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SHORT NOTE

Further increase of tūī (*Prosthemadera novaeseelandiae*) on Miramar Peninsula, Wellington

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Sustained observations over a 26-year period (1998–2023) at a Seatoun Heights site provided an index of change in tūī (*Prosthemadera novaeseelandiae*) numbers on the Miramar Peninsula, east of Wellington city. Few tūī used to be seen on the peninsula, as in other areas of the city; however, the species is now widespread and common across the area (Bell 2008; Brockie & Duncan 2012; Miskelly 2018; McArthur *et al*. 2023). As noted by Bell (2008), the search effort per day varied, generally continuing for at least 10 min until the first tūī was either seen or heard. If no tūī were encountered, efforts were made to locate them later the same day. The data reported here therefore represent the days on which tūī were searched for and recorded (or not), rather than numbers of tūī *per se*. Over time, the number of 'tūī days' increased dramatically, but with some year–to–year variation (Table 1).

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The percentage of observation days on which tūī were encountered in Seatoun was calculated for each year over 1998–2023, based on monthly totals of days on which tūī were seen or heard (Table 1; Fig. 1). The author's absence in some years accounted for fewer observations in some calendar months, with no records for 3 months over 2009–2015 (Table 1). The number of days on which tūī were noted was low over 1998–2000 (0.3%–0.4%), increased over 2001–2005 (1.2%–9.0%), then rose sharply in 2006 (44.2%) and 2007 (76.4%), with high percentages (>80%) thereafter. Tūī were encountered on every observation day (n=1,378) over the last 4 years of study (Table 1; Fig. 1).

The first breeding of tūī reported on Miramar Peninsula in recent times was at the Massey Memorial area (on the northern end of the peninsula) in 2005, following 2 years of intensive possum control, with at least two juvenile tūī reported there in January 2005 (Atkinson 2005). That date coincides with the data shown in Table 1 showing the start of the population rise over 2004–05, when tūī observation days first reached double figures. The population increase

Table 1. Monthly distribution of days on which tūī were encountered at Seatoun, Wellington (1998–2023).

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Days tūī recorded	Total days of obs.
1998	0	0	0	0	0	1	0	0	0	0	0	0	1	277
1999	0	0	0	0	0	0	0	0	0	0	0	1	1	319
2000	0	0	0	0	0	0	1	0	0	0	0	0	1	323
2001	1	0	0	0	0	0	1	2	0	0	0	0	4	347
2002	0	0	0	1	0	0	3	1	0	0	0	0	5	263
2003	0	0	1	1	1	1	0	0	0	0	0	0	4	324
2004	0	0	0	1	1	2	4	3	2	1	2	2	18	335
2005	1	1	0	5	4	0	6	2	1	4	4	2	30	334
2006	2	2	4	9	12	8	14	22	17	12	20	22	144	326
2007	24	3	10	22	21	28	31	19	22	27	21	28	256	335
2008	27	14	23	28	24	22	27	25	26	31	23	13	283	329
2009	24	27	24	20	26	0	25	29	28	26	28	27	284	298
2010	27	19	26	30	23	28	26	31	29	24	28	22	313	332
2011	25	15	30	25	18	0	18	28	16	25	25	28	253	284
2012	26	21	26	29	19	16	24	13	19	24	30	29	276	291
2013	25	27	23	29	27	22	27	27	25	25	25	19	301	319
2014	21	10	14	27	23	15	15	20	20	30	24	22	241	285
2015	21	7	8	21	0	19	27	26	12	25	29	21	216	254
2016	29	26	25	29	26	18	23	25	12	20	23	30	286	292
2017	27	26	29	25	15	28	27	27	24	26	30	29	313	322
2018	28	24	28	26	8	23	25	22	15	27	29	22	277	293
2019	20	21	23	28	30	17	23	29	29	24	30	27	301	318
2020	28	28	31	28	30	30	31	29	25	31	30	30	351	351
2021	30	27	31	29	20	27	31	31	27	23	30	31	337	337
2022	31	28	31	27	27	27	31	31	26	30	22	31	342	342
2023	31	28	31	30	28	22	31	31	27	30	30	29	348	348
Total	**448**	**354**	**418**	**470**	**383**	**354**	**471**	**473**	**402**	**465**	**483**	**465**	**5,186**	**8,178**

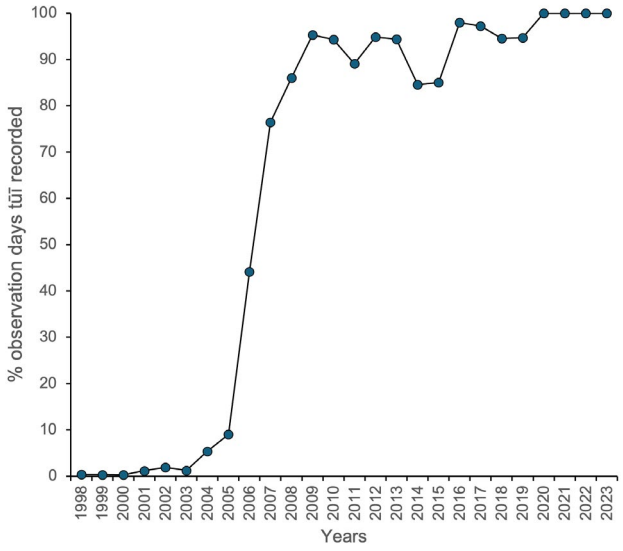

Figure 1. Annual percentages of observation days on which tūī were encountered at Seatoun, Wellington, over 1998–2023. Tūī were seen or heard on every observation day over the last 4 years.

of tūī around Wellington most likely results from two Wellington-based pest control initiatives: invasive mammal control and the establishment of the 252 ha predator-excluded Zealandia eco-sanctuary in Karori (Campbell-Hunt 2002; Atkinson 2005; Miskelly *et al*. 2005; Bell 2008; Brockie & Duncan 2012; Miskelly 2018; McArthur *et al*. 2023). Pest–mammal control was sustained intensively on the Miramar Peninsula over the period of study.

Along a 2.3 km bird count transect through a central Wellington suburb, Brockie & Duncan (2012) counted no tūī during the first three count periods (1969–70; 1970–71; 1981–82). Two tūī were recorded during 1988–89, with numbers then markedly increasing to 89 tūī over 2005–06, broadly consistent with the timing of increases at Seatoun over 1998–2005 (Table 1; Fig. 1). Around Zealandia, a multi–species predator exclusion fence was constructed in 1999 (Campbell–Hunt 2002). Within the ecosanctuary, 5-minute bird counts were compared over three time periods (Miskelly 2018): 1995–98 (pre-fence), 2002–05 (after pest mammal eradication) and 2013–16 (after several reintroduced endemic bird species had become established). Over these three time periods there was a total of 8,933 tūī encounters: 390 (4%) from 1995–98, 2589 (29%) from 2002–05, and 5,954 (67%) from 2013–16 (Miskelly 2018). Relatively few tūī were present in early years before the fence was installed, numbers rose after pest mammal eradication, reaching highest numbers by 2013–16. Again, this is broadly consistent with the trends evident at Seatoun (Table 1; Fig.1).

The changing pattern of tūī records reported here illustrates the value of sustained documentation of even casual observations of birds from a single site, involving a simple presence/absence approach This method is best suited to measuring dramatic changes in numbers, as illustrated here by the tūī population in the Wellington area. Finally, while this increase in tūī numbers in response to pest–mammal control has been dramatic,

increases of tūī populations following implementation of pest–mammal control have occurred elsewhere in New Zealand (e.g., Elliott & Kemp 2016; Ruffell & Didham 2017; Fea *et al*. 2020; Fitzgerald *et al.* 2021; Innes *et al*. 2022). Consequently, the tūī has recently become a relatively common species in many areas where formerly it was less often encountered. To maintain this improved situation, pest-mammal control needs to be sustained over the long-term, not only for the tūī but for a suite of other endemic species as well.

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