

New Zealand Fairy Tern (Tara-iti) *Sterna nereis davisae* Recovery Plan

1997 - 2002

THREATENED SPECIES RECOVERY PLAN NO. 23



Department of Conservation
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1. Summary

This recovery plan briefly summarises the changing numerical status and distribution of New Zealand fairy tern *Sterna nereis davisae* over the past 100 years. It details a conservation programme for the species, based on the perception that extreme weather events and mammalian predation remain the principal threats to the species.

The fairy tern is probably New Zealand's rarest breeding bird, with a population of around 30 individuals (c. 9 breeding pairs). It has a highly restricted distribution, confined in recent years to the south-east coast of Northland and the Kaipara Harbour. In the 19th century fairy terns were widespread but localised throughout much of the North Island and eastern parts of the South Island. In the 20th century birds bred around Pakiri and Whangarei until the 1950s and 1960s. The reason for the decline to the present distribution and numbers is unclear, but modification and degradation of breeding habitat, predation by introduced mammals, extreme environmental events, infertility, and disturbance by humans during the breeding season are probably the primary causes.

A recovery programme is outlined, the long-term goal of which is -

"To increase the population of fairy tern; improve their conservation status from Category A (endangered) to Category B (threatened), and expand their breeding range back into parts of their former range."

The short-term goals for the next five years are;

- a) To prevent the extinction of the New Zealand subspecies
- b) To increase the breeding population by 25% by 2002

The six objectives which set the direction for the five year period are:

1. To protect all known breeding pairs and nesting areas, including individuals found at new sites.
2. Maximise breeding productivity by manipulation.
3. Measure the population parameters and monitor the population dynamics of fairy tern.
4. Review and improve the legal status of the breeding and flocking habitat of fairy tern, and protect all known and potential habitat from development.
5. Raise public awareness of the need for the conservation of fairy tern.
6. Formalise a Fairy Tern Recovery Group.

Eleven topics have been ear-marked for research (in priority order):

- Sexing of fairy terns
- Nest relocation
- Cause of predation
- Taxonomic status of New Zealand fairy tern

- Life expectancy
- Movement and migration
- Parent-chick recognition and parental care
- Hatching and rearing of tern chicks in captivity
- Nest protection cages
- Assessing plumage
- Habitat requirements

2. Introduction

The New Zealand fairy tern (*Sterna nereis davisae*) (Mathews and Iredale 1913) is an endemic subspecies of an Australasian species which is found in Australia (*Sterna n. nereis*) and New Caledonia (*S. n. exsul*) (Harrison 1983; Howard and Moore 1984, Rogers in Higgins & Davies 1996). Five other taxa of terns; little (*S. albifrons*), Saunders (*S. a. saundersi*), least (*S. a. antillarum*), Peruvian (*S. lorata*) and Amazon (*S. superciliaris*) are closely related to the fairy tern. All six taxa have essentially separate distributions and form a superspecies (Smith 1990).

Mathews and Iredale (1913) described the New Zealand subspecies but several authors referred to the New Zealand bird as a population of the Australian subspecies/species (Kinsky 1970, 1980, Falla *et al.* 1979, Shaw in Robertson 1985). Bell (1986) classified the fairy tern as endangered in New Zealand but did not recognise it as an endemic subspecies. The 1990 edition of the Checklist of the Birds of New Zealand (Turbott, 1990) reinstated the subspecific status of New Zealand fairy tern. This was supported by Rogers (in Higgins & Davis 1996). In this recovery plan the New Zealand population is treated as an endemic subspecies.

The fairy tern is the smallest tern breeding in New Zealand. Adults are 210-270 mm in length, weigh approximately 70g, have a bill length of 30.7mm (28.8-32.2mm) and wings 172-196mm long (Hitchcock 1959; Rogers in Higgins & Davies 1996). The New Zealand fairy tern differs from the Australian subspecies (*S. n. nereis*) in having; longer wings, a shorter tail, more black in front of the eye, a black iris, darker first primary, and being probably darker overall dorsally (Hitchcock 1959, 1967, Slater 1971, Serventy *et al.* 1971, Harrison 1983, Shaw in Robertson *et al.* 1985, Hill *et al.* 1988, Rogers in Higgins & Davies 1996).

The Eastern little tern (*Sterna albifrons sinensis*), which visits New Zealand every summer, is often very similar to the fairy tern in non-breeding plumage and it can be difficult to distinguish between the two. Adult Eastern little terns in breeding plumage differ from fairy terns in having; yellow legs, a yellow bill with a black tip, a black eye stripe which extends to the bill, a white forehead which extends backwards above and beyond the eye forming a white superciliary stripe, black outer webs on the outermost two or three primaries, and a broad black line on the inner web which gives the wing a black outer edge.

The greatest difficulty in trying to distinguish between fairy terns and Eastern little terns occurs in the austral autumn. During this season fairy terns are moulting into their eclipse plumage and little terns are in breeding plumage. However, fairy terns always have a brighter bill and legs, and pale primaries. Immature birds of the two species are almost indistinguishable in the field, as are adult little terns in non-breeding plumage and immature fairy terns.

3. Status, Distribution and Decline

3.1 PAST DISTRIBUTION

All records of small "*Sterna*" terns before the 1950's were recorded as fairy terns because the Eastern little tern was not recognised as visiting New Zealand prior to this (McKenzie and Sibson 1957, Sibson and Edgar 1962). The number of records suggests that fairy terns were widespread around the coast of the North Island and eastern South Island (Figure 1), but were not abundant in any area. However, some records prior to 1957 are open to doubt. The first reference to the species in New Zealand is by Potts (Oliver 1955) who recorded a pair breeding on the Rakaia River in Canterbury in 1869. Buller (1888) described the species as "tolerably common". Oliver (1955) lists the following distribution records: "... formerly common in Marlborough and Canterbury Pakiri, Whangaroa, Whangarei, Ruakaka, Mangawhai, Kaipara, Manukau Harbour, Firth of Thames, Raglan, Tauranga, Rangitaiki, Waikanae, Porangahau, Wairau Bar, Lake Ellesmere". Buller (Oliver 1955) recorded seeing a pair on Lake Papaitonga near Levin and MacDonald (1953) records sightings from Tauranga, Manawatu, Blenheim and the Rangitikei River and some eggs from Hawkes Bay within the last 20 years i.e. 1930-50. In more recent times birds were noted breeding at Skull Creek in Whangarei Harbour (1951) and at least eight pairs were breeding along the Pakiri-Te Arai coast until the early 1970s (G. Moon pers. comm.).

3.2 PRESENT DISTRIBUTION AND STATUS

Falla *et al.* (1979) and Shaw (in Robertson *et al.* 1985) stated that less than ten pairs were likely to be breeding in New Zealand, and that they were all located between Mangawhai and Ruakaka. From 1976 until 1984 the population decreased from an estimated eight pairs to three pairs (Jowett 1987, Parrish & Pulham 1995b). Protection of nest sites at Mangawhai and Papakanui Spit on the Kaipara Harbour was initiated by the New Zealand Wildlife Service in 1983, and at Waipu in 1984 (Jowett 1987).

Fairy terns are now confined to the lower half of the Northland Peninsula (Figure 2), and breeding is restricted to three regularly used sites; Waipu, Mangawhai and the South Kaipara Head. The wintering range of the birds extends over the Kaipara Harbour with occasional sightings from other areas i.e. Manukau Harbour, Firth of Thames.

Outside the breeding season, fairy terns form flocks on the Kaipara Harbour. It appears that the east coast birds mainly congregate around Tapora, although juveniles from the east coast have been sighted at Papakanui Spit.

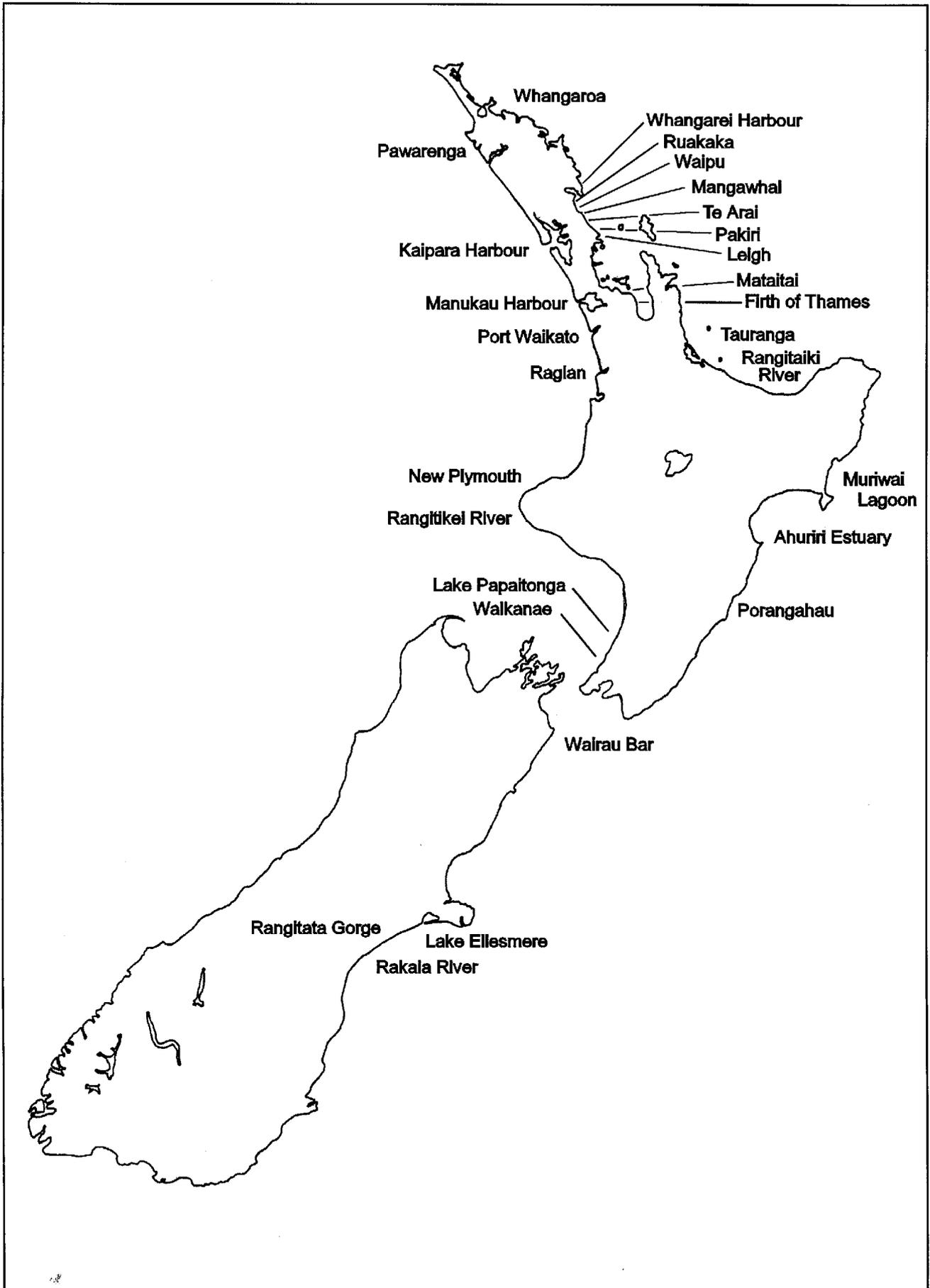


Figure 1. Past distribution of Fairy Tern in New Zealand (pre - 1986)

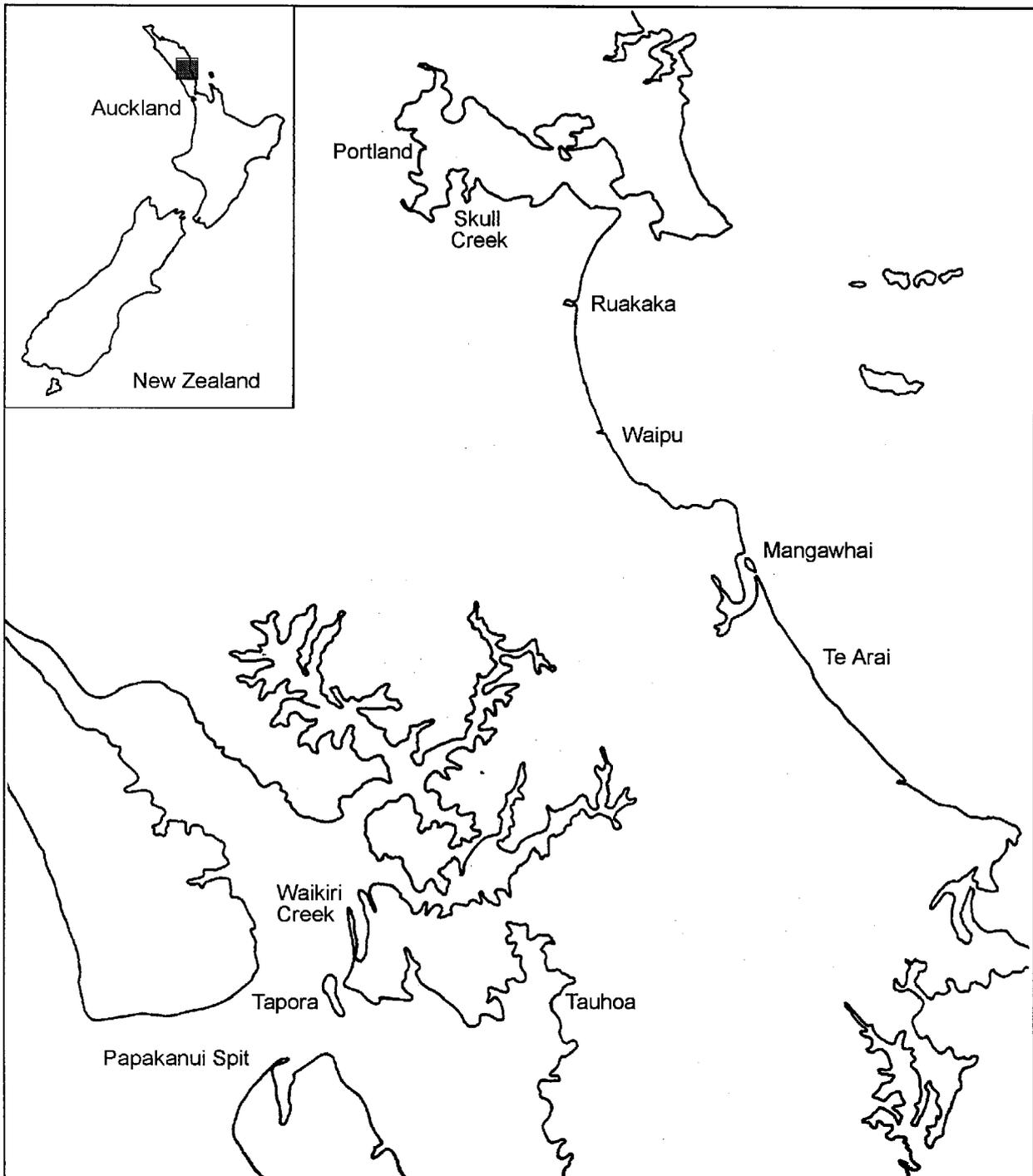


Figure 2. Present distribution of Fairy Tern in New Zealand (1986 - 1997). N.B. Map does not include sightings at Manukau Harbour and Firth of Thames.

The movements of the west coast birds is unclear, but at least one banded bird has been observed roosting at Tapora. The flock stays together until the end of June when birds disperse and can occasionally be seen back at east coast sites (Parrish & Pulham 1995b).

Jowett (1987) estimated that a maximum of eight breeding pairs were in existence in 1976. This declined to 3-4 pairs in 1983/84, and a total population of 16-18 individuals in 1986. Surveys of breeding sites and post-breeding flocking sites from 1991-94 indicated that the population contained approximately 30 individuals, with c. 9 breeding pairs (Parrish & Pulham 1995b). Recent surveys (20/4/96, 26/3/97) at post-breeding flocking sites detected a minimum of 26 individuals.

The New Zealand Fairy Tern is ranked as a Category A species (highest priority species for conservation action) by Molloy and Davis (1992).

3.3 POSSIBLE REASONS FOR DECLINE

It is difficult to ascertain the causes of decline of the New Zealand fairy tern. The most likely factors contributing to the decline of fairy tern are; modification and degradation of breeding habitat, predation by introduced mammals, extreme environmental events, infertility, and disturbance by humans during the breeding season.

Cummings (1991) found that stabilisation of the sand dune environment for residential development, pine plantations, and pastoral farming, reduced the number of areas of mobile sand used by New Zealand dotterels (*Charadrius obscurus*) for nesting. Fairy terns nest in more exposed areas of mobile sand and are likely to have suffered greater habitat loss. Jowett (1987) attributes the loss of fairy terns from Pakiri-Te Arai beaches, in part, to the planting of marram, lupin and pines, but he attributes most of the blame to increased residential development and an increase in the number of day visitors.

The disappearance of eggs and chicks has occurred on many occasions. Of the 65 eggs and chicks lost since 1992/93 a minimum of 32% were suspected to have been preyed upon (Table 1). However, the predators responsible have not been identified. Likely candidates include: southern black-backed gulls (*Larus dominicanus*), red-billed gulls (*Larus novaehollandiae*), Australasian harriers (*Circus approximans*), hedgehogs (*Erinaceus europaeus*), possums (*Trichosaurus vulpecula*), cats (*Felis catus*) and mustelids (*Mustela* spp). Rats (*Rattus* spp) were suspected of taking eggs on two occasions (Jowett 1987, Shaw 1990). The loss of eggs and chicks from two nests in 1993 at Mangawhai were suspected to have been caused by variable oystercatchers (*Haematopus unicolor*) (Parrish & Pulham 1995a).

TABLE 1: KNOWN LOSS OF NEW ZEALAND FAIRY TERN EGGS AND CHICKS SINCE 1992/93

CAUSE	1992/93	1993/94	1994/95	1995/96	1996/97	TOTAL
Environment	7	5 ^a	3	7 ^d	4 ^e	26 (40%)
Non-viable	3	2	3	0	1	9 (14% ^f)
Suspected Predation	2	4	11	2	2	21 (32%)
Unknown	2	2	2 ^b + 2 ^c	0	1	9 (14%)
	14	13	21	9	8	65

Notes:

- a. egg subsequently determined to be infertile
- b. Suspected infanticide of 2 chicks
- c. 2 eggs abandoned by parents, reason unknown
- d. 2 eggs abandoned by parents in adverse weather conditions and subsequently determined to be infertile
- e. eggs abandoned by parents in adverse weather conditions and subsequently determined to be infertile
- f. This value would equal 22% if the data on infertility from the above eggs is included

introduced predatory mammals are likely to have had, and will continue to have, a negative effect on fairy tern numbers, as they have on many ground nesting birds in New Zealand. Smith (1990) quotes a number of sources who recorded gulls, oystercatchers, rats, dogs and cats preying upon eggs and/or chicks of the little tern in America, Europe and Australia. He states that dogs appear to be the major predator in Australia.

Another common cause of nest failure is extreme environmental events. Since 1992/93 high tides, flooding, storms, and cyclones have been responsible for the failure of 40% of eggs and chicks lost (Table 1).

Infertile eggs have been recorded or suspected on a number of occasions. Since 1992/93 22% of the eggs of New Zealand fairy terns have been non-viable i.e. infertile, added (Table 1). In 1993/94, three nests each contained an infertile egg. For two of these nests one of the pair was a first time breeder (aged 2 years). One of these birds laid an infertile egg again in 1994/95. Infertility has also been recorded from older birds. See Jowett (1987) for further notes on the incidence of infertility in New Zealand fairy terns. The death of embryos (probably due to exposure to the elements) has also been recorded (R. Parrish, unpublished data.). Exposure is likely to result from birds being disturbed during incubation by predators, people, dogs, and vehicles.

Many recreational activities occur on Northland peninsula beaches, particularly during the summer months, and birds are continually being disturbed by swimmers, sunbathers, walkers, people fishing, barbecuing and picnicking. All these activities cause the birds to leave their eggs or chicks temporarily or cease to defend them. This can result in eggs becoming overheated or chilled, or preyed upon. New Zealand dotterel and variable oystercatcher eggs and chicks have been crushed by four-wheel drive vehicles and motorbikes (Shaw 1990). This has not yet been recorded for fairy tern but should be considered a potential threat.

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