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RESEARCH

Contrasting trends of Falkland skua populations at two key nesting sites

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Abstract

The Falkland skua (*Stercorarius antarcticus antarcticus*) is a long-lived seabird breeding primarily in the Falkland Islands. Despite its current Least Concern status by the IUCN, its population is declining, and trends remain poorly understood. We surveyed breeding populations across 18 islands and compared the changes in population size on New Island and Steeple Jason Island, the two largest known nesting sites. Between 2009 and 2023, the New Island population declined by 26% (2.1% annually), from 333 to 246 apparently occupied territories (AOTs). Over a similar period, the Steeple Jason Island population increased by 50% (3.1% annually), from 222 to 332 AOTs - reversing the population sizes at the two sites. A higher proportion of single-egg clutches and empty nests on New Island suggests lower breeding success. In contrast, the growth on Steeple Jason Island may be associated with a high number of food sources, including the establishment of a breeding rookery of South American fur seals (*Arctocephalus australis*). Resightings of skuas ringed as chicks indicate natal philopatry but also some dispersal across the archipelago. These results emphasise the need for a broad, multi-colony approach to better understand and manage Falkland skua populations.

Keywords The Falkland Islands · Malvinas · Brown skua · Population trends · Breeding · Conservation

Introduction

The Falkland skua (*Stercorarius antarcticus antarcticus*) is a long-lived migratory seabird distributed in the southern Atlantic Ocean. It breeds in the Falkland Islands and southeastern Argentina, where the breeding population has been estimated at 5,000–9,000 breeding pairs (Woods and Woods 1997). During the non-breeding season, the Falkland skua migrates to the south Atlantic waters around the central Patagonian shelf-break (Phillips et al. 2007; Furness et al. 2020). Recent genomic analyses indicate that Falkland skuas form part of the Chilean skua (*S. chilensis*) complex rather than the Brown skua (*S. antarcticus*) (Jorquera et al. 2025). Because the Chilean skua complex has a more restricted distribution and a smaller, more poorly known global population than the Brown skua, this reclassification increases the relative conservation importance of the Falkland Islands, where, under the revised taxonomy, a large proportion of the complex occurs. Brown skuas breed across the Antarctic Peninsula and sub-Antarctic islands, with 13,000–14,000 pairs estimated (Furness et al. 2020), whereas Chilean skuas breed along the coasts of southern Chile and Argentina and may comprise only several thousand breeding pairs (c. 1,250–5,000, not including the Falkland skua population; BirdLife International 2018a). This also emphasises the need for improved population estimates and targeted conservation planning for Falkland skuas within this smaller species complex.

Although both Brown and Chilean skuas are currently classified as Least Concern by the IUCN (BirdLife International 2018a; 2018b), on New Island, Falkland Islands, a 47% reduction in breeding pairs was observed between 2004 and 2009 (Catry et al. 2011), likely linked to low breeding success. Large austral skuas, including the Falkland skua,

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are opportunistic predators, scavengers, and kleptoparasites that feed on a wide variety of prey, including seabird eggs, chicks, carrion, fish, crustaceans, and molluscs (Reinhardt et al. 2000; Phillips et al. 2004; Borghello et al. 2019). On New Island, which hosts the largest known breeding colony of the Falkland skua (Catry et al. 2011), the Slender-billed prion (*Pachyptila belcheri*) is one of their main prey species (Catry et al. 2003; Alves 2015). One hypothesized contributing factor to the population decline is increasing numbers of Striated caracaras (*Daptrius australis*), which also feed on prions and therefore compete with skuas for food, as well as predate skua eggs and chicks (Catry et al. 2008, 2011), although further research is needed to evaluate this and other potential drivers.

Despite these trends, information on the ecology and long-term population dynamics of the Falkland skua remains scarce, highlighting the need for further research. Falkland skuas are considered highly philopatric, as reported for other large skua taxa (e.g. Klomp and Furness 1992), and therefore changes in local breeding populations are often assumed to primarily reflect local demographic processes, such as survival and recruitment, rather than large-scale dispersal. However, the importance of dispersal among colonies remains poorly known in the Falkland Islands.

Here, we present results from surveys of the breeding population of Falkland skua in several sites across the Falkland Islands. For the two most important breeding sites, New Island and Steeple Jason Island, we aim to assess changes in population size over more than a decade.

Methods

We conducted censuses on 18 islands (including many key seabird sites of the Falklands; Falklands Conservation 2006; Fig. 1), during late incubation to early chick rearing, between 5 December and 9 January from 2009 to 2023. Most islands were surveyed only once during the study period (Table 1). In addition to these, we also carried out later surveys in mid-January (hereafter referred to as 'later surveys') on Steeple Jason Island every year from 2016/17 to 2024/25 (except for 2021/22). Observers thoroughly searched the whole islands, walking slowly by the entire area of the island, recording each apparently occupied territory (AOT). In areas of high nest density, natural landmarks were used to define parallel survey lines to ensure systematic coverage and avoid double-counting AOTs. Depending on the island the censuses were made by one or two observers and lasted one to 17 days. An AOT was identified as a nest with eggs or chicks, an incubating or brooding adult and/or one or two birds showing evidence of territory defence or attachment (Furness 1982). Each AOT was considered to represent one breeding pair. During the surveys on New Island and Steeple Jason Island, whenever a nest was found, the content (egg, chick, empty) was recorded. In areas inaccessible to observers, such as near seabird breeding colonies highly sensitive to human disturbance (e.g. southern giant-petrel *Macronectes giganteus* colonies), AOTs were monitored using binoculars, and the nest contents were classified as unknown. Locations of AOTs were recorded with a handheld GPS device on New Island, and in order to compare

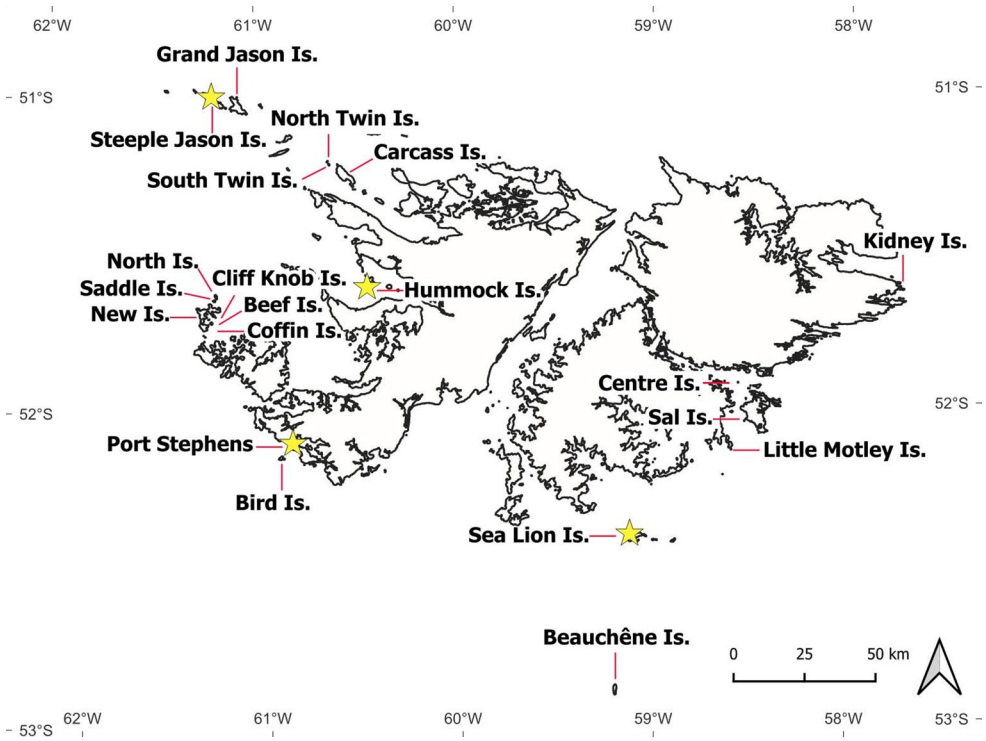

Fig. 1 Location of the islands surveyed for apparently occupied breeding territories of the Falkland skua (*Stercorarius antarcticus antarcticus*) and areas where chicks ringed on New Island were resighted (yellow stars). Port Stephens and Sea Lion Is. correspond only to resighting locations. Is. = Island

Table 1 Apparently occupied breeding territories (AOTs) of Falkland skua (*Stercorarius antarcticus antarcticus*) in the Falkland Islands, in different breeding seasons and islands, observed between 5 December and 9 January. Sites are ordered by the number of AOTs and then alphabetically

	Breeding season	AOTs
Steeple Jason Island	2009/10	222
	2022/23	332
New Island	2009/10*	333*
	2023/24	246
Grand Jason Island	2022/23	116
Carcass Island	2022/23	36
Bird Island	2017/18	20
Hummock Island	2019/20	18
Beauchêne Island	2015/16	14
Beef Island	2019/20	5
Centre Island	2017/18	0
Cliff Knob Island	2016/17	0
Coffin Island	2016/17	0
Kidney Island	2016/17; 2018/19	0
Little Motley	2017/18	0
North Island	2016/17	0
North Twin Island	2018/19	0
Saddle Island	2016/17; 2019/20	0
Sal Island	2017/18	0
South Twin Island	2018/19	0

*AOTs recorded on New Island in 2009/10 (obtained from Catry et al. 2011)

with previous surveys which surveyed only the south part of the island (Catry et al. 2011), the results are presented for the whole island, as well as for the north and south halves of the island, divided according to the location of former fence lines still visible in the field.

When possible, we non-systematically recorded resightings of ringed birds. These skuas had been fitted with metal rings as chicks as part of a long-term monitoring program of Falkland skuas on New Island. Between 2009/10 and 2019/20 (except in 2013/14), a total of 230 chicks were ringed (23.5 ± 20.5 per year, average ± SD).

Statistical analyses were performed in R software (R Core Team 2025).

Results

Between our two surveys, the breeding population of Steeple Jason Island increased by 50%, from 222 pairs in 2009/10 to 332 pairs in 2022/23 (Table 1), corresponding to an average annual growth rate of 3.1%. Over roughly the same period, the New Island population declined by 26%, from 333 in 2009/10 (Catry et al. 2011; surveyed using the same methodology) to 246 in 2023/24 (Table 1), at an annual rate of 2.1%.

Later surveys, carried out on Steeple Jason Island in mid-January, recorded fewer AOTs in 2022/23 (268; Online Resource 1), but showed a similar trend: an increase of 21% of the population between 2016/17 and 2024/25, at an annual increase rate of 2.4%. Restricting the comparison to the 2016/17–2022/23 period, to match the final main survey, the increase was 25%, corresponding to an annual growth rate of 3.7%.

During the surveys on New Island and Steeple Jason Island, most pairs were incubating two eggs (Table 2). Of the 246 AOTs recorded on New Island in 2023/24, 163 were in the southern part of the island, and the remaining 83 in the north (Fig. 2). The proportion of empty nests (excluding nests with unknown content) on Steeple Jason Island was 25% in the two seasons surveyed, whereas on New Island it was 32% on the one season surveyed (Table 2). A comparison of nest contents (excluding nests with chicks) showed a significant difference between these two islands (Chi-square test: $\chi_4 = 23.3$, $p < 0.001$). No significant differences were found between the two different seasons on Steeple Jason Island (Post hoc pairwise comparisons: $p = 0.199$), whereas New Island differed significantly from both Steeple Jason Island 2009/10 ($p < 0.05$) and 2022/23 ($p < 0.001$), showing a higher proportion of single egg nests and empty nests.

Of 230 individuals ringed as chicks on New Island, 27 individuals (11.7%) were observed in following years. Of those, 22 (81.5%) were observed on New Island and the remaining five (18.5%) elsewhere in the Falklands. Birds resighted on New Island were first observed at 6 ± 2 years of age (average ± SD; range: 2–9 years). Of the five individuals resighted at other sites, two were breeding on Steeple Jason Island (7 and 12 years old), while the other three were recorded on Hummock Island (9 years old), Port Stephens

Table 2 Falkland skua (*Stercorarius antarcticus antarcticus*) nest contents observed on the surveys carried out on Steeple Jason Island and on New Island, Falkland Islands. The percentages presented are based on nests with known content

	Steeple Jason Island 15–31 December 2009	Steeple Jason Island 20–26 December 2022	New Island 12–28 December 2023
One egg	30 (17.8%)	29 (11.8%)	59 (24.2%)
Two eggs	96 (56.8%)	156 (63.4%)	105 (43.0%)
One chick	1 (0.6%)	0 (0%)	1 (0.4%)
Empty	42 (24.9%)	61 (24.8%)	79 (32.4%)
Unknown	53	86	2
Total	222	332	246

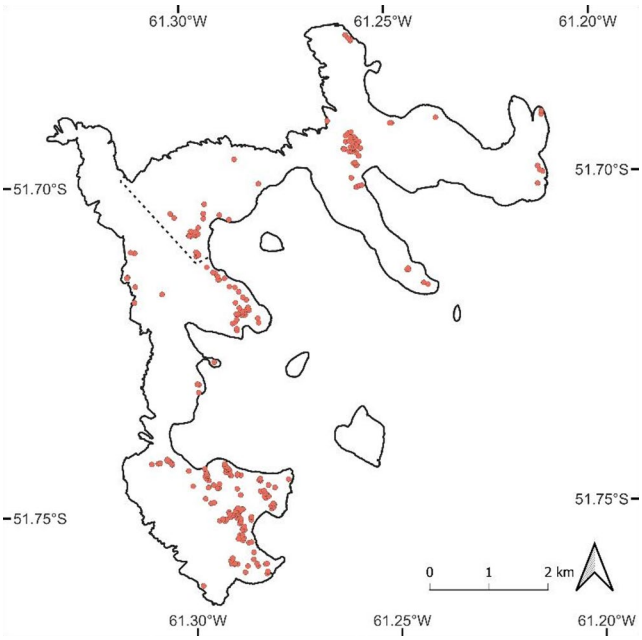

Fig. 2 Locations of all apparently occupied breeding territories of the Falkland skua (*Stercorarius antarcticus antarcticus*) recorded on New Island (2023/24), Falkland Islands. The dashed line separates the southern from the northern part of the island

(10 years old) and Sea Lion Island (age unknown), where breeding status could not be confirmed (Fig. 1).

Discussion

Here we show that Falkland skua populations present markedly contrasting changes in breeding population size over the past 13–14 years at the two largest known colonies for this species.

Surveys on the south part of New Island recorded 417 AOTs in 2004/05 and 219 AOTs in 2009/10 (Catry et al. 2011). In 2023/24, we found 163 AOTs in the same area, representing a 61% decrease since 2004/05, equivalent to an average annual decrease rate of 4.8%. Although the population has been declining since 2004, the sharpest decline occurred between 2004 and 2009, when the annual rate of decrease was 12.1% (Catry et al. 2011). The opposite trend was recorded for Steeple Jason Island, as the breeding population has increased by 50% over 13 years. Later surveys carried out on Steeple Jason Island (in mid-January), although accounting for fewer AOTs, likely reflecting the natural increase in nest failures as the breeding season progresses, indicate the same overall population trend and annual increase rate as those conducted earlier in the season. This reinforces the pattern observed on Steeple Jason Island. Notably, population sizes at the two sites have now reversed: New Island declined from 333 to 246 AOTs between 2009/10 and 2023/24, while Steeple Jason Island increased from 222 to 332 AOTs over a similar period.

The higher number of single eggs and empty nests recorded during late incubation and early chick rearing on New Island, compared to Steeple Jason Island, may indicate lower breeding success on the former, potentially reflecting poorer breeding conditions. One possible contributing factor is the increase in Striated caracaras on New Island (Catry et al. 2011). Interestingly, the numbers of breeding pairs of Striated caracara on both islands may be comparable, with the most recent survey from 2013/14 reporting 86 caracara pairs on New Island and 89 on Steeple Jason Island (Reeves et al. 2018). However, the density of breeding Striated caracaras on Steeple Jason Island is notably higher, given its smaller area. These contrasting trends despite similar predator abundance point to island-specific ecological drivers affecting skua populations.

The change in skua numbers recorded on New Island may also reflect significant variations in their local food sources. For example, skuas at this site are heavily reliant on Slender-billed prion as a food source (Alves 2015), a species which has been reported to be declining elsewhere in the Southern Ocean (Pacoureau et al. 2019). Although population trends of Slender-billed prion in the Falkland Islands are currently unknown, this highlights a potential urgency for monitoring the species.

On Steeple Jason Island, the observed increase in skua numbers might be linked, at least partially, to the growing population of breeding South American fur seals (*Arctocephalus australis*) in the Jason islands group (Baylis et al. 2019). Notably, there were no records of breeding fur seals on Steeple Jason Island until 2018 (Baylis et al. 2019), but in 2024/25 several hundred pups were observed on this island (pers obs). The establishment of a seal breeding population creates new feeding opportunities for scavengers such as the Falkland skuas, mainly through carrion and placentas from fur seals. Tracking data and direct observations from Steeple Jason Island indicate that skuas there largely feed on resources associated with seabird colonies and seal rookeries (including those of East and West Cays, adjacent to Steeple Jason Island; own unpubl. data). An increase in skua breeding populations has been previously linked to a rise in fur seal breeding populations in South Georgia (Phillips et al. 2004), further supporting the role of this food source in driving skua populations. However, the short time interval between the establishment of breeding fur seals and the observed increase in skua numbers suggests that other factors may also be contributing the changes in skua numbers.

The low number of resightings of skuas ringed as chicks (11.7%) may reflect limited observation effort, particularly outside New Island, and/or low survival rates among young birds. Although most resighted individuals were observed on New Island, consistent with natal philopatry commonly reported in skuas (e.g. Klomp and Furness 1992), 18.5% were recorded on other islands. Given the non-systematic and spatially uneven resighting effort, these observations should be interpreted cautiously. Nevertheless, they show that some individuals recruit outside New Island suggesting that dispersal among colonies may contribute, at least in part, to differences in population trends among islands, including the increase observed on Steeple Jason Island.

A general survey of the skua population on the Falklands has never been attempted. The counts presented in this paper nevertheless cover most of the largest seabird colonies on the islands, where the greatest concentrations of petrels, albatrosses, shearwaters, penguins and other seabirds are found, namely Steeple Jason Island, Grand Jason, Beauchêne, New, Bird and Kidney Islands (BirdLife International 2025). The data presented in Table 2 confirms that amongst the sites surveyed, New Island and Steeple Jason Island represent the two most important Falkland skua colonies in the Falklands, and likely the two largest colonies globally. Other sites with considerable numbers of skuas include Sea Lion Island, where breeding pairs ranged from 75 to 151 between 2015/16 and 2019/20(Galimberti and Sanvito 2020).

Overall, our findings reveal variation in population sizes among Falkland skua colonies across the Falkland Islands. While our study did not assess the ecological mechanisms underlying these patterns, interannual variability, together with differences in prey availability, interspecific interactions, predation pressure, and breeding success may plausibly contribute to the observed variation among colonies. These results highlight the importance of adopting a broad, multi-colony perspective when investigating population dynamics in the Falkland skua.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s00300-026-03513-x.

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Data availability No datasets were generated or analysed during the current study.

Declarations

Competing interests The authors declare no competing interests.

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