



2023/24 ANNUAL REPORT

Annual Report  
July 2023 – June 2024

# Fairy Tern Breeding Monitoring on Bird Island, South Australia.

A report for Green Adelaide and Flinders Ports



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Cover photo: Fairy Tern adult, Ian Forsyth. Second page: Fairy Tern fledgling eating a fish, Mary-Ann van Trigt.

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# Acknowledgements

For the past 6 consecutive seasons, the former Adelaide and Mount Lofty Ranges Natural Resources Management Board (AMLR NRM Board), now Green Adelaide Board have provided funding and support for this project. The work is part of broader conservation work on Bird Island guided by a Biodiversity Action Plan, and regional conservation work with BirdLife Australia on Beach-nesting Birds supported by the Green Adelaide Landscape Board and the previous AMLR NRM Board since 2008. The leadership on Fairy Tern conservation in the Gulf St Vincent has provided a consistent data set to guide on-going conservation. Thank you to Green Adelaide for recognising the importance of continued surveys and engagement by funding the Sharing our Shores with Coastal Wildlife Program to coordinate the Bird Island Fairy Tern Breeding Monitoring Program.

We acknowledge the ongoing support from Flinders Ports for providing funding for continued research and on ground works and allowing access to Bird Island (Section Bank) for weekly monitoring throughout the breeding season.

Thank you to the many valued volunteers, including members of the Friends of the Adelaide International Bird Sanctuary, for their continued support in undertaking both Fairy Tern breeding monitoring and shorebird surveys on Bird Island.

Dr Greg Johnston has given great insight and support throughout the Programs entirety and his knowledge of Bird Island is invaluable. Thank you, Greg, for your continued support and for providing your boat to access the island for monitoring and to Steve Papp for being our ever reliable and proficient boat captain.

# Executive Summary

The South Australian Fairy Tern (*Sternula nereis nereis*) population is in decline and breeding success is threatened. The Fairy Tern is listed as Endangered under the SA National Parks and Wildlife Act 1972, and Nationally Vulnerable under the Environment Protection Biodiversity Conservation Act 1999.

Bird Island, Outer Harbor, South Australia, is one of 11 known Fairy Tern breeding sites in South Australia (BLA 2024). The purpose of the Fairy Tern monitoring project on Bird Island is to monitor breeding success, establish the main threats to breeding success for future prioritisation of recovery actions, and to mitigate threats in real time where possible. Monthly monitoring of colonial breeding birds on Bird Island began in 2015 and included Fairy Terns (Johnston 2018). A finer temporal scale was required for Fairy Terns, so weekly surveys began during the 2018/19 breeding season. Weekly Fairy Tern censuses are coordinated through Birdlife Australia's Sharing our Shores with Coastal Wildlife Project staff and supported by the Green Adelaide Board. In 2021/22, the Australian Government's Department of Agriculture, Water and the Environment became a funding partner to support ongoing monitoring and threat management of Endangered Fairy Terns on Bird Island during that period.

This report is for 2023/24 breeding season monitoring on Bird Island, Outer Harbor. Twelve trained and skilled volunteers assisted the project monitoring team this season. Birdlife Australia staff and volunteers made 17 trips to the Island from October 2023 to April 2024. Monitoring data is recorded into Birddata's Colonial Nesting Birds' Program which is automatically shared with Biological Database of South Australia (BDBSA).

In 2023/24, three Fairy Tern colonies were recorded and monitored on Bird Island. Both Colonies A and B containing 6 nests and numerous scrapes failed on the 15<sup>th</sup> November 2023 due to tidal inundation / storm surge. A total of 121 adult Fairy Terns, 74 nests, 148 eggs and 54 chicks were recorded across the three colonies. From the 54 chicks that made it to hatching in Colony C, at least 22 fledged reaching 21-22 days old. The cause of the failure of the remaining 82 eggs and 32 chicks in Colony C is unknown. The introduction of chick shelters placed around the perimeter of the breeding colonies on Bird Island likely contributed towards the 22 chicks reaching fledging age as the shelters were regularly observed with varying ages of chicks under or close by. The number of Silver Gulls had increased this season compared to last (pers comms G. Johnston 2024) but with smaller numbers in January 2024, which coincided when Fairy Tern nests started to hatch, another likely contributing factor to the successful fledgling outcome.

Recommendations for continued Fairy Tern monitoring and species conservation in line with the Recovery Plan are provided at the end of the report.

# Introduction

The Australian Fairy Tern (*Sternula nereis nereis*) is a small piscivorous bird, that is generally restricted to shallow water coastal areas and estuaries. In South Australia the population is in decline and breeding success is threatened. The Fairy Tern is listed as Endangered under the SA National Parks and Wildlife Act 1972, and Nationally Vulnerable under the Environment Protection Biodiversity Conservation Act 1999.

Bird Island is one of 11 known Fairy Tern breeding sites in South Australia recorded in a state-wide survey during the 2023-24 breeding season (BLA 2024). With support from the Australian Government, a south-eastern Australia Fairy Tern census was coordinated by Birdlife Australia throughout the 2023-24 breeding season. This aimed to determine the distribution of breeding sites used by Fairy Terns across their south-eastern range, and to provide an estimate of population size, primarily for the well-surveyed states of South Australia and Victoria.

From 2018 more intensive monitoring of Fairy Terns on Bird Island was initiated by Green Adelaide, formerly the Adelaide and Mount Lofty Natural Resource Management Board (AMLR NRM), delivered via the Birdlife Australia's Sharing our Shores with Coastal Wildlife Project team. The aim was to monitor the breeding success, obtain more information on threats, and mitigate threats where possible. The project has continued over the last 6 consecutive breeding seasons (2018/19 - 2023/24). Monitoring is carried out with assistance from highly trained and skilled Birdlife Australia volunteers and is in line with the national monitoring framework of BirdLife Australia's National Beach-nesting Birds Program following the BirdLife Australia's guidelines for monitoring nesting success of Fairy Terns. In addition to regional training and mentoring support, volunteers active within the project have access to species-specific inductions, training resources and online workshops from BirdLife Australia's national program.

The rationale for the program is to support actions within the National Recovery Plan for the Australian Fairy Tern. The program is also linked directly to the Bird Island Biodiversity Action Plan (BIBAP) developed by Natural Resources AMLR (Ecological Evaluation Pty Ltd., 2014). The BIBAP guides conservation works on the island and provides vegetation baselines to monitor improvement. Bird Island is owned freehold by the Minister of Infrastructure and Transport under the Harbors and Navigation Act 1993, with areas under long-term control of Flinders Ports under a port operating agreement. A 2014 memorandum between the Transport and Environment Ministers and Flinders Ports enabled the previous NRM Board, and now Green Adelaide, as the Environment Minister's representative, to undertake conservation management on the island and breakwater. The development of the Biodiversity Action Plan is an outcome of the MOU.

One of the high priority actions in the BIBAP is to monitor locations and nesting success of Fairy Tern colonies across the island. The BIBAP also uses the Fairy Tern as a flagship species and a means of assessing the effectiveness of management actions undertaken on the island. The Fairy Tern Monitoring program is coordinated by BirdLife Australia and Green Adelaide with ongoing monitoring and threat management of endangered Fairy Terns on Bird Island. Flinders Ports also supports the Program by providing funding for on ground weed control, dune stabilisation via spinifex planting and monthly censuses of colony breeding birds. Australian Government funding to the previous AMLR NRM Board, and now via the Hills and Fleurieu

Landscape Board, provided for the purchase of two 'Felixer' grooming traps, deployed to control cats and foxes on Bird Island and adjacent Torrens Island.

The Bird Island project contributes to the knowledge of the Fairy Tern population and breeding trends across Australia. Fairy Tern monitoring projects are also occurring in the Coorong (SA) undertaken by Birdlife Australia at the Murray Mouth site and David and Fiona Paton at University of Adelaide and in the South East (SA) by Friends of Shorebirds SE. Conservation actions and monitoring are undertaken across the species range in Australia by a range of organisations. These include the Western Australia WA Fairy Tern Network, the Victorian Fairy Tern steering committee and BirdLife Tasmania.



Photo 1: Oblique aerial imagery of Bird Island in foreground looking south across the Port River and Adelaide Metro coast 30/12/2022 (Google Earth).

## Project Aims

- To monitor the occurrence of breeding and the success of colonies of Fairy Terns on Bird Island to improve our understanding of breeding at this site (BIBAP).
- To record threats to the colony on each visit made to Bird Island, and to use this data to guide real time threat mitigation to improve breeding success where possible, but also to review this data to guide future, long-term conservation actions (aligns with NRP strategy 3).
- To gather additional ecological data that could further contribute to our understanding of the species and its recovery needs, for example, breeding behavioural observations, banded bird resighting's and prey species information. To share findings with the national Fairy Tern network (NRP Strategy 4).
- To raise awareness amongst community and industry (Flinders Ports) and provide data to key Government Agencies and stakeholders of the significance of Bird Island as a key breeding site for the endangered Fairy Tern (NRP Strategy 5).

## Methods

Monitoring Fairy Tern breeding activities follow BirdLife Australia's national protocols for Fairy Tern monitoring. The guidelines are available within the Beach-nesting Birds program participant [hub](#). Volunteers who participate in the Fairy Tern breeding monitoring program undertake an online induction via the hub, which focuses on the health and safety of volunteers, the aims of the project and on the finer details around monitoring the birds so both volunteers and the sensitive breeding birds are not inadvertently placed at risk.

Since 2019/20 all data collected is recorded in [Birdata](#), an online citizen-science gathered observational database, through the 'Colonial nesting birds' program module. Opportunistic photo sampling of prey species was undertaken during the 2023/24 season where images of Fairy Terns flying in with prey species to feed mates and chicks were captured and recorded during the monitoring sessions.

A refresher of monitoring methodology and review of the 2022-23 breeding season was undertaken at the start of season training event with volunteers and staff in Port Adelaide on 19<sup>th</sup> October 2023 and a seasonal monitoring schedule devised. The frequency of monitoring throughout the season occurred weekly while colonies established. A Fairy Tern breeding colony is defined as a group of adult Fairy Terns nesting within close proximity i.e. 1-3 metres apart. Different colonies can occur throughout the same breeding season on Bird Island if they are separated by geographic location and / or time.

Once a colony is confirmed as establishing, when scrapes/nests are observed, weekly survey trips are undertaken up to a maximum of twice weekly at the peak of breeding. There is a minimum of two people required per monitoring trip from October to the end of March. Monitoring is not undertaken when extreme weather conditions are forecast ie high temperatures and/or wind.

For each trip in the 2023-24 season, the following was undertaken:

- Travel by boat over to Bird Island.
- Survey the Island (on foot) focusing on known breeding locations for Fairy Terns.
- If nesting birds are suspected, observe the site/colony from a distance that does not cause birds to move from nests (approximately 80m).
- Monitor nesting sites (colonies) for:
  - habitat characteristics i.e. vegetation type, distance to high tide mark, substrate
  - breeding success
  - threats (within 100m radius)
- Use a spotting scope or binoculars to observe and record details of the breeding colony directly on to the Birdata app on a mobile phone.
- Maximum time spent observing colony is 30 minutes if the colony has not been disturbed. Maximum of 20 minutes spent observing colony if birds have been disturbed and move away from their nesting sites.
- When Fairy Tern chicks are present, observers use the My Fairy Tern pocket guide to determine accurate age of chicks.
- All data are entered, inclusive of threat data, while in the field, directly into Birdata via the app, or using the data sheet and later transferred to Birdata.

# Results

## Monitoring visits to Bird Island

Over the 2023/24 season a total of 17 trips were made from the start of November 2023 up until April 2024 (see Table 1) when breeding colonies were active. Weather prevented a number of trips from occurring in October, November, December, January, February and March but the primary aim was to increase the frequency of trips to weekly when chicks were present. Green Adelaide engages Greg Johnston (with assistance from Steve Papp) to undertake ongoing monthly surveys of colony breeding birds (including Australian Pelican, White Ibis, Black-faced Cormorants) of Bird Island and the Northern Revetment Mound, Outer Harbor. BirdLife Australia are alerted if Fairy Terns are observed during their visits. This enabled targeted monitoring to occur from November 2023 when Fairy Terns were first recorded using the island (G. Johnston pers. comm. 2023/24).

Table 1: Number of monitoring trips across six seasons for the Fairy Tern monitoring project from 2018/19 to 2023/24.

Month	2018/19 Season	2019/20 Season	2020/21 Season	2021/22 Season	2022/23 Season	2023/24 Season
<b>August</b>	1					
<b>September</b>						
<b>October</b>	2				3	
<b>November</b>	2	2	2		4	4
<b>December</b>	4	2	3	5	1	2
<b>January</b>	5	4	2	4	5	3
<b>February</b>	3	3	4	4	5	4
<b>March</b>	5	4	4	5	4	4
<b>April</b>	2	3	1		1	
<b>Total # trips</b>	<b>24</b>	<b>18</b>	<b>16</b>	<b>18</b>	<b>23</b>	<b>17</b>
<b>Total Volunteers</b>	<b>7</b>	<b>7</b>	<b>10</b>	<b>12</b>	<b>11</b>	<b>12</b>

\*10 scheduled trips were cancelled / postponed in October through April 2024 due to inclement weather (6 due to high winds and 4 due to high temperature).

Once again volunteers contributed enormously to the Fairy Tern project on Bird Island. There were twelve dedicated volunteers throughout the 2023/24 season. Overall volunteers contributed 255 hours. In total, there is an impressive 1,740 volunteer in-kind hours contributed across the six seasons of monitoring for the project to date. This is a fantastic effort and very much appreciated. There was an average of 3 volunteers per trip, and each monitoring trip took approximately 5 hours. This also underestimates volunteer hours as it does not include travel time for volunteers to and from the site and the time spent emailing reports and downloading / editing photographs.

Table 2: Dates of individual volunteer monitoring sessions including Fairy Tern breeding observations on Bird Island for the 2023-2024 season. Unique colony locations are given a separate identifier (A-C).

	Colony	A		B		C		
Survey #	DATE	Adults	Nests	Adults	Nests	Adults	Nests	Chicks
1	3-Nov-2023							
2	6-Nov-2023	13	4					
3	14-Nov-2023	12	2	7	0			
4	20-Nov-2023							
5	5-Dec-2023							
6	27-Dec-2023							
7	3-Jan-2024					10	8	
8	9-Jan-2024					43	3	
9	30-Jan-2024					93	68	
10	6-Feb-2024					85	34	22
11	13-Feb-2024					121	12	28
12	20-Feb-2024					80	6	49
13	29-Feb-2024					30	2	26
14	6-Mar-2024					13	-	10
15	12-Mar-2024					7	-	2
16	19-Mar-2024					-	-	-
17	26-Mar-2024					-	-	-

## Breeding success

The 2023/24 breeding season resulted in 3 Fairy Tern nesting colonies, A, B and C (Figure 1). 121 adults were recorded near colony C on 13th February 2024, being the highest number of adults recorded on Bird Island for the 2023-24 breeding season. Overall, from the three colonies there were a total of 74 nests, 148 eggs and 54 chicks recorded (Table 3).



Figure 1: Map of Bird Island Fairy Tern Breeding Colonies 2023-24.

Colonies A and B were observed forming on 14<sup>th</sup> November 2023 with 12 adults in colony A and 2 x 1 egg nests. Seven adults were observed in colony B and fish presentations recorded, along with numerous scrapes. 4 chick shelters were deployed along the NW side of the colonies (photo 2). Both colonies failed due to being washed over by a storm event on 15<sup>th</sup> and 16<sup>th</sup> November 2023 (photo 3).



Photo 2: Colony A with 3 chick shelters at perimeter, above high tide mark 14/11/2023 (K. Bartley)



Photo 3: Colony A showing chick shelter inundated by tidal surge / storm event 20/11/2023 (I. Forsyth).

On the 3<sup>rd</sup> January 2024, Colony C was first observed establishing ~100 metres East of previously failed colonies A and B, with 10 adult Fairy Terns and 8 nests. The colony continued to build throughout January

and on the 30<sup>th</sup> January, the first 2 Fairy Tern chicks were observed at an approximate age of 3 -5 days old (photo 4). A total of 93 adults, with 68 of those adults sitting low (likely on nests), were observed. One week later, on the 10<sup>th</sup> survey for the season (6<sup>th</sup> February), there were 34 nests and 22 chicks of various ages recorded in Colony C.



Photo 4: One 3-5 day old Fairy Tern chick emerges from the cover of a Nitre bush in Colony C, 30/01/2024 (I. Forsyth).

On the 13<sup>th</sup> February 2024, the maximum number of Fairy Terns recorded for the 2023-24 breeding season being 121 adults were recorded, plus 26 chicks and 2 fledglings. Due to the high amount of rainfall during November and December 2023, there was an abundance of weedy sea rocket and native nitre bush (photo 4) including germinates and maturing shrubs, which provided good cover for the chicks along the southern and northern boundaries of the breeding colony. Six chick shelters were deployed by volunteers (photo 5) where there was limited cover for the birds to hide along the North Western side of the colony. The Chick shelters were placed ~10 metres apart and a remote camera deployed, hidden and backing onto sea rocket to monitor for threats and shelter uptake. Chick shelters were used to aid chick fledging success last season on Bird Island with regular usage observed and an increased number of fledglings from the 2021-22 season.



Photo 5: Birdlife Australia volunteer, Ian Forsyth, deploying chick shelters around the perimeter of the Fairy Tern colony, 13/02/2024 (K.Bartley).

On subsequent surveys, fledgling numbers continued to be recorded, and on the 29th February at least 18 fledglings were observed, plus an additional 8 chicks ranging in age from 3 to 16 days old. Several of these chicks were observed using the chick shelters for shade. One week later, on the 6<sup>th</sup> March, only 13 adults and 8 fledglings were recorded within the colony and resting amongst beach wrack (photo 6). It is likely that some of the 18 fledglings recorded the week prior, were out practising flying and being taught how to fish by their parents.

During the final monitoring survey on the island there were 7 Fairy Tern adults, and 2 fledglings recorded on the 12<sup>th</sup> March sitting quietly amongst the beach wrack along the high tide mark. The following weeks survey on the 18<sup>th</sup> March, breeding had finished for the season and the island vacated of all Fairy Terns.



Photo 6: Four x 18 day old chicks with 2 adults amongst beach wrack, 06/03/2024 (K. Bartley).

Table 3: 2023-24 dates of colony formation, suspected cause of colony failure, maximum number of adults, nests, eggs, chicks and fledglings including breeding comments.

Colony Date	Colony Failed Y / N Suspected cause	Max # Adults	Max # Nests	# Eggs	# Chicks	# Fledglings	Breeding comments
6/11/2023 Colony A	Y - tidal inundation	12	6	12			20/11 - nests washed over and failed at this visit. 2.72m tide and strong SW winds 33-48 kmph on both 15th and 16th November 2023
14/11/2023 Colony B	Y - tidal inundation	7					20/11 - nests washed over and failed at this visit. 2.72m tide on both 15th and 16th November 2023
03/01/2024 Colony C	N	121	68	136	54	22	30/01 - 93 adults, 68 sitting low and 2 x 3-5 DO chicks observed. 13/02 - 121 adults, 26 chicks and 2 fledglings recorded 29/02 - 30 adults, 18 fledglings and 8 chicks ranging in age 3 -16 DO 06/03 - 13 adults and 8 fledglings 12/03 - 7 adults, 2 fledglings At least 22 fledglings recorded - potential for up to 28 due to varying ages of fledglings but cannot be confirmed. 19/03 - breeding finished and Island vacated.

Nesting success across the season was calculated by the number of fledglings produced per nest attempt, not fledglings produced per pair. Calculating fledglings per pair across the breeding seasons is problematic due to the limitations in determining exactly how many pairs we have in total, due to repeated nesting on the island, and not knowing if they are the same pairs or new pairs coming in. Without banded adults it is impossible to know if colonies had the same birds nesting repeatedly in new (non-overlapping) colonies.

Overall, nesting success (fledglings produced per nest attempt) was nearly twice as successful this season with a 0.30 fledgling per nest attempt ratio compared to the result of 0.17 in 2022/23. From a total of 148 eggs, 54 chicks (36%) hatched across the 3 colonies, which is a vast improvement from the previous season with only 24 chicks hatching from 178 eggs. The percentage of chicks that then went on to fledge in 2023-24 was 41% which is the highest number of fledglings from Bird Island since monitoring commenced. Chick shelters were deployed on Bird Island for the second season with chicks observed on several occasions utilising the shelters, which likely contributed to the increase in chick survival by offering protection from both the elements and avian predation by species such as Silver Gulls and birds of prey.

Table 4: Breeding results for Bird Island six seasons from 2018-2024

Year	Total # pairs	Total # colonies	Total # nests	Total # eggs	Total # chicks	% of eggs to chicks	Total # fledglings	% of chicks / fledglings	Fledgling / Nest Attempt	Fledgling / pair
<b>18/19</b>	66	7	74	130	71	55%	0	0%	0.00	0
<b>19/20</b>	26	14	84	159	8	5%	5	63%	0.06	0.19
<b>20/21</b>	28	2	38	62	5	8%	3	60%	0.08	0.11
<b>21/22</b>	12	7	16	31	4	13%	1	25%	0.06	0.08
<b>20/23</b>	66	7	90	178	24	13%	15	63%	0.17	0.23
<b>23/24</b>	<b>60</b>	<b>3</b>	<b>74</b>	<b>148</b>	<b>54</b>	<b>36%</b>	<b>22</b>	<b>41%</b>	<b>0.30</b>	<b>0.37</b>

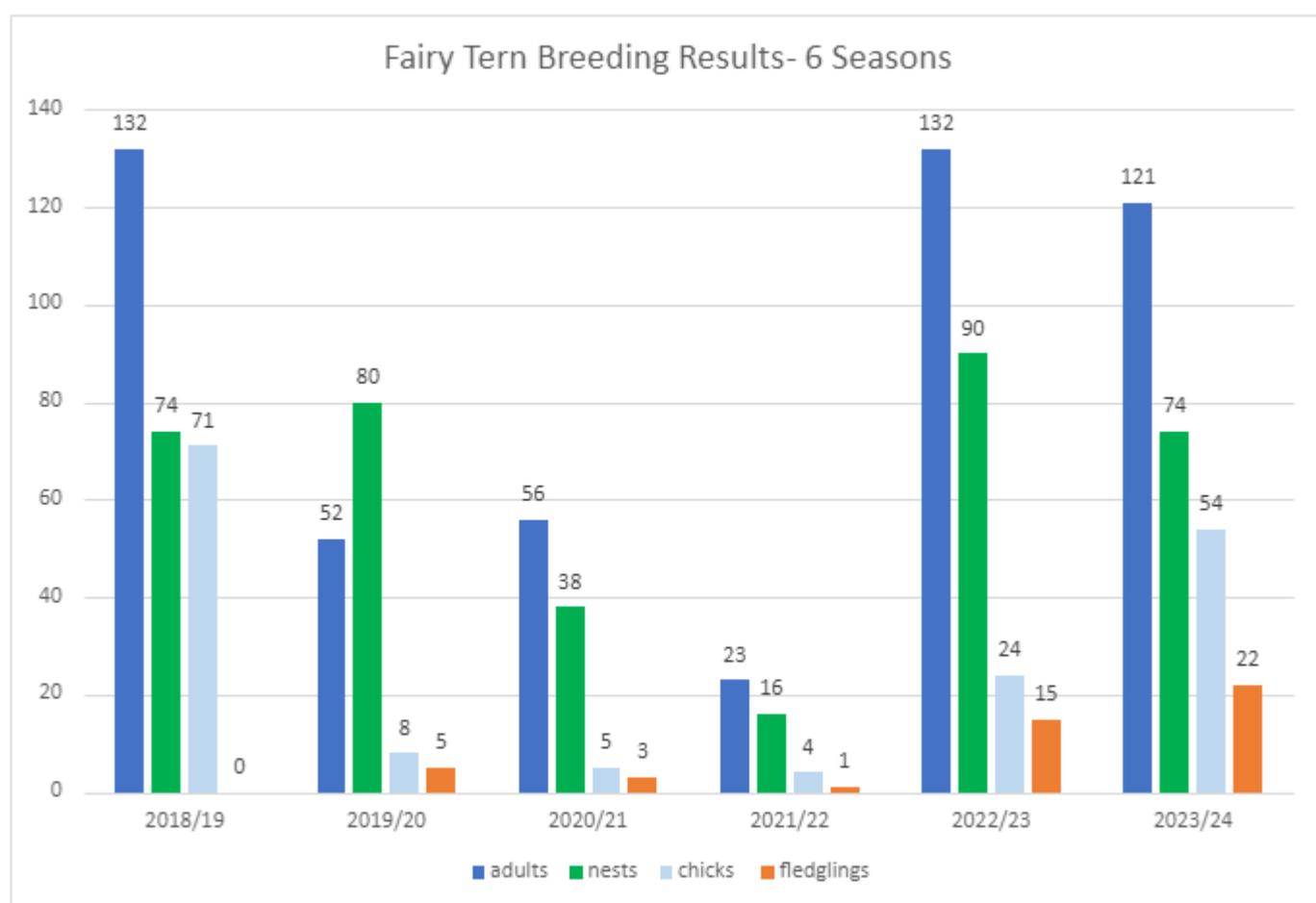


Figure 2: Bird Island breeding success across 6 consecutive seasons, including number of colonies, maximum number of adults, nests, chicks and fledglings from 2018/19 to 2023/24.

## Threats

Threats to breeding Fairy Terns directly observed by volunteers during visits made during the 2023/24 season were recorded in standardised fields within Birdata.

Tidal inundation and extreme weather were the cause of nest failure of the first two breeding attempts (Colony A and B) in November 2023. Due to the dynamic nature of the island which consists of extreme levels of sand and tidal movement from natural processes like severe wind and storm events, over washing of Fairy Tern nests occurred again this season. Historically, Bird Island experiences these events early on in the breeding season, usually around the months of November and December.

Introduced predators such as black rats, were recorded inside the colony on both remote cameras and also during the monitoring surveys by volunteers where rat prints were observed inside and adjacent to the colony.

Native predators such as Whistling Kites, White-Bellied Sea Eagles (photo 7), Nankeen Kestrels, Silver and Pacific Gulls were observed regularly throughout the breeding season with large numbers of Silver Gulls (photo 8) also recorded breeding on the island (Figure 3).

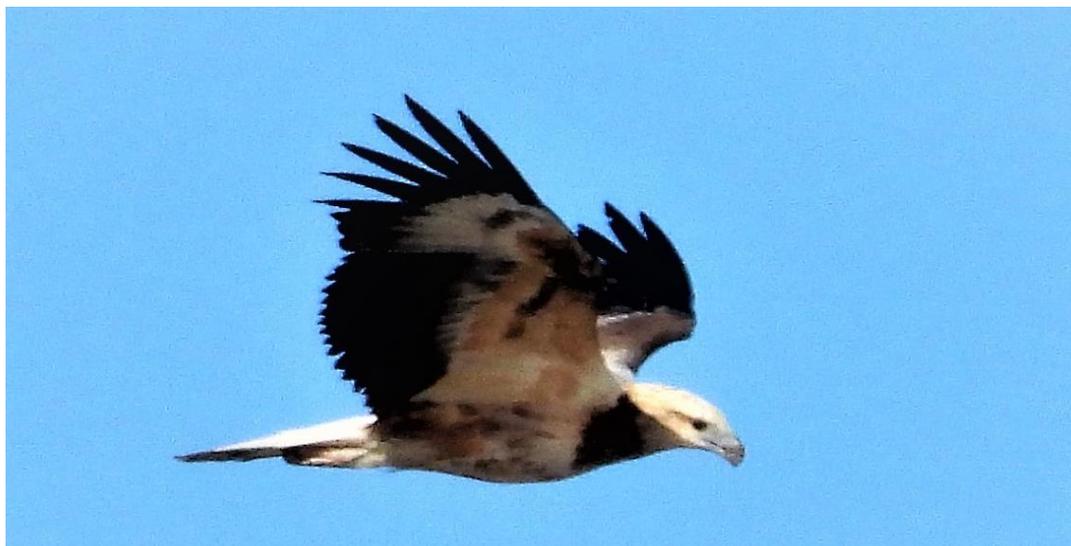


Photo 7: A Juvenile White Bellied Sea Eagle observed during the July Winter Shorebird count flying above Bird Island (K. Bartley).



Photo 8: Silver Gulls on Bird Island November 2023 (K.Bartley)

## Threats Discussion

Tidal inundation and extreme weather are natural processes which are becoming increasingly common and strengthening in intensity due to climate change. Artificially increasing beach height may assist with lessening the chance of complete tidal inundation of nests during early summer when Fairy Terns commence nesting. Dredge spoil is used in other areas of Australia to increase beach height to mitigate complete inundation of nests of breeding seabirds and beach-nesting birds and may be a consideration for Bird Island. Flinders Ports dredge the Port River to keep the channel deep enough to receive large international ships. Dredge spoil could be strategically placed to protect the island from inundation where Fairy Terns are known to nest.

Introduced threats like Black rats were observed inside the Fairy Tern breeding colony through images captured on the remote camera placed on the perimeter of the colony and backing on to vegetation. Black Rat tracks were also seen inside the colony, although not in high densities, like that of higher up on the island under thicker stands of *Atriplex cinerea* and on the eastern side of the island amongst Grey Mangrove stands. If Black Rat numbers and tracks are perceived to increase inside the Fairy Tern breeding colonies, then control via bait stations should be considered, although given the proximity of the adjacent port, <400 meters swim away, reinfestation of rats post treatment is likely. An intensive rat baiting program was undertaken on Bird Island in 2017-18 season to reduce the risk of predation on Fairy Tern eggs as well as other breeding birds on the island (Lamanna & Stephens 2022). Post treatment of Black Rats showed no major improvement in fledgling numbers in that or the following 2018-19 Fairy Tern breeding season (Figure 2).



Photo 9: Black Rat inside the Fairy Tern breeding colony 19/02/2024.

Foxes were not recorded on Bird Island during the 2023-24 breeding season and have not been recorded since a fox was controlled in March 2021. A Felixer unit (photo 10) has been in use on the island since February 2021 and was removed from the island for servicing post breeding in 2024.



Photo 10: Felixer unit deployed February 2021 for Fox control on Bird Island (Kerri Bartley)

Native avian predators which also breed on Bird Island, like the over abundant Silver Gull, is a serious concern for breeding Fairy Terns. Numbers of Silver Gills on Bird Island have been recorded across the last 10 years by Dr Greg Johnston (figure 3) with the most ever recorded in August 2015 with over 42,000 individuals. Silver Gull numbers are at their lowest during the months of January when Fairy Tern nests begin to hatch. The use of chick shelters over the past two breeding seasons seems to have assisted with providing cover for the very young chicks which are extremely vulnerable to Silver Gull predation. Silver Gull chicks were observed using the chick shelters and displacing Fairy Tern chicks from using them in the 2022-23 season as the breeding of both species overlapped. No silver gull chicks were recorded inside the shelters or near the colony during the 2023-24 season. Silver Gull egg control has been considered in the past to reduce the number of chicks hatching amongst the Fairy Tern breeding colonies. If the numbers of Silver Gulls breeding on the island was to increase, then control via egg oiling could be considered in comparison to egg removal (due to the birds initiating additional egg laying compared to incubating non-viable eggs).

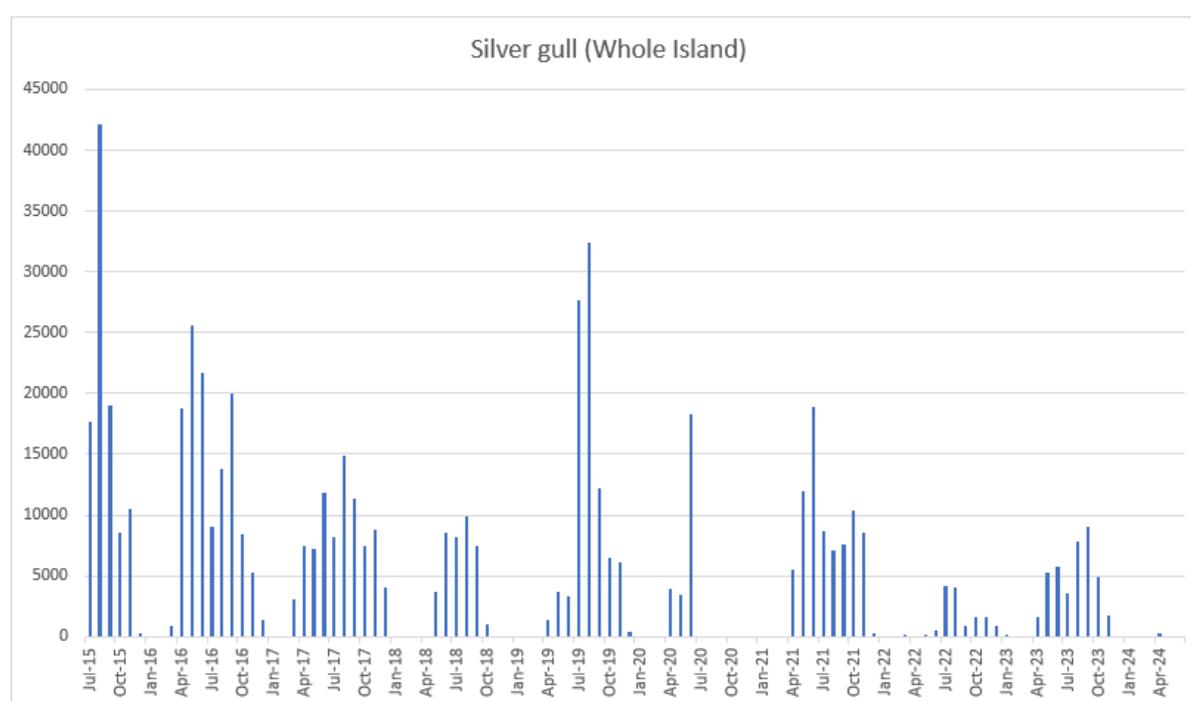


Figure 3: Silver Gull numbers recorded on Bird Island across 10 years, 2015-2024 (Dr Greg Johnston).

### Weeds:

Open sandy sites are with varying percentages of shell grit are favoured for nesting by Fairy Terns, whereas areas where vegetated and weedy ground cover exists, is favoured by Silver Gulls on Bird Island. As such, decrease in weed ground cover is seen as a positive outcome to favour more desirable seabird species nesting.

Habitat condition re-assessment of sites originally established in 2014 was undertaken on 16th March 2022 (T&M Ecologists 2022). There has been a decrease in high threat woody weeds (African Boxthorn) cover of weed species was observed to have generally declined as a result of weed control. Decrease in weedy ground covers such as Galenia and Marshmallow on the south of the island, is a positive outcome which favours the nesting of seabird species. A key consideration in managing this island as a significant seabird and shorebird

area is maintaining open spaces for nesting and roosting. In the Atriplex / Nitraria Open Shrubland (Management Zone 3), there was a notable increase in Beach Rocket (*Cakile maritima*). This increase in cover is not considered a high threat at this stage, although vigilance should be maintained to ensure that it does not impact on key seabird breeding habitat (such as open beach areas used by Fairy Terns).

Samphire communities remain weed free, however Grey Mangrove cover continues to increase. Expansion of mangroves can limit the availability of the open spaces for shorebird and seabird habitat. Ongoing monitoring of Grey Mangrove expansion will be needed to assess if shorebird roosting and feeding habitat is being compromised.

Sea Wheat-grass is present on the island and is controlled through Green Adelaide’s coastal conservation program to remove this threat. Follow up planting using the native dune species, Rolling Spinifex (*Spinifex hirsutus*) is completed each winter to replace the weedy sea-wheat grass which threatens the integrity of the dunes. Native Spinifex grass stabilises the sand and encourages a gentle sloped dune mound to develop and capture sand to mitigate erosion.

### Disturbance:

Visitation to the island by boaters, fishers and members of the general public can cause direct disturbance to breeding beach-nesting birds, not only causing them to leave their nests but also by direct crushing of eggs. Human and dog footprints adjacent to the breeding colony have been recorded during site monitoring sessions over the past 6 breeding seasons. A series of ‘Fairy Tern Breeding Area – Keep Out’ signs were developed for Bird Island in 2022-23 and installed again for this breeding season. The signs aim to raise awareness and protect the breeding Fairy Tern colonies on Bird Island by highlighting when breeding is occurring on the island. A total of six interpretive A1 sized corflute signs were installed at various access points across the island in November 2023 by Birdlife Australia volunteers (photo 11).



Photo 11: Birdlife Australia volunteers installing Fairy Tern breeding signs on Bird Island November 2023 (K.Bartley)

## Community Engagement

A Beach-nesting Birds Workshop was held at Henley Beach Sailing Club on Saturday 15<sup>th</sup> October 2023 where members of the community were invited to attend to learn about beach-nesting birds and specifically Fairy Terns, Red-capped Plovers and Hooded Plovers. A presentation on the Bird Island Monitoring Program was given and a 'flock' of life size model Fairy Terns were on display. The Fairy Tern models were created for education purposes and includes 3 phases of plumage; juvenile, non-breeding and breeding and Flinders Ports Holdings were given models to display in their offices at Port Adelaide to raise awareness amongst staff (photo 12).



Photo 12: Katrina and Jaimi, staff from Flinders Ports Holdings with Fairy Tern models (K. Bartley).

At the End of Season Beach-nesting Birds Celebration held in May 2024, a Bird Island Fairy Tern Monitoring Update presentation was delivered to over 70 Birdlife Australia volunteers, land managers and agency staff (photo 12).



Photo 12: End of season Beach-nesting Birds Celebration held in May 2024 (T. Flaherty).

# Recommendations

## Recommended actions for 2024/25 season

- Implementation of BirdLife Australia's national Beach-nesting Birds Program at a local scale for continued Fairy Tern monitoring and conservation in the region to support the National Fairy Tern Recovery Plan.
- Continue to monitor Fairy Tern breeding success and threats on Bird Island, and to enter all monitoring data into Birddata's colonial nesting birds program which automatically is shared with Biological Database of South Australia (BDBSA).
- When scheduling the monitoring trip roster, consider high tide trips when chicks are close to fledging age. High tide trips allow for closer observations and less chance of 'missing' chicks when the tidal flats are not exposed.
- Continue the use of 'chick shelters' which should be deployed soon after nests are observed and preferably prior to eggs hatching to minimise disturbance to the breeding colony, to offer a place of refuge away from the elements, as well as Silver Gulls, Ravens, and other avian predators. Continue to monitor chick shelters and adapt use of shelters if any learning occurs within local predator populations.
- Continue to install remote cameras to monitor uptake of chick shelters and other threats adjacent to breeding colonies.
- Continue Cat and Fox control using the Felixer device already installed on Bird Island and Torrens Island and liaise with National Parks and Wildlife to undertake fox baiting and / or shooting operations on Torrens Island Conservation Park. Develop an Emergency Response Plan for when/if a cat or fox is sighted on Bird Island. Continue to explore other alternative cost effective or novel fox controls.
- Maintain vegetation restoration actions recommended in the Bird Island Biodiversity Action Plan to maintain open habitat for fairy tern nesting. Monitor potential occurrence or increase in weeds such as Beach Rocket, Sea Wheat-grass and Marram Grass and control.
- Monitor the sand movement and weeds on Bird Island to compare to previous years' mapping to ensure there is enough suitable habitat available for breeding prior to season start.
- Investigate options for Silver Gull control and/or deterrent from nesting on Bird Island. Liaise with the Port Lincoln Silver Gull project to explore the best means of managing Silver Gulls.
- Encourage the existing Waste & Wildlife project to broaden its focus to include Silver Gulls in their applied research and management goals of available sources of anthropogenic sources of food.
- Support future Statewide/National Fairy Tern census initiatives.

- Consider the landscape scale dispersion of Fairy Terns and whether declines in number of breeding pairs using the island over time are indicative of population decline or differential site use.
- Devise a plan for Fairy Tern abundance and movements on the Samphire Coast and within the Adelaide International Bird Sanctuary (AIBS) to look for any possible juvenile birds after they leave Bird Island through existing shorebird volunteers and the iNaturalist citizen science app. The benefit of this area search would be enhanced by flagging of chicks.
- Pending national protocols for Fairy Tern colour banding, instigate a leg banding program to mark individual Fairy Terns to establish whether colonies are of the same individuals over the course of the season; to detect movements between sites; and to assist with tracking survival of chicks from colonies. Work with National Fairy Tern Recovery Team for advice on coloured bands across the state.
- Continue to use digital photo sampling to collect information on prey and use in diet analysis.
- Further our understanding of Fairy Tern ecology through collaboration with other researchers. Attend and contribute to National Fairy Tern meetings coordinated through BirdLife Australia and contribute to National Recovery Team once established.
- Engage with communities including the nearby Royal South Australian Yacht Squadron and scope for increased awareness and collaborations.
- Raise the profile of Fairy Terns in South Australia with the community, key project partners and stakeholders (kayak, sport fishing and boating clubs) around Bird Island including Flinders Ports. Do this through media articles, e-mails, social media and develop a Boating, Fishing and Birding guide relevant for the region to educate the public about the need to protect threatened species and their habitats.
- Investigate opportunities for funding to continue monitoring through grants. Leverage the Island's inclusion as part of Adelaide International Bird Sanctuary to assist with grant opportunities.
- Undertake on-going awareness of the project to the Green Adelaide Landscape Board and Flinders Ports to ensure ongoing resourcing of wildlife and habitat conservation work on Bird Island.

## Reference List

Adelaide & Mt Lofty Ranges Natural Resources Management Board, (2017), Bird & Torrens Island Vertebrate Pest Management Plan.

BirdLife Australia (2021) My Fairy Tern: A pocket guide to aging Fairy Terns in Australia. Written and compiled by Deb Sullivan.

Birdlife Australia (2020) Guidelines for monitoring nesting success of Fairy Terns. Written and compiled by Amy Adams.

Commonwealth of Australia (2020). National Recovery Plan for the Australian Fairy Tern (*Sternula nereis nereis*). Available at <https://www.legislation.gov.au/Details/F2022L00677>

Department of Environment and Natural Resources (DENR) (2012) Status of Fairy Terns in South Australia. Final Report to Nature Foundation SA.

Ecological Evaluation Pty Ltd., 2014 Bird Island Biodiversity Action Plan 2014. Adelaide and Mount Lofty Ranges Natural Resources Management Board.

Johnston, G.R. (2018) Colony breeding birds of Bird Island and the northern revetment at Outer Harbour, South Australia, July 2015 - June 2018. South Australian Department of the Environment and Water: Adelaide, South Australia.

Johnston, Greg (2023/24), personal communication over the 2023/24 season.

Lamanna, A. and Stephens, E. (2019) Fairy Tern Monitoring on Bird Island, South Australia. 18/19 Breeding Season Report. BirdLife Australia and Adelaide and Mount Lofty Ranges Natural Resources Management Board: Adelaide, South Australia.

Maguire G et al (2011). "Provision of artificial shelter on beaches is associated with improved fledgling success". Published Bird Conservation International 2011.

Papp, Steve (2024) personal communication over the 2023/24 season.

Sanchez, S., Cullen, M., and Maguire, G.S. (2024). Fairy Tern census in south-eastern Australia in 2023/2024. Unpublished report for the Department of Climate Change, Energy, the Environment and Water by BirdLife Australia.

T&M Ecologists Pty Ltd (2022), Bird Island BushRAT re-assessments May 2022 for Green Adelaide.



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# Thank you

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