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Responses of brooding Australasian Grebes *Tachybaptus novaehollandiae* to other waterbirds

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Summary. A breeding pair of Australasian Grebes *Tachybaptus novaehollandiae* was monitored nearly daily between November 2010 and March 2011. This paper describes the responses of the adults to other waterbirds that came within 5 m of their brood, either provoked or unprovoked. Brood loss was rapid, with only one of five chicks surviving more than 3 weeks. Nine instances of brood-defence were recorded, mostly in the first 2 weeks after hatching, as well as one observation of a chick defending itself. The Dusky Moorhen *Gallinula tenebrosa* was the main species that prompted reactions from the adult Grebes. A Moorhen was seen trying to prey on Grebe chicks on one or probably two occasions, the first time this has been reported. A Purple Swamphen *Porphyrio porphyrio* was also attacked by the Grebes, and is a likely potential predator of grebe chicks. Ducks and cormorants were attacked or tolerated on different occasions.

Introduction

Breeding habits of the Australasian Grebe *Tachybaptus novaehollandiae* remain poorly known, and many aspects of this species' ecology have been inferred from the similar Eurasian Little Grebe *T. ruficollis* (Cramp & Simmons 1977; Marchant & Higgins 1990; Christidis & Boles 2008). Breeding events have been followed chronologically in a few studies (e.g. Ashby 1933; Clarke 1966; Dann 1981; Hubregtse 2010), but provide little information about brood-defence. To date, published work on grebe interactions with sympatric species have largely focussed on commensalism (e.g. Hobbs 1959; Maddock 1997).

We report on the responses of a breeding pair of Australasian Grebes to other waterbirds that either threatened or strayed close to their chicks. The observations were made as part of a nearly daily monitoring program between November 2010 and March 2011. The purpose of this paper is to provide descriptions of nine accounts of brood-defence and one account of the chick defending itself. Our observations also add to the few literature reports of rallids attempting to kill grebe chicks (Boe 1993; Barker & Williams 2002).

Methods

Observations were made at Moore Reserve (Figure 1), a 14.2-ha recreational area located in Oatley and Hurstville Grove, southern Sydney, NSW. An artificial wetland (Figure 2), ~2 ha in size, was constructed in 2001 as a natural means of treating stormwater that

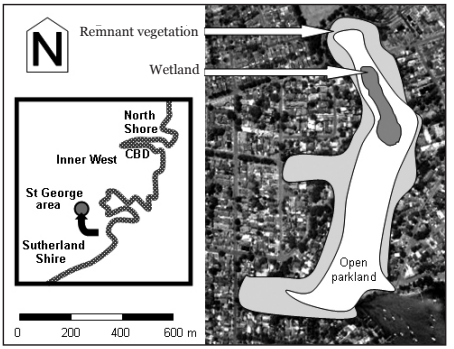

Figure 1. Map of the study site, showing the placement of the Moore Reserve wetland within adjacent parkland and urban development. Inset map shows the location of the study site in the context of the Sydney Metropolitan Area.

Figure 2. The southern end of the Moore Reserve wetland, where the adult Australasian Grebes constructed their nest. Photo: Matthew Mo

runs into Oatley Bay. The edges of the wetland are dominated by Flax-leaved Paperbark *Melaleuca linariifolia*, Prickly-leaved Paperbark *M. styphelioides* and Swamp She-oak *Casuarina glauca*. Ground-cover consists mainly of Tall Sedge *Carex appressa*, Tassel Sedge *C. fascicularis* and Woolly Frogsmouth *Philydrum lanuginosum*. The most widespread submergents are Water Plantain *Alisma plantago-aquatica*, Pacific Azolla *Azolla filiculoides* and Water Ribbon *Triglochin rheophilum*. Sedges and rushes, such as Giant Sedge *Cyperus exaltatus*, Sea Clubrush *Bolboschoenus caldwellii*, River Clubrush *Schoenoplectus validus* and Pale Rush *Juncus pallidus*, have been established to control the domination of Common Reed *Phragmites australis*. An artificial island at one end of the wetland provides protection for roosting waterbirds.

Between 2001 and 2014, we have recorded 23 waterbird species in the constructed wetland (Table 1). Between 2001 and 2010, Australasian Grebes were sighted on 13 occasions (from ~350 visits). The present study was prompted when three Grebes in breeding plumage were seen on 25 July 2010. A pair was constructing a nest on 17 November that year, and was monitored almost daily (mean 5 observation periods per week) until 8 March 2011, when the sole surviving chick had attained adult plumage. Observations (15–60 minutes) were between 1600 and 2000 h, when grebes are most active (Fjeldså 1988, 2004), except on 4 days (observation between 1000 and 1400 h).

Table 1. Waterbird species recorded in the Moore Reserve Wetland, 2001–2014 (based on ~350 visits). Frequency: F = frequent, I = intermittent, R = rare. Numbers of observations are provided for rare species. *Average number of individuals observed per visit at the wetland for species involved in the interactions: Chestnut Teal 12; Pacific Black Duck 16; domesticated duck 1; Little Black Cormorant usually 2 (sporadic); Purple Swamphen 4; Dusky Moorhen 12.

Family	*Species (and frequency)*
Anatidae (ducks, geese & swans)	Australian Wood Duck *Chenonetta jubata* (F) Grey Teal *Anas gracilis* (I) Chestnut Teal *Anas castanea* (F*) Pacific Black Duck *Anas superciliosa* (F*) Domesticated duck *Anas* sp. (F*) Hardhead *Aythya australis* (I)
Podicipedidae (grebes)	Australasian Grebe *Tachybaptus novaehollandiae* (I) Hoary-headed Grebe *Poliocephalus poliocephalus* (R, 4)
Anhingidae (darters)	Australasian Darter *Anhinga novaehollandiae* (I)
Phalacrocoracidae (cormorants & shags)	Little Pied Cormorant *Microcarbo melanoleucos* (I) Great Cormorant *Phalacrocorax carbo* (F) Little Black Cormorant *Phalacrocorax sulcirostris* (I*)
Ardeidae (herons, egrets & bitterns)	White-necked Heron *Ardea pacifica* (R, 6) Great Egret *Ardea alba* (R, 2) White-faced Heron *Egretta novaehollandiae* (F)
Threskiornithidae (ibis & spoonbills)	Australian White Ibis *Threskiornis moluccus* (I) Royal Spoonbill *Platalea regia* (I)
Rallidae (crakes, rails & swamphens)	Purple Swamphen *Porphyrio porphyrio* (F*) Baillon's Crake *Porzana pusilla* (R, 2) Dusky Moorhen *Gallinula tenebrosa* (F*) Eurasian Coot *Fulica atra* (F)
Recurvirostridae (stilts & avocets)	Black-winged Stilt *Himantopus leucocephalus* (R, 6)
Scolopacidae (snipe, sandpipers & allies)	Latham's Snipe *Gallinago hardwickii* (R, 4)

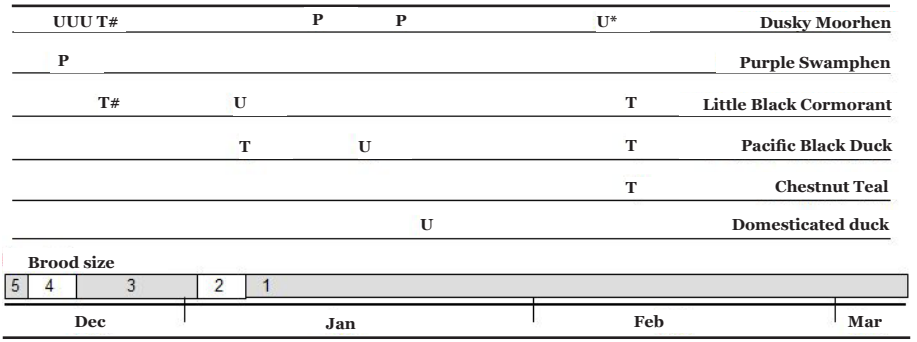

Figure 3. A timeline of 16 observed instances of waterbirds of six species coming within 5 m of the Australasian Grebe chicks from December 2010 to March 2011. A representation of the brood-size (number of chicks remaining) over the course of the study is provided. P = provoked incidents, U = unprovoked incidents, T = tolerance; # indicates where a pair of Grebes was involved; * indicates an unprovoked incident where no brood-defence from the adult Grebes occurred, i.e. the chick defended itself.

Results

During this study, the adult Australasian Grebes produced only one brood. The chicks were observed within 5 m of other waterbirds on 15 occasions (Figure 3). Two species, the Dusky Moorhen *Gallinula tenebrosa* and Purple Swamphen *Porphyrio porphyrio*, were recorded attempting to actually harm the Grebe chicks, hence brood-defence in these instances was considered to be provoked. These two species accounted for 33% of incidents recorded and 20% of instances involving a waterbird coming within 5 m of one or more chicks. In seven unprovoked incidents recorded, four species of waterbird were represented. The Grebes displayed tolerance in 33% of the times that waterbirds were close to chicks.

The rate of brood loss was rapid, with two chicks disappearing within 7 days of hatching. By the third week (early January), only one chick had survived. Causes of death were unknown, although an intact body was recovered from the second fatality. About half of the brood-defence incidents were in the first 3 weeks when multiple chicks were present, one being a provoked incident. Five more instances of brood-defence occurred after mid January, although incidents became more sporadic, being spread across a longer period (6 weeks).

Incidents with Dusky Moorhen

The Dusky Moorhen prompted most defensive assaults by the adult Australasian Grebes, with 60% of brood-defence incidents attributed to this species (Figure 3). During the study period, Moorhens were not breeding so the two provoked incidents (see p. 180) are not considered to be brood-defence on the part of the Moorhens.

The adult Australasian Grebes performed three unprovoked attacks on Dusky Moorhens within the first 7 days of the Grebe chicks hatching. The first incident (18 December, 1730 h) was brief, prompted by the Moorhen foraging within 5 m

of the Grebes' nest. The Grebe swam rapidly toward the Moorhen in the forwards-display posture (Marchant & Higgins 1990) and successfully moved it away. On 19 December, a Moorhen swam close to the Grebe chicks in open water at 1335 h. One adult Grebe responded by flying toward the Moorhen and diving beneath the surface to peck or lunge at it. Within the next hour, two Moorhens swam close to the Grebes and were attacked from below the surface. In both incidents, the Moorhens became obviously agitated. In the latter, one Moorhen took up a retaliatory posture with beak open toward the water. The same underwater assault technique was made by an adult Grebe on 20 December at *c.* 1800 h.

The first provoked incident was on 14 January (*c.* 1600 h), in response to an apparent predation attempt. A Dusky Moorhen that had been feeding nearby steadily approached an Australasian Grebe chick that was preening in open water. The Moorhen suddenly darted forward, capturing the chick in its beak, shook the chick vigorously and held it underwater. An adult Grebe flew in and landed on the water near the Moorhen, which was displaced. The chick soon surfaced several metres away, apparently unharmed. The incident lasted <5 seconds.

The second provoked incident occurred on 21 January at *c.* 1730 h. The Dusky Moorhen flew towards an Australasian Grebe chick, prompting the chick to dive and avoid it. There was no intervention by the adult Grebes on this occasion. On 8 February at 1230 h, a Moorhen swam close and was displaced by the Grebe chick from beneath the water surface as described above for adult Grebes.

Incident with a Purple Swamphen

A distraction display (Peter 2008) by the adult Australasian Grebes on 19 December at 1410 h was prompted by a Purple Swamphen wading intently toward their chicks. Both adult Grebes sounded *pit* alarm calls (cf. Marchant & Higgins 1990) and one purposefully came within 50 cm of the Swamphen, which lunged at it. The adult Grebes positioned themselves on either side of the Swamphen as it advanced closer to the chicks. One Grebe swam close to the front of the Swamphen and caused it to lunge, then the Grebe dived with a loud splash. The other Grebe then performed the same action, with both Grebes repeatedly resurfacing in tandem to repeat the process. The incident lasted at least 40 seconds before the Swamphen apparently lost interest and retired to a clump of sedge, where it preened.

This incident is the only one involving the Purple Swamphen. As with the Dusky Moorhen, this species was not breeding at the time of the study, hence the possibility of the Swamphen defending its own brood can be ruled out.

Aggression toward other waterbirds

Two brief unprovoked attacks by Australasian Grebes on ducks were recorded, representing 33% of the six unprovoked brood-defence incidents (Figure 3). The first occurred on 18 January at 1750 h, and involved a Pacific Black Duck *Anas superciliosa* close to the Grebes' nest. The Duck was chased off by an adult Grebe that had returned with gathered nest materials. The same scenario occurred with a domesticated duck *Anas* sp. in open water on 24 January at 1840 h.

On 6 January at *c.* 1700 h, a Little Black Cormorant *Phalacrocorax sulcirostris* swam within 5 m of the Australasian Grebe chicks. An adult Grebe emitted the *pit* alarm call and lunged in a forwards-display posture toward the Cormorant. The attack was short as the Cormorant moved away immediately.

Tolerance of nearby waterbirds

The adult Grebes did not attack waterbirds swimming within 5 m of their chicks in only 5 instances. Two Dusky Moorhens swimming past were tolerated on 22 December, and a pair of Little Black Cormorants fishing nearby was tolerated on 24 December. On 12 February, a Grebe chick swam close to the Cormorants, Pacific Black Ducks and a Chestnut Teal *Anas castanea* without aggression.

Discussion

A range of fauna, including gulls, crows, harriers, and coots as well as mammals and fish, is known to prey on grebes or depredate their nests (Llimona & del Hoyo 1992), but little has been published. In Australia, there are reports of predation by Pacific Gulls *Larus pacificus* (Watson 1952) and birds of prey (Hobbs 1958; Olsen *et al.* 2006a,b), and more general accounts of waterbird chicks taken by Australian Pelicans *Pelecanus conspicillatus* (Cambridge 1983), Purple Swamphens and other waterbirds (Marchant & Higgins 1990, 1993).

The present study is the first to identify the Dusky Moorhen as a threat to grebe chicks, and adds some evidence that the Purple Swamphen may be a potential predator (Marchant & Higgins 1993). The Purple Swamphen has been implicated in a severe decline in an island population of the Brown Teal *Anas chlorotis* in New Zealand, killing ducklings but not feeding on the bodies (Barker & Williams 2002). Nest-depredation by American Coots *Fulica americana* resulted in up to 3% of breeding failure in the Eared Grebe *Podiceps nigricollis* (Boe 1993).

Our study shows that brooding Australasian Grebes exhibit some tolerance to waterbirds feeding nearby. Some authors have described feeding associations between grebes and other birds, including Pacific Black Duck (Hobbs 1959; Maddock 1997) and Dusky Moorhen (Hobbs 1958; McAllan *et al.* 2008). The grebes probably benefit by preying upon arthropods disturbed from cover by the foraging of these species (Marchant & Higgins 1990). Other species that Australasian Grebes have been recorded feeding close to include Hardhead *Aythya australis* (Beaumont & Neumann 2013), Black Swan *Cygnus atratus* (McAllan *et al.* 2008) and Hoary-headed Grebe *Poliocephalus poliocephalus* (MM & DRW pers. obs.).

We recorded more unprovoked offensives by the Australasian Grebes than actual predation attempts by waterbirds, suggesting that the Grebes take a precautionary approach in deterring birds that could be a potential threat to their young.

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References

Ashby, E. (1933). Detailed observations of the nesting habits of the Black-throated Grebe at "Wittunga", Blackwood, S.A., from August 1932 until March 1933. *Emu* **32**, 250–259.

Barker, D. & Williams, M. (2002). Breeding of Brown Teal (*Anas chlorotis*) at Okiwi, Great Barrier Island. *Notornis* **49**, 199–208.

Beaumont, D. & Neumann, G. (2013). Commensalism between Australasian Grebe *Tachybaptus novaehollandiae* and Hardhead *Aythya australis*. *Canberra Bird Notes* **38**, 237–239.

Boe, J.S. (1993). Colony site selection by Eared Grebe in Minnesota. *Colonial Waterbirds* **16**, 28–38.

Cambridge, W. (1983). An observation of a pelican attacking and apparently eating a young Grey Teal. *Australian Birds* **17**, 74.

Christidis, L. & Boles, W.E. (2008). *Systematics and Taxonomy of Australian Birds*. CSIRO Publishing, Melbourne.

Clarke, G. (1966). Breeding of the Little Grebe. *South Australian Ornithologist* **24**, 109–110.

Cramp, S. & Simmons, K.E.L. (Eds) (1977). *The Birds of the Western Palearctic, Volume 1: Ostriches to Ducks*. Oxford University Press, New York.

Dann, P. (1981). Notes on the nest and eggs of the Australasian Grebe in north-western Victoria. *Corella* **5**, 34–36.

Fjeldså, J.F. (1988). *Comparative Ecology of the Australasian Grebes (Aves: Podicipedidae)*. Report to Royal Australasian Ornithologists Union, Melbourne.

Fjeldså, J.F. (2004). *The Grebes*. Oxford University Press, New York.

Hobbs, J.N. (1958). Some notes on grebes. *Emu* **58**, 129–132.

Hobbs, J.N. (1959). A feeding association between Little Grebe and Black Duck. *Emu* **59**, 207.

Hubregtse, V. (2010). Australasian Grebe activity on a flood-retarding basin. *Australian Field Ornithology* **27**, 142–154.

Llimona, F. & del Hoyo, J. (1992). Family Podicipedidae (grebes). In: del Hoyo, J., Elliott, A. & Sargatal, J. (Eds). *Handbook of the Birds of the World, Volume 1: Ostrich to Ducks*, pp. 174–187. Lynx Edicons, Barcelona, Spain.

Maddock, M. (1997). Foraging association between the Australasian Grebe *Tachybaptus novaehollandiae* and the Pacific Black Duck *Anas superciliosa*. *Australian Bird Watcher* **17**, 97–98.

Marchant, S. & Higgins, P.J. (Eds) (1990). *Handbook of Australian, New Zealand & Antarctic Birds, Volume 1: Ratites to Ducks*. Oxford University Press, Melbourne.

Marchant, S. & Higgins, P.J. (Eds) (1993). *Handbook of Australian, New Zealand & Antarctic Birds, Volume 2: Raptors to Lapwings*. Oxford University Press, Melbourne.

McAllan, I.A.W., Knight, B. & O'Brien, R.M. (2008). Australasian Grebes eat a mammal. *Australian Field Ornithology* **25**, 44–45.

Olsen, J., Fuentes, E. & Rose, A.B. (2006a). Trophic relationships between neighbouring White-bellied Sea-eagles (*Haliaeetus leucogaster*) and Wedge-tailed Eagles (*Aquila audax*) breeding on rivers and dams near Canberra. *Emu* **106**, 193–201.

Olsen, J., Fuentes, E., Rose, A.B. & Trost, S. (2006b). Food and hunting of eight breeding raptors near Canberra, 1990-1994. *Australian Field Ornithology* **23**, 77–95.

Peter, J.M. (2008). Distraction display of the Hoary-headed Grebe. *Australian Field Ornithology* **25**, 42–43.

Watson, I. (1952). Pacific Gull killing grebe. *Emu* **52**, 219.

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