

## SHORT NOTE

Tui (*Prosthemadera novaeseelandiae*) increase at Seatoun, Miramar Peninsula, Wellington, New Zealand during 1998-2006

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The tui (*Prosthemadera novaeseelandiae*) is an endemic honeyeater (Meliphagidae) whose typical habitat is forest and scrubland, but outside the breeding season it visits towns, rural gardens, and forest patches and feeds on nectar or fruit, as well as on invertebrates (Heather & Robertson 2005). It is one of several forest birds that have increased in the Greater Wellington region in recent years (Miskelly *et al.* 2005; Bell 2008). Extensive regeneration of forest remnants in Wellington's green belt and the growth of garden shrubs and trees are likely to have contributed to the increase, together with effective regional mammalian pest-control, and the establishment of the 252 ha predator-fenced Karori Wildlife Sanctuary in 1995 (Campbell-Hunt 2002; Miskelly *et al.* 2005).

The Miramar Peninsula, situated at the southeastern corner of Wellington city and east of Wellington International Airport, is relatively isolated from the hills surrounding Wellington by open, flat land occupied by the airport and residential suburbs. The ca. 800 ha peninsula comprises hills, valleys and coastal areas; the main land uses are suburban housing and light industry, but there are also scattered areas of regenerating forest and scrub. Since Feb 2003, the Greater Wellington Regional Council has undertaken extensive mammal control in the area, which has substantially reduced species such as the brushtail possum (*Trichosurus vulpecula*) (Atkinson 2005; Miskelly *et al.* 2005).

Between 1998 and 2006, I recorded birds seen and heard at a coastal suburban site overlooking Worsler Bay, Seatoun. Observations were made on most days (87%), usually in the morning or late afternoon (except in winter), or at weekends or on

public holidays, totaling >2800 observation days over 9 years (Table 1). While observation periods varied, on most days they involved constant watching for at least 10 min, supplemented by more casual observations at other times of the day.

Tui were seen infrequently during the 1st 6 years (1998-2003), with only single records each year in 1998-2000. In 2001-2003 tui were seen on 4-5 days each year, mostly in winter (Table 1). From 2004-2006, however, the percentage of observation days on which tui were recorded increased markedly, and birds were seen most months in 2005-2006, and on 44% of observation days in 2006 (Table 1).

From Dec 1997 - Nov 2006, there was seasonal variation in the number of days on which tui were recorded ( $\chi^2=45.3$ ,  $df=3$ ,  $P<0.001$ ); most records of tui were in the winter (Jun-Aug 71 days; 38%), slightly fewer in spring (Sep-Nov 63 days; 34%), fewer in autumn (Mar-May 40 days; 22%), and least in summer (Dec-Feb 12 days; 6%).

The data reported here represent counts of days on which tui were recorded, rather than numbers of tui *per se*. However, it is apparent that tui are now seen more frequently, and are more common than only a few years previously. In 2006, for example, 2-4 individual tui were seen often, particularly in the winter, while up to 7 individuals have been seen together. In earlier years, the occasional tui records represented mostly winter visitors, but by 2006 birds appeared to have been resident or more regular in their visits (Table 1). Although weather conditions likely affected conspicuousness, with birds generally more evident on dry, sunny days, with little wind, when calls were typically heard throughout the day, the increase in sightings of tui over the 9 years of the study were unlikely to be the result of differing weather conditions.

The 1st breeding of tui reported on Miramar

**Table 1** Days month<sup>-1</sup> on which tui (*Prothemadea novaeseelandiae*) were recorded at Worser Bay, Seatoun, Wellington in 1998-2006.

Month	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
Jan	0	0	0	1	0	0	0	1	2	4
Feb	0	0	0	0	0	0	0	1	2	3
Mar	0	0	0	0	0	1	0	0	4	5
Apr	0	0	0	0	1	1	1	5	9	17
May	0	0	0	0	0	1	1	4	12	18
Jun	1	0	0	0	0	1	2	0	8	12
Jul	0	0	1	1	3	0	4	6	14	29
Aug	0	0	0	2	1	0	3	2	22	30
Sep	0	0	0	0	0	0	2	1	17	20
Oct	0	0	0	0	0	0	1	4	12	17
Nov	0	0	0	0	0	0	2	4	20	26
Dec	0	1	0	0	0	0	2	2	22	27
Total days tui seen	1	1	1	4	5	4	18	30	144	208
Total observation days	277	319	323	347	263	324	335	334	326	2856

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. At least 2 juvenile tui were reported at the site in Jan 2005 (Atkinson 2005). As well as pest control, longer-term revegetation of the suburban regions, and preservation and regeneration of bush remnants on the Miramar Peninsula, are likely to have been factors in the increase in tui numbers.

The local increase is presumably part of a general increase in the Wellington region reported by Miskelly *et al.* (2005). The relative isolation of the Miramar Peninsula, with a lack of connecting corridors or patches of forest, may have delayed or inhibited the recolonisation of the peninsula by a range of other forest species that have been recolonising Wellington (Miskelly *et al.* 2005). For example, the New Zealand pigeon (*Hemiphaga novaeseelandiae*), is still rarely seen on the Miramar Peninsula, despite its being present in forest around Wellington City (to the west), Lower Hutt (north across Wellington Harbour) and Eastbourne (to the east, again across Wellington Harbour), although I have seen New Zealand falcons (*Falco novaeseelandiae*) regularly on the peninsula (Bell 2008).

The changing pattern of tui records reported here (Table 1) illustrates the value of sustained documentation of even casual observations of birds from a single site. While the increase has been real, there is likely to be some bias in the reporting rate over time. As tui records increased, the species was more specifically sought for, compared to when it

was infrequent. Proportionately more records may therefore have been missed in earlier years.

The monthly occurrence of tui at Seatoun during 2006 might be explained by the availability of suitable food plants at all times of year in forest remnants and mature suburban gardens there, including bottle brush (*Callistemon* and *Melaleuca* spp.), *Coprosma* spp., *Eucalyptus* spp., flax (*Phormium tenax*), *Fuchsia* spp., kohekohe (*Dysoxylum spectabile*), *Metrosideros* spp., *Pittosporum* spp., *Pseudopanax* spp., puriri (*Vitex lucens*) and *Sophora* spp. However, a study of tui diet in this region is needed before the cause of the seasonal abundance can be determined.

Miramar Peninsula may be seen as a natural 'spill-over' for birds from the 'source' populations of Karori Wildlife Sanctuary and other forests of the Wellington district. Although the increased incidence of tui recorded at Seatoun is dramatic, it is probably based on observations of relatively few individuals, and numbers may decline quickly if local pest management is not maintained. The density of domestic cats (*Felis catus*) remains high in suburban areas on Miramar Peninsula, which poses a significant risk of predation for local bird populations. The area may, therefore, be only a 'sink' for excess birds bred elsewhere in the area. A more optimistic view is that the peninsula is sharing the increase in tui seen elsewhere in the region, as a result of steady regeneration of suitable habitat and particular emphasis on pest mammal control within and beyond the Karori Wildlife Sanctuary (Miskelly *et al.* 2005). It would be a good return on

this effort and investment if, in time, other native forest species also recolonise this outlying coastal area of Wellington.

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[Note added in press: subsequent data from 2007 and 2008 confirm the continued presence of tui in the area, with birds being seen on 76% of 335 observation days in 2007 and 86% of 329 observation days in 2008. In both years, Jul was the month of most records and Feb the month of least records.]