

SHORT NOTE

Seasonal use of Slipper and Spectacle Lakes by New Zealand fairy tern (*Sternula nereis davisae*) and Caspian tern (*Hydroprogne caspia*)

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New Zealand fairy tern (*Sternula nereis davisae*; NZFT) has been documented foraging at 2 dune lakes, Slipper and Spectacle, on the New Zealand North Island east coast near Mangawhai, north of Auckland during January and February (Preddey & Pulham 2017). While it is known that NZFT use these lakes during their post-breeding period (AM Habraken *pers. comm.*; AJ Beauchamp *pers. comm.*) nothing has been published whether they visit at any other time of the year aside from Jeffries *et al.* (2016) recording NZFT flying towards the lakes from Te Arai Stream mouth.

Classed as Nationally Critical (Robertson *et al.* 2017), the national total of NZFT in November 2016 was 38 individuals (AM Habraken *pers. comm.*). NZFT have nested regularly at 3 east coast locations along a 30 km stretch of coastline since 2004, namely Mangawhai and Waipu sandspits and Pakiri River mouth (Fig. 1). Te Arai Stream mouth, 3.5 km to the south of Mangawhai sandspit, is occasionally used as a breeding site, but is well known (both historically and currently) as a post-breeding flock site for east coast birds and is valuable for juveniles in their post-fledging period (Jeffries *et al.* 2016). During the 2016/17 breeding season, 3 NZFT breeding pairs made nesting attempts (laying at least 1 egg each) at Mangawhai sandspit with another

pair at Te Arai Stream mouth (Patience 2017). Also at Mangawhai sandspit GAP recorded a breeding colony comprising a minimum of 60 pairs of Caspian terns (*Hydroprogne caspia*) a species classed as Nationally Vulnerable (Robertson *et al.* 2017). To investigate whether these tern species use Slipper and Spectacle Lakes over a full calendar year, MCH commenced observations of NZFT and Caspian tern in November 2016 and carried these on until the end of December 2017. MCH made the observations from a vantage point on adjacent farmland at Crest Road overlooking both Slipper and Spectacle Lakes.

The vantage point at Crest Road (marked x in Fig. 1) affords views of the whole of Slipper Lake (36.17183°S, 174.63075°E) and the northern portion of Spectacle Lake (36.17968°S, 174.62955°E) and is approximately 150 m from Slipper Lake and 750 m from Spectacle Lake (Fig. 1). Observations were made using 8x42 binoculars. The lakes were scanned for a minimum of 5 minutes and a maximum of 15 minutes on each occasion. Multiple independent scans (several hours apart) were conducted on some days, particularly during the summer months. During a scan, tern species present were recorded and other species were noted. The previous summer (2015/16) MCH and JMP identified NZFT at Slipper Lake and also observed them flying over Spectacle Lake.¹

Observations were made on a total of 226 days with 298 scans lasting a minimum of 1,490 minutes;

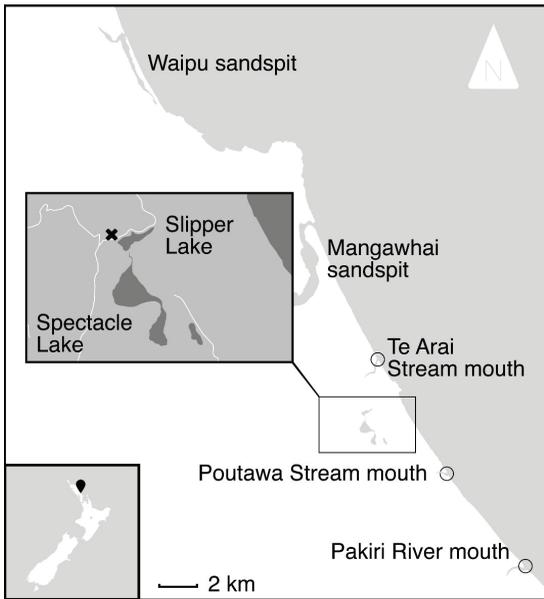


Figure 1. Location map showing the main east coast sites used by New Zealand fairy tern.

giving a total of just under 25 hours of search effort. The search effort varied considerably from month to month. The presence of Caspian tern and NZFT as a percentage of the number of observation periods undertaken each month are shown in Table 1. Caspian Terns were observed circling and occasionally diving during all months except July (when there was also less search effort). They were seen on 141 (47%) of the 298 observation periods,

with peaks of 87% for December 2016 and 88% for November 2017.

There were 9 sightings of NZFT over the 14 months of observations. There were 4 sightings, each of 2 NZFT together, from mid-late December 2017 during observations over a 20 day period. All (100%) of the sightings in this study were of either 1 or 2 birds ($n = 9$) compared with 81% ($n = 19$) of sightings of 1–2 birds by Preddey and Pulham (2017) over the 2015/16 summer, when 19% of sightings also included groups of 3–4 birds. During the 2016/17 summer months (December–March) NZFT were present at Slipper and Spectacle Lakes for a mean of 5% (range 3–6%) of the observation periods. They were absent for the remainder of the year. In only one month (December 2017) of this 14 month period, was the monthly mean presence of NZFT high (20%), and similar to the 25% presence noted during 33 hours of observations at Slipper and Spectacle Lakes the previous summer (late January–February 2016) (Preddey & Pulham 2017). The data indicates considerable variation in levels of lake usage between years.

The fledging dates of east coast NZFT chicks determines the timing of peak numbers of NZFT at Te Arai Stream mouth (36.14613°S, 174.63614°E) where breeding adults, their juveniles, sub-adults, and non-breeders roost post-breeding (authors *pers. obs.*). Successful families gather there once their young can fly strongly and on occasions juveniles join the flock independently. During the 2015/16 breeding season, all 4 east coast NZFT chicks (Fairs 2016; Stanbury 2016), were capable of prolonged flight by mid-January 2016, and accordingly NZFT numbers peaked at Te Arai Stream mouth later that month. By comparison, during the 2016/17 breeding

Table 1. Presence of Caspian terns and New Zealand fairy terns observed over Slipper and Spectacle Lakes from November 2016 to December 2017.

	Nov 2016	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec 2017
Caspian tern present (%)	27	87	53	26	24	15	31	14	0	25	24	62	88	85
Fairy tern present (%)	0	3	6	4	6	0	0	0	0	0	0	0	0	20
Number of days sampled	21	23	29	17	12	11	13	7	3	10	16	16	23	25
Number of periods observed (n)	48	39	48	23	17	13	13	7	3	12	17	21	17	20
Minimum observation time (minutes)	240	195	235	115	85	65	65	35	15	60	85	105	85	100

¹ We are aware that solo Little Tern *Sternula albifrons* visit Mangawhai Harbour infrequently. We are also aware of a single record of that species at Te Arai Stream mouth since 1993 (GAP, *unpubl. data*). It is therefore possible that a sighting, particularly at a distance over Spectacle Lake, could be of this species.

season only 1 of the 4 east coast chicks that survived post-fledging was capable of sustained flight by mid-January 2017, and the other 3 fledglings did not reach this stage until well into February 2017 (Patience 2017). Thus the family groups would not have been expected to appear at Te Arai Stream mouth until later in February.

There was a stark contrast in the peak numbers of NZFT flocking at Te Arai Stream mouth over the 2 consecutive summers. Maximum flock counts of 23 and 16 were recorded in January and February 2016 respectively, whereas maxima of 4 and 4 were reported for the same months in 2017 (AM Habraken *pers. comm.*). With far fewer terns congregating at Te Arai Stream mouth post-breeding in 2017, it is not surprising that fewer were observed traversing Slipper and Spectacle Lakes over the summer of 2016/17 compared with the previous 2015/16 summer by Preddey & Pulham (2017).

A contributing factor to the low January and February 2017 flock counts at Te Arai Stream mouth may have been that the stream mouth became occluded by sand during the 2016/17 summer. The resultant stagnation of the water trapped in the stream may have rendered the area unattractive as a roost site towards the end of that summer. Reported sightings of NZFT indicated that they headed to the Kaipara Harbour earlier than usual in 2017 (AM Habraken *pers. comm.*). The condition of Te Arai Stream mouth needs noting each summer, over multiple breeding seasons, to determine whether its attractiveness as a roost site is dependent on the stream water flowing freely.

NZFT may well forage over the dune lakes at other times of the year, but it appears unlikely based on our observations. It is also unlikely given that the majority of the NZFT population are known to move to the Kaipara Harbour during autumn and winter (Parrish & Pulham 1995; AM Habraken *pers. comm.*). The observations in December 2017 of 2 birds over the lakes together, raises the question of whether non-breeding pairs, or breeding pairs that are in-between nesting attempts, forage over these lakes during the summer months. If this is the case then it emphasises the importance of these lakes as a foraging resource. These observations show that NZFT used Slipper and Spectacle Lakes from mid-December 2016 to early March 2017 and again in December 2017, while Caspian terns were present throughout the year with a peak in usage during the chick-rearing months of November and December.

The number of Caspian tern breeding at the Mangawhai colony has declined from 120 pairs in the mid-1980s (Howell & Gaze 1987; Keeley & Gaze 1988) to 50–60 pairs in 2016 and 2017 (GAP *unpubl. data*). The NZFT population appears to be static at about 40 individuals (Preddey & Pulham 2017). Both species rely on undisturbed nesting and feeding areas to breed successfully. It is imperative

that these areas are protected, safe-guarded, and managed to ensure the continued survival of both these terns in New Zealand.

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