

## Rediscovery of the New Zealand storm petrel (*Pealeornis maoriana* Mathews 1932): two sightings that revised our knowledge of storm petrels

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**Abstract** A small black-and-white storm petrel seen off Whitianga, New Zealand, in Jan 2003 was tentatively identified as a New Zealand storm petrel (*Pealeornis maoriana*). A further sighting in the Hauraki Gulf in Nov 2003 of multiple birds identified as New Zealand storm petrels led to the realisation that the species was both extant and apparently locally common. Prior to these sightings this enigmatic seabird was known only from 3 specimens collected in the 1800s, and unreported since. This paper reviews these 2 sightings that constitute the rediscovery of an 'extinct' species not reported for more than 150 years. Possible reasons for the lack of sightings before 2003 are discussed and a review of black-and-white storm petrel records prior to 2003 around northern New Zealand is presented.

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### INTRODUCTION

The New Zealand storm petrel *Pealeornis maoriana* (hereafter NZSP) is a seabird taxon often overlooked in the recent literature. It was known only from 3 specimens collected in New Zealand oceanic waters in the 19th century (Quoy & Gaimard 1830; Bourne & Jouanin 2004; Medway 2004; Bourne *et al.* 2004), until 2003 when 2 separate sightings, 1st off the Coromandel Peninsula, then in the Hauraki Gulf, supported by photographic and video evidence, spectacularly raised the species 'from the dead'. Despite a cautious initial response by several authorities, these sightings led to international recognition that the species was both valid and extant (Saville *et al.* 2003; Flood 2003).

On the strength of the 2003 sightings, organised pelagic trips into the Hauraki Gulf in 2004 and 2005 searched for more NZSPs and found they were consistently present throughout the austral summer (Gaskin & Baird 2005). Research programmes were instigated, leading to live captures of NZSP in the Hauraki Gulf in Nov 2005 and Jan 2006 that confirmed that the birds were indeed the same taxon as the 19<sup>th</sup> Century museum specimens (Scofield 2007; Stephenson *et al.* submitted ms).

The taxon now known as *Pealeornis maoriana* was first considered to be conspecific with *Thalassidroma lineate*, which had been described by Peale from Samoa (Cassin 1858). It was then given its own genus and species *Pealeornis maoriana* by Mathews (1932), but this genus was later synonymised with *Oceanites* (Oliver 1955). Murphy & Snyder (1952) considered the taxa to be only a colour morph of Wilson's

storm petrel *Oceanites oceanicus* and considered this dimorphism the “*Pealea*” phenomenon. In a review of the history of these 3 specimens and several other streaky storm petrels originally considered part of the same “*Pealea*” phenomenon, Stephenson *et al.* (submitted ms) suggest the reinstatement of the scientific name *Pealeornis maoriana* and adoption of the common name New Zealand storm petrel, which we use herein.

The purpose of this paper is to summarise details of the first 2 sightings that, combined, led to the rediscovery of the NZSP and eventually to official acceptance by the Ornithological Society of New Zealand’s (OSNZ) Rare Birds Committee. Although the two initial (2004) submissions did not satisfy, “beyond reasonable doubt that the birds seen and photographed by the reporters in the outer Hauraki Gulf are identical to the only 3 known specimens in Tring and Paris that Mathews described as *Pealeornis maoriana*” (Rare Birds Committee 2005), subsequent captures and studies in the hand of live NZSPs in Nov 2005 and Jan 2006 (Stephenson *et al.* submitted ms) provided the detail that confirmed formal acceptance of the rediscovery (Scofield 2007).

### First sighting

On 25 Jan 2003, a pelagic birding trip organised by Wrybill Birding Tours, NZ departed from Whitianga at approximately 10:35 h, returning 20:55 h. Sea conditions were moderate, with a 1 m swell and a 1 m chop, increasing during the latter afternoon. The wind was from the SW with strength 20-30 knots, increasing slightly during the afternoon.

The vessel set out into Mercury Bay, heading generally NEE, with the aim of spending most time along the 100 m depth mark. Whilst steaming through Mercury Bay small groups (2-5+) of feeding white-faced storm petrels *Pelagodroma marina* were encountered (150+ during the day). When at position 36° 43' 45" S; 176° 01' 58" E (approximately 10 nm east of Opito Point), SS spotted a small black-and-white storm petrel approaching the bow. Several other observers onboard saw it and BMS took 6 photos of the storm petrel as it crossed the bow several times, coming no closer than 30 m. The storm petrel was in view for just over a minute before then heading off NE, the general direction from which it had come. No further black-and-white storm petrels were seen that day, even whilst chumming at various locations, and the consensus onboard was that we had seen a black-bellied storm petrel *Fregetta tropica*. Two further pelagic trips from Whitianga on 7 Sep 2003 and 6 Nov 2003 failed to see black-and-white storm petrels, despite using ‘drift and chum’ techniques.

The black-and-white storm petrel was widely discussed through publications (Saville *et al.* 2003) and on the internet, and it was A.J.D. Tennyson, Museum of New Zealand Te Papa Tongarewa, who suggested in an email “And how about this for a suggestion way out of left field...it’s *Oceanites maorianus* - the plumage matches!”. BMS & SS became increasingly convinced that they had seen the ‘extinct’ NZSP, but this was not universally accepted. Then in late Nov 2003, RF & BT reported that they had sighted, photographed and videoed a flock of near identical black-and-white storm petrels in the Hauraki Gulf that they identified as NZSP.

### Second sighting

On 17 Nov 2003 RF & BT chartered a small fishing boat (MV *Assassin*) from Sandspit, just north of Auckland. The purpose was to study white-faced storm petrels close-up in the outer Hauraki Gulf. The method used to attract storm petrels was the same as the ‘drift and chum’ technique RF & BT use to attract European storm petrels *Hydrobates pelagicus* and Wilson’s storm petrels off the Isles of Scilly, UK. This involved drifting for 2 or 3 hours whilst hanging onion bags filled with pummelled fish (‘rubby-dubby’) over the side and just below the surface (Flood & Thomas 2007). MV *Assassin* left harbour at 07.30 h and the skipper steamed to 2 nm north of Little Barrier I, a location suggested by K. Baird and C. Gaskin as productive for seabirds. After arrival at approximately 09.00 h they started drifting with ‘rubby-dubby’ deployed. Sunlight was strong, skies clear, and wind was W force 5-6 that, coupled with strong currents in the Hauraki Gulf, resulted in a relatively rough sea-state for the small vessel.

Approximately 20 minutes later a storm petrel arrived from down-wind. It was a medium-sized black-and-white storm petrel, and not the expected white-faced storm petrel. The storm petrel fed about 30 m off the boat, then continued along the oily chum slick forming up-wind, directly into the sunlight. Over the following hour-and-a-half more of these black-and-white storm petrels arrived from down-wind, heading straight for the slick. They mainly remained on the slick where up to 10 were counted at 1 time. About 20 of these black-and-white storm petrels visited the slick and were photographed and videoed. It was not immediately obvious what species they were, but initial thoughts were that they ‘must be’ black-bellied storm petrels.

MV *Assassin* then changed location and drifted from 13:00 h to 16:00 h about 1.5 nm off Needles Point at the N end of Great Barrier I. Many white-faced storm petrels were seen, but no more black-

and-white ones. Analysis of the photographs that evening and the next day led to the realisation that the black-and-white storm petrels fitted the description of NZSP as discussed in Saville *et al.* (2003). The NZSP indeed was apparently not extinct! RF & BT then flew to Sydney from where they contacted SS & BMS with the news. Over the next few months all 4 of us became engaged in perhaps the most exciting of dialogues possible for serious birders, our rediscovery of a species presumed to be extinct.

## DISCUSSION

With the exception of Oliver (1955), the NZSP was either over-looked or merely mentioned as a colour variant in most New Zealand reference texts published since 1932. Our lack of awareness of the NZSP was therefore not surprising, leading to our initial identifications of the birds seen during Jan and Nov 2003 as black-bellied storm petrels. Perhaps the greatest surprise is that it has taken more than 150 years for the species to be rediscovered, especially when pelagic birding trips in the outer Hauraki Gulf are now able to reliably find them, often in some numbers (Gaskin & Baird 2005; Stephenson *et al.* submitted ms). Where have these birds been all this time?

Although pelagic birding trips are a recent phenomenon, the Hauraki Gulf has been relatively well visited by ornithologists over the past century. Between the 1960s and 1980s there were hundreds of visits to the islands in northern New Zealand, conducted by Wildlife Service (G. Taylor *pers. comm.*), and subsequently Department of Conservation staff, many of them reported in *Notornis*. Often these people were going to these islands to study seabirds, and many were excellent observers who spent time looking for birds during travel to these islands. Why were no NZSP recorded on these trips?

We suggest there are two possible reasons. Firstly, both first sightings outlined above were supported by digital photography that facilitated discussion of the Jan 2003 sighting and provided further evidence for the Nov 2003 sighting (Flood *et al.* 2004). Secondly, the Nov 2003 sighting was made whilst utilising 'drift and chum' techniques. Observing storm petrels from a steaming vessel is difficult, and identification even more so. Similar 'drift and chum' techniques employed on trips into the Hauraki Gulf since Nov 2003 would appear to account for the vast majority of subsequent NZSP sightings (Gaskin & Baird 2005; B. Stephenson *unpubl. data*). Perhaps this species has always been

there but evaded being seen and recognised until the use of "drift and chum" brought birds in closer to study and modern photography allowed detailed analysis. Digital photography has continued to greatly assist in confirming NZSP sightings by allowing subsequent examination by independent observers.

Alternative hypotheses explaining the rediscovery of NZSP are that the species has only recently moved back into northern New Zealand following changes in oceanic conditions, or that the population of this species has increased to a level at which they are now more obvious, due to nesting on an island that has had rodents recently removed. Both of these alternatives seem unlikely. Firstly, at least 2 of the 3 original specimens of the species were collected in northern New Zealand (Bourne *et al.* 2004). Secondly, there have been no additional seabird species suddenly recorded (or becoming absent) as a result of oceanic changes. Influxes of both Wilson's and grey-backed storm petrels *Garrodia nereis* have occurred sporadically in the past (see below), but the continued sightings of NZSP over 4 consecutive seasons are clearly not of the same nature. Thirdly, most of the islands that have now been made rodent free in the Hauraki Gulf have been made so in the last 2 decades, an amount of time that would seem insufficient to lead to an increase in population size from almost no birds to the level with which we are now seeing them. This is not to say that a population increase has not occurred, but that this alone seems unlikely to be why we are now observing birds. We favour the hypothesis that the species has been present in low numbers in the outer Hauraki Gulf ever since initial collection of the specimens, and has either remained unrecorded or incorrectly identified.

With poor views it would be easy to misidentify a NZSP as either a Wilson's, white-bellied *Fregatta grallaria*, or black-bellied storm petrel, as indeed we did initially for both 1st sightings. Although Wilson's and grey-backed storm petrels have been recorded in the Hauraki Gulf, and other parts of northern New Zealand, since the rediscovery (therefore with identification being made in light of knowledge that the NZSP is extant) this has not been a frequent occurrence. The large numbers of grey-backed storm petrels seen within the Hauraki Gulf in Sep 1981 certainly stands out as an anomaly (Miskelly 2006; Table 1, 14). Despite regular trips since 2003, there have been no recent records of white-bellied or black-bellied storm petrels in the Hauraki Gulf, with only 1 recent record of a probable black-bellied storm petrel off North Cape in May 2005 (<http://>

Table 1. Sightings of black-and-white storm petrels around northern New Zealand (north of and including Waikato north on the west coast and Bay of Plenty north on the east) prior to 2003.

	Date	Species	Location	Observation type	Observer
1	1886	Black-bellied	Burgess I, Mokohinau Is	1 below lighthouse	W.R. Wilson <sup>1</sup>
2	1939-59	Wilson's	Auckland E Beach patrol zone	Beach-cast specimen	Unknown <sup>2</sup>
3	1941-42	Wilson's	Mata, Whangarei	1 seen	W. Sanderson <sup>3</sup>
4	09/02/53	Wilson's	Otumoetai Beach, Tauranga	Beach-cast specimen	M. Hodgkins <sup>25</sup>
5	04/10/62	Black-bellied	55-190 nm W of North Cape	3 seen, then 1 seen	A.Y. Norris <sup>4</sup>
6	05/10/62	Black-bellied	7 nm N of the Hen & Chickens Is	1 seen	A.Y. Norris <sup>4</sup>
7	08/11/62	Wilson's	80 nm E of Great Barrier I.	1 seen	A.Y. Norris <sup>4</sup>
8	06/12/69	White-bellied	Between Tutukaka & Poor Knights Is	2 seen	J.P. Croxall <sup>5</sup>
9	07/12/69	Grey-backed	Between Tutukaka & Poor Knights Is	1 seen	J.P. Croxall <sup>5</sup>
10	18/12/71	Wilson's	Ngunguru Bay, Whangarei	Beach-cast specimen	W. Campbell, M. Munro <sup>6 &amp; 25</sup>
11	23/04/78	White-bellied	Ninety-mile Beach	Beach-cast specimen	D.E. Crockett <sup>7</sup>
12	16/12/78	Wilson's	Port Waikato, Auckland W	Beach-cast specimen	A. Habraken <sup>25</sup>
13	23/05/79	Wilson's	5 nm W of Cape Colville on course for Tiritiri Matangi I.	3 seen	T.G. Lovegrove & C. Miskelly <sup>8</sup>
14	01/09/81	Grey-backed	Between Rangitoto & Little Barrier Is	104 seen, with max of c.30 at one time	C. Miskelly <sup>9</sup>
15	June 82	Wilson's	Bay of Plenty Beach patrol zone	Beach-cast specimen	G.A. Taylor <sup>10</sup>
16	18/01/83	Wilson's	Whangaparaoa Beach, Bay of Plenty	Beach-cast specimen	G.A. Taylor <sup>11</sup>
17	13/05/84	Wilson's	Maunganui Bluff to Schick Rd, Auckland W	Beach-cast specimen	D.E. Crockett <i>et al.</i> <sup>12 &amp; 25</sup>
18	26/05/84	Wilson's	Ocean Beach, Whangarei	Beach-cast specimen	B. & A. Poulton <sup>12 &amp; 25</sup>
19	17/05/85	White-bellied	Piha, Beach, Auckland W	Beach-cast specimen	A. Ringer <sup>13 &amp; 25</sup>
20	28/05/86	Wilson's	Halfway between Great Barrier & Little Barrier Is	1 seen	P.F. Battley <sup>14</sup>
21	06/04/87	Wilson's	Rurima Islets, Whakatane	1 seen	W.M. Hutton <sup>15</sup>
22	03/05/89	Storm petrel sp.	Little Barrier I.	1 seen	A.J. Tennyson <sup>16</sup>
23	13/04/90	Wilson's	Between Mokohinau Is and Great Barrier I.	3 seen, including 2 together	A.J. Tennyson, G.A. Taylor, T.G. Lovegrove <sup>17</sup>
24	16/04/90	Wilson's	W of Mokohinau Is	1 seen	A.J. Tennyson, G.A. Taylor, T.G. Lovegrove <sup>17</sup>
25	23/04/90	Wilson's	To the S of Little Barrier I.	1 seen	A.S. Rowe, P. Scofield, T.C. Greene <sup>17</sup>
26	20/05/90	Wilson's	To the SW of Little Barrier I.	1 seen flying N	A.J. Tennyson, P. Scofield <sup>17</sup>
27	25/10/90	Wilson's	2 nm offshore at Matata	1 seen	W.M. Hutton <sup>18</sup>
28	Nov 1990	Grey-backed	c. 1 nm W of Little Barrier I.	1 seen with White-faced storm petrels	H. Spencer <sup>19</sup>
29	08/01/91	White-bellied	Between Little Barrier and Great Barrier Is	1 seen with White-faced storm petrels	W. Pickwell <sup>20</sup>
30	17/03/93	Wilson's	2 nm N of Motiti I.	1 seen	J.E. Houston <sup>21</sup>

Table 1. Continued.

31	18/01/96	Wilson's	Rurima Islets, Whakatane	1 seen	W.M. Hutton <sup>22</sup>
32	01/01/99	Wilson's	Bream Bay, Northland	Beach-cast specimen	A. Williams <sup>23</sup>
33	06/02/99	Black-bellied	Moutohora I., near Whakatane	Beach-cast specimen	S. Rowe <sup>23</sup>
34	09/01/01	Storm petrel sp.	Mangawhai Wildlife Refuge	Beach-cast specimen	A. Williams <sup>24</sup>

1 Sandager 1889, 2 Bull & Boeson 1961, 3 Ornithological Society of New Zealand 1942, 4 Norris 1965, 5 Jenkins & Croxall 1970, 6 Veitch 1980, 7 Sibson 1978, 8 Sibson 1979, 9 Miskelly 2006, 10 Powlesland 1984, 11 Taylor 1983, 12 Powlesland 1986, 13 Powlesland 1987, 14 Howell 1987, 15 Keeley 1988, 16 Taylor 1990, 17 Taylor & Parrish 1991, 18 Taylor & Parrish 1992, 19 Gaskin & Baird 2005, 20 Guest 1992, 21 Taylor & Parrish 1994, 22 Parrish & Lock 1997, 23 Taylor 2004, 24 A. Williams *pers comm.*, 25 OSNZ Beach Patrol Scheme *unpubl. data*

*www.nzseabirds.com*, 13 Sep 2007). This suggests that both *Fregatta* spp. are uncommon to rare in northern New Zealand waters, a conclusion supported by few beach cast specimens (Table 1).

In order to determine whether NZSPs may have been present in the Hauraki Gulf throughout this period but were misidentified, we reviewed all available records of black-and-white storm petrels from northern New Zealand waters prior to 2003 (Table 1). Some of these sightings have been reviewed elsewhere prior to the rediscovery of NZSP (Petyt 2001) and following it (Gaskin & Baird 2005; Miskelly 2006), and many of the records may indeed be of the species originally claimed. However, re-analysis of these sightings now that we know that the NZSP is extant allows an alternative identification to be hypothesised that was probably not considered by most observers before 2003. Several of these records (e.g., sightings 4 & 12 in Table 1) have not been published before and were found only as Beach Patrol Cards within the Ornithological Society of New Zealand's Beach Patrol database. There may well be more.

The 1886 record of a black-bellied storm petrel captured at the Burgess I. lighthouse, Mokohinau Is (Table 1, sighting 1), was most likely a NZSP. Night-time spotlighting searches in recent years have resulted in unconfirmed sightings of NZSP in this area (M. Imber *pers. comm.*), and the Mokohinau Is have been considered by some as the strongest possibility for the species' breeding location (Gaskin & Baird 2005). The sightings of black-bellied storm petrels off northern New Zealand by A.Y. Norris in Oct 1962 are also of interest, especially the bird seen north of the Hen & Chicken Is (Norris 1965; our Table 1, sighting 6). Although at the right time of year for southward migration of black-bellied storm petrels, we consider that this bird is more likely to have been a NZSP returning to the Hauraki Gulf, where they are known to be present from Oct to Mar (Gaskin & Baird 2005). Unfortunately,

this bird was not described by Norris in his paper, although interestingly when discussing the difficulty of distinguishing black-bellied and white-bellied storm petrels, Norris (*ibid*) stated that "The problem of identification is complicated by variable amounts of dark streaking on the undersides of *grallaria*." The only white-bellied storm petrels that he documented were nearly 900 nm to the W of North Cape. Probably the most compelling record of a possible NZSP, however, is that by J.P. Croxall of 2 "white-bellied storm petrels" seen between Tutukaka and the Poor Knights Is on 6 Dec 1969 (Jenkins & Croxall 1970; our Table 1; sighting 8). The written description of the 1 bird which came close enough to be adequately viewed fits NZSP, especially "The lower breast, abdomen, flanks, and undertail coverts were white, with a few dark marks on the flanks." We suggest that the Jan 1991 sighting of a "white-bellied storm petrel" feeding with white-faced storm petrels between Little Barrier and Great Barrier Is (W. Pickwell *in* Guest 1992; our Table 1, sighting 29) is also likely to have been a NZSP based on the time of year and location. Given the possible confusion with NZSP, we recommend that all live records of white-bellied storm petrels within New Zealand coastal waters to date be considered either incorrect or, at best, unsubstantiated. On the other hand, the beach-cast white-bellied storm petrel found in 1978 (Sibson 1978; our Table 1, sighting 11) is in the collection at Canterbury Museum (Av 39130), and is undoubtedly a white-bellied storm petrel (R.P. Scofield *pers. comm.*). The remaining beach-cast white-bellied storm petrel found by A. Ringer on 17 May 1985 (Powlesland 1987; OSNZ Beach Patrol Scheme *unpubl. data*; our Table 1, 19) is unable to be verified due to the lack of a specimen or description of the bird.

In some years there appear to have been influxes of Wilson's storm petrels into the Hauraki Gulf. The multiple sightings of this species near the Mokohinau Is and Great and Little Barrier Is during Apr and

May 1990, by a number of different observers, may represent either an influx of birds or the presence of an unusually high amount of observation in a month rarely observed in the outer Hauraki Gulf (A.J. Tennyson & R.P. Scofield *pers. comm.*; Table 1, 23-26). The earlier sighting of an all dark storm petrel with a white rump in May 1986, in the same general vicinity, would also appear to be a Wilson's storm petrel (P.F. Battley *pers. comm.*). Additional records of live Wilson's storm petrels in northern New Zealand are given in Table 1 (sightings 3, 7, 13, 21, 30, and 31), but without further evidence are unable to be further examined.

The identification of a bird in the hand (e.g., a beach-cast specimen) should not necessarily be taken as correct as sometimes identification is based on only partial remains. There has been 1 black-bellied storm petrel, 1 storm petrel sp., and 9 Wilson's storm petrels found as beach-cast specimens within northern New Zealand (Table 1). From measurements of the black-bellied storm petrel found as skeletal remains on Moutohora I (Taylor 2004; our Table 1, sighting 33), this identification is correct (G.A. Taylor *pers. comm.*). Identification of the beach-cast storm petrel sp. found in Jan 2001 (Table 1, sighting 34) was unable to be made due to the condition of the bird (A. Williams *pers. comm.*), but it was found within 50 kms of where NZSP regularly occur at that time of the year. Of the 9 Wilson's storm petrels at least 1 of these appears to have been misidentified. The beach-cast bird collected near Whangarei on 18 Dec 1971 (Veitch 1980; our Table 1, sighting 10) lacked feathers on the underparts, but was identified as a Wilson's storm petrel (OSNZ Beach Patrol Scheme *unpubl. data*). However, it is now suggested to be a NZSP based on measurements of the bones that are in the Museum of New Zealand Te Papa Tongarewa (MNZ 17199) (Worthy 2000; Gaskin & Baird 2005). Further work is needed to confirm this skeleton's identity. The 2 birds found beach-cast in the Bay of Plenty by G.A. Taylor (Table 1, sightings 15 & 16) were both Wilson's storm petrels, being all dark with a white rump (G.A. Taylor *pers. comm.*), as apparently was the Jan 1999 bird (Table 1; sighting 32) (A. Williams *pers. comm.*). Of the remaining 5 beach-cast birds identification is unable to be verified due to the lack of specimens or written descriptions. However, the 2 specimens from May 1984 (Table 1; sightings 17 & 18) were found at a time when other southern ocean breeding seabirds were being washed up, suggesting the identification of these birds is correct.

Although much of this information on previous sightings and beach cast birds is inconclusive

due to a lack of detailed notes, photographs, or specimens, it does highlight the possibility that NZSP could have been misidentified in northern New Zealand waters for many years. The most compelling evidence that NZSPs have been in the outer Hauraki Gulf for at least the last 4 decades comes from the Dec 1969 sightings by J.P. Croxall, and the 1971 beach-cast specimen, the bones of which should be further examined. In future all beach cast black-and-white storm petrel specimens should be kept for further investigation. Even if the bird is extremely decayed and lacking feathers, its identity can be confirmed with measurements, and the skeleton made available for further study. All such specimens could be extremely valuable. Future sightings of black-and-white storm petrels anywhere in northern New Zealand would also be welcomed, and photographs and detailed descriptions should be taken.

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