

FACTORS INFLUENCING CHICK SURVIVAL IN THE WEDGE-TAILED EAGLE *Aquila audax*

LISA COLLINS and DAVID B. CROFT¹

School of Biological, Earth and Environmental Sciences, University of New South Wales, Sydney, New South Wales 2052

¹Present address: UNSW Arid Zone Field Station, Fowlers Gap via Broken Hill, New South Wales 2880; corresponding author: d.croft@unsw.edu.au

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Nest-site characteristics of the Wedge-tailed Eagle *Aquila audax* were studied in 1999 at Fowlers Gap, in arid western New South Wales, by measuring parameters of nest trees for five active nests and eight other nests. Parental and chick behaviour and prey items were recorded at five nests by remote time-lapse video surveillance, through the nestling period to fledging, and prey populations were surveyed. The five monitored nests were mostly in live gums *Eucalyptus* sp. in creeks, and the other nests were mostly in non-eucalypts in other habitats. Six clutches were all of two eggs; fledging success was 0.64 young per pair per year over 14 pair-years 1997–99. The eagles' breeding diet consisted of mammals (25% by number) and reptiles (72%): mostly juvenile kangaroos *Macropus* sp. (20%) and Bearded Dragons *Pogona vitticeps* (68%). By biomass, important prey were mammals (78%: kangaroos 73%) and reptiles (21%). Rabbits were scarce in the environment and in eagle prey; the eagles strongly selected juvenile kangaroos relative to their abundance, but took rabbits in proportion to their abundance. Parental and siblicidal behaviour is described. Sample sizes were too small to draw definitive conclusions, but tree canopy cover, human disturbance, sibling competition, and prey size and availability all appeared to have some influence on chick survival.

INTRODUCTION

Factors contributing to development and survival of eagle chicks may include the interplay between the offspring and their parents, between siblings, and between the chicks and the physical characteristics of the nest site. This study on the Wedge-tailed Eagle *Aquila audax* continues that of Silva and Croft (2007), by focussing on nest-site characteristics, prey selection, parental behaviour and siblicidal behaviour. Silva & Croft (2007) compared nest trees and non-nest trees; this study sought to compare successful and unsuccessful nests. The studies of Harder (2000) and Silva and Croft (2007) remain the only other quantified accounts of aspects of the eagle's breeding behaviour.

Chick survival from hatching to fledging may be affected by nest quality and parental quality. Nest quality may include nest and tree characteristics (e.g. cover, stability) and nest location, in relation to prey densities. Parental quality may include the rate of nest attendance and parental care, nestling dietary composition, and feeding rate. The nest environment may also be affected by sibling competition.

The Wedge-tailed Eagle is facultatively siblicidal; that is, siblicide (or cainism) is not invariable but seems related to food supply, as two (or rarely three) chicks can fledge in times of abundant food (Marchant and Higgins 1993; Olsen 1995). This aspect is little studied in Wedge-tailed Eagles though much studied in other *Aquila* eagles, notably obligate cainists that always fledge one chick from clutches of two eggs regardless of food supply (e.g. Gargett 1990; Meyburg 2002). Siblicide may be the greatest single cause of eaglet loss (Brown 1976).

This study sought to investigate some of the factors influencing chick survival in the Wedge-tailed Eagle: nest-site characteristics, diet and prey selection, and the level of parental care of the nestlings. The aims of the study were to identify characteristics of trees containing active nests; quantify prey items in relation to the availability of certain prey species;

describe and quantify parental behaviour in relation to chick age; and describe and quantify siblicidal behaviour.

STUDY AREA AND METHODS

Study site

The present study was conducted at Fowlers Gap Arid Zone Research Station (31°05'S, 141°45'E) in western New South Wales, as described by Silva and Croft (2007). The station, of 392 square kilometres, is semi-arid pastoral land running 5000–7000 sheep and a small number of cattle. The landscape varies from high sandstone ridges to grassy plains and chenopod shrublands, with eucalypts along ephemeral creeks, and *Acacia* and *Casuarina* on ridges, hills and plains away from creeklines. The mammal fauna is dominated by large kangaroos (Red Kangaroo *Macropus rufus*, Eastern Grey *M. giganteus*, Western Grey *M. fuliginosus* and Euro *M. robustus*). Common feral animals include Goats *Capra hircus*, Pigs *Sus scrofa*, Cats *Felis catus* and Foxes *Vulpes vulpes*. Rabbits *Oryctolagus cuniculus* were generally numerous, but their numbers were reduced by the calicivirus (Sharp *et al.* 2002) although small populations persist and are recovering. The avifauna is diverse (~100 species). There are at least 21 species of lizard (Magarey 1999), those of most relevance being the Central Bearded Dragon *Pogona vitticeps* and Shingleback *Tiliqua rugosa*.

Nests

The nests located by Silva and Croft (2007) in 1997 were revisited in 1999, and the study area was resurveyed as some of the previous nests had been destroyed by storms in 1997–98. A further eight inactive nests, in previously unsurveyed parts of the station, were located. Nests were recorded by GPS and plotted on a topographic map. Nests were visited in late June and classified as active (green foliage, adult or eggs on/in nest; n = 8) or inactive (no sign of activity), and categorised as 'ridge' 'creek' or 'downs' according to the criteria of Silva and Croft (2007).