

SHORT NOTE

Polygyny observed in pāteke (brown teal, *Anas chlorotis*)

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Pāteke (brown teal, *Anas chlorotis*) is a small, endemic dabbling duck that was once widespread throughout lowland New Zealand (Williams 2013). It suffered a catastrophic population decline following European settlement in the mid-1800s and was reduced to relict populations in Northland, Aotea/Great Barrier Island, and Fiordland by the mid-twentieth century (Hayes & Williams 1982; Parish & Williams 2001; Ferreira & Taylor 2003; Harper 2009). The reasons for this decline are depressingly familiar; introduced mammalian predators combined with the loss of wetland habitat, and possibly disease (McKenzie 1971), reduced the number of wild birds to an estimated 1,500 by the 1970s (Dumbell 1986). Successful captive breeding programmes were established by Ducks Unlimited (Operation Pāteke) and the Mount Bruce Native Bird Reserve, with reared birds being released at suitable predator-controlled sites from the late 1960s (Hayes & Williams 1982). The success of these programmes resulted in a downgrading of the threat level from Nationally Endangered to Recovering in 2008 (Department of Conservation 2022), although the species is still considered vulnerable with an estimated wild population of only 2,000–2,500; mainly in Northland (c. 600), Aotea (c. 700), and the Coromandel (c. 400) (Department of Conservation 2022).

Pāteke are crepuscular and actively feed at night (Williams 2013). They prefer still or sluggishly moving water and ample vegetation cover that provides daytime shelter and secluded nesting sites. As the breeding season approaches in late winter or early spring (July–September; Williams 2013), birds that have congregated at flocking sites pair off and establish breeding territories that they vigorously defend against both conspecifics and other water fowl (Hayes & Williams 1982). This short note reports an example of polygyny in the usually strictly monogamous pāteke, which was observed at the Weiti chéniers, Auckland (Fig. 1) during the 2021/22 breeding season. The Weiti chénier area, a series of shell ridges separated by mangrove swamps, provides ideal habitat for pāteke. A brackish water lagoon (0.6 ha) formed on the landward side of the outer chénier and extensive mudflats on its seaward side provide adequate sources of food (Moore & Battley 2003; Moore *et al.* 2006), and an adjacent vegetated area of 0.4 ha provides daytime shelter and suitable nesting sites. Pest control on and around the chéniers has been carried out since 2013 by a local community group, initially to protect New Zealand dotterel (tūturiwhatu, *Charadrius obscurus*) and variable oystercatcher (tōrea pango, *Haematopus unicolor*) nesting sites, but this has also reduced predator pressure on nesting pāteke and their ducklings.

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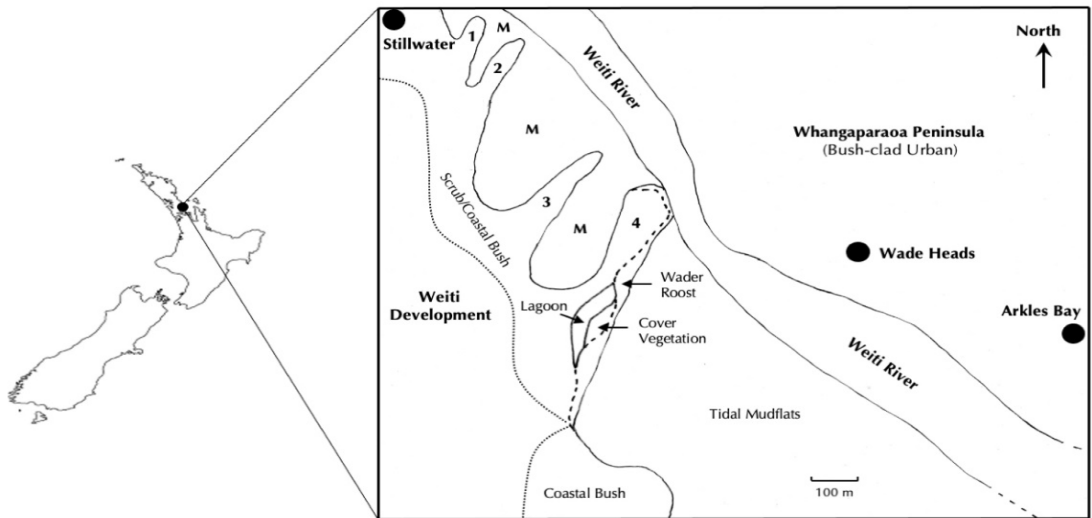


Figure 1. The four chéniers are labelled 1–4. M = mangroves. The dashed line on the youngest chénier (4) separates bare shell from vegetated areas. The cover vegetation adjacent to the lagoon is used by pāteke (brown teal, *Anas chlorotis*) for daytime shelter and nesting. Extensive areas of mudflats are available for nocturnal feeding. The Scrub/Coastal Bush vegetation includes grassland, mature macrocarpa (*Cupressus macrocarpa*), regenerating native vegetation, replanted areas and mature pōhutukawa (*Metrosideros excelsa*) and pūriri (*Vitex lucens*) along old cliff faces. The lagoon is at 36°38'43"S, 174°43'32"E.

Pāteke have successfully bred at this site since 2017 when a pair raised two offspring (Martin Sanders *pers. comm.*). The Weiti birds are self-introduced and were originally banded on Motutapu island in the Hauraki Gulf. In the 2021/22 breeding season three birds, a male and two females, were first observed at the lagoon on the 2 July 2021. One of the females was uniquely banded (metal/white). However, the white band may have faded from an original yellow, as a female with a metal/yellow band combination was observed at Weiti in 2018. While the birds were usually seen resting together, the unbanded female was observed on several occasions to be aggressive towards the banded female. Two or three adult pāteke were observed on twelve subsequent visits between 2 July 2021 and 11 February 2022 indicating that they were holding a territory; this was confirmed by the aggressive behaviour of the drake towards mallards (*A. platyrhynchos*) that were also breeding at the lagoon. A brood of four pāteke ducklings (Fig. 2) was first seen on the 9 December 2021 (*pers. obs.*) and based on shape and size were about four weeks old (Barker & Williams 2002). The four ducklings were observed until 21 December 2021 (Martin Sanders *pers. comm.*) after which the unbanded female and four juveniles vacated the territory and

were not observed again. This was coincidental with a new brood of three ducklings, estimated to be a week or so old, observed with the banded female on the 22 December 2021. It is likely that these two events are linked and that the maturing juveniles were old enough to survive in the wider environment as they became progressively more independent from the adults, leaving their more protected natal habitat for the younger brood. Whether the banded female and male ejected the unbanded female and her brood or it was a natural progression as the ducklings matured is not known. The three juveniles and parents were still present at the lagoon on 27 January 2022 when they were almost adult size.

Monogamy is the primary mating system in dabbling ducks, with pāteke males protecting nesting females, defending feeding territory, and helping to care for ducklings, but three southern hemisphere species – Cape teal (*A. capensis*), speckled teal (*A. flavirostris*), and white-cheeked pintail (*A. bahamensis*) frequently exhibit polygyny (McKinney 1985). Polygyny has also been observed occasionally in northern hemisphere species such as the Eurasian wigeon (*A. penelope*) (Jacobsen & Ugelvik 1995). McKinney (1985) suggested that polygyny may be favoured in dabbling duck species



Figure 2. Unbanded female pāteke (brown teal, *Anas chlorotis*) with four ducklings resting on the vegetated margin of the Weiti lagoon and about to take to the water in response to the approaching photographer. Photograph: Martin Sanders.

that have extended and/or irregular breeding seasons, as is the case with pāteke, which might produce asynchrony in breeding and moult timing resulting in a skewed sex ratio thereby relaxing constraints on strict monogamy. If this is the case, one may expect to find polygyny in dabbling duck population where the sex ratio is skewed for other reasons. Wingfield (1984) demonstrated that polygyny could be induced in monogamous species by artificially increasing testosterone. Because pāteke are known to exhibit territorial aggression, even towards species as large as black swans (*Cygnus atratus*) (Hayes & Williams 1982), we can assume that testosterone levels are high enough in males during the breeding season to create a potential for polygyny in this species. Whether this potential is realised will depend on circumstances (Emlen & Oring 1977).

Perhaps the polygyny observed this breeding season at Weiti was simply a result of the trio's isolation from other pāteke. The staggered breeding times observed allowed the male to protect both females while they were nesting and to provide for both sets of ducklings, and perhaps could best be described as serial monogamy rather than true polygyny. To my knowledge, this is the first report of multiple mating by a male pāteke

and has implications for the conservation of this species. Provided there is no significant difference in survival of young to fledging age between monogamous and polygynous pairings, polygyny could increase the potential for pāteke to self-spread and that reintroductions could be successful even if only few individuals were translocated.

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