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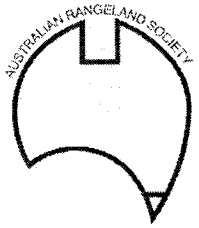

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RE-APPRAISAL AND ENHANCEMENT OF THE CURRENT METHODOLOGY USED IN THE ESTIMATION OF KANGAROO POPULATIONS IN WESTERN NEW SOUTH WALES

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A project, jointly funded by West 2000 and the New South Wales National Parks & Wildlife Service, is presently being undertaken to re-appraise and enhance the methodology used in the estimation of kangaroo populations in western New South Wales. It began in 1998 and concludes this year, in 2000. In part, the project involves the development of a new set of species-specific, habitat correction factors to be applied to the results of future annual fixed-wing aircraft surveys of the kangaroo populations in western New South Wales. It also involves the assessment of the use of 100 m and 200 m wide survey strips for fixed-wing aircraft surveys. Currently, a 200 m wide survey strip is used.

Experimental aerial surveys using a helicopter and line transect (distance) sampling, and a fixed-wing aircraft and strip transect sampling have been carried out on 13 survey blocks in western New South Wales and southwestern Queensland. These survey blocks are approximately 3,200 km^{-2} in area and have been selected as being representative of the nine of the 13 biogeographic regions of western New South Wales over which the annual kangaroo surveys are conducted.

Aerial surveys of kangaroos using helicopters and line transect sampling produce estimates of red and grey kangaroo numbers that compare favourably to estimates obtained using walked surveys with line transect sampling, a sampling method recognised as the benchmark for estimating kangaroo numbers on a small to medium scale. In general, fixed-wing aircraft surveys are known to be consistent and repeatable, but biased. It is for this third reason that habitat correction factors need to be applied in order to produce as accurate as possible estimates of kangaroo numbers. The correction factors derived from this project are expected to improve the accuracy of the New South Wales aerial surveys. In this context, improving accuracy involves the elimination of the bias inherent in the strip transect sampling procedure of the fixed-wing aircraft surveys.

Compared to helicopter line transect sampling, fixed-wing surveys using both 200 m and 100 m wide survey strips have been shown to be consistent for both red and grey kangaroos. The correction factors derived in relation to the helicopter line transect sampling for the two fixed-wing survey methods, using a 200 m wide and a 100 m wide survey strip, vary between red and grey kangaroos and between survey blocks. For red kangaroos, the correction factors for the 200 m wide survey strip have been found to range from 2.00 to 5.18; the higher values being associated with country with considerable tree cover on it. For the 100 m wide survey strip the correction factors were, as would be expected, less than those for the 200 m wide strip, ranging from 1.20 to 3.26. For grey kangaroos, the correction factors for the 200 m wide survey strip were found to range from 2.60 to 6.78; the higher values being associated with relatively high tree cover. For the 100 m wide survey strip, the correction factors for grey kangaroos ranged from 1.87 to 6.89.

To generalise with regard to these correction factors, the weighted average correction factors for red kangaroos for fixed-wing aircraft surveys using 200 m and 100 m survey strips were 2.88 and 1.93, respectively. The weighted average correction factors for grey kangaroos for fixed-wing aircraft surveys using 200 m and 100 m survey strips were 3.42 and 2.36, respectively. In both cases, these weighted average correction factors for a 200 m wide survey strip are higher than those that have been used in the past.