**SUPPORTING INFORMATION**

**Appendix S2**

**A framework for mapping the distribution seabirds by integrating tracking, demography and phenology**

More details can be found at <https://github.com/anacarneiro/DensityMaps>

**TABLE S1** Population estimates (i.e. annual breeding pairs), % of all sites (i.e. percentage in relation to global estimates), demographic estimates of juvenile/immature (average annual survival from fledging to average age of 1st breeding) and adult annual survival, breeding frequency and success and age at first breeding for the populations from which tracking data were available for the analysis. Where no estimates were available for particular demographic parameters from a given population or age class, we used parameters from another location or another species with similar life-history attributes. For some species, no estimates of juvenile survival existed, and we estimated juvenile survival from adult survival, using age effect: juvenile survival = adult survival multiplied by the average ratio of juvenile to adult survival calculated from all available data for the relevant genus (*Procellaria*, *Thalassarche*, or both). Species in bold were representative of island or island group(s) holding >50% of the global population estimates.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Population (reference) | Annual pairs | % all sites | Juv/Immsurvival | Adult survival | Brfrequency | Br success | Age 1st br |
| **Wandering albatross** |  |  |  |  |  |  |  |
|  Crozet (1, 2, 3, 4, 5, 6) | 1,815 | 23.1 | 0.889 | 0.945a | 0.566b | 0.730 | 10.0 |
|  Kerguelen (1, 2, 3) | 1,184 | 14.7 | 0.889c | 0.945c | 0.566c | 0.730c | 10.0c |
|  South Georgia (1, 7) | 1,858 | 17.6 | 0.819 | 0.879 | 0.365b | 0.808 | 9.8 |
| **Tristan albatross** |  |  |  |  |  |  |  |
|  Gough (1, 8, 9) | 1,650 | 100.0 | 0.836 | 0.910 | 0.550 | 0.283 | 10.1 |
| **Antipodean albatross** |  |  |  |  |  |  |  |
|  Antipodes Islands (1, 10, 11, 12) | 3,945 | 54.4 | 0.894 | 0.918 | 0.489 | 0.600 | 12.0 |
|  Auckland Islands (1, 11, 13, 14) | 5,817 | 45.6 | 0.880 | 0.889 | 0.536 | 0.427 | 12.4 |
| **Amsterdam albatross** |  |  |  |  |  |  |  |
|  Amsterdam (1, 15, 16, 17) | 51 | 100.0 | 0.936 | 0.971 | 0.600 | 0.677 | 9.4 |
| **Northern royal albatross** |  |  |  |  |  |  |  |
|  Chatham Island (1, 11) | 5,800 | 99.5 | 0.876 | 0.960 | 0.581 | 0.427 | 9.0 |
| **White-capped albatross** |  |  |  |  |  |  |  |
|  Auckland Islands (1, 11, 18) | 97,089 | 99.9 | 0.834 | 0.960 | 0.680 | 0.630 | 9.0 |
| Salvin's albatross |  |  |  |  |  |  |  |
|  The Snares (1, 11, 19) | 1,195 | 3.7 | 0.837 | 0.967 | 0.859 | 0.467 | 9.0 |
| **Chatham albatross** |  |  |  |  |  |  |  |
|  Chatham Island (1, 11, 20) | 5,245 | 100.0 | 0.828 | 0.887 | 0.773 | 0.463 | 8.0 |
| Buller's albatross |  |  |  |  |  |  |  |
|  The Snares (1, 21, 22) | 8,704 | 28.6 | 0.910 | 0.950 | 0.800 | 0.727 | 12.0 |
| **Grey-headed albatross** |  |  |  |  |  |  |  |
|  Prince Edward Islands (1, 11, 23) | 9,500 | 10.8 | 0.883d | 0.949d | 0.601d | 0.427d | 12.0d |
|  South Georgia (1, 7) | 47,674 | 49.8 | 0.912 | 0.952 | 0.368b | 0.365 | 14.2 |
|  |  |  |  |  |  |  |  |
| Cont. |  |  |  |  |  |  |  |
| Population (reference) | Annual pairs | % all sites | Juv/Immsurvival | Adult survival | Brfrequency | Br success | Age 1st br |
| **Black-browed albatross** |  |  |  |  |  |  |  |
|  Falkland Islands (1, 7, 24, 25, 26) | 399,416 | 66.6 | 0.862e | 0.942 | 0.787b,f | 0.620 | 7.5 |
|  Islas Diego Ramirez (1, 7, 24, 25, 27) | 55,000 | 9.2 | 0.862g | 0.942g | 0.787g | 0.750 | 7.5g |
|  Kerguelen (1, 5, 7, 28, 29) | 3,215 | 0.5 | 0.843 | 0.910 | 0.818b,h | 0.763 | 9.7 |
|  South Georgia (1, 7) | 74,296 | 12.4 | 0.820 | 0.875 | 0.586b | 0.300 | 12.1 |
| Atlantic yellow-nosed albatross |  |  |  |  |  |  |  |
|  Gough (1, 31, 33, 34) | 5,300 | 15.9 | 0.836 | 0.920 | 0.655 | 0.630 | 10.5 |
| **Indian yellow-nosed albatross** |  |  |  |  |  |  |  |
|  Amsterdam and St Paul (1, 15, 17, 31, 32) | 22,000 | 65.0 | 0.794 | 0.902 | 0.655i | 0.159 | 9.0 |
| **Sooty albatross** |  |  |  |  |  |  |  |
|  Prince Edward Islands (1, 34, 35, 36) | 2,493 | 18.8 | 0.842e | 0.920 | 0.600 | 0.560 | 11.8 |
|  Tristan da Cunha (1, 33, 34, 35) | 8,188 | 61.7 | 0.842e | 0.920 | 0.600 | 0.480 | 11.8 |
| Light-mantled albatross |  |  |  |  |  |  |  |
|  Prince Edward Islands (1, 11) | 657 | 3.2 | 0.876 | 0.959j | 0.597j | 0.352j | 11.0j |
| Southern giant petrel |  |  |  |  |  |  |  |
|  Prince Edward Islands (1, 23, 35, 37, 38) | 2,800 | 4.7 | 0.795k | 0.890l | 0.730 | 0.550 | 8.0 |
|  South Georgia (1, 35, 39, 40) | 5,500 | 11.0 | 0.821k | 0.920 | 0.730 | 0.449 | 8.0 |
| Northern giant petrel |  |  |  |  |  |  |  |
|  Prince Edward Islands (1, 23, 32, 35, 37, 41) | 750 | 3.9 | 0.795k | 0.890 | 0.730m | 0.680 | 10.0 |
|  South Georgia (1, 32, 35, 39, 40) | 4,310 | 36.5 | 0.813k | 0.910 | 0.730m | 0.573 | 10.0 |
| **White-chinned petrel** |  |  |  |  |  |  |  |
|  Antipodes Islands (1, 7, 35, 37, 42, 43) | 40,000 | 3.0 | 0.819k | 0.940 | 0.750 | 0.300n | 6.5 |
|  Prince Edward Islands (1, 35, 44, 45, 46, 47) | 36,000 | 2.7 | 0.700o | 0.895o | 0.750 | 0.590 | 6.1o |
|  South Georgia (1, 7, 35, 43) | 773,150 | 58.8 | 0.820n | 0.875n | 0.750 | 0.444 | 6.0 |
| **Spectacled petrel** |  |  |  |  |  |  |  |
|  Tristan da Cunha (1, 34, 35, 48, 49) | 30,000 | 100.0 | 0.840 | 0.970 | 0.790p | 0.600q | 5.0q |
| **Black petrel** |  |  |  |  |  |  |  |
|  Great Barrier Island (1, 49, 50, 51, 52) | 2,427 | 94.3 | 0.792 | 0.903 | 0.800 | 0.735 | 6.6 |
| **Westland petrel** |  |  |  |  |  |  |  |
|  New Zealand (1, 53) | 4,000 | 100.0 | 0.875r | 0.936 | 0.460 | 0.607 | 7.7s |
| Grey petrel |  |  |  |  |  |  |  |
|  Antipodes Islands (1, 35, 52, 55) | 53,000 | NA | 0.819t | 0.940u | 0.810 | 0.735v | 7.0u |
|  Prince Edward Islands (1, 35, 52, 55, 56) | 5,000 | NA | 0.819t | 0.940u | 0.810 | 0.735v | 7.0u |
|  Gough (1, 35, 52, 55, 56) | 15,000 | NA | 0.819t | 0.940u | 0.810 | 0.735v | 7.0u |

a Average between males: 0.947 and females: 0.942; b Product of return and breeding probabilities; c Replaced from Crozet; d Replaced from grey-headed albatross at New Zealand, e AGE EFFECT - *Thalassarche*; f Breeding probability from Falkland Islands and return probability replaced from South Georgia; g Replaced from Falkland Islands; h Breeding probability from Kerguelen and return probability replaced from South Georgia; i Replaced from Atlantic yellow-nosed albatross at Gough; j Replaced from light-mantled albatross at New Zealand; k AGE EFFECT - *Procellaria* and *Thalassarche*; l Replaced from northern giant petrel at New Zealand; m Replaced from southern giant petrel; n Replaced from black-browed albatross at South Georgia; o Replaced from white-chinned petrel at Crozet; p Average of other *Procellaria* species; q Replaced from white-chinned petrel at Marion; r From fledging to first return; s Age of first return used as proxy for age of first breeding; t AGE EFFECT - *Procellaria*; u Replaced from grey petrel at Crozet; v Replaced from black petrel at New Zealand.

1 ACAP; 2 Delord et al., (2013); 3 Fayet et al., (2015); 4 Barbraud & Weimerskirch, (2012); 5 Pardo, Barbraud, Authier, & Weimerskirch, (2013); 6 Barbraud & Weimerskirch, (2012); 7 Pardo et al., (2017); 8 Davies, Dilley, Bond, Cuthbert, & Ryan, (2015); 9 Wanless et al., (2009); 10 Elliott & Walker, (2017); 11 Abraham, Yvan, & Clements, (2016); 12 Edwards, Robers, Walker, & Elliott, (2017); 13 Elliott, Walker, Parker, & Rexer-Huber, (2016); 14 Francis, Elliott, & Walker, (2015); 15 Heerah et al., (2019); 16 Rivalan, Barbraud, Inchausti, & Weimerskirch, (2010); 17 Jaeger et al., (2018); 18 Francis, (2012); 19 Sagar, (2011); 20 Fraser, Henderson, Robertson, & Scofield, (2011); 21 Sagar, (2014); 22 Francis & Sagar, (2012); 23 Ryan, Jones, Dyer, Upfold, & Crawford, (2009); 24 Catry, Forcada, & Almeida, (2011); 25 Campioni, Granadeiro, & Catry, (2017); 26 Catry unpub. data; 27 Robertson et al., (2014); 28 Nevoux, Weimerskirch, & Barbraud, (2010); 29 Pardo, Jenouvrier, Weimerskirch, & Barbraud, (2017); 30 Rolland, Barbraud, & Weimerskirch, (2009); 31 Cuthbert, Ryan, Cooper, & Hilton, (2003); 32 NZ birds online; 33 Cuthbert, Cooper, & Ryan, (2014)); 34 Ryan pers. comm; 35 Dobson & Jouventin, (2007); 36 Schoombie, Crawford, Makhado, Dyer, & Ryan, (2016), 37 Richard, Abraham, & Berkenbusch, (2017); 38 Ryan et al., (2003); 39 Gianuca et al., (n.d.); 40 Brown, Techow, Wood, & Phillips, (2015), 41 Jones, Risi, Cleeland, & Ryan, (2019), 42 Thompson pers. comm.; 43 Clay et al., (2019), 44 Ryan, Dilley, & Jones, (2012), 45 Rollinson, Dilley, Davies, & Ryan, (2018); 46 Barbraud, Marteau, Ridoux, Delord, & Weimerskirch, (2008); 47 Dilley et al., (2018); 48 Ryan, Dorse, & Hilton, (2006); 49 Francis & Bell, (2010); 50 Bell et al., (2018); 51 Bell, Sim, & Scofield, (2011); 52 Bell, Mischler, MacArthur, Sim, & Scofield, (2016); 53 Waugh et al., (2015); 54 Bell, (2013); 55 Barbraud, Delord, Marteau, & Weimerskirch, (2009); 56 Dilley pers. comm.

*References*

Abraham, E., Yvan, R., & Clements, K. (2016). *Evaluating threats to New Zealand seabirds*. Report for the Department of Conservation, New Zealand.

Barbraud, Christophe, Delord, K., Marteau, C., & Weimerskirch, H. (2009). Estimates of population size of white-chinned petrels and grey petrels at Kerguelen Islands and sensitivity to fisheries. *Animal Conservation*, *12*(3), 258–265. doi: 10.1111/j.1469-1795.2009.00248.x

Barbraud, Christophe, Marteau, C., Ridoux, V., Delord, K., & Weimerskirch, H. (2008). Demographic response of a population of white-chinned petrels *Procellaria aequinoctialis* to climate and longline fishery bycatch. *Journal of Applied Ecology*, *45*(5), 1460–1467. doi: 10.1111/j.1365-2664.2008.01537.x

Barbraud, Christophe, & Weimerskirch, H. (2012). Estimating survival and reproduction in a quasi-biennially breeding seabird with uncertain and unobservable states. *Journal of Ornithology*, *152*(2), 605–615. doi: 10.1007/s10336-011-0686-1

Bell, E. (2013). Notes on the distribution, behaviour and status of grey petrel (*Procellaria cinerea*) on Antipodes Island, New Zealand. *Notornis*, *60*(4), 269–278.

Bell, E. A., Burgin, D., Sim, J., Dunleavy, K., Fleishman, A., & Scofield, R. P. (2018). *Population trends, breeding distribution and habitat use of black petrels (Procellaria parkinsoni) – 2016/2017 operational report.* (New Zealand Aquatic Environment and Biodiversity Report No. 198; p. 50). Wellington, New Zealand: Ministry for Primary Industries.

Bell, E. A., Mischler, C. P., MacArthur, N., Sim, J. L., & Scofield, P. (2016). *Population parameters of black petrels (Procellaria parkinsoni) on Great Barrier Island/Aotea, 2015/16.* [Report to the Conservation Services Programme]. Wellington, New Zealand: Department of Conservation.

Bell, E. A., Sim, J. L., & Scofield, P. (2011). *Population parameters of the black petrels (Procellaria parkinsoni) on Great Barrier Island (Aotea Island), 2009/10.* [POP2009-01 Black petrel population parameters - DRAFT]. Wellington, New Zealand.

Brown, R. M., Techow, N. M. S. M., Wood, A. G., & Phillips, R. A. (2015). Hybridization and back-crossing in giant petrels (*Macronectes giganteus* and *M. halli*) at Bird Island, South Georgia, and a summary of hybridization in seabirds. *PLOS ONE*, *10*(3), e0121688. doi: 10.1371/journal.pone.0121688

Campioni, L., Granadeiro, J. P., & Catry, P. (2017). Albatrosses prospect before choosing a home: Intrinsic and extrinsic sources of variability in visit rates. *Animal Behaviour*, *128*, 85–93. doi: 10.1016/j.anbehav.2017.04.008

Catry, P., Forcada, J., & Almeida, A. (2011). Demographic parameters of black-browed albatrosses *Thalassarche melanophris* from the Falkland Islands. *Polar Biology*, *34*(8), 1221–1229. doi: 10.1007/s00300-011-0984-3

Clay, T. A., Small, C., Tuck, G. N., Pardo, D., Carneiro, A. P. B., Wood, A. G., … Phillips, R. A. (2019). A comprehensive large-scale assessment of fisheries bycatch risk to threatened seabird populations. *Journal of Applied Ecology*, *56*(8), 1882–1893. doi: 10.1111/1365-2664.13407

Cuthbert, R., Cooper, J., & Ryan, P. G. (2014). Population trends and breeding success of albatrosses and giant petrels at Gough Island in the face of at-sea and on-land threats. *Antarctic Science*, *26*(2), 163–171. doi: 10.1017/S0954102013000424

Cuthbert, R., Ryan, P. G., Cooper, J., & Hilton, G. (2003). Demography and population trends of the Atlantic yellow-nosed albatross. *The Condor*, *105*(3), 439–452.

Davies, D., Dilley, B., Bond, A., Cuthbert, R., & Ryan, P. (2015). Trends and tactics of mouse predation on Tristan albatross *Diomedea dabbenena* chicks at Gough Island, South Atlantic Ocean. *Avian Conservation and Ecology*, *10*(1). doi: 10.5751/ACE-00738-100105

Delord, K., Barbraud, C., Bost, C.-A., Cherel, Y., Guinet, C., & Weimerskirch, H. (2013). *Atlas of top predators from French Southern Territories in the Southern Indian Ocean* (p. 252). Villiers en Bois: Centre d’Etudes Biologiques de Chizé, Centre National de la Recherche Scientifique.

Dilley, B. J., Schoombie, S., Stevens, K., Davies, D., Perold, V., Osborne, A., … Ryan, P. G. (2018). Mouse predation affects breeding success of burrow-nesting petrels at sub-Antarctic Marion Island. *Antarctic Science*, *30*(2), 93–104. doi: 10.1017/S0954102017000487

Dobson, S. F., & Jouventin, P. (2007). How slow breeding can be selected in seabirds: testing Lack’s hypothesis. *Proceedings of the Royal Society B: Biological Sciences*, *274*(1607), 275–279. doi: 10.1098/rspb.2006.3724

Edwards, C. T. T., Robers, J. O., Walker, K., & Elliott, G. (2017). *Quantitative modelling of Antipodean wandering albatross* (New Zealand Aquatic Environment and Biodiversity Report No. 180). Wellington, New Zealand: Ministry for Primary Industries.

Elliott, G., & Walker, K. (2017). *Antipodean wandering albatross census and population study 2017* (p. 20). Wellington, New Zealand: Department of Conservation.

Elliott, G., Walker, K., Parker, G., & Rexer-Huber, K. (2016). *Gibson’s wandering albatross census and population study 2015/16*. Wellington, New Zealand: Department of Conservation.

Fayet, A. L., Freeman, R., Shoji, A., Padget, O., Perrins, C. M., & Guilford, T. (2015). Lower foraging efficiency in immatures drives spatial segregation with breeding adults in a long-lived pelagic seabird. *Animal Behaviour*, *110*, 79–89. doi: 10.1016/j.anbehav.2015.09.008

Francis, R. I. C. (2012). *Fisheries risks to the population viability of white-capped albatross Thalassarche steadi* (New Zealand Aquatic Environment and Biodiversity Report No. 104). Wellington, New Zealand: Ministry for Primary Industries.

Francis, R. I. C., & Bell, E. A. (2010). *Fisheries risks to the population viability of black petrel (Procellaria parkinsoni)* (New Zealand Aquatic Environment and Biodiversity Report No. 51). Wellington, New Zealand: Ministry of Fisheries.

Francis, R. I. C., Elliott, G., & Walker, K. (2015). *Fisheries risks to the viability of Gibson’s wandering albatross Diomedea gibsoni* (New Zealand Aquatic Environment and Biodiversity Report No. 152). Wellington, New Zealand: Ministry of Primary Industries.

Francis, R. I. C., & Sagar, P. M. (2012). Modelling the effect of fishing on southern Buller’s albatross using a 60-year dataset. *New Zealand Journal of Zoology*, *39*(1), 3–17. doi: 10.1080/03014223.2011.600766

Fraser, M., Henderson, G., Robertson, C. J. R., & Scofield, P. (2011). *Population dynamics of the Chatham Mollymawk at The Pyramid, 19 November – 2 December 2010.* [Final Research Report for project PRO2006-01E (unpublished report)]. Wellington, New Zealand: Ministry for Primary Industries.

Gianuca, D., Votier, S. C., Pardo, D., Wood, A. G., Sherley, R. B., Ireland, L., … Phillips, R. A. (n.d.). Sex-specific effects of fisheries and climate on the demography of sexually dimorphic seabirds. *Journal of Animal Ecology*, *0*(0). doi: 10.1111/1365-2656.13009

Heerah, K., Dias, M. P., Delord, K., Oppel, S., Barbraud, C., Weimerskirch, H., & Bost, C. A. (2019). Important areas and conservation sites for a community of globally threatened marine predators of the Southern Indian Ocean. *Biological Conservation*, *234*, 192–201. doi: 10.1016/j.biocon.2019.03.037

Jaeger, A., Lebarbenchon, C., Bourret, V., Bastien, M., Lagadec, E., Thiebot, J.-B., … Weimerskirch, H. (2018). Avian cholera outbreaks threaten seabird species on Amsterdam Island. *PLOS ONE*, *13*(5), e0197291. doi: 10.1371/journal.pone.0197291

Jones, C. W., Risi, M. M., Cleeland, J., & Ryan, P. G. (2019). First evidence of mouse attacks on adult albatrosses and petrels breeding on sub-Antarctic Marion and Gough Islands. *Polar Biology*, *42*(3), 619–623. doi: 10.1007/s00300-018-02444-6

Nevoux, M., Weimerskirch, H., & Barbraud, C. (2010). Long- and short-term influence of environment on recruitment in a species with highly delayed maturity. *Oecologia*, *162*(2), 383–392. doi: 10.1007/s00442-009-1482-y

Pardo, D., Barbraud, C., Authier, M., & Weimerskirch, H. (2013). Evidence for an age-dependent influence of environmental variations on a long-lived seabird’s life-history traits. *Ecology*, *94*(1), 208–220.

Pardo, D., Forcada, J., Wood, A. G., Tuck, G. N., Ireland, L., Pradel, R., … Phillips, R. A. (2017). Additive effects of climate and fisheries drive ongoing declines in multiple albatross species. *Proceedings of the National Academy of Sciences*, *114*(50), E10829–E10837. doi: 10.1073/pnas.1618819114

Pardo, D., Jenouvrier, S., Weimerskirch, H., & Barbraud, C. (2017). Effect of extreme sea surface temperature events on the demography of an age-structured albatross population. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *372*(1723), 20160143. doi: 10.1098/rstb.2016.0143

Richard, Y., Abraham, E., & Berkenbusch, K. (2017). *Assessment of the risk of commercial fisheries to New Zealand seabirds, 2006–07 to 2014–15.* (New Zealand Aquatic Environment and Biodiversity Report No. 191; p. 133). Wellington, New Zealand: Ministry for Primary Industries.

Rivalan, P., Barbraud, C., Inchausti, P., & Weimerskirch, H. (2010). Combined impacts of longline fisheries and climate on the persistence of the Amsterdam Albatross *Diomedia amsterdamensis*. *Ibis*, *152*(1), 6–18. doi: 10.1111/j.1474-919X.2009.00977.x

Robertson, G., Moreno, C., Arata, J. A., Candy, S. G., Lawton, K., Valencia, J., … Suazo, C. G. (2014). Black-browed albatross numbers in Chile increase in response to reduced mortality in fisheries. *Biological Conservation*, *169*, 319–333. doi: 10.1016/j.biocon.2013.12.002

Rolland, V., Barbraud, C., & Weimerskirch, H. (2009). Assessing the impact of fisheries, climate and disease on the dynamics of the Indian yellow-nosed Albatross. *Biological Conservation*, *142*(5), 1084–1095. doi: 10.1016/j.biocon.2008.12.030

Rollinson, D. P., Dilley, B. J., Davies, D., & Ryan, P. G. (2018). Year-round movements of white-chinned petrels from Marion Island, south-western Indian Ocean. *Antarctic Science*, *30*(3), 183–195. doi: 10.1017/S0954102018000056

Ryan, P. G., Cooper, J., Dyer, B. M., Underhill, L. G., Crawford, R. J. M., & Bester, M. N. (2003). Counts of surface-nesting seabirds breeding at Prince Edward Island, summer 2001/02. *African Journal of Marine Science*, *25*(1), 441–451. doi: 10.2989/18142320309504033

Ryan, P. G., Dilley, B. J., & Jones, M. G. W. (2012). The distribution and abundance of white-chinned petrels (*Procellaria aequinoctialis*) breeding at the sub-Antarctic Prince Edward Islands. *Polar Biology*, *35*(12), 1851–1859. doi: 10.1007/s00300-012-1227-y

Ryan, P. G., Jones, M. G., Dyer, B. M., Upfold, L., & Crawford, R. J. (2009). Recent population estimates and trends in numbers of albatrosses and giant petrels breeding at the sub-Antarctic Prince Edward Islands. *African Journal of Marine Science*, *31*(3), 409–417. doi: 10.2989/AJMS.2009.31.3.13.1001

Ryan, Peter G., Dorse, C., & Hilton, G. M. (2006). The conservation status of the spectacled petrel *Procellaria conspicillata*. *Biological Conservation*, *131*(4), 575–583. doi: 10.1016/j.biocon.2006.03.004

Sagar. (2011). Population size, breeding frequency and survival of Salvin’s albatrosses (<i>Thalassarche salvini<i>) at the Western Chain, The Snares, New Zealand. *Notornis*, *58*(2), 57–63.

Sagar, P. (2014). *Population studies of Southern Buller’s albatrosses on The Snares*. Wellington, New Zealand: Department of Conservation, Ministry for Primary Industries and Deepwater Group Limited.

Schoombie, S., Crawford, R. J. M., Makhado, A. B., Dyer, B. M., & Ryan, P. G. (2016). Recent population trends of sooty and light-mantled albatrosses breeding on Marion Island. *African Journal of Marine Science*, *38*(1), 119–127. doi: 10.2989/1814232X.2016.1162750

Wanless, R. M., Ryan, P. G., Altwegg, R., Angel, A., Cooper, J., Cuthbert, R., & Hilton, G. M. (2009). From both sides: Dire demographic consequences of carnivorous mice and longlining for the Critically Endangered Tristan albatrosses on Gough Island. *Biological Conservation*, *142*(8), 1710–1718. doi: 10.1016/j.biocon.2009.03.008

Waugh, S. M., Barbraud, C., Adams, L., Freeman, A. N. D., Wilson, K.-J., Wood, G., … Baker, G. B. (2015). Modeling the demography and population dynamics of a subtropical seabird, and the influence of environmental factors. *The Condor*, *117*(2), 147–164. doi: 10.1650/CONDOR-14-141.1