

Free-living adult Spectacled Flying-fox (*Pteropus conspicillatus*) observed with two pups

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Abstract

This note documents a rare observation of an adult Spectacled Flying-fox (*Pteropus conspicillatus*) nursing two pups in the wild. The pups were visually in different stages of development, which is suggestive of superfoetation.

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Introduction

Reproductive biology in flying-foxes, or fruit bats, is strongly seasonal and characterised by a long gestation (Martin *et al.* 1996). In the Spectacled Flying-fox (*Pteropus conspicillatus*), a species endemic to north-eastern Queensland, New Guinea and nearby islands, reproduction follows an annual pattern of mating primarily from March to May (Hall & Richards 2000), with pups born between October and December (Queensland DERM 2010) and maternal care provided for at least three to five months (Martin *et al.* 1996). Most sexually mature females conceive each year, typically producing a single pup annually (Fox *et al.* 2008a). The occurrence of twins in Australian flying-foxes has been reported but is rare (Ratcliffe 1932; Fox *et al.* 2008b). These low reproductive rates are exceptional to the general trend in mammals of larger species having a slow life-history and smaller species exhibiting rapid rates of reproduction (Stearns 1983). A slow life-history relies on longevity and naturally low mortality rates to be successful (McIlwee & Martin 2002). This may be a contributing factor in the decline of the Spectacled Flying-fox amid the spectrum of anthropogenic threats facing the species (Garnett *et al.* 1999; Fox *et al.* 2008a).

On 8 November 2018, while observing a communal roost comprising Spectacled Flying-foxes and Little

Red Flying-foxes (*Pteropus scapulatus*) in Cairns, north Queensland, I photographed an adult female Spectacled Flying-fox with two pups (Fig. 1). The different stages of development in the pups were visually distinguishable, with the pup on the left-hand side of the adult in advanced stages of fur development (Fig. 2, A), whilst the pup on the mother's right-hand side was mostly unfurred (Fig. 2, B). Based on being unfurred, the younger pup was assumed to have been born prematurely. This is a strong indication of the presence of pups at different developmental stages, which is indicative of superfoetation, in which fertilisation of a second egg occurs when a foetus is already present (Fox *et al.* 2008b).

An observation of a Spectacled Flying-fox nursing two pups represents a rare find. In a review of all known examples of twinning in Australian flying-foxes, only three of the nine examples were free-living and not captive animals (Fox *et al.* 2008b). Furthermore, there was only one example of twinning in a Spectacled Flying-fox in that study, which was from a captive colony (Fox *et al.* 2008b). To the best of my knowledge, there has not been a further case of twinning in the Spectacled Flying-fox reported in the scientific literature. Thus, the observation reported in this note may be the only reported observation of twinning in a free-living



Figure 1. A Spectacled Flying-fox with two pups (individual on the right) within a communal roost.
Photos are by Matthew Mo.



Figure 2. Cropped images of the two pups showing different stages of development.
An older pup clinging to the left-hand side of the adult (left (A) and centre) and a younger pup clinging to the right-hand side of the adult (right (B)).

Spectacled Flying-fox. The probability of observing twins in the wild population is also presumably low due to the need to obtain viewing of the pups unobscured by the adults' wings and with the assistance of optical aids such as binoculars or cameras equipped with zoom lens.

Observing a flying-fox nursing two pups is also rare considering the higher likelihood of mortality in these pups and the adult individual. In mammals, gestation and lactation are energetically expensive (Wade & Schneider 1992). Thus, a flying-fox carrying an additional foetus during gestation, then sustaining high levels of lactation required to feed an additional pup is placed under higher energetic demands than conspecifics, potentially affecting its health and survival. The same physiological challenges also presumably reduce the chances of one or both pups' survival both during gestation and prior to weaning. These challenges may be especially life-threatening in a species that relies on large-scale movements to achieve sufficient nutrition (Shilton *et al.* 2008). For the particular case of this Spectacled Flying-fox and its pups, there was an extreme heat event 18 days after the day of observation, during which an estimated one third of the total Spectacled Flying-fox population perished (Kim & Stephen 2018).

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