

Observation of raptor-avoidance behaviour by a Dusky Woodswallow *Artamus cyanopterus*

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Abstract. This note describes an observation of a Dusky Woodswallow *Artamus cyanopterus* employing a seldom observed and unusual defensive behaviour against a Peregrine Falcon *Falco peregrinus*. Instead of mobbing or fleeing, the Woodswallow hid beneath a branch to avoid detection and potential predation. We discuss various predator-avoidance and defensive behaviours and explain the advantages of hiding as a quick and safer survival strategy. This observation reveals additional tactics used by woodswallows and expands our understanding of avian predator avoidance. Understanding these unconventional strategies broadens our knowledge of defensive behaviours in passerine birds.

Introduction

The Dusky Woodswallow *Artamus cyanopterus* is a medium-sized, dark-coloured passerine within the family Artamidae (Menkhorst *et al.* 2017). It occurs commonly throughout open habitats in south-eastern Australia, including open sclerophyll woodlands, where it forages on invertebrates, mainly insects, and occasionally on nectar, fruit and seeds (Higgins *et al.* 2006). Dusky Woodswallows are spring–summer migrants to the state of Tasmania, with a reported detection probability of 22.5% in summer and 0.3% in winter (Higgins *et al.* 2006; Clarke *et al.* 2010).

The Peregrine Falcon *Falco peregrinus* is a large and widely distributed falcon species best known for its high-speed pursuit hunting strategies (Debus 2022). Predominately avian predators, Peregrine Falcons search for prey by soaring and prospecting, identifying possible prey and attacking in a variety of ways, including diving, direct flying attacks and tail-chases, among other methods (Debus 2022).

An overview of (seven) studies assessing the diet of Peregrine Falcons (where prey sample composition was denoted as a percentage value) showed that avian prey accounted for an average value of 97.7% of the dietary intake of Peregrine Falcons within Australia (Debus 2022). A detailed study of prey remains and pellets found at nest sites of Peregrine Falcons recorded Dusky Woodswallows constituting 0.17% of the 45.7-kg prey biomass sample collected (Olsen *et al.* 2004). The total Artamidae family representation within the sample was 113 g, or 0.25% (Olsen *et al.* 2004). Dusky Woodswallows have also been identified as a prey item for Brown Goshawks *Accipiter fasciatus*, Collared Sparrowhawks *A. cirrocephalus* (Olsen *et al.* 2017) and Australian Hobbies *Falco longipennis* (Debus *et al.* 2020).

Dusky Woodswallows have been observed to avoid predators mainly by mobbing and attacking, during which a loud two-note *kee-oo* call is made, alerting other individuals and calling them to the area (Rowley 2000). In response to alarm calls issued by adult birds, young nestlings crouch low and remain still (Rowley 2000). This species has also been known to swoop terrestrial predators, often only

narrowly avoiding contact but in one reported instance making contact with a researcher's head (Higgins *et al.* 2006). One observation reported that when a nestling was approached to within 10 m, it moved close against a tree trunk and assumed a cryptic pose, sitting upright with bill pointed upward to avoid detection (Higgins *et al.* 2006).

Two additional defensive observations have documented Dusky Woodswallows perching below branches to avoid potential predators. Rowley (2000, p. 56) wrote "...it lowered itself to the side of the branch furthest away from danger and clung there until the potential predator had passed over; it then quickly resumed its original position". This behaviour was also noted by Miles & Elvish (1975, p. 12), who stated that on the approach of an immature Brown Goshawk, a Dusky Woodswallow was "...seen to be hanging beneath the branch on which it had been perched". Here we report in detail (and provide photographs of) an observation of a Dusky Woodswallow employing similar defensive behaviour against a Peregrine Falcon and discuss this behaviour.

Observations

On 27 September 2021 at 1550 h, MK was photographing a Dusky Woodswallow on a property at Molesworth, southern Tasmania (−42.809763, 147.115451). The area is grassland dominated by Tasmanian Blue Gum *Eucalyptus globulus* with sub-dominant White Peppermint *E. pulchella*. The weather was fine, ~16°C, and with little wind. The Woodswallow, which was previously perched on a small dead Blue Gum branch, began to adjust its posture, appearing to cower, and elongating itself along the branch (Figure 1).

The bird then positioned itself below the underside of the branch, where it appeared to be hiding, and remained motionless for c. 20 seconds (Figure 2). At this point, MK noticed a Peregrine Falcon approaching from the west (Figure 3), at an approximate height of 20 m. The Falcon circled over the area for an estimated duration of 1 minute, then continued flying east.



Figure 1. Dusky Woodswallow adjusting its posture by lowering its body along the perch as a Peregrine Falcon approached. Photo: Murray Kelman



Figure 2. Dusky Woodswallow appearing to hide on the underside of a branch from an approaching Peregrine Falcon. Photo: Murray Kelman



Figure 3. Peregrine Falcon that appeared as Dusky Woodswallow hid on perch. Photo: Murray Kelman

After the Falcon had left the immediate area, the Woodswallow returned to its previous position on top of the branch, where it continued to perch for c. 30 seconds before flying away.

Discussion

Standard methods of raptor avoidance among passerines include avoiding areas containing a high number of raptors (Norrdahl & Korpimäki 1998), foraging close to cover (Olsen *et al.* 2008), alarm calls and mobbing, fleeing into dense vegetation and freezing (Cunningham & Magrath 2017). These strategies occur widely and are commonly observed and, although most often noticed in birds because of relative abundance, most members of the animal kingdom employ similar tactics. Observations of passive predator avoidance such as hiding are not as common. Some animals may utilise camouflage (e.g. frogmouths *Podargidae*), but others rely on freezing. For example, Red-capped Plovers *Charadrius ruficapillus* have been observed to flatten themselves into the sand as birds of prey fly over (Helen Cunningham pers. comm.), and Debus (2013) described Hooded Robins *Melanodryas cucullata* freezing cryptically on an exposed dead branch (male) and hiding on a sheltered perch (female) when a Peregrine Falcon flew over. Scarlet Robins *Petroica boodang* have also been observed to freeze in the presence of raptors flying overhead, with an instance of a male appearing to crouch against a branch to hide its red breast and enabling its dorsal plumage to blend in with its perch (Stephen Debus pers. comm.).

Fleeing, freezing and defensive responses are the three general defensive responses across many taxa (Eliam 2005). An individual woodswallow is vulnerable to predation without the security of mobbing as a strategy to reduce predation risk. Consequently, the only two viable options are to freeze or flee. Freezing is only effective if initiated before the prey has been detected by the predator, otherwise the prey becomes a stationary target. If detected, the prey can attempt to flee from the predator in order to decrease predation risk. The most effective predator-avoidance strategy is a combination of alternately freezing and fleeing as the situation dictates (Eliam 2005).

Forming mixed-species feeding flocks can also be classified as a predator-avoidance tactic. Throughout the world, mixed flocks are an integral part of the foraging ecology exhibited by small to medium-sized passerines (Greig-Smith 1978; Latta & Wunderle 1996; Vanderduys *et al.* 2012). Within Australia, members of the Artamidae family are known to partake in feeding flocks, with Dusky Woodswallows having been recorded joining large mixed-species feeding flocks in the south-east (Higgins *et al.* 2006). Mixed-species flocks provide numerous benefits, as highlighted by Bell (1980) and Latta & Wunderle (1996). These benefits include protection from predation, improved foraging efficiency, and a natural inclination towards social behaviour. Latta & Wunderle (1996) emphasised that mixed feeding flocks enhance predator vigilance, leading to increased predator avoidance. By participating in flocks, individuals share the burden of vigilance, resulting in a reduced cost of vigilance for each bird. Furthermore, Elgar (1989) pointed out that joining mixed-species foraging flocks offers a twofold advantage: an increased likelihood

of detecting predators and a reduction in the time spent on predator vigilance. This in turn allows more time to be spent in other activities such as foraging, which is important for birds such as woodswallows with high energy-intake requirements.

The Dusky Woodswallow is a social species, displaying high levels of communal aggression towards potential predators (Higgins *et al.* 2006). It is known to mob birds of prey vigorously, driving them to leave the area (Rowley 2000) and thus reduce the collective risk of predation. Given its highly active lifestyle, camouflage as an option of predator avoidance is unlikely to be feasible for Dusky Woodswallows as it relies on both long periods of immobility and regularly patterned environments (Merilaita *et al.* 2017), neither of which is characteristic of the lifestyle of this species. As aerial foragers forming foraging flocks often in the open (Higgins *et al.* 2006), the lifestyle of a Dusky Woodswallow is one in which these birds are often conspicuous to potential predators. In species with such high-risk foraging behaviour, it is plausible to assume that anti-predator strategies are more advanced than in species with lower-risk foraging strategies.

Aggressive predator-avoidance strategies such as mobbing consume large amounts of energy and can be potentially dangerous when dealing with predators of high aerial manoeuvrability such as falcons. Mobbing also requires the coordination of multiple individuals, which cannot always be assured. In instances of low energy intake and/or separation from a feeding flock with which comes the ability to safely mob predators, it is plausible that rotating beneath a branch provides a quicker, easier and safer method of avoiding predation. Given the gregarious nature of Dusky Woodswallows, it is assumed that this type of behaviour is relatively uncommon and may be limited to instances when woodswallows forage alone and/or are separated from their flock. This assumption is supported by the relatively low number of published or anecdotal records of this behaviour. Moreover, it may not be as effective as relentlessly mobbing a would-be predator or simply fleeing into thick vegetation.

Dusky Woodswallows are aerial predators of predominantly open forests (Higgins *et al.* 2006), meaning that there are likely occasions when suitable dense foliage to seek cover is not available. In such instances, it is reasonable that taking temporary shelter beneath a branch may be the more prudent option, especially when compared with a risky and vulnerable strategy such as attempting to outfly one of the fastest avian predators in the world (Ponitz *et al.* 2014). Drawing from the observation that woodswallows form smaller flocks in southern regions compared with the north and that Dusky Woodswallows are a less gregarious species than other members of the *Artamus* genus (Higgins *et al.* 2006), it is possible that freezing and hiding may be a more prevalent predator-avoidance strategy within the southern regions of the Dusky Woodswallow's distribution. This observation occurred in spring and it is possible that the individual observed was an adult foraging as part of a breeding unit and was foraging alone while its mate was attending a nest (Higgins *et al.* 2006), hence increasing its vulnerability to predation and necessitating the need to employ freezing and crypsis as a defence strategy.

Although there are several common methods of predator avoidance and defence strategies employed by passerines, the behaviour of the Dusky Woodswallow in this observation suggests that there may be additional, opportunistic tactics that have yet to be fully understood. In certain instances, simply hiding may provide a quicker, easier and safer option than aggressively mobbing or fleeing from potential predators. This behaviour demonstrates that, in certain situations, hiding is an effective survival strategy for individual Dusky Woodswallows against avian predation.

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