UNDER THE Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012

IN THE MATTER OF a Decision-making Committee appointed to consider a marine consent application made by Trans-Tasman Resources Ltd to undertake iron ore extraction and processing operations offshore in the South Taranaki Bight

---

STATEMENT OF EVIDENCE OF RICHARD PAUL SCOFIELD FOR THE DIRECTOR-GENERAL OF CONSERVATION

24 February 2014

Counsel for Director-General of Conservation
Eleanor Jamieson
Email ejamieson@doc.govt.nz
Telephone (04) 496 1915

Department of Conservation
Conservation House – *Whare Kaupapa Atawhai*
PO Box 10 420, Wellington 6143
Telephone (04) 471 0726
Fax (04) 381 3057

INTRODUCTION

1. My full name is **Richard Paul Scofield**.

2. I have a Bachelor and a Master of Science in Zoology, both from the University of Auckland and a Doctor of Philosophy in Zoology and Statistics from the University of Otago. My PhD study examined the demography of Sooty Shearwaters (muttonbirds) breeding in New Zealand.

3. From 1994 till 1996 I was employed as a seabird-at sea observer by the Australian Antarctic Division. During that time I also spent 18 months on sub-Antarctic islands as a seabird researcher and 9 months in Antarctica undertaking similar research. I have travelled extensively aboard research vessels in temperate and Antarctic waters and have been involved in hundreds of hours of ship-based operations for oceanographic sampling, dredging and fishing often at night.

4. Since 2001 I have been employed by the Canterbury Museum as a collection manager, curator and scientist. During my employment I have undertaken research into birds in marine environments.

5. My expertise includes marine aquatic ecology, specialising in birds. I have considerable experience, over 30 years with the study of seabirds (including population dynamics and foraging movements of Sooty Shearwaters, Chatham Island albatross, and most New Zealand penguin, shearwater and petrel species) in both New Zealand and elsewhere. The results of these studies have been published in over 100 scientific papers in refereed New Zealand and international journals, plus contributions in several book chapters. I am the author of two books on birds including seabirds: The Field Guide to Albatross, Petrels and Shearwaters of the World (Croom Helm, 2007) and Birds of New Zealand: A Photographic Guide (Auckland University Press, 2013).

6. I am a member of the Ornithological Society of New Zealand, the British Ornithologists' Union, American Ornithologists' Union, and Australasian Seabird Group.

7. I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Consolidated Practice Note and I agree to comply with it in this Inquiry. My qualifications as an expert are set out above. I confirm that the issues set out in this brief of evidence are within my area of expertise. I have not omitted to consider facts known to me that might alter or detract from the opinions expressed.

SCOPE OF EVIDENCE

8. In this evidence I address:

- The importance of the South Taranaki Bight for seabirds.
- The information supplied by the applicant
- An evaluation of the potential impact the impact of this application on seabirds.
- Consideration of the conditions by the applicant.

9. In preparing this evidence I have read and considered the following reports and statements of evidence:

9.1 The applicant's impact assessment "Trans-Tasman Resources Ltd South Taranaki Bight Offshore Iron Sand Project. Supporting information for marine consent application." October 2013

9.2 The applicant's "Seabirds of the South Taranaki Bight" report by David Thompson NIWA Client Report No: WLG2013-15 March 2013.9.3

9.3 The applicant's "Effects of ships lights on fish, squid and seabirds" report by David Thompson NIWA Client Report No: WLG2013-16 April 2013.

9.4 The EPA's "Review of technical reports relating to seabirds submitted as part of Trans-Tasman Resources Limited application to mine iron sand in the South Taranaki Bight" report by Mitchell Partnerships Limited December 2013.

9.5 The EPA's request for further information from the applicant: http://epa.govt.nz/Publications/Further_information_requested_by_the_EPA.pdf Section 3 "Birds" Uploaded to EPA website 9 January 2014.

9.6 The Statement of Evidence in Chief of Dr David Thompson on behalf of Trans-Tasman Resources Ltd. 15 February 2014.

9.8 Statement of Evidence in Chief of Garry Charles Venus on behalf of Trans-Tasman Resources Ltd. 17 February.

SEABIRDS IN THE SOUTH TARANAKI BIGHT

10. As noted by Dr Thompson, New Zealand has a greater diversity of seabirds than anywhere else in the world[1]. New Zealand tourism operators often claim, with some credibility in my opinion, to be operating in the world's seabird capital. New Zealand waters contain at least 84 breeding species of seabird (by which we mean members of the orders of birds containing the penguins, albatross, petrels and shearwaters, shags, gannets, and the bird families that contain the gulls and terns)[2]. This total includes endemic taxa that breed nowhere else in the world. There are also a large number of migratory species that breed elsewhere but commonly visit New Zealand each year, and a significant number of other species which are vagrants. I agree with Thompson that in total there are approximately 161 seabird species occurring in New Zealand waters[3].

11. Species that occur in the largest numbers include the endemic fluttering shearwater (*Puffinus gravis*) and fairy prions (*Pachyptila turtur*) throughout the year and sooty shearwaters (*Puffinus giseus*) during the autumn and spring migrations. Other migrants that may occur in large numbers for short periods are highlighted in Table 1, attached as Appendix 1 to my evidence.

[1] NIWA report WLG2013-15 page 5

[2] NIWA report WLG2013-15 page 5

[3] The Statement of Evidence in Chief of Dr David Thompson on behalf of Trans-Tasman Resources Ltd. 15 February 2014, Paragraph 9

12. I do not agree with Dr Thompson that of the 11 seabird species classified as "Nationally Critical", only three are likely to occur in the STB area (Salvin's albatross, black-billed gull and fairy tern)[4]. I consider fairy tern is extremely unlikely to occur in the area and the "Nationally Critical" (Robertson et al. 2013) Grey-headed Albatross, Antipodes Wandering Albatross and Gibson's Wandering Albatross have been shown to occur here (analysis of published OSNA Beach Petrol results (especially Powlesland 1985) and observations available at http://www.birdingnz.net/forum).

13. I concur with Dr Thompson and others that there are limited breeding opportunities for seabirds in the South Taranaki Bight but it is an area visited by a large diversity of seabirds either passing through or foraging. Of the species that have been recorded in the area approximately three quarters are considered either uncommon in New Zealand or have been listed as part of the Department of Conservation's threat assessment (Robertson et al. 2013).

14. I agree with Dr Thompson that there are a number of coastal estuarine sites in the South Taranaki Bight (for example the Waikirikiri Lagoon, and the Whanganui, Whangaehu, Turakina, Manawatu and Rangitikei river estuaries) that are of significant value to coastal, shore, wading and migratory bird species (NIWA report WLG2013-15 page 5). Indeed the Manawatu Estuary is particularly significant and was declared a Wetland of International Importance under the Ramsar convention in July 2005. It is also supports one of the diverse avifaunas of any site in New Zealand (Robertson et al. 2013). Many of the birds breeding and frequenting the Manawatu Estuary rely on the waters of the South Taranaki Bight to forage (for example the terns, gulls and shags).

[4] The Statement of Evidence in Chief of Dr David Thompson on behalf of Trans-Tasman Resources Ltd. 15 February 2014, Paragraph 14

INFORMATION SUPPLIED BY TTR

15. I note and agree with Dr Thompson and the EPA's independent reviewer and the EPA's staff report that data on the at-sea distribution and abundance of bird species in the STB is lacking.

> Surveys of seabirds were not undertaken to inform the TTR proposal and no attempt has been made to quantify the use of the area by any bird species. This makes it very difficult to assess what the effects might be on any particular bird species including those that may be of conservation importance.[5]

This lack of data also makes it difficult to assess the importance of the South Taranki Bight for seabirds relative to other coastal areas within the EEZ as suggested by the independent review and requested in the EPAs further information request[6].

16. I note that cetacean surveys were undertaken by Martin Cawthorn Associates Ltd over the period from July 2011 to February 2013 recorded observation of a variety of other non-cetacean fauna including seabirds, fish and sharks, but these were not identified to species level and therefore do not significantly inform the baseline environment.

17. Dr Thompson has referred to the beach patrol survey results and the EPA's independent reviewer, Mitchell Partnerships, list 4 areas where more up to date information in relation to seabirds than that used by NIWA is available.[7] I note that there are a significant number of unpublished records on seabirds that can help inform our knowledge of seabirds in this area. For example:

    17.1 tracking of the at risk Westland Petrel *Procellaria westlandica* that is currently unpublished but available on line.[8] This data shows that some Westland Petrel use the southernmost part of the STB during

[5] EPA Staff Report, Feb 2014, para 140, page 33 and Thompson Evidence Paragraph 23

[6] Mitchell Partnerships Limited Review of technical reports relating to seabirds December 2013 paragraph 21, page 7 and EPA Staff Report, Feb 2014, para 141, page 34

[7] Mitchell Partnerships Limited Review of technical reports relating to seabirds December 2013 paragraph 12, pages 4-5

[8] http://blog.tepapa.govt.nz/2012/09/21/westland-petrels-circumnavigate-south-island/

breeding. Similarly recently completed but as yet unpublished tracking of the endemic declining Huttons Shearwater *Puffinus huttoni* also shows hitherto unsuspected use of this area by this species.

17.2 In "Scofield, R. P., Christie, D. 2002. Beach patrol records indicate a substantial decline in sooty shearwater (Puffinus griseus) numbers. *Notornis* 49(3): 158-165" I analysed Beach patrol records. This analysis did not analyse the relative importance of western versus eastern coastlines for Sooty Shearwaters nor did it analyse the importance of the South Taranaki coastline but it did show that the beach patrol database of records from between 1954 and the present contains significant amounts of information that could inform decision making.

17.3 The seabird tracking database of Birdlife International http://www.seabirdtracking.org/ contains tracks of Sooty Shearwaters that use the Southern Taranaki Bight area during their foraging from the muttonbird islands off Stewart Island and during migration.

18. I consider that a more thorough analysis of existing unpublished information would usefully inform the decision making process on the importance of the STB for seabirds.

19. Given the lack of information I do not agree that it is possible to conclude at this stage that the South Taranaki Bight supports a "relatively modest seabird assemblage"[9]. There is simply insufficient information to draw that conclusion.

20. For the same reason, I do not agree with the conclusion in TTR's Impact Assessment in relation to mid-shore aerial predators:

> In addition, the extend [sic] of marine bird populations in this region is considered to be relatively low.[10]

[9] Thompson WLG2013-15 Conclusions, Page 8

[10] TTR Impact Assessment Final Part III Chapters 10-18.pdf Page 273

21. Indeed that statement does not appear to be supported by the NIWA technical report itself which states:

> Detailed, systematic and quantitative information on the at-sea distribution of virtually all species is currently lacking.[11]

22. Similarly the Impact Assessment's conclusion in relation to inshore aerial predators states:

> In addition, the extent of marine bird populations in this region is considered to be relatively low. [12]

23. I consider that this statement trivialises the information provided. I note these concerns about the lack of information were shared by the independent EPA reviewer[13]. Mitchell Partnerships Ltd, recommended that the applicant be asked to provide additional information[14], which the EPA requested[15].

THE POTENTIAL EFFECTS OF THE APPLICATION ON SEABIRDS

24. I consider that the following potential effects of the TTR application on seabird distribution and use of the South Taranaki Bight: light, the effects of bioturbation on water quality and oil spill.

The effects of Light

25. I understand that TTR propose to operate their permanently moored processing vessel over the extraction site 22-40 km offshore in water depths of 25-45 m. The vessel is intended to operate 24 hours a day and will require deck lighting[16]. I consider that this operational lighting and the associated navigational lighting will potentially pose a threat to seabirds.

---

[11] Thompson WLG2013-15 Conclusions, Page 8

[12] TTR Impact Assessment Final Part III Chapters 10-18.pdf Page 273

[13] Mitchell Partnerships Limited Review of technical reports relating to seabirds December 2013 paragraph 10.

[14] Mitchell Partnerships Limited Review of technical reports relating to seabirds December 2013 paragraph 21

[15] EPA Staff Report 2014, paragraph 14.1

[16] TTR Impact Assessment Final Page 12

26. I consider that the impacts of light on seabirds at night are potentially significant. This has been demonstrated to be a serious issue overseas (Black 2005) and is likely to also be significant in New Zealand. Oil platforms are susceptible to this sort of mortality but it has rarely been quantified (Wiese 2001). In most cases the flaring and lighting on oil platforms is considerably higher off the water than the TTR proposed operation would be. In my experience suggests that seabirds are more susceptible to light impacts at sea level.

27. During my many months aboard research vessels the attraction of birds to light has frequently been evident. In January 1992, I was aboard on the MV Aurora Australis whilst anchored in Atlas Cove, Heard Island. The night was calm and foggy, deck operations necessitated the use of deck lighting. By morning over 200 birds were dead as a result of collisions with the vessel and a combination of hypothermia and drowning on deck; many more were released alive. The dead birds included Antarctic prion, fulmar prion *Pachyptila crassirostris*, Kerguelen petrel *Lugensa brevirostris*, Wilson's storm-petrel, common diving petrel and Georgian diving-petrel.

28. As a consequence of this event shipping operations at Heard and Macquarie islands have changed with deck operations no longer being conducted during the hours of darkness. It is now a requirement of all ships operating in Australian Antarctic waters to minimize light escape from cabin windows.

29. Black (2005) suggested that bird strikes on vessels operating in the southern oceans are an almost nightly occurrence, but that the level of mortality is generally low. A possible reason for this is that, although birds collide with mobile ships, they land on the deck which are cleaned from frequent inundation from the sea and as the decks are not cluttered with obstacles seabirds are able to take off before being discovered or succumbing to stress induced mortality. This low mortality level could at least partly explain why relatively few birds are returned from commercial fishing vessels operating in New Zealand waters. The situation of a large ship (such as the Floating Processing Storage and Offloading Vessel) that is mostly stationary and is likely to have large amounts of dirty seafloor dredge product aboard is considerably different and untested.

30. I consider the NIWA report[17] to be a succinct summary of potential light factors but the report does not propose concrete mitigation measures. That same NIWA report concludes that it is potentially possible that the vessel's lights may attract nocturnal species, particularly in poor weather and considers that standard mitigation protocols, should be applied wherever possible, to reduce any measurable impact on the attracted seabird species[18]. While that NIWA report does not set out the details of what these standard mitigation protocols may be Dr Thompson does state in more detail in his evidence he thinks it necessary. He recommends:

> Monitor bird strike as recommended. In the highly unlikely event that unexpected and untoward effects are recorded this would presumably trigger a requirement that further mitigation measures could be considered and implemented if necessary.[19]
>
> Include measures to mitigate the adverse effects of nocturnal lighting on seabirds should include the use of: black-out blinds on all non-operationally important windows and portholes at night, external lighting kept to the minimum required for safe operation and navigation, deck lighting, wherever practicable, to be directed downwards and to be shielded to reduce light emanating horizontally or vertically from the vessel, and crew to be aware and able to deal safely with any birds that alight on the vessel.[20]
>
> All seabirds that strike the vessel should be noted, photographed and date, time and weather conditions recorded. If the bird is released alive or killed should be noted.[21]

31. In addition, if the application is to be approved, the Decision-making Committee should consider including the following conditions:

    a. Use of light sources that are low in spectra seabirds can see.

---

[17] Thompson, D, 2013 Effects of ships lights on fish, squid and seabirds" NIWA Client Report No: WLG2013-16

[18] NIWA report WLG2013-16 pages 11 and 12

[19] The Statement of Evidence in Chief of Dr David Thompson on behalf of Trans-Tasman Resources Ltd. 15 February 2014 Paragraph 25

[20] The Statement of Evidence in Chief of Dr David Thompson on behalf of Trans-Tasman Resources Ltd. 15 February 2014 Paragraph 33

[21] The Statement of Evidence in Chief of Dr David Thompson on behalf of Trans-Tasman Resources Ltd. 15 February 2014 Paragraph 34

b. Cessation of operations and turning out all deck lights during foggy, calm conditions

32. I also consider that periodically observers should be placed aboard the TTR vessel. Observer presence would be especially important during start-up.

33. In response to the EPAs further information request, Thompson notes "no collisions or deaths have been observed on the Tui oil field FPSO, and on average only one bird every 3 or 4 years has been found disorientated by the FPSO lights and has been delivered to DOC."[22] It is unclear where this assertion comes from. Certainly Wiese et al. 2001 detail significant casualties due to oil platform mortality but point out that the effects of this mortality are poorly documented and always trivialised by agencies involved in drilling.

34. Whilst a large amount of work has been done on mitigating against the effects of light for seabirds on land especially in Hawaii (Telfer et al 1987) there appear to be only a few publications regarding such mitigation at sea (Black 2005; Reed et al 1985; Poot et al 2008).

35. Measures to reduce the effects of light at sea are largely untested. Black (2005) suggests several recommendations for reducing light-induced seabird mortality that are detailed in NIWA WLG2013-16. This report does stress that deck lights should, wherever possible and practicable be directed downwards and shielded to reduce as much horizontal light shining out from the vessel as possible (recommended for inclusion in conditions as noted above). Interestingly, there is some experimental evidence that red filters in front of white floodlights on tall structures reduced avian casualties by up to 80% (Wiese et al. 2001), and on an offshore gas-production platform in the North Sea, the use of green lights, instead of the usual white lights, reduced the number of birds that were disorientated (Poot et al. 2008).

36. For the reasons given in paragraphs 35 and 36 above, I think that all the mitigation options suggested in those publications need to be incorporated into conditions or at least trialled and implemented if effective. A monitoring regime for seabirds should be proposed.

[22] EPA Staff Report 2014, paragraph 138.

The effects of oil spill

37. I note that in Dr Thompson's evidence he now considers the likely effects of oil spill[23]. Whilst an oil spill would have severe and detrimental effects, I do not consider this to be any more significant a threat than for any other vessel operating at sea in the STB.

38. The Mitchell Partnerships independent review accepts the assertion from NIWA that the remoteness of the operating vessel from major breeding colonies of seabirds will mitigate impact24. I accept that the remoteness will certainly reduce the impact of oil spills on breeding colonies and, as already established, this area is not an important breeding area for many seabirds. The South Taranaki Bight is primarily important as a remote foraging area and a migration pathway for seabirds. Pelagic seabirds forage in the open ocean. Any oil spills will not be obvious to the general public and few, if any, birds will float up on Taranaki Beaches due to the propensity of oiled birds to sink. For this reason the impact of such mortality is, and will be, impossible to assess.

The effects of bioturbation on water quality

39. Marine birds require specific environmental conditions to effectively forage. I agree with Dr Thompson's conclusions that:

    a. Trans-Tasman Resources Ltd's (TTR) proposed activities will affect the seafloor community at the extraction site and has the potential to affect pelagic and benthic ecosystems downstream[25].

    b. The area does not support large breeding colonies for any species but that a number of coastal estuarine sites are of significant value to coastal, shore, wading, and migratory bird species.

[23] The Statement of Evidence in Chief of Dr David Thompson on behalf of Trans-Tasman Resources Ltd. 15 February 2014 paragraph 20

[24] Mitchell Partnerships Limited Review of technical reports relating to seabirds December 2013 paragraph 5

[25] NIWA report WLG2013-15 page 5 paragraph 1

40. I also agree with the statement in Dr Thompson's evidence that the sediment plume associated with the discharge of tailings sediment back to the seafloor has the potential to affect seabirds through an increase in water turbidity and a corresponding reduction in foraging efficiency in visual predators such as shag species (see comments below)[26].

41. I reiterate that the South Taranaki Bight is primarily important as a remote foraging area and a migration pathway.

42. A tropic modelling approach suggest by Mitchell Partnerships may inform this issue but I am not aware of any overseas examples where such an effect has been effective[27].

COMMENTS ON PROPOSED CONDITIONS

43. The draft Environmental Monitoring and Management Plan (EMMP) proposes the following baseline monitoring in relation to seabirds:

> Incidental observations of seabirds in vicinity of Project Area[28].

It proposes that operational monitoring comprise:

> Operational observations of seabirds in vicinity of FPSO and FSO[29].

44. In my opinion such observations may yield some interesting information but will not provide any basis for establishing "trigger values" in respect of the possible impact of the proposed activity.

45. I note that Dr Thompson proposes that the best approach is to monitor bird strike. He says:

---

[26] Statement of Evidence in Chief of Dr David Thompson on behalf of Trans-Tasman Resources Ltd Paragraph 13

[27] Mitchell Partnerships Review of Technical Reports relating to Seabirds Submitted as Part of TTR Application (Dec 2013)

[28] Statement of Evidence in Chief of Garry Charles Venus - Appendix A Proposed Conditions and Environmental Monitoring and Management Plan (EMMP) section 4.10

[29] Statement of Evidence in Chief of Garry Charles Venus - Appendix A Proposed Conditions and Environmental Monitoring and Management Plan (EMMP) section 5.10

> In the unlikely event that unexpected and untoward effects are recorded this would presumably trigger a requirement that further mitigation measures could be considered and implemented if necessary.[30]

46. This suggestion does not appear to be reflected in either the conditions or the draft EMMP. While I agree strike should be recorded it is difficult to see how this approach will generate information from which trigger levels can be derived.

47. The draft conditions proposed by the applicant include a requirement that the consent holder prepare a "Seabird Effects Mitigation Plan"[31]. I agree that such a plan is necessary but note that its effectiveness for mitigating the possible effects of lighting on seabirds will depend on close monitoring by an independent authority. None of this is required or specified in the conditions or the EMMP.

48. I consider that a detailed lighting risk mitigation plan should be required that should address at least the following:

    a. The way the shielded lighting systems would be implemented

    b. That all birds found on deck are removed and reported ASAP

    c. Recognition of conditions during which operations may have to be suspended (i.e. fog, heavy rain)

    d. Identification of a trigger level of bird strike that might trigger closedown

    e. A robust reporting mechanism

    f. Potential for DOC observers onboard.

49. The requirements for monitoring the sediment plume should also provide for monitoring of implications on seabirds.

[30] The Statement of Evidence in Chief of Dr David Thompson on behalf of Trans-Tasman Resources Ltd. 15 February 2014 paragraph 25.

[31] Appendix A Proposed Conditions and Environmental Monitoring and Management Plan (EMMP) paragraph 53

50. I am able to discuss the draft consent conditions further during expert caucusing.

Richard Paul Scofield

26 February 2014

REFERENCES

Black, A. (2005). Light induced seabird mortality on vessels operating in the Southern Ocean: incidents and mitigation measures. *Antarctic Science 17*: 67-68.

Gill, B.J., Bell, B.D., Chambers, G.K., Medway, D.G., Palma, R.L., Scofield, R.P.,

Tennyson, A.J.D., Worthy, T.H. 2010. Checklist of the Birds of New Zealand, Norfolk and Macquarie Islands, and the Ross Dependency, Antarctica. Te Papa Press, Wellington. 500 p

Merkel, F.R.; Johansen, K.L. (2011). Light-induced bird strikes on vessels in southwest Greenland. *Marine Pollution Bulletin 62*: 2330-2336.

Powlesland, R. 1985. Seabirds found dead on New Zealand beaches in 1983 and a review of albatross recoveries since 1960. Notornis 32: 23-41.

Poot, H.; Ens, B.J.; de Vries, H.; Donners, M.A.H.; Wernand, M.R.; Marquenie, J.M. (2008). Green light for nocturnally migrating birds. *Ecology and Society 13*: 47.

Reed, J. R., Sincock, J. L. and Hailman, J. P. (1985) Light attraction in endangered procellariiform birds: reduction by shielding upward radiation. *Auk* 102: 377–383.

Robertson Hugh A, John E Dowding, Graeme P Elliott, Rodney A Hitchmough, Colin M Miskelly, Colin FJ O'Donnell, Ralph G Powlesland, Paul M Sagar, R Paul Scofield, Graeme A Taylor 2013 Conservation status of New Zealand birds, 2012. New Zealand Threat Classification Series. Volume 4 Department of Conservation, Wellington

Robertson C. J. R., P. Hyvönen, M. J. Fraser, C. R. Pickard 2007. Atlas of Bird Distribution in New Zealand 1999–2004. Ornithological Society of New Zealand. Wellington. i–x + 533 pp.

Scofield, R. P., Christie, D. 2002. Beach patrol records indicate a substantial decline in sooty shearwater (Puffinus griseus) numbers. Notornis 49(3): 158-165

Telfer, T.C.; Sincock, J.L.; Bryd, G.V., Reed, J.R. (1987). Attraction of Hawaiian seabirds to lights: conservation efforts and effects of moon phase. *Wildlife Society Bulletin 15*: 406-413.

Wiese, F.K.; Montevecchi, W.A.; Davoren, G.K.; Huettmann, F.; Diamond, A.W.; Linke, J. (2001). Seabirds at risk around offshore oil platforms in the north-west Atlantic. *Marine Pollution Bulletin 42*: 1285-1290.

Appendix 1

A list of the birds considered likely to occur in the South Taranaki Bight based on: published records in OSNZ(*Notornis* and *OSNZ News*); the OSNZ Atlas (Robertson et al 2007); the publiched distribution of seabird species in the eastern Tasman Sea (Gill et al 2010); Analysis of published OSNA Beach Petrol results (especially Powlesland 1985); and observations available at http://www.birdingnz.net/forum).

#	Species	NZ Endemic?	Threat status (Robertson et al 2013)	Abundance in STB	Timing	Migratory through/into area?
1	Blue Penguin, *Eudyptula minor*	N	At Risk	Common	All year	N
2	Southern Giant Petrel, *Macronectes giganteus*	N	Not Threatened	Occasional	Winter visitor	Y
3	Northern Giant Petrel, *Macronectes halli*	N	Not Threatened	Common	All year	Y
4	Southern Fulmar, *Fulmarus glacialoides*	N	Not Threatened	Rare	Winter	Y
5	Antarctic Petrel, *Thalassoica antarctica*	N	Not Threatened	Rare	Winter	Y
6	Cape Petrel, *Daption capense*	N	Not Threatened	Rare	Winter	Y
7	Grey-faced Petrel, *Pterodroma gouldi*	Breeder	At Risk	Common	Winter	N
8	White-headed Petrel, *Pterodroma lessonii*	N	At Risk	Rare	Winter	Y
9	Mottled Petrel, *Pterodroma inexpectata*	Breeder	At Risk	Uncommon	Winter	Y
10	Soft-plumaged Petrel, *Pterodroma mollis*	N	At Risk	Rare	Winter	N
11	Cook's Petrel, *Pterodroma cookii*	Breeder	At Risk	Rare	Winter	N
12	Gould's Petrel, *Pterodroma leucoptera*	N	At Risk	Very Rare	Winter	N

13	Black-winged Petrel, *Pterodroma nigripennis*	N	At Risk	Rare	Winter	N
14	Blue Petrel, *Halobaena caerulea*	N	At Risk	Rare	Winter	Y
15	Broad-billed Prion, *Pachyptila vittata*	N	At Risk	Uncommon	Winter	Y
16	Salvin's Prion, Pachyptila salvini	N	At Risk	Rare	Winter	Y
17	Antarctic Prion, Pachyptila desolata	N	At Risk	Rare	Winter	Y
18	Thin-billed Prion, Pachyptila belcheri	N	At Risk	Rare	Winter	Y
19	Fulmar Prion, *Pachyptila crassirostris*	N	At Risk	Rare	Winter	Y
20	Fairy Prion, *Pachyptila turtur*	N	At Risk	Abundant	All year	Y
21	Grey Petrel, *Procellaria cinerea*	N	At Risk	Rare	Winter	N
22	White-chinned Petrel, *Procellaria aequinoctialis*	N	At Risk	Common	Winter	Y
23	Parkinson's Petrel, Procellaria parkinsoni	Breeder	At Risk	Rare	Winter	N
24	Westland Petrel, Procellaria westlandica	Breeder	At Risk	Rare	Winter	N
25	Kerguelen Petrel, Aphrodroma brevirostris	N	At Risk	Very Rare	Winter	Y
26	Flesh-footed Shearwater, Puffinus carneipes	N	At Risk	Rare	Winter	Y
27	Buller's Shearwater, Puffinus bulleri	Breeder	At Risk	Uncommon	Winter	N
28	Sooty Shearwater, Puffinus griseus	N	At Risk	Adundant	Winter	Y
29	Short-tailed Shearwater, Puffinus tenuirostris	N	Not Threatened	Adundant	Winter	Y
30	Hutton's Shearwater, Puffinus huttoni	Breeder	At Risk	Uncommon	Winter	Y

31	Fluttering Shearwater, Puffinus gavia	N	Not Threatened	Common	Winter	N
32	Little Shearwater, Puffinus assimilis	N	Not Threatened	Rare	Winter	N
33	White-faced Storm Petrel, *Pelagodroma marina*	N	Not Threatened	Rare	All year	N
34	Snowy Albatross, *Diomedea exulans* - Vulnerable	N	Not Threatened	Rare	Winter	Y
35	Gibson's Wandering Albatross *Diomedea exulans gibsoni*	Breeder	Nationally Critical	Uncommon	All year	N
36	Antipodes Wandering Albatross *Diomedea antipodensis*	Breeder	Nationally Critical	Uncommon	All year	N
37	Southern Royal Albatross, *Diomedea epomophora*	Breeder	At Risk	Rare	Winter	N
38	Northern Royal Albatross, *Diomedea sandfordi*	Breeder	At Risk	Rare	All year	N
39	Grey-headed Albatross, Thalassarche chrysostoma - Endangered	N	Nationally Critical	Very Rare	Winter	Y
40	Black-browed Albatross, *Thalassarche melanophris*	N	At Risk	Common	Winter	Y
41	Campbell Albatross T. (melanophris) impavida	Breeder	Not Threatened	Uncommon	Winter	Y
42	Buller's Albatross, Thalassarche bulleri	Breeder	At Risk	Common	Winter	Y
43	Shy Albatross, *Thalassarche cauta*	N	At Risk	Common	Winter	Y
44	Salvin's Albatross *Thalassarche salvini*	Breeder	Nationally Critical	Uncommon	Winter	Y

45	Light-mantled Albatross, *Phoebetria palpebrata*	N	At Risk	Very Rare	Winter	Y
46	Common Diving Petrel *Pelecanoides urinatrix*	N	Not Threatened	Common	All year	N
47	Australasian Gannet, *Sula serrator*	N	Not Threatened	Abundant	All year	N
48	Great Cormorant, *Phalacrocorax carbo*	N	Not Threatened	Abundant	All year	N
49	Little Black Shag, *Phalacrocorax sulcirostris*	N	Not Threatened	Common	All year	N
50	Pied Cormorant, Phalacrocorax varius	N	Nationally Vulnerable	Abundant	All year	N
51	Little Pied Cormorant, *Phalacrocorax melanoleucos*	N	Not Threatened	Abundant	All year	N
52	Spotted Shag, *Phalacrocorax punctatus*	Yes	Not Threatened	Abundant	All year	N
53	Kelp Gull, *Larus dominicanus*	N	Not Threatened	Abundant	All year	N
54	Red-billed Gull, *Larus scopulinus*	Yes	Nationally Vulnerable	Abundant	All year	N
55	Sooty Tern, *Sterna fuscata*	N	At Risk	Very rare	Summer	N
56	Common Noddy, *Anous stolidus*	N	Not Threatened	Very rare	Summer	N
57	Caspian Tern, *Hydroprogne caspia*	N	Nationally Vulnerable	Uncommon	All year	N
58	White-fronted Tern, *Sterna striata*	N	At Risk	Abundant	All year	N
59	Black-fronted Tern, *Chlidonias albostriatus*	Yes	Nationally Endangered	Uncommon	Winter	Y

60	Arctic Skua, *Stercorarius parasiticus*	N	Not Threatened	Common	Summer	Y
61	Pomarine Skua, *Stercorarius pomarinus*	N	Not Threatened	Common	Summer	Y
62	Sub-antarctic Skua, *Catharacta lonnbergi*	N	Not Threatened	Rare	Winter	Y
63	Long-tailed Skua, *Stercorarius longicaudus*	N	Not Threatened	Rare	Summer	Y
64	South Polar Skua, *Stercorarius maccormicki*	N	Not Threatened	Rare	Spring/Autumn	Y