

SHORT NOTE

Observation of a female mallard (*Anas platyrhynchos*) with 29 ducklings

MARK SEABROOK-DAVISON

Ecology & Conservation Group, Institute of Natural and Mathematical Sciences, Massey University, Private Bag 102904, Albany, New Zealand

On 2 September 2007, at Sullivan's Bay Mahurangi Regional Park, Auckland, New Zealand (36°46'48"S, 174°45'58"E), I observed a female mallard (*Anas platyrhynchos*) with 29 recently hatched ducklings. The unusually large size of this brood is described here and I present some possible explanations for its occurrence.

I noticed the female duck walking across a road with a large number of ducklings during a bird survey at the park. I took a series of photographs and from these confirmed 29 ducklings were associated with this female. The ducklings were of similar size, colouration and pattern and therefore were most probably of similar age (Fig. 1). All the ducklings had the same post-hatching plumage colouring of yellow on the underside and a face with black streaks by the eyes and black on their backs. They also all had black bills and legs (Madge 1992).

The abnormally large brood size I observed raises the question as to why one female would be tending such a large number of ducklings. Possible explanations are: (1) the female has laid a large clutch of eggs and all the young are her own, (2) a number of eggs have synchronously hatched from different

nests but the broods have become amalgamated by ducklings from more than one nest following only one female, or (3) a number of females have exhibited intraspecific brood parasitism by laying in another mallard's nest. Heather and Robertson (2005) recorded that the mallard in New Zealand has an average clutch size of 13 but can range from 10 to 16 eggs. In its native range throughout the northern hemisphere, the clutch size ranges from 1 to 13 eggs (Cramp 1977; Krapuet *al.* 2004; Shah *et al.* 2009). Thus, the brood I observed is more than double that considered a normal clutch and suggests it is likely the result of laying by more than one female.

A possible explanation for this observation is that a communal nest has been used by a number of females. This breeding behaviour has been observed to occur with the New Zealand Pukeko *Porphyrio melanotus* (Craig 1977, 1980). This behaviour is described as "joint-laying" where a number of breeding females lay in the same nest (Dey & Jamieson 2013). Pukeko form family groups and there are a number of helpers that assist the incubating female and subsequent rearing of chicks. Brown (1978) described avian communal breeding systems as a form of operational altruism or helping behaviour. However, in the case of the female described in this observation, having to care solely for the 29 chicks, with no parental care offered by the other females who laid eggs in the communal

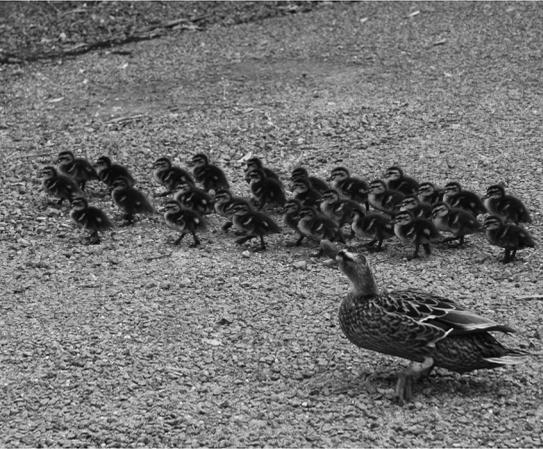


Fig. 1. Female mallard (*Anas platyrhynchos*) with 29 ducklings, Mahurangi Regional Park, Auckland.

nest, it is suspected that this large brood is more likely the result of intraspecific brood parasitism (Gill 1983; Ahlund & Anderson 2001; Davies 2000; Payne 2005; Steer & Burns 2008).

Avian parasitism in New Zealand is known to exist with two cuckoo species, the shining cuckoo *Chrysococcyx lucidus* which is an obligate brood parasite of the grey warbler *Gerygone igata* (also, Chatham Island warbler *Gerygone albofrontata*) and the long-tailed cuckoo which parasitises the nests of yellowhead *Mohoua ochrocephala*, whitehead *Mohoua albicilla* and brown creeper *Mohoua novaeseelandiae* (Gill 1998; Seabrook-Davison *et al.* 2008; Anderson *et al.* 2009). The majority of brood parasitism research has been conducted on these two cuckoo species with a paucity of information available on other incidences of avian parasitism in New Zealand (Anderson *et al.* 2010; Aidala *et al.* 2013). Conspecific or intraspecific brood parasitism is common in Anseriformes (swans, geese, ducks) with Denk (2005) reporting its occurrence in 70% (74 species) of Anseriformes breeding in North America and areas of the Western Palearctic. Therefore it is highly likely it occurs in New Zealand duck species within the order Anseriformes.

Although I identified the female and her young as mallards using field marks (Williams & Basse 2006), after consulting Gillespie (1985) and Braithwaite and Miller (1975) on the head morphology of hybrids between mallard and grey duck (*Anas superciliosa*; Williams 2013), I cannot rule out that the female may have been a hybrid of these two species. Gillespie (1985) suggests that pure forms of both mallard and grey duck are rapidly decreasing and he recorded levels of hybridisation in populations in Otago (1981-82) reaching 51%. As grey ducks have an even smaller clutch size than mallards, the large brood I observed would be even more atypical for a grey duck.

Further research is required to provide an explanation for the observation described in this short note. As intraspecific brood parasitism is common amongst mallard in its natural distribution, there is a research opportunity to investigate its occurrence within the naturalised populations of New Zealand mallard. An extension to this research could be to answer the question whether brood parasitism occurs in other New Zealand species of duck such as the grey (*Anas superciliosa*), Australasian shoveler (*Anas rhynchos*) and paradise shelduck (*Tadorna variegata*). As there is extensive hybridisation between mallard and grey duck, there is an opportunity to investigate whether there are differences in mating and breeding systems between hybrids and the pure forms of both species. Another question to answer is how successful are large broods with respect to the number of nestlings that survive and is there any difference in survival rate between the different clutches laid in a nest. Answers to these research questions could show that brood parasitism is more widespread than currently known. Such knowledge will assist in how native and introduced species of duck are managed and conserved in New Zealand.

ACKNOWLEDGEMENTS

This short note was improved by helpful comments from Dr Tim Lovegrove and a reviewer

LITERATURE CITED

- Ahlund, M.; Anderson, M. 2001. Brood parasitism – female ducks can double their reproduction. *Nature* 414: 600-601.
- Aidala, Z.; Chong, N.; Anderson, M.G.; Ortiz-Catedral, L.; Jamieson, I.G.; Briskie, J.V.; Cassey, P.; Gill, B.J.; Hauber, M.E. 2013. Phylogenetic relationships of the genus *Mohoua*, endemic hosts of New Zealand's obligate brood parasitic long-tailed cuckoo (*Eudynamis taitensis*). *Journal of Ornithology* 154: 1127-1133.
- Anderson, M.G.; Brunton, D.H.; Hauber, M.E. 2010. Species-specificity of grey warbler begging solicitation and alarm calls revealed by nestling responses to playbacks. *Animal Behaviour* 79: 401-409.
- Anderson, M. G.; Ross, H. A.; Brunton, D. H.; Hauber, M. E. (2009) Begging call matching between a specialist brood parasite and its host: a comparative approach to detect coevolution. *Biological Journal of the Linnean Society* 98: 208-216.
- Braithwaite, L.W.; Miller, B. 1975. The mallard, *Anas platyrhynchos*, and mallard-black duck, *A. superciliosa rogersi*, hybridization. *Australian Wildlife Research* 2: 47-61.
- Brown, J.L. 1978. Avian communal breeding systems. *Annual Review of Ecological Systematics* 9: 123-55.
- Craig, J.L. 1977. The behaviour of the pukeko, *Porphyrio porphyrio melanotus*. *New Zealand Journal of Zoology* 4: 413-433.
- Craig, J.L. 1980. Pair and group breeding behaviour of a communal gallinule, the pukeko, *Porphyrio porphyrio*. *Animal Behavior* 32: 23-32

- Cramp, S. (ed). 1977. *Handbook of the birds of Europe the Middle East and North Africa. The birds of the Western Palearctic, Volume 1: Ostrich to Ducks*. Oxford: Oxford University Press.
- Davies, N.B. 2000. Cuckoos, cowbirds, and other cheats. London: T. & A.D. Poyser.
- Denk, A.G. 2005. Male and female reproductive tactics in mallards (*Anas platyrhynchos*). Cuvillier Verlag, Germany.
- Dey, C.; Jamieson, I. 2013. Pukeko. In Miskelly, C.M. (ed.) *New Zealand Birds Online*. www.nzbirdsonline.org.nz
- Gill, B.J. 1998. Behaviour and ecology of the shining cuckoo *Chrysococcyx lucidus*. Pp 143-151 in Rothstein, S.I.; Robinson, S.K. (eds) *Parasitic birds and their hosts; studies in coevolution*. New York: Oxford University Press.
- Gill, B.J. 1983b. Brood parasitism by the shining cuckoo *Chrysococcyx lucidus* at Kaikoura New Zealand. *Ibis* 125: 40-55.
- Gillespie, G.D. 1985. Hybridization, introgression, and morphometric differentiation between mallard (*Anas platyrhynchos*) and grey duck (*Anas superciliosa*) in Otago, New Zealand. *Auk* 102: 459-469.
- Hamilton, W.D. 1963. The evolution of altruistic behaviour. *American Naturalist* 97: 354-56.
- Hamilton, W.D. 1964. The genetical evolution of social behaviour. I. and II. *Journal of Theoretical Biology* 7: 1-52.
- Heather, B.; Robertson, H. 2005. *Field guide to the birds of New Zealand*. Penguin Books New Zealand Ltd.
- Krapu, G.; Reynolds, R.; Sargeant, G.; Renner, R. 2004. Patterns of variation in clutch sizes in a guild of temperate-nesting dabbling ducks. *USGS Northern Prairie Wildlife Research Center. Paper 42*. <http://digitalcommons.unl.edu/usgspwrc/42>
- Madge, S. 1992. *Waterfowl: an identification guide to the ducks, geese, and swans of the world*. Houghton Mifflin Harcourt.
- Payne, R.B. 2005. *The cuckoos*. Oxford: Oxford University Press.
- Seabrook-Davison, M.N.H.; Anderson, M.G.; Brunton, D.H. 2008. First observation of pre-copulatory behaviour and copulation in shining cuckoos (*Chrysococcyx l. lucidus*) in New Zealand. *Notornis* 55: 220-221.
- Shah, G.M.; Jan, U.; Ahanger, F.A.; Bhat, B.A.; Fazili, M.F. 2009. Egg laying, egg parameters and clutch size in mallard *Anas platyrhynchos*. *Indian Birds* 4: 106-108.
- Steer, J.; Burns, K.C. 2008. Seasonal variation in male-female competition, cooperation and selfish hoarding in a monogamous songbird. *Behavioural Ecology Sociobiology*. DOI 10.1007/s00265-008-0546-zt
- Williams, M.J. 2013. Grey duck. In Miskelly, C.M. (ed.) *New Zealand Birds Online*. www.nzbirdsonline.org.nz
- Williams, M.; Basse, B. 2006. Indigenous gray ducks, *Anas superciliosa*, and introduced mallards, *A. platyrhynchos*, in New Zealand: processes and outcome of a deliberate encounter. *Acta Zoologica Sinica* 52 (Suppl.): 579-582.

Keywords mallard; *Anas platyrhynchos*; brood size; parasitism; New Zealand