

I INTRODUCTION TO BILLYACATting HILL NATURE RESERVE

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The biological survey of this reserve is part of a programme evaluating the relationship between vertebrate fauna and vegetation on reserves in the Western Australian wheatbelt. Kitchener (1976) gives the background to this study and Dell (1979a) and Chapman (1979) list reports published.

Billyacatting Hill Nature Reserve (No. 17746) is in the eastern wheatbelt, 16 km north-east of the town of Kununoppin ($118^{\circ}00'E$, $31^{\circ}03'S$) which is ca 220 km north-east of Perth. The reserve has an area of 2075 ha of which 66% is granite outcrop (Muir, this report). Billyacatting Hill, the highest point on the reserve, is 417 m above mean sea level. This reserve and the wheatbelt generally are situated on the granites and granitic gneisses of the Yilgarn Block of the Precambrian Shield.

The original purpose of the reserve was as a water catchment. This purpose was amended to include conservation of flora and fauna on 24 July 1970 and it is currently vested in the Minister for Water Supply, Sewerage and Drainage. On 18 June 1970 two mineral claims located on the south-east corner of the reserve were lodged for 'quartz, lithium, palladium, molybdenum and all rare earth metals'. The Shire of Trayning and the Department of Fisheries and Wildlife lodged protests against the claims and one was withdrawn in 1972. The remaining claim was refused in a Warden's Court hearing on 5 June 1974.

Prior to this survey the only information on the biota of the reserve was from fauna wardens' inspections. An inspection on 19 June 1969 recorded 'Grey Kangaroos, Echidna, Mallee Fowl nest, dragon lizards' and several birds.

Climate

At Kununoppin the annual rainfall is 308 mm and annual median is 300 mm. Table 1 indicates the seasonal distribution of rainfall at Kununoppin, from Anon. (1958).

TABLE 1

	J	F	M	A	M	J	J	A	S	O	N	D
Average rainfall (mm)	10	19	23	23	34	47	46	37	20	18	9	11

Most climatic data are for Merredin, 45 km south-east of Kununoppin where annual average and median rainfalls are 327 mm and 320 respectively. Table 2 indicates temperature and humidity data for Merredin, from Anon. (1975).

TABLE 2

	J	F	M	A	M	J	J	A	S	O	N	D	Year
Mean daily max. temp. (°C)	33.2	32.8	29.5	24.5	20.2	16.9	15.9	16.4	19.3	23.9	28.4	31.9	24.4
Mean daily min. temp. (°C)	17.6	17.5	15.4	11.7	8.4	6.8	5.2	4.6	5.7	9.2	12.9	15.6	10.9
9 am mean humidity (%)	47	50	54	62	68	82	83	75	65	58	50	44	62
3 pm mean humidity (%)	27	29	33	43	47	65	64	55	45	39	30	26	42

Evaporation and wind data are not recorded in the vicinity of the reserve. For the years of the survey the rainfall at Kununoppin was 275 mm (1972), 334 mm (1973) and 479 mm (1974) cf. average 308 mm. For the period of the surveys, 30 October-7 November 1972 the weather was fine and warm to hot. Temperatures were not recorded. Some rain fell on 2 November. For the period 30 March-6 April 1974 the weather was unsettled with cool overcast days, followed by thunderstorm activity. On 4 March Kununoppin recorded 85 mm of rain.

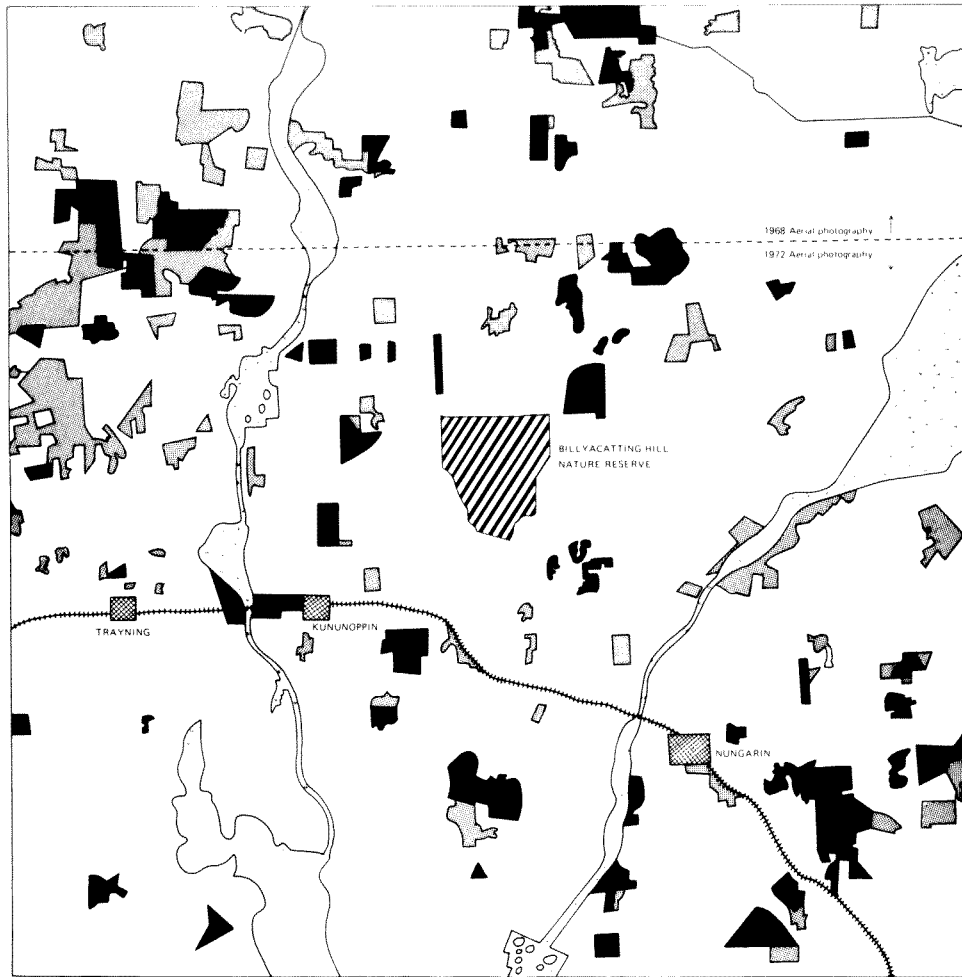
Fire History

Apart from a small, localised fire on the north boundary in loc. 4.1 (described by Muir, this report), there does not appear to have been any major fire on Billyacatting Hill Nature Reserve for at least 20-30 years. This is unusual for wheatbelt reserves and adds significantly to the scientific interest. It is likely that the granite outcrops confer a degree of fire protection to the vegetation of this reserve.

Agricultural Development and Isolation

Land was first selected in the district in 1867 at Yarragin which is 8 km north of Kununoppin. At this time Goomalling, 115 km to the west, was the closest settlement. Mangowine Homestead which was the first permanent settlement was established by Charles Adams in 1874. Land was opened for agricultural settlement in 1909-10 and clearing and cropping commenced shortly thereafter (Adams, undated).

Rates of alienation and clearing of adjoining natural vegetation are documented where possible because the fauna of a reserve, particular avifauna and other mobile species, e.g. kangaroos, possums, and goannas, is dependent to a certain extent on the quantity and spatial arrangement of other uncleared land in its vicinity.



LEGEND




-  Salt complex
-  Uncleared land at 1968/72
-  Uncleared land at 1962

Fig. 1: Map showing amount of uncleared land in vicinity of Billyacatting Hill Nature Reserve in 1968/72 compared to 1962.

The following analysis is based on 1:40,000 aerial photography taken in September 1962, November 1972 and 1:56,000 photography taken in March 1968. The reserve is considered at the centre of an area 46 x 46 km. This is derived by extending 20 km from the northernmost, southernmost, easternmost and westernmost points on the reserve (see Fig. 1). Within this area at September 1962 there were 22,930 ha of uncleared land or 11.0% of the area. By 1968/72 this had been reduced to 13,084 ha or 6.2%. These uncleared lands exclude 11,789 ha of salt complex.

In November 1972 there were only two small patches, each less than 20 ha, of uncleared eucalypt woodland adjacent to the east boundary of the reserve, which is therefore quite isolated and for some fauna, effectively an island.

Biological Survey

Fieldwork was undertaken on Billyacatting Hill Nature Reserve between 30 October-7 November 1972 by A. Chapman, J. Dell, G. Harold and D.J. Kitchener and between 30 March-6 April 1974 by A. Chapman and J. Dell. B. Muir (with J. Dell) mapped the vegetation between 2-5 September 1977.