Falkland Islands Seabird Monitoring Programme

Annual Report 2013/2014 (SMP21)

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Summary

The Falkland Islands support seabird populations that are of global importance; both numerically, and in terms of conservation status. Accordingly, fluctuations in local populations impact the global conservation status of these species.

Currently the Falkland Islands Seabird Monitoring Programme (FISMP) monitors Gentoo Penguin (*Pygoscelis papua*) at 11 sites (16 colonies), Magellanic Penguin (*Spheniscus Magellanicus*) at one site (one colony), and Southern Rockhopper Penguin (*Eudyptes chrysocome*) at five sites (13 colonies). Imperial Shag (*Phalacrocorax atriceps*) is monitored at two sites. King penguin (*Aptenodytes patagonicus*) and Black-browed Albatross (*Thalassarche melanophris*) are monitored at single, but key, sites; in terms of population numbers. Southern Giant Petrel (*Macronectes giganteus*) is monitored at one site (three colonies). Additional count data have been contributed by landowners at two further sites.

In the 2013/2014 season, estimated numbers of Gentoo Penguin breeding pairs at monitored sites decreased by 13.0 % from the previous season to 26,241. Given similar previous fluctuations in what has been an increasing population trend over the last nine years, there is currently no indication of any overall decline. Notably, mid-east and south-east colonies showed relatively large reductions in both estimated breeding pairs and breeding success compared to other areas. These localised reductions contributed substantially to the overall fall in breeding pair and breeding success estimates for the season. Estimated breeding success was down from the previous season to 0.84 chicks/pair; below the seasonal average for the last 22 years.

Estimated breeding numbers of Southern Rockhopper Penguin at monitored sites increased on those from the previous season (up 6.7 %), taking it to the highest number recorded since monitoring began, and continuing a general increase over the past seven years. Mean breeding success fell from the previous season (0.54 %) to 0.48 %, which remained below the seasonal average.

Magellanic Penguin distribution, density and occupancy rates at Gypsy Cove were comparable to the previous season.

Estimated numbers of pre-fledged King penguin chicks at Volunteer were down 14.9 % on the previous season. There is currently nothing to suggest that this was anything but natural variation in the existing general increasing trend.

Indications from the monitoring sites at Steeple Jason were of stable to increasing numbers at the largest breeding colony of Black-browed Albatross. This increasing trend is mirrored in the count data provided for Penguin Point South at Dunbar. Most of the increase in estimated breeding pairs on last season (up 26.8 %) at Steeple Jason was due to a rebound in the Study Area numbers. This followed significant reductions over the previous two years resulting from a severe storm event in 2010. Breeding success at Steeple Jason remains relatively high compared to historical data as far back as 1989.

There is still an apparent steady upward trend in the Steeple Jason population of Southern Giant Petrel. At Bleaker Island, chick counts have fluctuated but generally increased during the monitoring period (a 6.6 % annual increase).

Contents

Introduction

The Falkland Islands support seabird populations that are of global importance; both numerically, and in terms of conservation status. An estimated 67-70 % of the global population of Black-browed Albatross (*Thalassarche melanophris*) breeds in the Falkland Islands (ACAP 2010, BirdLife International 2012). This species is currently listed as 'Near Threatened' on the IUCN Red List (IUCN 2013). The Falklands are also home to approximately 36 % of the world's population of Southern Rockhopper Penguin (*Eudyptes chrysocome*) (Red Listed as 'Vulnerable') and approximately 34 % of the world's population of Gentoo Penguin (*Pygoscelis papua*) (Red Listed as 'Near Threatened'). Accordingly, fluctuations in local populations impact the global conservation status of these species.

Falklands Conservation initiated the Falkland Islands Seabird Monitoring Programme (FISMP) in 1989/90. Its initial purpose was to monitor the diet and population dynamics of Gentoo Penguin, Magellanic Penguin (*Spheniscus Magellanicus*), Southern Rockhopper Penguin, and Black-browed Albatross. Diet sampling was discontinued in 2003. Since then, population monitoring has continued on an annual basis with some changes taking place to the original format, such as the addition and loss of some monitoring sites and the addition of other species.

Currently the FISMP monitors Gentoo Penguin at 11 sites (16 colonies), Magellanic Penguin at one site (one colony), and Southern Rockhopper Penguins at five sites (13 colonies). King penguin (*Aptenodytes patagonicus*) and Black-browed Albatross are monitored at single, but key, sites, in terms of population numbers. Since 2006, Southern Giant Petrel (*Macronectes giganteus*) has been monitored at one site (three colonies). Imperial shag (*Phalacrocorax atriceps*) has been monitored at two sites, commencing this season.

In 2010, monitored colonies made up approximately 18 % of the Falklands' breeding population of Gentoo Penguin (estimated at 132,000 breeding pairs); approximately 2.6 % of the Falklands' breeding population of Southern Rockhopper Penguin (estimated to be 319,000 breeding pairs) and approximately 0.5 % – 0.6 % of the total Falklands' breeding population of Black-browed Albatross (estimated to be between 475,500 and 535,000 breeding pairs) (Baylis 2012, Wolfaardt 2012). Based on 2005 figures (the last Island-wide Census for Southern Giant Petrel), the monitoring site for Southern Giant Petrel made up approximately 7.3 % of the total Falklands'

breeding population (Reid and Huin 2005). The only population estimate for Magellanic Penguin in the Falkland Islands is for 76,000 to 142,000 pairs (Woods and Woods 1997). As a very broad estimate, the current monitoring site is likely to represent less than one percent of this. There are no other significant King penguin colonies within the Falkland Islands and the small numbers of individuals at other locations are not systematically monitored. The current monitoring site is likely to represent over 95 % of the breeding population.

The information gathered as a result of the FISMP has contributed to the identification of local, regional and global conservation priorities and provided information necessary for IUCN Red Listing of both Southern Rockhopper Penguins and Black-browed Albatross. The FISMP provides an important long-term data set on population trends and breeding success, which further contributes to other areas of research.

This report details monitoring results from the 2013/2014 breeding season as well as contributed current and historic data collected by landowners at Dunbar and Bleaker Island settlements.

Materials and Methods

Within this report, breeding seasons are referred to by the year in which they commenced, for example; 2013 describes the 2013/2014 season. 'Location' or 'site' refers to a named geographical area, such as a settlement or 'camp', and this may support more than one colony. For example, Volunteer has Gentoo Penguin colonies at Volunteer Green, Lagoon Sands and at Cow Bay; Race Point has Gentoo Penguin colonies at Rookery Sands and Fanning Harbour. 'Colony' refers to a group or groups (sub-colonies) of birds in close proximity, typically within 50-100 m of each other and/or with the same or proximate access from the sea. Monitoring locations are shown in **Figure 1**, exact grid references are provided in **Appendices 2** to **5**.

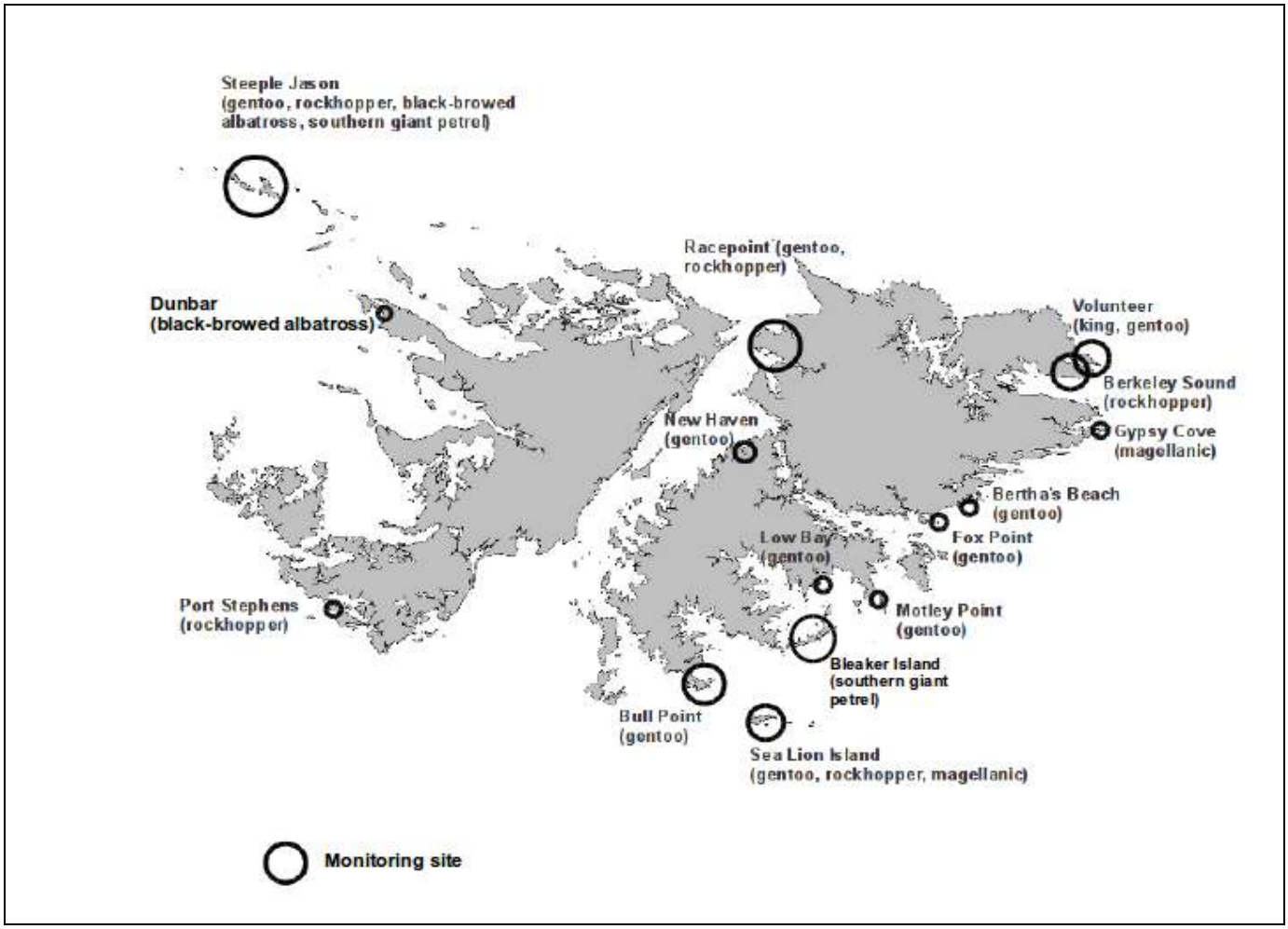

Figure 1: Map of monitoring locations.

In addition to those counts undertaken by Falklands Conservation (below), counts have also been undertaken at Dunbar (Black-browed Albatross) and Bleaker Island (Southern Giant Petrel) by the landowners. Any variation from the standard methodology is reported in the text.

Gentoo Penguin

Breeding pairs of Gentoo Penguins were counted during egg-laying, over the period 31 October to 21 November 2013. The number of chicks were counted soon before fledging, during the period 3 January to 21 January 2014, and used to estimate breeding success. The monitoring locations (colonies in brackets if more than one) were:

- Volunteer (Volunteer Green, Cow Bay and Lagoon Sands);
- Race Point (Fanning Harbour and Rookery Sands);
- Sea Lion Island;
- New Haven;
- Bull Point (Bull Point and Bull Roads);
- Motley Point;
- Low Bay;
- Bertha's Beach;
- Fox Point;
- Pleasant Roads; and
- Steeple Jason (House and Neck).

Southern Rockhopper Penguin

Southern Rockhopper Penguin breeding pair counts were performed from the commencement of egg-laying during the period 4 November to 21 November 2013. Chick counts were carried out between 6 January and 21 January 2014. The locations (colonies in brackets if more than one) were:

- Steeple Jason (North West Flat, North West Ridge, S5Tip and South East);
- Sea Lion Island (Rockhopper Point);
- Race Point (Fanning Head North and Fanning Head South);
- Berkeley Sound (Diamond Cove, Rugged Hill and Eagle Hill); and
- Port Stephens (Stephen's Peak).

Magellanic Penguin

Transects were carried out every 100 m (approximately) from Engineer Point to the Car Park at Gypsy Cove on 16 December 2013. Transects were 4 m wide, starting from the shore line, and running perpendicular to it, for a distance 40 m further than the last burrow found. Using a pole with torch attached, burrows within the transect were categorised as either 'occupied', 'unoccupied' or 'unknown' if it was not possible to determine occupancy. Burrow density was derived from each transect as number of burrows in the transect area from the start of the transect to as far as the last recorded burrow.

King penguin

The only significant population of King Penguins within the Falkland Islands is found at Volunteer. This population has been monitored annually since the onset of the FISMP, with the first independent counts having been performed earlier, since 1980. A few individuals also breed at nearby Lagoon Sands. The breeding cycle of King Penguins extends over a year and consequently is not synchronised to summer breeding as with the other penguin species. The chosen unit of measure for King Penguin is pre-fledged chicks that have survived the winter. This is not a measure of the total number of chicks produced (as some will have perished over the winter), nor is it an exact indicator of the number of breeding pairs. Counts of pre-fledged chicks were performed on 19 November 2013.

Imperial Shag

Counts of Imperial shag were conducted at Motley Point (16 November 2013) and Berkeley Sound (21 November 2013) during Gentoo Penguin breeding pair counts. Due to the late breeding of Imperial Shag, numbers derived represent potential breeders rather than actual breeding pairs.

Black-browed Albatross and Southern Giant Petrel

Counts of Black-browed Albatross and Southern Giant Petrel breeding pairs at Steeple Jason were performed between 31 October and 5 November, and in order to estimate breeding success, chicks from these colonies were counted between 16 and 19 March 2013. Three colonies of Southern Giant Petrel and five sub-colonies (distinct nodes from the main colony, or groups of breeding birds that are slightly separated from the main colony) of Black-browed Albatross are monitored.

Counts of Black-browed Albatross breeding pairs and chicks were made at Penguin Point South, Dunbar in November/December and January, respectively.

Counts of Southern Giant Petrel chicks were made at Bleaker Island in February.

Count Methods

Whenever possible the total counts were made of all breeding pairs/chicks at individual locations, whilst in the field, by paired observers (**Appendix 1**). The count units for estimated breeding pairs and estimated breeding success were 'apparently occupied nest' and 'pre-fledged chick', respectively. The decision to utilise photo counting was made on an individual colony/sub-colony basis, where it was felt that a paired tally count in the field would not provide a reliable estimate. This was generally due to the size of some colonies (e.g. Steeple Jason Neck). In some instances, for chick counting, large numbers of highly mobile chicks had merged sub-colonies over large areas. Here again, it was felt, that reliable estimates could not be derived and the decision was made to count the other various sub-colonies that had remained distinct. These counts still related to individual breeding pair numbers from the counts earlier in the season, and from this breeding success could be derived; in essence a sub-sampling technique. The various methods, or combination of methods, employed for each location/ colony is presented in **Appendices 2** to **5**.

Grid references of individual colonies (approximate centres) were taken where possible and are provided in relevant **Appendices 2** to **5**.

Field Counts

Whenever possible, the number of 'apparently occupied nests' and 'pre-fledged chicks' were counted at least three times by two or more observers using tally counters in accordance with standard methods (Thompson and Riddy 1993). These counts (and those few of reduced replication) were subsequently averaged to give estimates of breeding pair and chick numbers. These counts are referred to as 'Tally Repeated'. Counts at Penguin Point South, Dunbar and Bleaker Island were single counts by a single observer. In some instances groups or count unit numbers were so small that it was felt the number of count units could confidently counted without error on a single occasion. These counts are referred to as 'Tally Agreed'. The Breeding success is expressed as the number of chicks per breeding pair for species with two or more chicks and as a percentage for those with one chick on graphs.

Photo Counts

The majority of photographs were taken using a GoPro HD Hero. The camera was pole mounted and held aloft from a vantage point to a height of approximately 5 m whilst a minimum of three photos were taken in 1920x1080 resolution in jpeg format giving a 127 ° field of view. Where colonies were too large to fit into a single photograph, markers or natural features were used to subdivide the colonies into sections that could be photographed. There was no evidence of disturbance in the colonies from using this technique. A number of other photos were taken using digital SLR cameras using the highest possible resolution images.

Photographs were down-loaded and were counted using Imagej software. Counts were repeated a minimum of three times and the average taken. These are referred to as 'Photo Counts' in Tables.

Results

Gentoo Penguin

Breeding Pairs

There is a complete data set for the current annually monitored locations (excluding Pleasant Roads) for the last 11 seasons. The combined total of estimated breeding pairs for all these locations is shown in **Figure 2**. At the currently monitored sites, the total number of pairs decreased from 30,146 in the 2012 season to 26,241 in the 2013 season; a 13.0 % decrease.

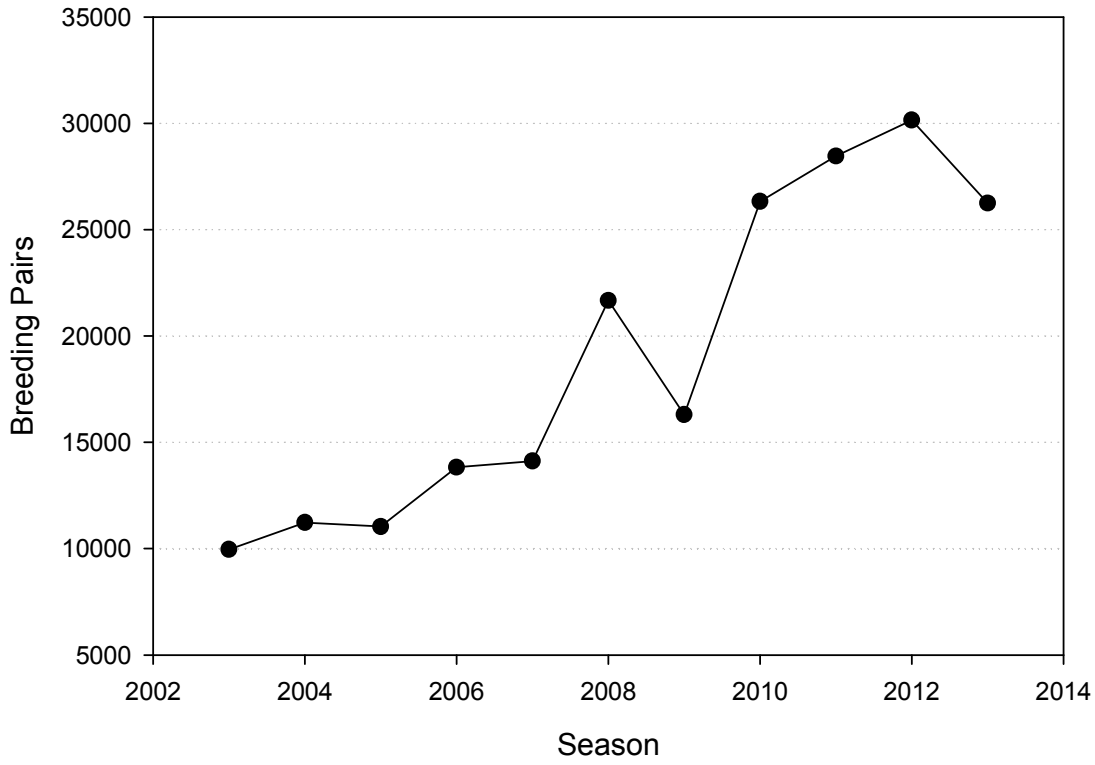

Figure 2: Seasonal changes in total estimated Gentoo Penguin breeding pairs from current annually monitored locations.

The estimated number of Gentoo Penguin breeding pairs decreased at eleven of the fourteen monitoring locations (**Figures 3** to **7**). Breeding pair estimates declined by as much as 51.7 % on the previous season. Declines were most evident in mid-east and south-east Falkland's colonies, with mean reductions in estimated breeding pairs of 42.3 ± 22.8 % and 34.5 ± 24.2 % respectively for those areas. Falkland Sound colonies showed some reduction 13.6 ± 14.3 % whilst Steeple Jason colonies increased slightly and north-east colonies more notably so; 8.7 ± 13.5 % and 13.1 ± 11.9 % respectively.

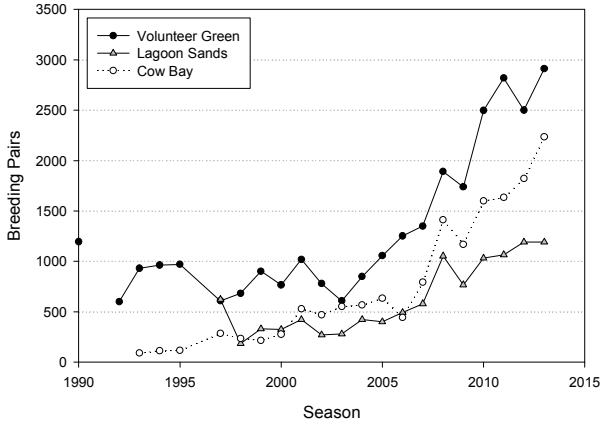

Figure3: Seasonal changes in estimated Gentoo Penguin breeding pairs for locations in north-east Falkland.

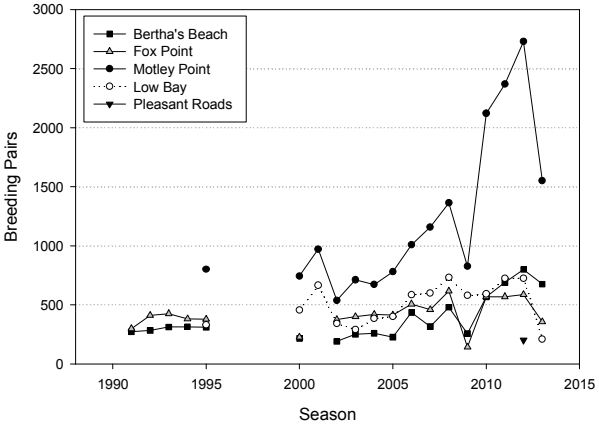

Figure 4: Seasonal changes in estimated Gentoo Penguin breeding pairs for locations in mid-east Falkland.

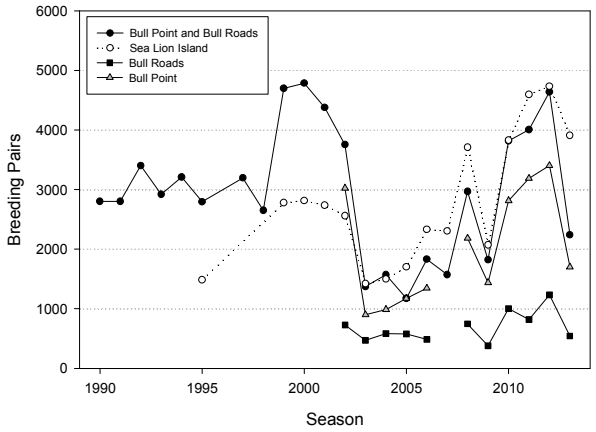

Figure 5: Seasonal changes in estimated Gentoo Penguin breeding pairs for locations in south-east Falkland.

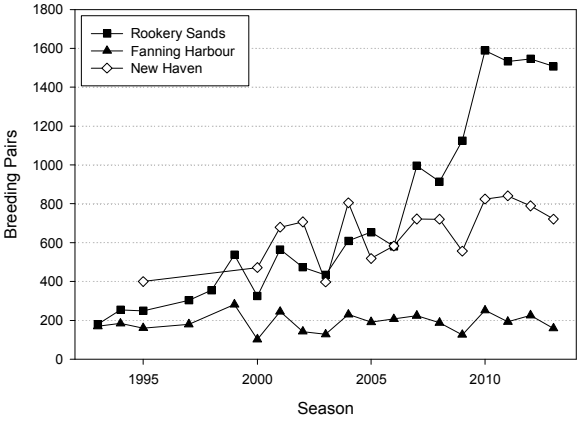

Figure 6: Seasonal changes in estimated Gentoo Penguin breeding pairs for locations on Falkland Sound.

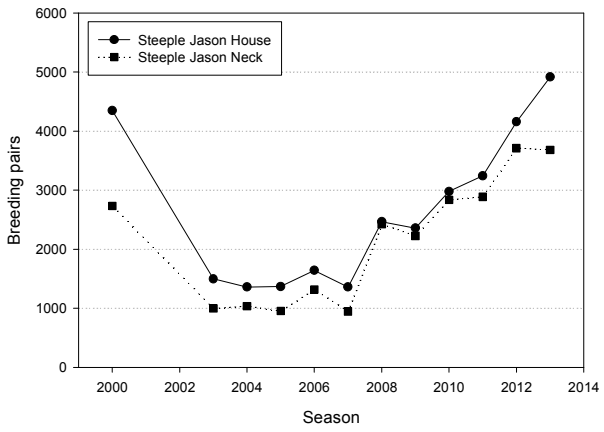

Figure 7: Seasonal changes in estimated Gentoo Penguin breeding pairs for locations on Steeple Jason.

Breeding Success

Average estimated breeding success fell from 0.95 chicks/pair in 2012 to 0.84 chicks/pair in 2013 remaining below the seasonal average (**Figure 8**).

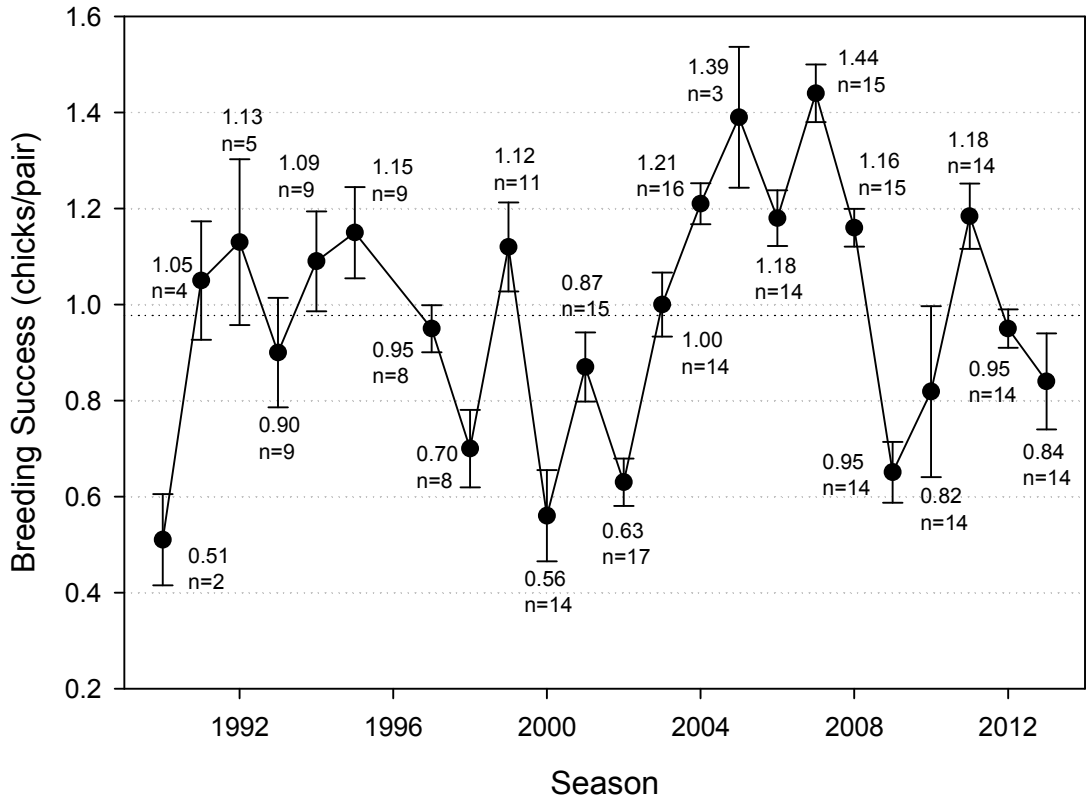

Figure 8: Seasonal changes in estimated Gentoo Penguin breeding success from current annually monitored sites (dotted line – combined seasonal average). Standard Error bars show error about the overall mean by site means, and do not incorporate error about individual sites.

The range of breeding success between locations varied from a minimum of 0.39 chicks/pair at Bull Point to a maximum of 1.1 chicks/pair at Cow Bay. Declines in breeding success were most evident in south-east and north-west colonies; down 54.8 ± 8.3 % and 38.3 ± 0.01 % respectively. Mid-east colonies experienced slightly less of a decline (28.7 ± 26.9 %) whereas both north-east and Falkland Sound colonies exhibited small increases; 3.7 ± 5.3 % and 8.7 ± 29.6 respectively. Considerable variation in breeding success was evident between sub-colonies within location, for example at Volunteer Green the range was from 0.5 to 1.4 (*n*=4).

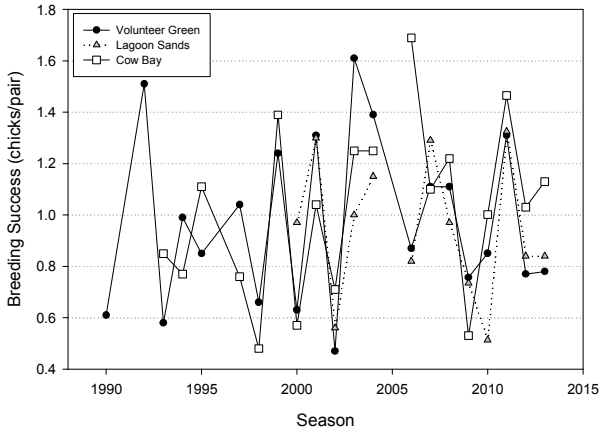

Figure 9: Seasonal changes in estimated Gentoo Penguin breeding success for locations in north-east Falkland.

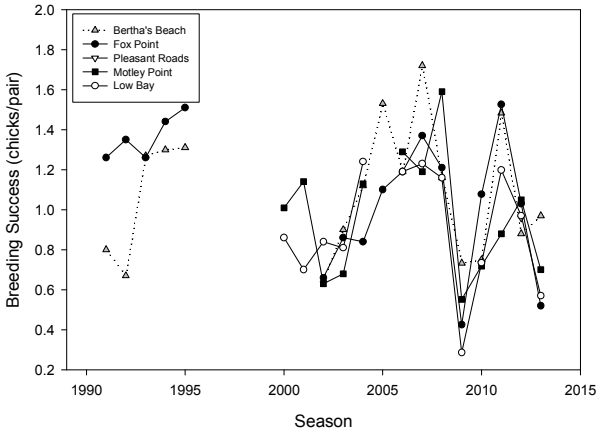

Figure 10: Seasonal changes in estimated Gentoo Penguin breeding success for locations in mid-east Falkland.

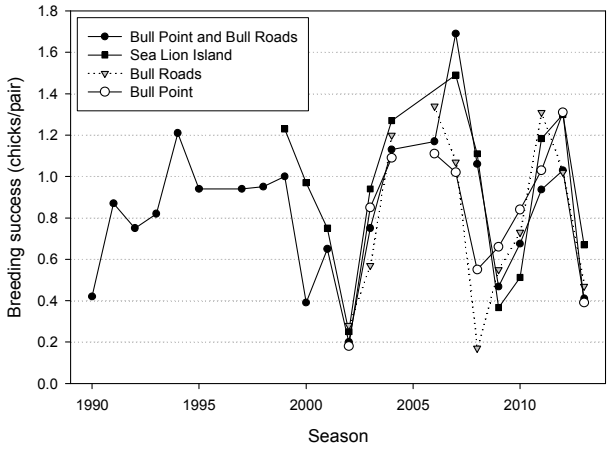

Figure 11: Seasonal changes in estimated Gentoo Penguin breeding success for locations in south-east Falkland.

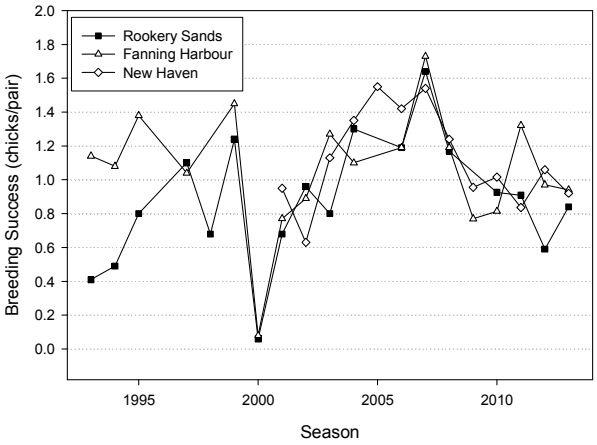

Figure 12: Seasonal changes in estimated Gentoo Penguin breeding success for locations on Falkland Sound.

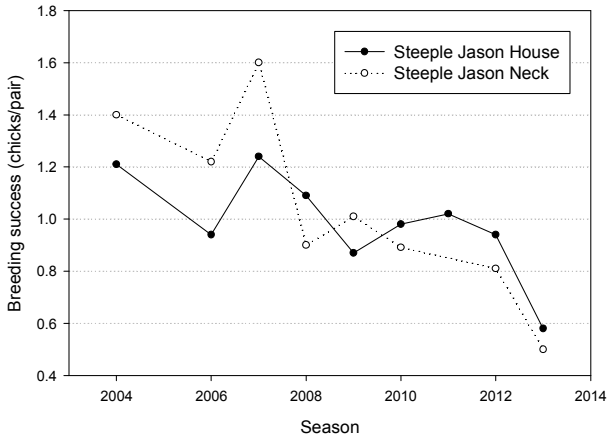

Figure 13: Seasonal changes in estimated Gentoo Penguin breeding success for locations on Steeple Jason.

Southern Rockhopper Penguin

Breeding Pairs

Five locations have been monitored yearly since 2005. At these sites, the combined total estimate of the number of breeding increased from 5542 in the 2012 season to 5912 in the 2013 season; a 6.7 % increase (**Figure 14**), and the highest number recorded since monitoring began at these sites.

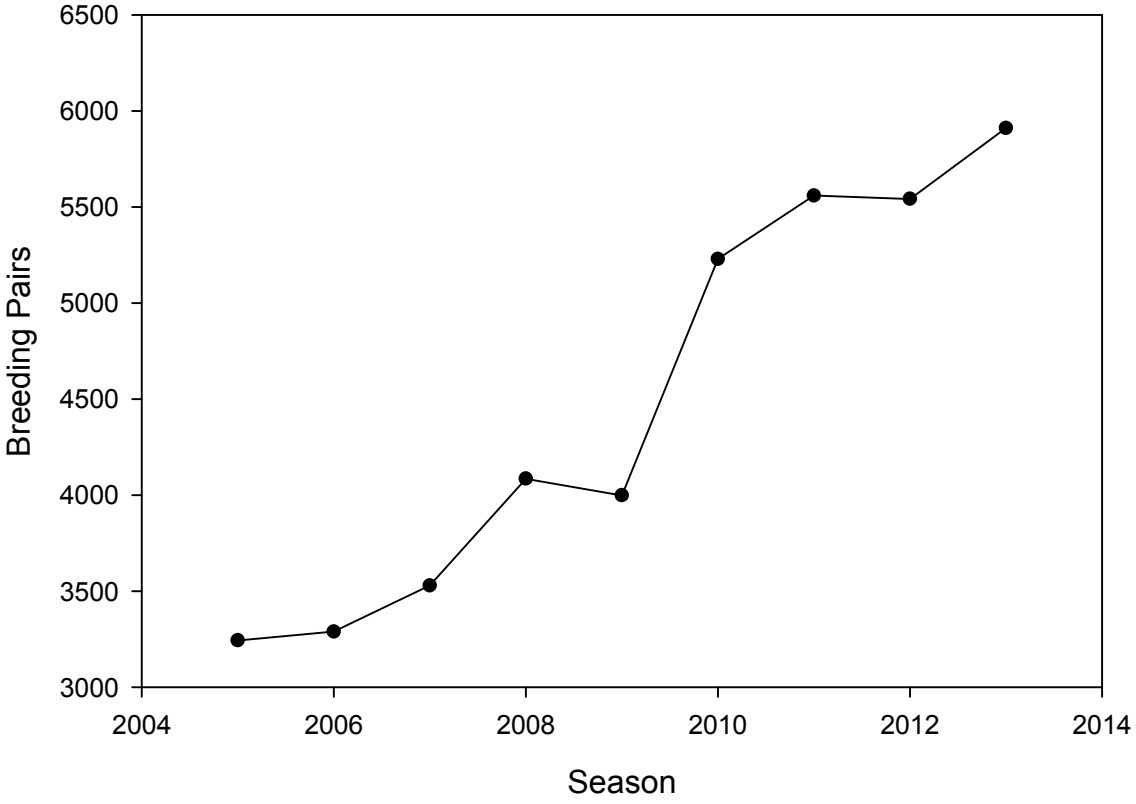

Figure 14: Seasonal changes in total estimated Southern Rockhopper Penguin breeding pairs from current annually monitored locations.

The estimated number of Southern Rockhopper Penguin breeding pairs increased at four of the five monitoring locations. Berkeley Sound breeding pairs increased notably by 20.1 % on last season, whilst numbers at Port Stephens (Stephen's Peak), Race Point (Fanning Head) and Steeple Jason (all sub-colonies combined) also increased, but less markedly, by 6.8, 4.0 and 6.2 % respectively (**Figures 15** to **16**). The number of estimated breeding pairs at Sea Lion Island decreased by 4.7 %. Steeple Jason Neck population was not monitored in 2014.

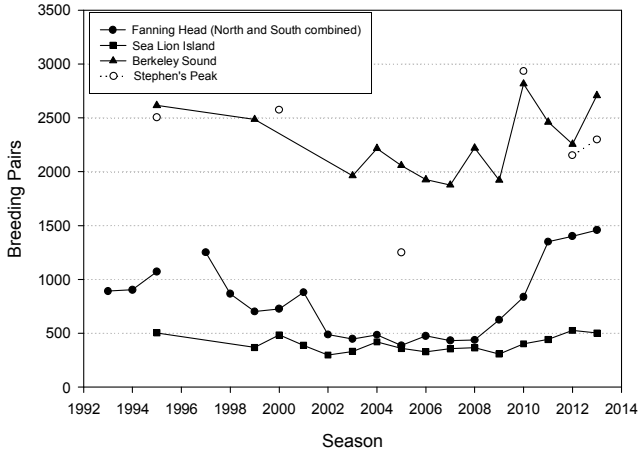

Figure 15: Seasonal changes in estimated Southern Rockhopper Penguin breeding pairs for locations in mainland East and West Falkland.

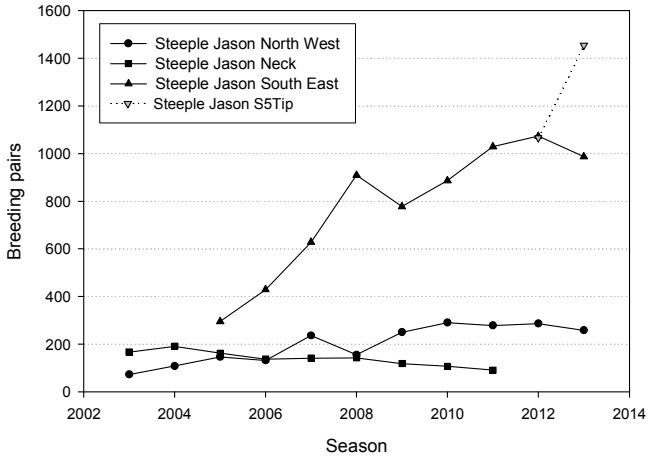

Figure 16: Seasonal changes in estimated Southern Rockhopper Penguin breeding pairs for locations on Steeple Jason.

Breeding Success

Average breeding success in Southern Rockhopper Penguin fell from 0.54 chicks/pair in 2012 to 0.48 chicks/pair in 2013, remaining below the seasonal average (**Figure 17**).

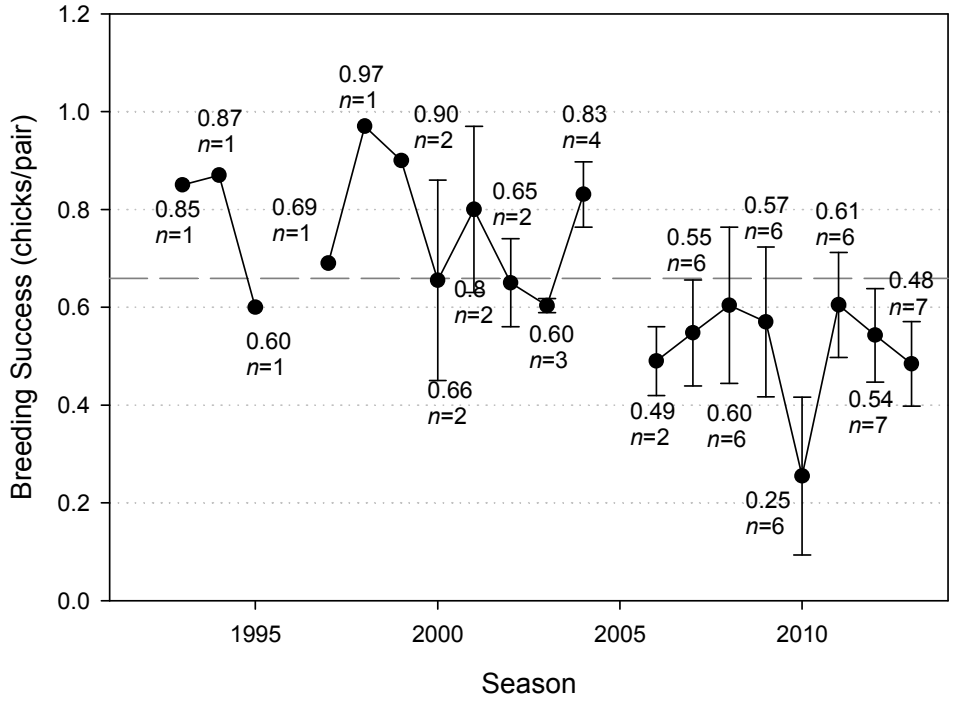

Figure 17: Seasonal changes in estimated southern rockhopper breeding success from current annually monitored sites (dashed line – seasonal average). Standard Error bars show error about the overall mean by site means, and do not incorporate error about individual sites.

Berkeley Sound and Steeple Jason colonies had improved breeding success since the previous season (**Figures 18** and **19**). The range of breeding success between locations varied from a minimum of 0.14 chicks/pair at Sea Lion Island to a maximum of 0.89 chicks/pair at Berkeley Sound.

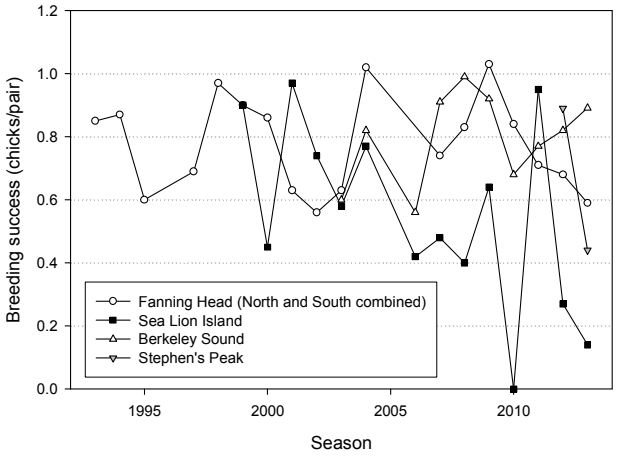

Figure 18: Seasonal changes in estimated Southern Rockhopper Penguin breeding success for locations in mainland East and West Falkland and Sea Lion Island.

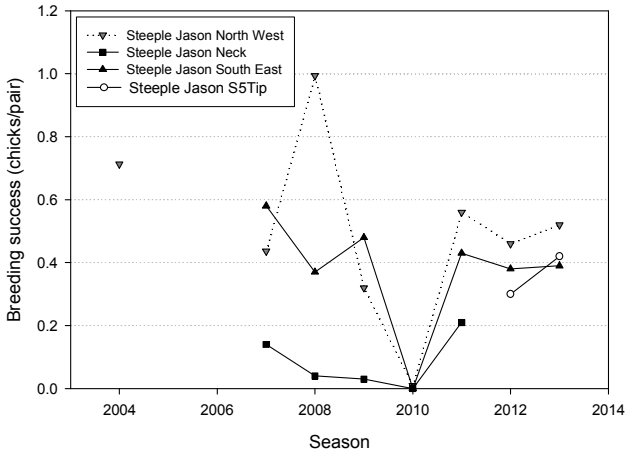

Figure 19: Seasonal changes in estimated Southern Rockhopper Penguin breeding success for locations on Steeple Jason.

Magellanic Penguin

The location and extents of transects and the estimated occupied burrow densities at Gypsy Cove are shown in **Figure 20**. Twenty nine transects were carried out between Engineer Point and the Car Park at Gypsy Cove, of which, just over half (*n*=16) contained Magellanic Penguin burrows, of which 13 (yellow, orange and dark orange coloured bars on **Figure 20**) contained occupied burrows. Burrows appeared to be clustered in three distinct groups.

Figure 20: Transect locations for the Magellanic Penguin survey at Gypsy Cove. Yellow (≥ 0 and ≤ 10,000 breeding pairs/km²), light orange (> 10,000 and ≤ 20,000 breeding pairs/km²) and dark orange (> 20,000 and ≤ 30,000 breeding pairs/km²) lines show burrow densities between the shore and the furthest burrow from the shore; grey lines show the extent of each transect where no burrows are present.

Estimated densities ranged from 2,583 to 27,144 occupied burrows /km², with an average density of 10,858 ± 2,785 /km². Mean occupancy rate derived from transects using the current

methodology for Gypsy Cove was 29.8 ± 6.8 %. Taking all burrows (*n*=105), as per surveys prior to 2012, gave an occupancy rate of 32.2 %, still above the mean for the last ten seasons (**Figure 21**).

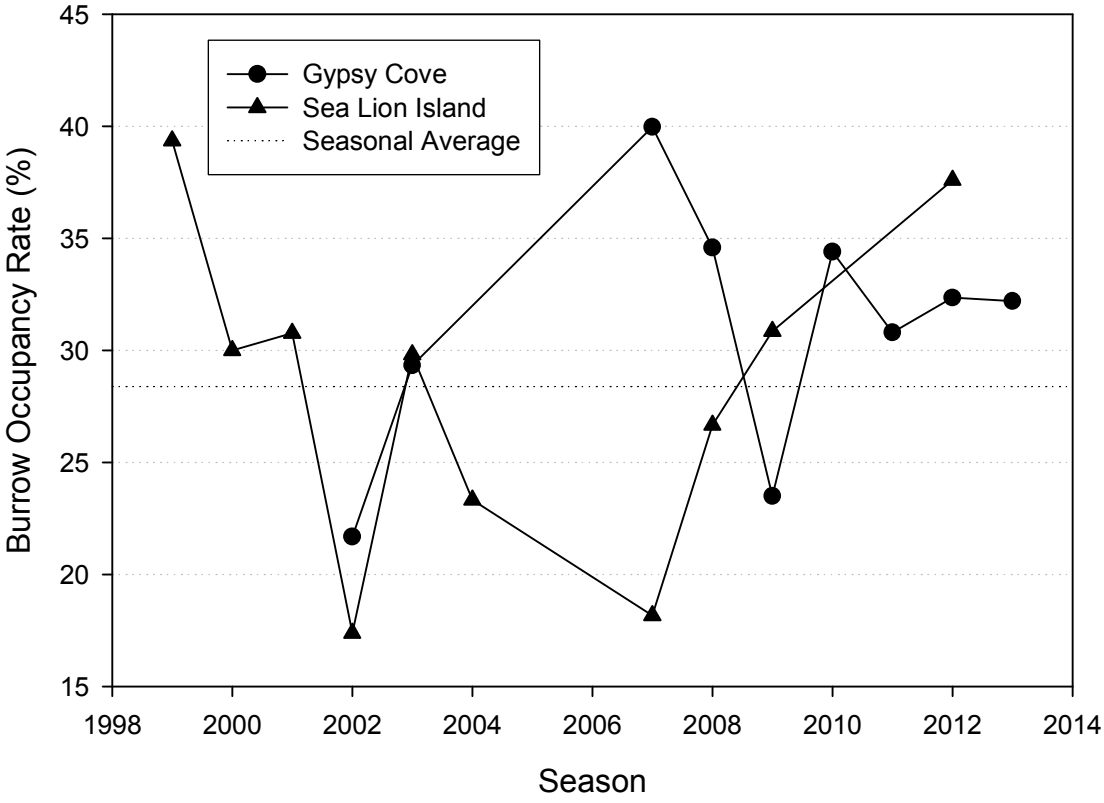

Figure 21: Seasonal changes in Magellanic Penguin burrow occupancy rate at Gypsy Cove.

King penguin

The number of pre-fledged chicks at Volunteer in the 2013 season was down 14.9 % on the 2012 season (**Figure 22**).

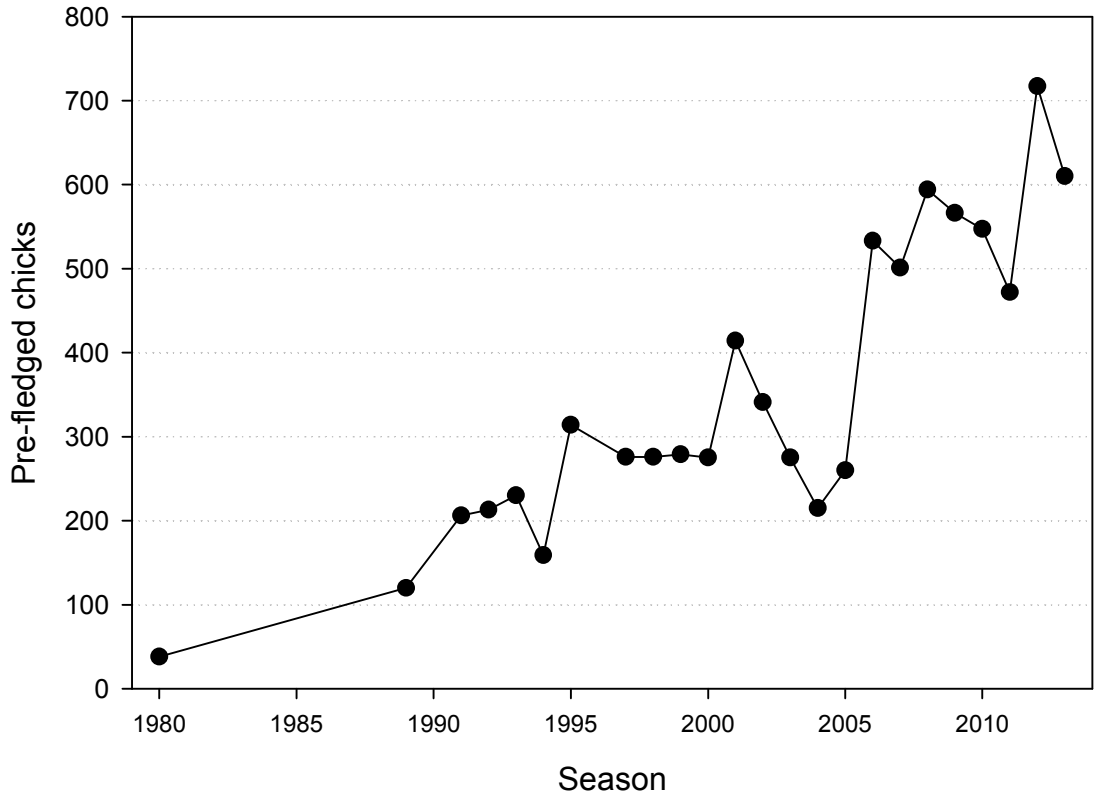

Figure 22: Seasonal changes in the number of King Penguin pre-fledged chicks at Volunteer.

Imperial Shag

At Motley Point there were 230 ± 8.8 apparently occupied imperial shag nests. At Eagle Hill there were 283 ± 8.3 apparently occupied imperial shag nests.

Black-browed Albatross

Breeding Pairs

The total estimated number of breeding pairs of Black-browed Albatross on Steeple Jason rose by 26.8 % from 2,299 to 2,916 breeding pairs (**Figure 23**). This was due mostly to increases at the Study Area site (**Figure 24**).

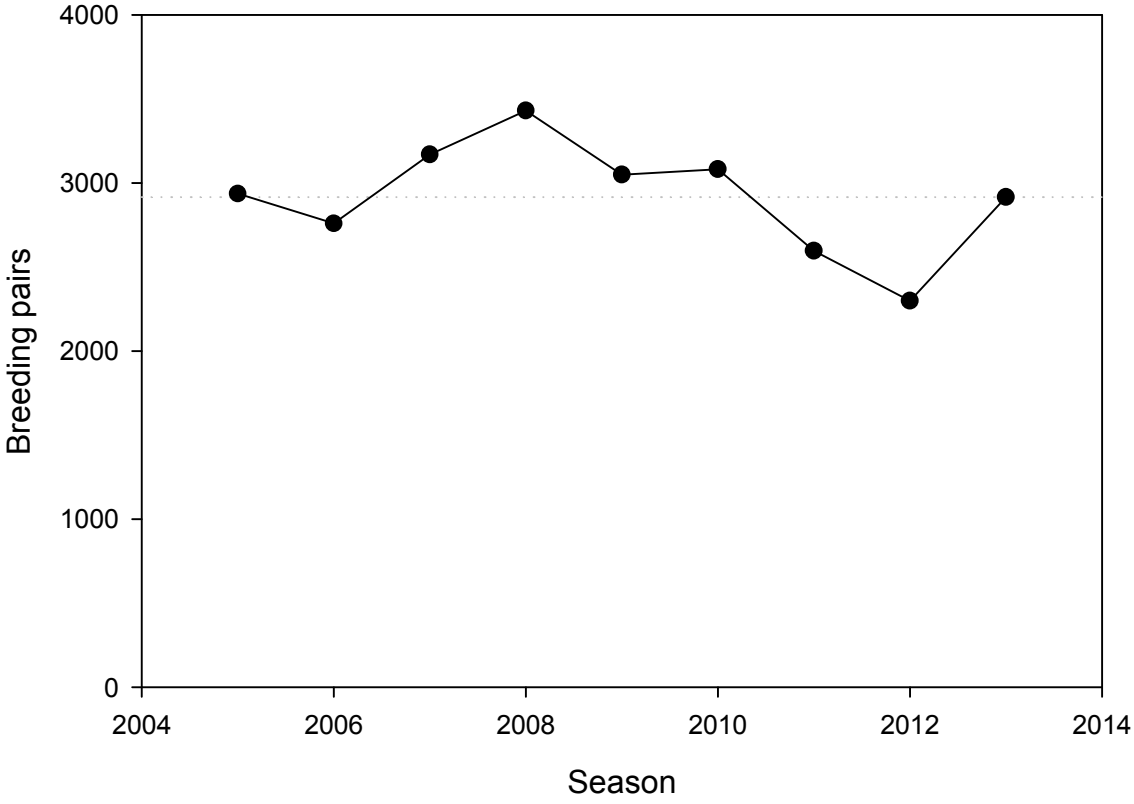

Figure 23: Seasonal changes in total estimated Black-browed Albatross breeding pairs from current annually monitored locations on Steeple Jason.

When compared to 2012, estimated breeding pair numbers increased at all smaller monitoring sites (**Figure 24**), namely; S5Tip up 14.1 %, NW Flat up 10.7 %, NW Ridge up 14.8 % and Penthouse up 4.1 %. There was a notable increase in the largest monitoring sub-colony (Study Area) which rose by 42.6 %, after four years of continual decline.

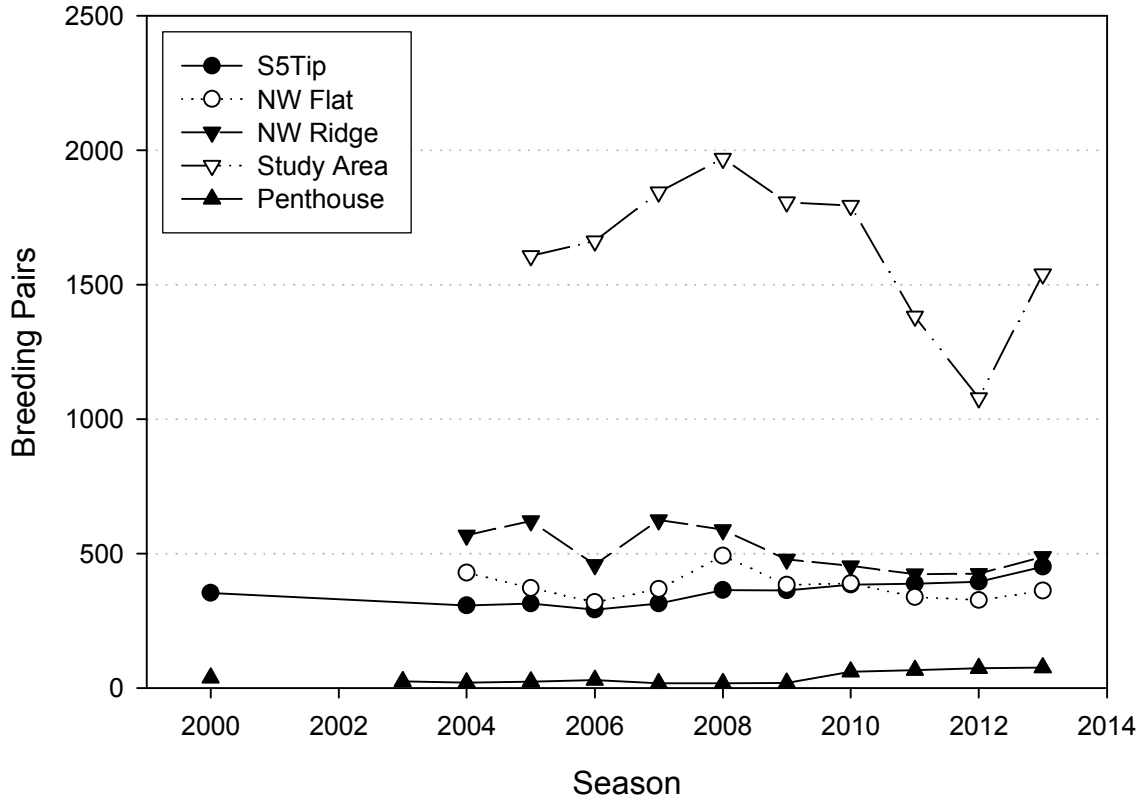

Figure 24: Estimated breeding pair counts of Black-browed Albatross at monitoring sub-colonies on Steeple Jason.

Breeding Success

Overall, mean breeding success for all sub-colonies on Steeple Jason decreased from 69.0 % to 60.8 % (**Figure 25**). Despite the decrease, 60.8 % still remains towards the upper limit of those figures observed over the course of the monitoring period.

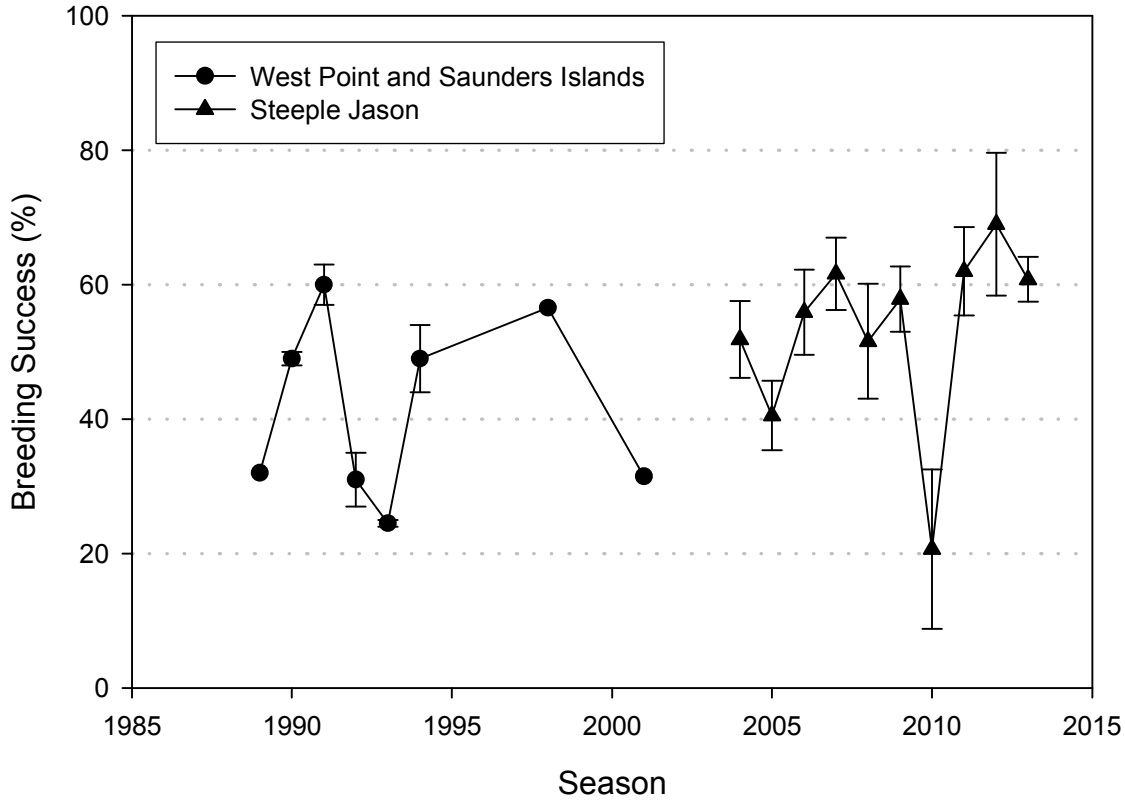

Figure 25: Estimated breeding success of Black-browed Albatross at monitoring sub-colonies on Steeple Jason. Standard Error bars show error about the overall mean by sub-colony means and do not incorporate error about individual sites.

Estimated breeding success was down at the Study Area, NW Ridge and NW Flat, but up at S5Tip and Penthouse (**Figure 26**). Changes varied from a 51 % increase at the Penthouse to a 40 % decrease at the Study Area.

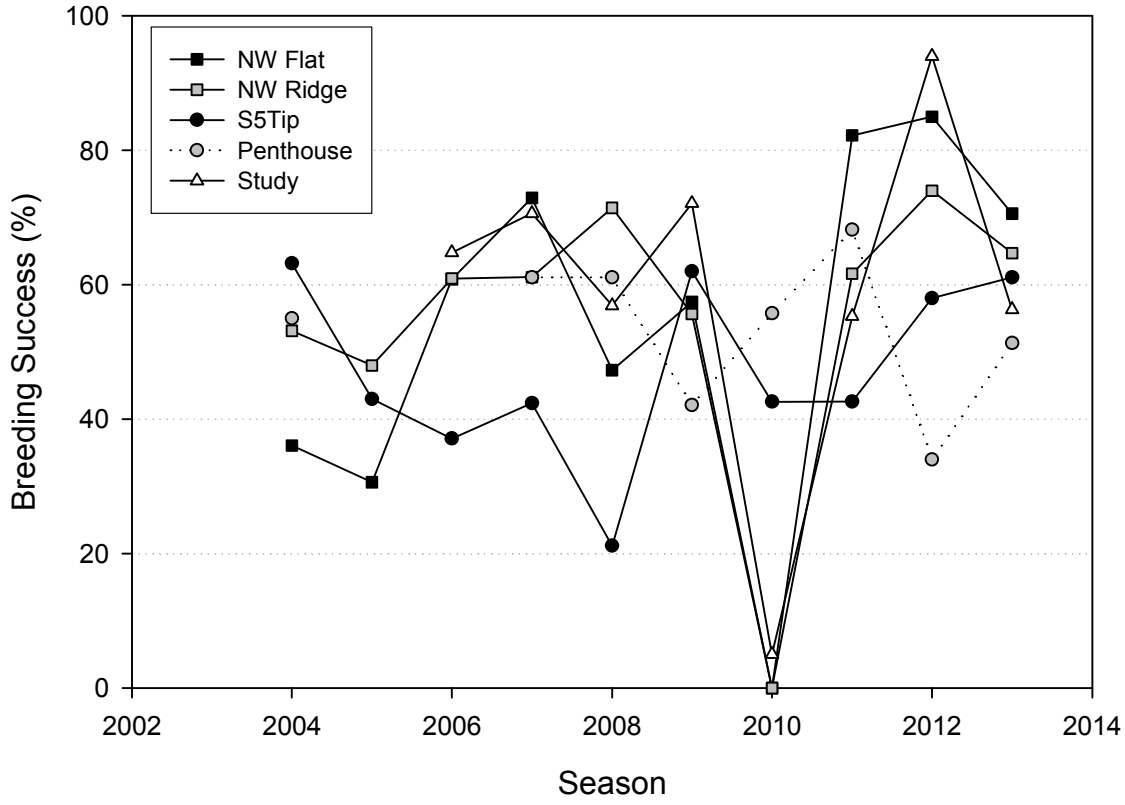

Figure 26: Estimated breeding success of Black-browed Albatross at monitoring colonies/sub-colonies on Steeple Jason.

Penguin Point South, Dunbar

Counts of breeding pairs at Penguin Point South have increased from 182 in 2009 to 249 in 2013; a 42.3 % rise over a four year period (**Figure 27**). Chick counts have fluctuated by around 10 %, both upwards and downwards in the 3 year period over which they have been recorded.

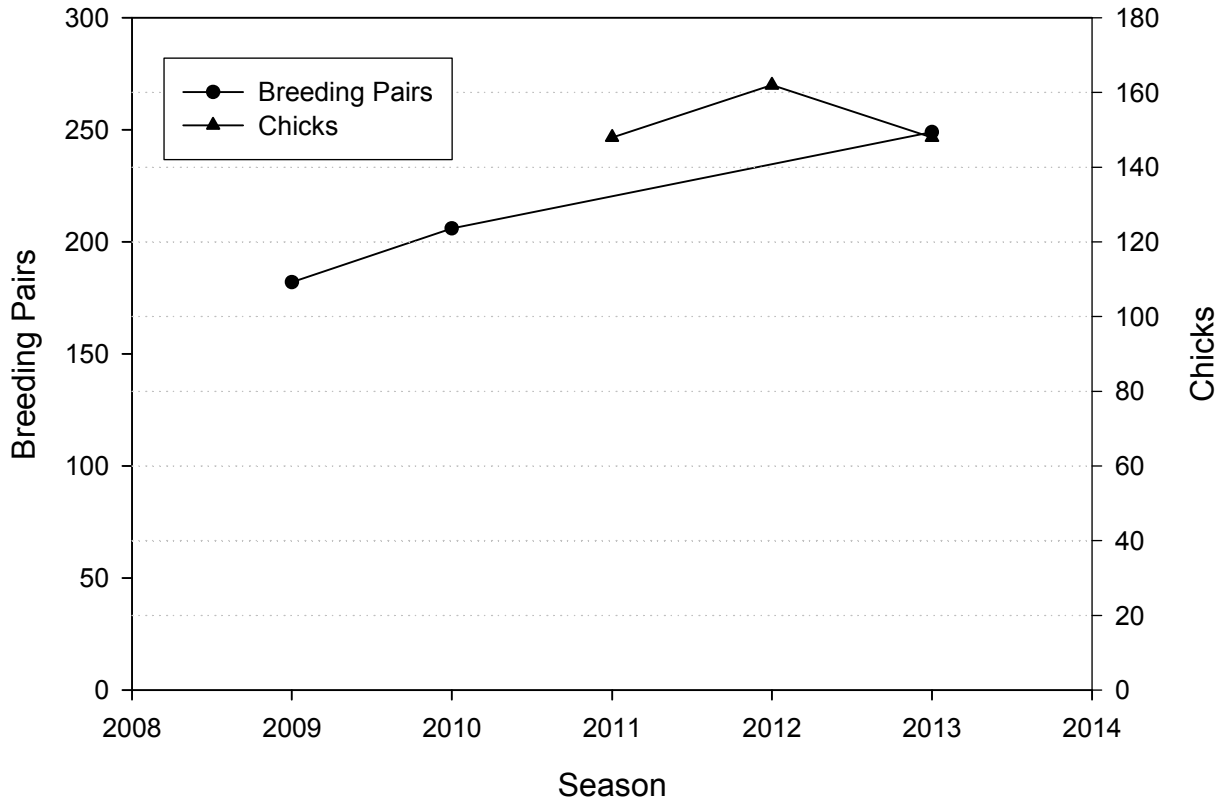

Figure 27: Black-browed Albatross breeding pair and chick counts for Penguin Point South, Dunbar.

Southern Giant Petrel

Breeding Pairs

The total estimated number of breeding pairs of Southern Giant Petrel at monitored colonies on Steeple Jason remained close to those reported for the previous season, with an estimated decline of only 18 breeding pairs (**Figure 28**). This is attributed to a 10.5 % drop in the NW colony, compensated to a degree by continuing increase at the Neck colony, which again reached the highest recorded value thus far. Five pairs attempted to nest at the Steeple NE site and a further five at the edge of the Black-browed Albatross colony near the NW flat site (previously unrecorded for this area).

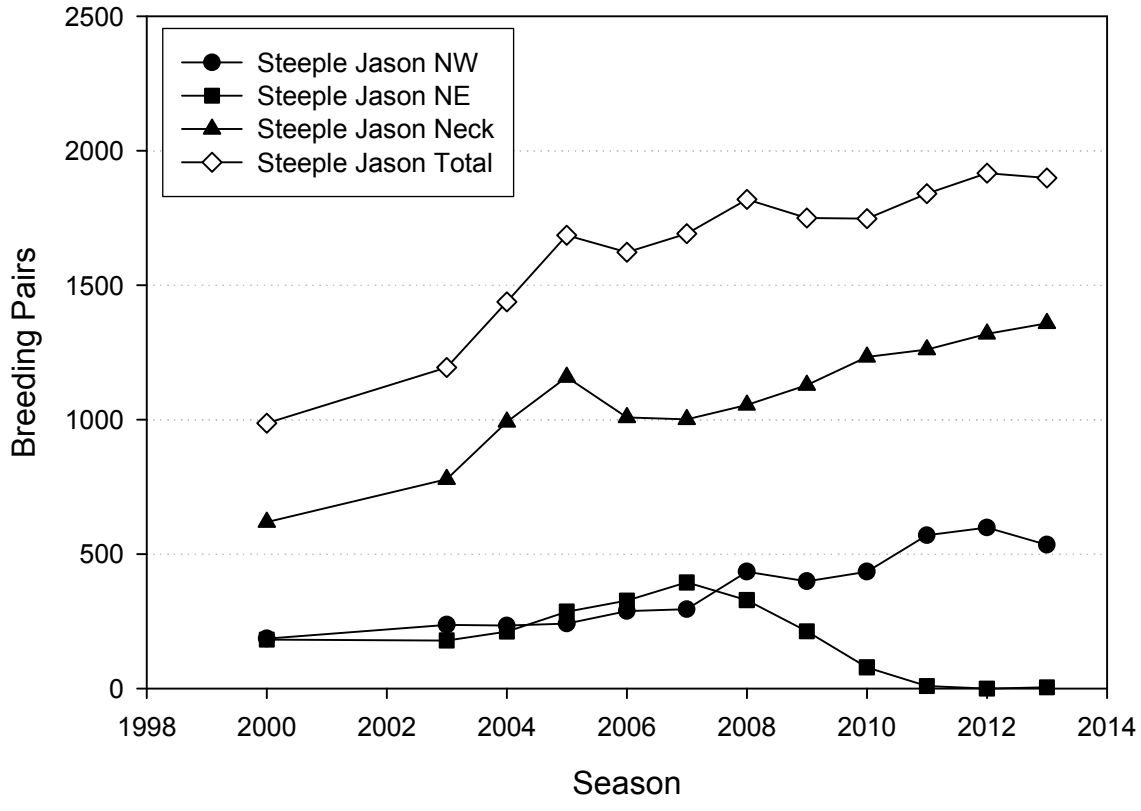

Figure 28: Estimated breeding pair numbers of Southern Giant Petrel at monitoring colonies on Steeple Jason.

Breeding Success

There was no breeding success at the NE colony (**Figure 29**), or indeed at those few nests near the NW flat albatross site. Estimated breeding success was down 8 % at the NW colony and up 8.1 % at the Neck.

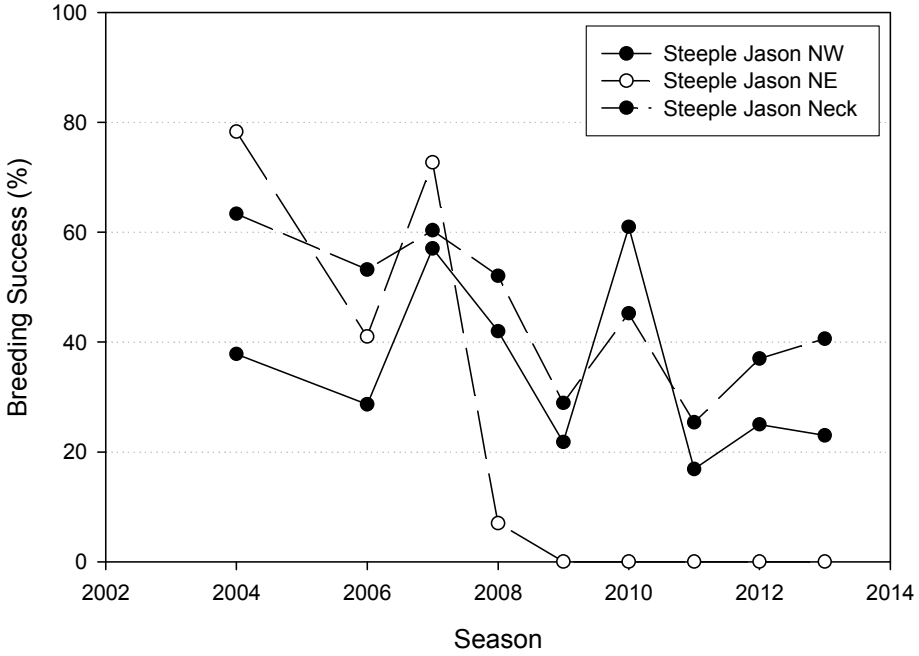

Figure 29: Estimated breeding success of Southern Giant Petrel at monitoring colonies on Steeple Jason.

Chick Count

Chick count data from Bleaker Island show an overall increasing trend despite annual fluctuations (**Figure 30**). The chick count figure has increased from 150 to 269 in the period 2001 to 2013, a 79.3 % rise.

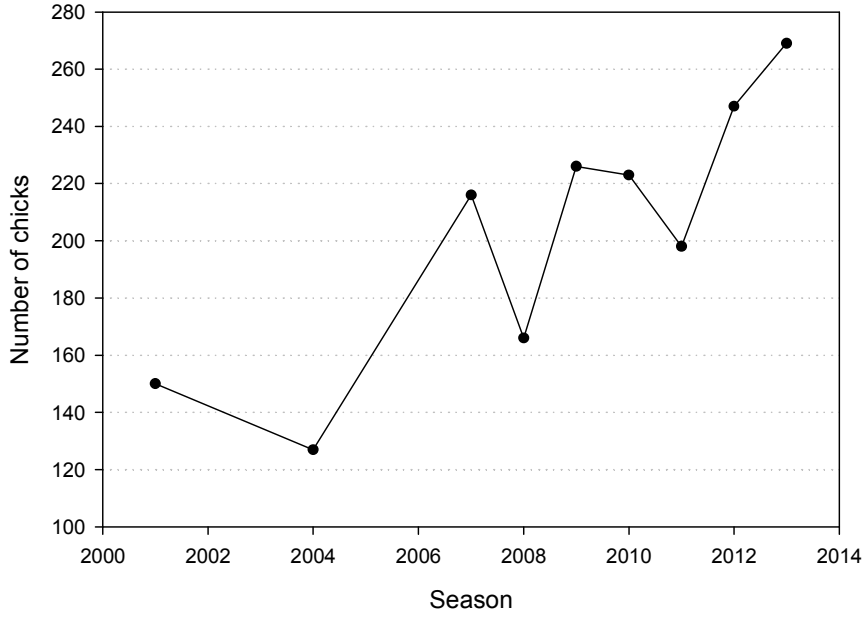

Figure 30: Southern Giant Petrel chick counts for Bleaker Island.

Discussion

Gentoo Penguin

In the 2013/2014 season, estimated numbers of Gentoo Penguin breeding pairs at monitored sites decreased by 13.0 % from the previous season to 26,241. Given similar previous fluctuations in what has been an increasing population trend over the last nine years, there is currently no indication of any overall decline. Monitored sites of Gentoo Penguin exhibited marked regional differences. Notably, mid-east and south-east colonies showed relatively large reductions in both estimated breeding pairs and breeding success compared to other areas. These localised reductions contributed substantially to the overall fall in breeding pair and breeding success estimates for the season. In contrast, Falkland Sound colonies showed only slight declines whilst north-east colonies appeared stable or increasing. Historically, colonies on Steeple Jason have shown less seasonal fluctuation in both pairs and breeding success compared to other sites, and maintained a relatively consistent increase in breeding pairs matched with a relatively constant decline in breeding success. This trend continued in the 2013 season.

At sea, the 2013 season was characterised by lower than usual Sea Surface Temperatures in the south of the islands, exceptional catches of squid to the north of the islands, and record jellyfish bycatch (over 100,000 tons in one month) (source - Falkland Islands Government Fisheries Department). These potential indicators of differing oceanographic conditions from the previous season, particularly in the south of the Islands, may relate to the observed changes above.

Southern Rockhopper Penguin

The total breeding pair estimate of Southern Rockhopper Penguin for monitoring sites climbed to a new high since monitoring began in 2005. Estimated breeding populations at individual sites were considered generally to be stable/ increasing; however, estimates of average breeding success over recent seasons have remained below pre-2005 figures. Weather events, certainly at Sea Lion Island (this season and also in 2010) as witnessed by landowners, but also at Steeple Jason, appear to contribute to reduced success. Estimated breeding pairs at Steeple Jason, which subsamples the largest single colony, appear stable/ increasing whilst breeding success appears low in comparison to other sites, but currently not declining.

Other species continue to be observed within rockhopper colonies. A Northern Rockhopper

(*Eudyptes moseleyi*) was observed at Diamond Cove and had been recorded for at least the last three seasons. Macaroni Penguin (*Eudyptes chrysolophus*) and hybrid Macaroni x southern rockhopper were observed in mixed pairs at Race Point and several at Berkeley Sound.

Magellanic Penguin

Birds remain in three distinct groupings and showed similar occupancy rate to last season. There was no evidence to suggest a reduction in breeding area, which appears to be associated with the extent of tussac habitat at the monitoring site.

King penguin

A drop in numbers of estimated pre-fledged chicks was observed, but nothing to suggest that it was anything but natural variation in the existing general increasing trend.

Black-browed Albatross

Indications from the monitoring sites at Steeple Jason were of stable to increasing numbers at the largest breeding colony of this species. This is mirrored in the count data provided for Penguin Point South. Most of the increase in estimated breeding pairs on last season at Steeple Jason was due to a rebound in the Study Area numbers. This followed significant reductions over the previous two years resulting from a severe storm event in 2010. Breeding success at Steeple Jason remains relatively high compared to historical data as far back as 1989.

Southern Giant Petrel

There is still an apparent steady upward trend in the Steeple Jason population of this species though a general downward trend in estimated breeding success also seems apparent. At Bleaker Island, chick counts have fluctuated but generally increased during monitoring (a 6.6 % annual increase). Whilst it is clear from the Steeple Jason population that increasing breeding pair numbers do not necessarily correlate positively with increasing estimated breeding success, it is suspected that increasing chick numbers at Bleaker Island are likely to indicate a at least a stable to increasing number of breeding pairs.

Acknowledgements

The continuation of the FISMP is dependent on access to seabird colonies. Falklands Conservation would like to thank the landowners/managers who have allowed us to conduct fieldwork on their land, including the Wildlife Conservation Society, Falkland Islands Government, Port Stephens, Fitzroy, Race Point, Johnsons Harbour, Goose Green, Walker Creek, and North Arm. We thank Mike Clarke, Derek Pettersson and Rob McGill for logistical support and the many volunteers that participated in data collection. We would also like to thank the landowners at Dunbar and Bleaker Island for providing their survey data and allowing it to be included within the report. The FISMP is made possible with financial support of the Falkland Islands Government through the Environmental Studies Budget.

References

Agreement on the Conservation of Albatrosses and Petrels 2010. ACAP Species Assessment: Black-browed Albatross *Thalassarche melanophris*. Downloaded from http://www.acap.aq on 20 May 2013.

Baylis, AMM. 2012. 2010 archipelago-wide census of gentoo and rockhopper penguins breeding at the Falkland Islands. Falklands Conservation.

Baylis, A. 2012. Falkland Island Seabird Monitoring Programme. Annual Report 2011/2012. Falklands Conservation.

BirdLife International 2012. Species factsheet: *Thalassarche melanophrys*. Downloaded from http://birdlife.org on 18/06/2012.

IUCN 2013. IUCN Red List of Threatened Species. Version 2013.2. <www.iucnredlist.org>.

Reid, T.A. & Huin, N. 2005. Census of the Southern Giant Petrel population of the Falkland Islands, 2004/05. Falklands Conservation.

Stanworth, A. 2013. Black-browed Albatross Demographic Study. Annual Report 2012/2013. Falklands Conservation.

Stanworth, A. 2013. Falkland Islands Seabird Monitoring Programme - Annual Report 2012/2013 (SMP20). Falklands Conservation.

Thompson, K.R. and M.D.Riddy 1993. Falkland Islands Seabird Monitoring Programme. Manual of Information and Methods. Falklands Conservation

Wolfaardt, A. 2012. An assessment of the population trends and conservation status of Black-browed Albatrosses in the Falkland Islands. JNCC.

Woods, R.W. & Woods, A. 1997. Atlas of breeding birds of the Falkland Islands. Anthony Nelson, Oswestry, UK.

Woods, R. W. & Woods, A. 2006. Birds and mammals of the Falkland Islands. Oswestry, UK: Anthony Nelson.

Appendix 1: Count Information

Location	Date of breeding pair count	Counters	Date of chick count	Counters
Volunteer Green	19/11/13	A. Stanworth W. Miles	9/1/14	A. Stanworth J. Handley
Race Point	17/11/13	A. Stanworth W. Miles	6/1/14	A. Stanworth J. Handley
Sea Lion Island	2/11/13	M. Morrison	2/1/13	M. Morrison
New Haven	14/11/13	A. Stanworth W. Miles	3/1/13	A. Stanworth J. Handley
Bull Roads	14/11/13	A. Stanworth W. Miles	3/1/13	A. Stanworth J. Handley
Bull Point	15/11/13	A. Stanworth W. Miles	4/1/13	A. Stanworth J. Handley
Cow Bay	20/11/13	A. Stanworth W. Miles	9/1/13	A. Stanworth J. Handley
Low Bay	15/11/13	A. Stanworth W. Miles	4/1/13	A. Stanworth J. Handley
Motley Point	16/11/13	A. Stanworth W. Miles	5/1/13	A. Stanworth J. Handley
Bertha's Beach	17/11/13	M. Morrison	12/1/13	M. Morrison
Fox Point	17/11/13	M. Morrison	12/1/13	M. Morrison
Pleasant Roads	Not carried out	NA	13/1/13	M. Morrison
Steeple Jason	Gentoo 31/10/13 – 1/11/13. Rockhopper 4 – 8/11/13. Black-browed and giant petrel 31/10/13 - 8/11/13	A. Stanworth W. Miles M. Reeves E. Milston	Gentoo and Rockhopper 21-25/1/14. Black-browed and Giant Petrel 17-19/3/14	A. Stanworth S. Crofts M. Reeves R. King J. Pompert
Lagoon Sands	19/11/13	A. Stanworth W. Miles	9/1/13	A. Stanworth J. Handley
Diamond Cove	20/11/13	A. Stanworth W. Miles	8/1/13	A. Stanworth J. Handley
Rugged Hill/Eagle Hill	21/11/13	A. Stanworth W. Miles	8/1/13	A. Stanworth J. Handley
Port Stephens	20/11/13	S. Crofts D. Towsey	11/1/13	D. Doxford F. Gill C. Cockwell
Penguin Point South	November	M. Delignieres	January	M. Delignieres
Bleaker Island	Not carried out	NA	6/2/2014 and 15/2/2014	M. Rendell

Appendix 2: Gentoo Penguin Count Data

Location	Colony	Grid Ref.	Breeding Pairs (Mean±1SD)		Breeding Success (Mean±1SD)	
			Count	Count Type*	Count	Count Type*
Bertha's Beach	Bertha's Beach	-58.358916 -51.882233	675.1 ± 17.3	TR	0.97 ± 0.03	TR
Bull Point	Bull Roads	-59.398188 -52.309364	542.3 ± 12.3	TR	0.47 ± 0.06	TR
Bull Point	Bull Point	-59.321461 -52.342591	1697.7 ± 44.6	TR, TA	0.39 ± 0.03	TR, TA, Ph
Fox Point	Fox Point	-51.92 -58.45	355.5 ± 8.3	TR	0.52 ± 0.02	TR
Low Bay	Low Bay	-58.879630 -52.077608	208.0 ± 10.1	TR	0.58 ± 0.07	TR
Motley Point	Motley Point	-58.643177 -52.108576	1551.2 ± 34.0	TR	0.70 ± 0.03	TR
New Haven	New Haven	-59.222044 -51.742073	706.8 ± 51.0	TR	0.92 ± 0.10	TR
Pleasant Roads	Pleasant Roads	-51.83 -58.24	Not carried out	NA	Chick count 124.5 ± 2.4	TR
Race Point	Fanning Harbour	-59.087958 -51.464667	158.7 ± 6.2	TR	0.94 ± 0.06	TR
Race Point	Rookery Sands	-59.106928 -51.434122	1507.3 ± 33.6	TR, TA	0.84 ± 0.06	TR, TA
Sea Lion Island	Sea Lion Island	-59.072513 -52.426578	3908.4 ± 55.2	TR	0.67 ± 0.02	TR
Steeple Jason	House	-61.233113 -51.020186	4914.7 ± 47.7	TR, TA, Ph	0.58 ± 0.01	TR, TA Ph
Steeple Jason	Neck	-61.214888 -51.034787	3680.7 ± 40.8	TR, TA, Ph	0.5 ± 0.02	TR, Ph
Volunteer	Cow Bay	-57.879051 -51.428572	2235.7 ±29.1	TR, TA, Pr	1.13 ± 0.03	TR, TA, Ph
Volunteer	Lagoon Sands	-57.77581 -51.513702	1190.7 ± 12.2	TR	0.84 ± 0.03	TR
Volunteer	Volunteer Green	-57.837858 -51.478494	2911.3 ± 56.2	TR	0.78 ± 0.03	TR, Ph

* TR – Tally Repeated, TA – Tally Agreed, Ph – Photo Count, Pr – Single sub-colony breeding pair count predicted from chick count data using mean breeding success for the colony.

Appendix 3: Southern Rockhopper Penguin Count Data

Location	Colony/Sub-colony	Grid Ref.	Breeding Pairs (Mean ± 1 SD)	Breeding Success (Mean ± 1 SD)
Berkeley Sound	Diamond Cove	-57.923512 -51.538059	206.7 ± 4.3	0.85 ± 0.02
	Eagle Hill East	-57.785118 -51.544064	98.3 ± 3.71	0.99 ± 0.05
	Eagle Hill	-57.802981 -51.544497	774.7 ± 24.1	0.91 ± 0.04
	Eagle Hill West	-57.810499 -51.545082	809.8 ± 15.8	0.86 ± 0.05
	Rugged Hill East	-57.845031 -51.543674	352.2 ± 11.1	1.01 ± 0.04
	Rugged Hill West	-57.851570 -51.543488	469.5 ± 25.2	0.82 ± 0.07
Port Stephens	Stephen's Peak	-60.859281 -52.133803	2298.8 ± 11.4	0.44 ± 0.01
Race Point	Fanning Head North	-59.141540 -51.460831	636.5 ± 16.7	0.49 ± 0.03
	Fanning Head South	-59.137749 -51.469284	821.6 ± 26.3	0.67 ± 0.03
Sea Lion Island	Rockhopper Point	-59.115501 -52.446667	502.8 ± 26.2	0.14 ± 0.05
Steeple Jason	NW Flat	-61.252682 -51.012810	77.5 ± 2.07	0.73 ± 0.06
	NW Ridge	-61.252884 -51.012939	180.5 ± 3.6	0.43 ± 0.02
	S5Tip	-61.220460 -51.037932	1455.1 ± 33.4	0.42 ± 0.02
	Study Area	-61.206635 -51.046215	986.7 ± 9.1	0.39 ± 0.01

Appendix 4: Magellanic Penguin Survey Data

Transect	Number of Burrows	Occupancy (%)	Distance to last burrow	Density per Km²
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	6	33.3	31.86	47081
5	6	33.3	35.52	42230
6	4	25	96.78	10333
7	0	0	0	0
8	0	0	0	0
9	2	0	10.54	47438
10	0	0	0	0
11	0	0	0	0
12	4	50	81.73	12235
13	7	20	36.01	48598
14	14	33.3	46.36	75496
15	11	36.4	73.82	37253
16	5	80	43.92	28461
17	0	0	0	0
18	4	75	27.63	36193
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	4	0	39.84	25100
23	8	40	39.91	50113
24	15	16.7	71.29	52602
25	3	50	32.69	22943
26	9	14.3	42.95	52387
27	1	0	0	2583
28	2	0	17.41	28719
29	0	0	0	0

Appendix 5: Black-browed Albatross and Southern Giant Petrel Count Data

Black-browed Albatross

Sub-colony	**Breeding Pairs (Mean ± 1 SD)**	**Breeding Success (chicks/pair) (Mean ± 1 SD)**
Study Colony	1539.3 ± 21.0	0.56 ± 0.01
S5Tip	451.0 ± 9.0	0.61 ± 0.02
Penthouse	76.0	0.51
NW Flat	361.5 ± 6.0	0.71 ± 0.04
NW Ridge	487.8 ± 9.6	0.65 ± 0.02

Southern Giant Petrel

Colony	**Breeding Pairs (Mean ± 1 SD)**	**Breeding Success (chicks/pair) (Mean ± 1 SD)**
Neck	1359.1 ± 48.4	0.41 ± 0.04
West	534.6 ± 5.7	0.23 ± 0.01
House	5	0