

SHORT NOTE

A little penguin (*Eudyptula minor*) from South Bay, Kaikōura, New Zealand with a unique breeding history

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The little penguin is considered a species of “least concern” (BirdLife International 2018) but recently under the New Zealand Threat Classification it has been downgraded within the “At Risk: Declining” category (Robertson *et al.* 2017). There is also continuing uncertainty about the taxonomy of little penguins, and hence, all little penguins including the white-flipped morph have been placed into one species, *Eudyptula minor*, awaiting further clarification (Gill *et al.* 2010). Wilson & Mattern (2018) have recently undertaken a review of the state of knowledge and priorities for research on little penguins.

In 2006, LR began a study at South Bay, Kaikōura, (42.43°S, 173.68°E) where the main concentration of little penguins on the Kaikōura Peninsula is located (Fig. 1). Rowe *et al.* (2020) reported the background to the study and breeding by little penguins over 11 seasons. Approximately weekly visits were made to

the colony throughout the year to band and record penguins present, and to determine the numbers of eggs, chicks, and fledglings. While little penguins are known to have multiple broods in a season (e.g. Marchant & Higgins 1990; Flemming 2013), in New Zealand it has been reported that outside Otago penguins do not double brood (Gales 1985; Agnew *et al.* 2014; Heber *et al.* 2008). There are few, if any, studies which publicly report the detailed breeding histories of individual penguins. Here, we report on the first 11 years in the life of a little penguin, P38299, at the South Bay colony, Kaikōura. This is one of 12 little penguins known to have multiple brooded at this site (Rowe *et al.* 2020).

2010–11

P38299, a female blue-morph little penguin, was first seen on the beach outside the DOC shelter (Fig. 1) on 9 November 2010 when it was banded and a passive integrated transponder (PIT) tag inserted; this was the only sighting for that summer (Table

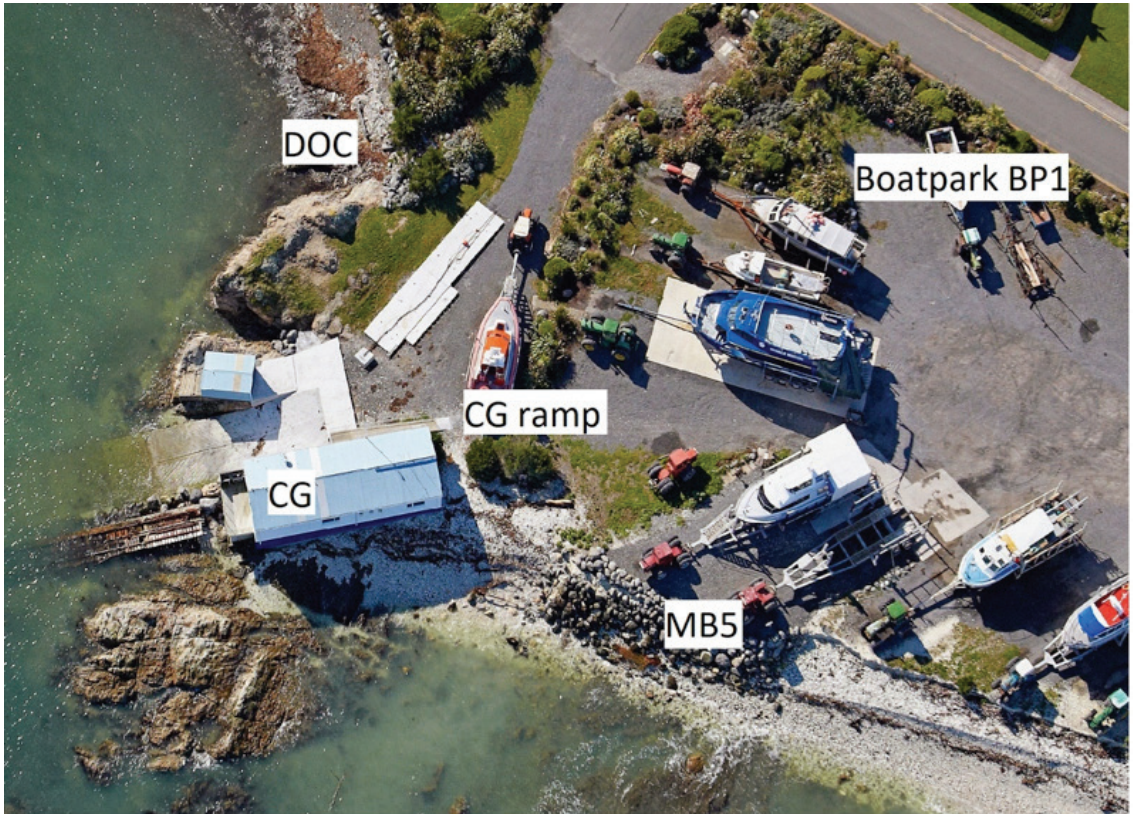


Figure 1. South Bay (Kaikōura, New Zealand) little penguin colony showing sites where P38299 and partners nested. (Photo: Andrew Spencer).

1). All unbanded penguins that were seen ashore at South Bay were captured and banded. Those penguins that were only seen a few times or were ashore to moult and never seen again are thought to have been birds from other South Island sites. Young birds disperse widely after fledging and return to their natal colony after two or three years (Marchant & Higgins 1990). At Kaikōura, returning chicks banded between 2006 and 2015 were first seen back on average at 15.9 months old (41 birds; range 7.1–26.9 months, 95% CL \pm 1.4 months). Therefore, birds first caught without bands and that have stayed at the colony after banding were probably chicks that were not able to be caught and banded before they left the colony in the previous 1–2 seasons (a season is defined as 1 April to 31 March the following year, this starting after moulting is completed). As most Kaikōura chicks hatch in late October/early November, when first seen in November 2010, P38299 may have been about 12 months-old having been assumed to have been raised at the colony during the 2009–10 breeding season.

2011–12

This season P38299 paired with P44314. The one egg found on 17 October 2011 failed, as did a single replacement egg found on 14 November 2011 (Table 1). Many little penguins first breed at about two years old (Dann 2013) but Perriman & Steen (2000) noted some bred as early as 16 months. One known age bird at South Bay was seen on an egg first at 12 months old and nine more were first seen on eggs or chicks between 23 and 27 months. Therefore, the age for P38299, now estimated at about 24 months old, is in the expected range.

2012–13

For this season P38299 paired with P44314; two eggs were laid and two chicks fledged.

2013–14

It appears that this pair, P38299 & P44314, separated about 1 May 2013 because P38299 was nesting with P44332 under the walking ramp up to the

Table 1. The breeding history of little penguin P38299 and partners, 2010–2020, at South Bay, Kaikōura, New Zealand.

Date	Site	Mate seen	Comment
09 November 2010	Outside DOC shelter		First sighted. Banded and PIT tagged
26 May 2011	Marina		
17 October 2011		P44314	1 cold egg
03 November 2011	Cg11	P44314	0 eggs = failed
14 November 2011	Cg11	P44314	1 egg = clutch 2
28 December 2011	Cg11	P44314	0 eggs = failed replacement
02 October 2012	Cg11	P44314	1 egg
09 October 2012	Cg11		2 eggs
30 October 2012	Cg11	P44314	1 egg + 1 egg pipping
20 November 2012	Cg11	P44314	2 chicks
01 January 2013	Cg11		2 chicks fledged = successful double brood
23 April 2013	Cg11	P44314	Last time seen together – divorce
08 May 2013	Cg ramp	P44332	New pairing – first time seen together
12 September 2013	Cg ramp	P44332	2 eggs
15 October 2013	Cg ramp	P44332	2 chicks
22 October 2013	Cg ramp		P44332 last seen – dead?
>03 December 2013	Cg ramp		2 chicks fledged
13 May 2014	Cg5	P44317	First seen with new mate
12 August 2014	Bp1	P44317	Change of nestbox; 2 eggs
20 August 2014	Bp1	P44317	2 chicks
<23 October 2014	Bp1	P44317	2 chicks fledged
29 October 2014	Bp1	P44317	1 egg = clutch 2
05 November 2014	Bp1	P44317	2 eggs
24 December 2014	Bp1		Abandoned = failed double brood
02 July 2015	Cg5	P44317	Change of nestbox; last time seen with P44317
28 July 2015	Cg5	P44345	New mate; P44317 divorced
06 October 2015	Mb5	P44345	Change of nestbox; 2 eggs
04 November 2015	Mb5	P44345	1 chick
>14 December 2015	Mb5		1 chick fledged

Table 1. *continued*

Date	Site	Mate seen	Comment
18 April 2016	Cg9	P44345	2 eggs
23 May 2016	Cg9	P44345	2 chicks
25 May 2016	Cg9	P44345	2 chicks; last sighting of P44345 with P38299
08 June 2016	Cg5	P48417	Change of nestbox; new partner
20 July 2016	Cg9		Chicks in nestbox Cg9 now fledged
03 August 2016	Cg5	P48417	
10 August 2016	Cg5	P48417	2 eggs = clutch 2
14 September 2016	Cg5		2 chicks
>09 November 2016	Cg5		2 fledged chicks
04 December 2016	Cg4	P48417	2 eggs = clutch 3
31 December 2016	Cg4		1 egg, 1 chick
09 January 2017	Cg4	P48417	1 chick
27 February 2017	Cg4		Chick fledged = successful triple brood
31 March 2017	Cg5	P48417	Birds together
02 July 2017	Cg5		2 eggs seen
09 July 2017	Cg5	P48417	2 eggs
30 July 2017	Cg5	P48417	2 chicks seen
<01 October 2017	Cg5		2 chicks fledged
15 October 2017	Cg5	P48417	2 eggs = clutch 2 – did not hatch
17 December 2017	Cg5 Cg4		P38299 on 1 old egg from clutch 2 P48417 on 1 new egg = clutch 3
24 December 2017	Cg5		P38299 on 1 old & 1 new egg = clutch 3
>24 December 2017			Eggs failed, thus a failed triple brood. P48417 & P38299 not seen again this season
12 August 2018	Cg5	P48498	P38299 & P48498 on 2 eggs = clutch 1
??	Cg5		2 chicks fledged
29 November 2018	Cg11	P48498	2 eggs which did not hatch = clutch 2 Thus, a failed double brood
1 December 2019	Cg5	Unknown	Two eggs that did not hatch

Coastguard building on 8 May. P38299 laid two eggs and the resulting chicks fledged despite P44332 not being seen after 22 October 2013. When carrying out our observations it was common for both adults of a pair to be present in the nest. Only P38299 was seen in or near that nest for the rest of the season, so we suspect the two chicks were raised by her from about two weeks-old through to fledging.

2014–15

By May 2014, P38299 had a new mate, P44317. Eggs were laid in July and two chicks fledged in October. Two more eggs were laid about the end of October but they did not hatch. The season's activity constituted a failed attempt at a double brood (a successful double brood is two consecutive clutches in one season with a least 1 fledgling per clutch).

2015–16

P44317 was divorced in July 2015 and the new pairing of P38299 with P44345 had a successful single clutch raising one chick from the two eggs laid in this season.

2016–17

The pairing of P38299 and P44345 had two eggs in nestbox Cg9 on 18 April 2016, the earliest published date for little penguins to lay in New Zealand (Rowe *et al.* 2020), and possibly Australia. Two eggs hatched and the chicks fledged by 20 July. It appears that P44345 was divorced between 25 May and 8 June as P38299 was sharing nestbox Cg5 with P48417 on that date. The second clutch for P38299 for this season, two eggs, was laid in Cg5 before 10 August, they hatched by 14 September, and the resulting two chicks fledged about 9 November. On 4 December, two eggs found in Cg5 made up clutch 3 for P38299 and clutch 2 for P48417. One of the two eggs hatched before 31 December and that chick fledged by 27 February 2017. This Kaikōura pairing has, with others, extended the range reported previously for successful double brooding, for Otago and Australia only (Gales 1985; Agnew *et al.* 2014). To our knowledge, this is the first record of successful triple brooding in a season by a little penguin (Rowe *et al.* 2020). In total, P38299 laid six eggs in the 2016–17 season, five of which hatched and fledged.

2017–18

P38299 attempted another triple brood with P48417 this season. Again, she laid the first known eggs at the colony for the season. Both chicks from the first clutch fledged about 1 October 2017 from eggs laid

before 30 June. The second clutch in October was also two eggs; one egg was found outside the nestbox on 10 December but the other was incubated until at least 24 December when the clutch was considered to have failed. On 17 December, P48417 was seen on a new egg in box Cg4 but it is not known whether P38299 had laid that egg; this was the last time P48417 was seen so was considered lost. On December 24, P38299 was in Cg5 sitting on a new egg and the remaining one egg from clutch 2. These eggs were abandoned in the next week and the Cg5 egg at least can be considered the third clutch for the season. Thus, for this season P38299 had a failed triple brood.

2018–19

With a new partner, P48498, P38299 had laid two eggs in Cg5 before 12 August 2018. Again, she laid the earliest eggs in the colony that season. Both chicks fledged. This pair laid another two eggs, this time in Cg11 before 29 November, but neither egg hatched, therefore constituting a failed double brood.

2019–20

P38299 had laid two eggs in Cg5, partner unknown, by 1 December 2019 and neither hatched.

Table 2. The productivity of little penguin P38299 at Kaikōura Peninsula, 2010–2020, at South Bay, Kaikōura, New Zealand.

Season	Clutch	Eggs	Chicks	Fledglings
2011–12	1	1	0	0
	2	1	0	0
2012–13	1	2	2	2
2013–14	1	2	2	2
2014–15	1	2	2	2
	2	2	0	0
2015–16	1	2	1	1
2016–17	1	2	2	2
	2	2	2	2
	3	2	1	1
2017–18	1	2	2	2
	2	2	0	0
	3	2	0	0
2018–19	1	2	2	2
	2	2	0	0
2019–20	1	2	0	0
Total	16	30	16	16

Over nine breeding seasons, P38299 laid a total of 30 eggs, 3.3 per season over her breeding lifetime to date (Table 2). From the 16 clutches, 16 eggs hatched at a hatching success rate of 53%. All chicks survived to fledging and, hence, P38299 has produced 1.8 chicks/season.

Divorce is not uncommon in little penguins ranging from 0–42% in a year at some Australian colonies (Chiaradia 2001; Rogers & Knight 2006). At the Kaikōura colony there have been many instances where mates have been replaced after winter storms and the occasional divorce, but no other little penguin there has had six mates in nine seasons: the original mate, two replacement mates after losses, and three more after divorces one of which took place mid-season. This is considerably more than an average of 1.8 mates/lifetime in Victoria (Reilly & Cullen 1981) but less than the eight pair bonds for an individual at Phillip Island where some birds were 22 years old (Nisbet & Dann 2009). Having successfully fledged 16 chicks since 2011, including a successful triple brood, P38299 is a remarkable little penguin.

ACKNOWLEDGEMENTS

We wish to acknowledge the help of Alastair Judkins and the many others that assisted with collecting observation data, and an anonymous reviewer and editor whose comments improved this manuscript. This work was carried out under permits issued by the Department of Conservation, Wellington.

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Keywords: *Eudyptula minor*, little penguin, life history, breeding success, double brooding, triple brooding