ORUAWHARO MEDLANDS ECOVISION.
2025-26 Season Report to members

PRODUCTIVITY AND INDIVIDUAL LONGEVITY DETERMINE DOTTEREL AND OYSTERCATCHER POPULATION STABILITY, GROWTH OR DECLINE.

Monitoring the success of breeding dotterels or oystercatchers on our beach is important because it provides insights into the longer-term success of these birds. Individual birds in individual years may succeed in fledging young or may fail, but it is the long-term average of fledged young over the whole beach population that determines the stability, growth or decline of the population. This also depends on the life-span (survivorship) of fledged (adult) individuals. Consider the following:

(1) If a **pair** of dotterels succeed in fledging one chick every second year they have a productivity of one chick per 2 years, or ½ = 0.5 per annum. (Each individual bird thus has a productivity of 0.25 per annum). Consequently: it will take a pair with such a productivity 4 years to replace themselves.

(2) If a pair fledges only one chick every 5th year, the pair productivity is 1/5 = 0.2 per annum. Each individual thus has a productivity of 0.1. Consequently: it will take a pair with this productivity 10 years to replace themselves (assuming they live that long).

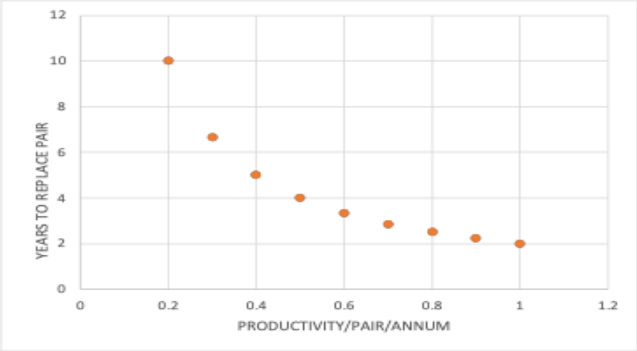
The same reasoning applies to the *average* productivity of a population – if the average pair productivity is 0.5 it will take the population 4 years to replace itself, if productivity drops to 0.2 it will take 10 years. The same reasoning also applies to Variable Oystercatchers.

Table 1. Productivity of NZ Dotterels at Oruawharo/Medlands

Season	2018 -19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	AVG
Pairs	4	5	7	5	5	4	4	4	4.75
Known chick	7	9	11	7	6	2	4	3	6.13
fledged	3	3	3	2	2	2	3	1	2.38
Productivity (averageoff spring/pair)	0.75	0.60	0.43	0.40	0.40	0.50	0.75	0.25	0.51

Table 1, based on 8 years of dotterel watching at Medlands gives an average productivity per pair estimate of 0.51. Note that having more pairs present (eg. 2020-21) doesn't necessarily increase productivity because several pairs may fail to fledge young (high chick mortality). Note too, that in 2025-26 only 3 of the 4 pairs were known to nest , one pair (BB) at least twice. However, only one chick fledged.

The average productivity (0.51) implies 4 years for birds (or the population as a whole) to replace themselves (see (1). Above) To do so they must however live for at least 4 years. On average they do so: from limited bird banding results on Aotea (14 birds) the average survival is 4.2±2.7 years (average ± 95% confidence interval). This is survival between the date of banding and the date on which the banded bird was last seen (rather than actually dead), so it will underestimate true longevity. One bird ("Metal/Yellow") survived for at least 18 years. Median survival, of birds living for more than one year, was c. 4.0 years. Higher average survivals (6 – 8 years) have been obtained for NZ dotterels in North Auckland, and indeed the confidence limits on the Medlands estimate do not rule out an average survival of c. 7 years (4.2 + 2.7 years).



An average pair productivity of 0.51 and a longevity of 4 – 7 years is thus sufficient to more than replace the population, rather it should lead to slow population growth. This indeed is supported by the Aotea-wide post-breeding counts, which show an increase of c. 20% from 2000 to 2025 even after the mortality caused by Cyclone Gabrielle (Fig 1).

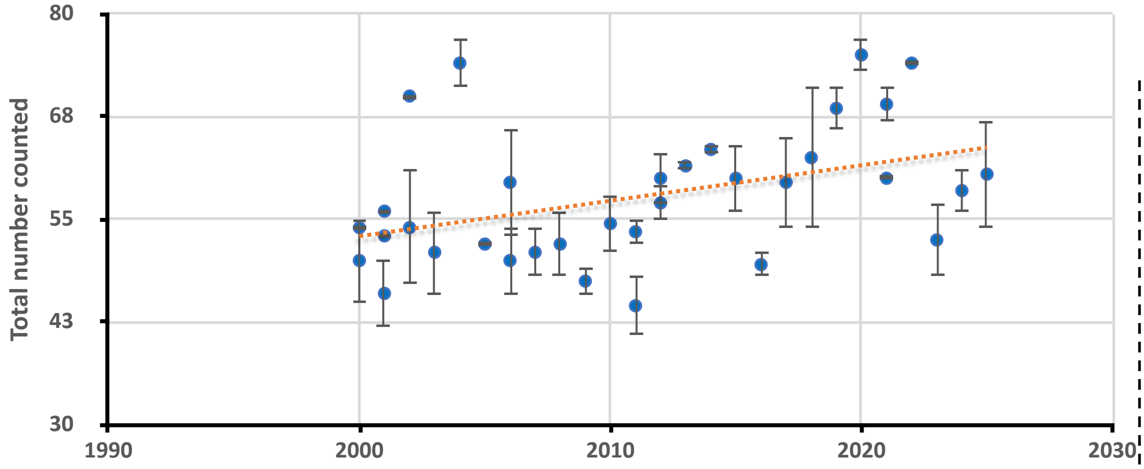


Fig 1. New Zealand dotterel count in post-breeding period on all beaches of Aotea, with count error bars. The trend line shows a significant increase. The vertical dotted line is Cyclone Giselle (Feb. 2023) and squared symbols are counts since then.

Links to Coromandel. While the local productivity and survival rates are adequate to maintain the population, the migration to Aotea of juvenile birds from populations on the Coromandel / Hauraki Gulf beaches could also be involved. Of the 14 banded birds, six (43%) moved between Aotea and the Coromandel area, in some cases back and forth more than once. Flights of c. 100km seem likely to have been involved. Thus, the dotterel population on Aotea is probably 'buffered' by this mobility, giving further confidence in its future stability.

This positive conclusion must be modified by a proviso: on nearly all beaches where New Zealand dotterels now nest in the northern North Island (including Coromandel) there is now some protection from introduced predators, people, vehicles and such like. This protection is largely carried out by community groups, supported by local councils and the Department of Conservation. This applies too of course at Medlands, where, for example, the ultimate fledging of 3 chicks in 2024-25 was almost certainly due mainly to the vigilance of the OME 'beachcare' group. Tape- fencing, signs and person-person discussions increased awareness and allowed both adult and juvenile birds to use the beach – their only source of food. Without positive human interventions dotterel breeding success would certainly decline. Should average pair productivity decline to 0.1 for example, average adult longevity would have to be 20 years. Although a small proportion of birds do live longer than 10 years, unless there is inwards migration from other beaches average pair productivities lower than c. 0.3 seem likely to cause population decline (Fig 2). Thus, as a Conservation Group, OME must aim to keep productivity above 0.3 on average, but not be too discouraged by some failures.

Fig. 2. New Zealand dotterel (or Oystercatcher) productivity per pair and years to replace the pair. With a productivity of 0.3, c. 7 years would be required for replacement (blue arrow). Current average NZ dotterel productivity on Medland beach indicated by red line.

Oystercatchers. Variable Oystercatchers have been monitored on Medland Beach by Peggy Garlick since before 2018. Individual birds can often be recognized by white markings and site fidelity, so it is known that some pairs have been together for 12 years. Elsewhere *individual* longevities up to 19 years have been recorded. The 8 years of data in Table 2 might suggest a progressive decline in productivity over those years, but the average productivity of 0.41 is adequate to maintain a population with average individual longevity of >5 years. Consequently, this apparently low productivity is not a cause for concern, rather the current eight-year average implies a likely population increase, and this is substantiated by annual counts on Okiwi Spit, where the total increased from c. 50 to c. 80 birds (60%) between 2000 and 2020 (before Gabrielle).

Table 1. Productivity Variable Oystercatchers at Oruawharo/Medlands

Season	2018 -19	2019-20	2020-21	2021-22	2022-23	23-24	24-25	25-26	AVG
Pairs present	6	6	5	5	5	6	6	6	5.63
Pairs nested	4	4	3	4	5	5	1	3	3.63
Known chicks	7	5	5	6	6	7	2	7	5.63
fledged	4	3	3	3	2	2	0	1	2.25
Productivity (average offspring/pair)	0.67	0.50	0.60	0.60	0.40	0.33	0.00	0.17	0.41

However, it is certainly possible that the old pairs on Medland beach are losing fertility. The Far North pair have never succeeded in having chicks, or even eggs so far as I am aware. They took over a dotterel clutch one year, but they were washed away by a high tide. A new pair occupied vacant territory on the S end of SS beach in 2023-24 (possibly from birds fledged on Medlands the previous year) but have so far raised no young.

End of Season activity (addition)

After breeding dotterel pairs and fledged young usually disappear from the beach, almost certainly going to the main post-breeding aggregation on Okiwi Spit. However, there is also movement to and from other beaches. Fledged juveniles may move about more than adults. This year, a pair of fledged juveniles appeared on the Far North end of Medland on February 6th and were seen again on the 11th. These could have come from Kaitoke or elsewhere, but note that had there not been regular monitoring on the beach it might have been assumed that these two birds were produced by the Far North dotterel pair, which did appear to be nesting early in the season. However, that was not the case! One bird was fledged on Okupu beach early so it is unlikely the two newcomers came from there. Productivity on Okupu is estimated as one fledged to one pair (i.e. 0.5). Two birds may have fledged at Awana this year so productivity there may have been 1.0.

Acknowledgements

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