

ABSTRACT

The Sandstone–Sir Samuel Study Area is located between latitudes 27°00'S and 28°00'S and longitudes 118°30'E and 120°45'E. The Laverton–Leonora Study Area is situated between latitudes 28°00'S and 29°00'S and longitudes 120°45'E and 123°00'E. The two Study Areas are adjacent, and have a similar climate, geomorphology and biota.

Ten landform units are recognized in these Study Areas. The most extensive are Sandplains and Broad Valleys. Salt Lake Features, Calcareous Plains bordering salt lakes, and Undulating Plains are prominent in both Study Areas. Small areas of Dunefields, Breakaways and Granite Exposures are scattered throughout the Study Areas while Hills and Drainage Lines occur largely within Undulating Plains.

The main vegetations are low woodlands of *Acacia aneura* (Mulga). *Eucalyptus* species with an understorey of hummock grasses (*Triodia*) are dominant on deep sands. Tall and low shrublands occur in limited areas, generally in association with salt lakes and dunes. Although the Study Areas lie within the Austin Botanical District, the eastern sections of both Study Areas are strongly influenced by the Helms Botanical District (Great Victoria Desert).

Their known vascular flora comprises 7 species of ferns and 777 taxa of flowering plants, including 303 taxa recorded from Wanjarri Nature Reserve. Exhaustive floristic lists for 31 sample sites, representing most of the Study Areas' surface lithologies, are included as an appendix. No species of Declared Rare Flora were recorded within the Study Areas.

Vertebrate species were surveyed in two survey areas, one in each Study Area. The 6 sites sampled in the Wanjarri survey area represent surface types high in the landscape, whereas the 8 sites sampled in the Erlistoun survey area represent surfaces lower in the landscape.

A total of 18 native mammal, 54 reptile, 3 frog and 94 bird species were recorded. The known vertebrate fauna of the Study Areas is listed, and discussed in terms of the sampling strategy and post-European changes. Twelve mammal species are now extinct or very much rarer in the Study Areas. It is essentially an Eyrean fauna. Differences in the foraging behaviour of the 6 bat species are described. Preliminary numerical analyses of the quadrat and site data reveal a relationship between vertebrate species composition and surface lithology, and that species of lizard occur on a smaller variety of surfaces than do birds or mammals.

Wanjarri Nature Reserve is the only conservation reserve in the Study Areas. This reserve, in the north-eastern corner of the Sandstone–Sir Samuel Study Area, does not include representatives of several important landforms and vegetation types.

INTRODUCTION

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This report is the tenth in a series of biological survey reports covering the Eastern Goldfields Region (e.g. Newbey *et al.* 1984, Dell *et al.* 1985, How *et al.* 1988, Dell *et al.* 1988, Dell *et al.* 1992, How *et al.* 1992, McKenzie and Hall 1992, Hall and McKenzie 1993). The philosophies behind the survey, its design and the methods employed are outlined in an earlier report (Biological Surveys Committee of Western Australia 1984).

The region was divided into 12 Study Areas (Figure 1). Herein we document the vegetation, flora and vertebrate fauna recorded during our survey of two Study Areas: the Sandstone–Sir Samuel Study Area and the Laverton–Leonora Study Area. This report aims to present data rather than focussing on regional interpretation. The data from all Study Areas will be pooled for analysis, and a quantitative synthesis of patterns in the Eastern Goldfields biota will be published later.

The Sandstone–Sir Samuel Study Area, an area of approximately 19,000 km², is covered by two 1:250,000 geological maps: "Sandstone", excluding the north-western corner, (Tingey

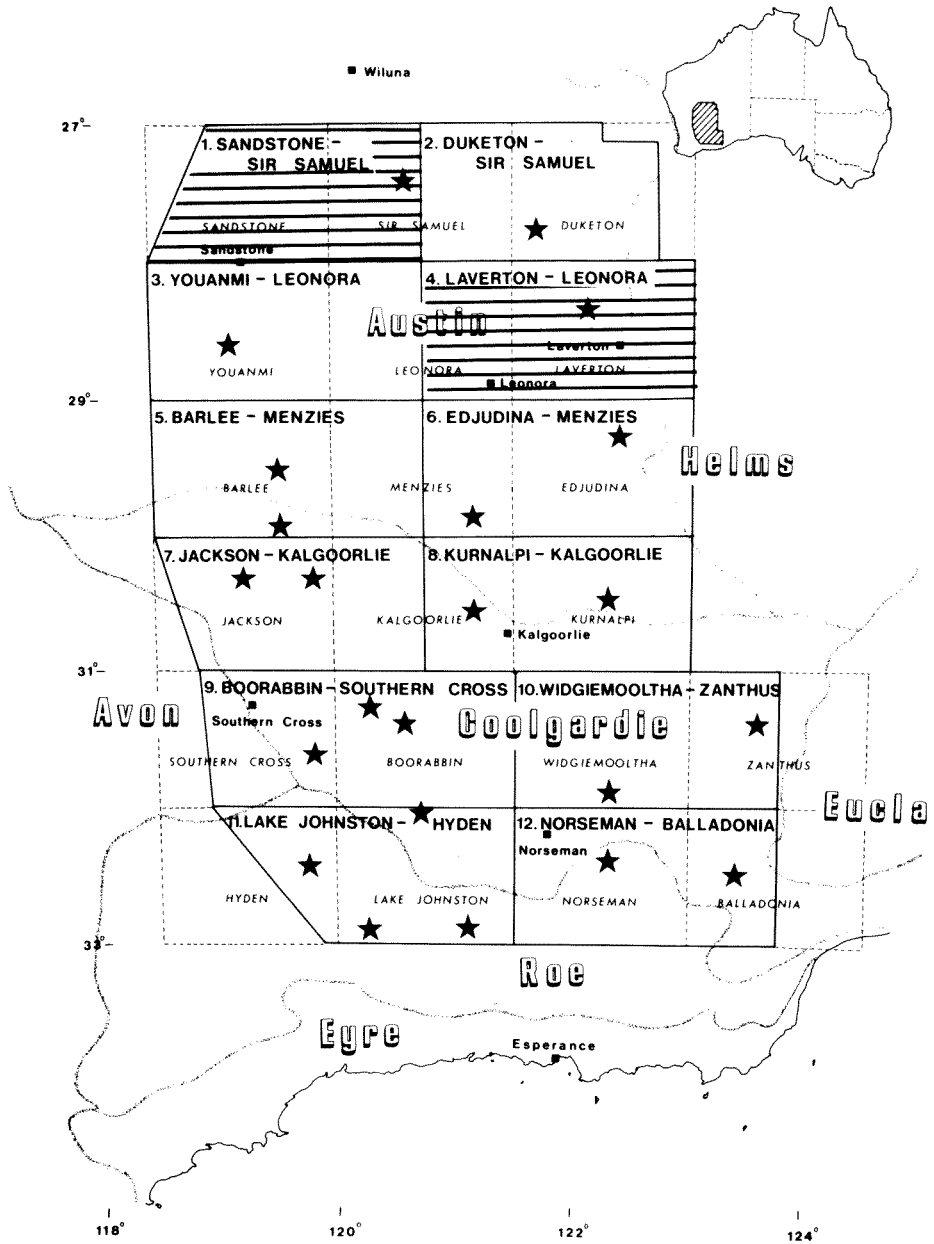


Figure 1 The extent of the Eastern Goldfields Region, the vegetation districts and the boundaries of the Study Areas included in the biological survey. The shaded portion shows the Sandstone-Sir Samuel and Laverton-Leonora Study Areas covered by this report.

1985) and the western half of "Sir Samuel" (Bunting and Williams 1979). The Study Area is situated north-east of Mount Magnet, south of Wiluna and south-east of Meekatharra. The townsites of Sandstone and Leinster lie on the southern boundary of the Study Area.

The Laverton-Leonora Study Area is an area of approximately 20,000 km², covered by two 1:250,000 geological maps: "Laverton" (Gower 1976) and the eastern half of "Leonora" (Thom and Barnes 1977). The Study Area contains the townsites of Leonora in the south-west and Laverton in the east.

The biological survey was conducted in two parts. The vegetation and flora was documented by a consultant botanist (A.V. Milewski) and G.J. Keighery (Department of Conservation and Land Management). The fauna was surveyed by staff of the Western Australian Department of Fisheries and Wildlife (now the Department of Conservation and Land Management).

The initial vegetation survey was carried out during several brief visits to the two Study Areas from January 1980 to August 1982. Subsequent work was conducted by G.J. Keighery in October 1987 and September 1992. Field traverses and vegetation sample sites, selected to document the vegetation on the main landform units, are shown in Figure 2 (Sandstone-Sir Samuel Study Area) and Figure 3 (Laverton-Leonora Study Area).

Most vegetation sampling was concentrated in two survey areas, chosen to provide access to the widest variety of landforms: the Wanjarri survey area (27°25'S, 120°40'E), located in the north-eastern corner of the Sandstone-Sir Samuel Study Area (Figure 4) and the Eristoun survey area (28°20'S, 122°10'E), located in the central portion of the Laverton-Leonora Study Area (Figure 5).

Vertebrates were sampled in the Wanjarri survey area during February 1979, May 1980 and August 1981. Eight vertebrate sample sites were selected in the Sandstone-Sir Samuel Study Area to sample relatively homogeneous areas of the most extensive surface types distinguished by Tingey (1985) and Buntings and Williams (1979). The location of these sites is shown in Figure 4. The five quadrats (1W-01 to 1W-05) and 3 fauna sites (1W-06 to 1W-08) were established to sample typical surfaces high in the landscape.

Vertebrates of surface types at lower levels in the landscape were sampled in the Eristoun survey area of the Laverton-Leonora Study Area during February 1979, May 1980 and August 1981. Five quadrats (1E-01 to 1E-05) and 1 fauna site (1E-06) were established to sample relatively homogeneous areas of the most extensive surface types distinguished by Gower (1976) and Thom and Barnes (1977). The location of the six sites is shown in Figure 5.

The main access to the Sandstone-Sir Samuel and the Laverton-Leonora Study Areas is via sealed roads to Leinster, Leonora and Laverton. A number of unsealed graded roads, linking Sandstone with Wiluna to the north of the Sandstone-Sir Samuel Study Area, and running north-east from Laverton, are relatively well maintained. The network of pastoral station tracks in both Study Areas vary in condition. Most are impassable following rain, and some have patches of deep sand which is hazardous for travelling when it becomes loose and dry.

An account of previous exploration in the Sandstone-Sir Samuel Study Area can be found in Beard (1976). The Study Area is sparsely settled and contains only Sandstone, near its southern border, and the recently developed mining town of Leinster in the south-eastern corner. A number of old abandoned mining settlements, such as Barrambie and Sir Samuel, occur throughout the greenstone areas. Recent mining exploration and development has been conducted in the vicinity of Yakabindie Station, just to the south of the Wanjarri survey area.

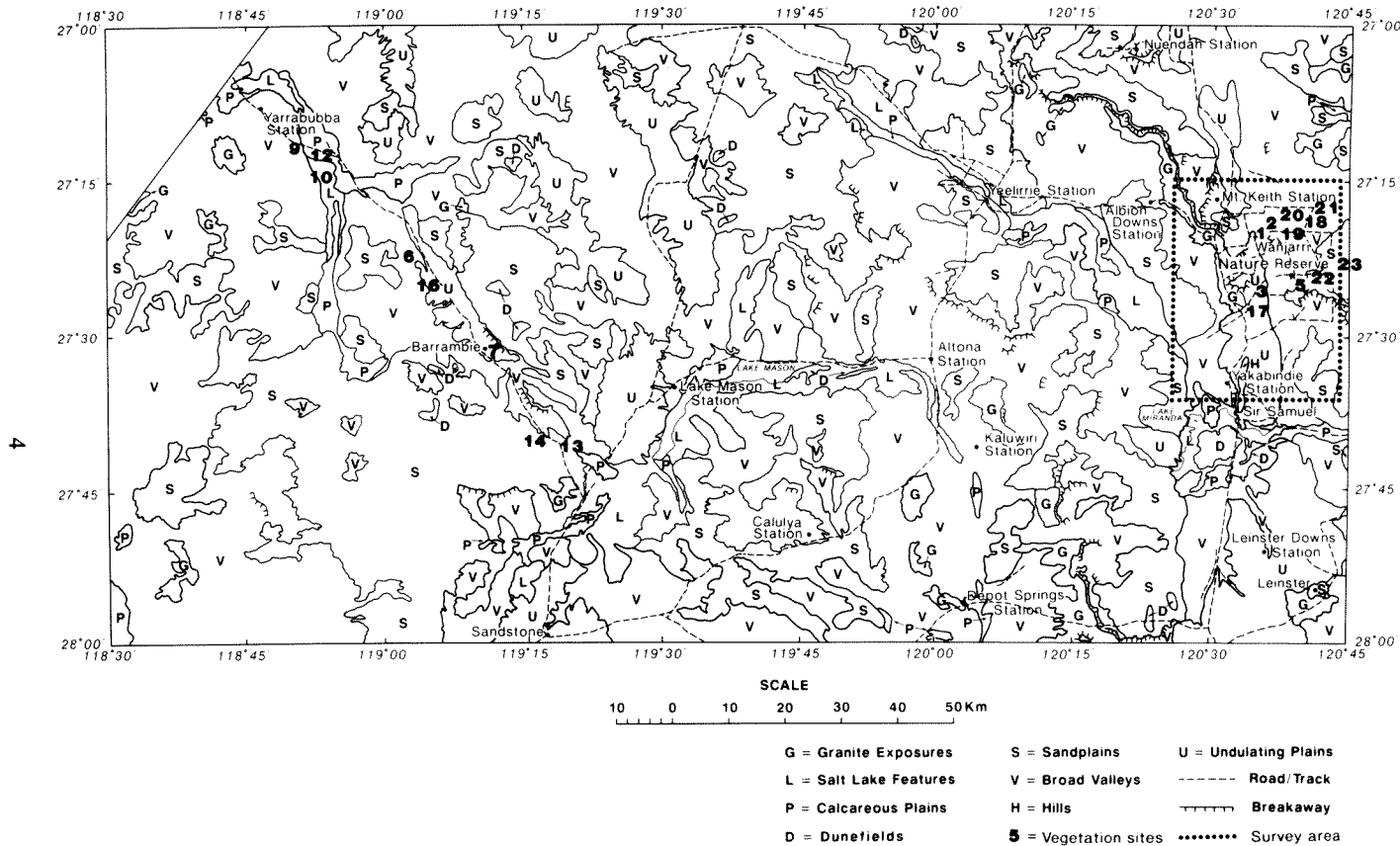


Figure 2 The main landform units of the Sandstone-Sir Samuel Study Area. Numbers indicate the vegetation sites described in Appendix 1. Locations of quadrats are shown in the enlargement of the Wanjarri survey area (Figure 4).

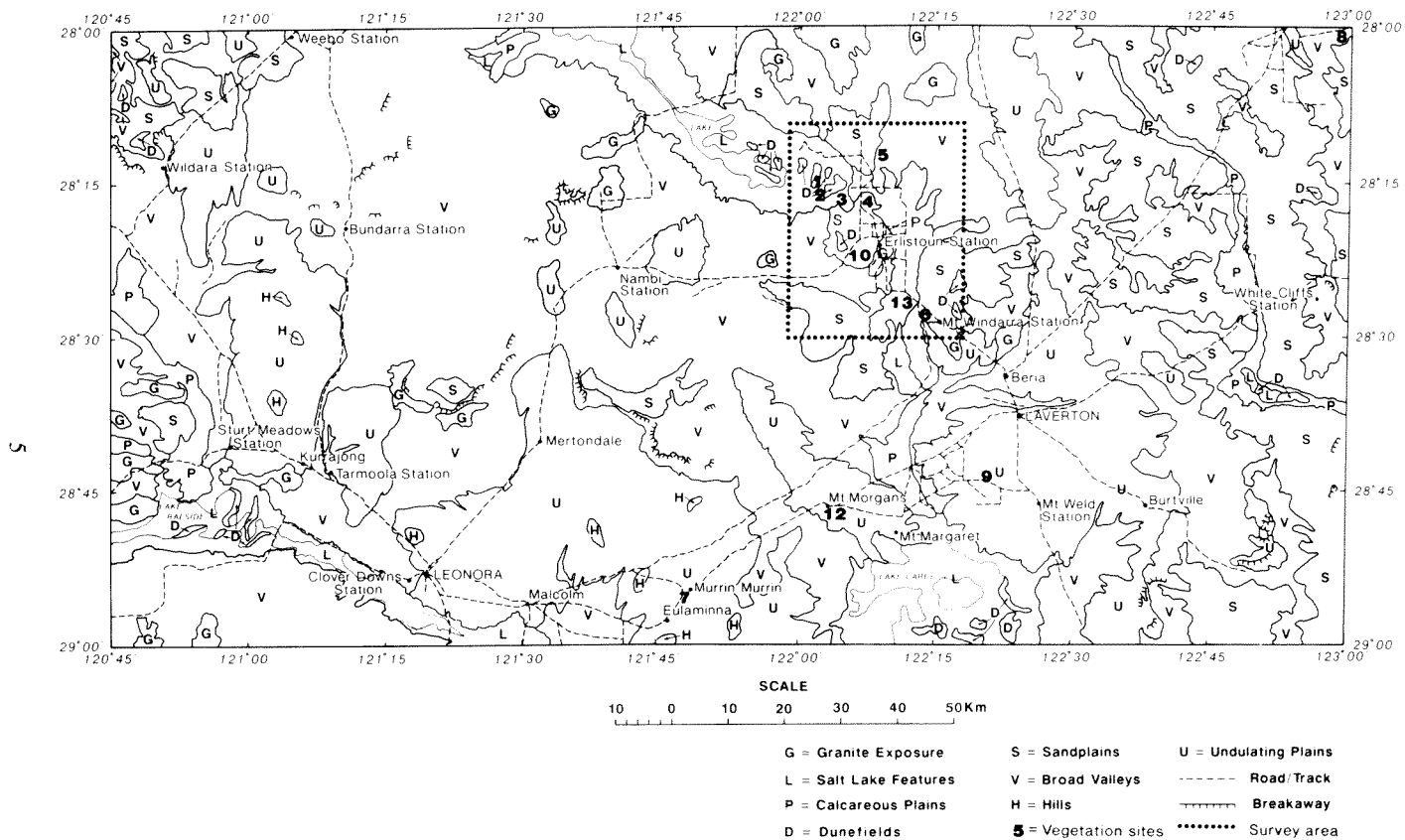


Figure 3 The main landform units of the Laverton-Leonora Study Area. Numbers indicate the vegetation sites described in Appendix 1. Locations of quadrats are shown in the enlargement of the Eristoun survey area (Figure 5).

Pastoral leases, supporting a sheep grazing industry, cover the entire Sandstone–Sir Samuel Study Area. In the past, timber was cut from parts of the Sandstone–Sir Samuel Study Area for use in mining operations. The effects of this exploitation, however, are hard to pinpoint as much of the area has been degraded by pastoral use. This is particularly evident in the eastern half of the Study Area, which includes the Wanjarri survey area.

Beard (1974, 1976) outlines the exploration of the Laverton–Leonora Study Area. The sparse population of the Study Area is concentrated within two towns, Leonora and Laverton, and in Aboriginal communities such as Cosmo Newbery (located on the north-eastern border) and Mt Margaret. The Study Area is under pastoral lease, except for small areas of Crown land in the eastern section, which abut the adjacent Great Victoria Desert. There are a number of active mines (e.g. Tutonic Bore and Windarra), and several abandoned mining centres within the Study Area. Timber, used in mining operations, was cut from parts of the Study

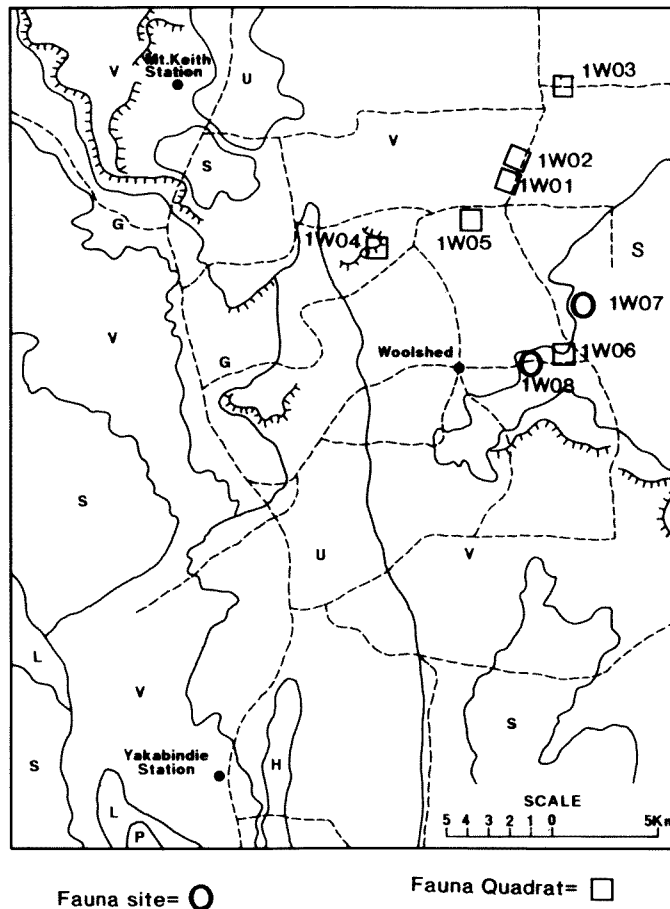


Figure 4 The location of vertebrate sampling quadrats and sites within the Wanjarri survey area in the Sandstone-Sir Samuel Study Area.

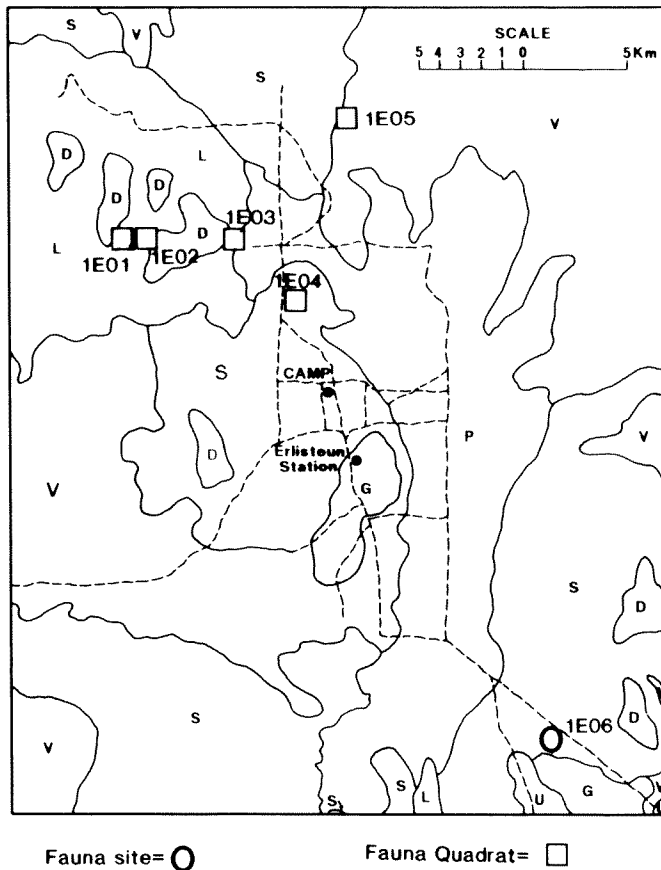


Figure 5 The location of vertebrate sampling quadrats and sites within the Eristoum survey area in the Laverton-Leonora Study Area.

Area. The immediate vicinity of large settlements remain severely denuded in the Laverton-Leonora Study Area.

The only large nature conservation reserve within the two Study Areas is the Wanjarri Nature Reserve (53,248 ha.). This A Class reserve (No. 30897) is located in the north-eastern corner of the Sandstone-Sir Samuel Study Area and encompasses the Wanjarri survey area. Malcolm Dam, a small reserve of 400 ha., is situated near Leonora on the southern boundary of the Laverton-Leonora Study Area.

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