutting of timber for mining industries to the same extent as has happened further south (Newbey and Hnatiuk 1984), stocking would have led to a decline in the shrub layer, depletion of perennial grasses, sealing of soil surfaces and localised wind and water erosion as has occurred elsewhere in the northern part of the Eastern Goldfields (Wilcox and Speck 1963). Introduced weeds have become widespread throughout the Study Area (Appendix II) and are especially typical of margins of roads, around previous habitations and on the heaviest grazed parts of pastoral leases. In addition, mineral exploration and mining operations have had significant effect on landform units over greenstone. Fire is having a pronounced and continuous effect on the age of vegetation as well as species composition in southern parts of the Study Area (Fox 1980).

The Edjudina—Menzies Study Area essentially forms a broad, gentle gradient in vegetation from south-west to north-east. Outliers of the South-western Botanical Province occur mainly in the south-western corner and decrease in number in a north-easterly direction (e.g. *Calytrix* spp. and *Verticordia* spp.).

Soils carrying south-western elements of the flora are largely neutral to acid (e.g. on Granite Exposure and Sandplain) while those of the Eremaean Botanical Province are neutral to basic; however, the presence of laterite (iron and aluminium compounds) generally coincides with the acid soils. Most of the species referable to the south-west flora that persists outside the south-western corner of the Study Area are found on Breakaway and siliceous Dunefield derived from lateritization

of granite landforms and subsequent erosion and reworking of the highly leached surface deposits. On Granite Exposure, run-off from the bare rock may produce marginally moist environments favouring south-western elements but this does not necessarily apply to Hill. Generally a major determinant of the distribution of the flora is soil chemistry which may override climatic factors.

Sandy soils associated with Salt Lake Feature are alkaline in the Edjudina—Menzies Study Area and northwards in contrast to the southern Study Areas of the Eastern Goldfields where they tend to be siliceous and neutral to acidic. Salt Lake Feature in the southern parts of the Eastern Goldfields contain plant taxa which in the Edjudina—Menzies Study Area and northwards are confined to Sandplain and associated Dunefield.

A comparison of the number of species in plant families occurring in the Study Area with those of other Eastern Goldfields Study Areas in general shows that Myrtaceae and Chenopodiaceae have relatively more species while Poaceae have less species. Several plant species recorded during this survey are probably rare and their distributions need further documentation as they may meet the criteria of Gazetted Rare Flora (Rye and Hopper 1981). These species include *Calytrix stipulosa*, *Acacia* aff. p. 41, *Eucalyptus jutsonii* and *Crenidium spinescens*.

The two survey sites within the Edjudina—Menzies Study Area, collectively, have 71 species of amphibians and reptiles making this the richest herpetological area in the Eastern Goldfields. The gradation in vegetation from south-western to Eremaean elements is reflected in the herpetofauna with only 37 per cent of the reptiles and no amphibians in common between the two areas. A number of southern species are at their inland extreme of distribution in the Study Area, and conversely several Eremaean species are not found further south (Dell and How, this publ.). One gecko, *Gehyra purpurascens*, and one skink, *Ctenotus greeni* were revealed as new species by this study and their type localities are in the Study Area.

Birds and mammals mirror the herpetofauna in having an admixture of south-western and Eremaean species in the Study Area. The eucalypt associations in the southern part of the Study Area contain a number of southern passerines which were not recorded in *Acacia* associations further north. Some Eremaean passerines occurred in the northern *Acacia* associations but did not extend into the eucalypt woodlands or mallee.

The number of similar sized mammal species occurring sympatrically is noteworthy. For example two *Sminthopsis* and two *Notomys* were trapped in the same habitats and two species of morphologically remarkably similar *Pseudomys* occurred in close proximity but on different soil types.

Our reconnaissance of Goongarrie National Park, the only conservation area in the Edjudina—Menzies Study Area, revealed a limited range of soil types and a uniformity of vegetation associations as a consequence of recent extensive fires. Only 11 of 29 vegetation types known from the Study Area are present in Goongarrie National Park and none appears to be large enough to ensure long term survival of their component flora and fauna especially in view of the suscepti-

bility of this vegetation to fire. There is a need, then, for the re-assessment of the conservation requirements of the Edjudina–Menzies Study Area.

This study has highlighted the rich biota of Dunefield and Sandplain in the Edjudina–Menzies Study Area. For example, at site EM3 were two species of *Notomys*, two species of malurid fairy wrens, dense populations of the gecko *Nephrurus laevis* and the agamid *Ctenophorus fordi* and an outlying population of the skink *Ctenotus brooksii*. A Sandplain site (EM12) has the richest herpetofaunal assemblage recorded by us in the Eastern Goldfields. In it we also recorded Scarlet-chested Parrot, *Neophema splendida*, an infrequently recorded species.

Extension of Goongarrie National Park to incorporate the diverse areas mentioned above would greatly add to the physical and biological heterogeneity of the Park. The National Park has good representatives of mulga communities but its conservation role would be considerably enhanced by addition of additional landform and vegetation units. It is unlikely that permanent potable water occurs in the Park. The addition of features such as White Quartz and Granite Dams where bats were abundant would be of considerable value.