

Population study of Southern Buller's Albatross at The Snares, April 2017

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Development of a long-term research project

- 1948 – Dr Lance Richdale spends 6 weeks studying courtship and laying behaviour.
- 1961-1987 – University of Canterbury undertakes several expeditions. Under the supervision of Drs Bernard Stonehouse and John Warham a number of students determine the timing of the breeding cycle and ascertain breeding frequency, adult survival and breeding behaviour. In 1972-73 Carol Horning completes the only study yet completed of one complete breeding season.
- 1992-present – funded by NIWA, FRST/MBIE, MPI, Deepwater Group & DoC undertake studies to determine any impacts of commercial fisheries.

Demographic field work/effort

- 1992-2005 – consistent effort usually involving 15-20 days in February-March (incubation period) for capture-recapture of adults and breeding effort in study colonies, plus 10-12 days in late Jul-Aug to determine breeding success and to band fledglings.
- 2006-present – consistent effort but at a lower level, usually involving 4-10 days in March-April (guard stage) for recapture of adults and estimation of breeding effort in study colonies.
- However, the decrease in resighting effort did not induce a strong trend in survival estimates, and so we conclude that estimated declines in survival rates since 1992 are likely to be real (Francis & Sagar 2012)

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- Resurvey three established study colonies
- Establish the number of pairs breeding in the three study colonies
- Estimate annual survival of banded birds from recapture data

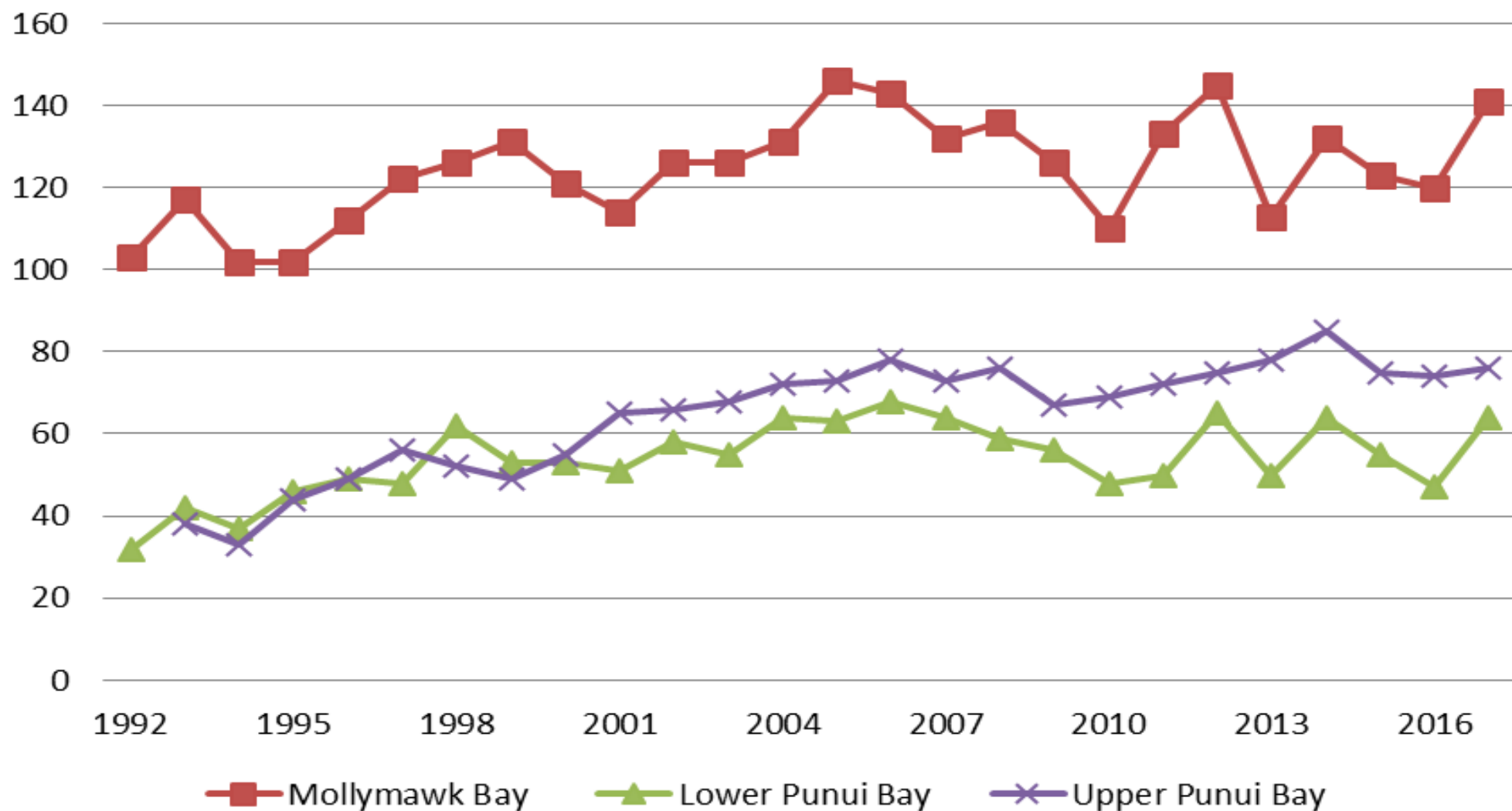


Methods

- Fieldwork completed 3-6 April 2017
- Banded birds associated with a nest were recaptured
- All unbanded birds incubating or guarding a chick were captured, banded and measured
- Subsequent visits to colonies enabled recapture/capture of birds that had taken over incubation/chick guarding duties
- Searches made for banded birds in colonies adjacent to and up to 300m from study colonies
- Survival estimated for banded birds using MARK 7.1



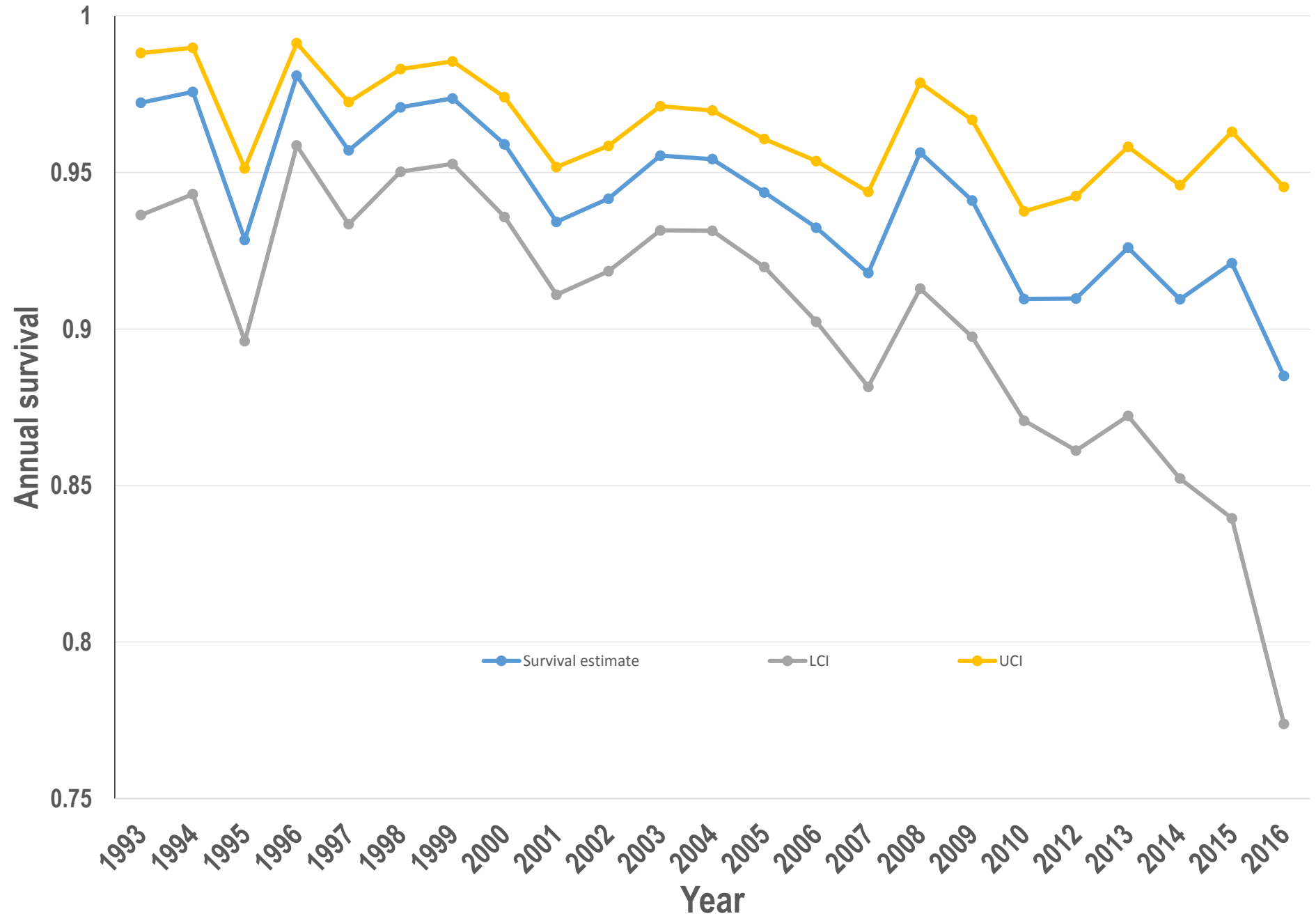
Numbers of breeding pairs of Buller's albatrosses in 3 study colonies, The Snares 1992-2017



Adult survival

- 247 birds that had been banded as breeding adults of unknown age were recaptured – this included breeding birds, non-breeding birds and failed breeders.
- A further 56 birds were banded this year – these were birds that were incubating or guarding a chick. These are assumed to be 1st-time breeders, and so an estimated average age of 10-12 years.
- Of the 247 birds banded previously as breeding adults, 15 had been banded in 1992, and so likely to be over 36 years old.

Estimated annual survival of adult Southern Buller's Albatross



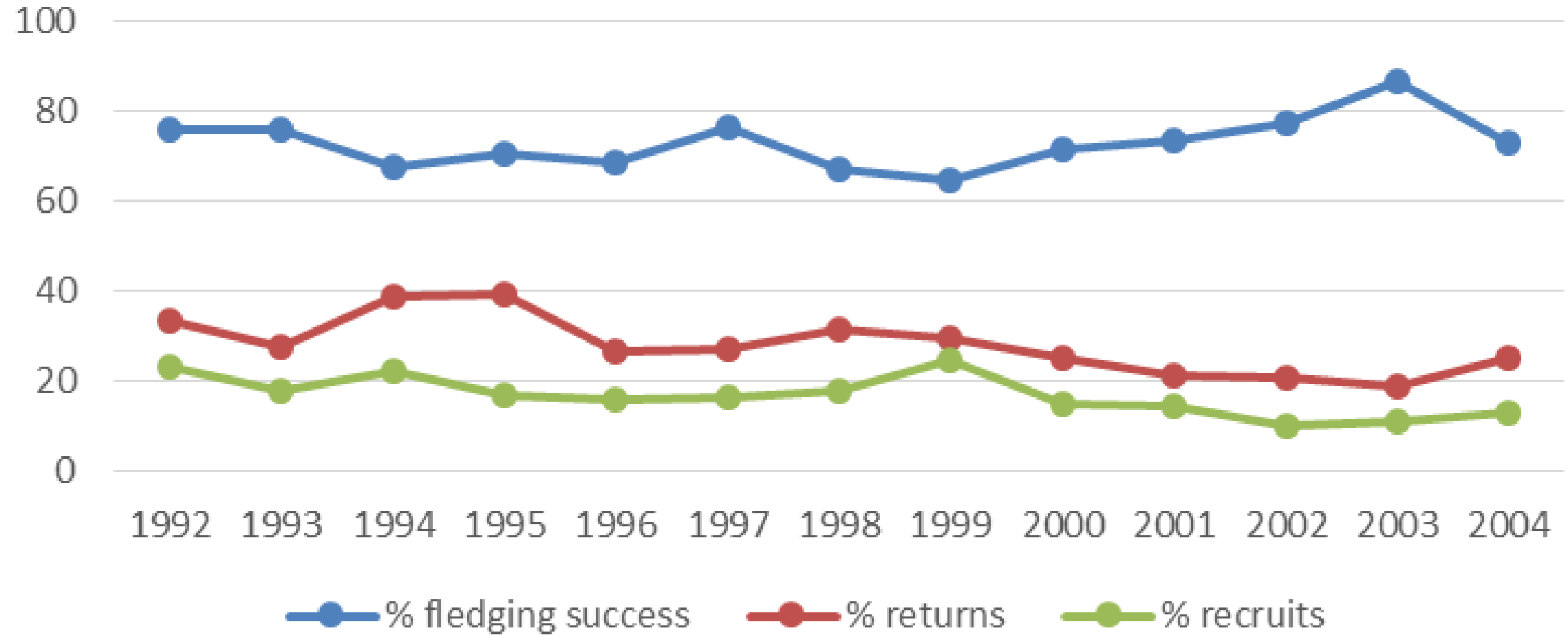
Survival & recruitment known-age birds - 1

- Of 2765 near-fledged chicks banded in the study colonies and adjacent colonies between 1992 and 2004, 124 were recaptured
- 18 of these 124 were recaptured for the 1st time and came from cohorts banded 1998-2004
- Of 1991 chicks banded in the study colonies 1992-2004, 536 (26.9%) have been recaptured
- Return rates have varied widely between colonies and years, ranging from 4.7% (5 recaptured from 107 banded) from Punui Bay in 2003 to 44.3% (27 recaptured from 61 banded) from Punui Bay in 1995.

Survival & recruitment known-age birds - 2

- 25 birds banded as chicks in the study colonies were found breeding for the 1st time in April 2017
- These were aged from 13 years (banded as chicks in 2004) to 21 years (banded as a chick in 1996)
- Currently, for the cohorts 1992-1999 recruitment ranges from 16.0% (1996) to 24.5% (1999)
- Currently, for the cohorts 2000-2004 recruitment ranges from 10.1% (2002) to 14.7% (2001), with more birds likely to be recorded from these cohorts.

Fledging success, return rate and recruitment rate of Southern Buller's Albatrosses at The Snares



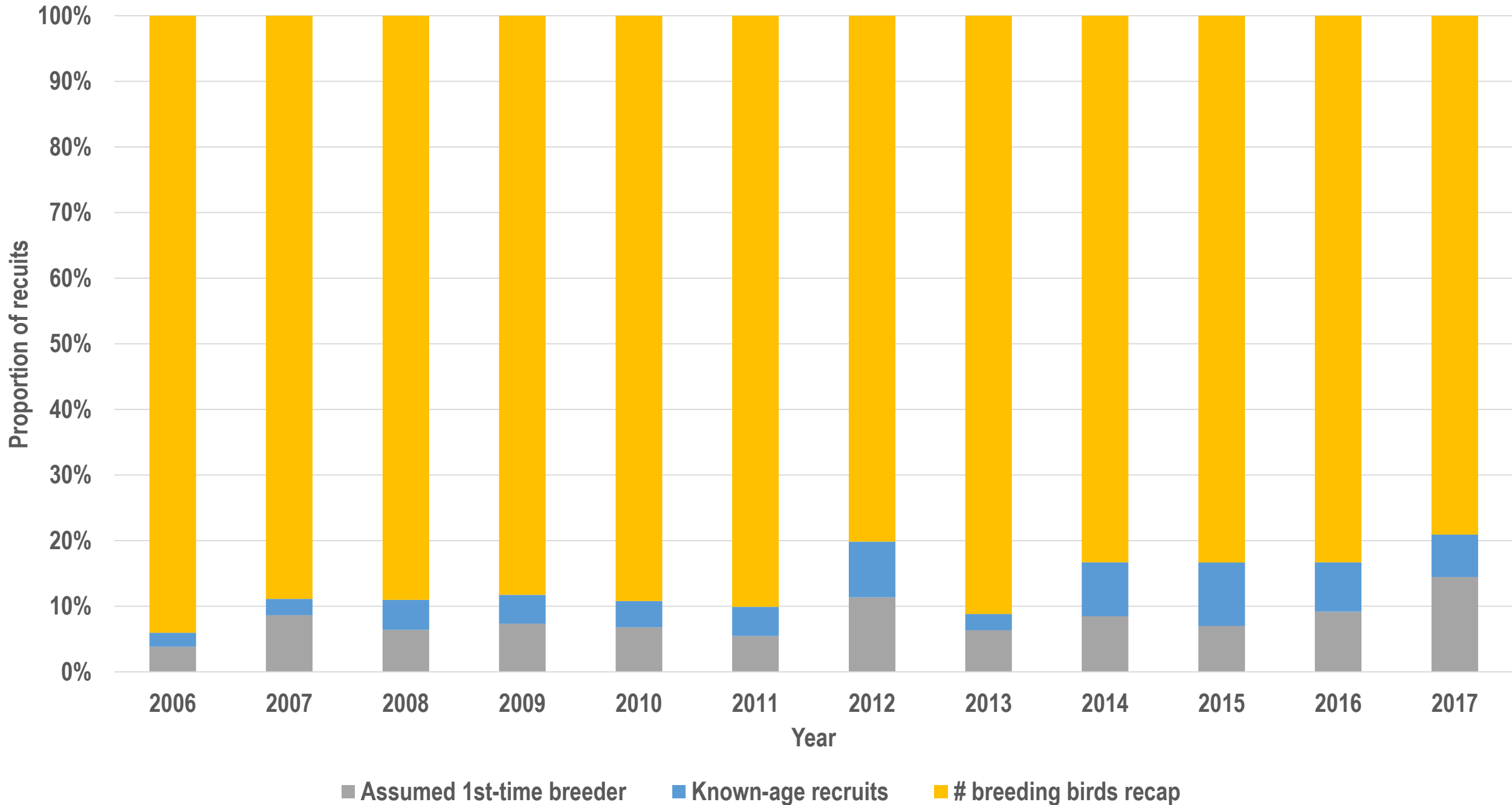
Movements of banded birds between colonies

- No birds banded as breeding within the study colonies were found breeding in other colonies, this has been a consistent finding throughout this study
- In April 2017 movements of birds from their natal colonies was detected, which again is consistent with findings in previous years
- This year, of 4 birds that were now breeding in colonies other than their natal colony, 3 had moved <100m and 1 had moved about 1500m

Overall recruitment to the study colonies

- Assuming that (1) established breeders are highly unlikely to move nests from one colony to another between seasons and (2) any unbanded birds breeding in the study colonies are likely to be 1st-time breeders.
- Then the proportion of recruits (newly banded birds + known-age birds recorded as 1st-time breeders) to the overall number of breeding birds captured/recaptured varied around 10-11% 2006-2011 and then mostly 16-21% 2012-2017.

Birds recruited to study colonies



Birds banded before 1992

- No birds banded as breeding birds of unknown age were recaptured during April 2017, the last such birds were recaptured in 2013.
- A bird banded as a chick in Punui Bay during August 1972 was again recaptured breeding on a nest near its natal site in April 2017; this bird is 45 years old.

Modelling population data 1948-2007:
conclusions of analysis by Francis & Sagar (NZ Journal of Zoology
2012)

- There is some cause for concern in recent changes in demographic parameters – population growth has slowed and perhaps reversed, and adult survival rates are declining.
- Though this population is not in immediate danger from fishing, there is a need for continued monitoring to see whether the recent fall in survival rate persists and causes an overall decline in abundance.

Conclusions

- Annual counts of the numbers of breeding birds in all 3 study colonies combined indicate that the population increased from 1992 to peak 2005-2006, then trended downwards to 2010 since when it has had marked annual fluctuations.
- Annual survival estimates through to 2016 indicate that the decline in adult survival has continued.
- Since 2012 the breeding population in the study colonies appears to have been sustained by an increased rate of recruitment.
- These changes in demographic values highlight the need to continue monitoring the Southern Buller's Albatross population at The Snares.

Acknowledgements

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