

# A natural grey kangaroo hybrid?

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## ABSTRACT

The eastern grey kangaroo, *Macropus giganteus*, and the western grey kangaroo, *M. fuliginosus*, occur over an extensive zone of sympatry, but there has been no record of hybridisation between these sibling species in the field. The two species can be reliably distinguished by their characteristic pelage, which is grey-brown in eastern grey kangaroos and chocolate brown in western grey kangaroos. The pattern of colour on the face is particularly distinctive: the pale grey face of the eastern grey kangaroo contrasts with dark shading around the eyes, whereas the western grey kangaroo has a monochrome dark brown face. We report a sighting of a probable hybrid grey kangaroo in June 2000 at Willandra National Park (33° 13' S, 145° 07' E), western New South Wales. This individual was an adult female, which was intermediate in phenotype and was accompanied by a possible back-crossed sub-adult. In view of this and other reports of putative hybrids, we urge greater scrutiny of grey kangaroos in the sympatric zone.

Key words: eastern grey kangaroo, western grey kangaroo, hybrid, *Macropus giganteus*, *Macropus fuliginosus*

## Introduction

The eastern grey kangaroo, *Macropus giganteus* Shaw 1790, and the western grey kangaroo, *M. fuliginosus* (Desmarest 1817), are sibling species (Kirsch and Poole 1972). They occur sympatrically over an extensive zone of secondary contact in south-western Queensland, western New South Wales, north-western Victoria and south-eastern South Australia (Caughley et al. 1984). There is obvious habitat segregation in some areas within this zone of sympatry (Coulson 1990; McCullough and McCullough 2000), but the two species occur syntopically in other places and sometimes form mixed-species groups (Coulson 1999).

Despite the extensive geographical overlap between the two species, there is no evidence of hybridisation between the two species under natural conditions. That the two species are capable of producing hybrid offspring is evident from captive breeding experiments reported by Kirsch and Poole (1972) and Poole and Catling (1974); these crosses were successful only one-way (western male x eastern female), and only the female offspring showed some fertility and

were able to back-cross with males of the parent species. Kirsch (1984) later reported the reverse cross in a captive group, but the fertility of the hybrid offspring was unknown. In the field, Kirsch and Poole (1972) collected 550 kangaroos across the range of the two species, and no hybrids were detected by analysis of antisera or transferrin polymorphisms. Subsequently, Caughley et al. (1984) identified 6853 grey kangaroos in and adjacent to the known sympatric zone; the species were determined mainly by sight, augmented by road-killed and shot specimens, and again no hybrids were reported.

With experience, the two species can be distinguished at a distance in the field by their characteristic pelage. Eastern grey kangaroos range from silver-grey to mid-brown in colour, and are paler overall than the chocolate brown of western grey kangaroos (Kirsch and Poole 1972). This difference is particularly evident in the colour of the face, which is pale grey in eastern grey kangaroos and dark brown, almost black, in western grey kangaroos (Fig. 1). The face is the

most distinctive feature, as described by Caughley et al. (1984): the eyes of eastern grey kangaroos ‘... appear prominent because of a subdued masking around the eyes that is slightly darker than the rest of the face...’, whereas western grey kangaroos have no prominent facial markings, but ‘...its dark brown colour contrast sharply with a much lighter throat...and in frontal view a line of white often outlines the face.’ These contrasting patterns are obvious even in poor light. The differences are reinforced by characteristics of the ears, which are usually concave on the distal half of the outer edge in western grey kangaroos. The ears of western grey kangaroos are also relatively longer (Poole et al. 1984), more sparsely furred (Wallis, 1989), more darkly pigmented on the back, and are often carried lower by comparison with eastern grey kangaroos (Fig. 1). Hybrids produced in captivity are intermediate in pelage characteristics (Kirsch and Poole 1972) and in body proportions (Poole et al. 1984).

### Field observation

In this paper we report a sighting of a probable hybrid grey kangaroo in the field. We were conducting a study of mixed-species groups of grey kangaroos at Willandra National Park (33° 13' S, 145° 07' E), in western New South Wales. Both species of grey kangaroo, together

with the red kangaroo (*M. rufus*) are common in the park. Our study site was an open grassy plain, roughly 3000 ha in area, which was bounded by dense riparian vegetation along the course of Willandra Creek to the north. We observed kangaroos from a vehicle during 10 morning (0700 – 1000 h) and 11 evening sessions (1500 – 1800 h) from 29 May – 3 June and 26 June – 1 July, 2000. In a survey of minimum population size, we recorded a total of 456 kangaroos: 50.4% were eastern grey kangaroos, 34.2% were western grey kangaroos and the remainder (15.4%) were red kangaroos.

At 0720 on 28 June, about one km west of the Willandra woolshed, we saw a female grey kangaroo that could not be categorised as either eastern or western grey kangaroo (Fig. 2). She was an adult, with a large pouch-young. The pelage was dark grey-brown, intermediate between the eastern grey kangaroos and western grey kangaroos nearby. The face was darker than a typical eastern grey kangaroo, contrasting somewhat with a paler throat, but the darker shading around the eyes was not consistent with a western grey kangaroo. The ears were relatively long, like those of a western kangaroo, but were brown rather than black, lacked a concave outer edge, and were carried higher like an eastern grey kangaroo. The female was accompanied by a sub-adult male,



**Figure 1.** Eastern grey kangaroo (left) and western grey kangaroo, showing species-specific characteristics in pelage colour; notably on the face, and differences in morphology and carriage of the ears. The photograph was taken at Willandra National Park, western New South Wales, on 2 June 2000, and has been digitally edited to reduce the space between the two individuals. (see colour cover.)

which resembled an eastern grey kangaroo in many respects but had darker pelage than eastern grey kangaroos nearby. We kept these two animals under observation in reasonably good light conditions for about 15 min, using 10 x 40 binoculars and a 30 x spotting telescope, and took several photographs with a 300 mm zoom lens. The female and sub-adult were initially in a group with two western grey kangaroos, then they moved away from the western grey kangaroos and retreated into shrubland near the creek. This putative hybrid was not seen again in four subsequent observation sessions conducted from 28 June to 2 July 2000.

### Implications

Despite over 25 years of experience with both species of grey kangaroo in much of their range, we were unable to decide on the identity of the female at Willandra. The intermediate phenotype of this female was consistent with a diagnosis of a hybrid grey kangaroo. If that were the case, then her pouch young and probably the dark-coloured sub-adult accompanying her, represent back-crossed F2 progeny. The pelage of the sub-adult male, which was lighter than the adult female but darker than a typical eastern grey kangaroo, suggested that he may have been sired by an eastern grey kangaroo.

Given the extensive zone of sympatry between eastern and western grey kangaroos, their overlapping habitat preferences, and their ability to hybridise in captivity, it is not surprising that a hybrid might be produced occasionally. Kirsch and Poole (1972) examined only about 250 specimens from the sympatric zone, a sampling effort that may have been insufficient to detect infrequent hybrids. In the subsequent survey of the sympatric zone by Caughley et al (1984), a substantial number of kangaroos were sampled, but the survey was not designed to detect hybrids, and specifically excluded individuals that could not be identified confidently as either eastern or western grey kangaroo.

There is also some corroborative evidence of putative hybrids from other parts of the sympatric zone. In December 1982, one of us (GC) observed an adult female grey kangaroo on a grassy airstrip (37° 11' S, 142° 20' E) in the Grampians National Park, western Victoria. Both species occurred regularly at the site, and were often grouped together (Coulson 1990, 1999), but this female could not be classified as either eastern or western grey kangaroo with confidence. Although she most resembled an eastern grey kangaroo, her face was much darker and her ears were longer than those of eastern grey kangaroos nearby. She was also unusual in that she showed no sign of



**Figure 2.** The putative grey kangaroo hybrid female at Willandra National Park, western New South Wales, accompanied by a possible back-cross sub-adult male. The forepaws appeared dark because the fur was wet from feeding in dew-soaked grass. The photograph was taken with a zoom lens at 300 mm from the Merton Motor Trail at about 0730 on 28 June 2000. (see colour cover.)

breeding at a time when all other females of both species were carrying large pouch young. What was apparently the same female was seen again in June and August 1983, still without an obvious pouch-young. Another case of a possible hybrid was reported by McCullough and McCullough (2000, p. 165) at Yathong Nature Reserve, about 75 km north-east of Willandra. During their surveys of Yathong in 1985 and 1986, McCullough and McCullough made over 5,000 observations of grey kangaroos, and on three occasions sighted a grey kangaroo (perhaps the same individual) that they could not identify by spotlight.

Although confirmation of the identity of putative hybrids cannot be made without an animal in the hand, our sighting at Willandra is strongly

suggestive of a hybrid. Taken together with the records of intermediate phenotypes at other sites, it appears likely that hybrid grey kangaroos can occur under natural conditions. This inference does not invalidate the primary division of grey kangaroos, because there is clearly a high level of behavioural and genetic incompatibility between the two taxa (Kirsch and Poole 1972; Coulson 1997). Although they are likely to be rare, the possibility of encountering hybrids must be considered in studies where it is necessary to distinguish between the species. We encourage zoologists to be alert to the possibility of hybrid grey kangaroos throughout the sympatric zone.

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