Monitoring Hooded Plovers on the Fleurieu Peninsula:
Distribution, breeding success and management in the 2016/2017 season

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Government of South Australia
Adelaide and Mount Lofty Ranges
Natural Resources Management Board

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Contents

Photo: Lance Gray. Two day old chick and adult at the Victor Harbor Bowling Club Beach.

Introduction

The pressures placed on the Australian coast by over 85% of the population living within 50kms of the coast, a growing trend for a 'seachange', and coastal tourism representing a 20 million dollar recreation investment, are undoubtedly taking their toll on the resident shorebirds who breed on our ocean beaches during the spring and summer. In South Australia, there are four species of resident shorebirds, the Pied and Sooty Oystercatchers, Red-capped Plovers and Hooded Plovers, that nest on ocean beaches and offshore islands, as well as seabirds such as the Nationally threatened Fairy Tern.

Hooded Plovers are listed as Vulnerable and both Oystercatcher species as Rare in South Australia under the National Parks and Wildlife Act 1972. Hooded Plovers (Eastern) are also listed as Vulnerable under national legislation, the Environment Protection and Biodiversity Conservation Act 1999. This listing occurred in 2015 after years of detailed data collection that was able to provide evidence for the species eligibility for meeting threatened criteria.

The Hooded Plovers are the most threatened of beach-nesting resident shorebirds because they are habitat specialists. They are limited to breeding exclusively on ocean beaches in South Australia, with the rare exception of some coastal saline lakes in parts of the South East coast, Yorke Peninsula and on the Eyre Peninsula. The oystercatchers have a broader nesting habitat range which includes rocky outcrops, islands and more heavily vegetated dune areas, and red-capped plovers occupy a range of habitats including samphire saltmarsh, freshwater wetlands, low energy beaches, saltfields and claypans.

Beach-nesters make simple nest-scrapes in the sand and their well-camouflaged eggs and chicks are extremely difficult to spot, and therefore at great risk of being trampled by visitors to the beach. People, unleashed dogs, horses and vehicles on beaches not only pose a direct threat, but they also disturb incubating adults, resulting in temporary nest abandonment which exposes the eggs to harsh temperatures, and predators such as ravens, gulls, foxes and cats. This is particularly true of disturbances caused by unleashed dogs, where adults spend long periods away from the nest. Furthermore, residential development and littering attract increased numbers of predators to beaches.

Chicks cannot fly for 5 weeks and need to forage on the beach in order to survive – this places them in harm's way, and they are easily crushed or disturbed by people, dogs and vehicles on the beach. If they spend too much time in hiding, they can starve to death or be exposed to harsh temperatures in the absence of brooding. The parent birds try to distract potential threats, leaving the chicks unattended and exposed to predators. In addition, vehicles on beaches compact the sand, killing the bulk of prey items that these shorebirds rely on.

Given the severe pressures placed on coastal breeding birds, in particular the threatened status of the Hooded Plover, BirdLife Australia embarked on a project to 'promote coexistence between recreationists and beach-nesting birds' in 2006. Beaches will always be popular places for recreation within Australian culture, and the best solution to a problem which is very much human generated, is to try and engage people to change their behaviours and help protect these birds so they have a future. This project has been funded over the years by the Australian Government, Landcare Australia, The State Government of Victoria, several NRM Boards throughout South Australia and CMAs throughout Victoria, NSW Environment Trust, and various philanthropic trusts and donors including the Hugh D. T. Williamson Foundation.

The main aim of the beach-nesting birds' (BNB) project is to involve coastal communities and land managers in protection of breeding sites to see an overall improvement in breeding success. The project focuses on the Hooded Plover in Victoria and South Australia and uses an adaptive management approach, improving on-ground management and community awareness strategies over time. The results are applicable in a broader sense to other beach-nesting birds around Australia.

On the Fleurieu Peninsula, the project aims to:

1. Maintain a distribution map and database of location of breeding pairs of Hooded Plovers;
2. Estimate population numbers of Hooded Plovers in an eastern mainland census every two years (e.g. November 2016, November 2018);
3. At the time of each biennial count, assess the threats to each pair in a snapshot assessment and any management in place to alleviate these threats;
4. Assess occurrence of threats at breeding sites from data collected during the biennial count and map sites according to threat status;

5. Monitor the breeding status of all known pairs on the Fleurieu Peninsula during the breeding months (August-March). Seek to maintain monitoring of these sites over at least 5 years for a comparison of site-based threat profiles and to quantify improvements in breeding success related to management;
6. For sites where we have been collecting threat data, seek to assess changes in the occurrence and severity of threats over time and the impact of threats on breeding outcomes;
7. Carry out on-ground management of vulnerable breeding sites following management directions outlined in 'A practical guide to managing beach-nesting birds in Australia';
8. Investigate the effectiveness of nest site protection (does management work) and make modifications for subsequent seasons. Managements need to adapt to local site and beach user specifications;
9. Use nest cameras at sites where nests repeatedly fail to detect and identify nest predators and to determine nest fates. This is done following strict protocols and to a limited degree to avoid any potential for training predators to associate cameras with nests;
10. Band a sample of Hooded Plovers on the Fleurieu Peninsula and maintain resighting database so as to track movements, dispersal and document survival rates and site fidelity. This will lead to better knowledge about exchange of birds between the Fleurieu Peninsula and other regions of South Australia, and possibly other states, enabling a better idea of what we consider a population. Blood samples are taken and contribute to a collaborative study of population genetics carried out by Museums Victoria, Deakin University and BirdLife Australia;
11. Establish 'Friends of the Hooded Plover' regional groups on the Fleurieu Peninsula to encourage community ownership and long-term sustainability of the program, and;
12. Engage communities in Hooded Plover conservation via organised events or activities such as the biennial count; scope viewing; dogs' breakfasts; school visits; craft stalls. Awareness raising and opportunities to participate are carried out with the aim of changing beach user behaviours to promote coexistence and long-term sustainable beach use.

The main roles of the different groups working on this project are as follows:

- BirdLife Australia Staff provide strategic direction for recovery of Hooded Plovers across the Eastern mainland, register and induct volunteers, maintain ethics and

permit approvals, provide advice, workshops, training and technical support, as well as data analysis and maintenance of the national MyBeachBird database. BirdLife Australia staff also carry out research to improve recovery efforts, analyse and review data to maintain an adaptive management approach, and maintain a national network for information sharing and supporting recovery of the Hooded Plover.

- On the Fleurieu Peninsula, Natural Resources Adelaide and Mount Lofty Ranges Coast, Marine and Estuary managers and officers coordinate and support the project and volunteers, and local council and Department of Environment, Water and Natural Resources (DEWNR) staff assist with nest protection responses.
- Volunteer Regional Coordinators and Volunteers undertake the very important roles of monitoring breeding birds and site threats, recording data on the portal, installing fences/signs, and talking with the public, etc.

At a regional level, two Coastal Action Plans have been completed for the Adelaide and Mount Lofty Ranges Natural Resources Management Board region; the Southern Fleurieu Coastal Action Plan and for relevant coastal areas of the Metropolitan Adelaide and Northern Coastal Action Plan. These plans contain detailed coastal maps and plant and animal lists. The plans also outline key conservation priorities along the coast, provide suggested actions and identify key players to be involved.

The Coastal Action Plans are used to assist in priority setting of coastal management actions for the AMLR NRM Board, councils and DEWNR. In implementing the Coastal Action Plans, the Adelaide and Mount Lofty Ranges NRM Board resources the local implementation of actions identified in the Coastal Action Plans including implementation of local initiatives to conserve Hooded Plovers.

The South Australian Recovery Plan for the Hooded Plover (Baker-Gabb and Weston 2006) still remains in draft form. Relevant actions and priorities of this draft were incorporated into the Coastal Action Plan's detailed local actions to manage foreshore use to minimise impact on the species during the nesting and fledging season. Key players identified are the Department for Environment, Water and Natural Resources, councils, community and the Natural Resources Management Board. Many of these actions and priorities however, would now need updating due to the considerable advances in research and knowledge of South Australian Hooded Plover sites, threats and actions since 2006.

In view of the status of this species, the Hooded Plover has also been flagged as a focal species for the Southern Fleurieu Coastal Action Plan and for relevant coastal areas of the Metropolitan Adelaide and Northern Coastal Action Plan area.

An overview of the 2016-2017 Breeding Season

As a part of BirdLife Australia's Beach-nesting Birds Project, monitoring of breeding Hooded Plover pairs via the MyBeachBird portal occurred on the Fleurieu Peninsula, Yorke Peninsula, Eyre Peninsula, Kangaroo Island and South East South Australia. With the exception of the Fleurieu Peninsula, monitoring efforts are only of a small sample of breeding pairs in other parts of the species South Australian range.

On the Fleurieu Peninsula, a total of 2,246 data records season were entered into the online data portal during the 2016/2017 season; this is an increase of 15.7% from the previous season. Nine volunteers were responsible for 1,487 (65.6%) of all entries, with one volunteer entering a record of 559 sightings into the portal. An additional 19 sightings were added to our analyses from volunteer emails, phone calls, SMS messages, and comments from data portal entries where volunteers have visited a site over a couple of days but have only entered data for one date, or entered two separate sightings in the one entry. This makes a grand total of 2,265 data points, which is a tremendous effort from the volunteers and something they should be incredibly proud of. This exceeds data entries for elsewhere in South Australia and highlights the value of having an employed volunteer coordinator (funded by the Adelaide and Mount Lofty Ranges NRM Board). Overall, volunteers from the Fleurieu accounted for 35% of the data portal entries received from across Victoria and South Australia (entered as of the 8th June 2017), which is to be commended.

Volunteer investment in monitoring alone is calculated as a minimum of 1,189 hours (32 hours more than the previous season). This is an underestimate as many data entries did not record duration of site visits, and these calculations do not include travel times to and from sites, and time invested in data entry post-visit. Ten volunteers contributed over 50 hours to monitoring alone, contributing to 66% of all hours recorded. Remarkably, one volunteer was able to contribute to 25% of the total hours, clocking up over 300 hours individually!

There were 46 sites that were checked by volunteers over the breeding season. Figures 1-4 provide an overview of sites monitored, including the presence of birds and nesting activity at sites during the season. Of these 46 sites, 28 sites had pairs on territory, and 11 sites had birds sighted however these were not nesting pairs (no breeding detected). The remaining seven sites, had no birds sighted for the season. A breakdown of the number of data portal entries for each site, and the volunteers who monitored sites can be found in Table 1.

Hooded Plovers were not observed during the 2016/17 season at: Christies Beach, Coolawang, Moana Beach, Moana Beach South, O'Sullivans beach, Southport and Tunkalilla - Tunk Head alcove. The sites where Hooded Plovers were observed, but were either individuals, or flocks, and non-breeding pairs were: Ballaparudda, Bashams, Carrickalinga South, Goolwa, Lands End, Maslins, Morgans, Myponga, Normanville North, Tunkalilla Base/Mid West Gully, Tunkalilla 1st Alcove Far East, Waitpinga Estuary, Waitpinga Beach (west) and Yankalilla river mouth.

Lands End (JW and unbanded) and Myponga Beach (EY and US) both had a pair regularly present on territory but no nests were detected here. Nests at Lands End can be inherently difficult to find, although loss of beach is also apparent at this site related to storm surges, and Myponga was visited very infrequently (see Table 1), so it is likely that these pairs did attempt to nest but had no success and thus were not detected. While at other sites, it is likely that these are genuinely only used as foraging sites or as dispersal routes and are not suitable as breeding territories.

It should be noted that the number of pairs occupying Tunkalilla beach has reduced this season, and so, two territories Tunkalilla *far west* and *western estuary*, have become occupied by one pair and are referred to as Tunkalilla *west* throughout this report. Similarly, Tunkalilla *creek/3rd house east* and *Heysen east* are reported as Tunkalilla *east*, and Tunkalilla *mid-west estuary* and *first house east* are referred to as Tunkalilla *midway*.

In the 2016/17, there were a number of territory changes as well as new sites (or sites unoccupied last season) occupied. These include:

- The pair that nested at Port Willunga, DP and HV, nested at Aldinga last season.
- Aldinga had a pair in the north (unbanded and unbanded) and a pair at the south this season (SR and unbanded).

- Waitpinga Beach (west), had a scrape from pair EV and unb, but this was not used for further nesting throughout the season, with EV and unb nesting instead, at Parsons Beach.
- Tunkalilla Heysen East had a pair change. DK and unbanded nested early in the season, but DK was unfortunately never seen after this nesting attempt. YB and unbanded then took over the territory, which is referred to as Tunkalilla Creek East.
- Port Stanvac recorded a nesting attempt. Port Stanvac has no public access, and investment in training the Exxon-Mobil staff undertaken so that nesting from the site could be recorded. There was no nesting recorded in 2015-16 as there was no monitoring in the restricted site, but there has been in every year before that season.
- A big surprise was the presence of an unbanded pair turning up at Seacliff Beach, which is a metropolitan beach, quite different habitat to the high energy surf beaches that Hooded Plovers are typically found on. Amazingly, this pair managed three nesting attempts, and successfully hatched two chicks.

Photo: Debbie Prestwood. UE at Middleton Beach.

Figure 1: Sites that were monitored during the 2016/17 breeding season on the northern coast of Fleurieu Peninsula and the number of nesting attempts per site.

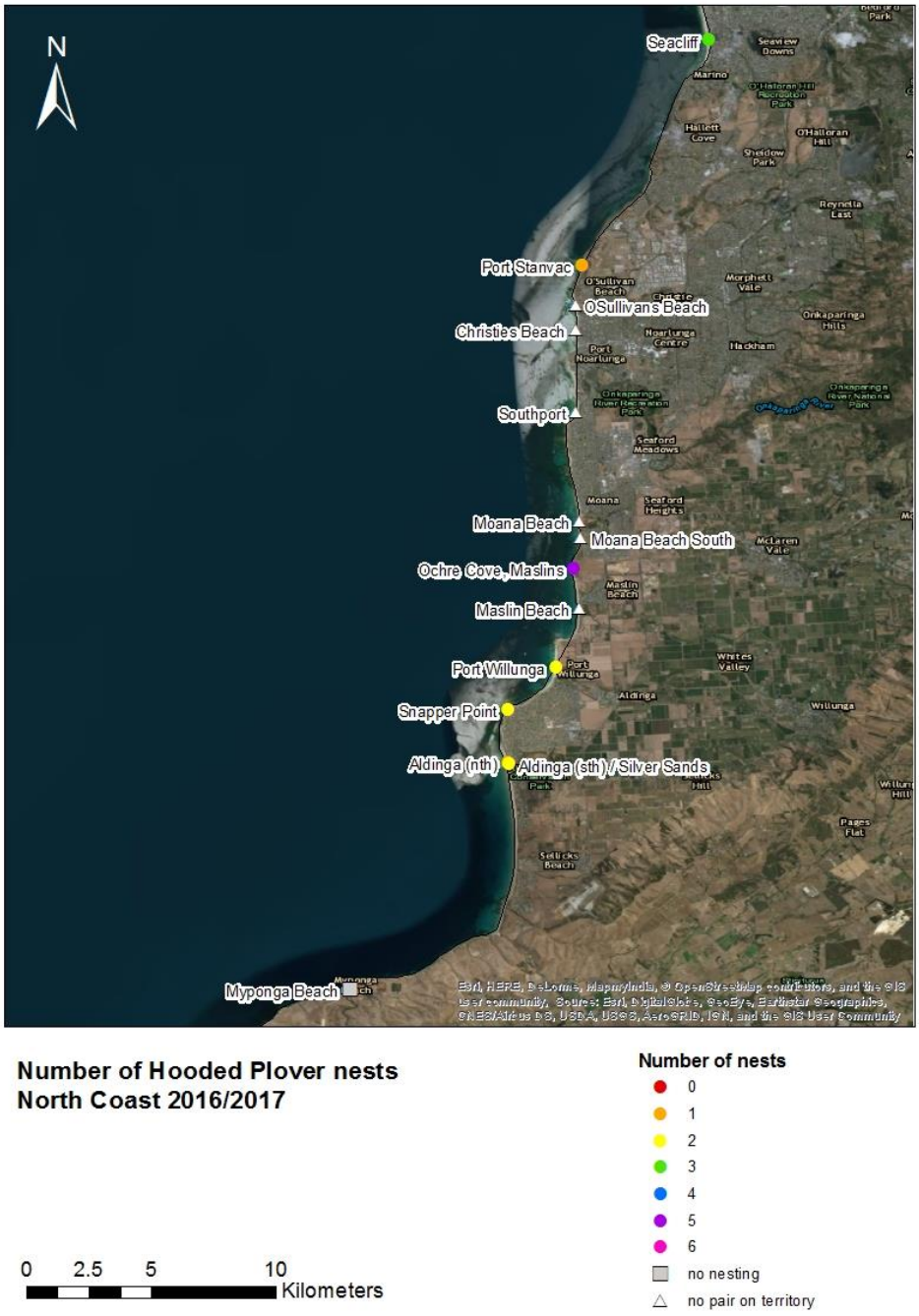

Figure 2: Sites that were monitored during the 2016/17 breeding season on the south west coast of Fleurieu Peninsula and the number of nesting attempts per site.

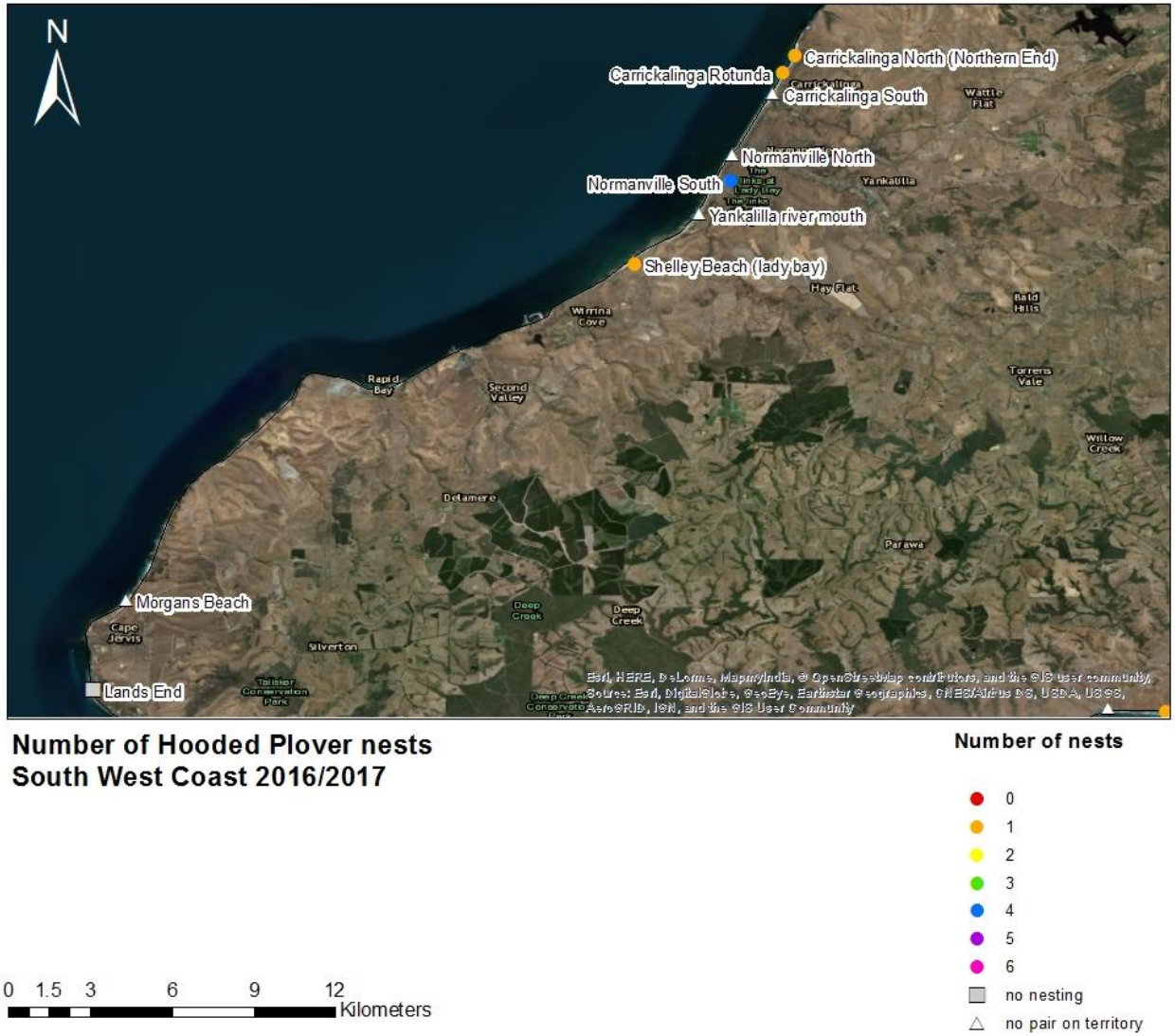

Figure 3: Sites that were monitored during the 2016/17 breeding season on the southern coast of Fleurieu Peninsula and the number of nesting attempts per site.

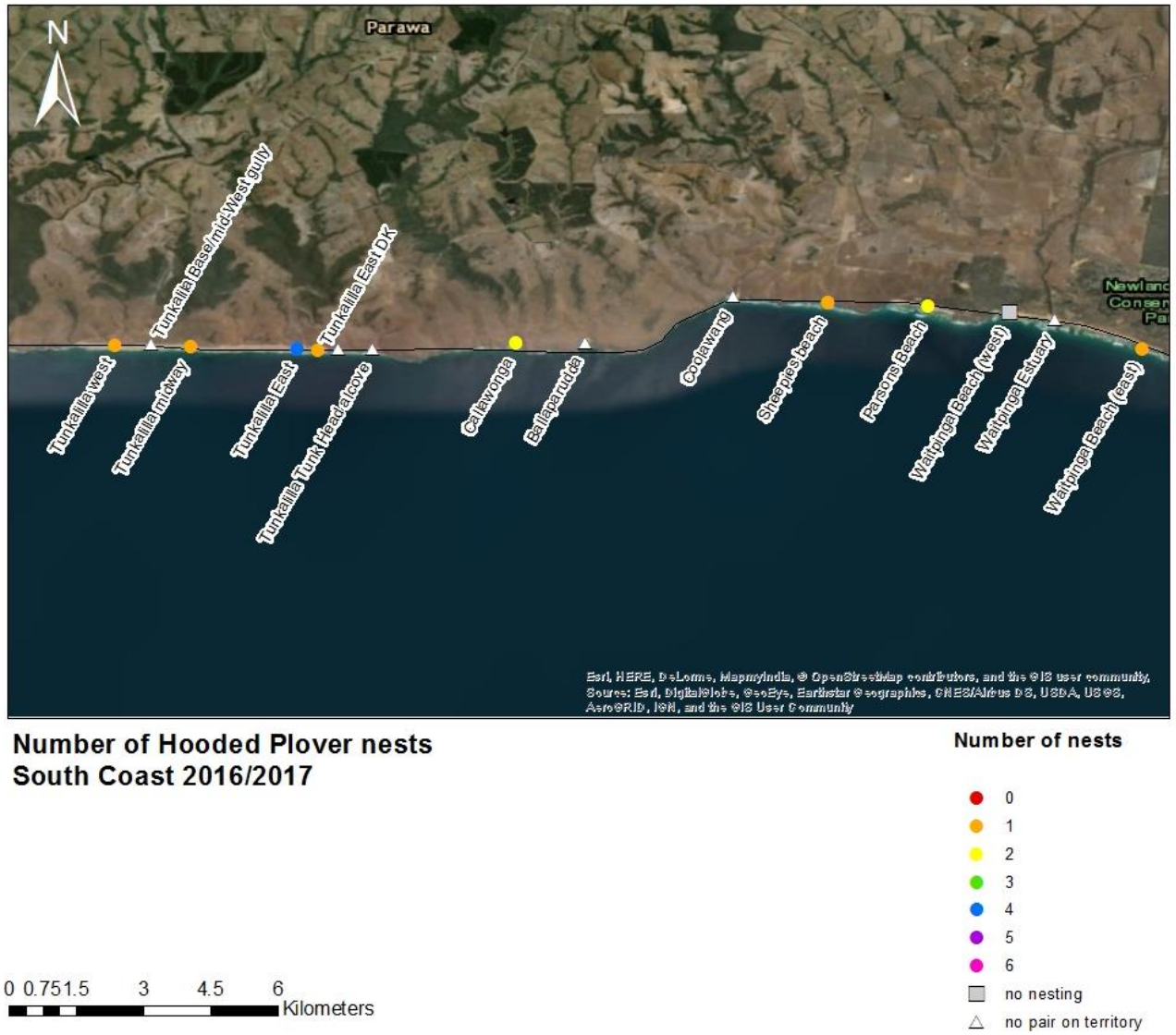

Figure 4: Sites that were monitored during the 2016/17 breeding season on the southern eastern of Fleurieu Peninsula and the number of nesting attempts per site.

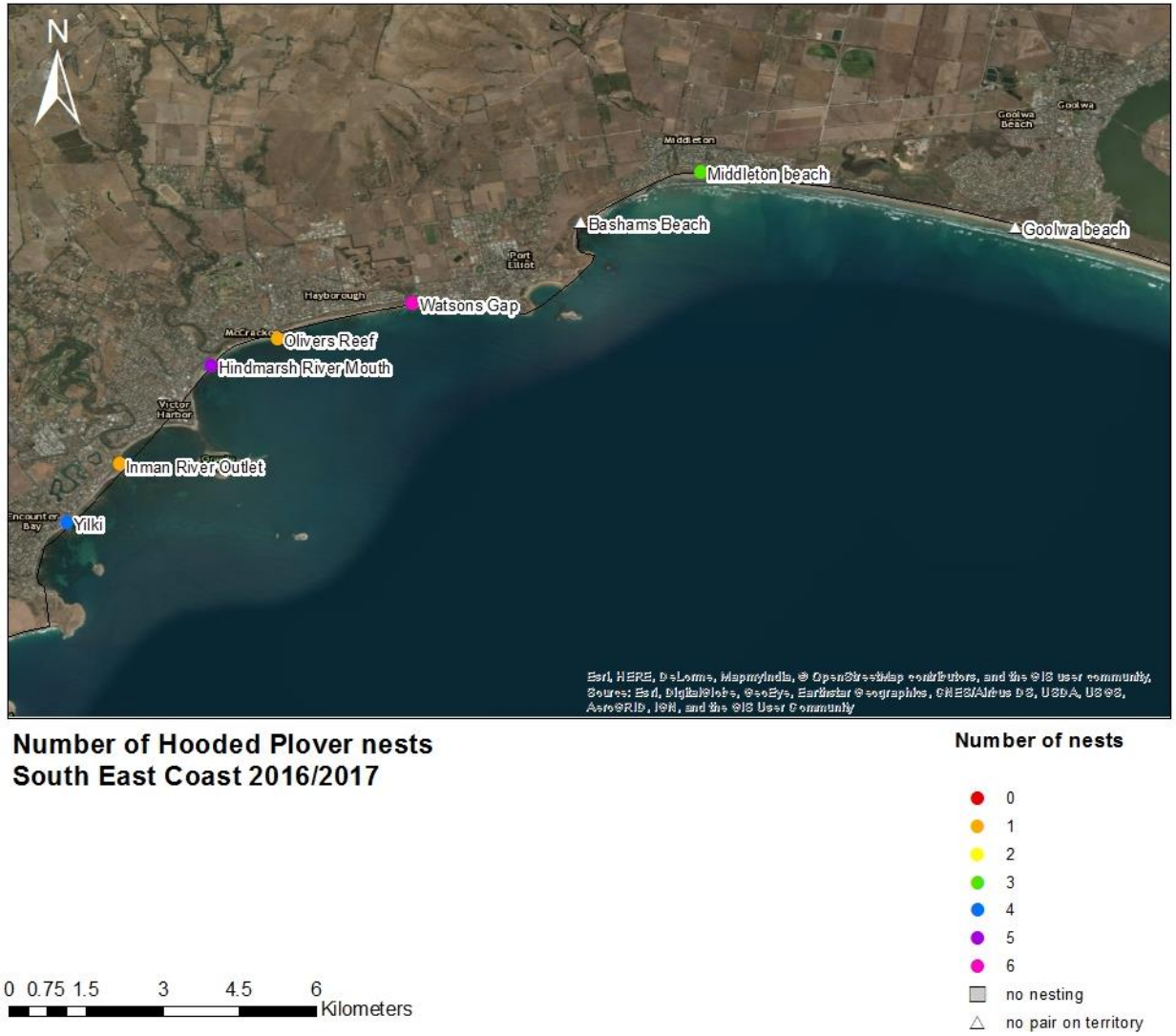

Table 1. Number of portal entries and coverage across the breeding season at sites on the Fleurieu Peninsula during the 2016/17 breeding season. Portal entries are the number of entries entered via the online data portal. Grey cells represent sites where no birds were sighted during the breeding season. Apricot cells represent sites where no breeding occurred, but instead there were sightings of single adults, juveniles or flocks. Blue cells represent sites where a pair were on territory regularly but no nests were detected.

Site/Territory	Portal entries	Main monitor/s	Additional observers
Aldinga/Silver Sands	210	Dudley Corbett, Neville Hudson, Sue and Ash Read	Faye Lush and Joyce West, Stephen Johnson, Kerri Bartley
Ballaparudda	4	David and Sue Thorn	
Bashams beach	21	Debbie Prestwood	Mary Akkerman, Win Syson, Ross Brittain, Janette Diment, Rob Brinsley, Stephen Johnson, Keith Jones, Richard Edwards
Callawonga	5	David and Sue Thorn	Elizabeth Steele-Collins
Carrickalinga North	65	Anthea and Rick Williams	David and Sue Thorn, Caroline Weatherstone, Wendy White, Mike Heard
Carrickalinga Rotunda	49	Anthea and Rick Williams	Mike Heard, Jacqui Salkeld, Corey Jackson
Carrickalinga South	33	Sondra Bywater	Corey Jackson, Mike Heard, Anthea and Rick Williams, Wendy White, David and Sue Thorn
Christies Beach	2	John Cobb, Angela Parker	
Coolawang	4	Rob Brinsley	Dean Cutten, Emma Rowe
Goolwa Beach	5	Debbie Prestwood	Rob Brinsley, Corey Jackson, David and Sue Thorn
Hindmarsh River mouth	117	Richard Edwards, Debbie Prestwood, David and Sue Thorn	Mary Akkerman, Rob Brinsley, Elizabeth Steele-Collins
Inman River Outlet	93	Debbie Prestwood, David and Sue Thorn	Richard Edwards, Ross Brittan, Janette Diment, Kerri Bartley, Meg Cullen, Grainne Maguire, Mary Akkerman
Lands End	36	Michael Rumsewicz	Rhonda Smith, Wendy White, David and Sue Thorn, Corey Jackson
Maslins Beach	4	Karin Riederer, Meredith Harvey	
Middleton	219	Debbie Prestwood	Rob Brinsley, David and Sue Thorn, Win Syson, Keith Jones, Corey Jackson, Peter Allan, Stephen Johnson
Moana Beach	12	Angela Parker	Sue and Ash Read, Peter Allan
Moana Beach South	13	Angela Parker	Peter Allan
Morgans beach	5	Corey Jackson	Peta Kruse, Michael Rumsewicz
Myponga beach	11	Caroline Weatherstone, Neville Hudson	Corey Jackson, Wendy White, Ross Brittain, Janette Diment

Site/Territory	Portal entries	Main monitor/s	Additional observers
Normanville North	31	Joy Whellum, Sondra Bywater	David and Sue Thorn, Wendy White, Anthea and Rick Williams, Mike Heard
Normanville South	89	Joy Whellum, Maxine Agnew	Wendy White, Corey Jackson
Ochre Cove, Maslins beach	198	Graham and Jan Thomas, Karin Riederer, Sue and Ashley Read	Peter Allan, Meredith Harvey
Olivers Reef	58	Richard Edwards, David and Sue Thorn	Debbie Prestwood
O'Sullivans beach	2	John Cobb, Angela Parker	
Parsons beach	28	Rob Brinsley, Dean Cutten	Emma Rowe
Port Stanvac	41	Annie Young	
Port Willunga	71	Sue and Ash Read	Dudley Corbett, Dylan Braund, Stephen Johnson, Renee Mead, Petra Hanke
Seacliff	146	John Cobb, Ligita Bligzna	Lynda Yates, Mike Hemus, Emma Stephens, Faye Lush, Joyce West, Nikki Francis, Betty Snowden, Kerri Bartley
Sheepies Beach	20	Rob Brinsley, Dean Cutten	
Shelley Beach (lady bay)	27	Peta Kruse	Anthea and Rick Williams, Wendy White, Ross Brittain, Janette Diment, Joy Whellum, Lauren Davis, Michael Rumsewicz
Snapper Point	49	Dudley Corbett, Sue and Ash Read, Neville Hudson	Angela Parker, Faye Lush, Joyce West, Stephen Johnson
Southport	12	Angela Parker, John Cobb	
Tunkalilla Base/mid-West gully	14	Rob Brinsley	Michael Rumsewicz
Tunkalilla 1st alcove far east	5	Rob Brinsley	
Tunkalilla East	34	Rob Brinsley	
Tunkalilla Midway	38	Rob Brinsley	Michael Rumsewicz
Tunkalilla West	34	Rob Brinsley	Michael Rumsewicz
Tunkalilla Tunk Head alcove	1	Rob Brinsley	
Waitpinga Beach (east)	20	Rob Brinsley	Emma Rowe, Win Syson, Sandra and Phillip Caballero
Waitpinga Beach (west)	14	Rob Brinsley	Dean Cutten
Waitpinga Estuary	14	Rob Brinsley	Win Syson
Watsons Gap	216	Debbie Prestwood	Win Syson, Rob Brinsley, David and Sue Thorn, Wendy White, Elizabeth Steele-Collins, Kerri Bartley
Yankalilla river mouth	6	David and Sue Thorn, Corey Jackson	Ross Brittain, Janette Diment
Yilki	175	Debbie Prestwood, David and Sue Thorn	Richard Edwards, Ross Brittain, Janette Diment, Mary Akkerman, Elizabeth Steele-Collins

Nesting success

In the 2016/17 breeding season there were 56 Hooded Plover nesting attempts by 24 breeding pairs on the Fleurieu Peninsula. This was the highest number of nests recorded in seven seasons of intensive monitoring and likely relates to the highest number of pairs that have bred on the Fleurieu in a given season (24 pairs compared to 18-20 in the last four seasons, see Table 2).

Table 2. Summary of nests, hatching or failing at egg stage, total number of eggs and chicks observed, and total chicks that fledged on the Fleurieu Peninsula over eight breeding seasons.

Season	# nests	# nests hatch	# nests fail egg stage	# eggs	# chicks obsv. (% of eggs)	# fledglings (% of chicks)	Fldlg/ Pair
2009/2010 12 sites 12 breeding pairs	18	9 (50.0%)	9	49	19 (38.8%)	7 (36.8%)	0.58
2010/2011 23 sites 19 breeding pairs	36	14 (38.9%)	22	83	26 (31.3%)	9 (34.6%)	0.47
2011/2012 26 sites 14 breeding pairs	24	10 (41.7%)	14	60	22 (36.7%)	8 (36.4%)	0.57
2012/2013 38 sites 20 breeding pairs	34	11 (32.4%)	23	76	23 (30.3%)	9 (39.1%)	0.45
2013/2014 35 sites 18 breeding pairs	35	12 (34.3%)	23	84	23 (27.4%)	9 (39.1%)	0.50
2014/2015 44 sites 20 breeding pairs	46	17 (37.0%)	29	107	32 (29.9%)	10 (31.3%)	0.50
2015/2016 45 sites 21 breeding pairs	42	26 (61.9%)	16	112	63 (56.3%)	19 (30.2%)	0.90
2016/2017 46 sites 24 breeding pairs	56	19 (33.9%)	37	141	39 (27.7%)	16 (41.0%)	0.67

Sixteen fledglings were produced in the 2016/17 breeding season, which was a decrease from the nineteen produced the previous season by fewer pairs (21 pairs compared to 24), but still the second highest result ever in the eight seasons of monitoring (Table 2). The number of nests hatching was within the average range recorded for the Fleurieu, but half of the success of the unusually successful 2015/16 breeding season. Of the chicks that hatched, survival rates to fledging were the highest that have ever been recorded on the Fleurieu, with 41% of chicks surviving to fledge. The benchmark for fledgling production that we set for evaluating success and maintaining population

numbers over time is between 0.40 – 0.50 fledglings per pair per season. In 2016/17, the Fleurieu exceeded the benchmark and had the second best season on record, with 0.67 fledglings per pair. The highest fledging success ever recorded is from the 2015/16 season where there were 0.90 fledglings per pair.

Figures 5 to 7 provide a geographic overview of successes and failures, Table 3 provides a summary of nesting attempts for each pair monitored and Table 4 expands this into more detail about each individual nesting attempt.

The earliest recorded nests were in mid-August, at Watsons Gap and Ochre Cove. These early attempts failed, with Watsons Gap failing at the egg stage, and Ochre Cove hatching three chicks, which didn't survive beyond two weeks of age. Nesting slowed in February where most pairs had finished breeding. Only two sites had active nests in February: Tunkalilla creek east, which fledged one chick in April, and Watsons Gap, which hatched one chick, which did not survive.

Nearly half of the pairs (48%; 12 pairs) had only one recorded nesting attempt for the season, 20% of pairs (5) had two attempts, 12% pairs (3) had three attempts, 12% of pairs (3) had four nesting attempts, and Hindmarsh River Mouth and Ochre Cove pairs had five attempts. The highest number of attempts was six by the pair at Watsons Gap, with five of these failing, and their final nesting attempt hatching, but the chick did not survive.

Of the 56 nests monitored, 66% failed during the egg stage. It is difficult to determine the causes of fate, and 38% (14 nests) of nests failed to unknown causes. 22% (8) of failed nests were due to the tide (Hindmarsh River Mouth, Middleton Beach, two at Normanville South, Ochre Cove, Parsons Beach, Tunkalilla creek east and Tunkalilla Midway) which is one of the easiest fates to accurately confirm. 11% (4) of nests were suspected to be caused by domestic dogs (two at Watsons Gap, two at Yilki), 8% of nests were abandoned (Olivers Reef was abandoned due to territorial disputes between neighbouring Hooded Plovers; Seacliff was abandoned and had high levels of recreational use, but there is no other evidence; and Watsons Gap had extreme weather days of over 38 degrees leading up to the abandonment), and also 8% were suspected to be taken by foxes (Hindmarsh River Mouth, Ochre Cove and Watsons Gap). Avian predators were suspected for 13% of nest failures as they had been seen in the area prior to failure (Gulls 5%: Hindmarsh River Mouth and Watsons Gap; Magpie/Raven 8%: Hindmarsh

River Mouth, Parsons Beach and Normanville South). One unfortunate failure was at Snapper Point, where the eggs were seen broken in the nest. It appeared that a person used a piece of dried cuttlefish bone to crack open the eggs. Each of these assigned fates above need to be treated with caution as they are suspected causes only.

Photo: Debbie Prestwood. BX standing over eggs at Watsons Gap

Figure 5: Nesting failure on the Fleurieu Peninsula during the 2016/17 season.

Figure 6: Hatched nests on the Fleurieu Peninsula during the 2016/17 season.

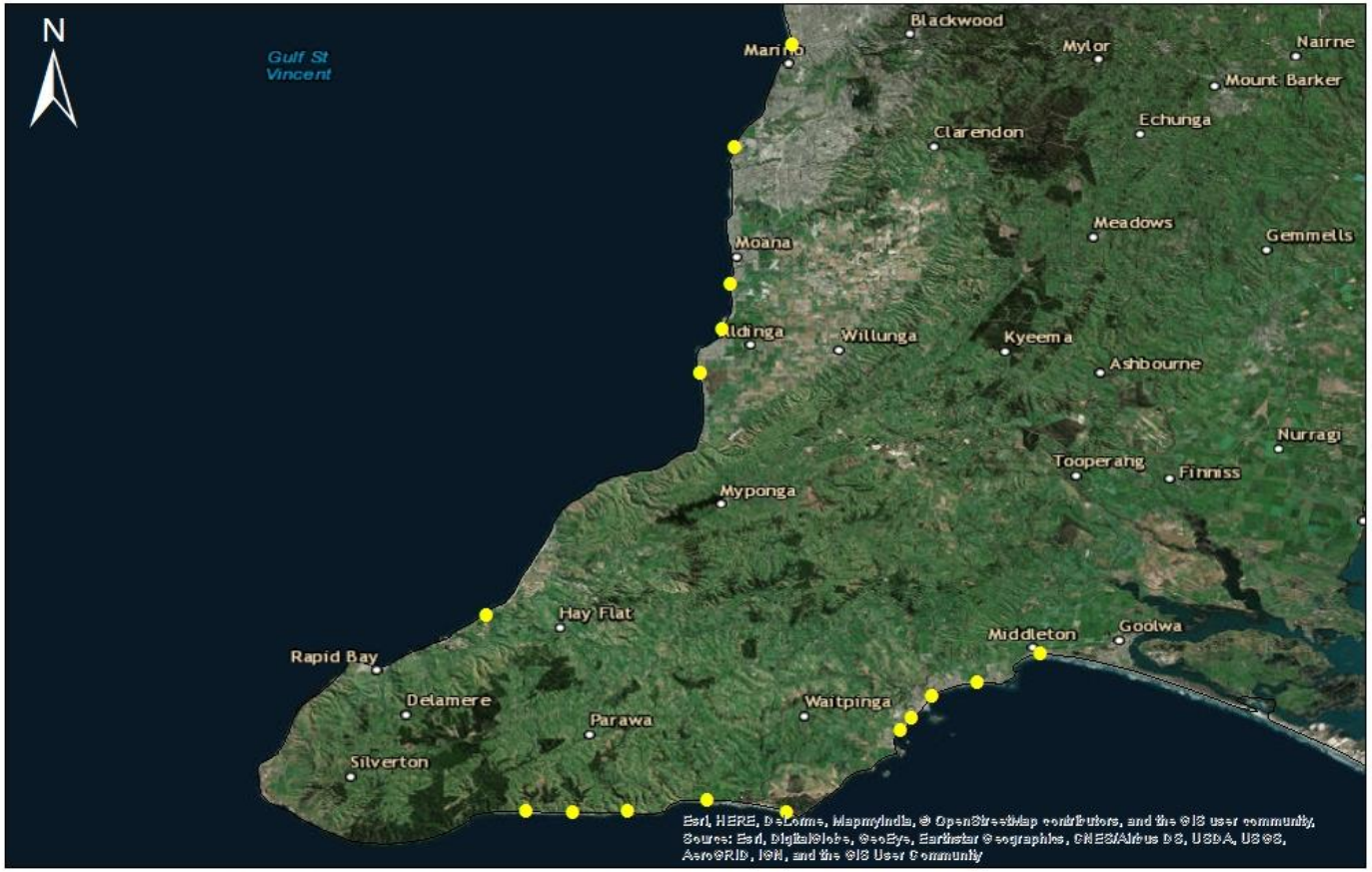

Figure 7: Fledged nests on the Fleurieu Peninsula during the 2016/17 season.

Hooded Plover fledgling locations
2016/2017 season

● Fledged nests

0 4.5 9 18 27 36
Kilometers

Table 3. Summary of nests, number of nests that failed, hatched and fledged, and total number of eggs, chicks observed and chicks that fledged from each site monitored in the 2016/17 breeding season. Asterisk refers to atypical protection at industrial site.

Site	Pair ID	# Nests	# nests fail egg stage	# nests hatch	# nests fledge	# eggs	# chick obsv.	# fledglings
Aldinga Nth	unb & unb	1	0	1	0	2	2	0
Aldinga Sth/Silver Sands	SR & unb	2	1	1	0	6	3	0
Callawonga	unb & unb	2	1	1	1	5	3	3
Carrickalinga North (Nth end)	PD & unb	1	1	0	0	2	0	0
Carrickalinga Rotunda	LP & unb	1	1	0	0	2	0	0
Hindmarsh River Mouth	unb & unb	5	4	1	0	15	3	0
Inman River Outlet	RR & unb	1	0	1	1	2	2	1
Middleton Beach	SA & UE	3	1	2	1	9	3	2
Normanville South	unb & unb	4	4	0	0	11	0	0
Ochre Cove, Maslins	NA & unb	5	3	2	0	14	4	0
Olivers Reef	RR & unb	1	1	0	0	2	0	0
Parsons Beach	EV & unb	2	2	0	0	3	0	0
Port Stanvac	AR & unb	1	0	1	1	2	2	1
Port Willunga	DP & HV	2	1	1	0	3	2	0
Seacliff	unb & unb	3	2	1	0	8	2	0
Sheepies Beach	unb & unb	1	0	1	1	1	1	1
Shelley Beach (lady bay)	SB & unb	1	0	1	0	2	2	0
Snapper Point	unb & unb	2	2	0	0	5	0	0
Tunkalilla Creek East	YB & unb	4	3	1	1	10	1	1
Tunkalilla Creek East	DK & unb	1	1	0	0	3	0	0
Tunkalilla Midway	ME & MT	1	1	0	0	3	0	0
Tunkalilla West	LA & unb	1	0	1	1	3	2	2
Waitpinga Beach (east)	KP & unb	1	0	1	1	3	3	2
Watsons Gap	BX & AU	6	5	1	0	13	1	0
Yilki	KV & VH	4	3	1	1	12	3	3
Total		**56**	**37**	**19**	**9**	**141**	**39**	**16**

There were 19 nests which hatched (34% of all nests), and nine of these nests successfully fledged chicks (47% of hatched nests fledged). Of the hatched nests, 39 chicks were observed, and 16 of these chicks survived to fledging age. Fledglings were produced in December (1), January (5), March (2) and April (1), with most fledging during the busiest time on the beaches, that is the peak of summer!

The 16 fledglings produced were from nine pairs of Hooded Plovers: Callawonga (3 fledglings), Inman River (1 fledgling), Middleton Beach (2 fledglings), Port Stanvac (1 fledgling), Sheepies Beach (1 fledgling), Tunkalilla Creek East (1 fledgling), Tunkalilla western estuary (2 fledglings), Waitpinga beach east (2 fledglings), and Yilki (3 fledglings). Nine of the 16 fledglings produced this season were from remote beaches on the southern coastline of Fleurieu Peninsula, which demonstrates these beaches continue to be productive beaches, in particular Tunkalilla being the most consistent beach for successful breeding.

Overall, an egg had an 11.3% chance of fledging a chick successfully (16 fledglings out of a total of 141 eggs) and a nest had a 16.1% chance of fledging at least one chick (9 fledged nests out of 56 total nests). Although there were less fledglings than last season, (16 in 2016/17; 19 in 2015/16), chick survival was greater than the previous season (41.0%), with a 10.9% increase in chick survival.

The causes of chick failure were predominately unknown, but there were suspected failures due to: fox (Ochre Cove), magpie (Ochre Cove), and vehicle as the body was found in a wheel rut (Aldinga South/Silver Sands). One chick at Watsons Gap was taken into the care of veterinarian experts, as the chick had been injured from an attack from an intruding Hooded Plover. While the chick survived the night in care and injuries were assessed, the chick succumbed to its injuries. The following day, the adult/parent flagged bird AU, was found dead and decomposed on the beach, likely killed by injuries sustained in attempting to protect its chick from the intruding Hooded Plovers. The last sighting of AU alive was 28/03/2017 – two days before the attack.

Photo: Sue and Ash Read. Silver Sands Chick

Table 5. Detailed summary of nest progress for each site according to data entered in the MyBeachBird data portal and sent to BirdLife Australia for the 2016/17 breeding season. * denotes cases where the nest was not found and egg number has been assigned as the average clutch size. Aldinga (sth) and Silver Sands have been combined as sites, as SR and unbanded used these two territories as one individual site.

Site	Date	Nesting stage	Attempt #	egg #	chick #	band ID
Aldinga (nth)	30/10/16	Nest (with eggs)	1	2		unb & unb
Aldinga (nth)	27/12/16	Failed since last visit (unknown)	1			unb & unb
Aldinga (sth) / Silver Sands	16/09/16	Nest (with eggs)	1	3		SR & unb
Aldinga (sth) / Silver Sands	25/09/16	Failed since last visit (unknown)	1			SR & unb
Aldinga (sth) / Silver Sands	11/11/16	Nest (with eggs)	2	3		SR & unb
Aldinga (sth) / Silver Sands	8/12/16	Chicks sighted	2		3	SR & unb
Aldinga (sth) / Silver Sands	11/12/16	Chicks sighted (one chick failed)	2		2	SR & unb
Aldinga (sth) / Silver Sands	11/12/16	Chicks sighted moved to Silver Sands	2		2	SR & unb
Aldinga (sth) / Silver Sands	12/12/16	Chick sighted (one chick failed, body found in wheel rut)	2		1	SR & unb
Aldinga (sth) / Silver Sands	14/12/16	Chick sighted moved to Aldinga Sth	2		1	SR & unb
Aldinga (sth) / Silver Sands	14/12/16	Suspect Chick Failed (unknown)	2			
Ballaparudda		Not used for nesting				
Bashams Beach		Not used for nesting				
Callawonga	28/11/16	Nest (with eggs)	1	2		unb & unb
Callawonga	15/01/17	Assumed failed since last visit	1			unb & unb
Callawonga	5/02/17	One chick sighted	2	3*	1	unb & unb
Callawonga	5/03/17	Third chick sighted	2		3	unb & unb
Callawonga	14/03/17	Fledged (x3)	2		3	unb & unb
Carrickalinga North (Nth End)	14/12/16	Suspect nest				PD & unb
Carrickalinga North (Nth End)	15/12/16	Suspect nest				PD & unb
Carrickalinga North (Nth End)	16/12/16	Nest (with eggs)	1	2		PD & unb
Carrickalinga North (Nth End)	20/12/16	Failed since last visit (unknown)	1			PD & unb
Carrickalinga Rotunda/Nth	30/09/16	Scrape (no eggs)				LP & unb
Carrickalinga Rotunda/Nth	15/11/16	Scrape (no eggs)				LP & unb
Carrickalinga Rotunda/Nth	14/12/16	Nest (with eggs)	1	2		LP & unb
Carrickalinga Rotunda/Nth	26/12/16	Failed since last visit (unknown)	1			LP & unb
Carrickalinga South		Not used for nesting				CK & SS

Site	Date	Nesting stage	Attempt #	egg #	chick #	band ID
Christies Beach		No birds sighted				
Coolawang		No birds sighted				
Goolwa		Not used for nesting				
Hindmarsh River Mouth	7/08/16	Scrape (no eggs)	1			unb & unb
Hindmarsh River Mouth	22/08/16	Nest found (one egg)	1	1		unb & unb
Hindmarsh River Mouth	29/08/16	third egg confirmed	1	3		unb & unb
Hindmarsh River Mouth	13/09/16	Failed since last visit (Suspect fox)	1			unb & unb
Hindmarsh River Mouth	27/09/16	Nest (with eggs)	2	3		unb & unb
Hindmarsh River Mouth	29/09/16	Failed since last visit (tide)	2			unb & unb
Hindmarsh River Mouth	27/10/16	Nest (with eggs)	3	3		unb & unb
Hindmarsh River Mouth	23/11/16	Chicks sighted (x2)	3		2	unb & unb
Hindmarsh River Mouth	24/11/16	Third chick sighted	3		3	unb & unb
Hindmarsh River Mouth	8/12/16	one chick failed (two remain)	3		2	unb & unb
Hindmarsh River Mouth	9/12/16	Suspect chicks failed	3			unb & unb
Hindmarsh River Mouth	12/12/16	Failed since last visit	3			unb & unb
Hindmarsh River Mouth	16/12/16	Scrape (no eggs)				unb & unb
Hindmarsh River Mouth	18/12/16	Scrape (no eggs)				unb & unb
Hindmarsh River Mouth	23/12/16	Nest found (one egg)	4	1		unb & unb
Hindmarsh River Mouth	24/12/16	Second egg confirmed	4	2		unb & unb
Hindmarsh River Mouth	30/12/16	third egg confirmed	4	3		unb & unb
Hindmarsh River Mouth	5/01/17	Failed since last visit (Suspect: Raven/Magpie Prints around nest)	4	3		unb & unb
Hindmarsh River Mouth	15/01/17	Nest found (one egg)	5	1		unb & unb
Hindmarsh River Mouth	23/01/17	third egg confirmed	5	3		unb & unb
Hindmarsh River Mouth	30/01/17	Failed since last visit (Suspect Gull: gulls in fenced area)	5			unb & unb
Inman River Outlet	24/12/16	Nest found (one egg)	1	1		RR & unb
Inman River Outlet	26/12/16	Second egg confirmed	1	2		RR & unb
Inman River Outlet	23/01/17	Chick sighted	1		1	RR & unb
Inman River Outlet	23/01/17	Second chick sighted	1		2	RR & unb
Inman River Outlet	4/02/17	one chick failed, found nead near nest	1			RR & unb

Site	Date	Nesting stage	Attempt #	egg #	chick #	band ID
		(unknown cause of failure). one still alive.				
Inman River Outlet	11/03/17	Fledged (x1 DT)	1		1	RR & unb
Lands End		Pair on territory, no nesting recorded				JW & unb
Maslin Beach		Not used for nesting				
Middleton beach	22/09/16	Nest (with eggs)	1	3		SA & UE
Middleton beach	29/09/16	Failed since last visit (tide)	1			SA & UE
Middleton beach	13/10/16	Nest found (one egg)	2	1		SA & UE
Middleton beach	15/10/16	Second egg confirmed	2	2		SA & UE
Middleton beach	17/10/16	third egg confirmed	2	3		SA & UE
Middleton beach	16/12/16	Fledged (x2)	2		2	SA & UE
Middleton beach	30/12/16	Scrape (no eggs)	2			SA & UE
Middleton beach	3/01/17	Nest (with eggs)	3	1		SA & UE
Middleton beach	5/01/17	Second egg confirmed	3	2		SA & UE
Middleton beach	13/01/17	third egg confirmed	3	3		SA & UE
Middleton beach	4/02/17	One chick sighted	3		1	SA & UE
Middleton beach	7/02/17	two remaining eggs failed to hatch	3		1	SA & UE
Middleton beach	25/02/17	Failed since last visit (unknown)	3			SA & UE
Moana beach		No birds sighted				
Moana Beach south		No birds sighted				
Morgans Beach		No birds on territory				
Myponga		Not used for nesting				US & EY
Normanville North		Not used for nesting				
Normanville South	16/09/16	Nest (with eggs)	1	3		unb & unb
Normanville South	29/09/16	Failed since last visit (tide)	1			unb & unb
Normanville South	9/10/16	Scrape (no eggs)				unb & unb
Normanville South	26/10/16	Nest (with eggs)	2	3		unb & unb
Normanville South	28/10/16	one egg failed (two remain) (suspect Raven)	2	2		unb & unb
Normanville South	28/10/16	Failed since last visit (suspect Raven, raven sighted at nest site)	2	2		unb & unb
Normanville South	15/11/16	Nest (with eggs)	3	2		unb & unb

Site	Date	Nesting stage	Attempt #	egg #	chick #	band ID
Normanville South	25/11/16	Failed since last visit (unknown)	3			unb & unb
Normanville South	11/12/16	Nest (with eggs)	4	3		unb & unb
Normanville South	30/12/16	Failed since last visit (tide)	4			unb & unb
Ochre Cove, Maslins	19/08/16	Nest found (one egg)	1	1		NA & unb
Ochre Cove, Maslins	21/08/16	Second egg confirmed	1	2		NA & unb
Ochre Cove, Maslins	23/08/16	third egg confirmed	1	3		NA & unb
Ochre Cove, Maslins	23/09/16	Chicks sighted	1		3	NA & unb
Ochre Cove, Maslins	23/09/16	Chicks sighted (1 chick failed)	1		2	NA & unb
Ochre Cove, Maslins	5/10/16	Chicks sighted (second chick failed)	1		1	NA & unb
Ochre Cove, Maslins	6/10/16	Failed since last visit (third chick failed - highly suspect magpie as 7 magpies harassing hoodies. Chick body found)	1			NA & unb
Ochre Cove, Maslins	19/10/16	Scrape (no eggs)				NA & unb
Ochre Cove, Maslins	23/10/16	Nest (with eggs)	2	3		NA & unb
Ochre Cove, Maslins	31/10/16	Failed since last visit (tide)	2			NA & unb
Ochre Cove, Maslins	14/11/16	Nest (with eggs)	3	3		NA & unb
Ochre Cove, Maslins	27/11/16	Failed since last visit (assumed fox)	3			NA & unb
Ochre Cove, Maslins	6/12/16	Nest found (one egg)	4	1		NA & unb
Ochre Cove, Maslins	8/12/16	Second egg confirmed	4	2		NA & unb
Ochre Cove, Maslins	11/12/16	third egg confirmed	4	3		NA & unb
Ochre Cove, Maslins	28/12/16	Failed since last visit (heavy rain washed any evidence)	4			NA & unb
Ochre Cove, Maslins	8/01/17	Nest (with eggs)	5	1		NA & unb
Ochre Cove, Maslins	13/01/17	Second egg confirmed	5	2		NA & unb
Ochre Cove, Maslins	10/02/17	Chicks sighted	5		1	NA & unb
Ochre Cove, Maslins	17/02/17	Failed since last visit (persistent encroachment of fox into HP breeding territory)	5			NA & unb
Olivers Reef	5/12/16	Scrape (no eggs)	1			RR & unb
Olivers Reef	5/12/16	Birds sighted	1			RR & unb
Olivers Reef	6/12/16	Nest (with eggs)	1	1		RR & unb

Site	Date	Nesting stage	Attempt #	egg #	chick #	band ID
Olivers Reef	7/12/16	Nest (with eggs)	1	1		RR & unb
Olivers Reef	8/12/16	Second egg confirmed	1	2		RR & unb
Olivers Reef	16/12/16	Failed since last visit (abandoned)	1			RR & unb
O'Sullivans Beach		No birds sighted				
Parsons Beach	6/12/16	Nest (with eggs)	1	2		EV & unb
Parsons Beach	16/12/16	third egg confirmed	1	3		EV & unb
Parsons Beach	21/12/16	Failed since last visit (suspect Raven/magpie/fox)	1			EV & unb
Parsons Beach	3/01/17	Nest (with eggs)	2	3		EV & unb
Parsons Beach	18/01/17	Failed since last visit (tide)	2			EV & unb
Port Stanvac	10/11/16	Nest (with eggs)	1	2		AR & unb
Port Stanvac	28/11/16	Chicks sighted	1		2	AR & unb
Port Stanvac	12/12/16	Chicks sighted (one chick failed)	1		1	AR & unb
Port Stanvac	3/01/17	Fledged (x1)	1		1	AR & unb
Port Willunga	8/09/16	Nest (with eggs)	1	1		DP & HV
Port Willunga	11/09/16	Failed since last visit (unknown)	1			DP & HV
Port Willunga	17/09/16	Scrape (no eggs)	1			DP & HV
Port Willunga	23/09/16	Scrape (no eggs)				DP & HV
Port Willunga	14/11/16	Scrape (no eggs)				DP & HV
Port Willunga	16/11/16	Nest (with eggs)	2	1		DP & HV
Port Willunga	21/11/16	Second egg confirmed	2	2		DP & HV
Port Willunga	17/12/16	Chicks sighted	2	unchecked		DP & HV
Port Willunga	24/12/16	Chicks sighted (one chick failed)	2		2	DP & HV
Port Willunga	27/12/16	Failed since last visit (unknown)	2			DP & HV
Seacliff	14/10/16	Nest (with eggs)	1	1		unb & unb
Seacliff	16/10/16	Second egg confirmed	1	2		unb & unb
Seacliff	18/10/16	Third egg confirmed	1	3		unb & unb
Seacliff	14/11/16	Chick sighted	1	unchecked	1	unb & unb
Seacliff	15/11/16	second chick confirmed	1		2	unb & unb
Seacliff	17/11/16	Chicks sighted (one chick failed; unknown)	1		1	unb & unb
Seacliff	21/11/16	Failed since last visit (unknown)	1			unb & unb

Site	Date	Nesting stage	Attempt #	egg #	chick #	band ID
Seacliff	7/12/16	Nest (with eggs)	2	2		unb & unb
Seacliff	14/12/16	third egg confirmed	2	3		unb & unb
Seacliff	21/12/16	Failed since last visit (unknown)	2			unb & unb
Seacliff	3/01/17	Nest (with eggs)	3	2		unb & unb
Seacliff	9/01/17	Failed since last visit (abandoned)	3	2		unb & unb
Sheepies beach	8/01/17	Chicks sighted	1	1*	1	unb & unb
Sheepies beach	27/01/17	Fledged (x1)	1			unb & unb
Shelley Beach (lady bay)	2/10/16	Scrape (no eggs)				SB & unb
Shelley Beach (lady bay)	23/11/16	Nest (with eggs)	1	2		SB & unb
Shelley Beach (lady bay)	21/12/16	Chicks sighted	1		2	SB & unb
Shelley Beach (lady bay)	25/12/16	Chicks sighted (one chick failed)	1		1	SB & unb
Shelley Beach (lady bay)	28/12/16	Failed since last visit (unknown)	1			SB & unb
Snapper Point	30/08/16	Nest (with eggs)	1	3		unb & unb
Snapper Point	2/09/16	Failed since last visit (unknown)	1			unb & unb
Snapper Point	15/09/16	Suspect nest	2			unb & unb
Snapper Point	17/09/16	Confirmed nest presence, at time of failure. Suspect eggs cracked open by person with cuttlefish bone	2	2		unb & unb
Southport		No birds sighted				
Tunkalilla Base/mid west gully		Not used for nesting				
Tunkalilla 1st alcove far east		Not used for nesting				
Tunkalilla east	1/09/16	Nest (with eggs)	1	3		DK & unb
Tunkalilla east	27/10/16	Assumed nest failed (unknown)	1			DK & unb
Tunkalilla east *new partners	9/11/16	Nest (with eggs)	1	2		YB & unb
Tunkalilla east	1/12/16	Assumed nest failed (unknown)	1			YB & unb
Tunkalilla east	1/12/16	Nest (with eggs)	2	2		YB & unb
Tunkalilla east	10/12/16	third egg confirmed	2	3		YB & unb
Tunkalilla east	4/01/17	Failed since last visit (unknown)	2			YB & unb
Tunkalilla east	4/01/17	Scrape (no eggs)				YB & unb

Site	Date	Nesting stage	Attempt #	egg #	chick #	band ID
Tunkalilla east	13/01/17	Nest (with eggs)	3	3		YB & unb
Tunkalilla east	24/01/17	Failed since last visit (tide)	3			YB & unb
Tunkalilla east	7/02/17	Nest (with eggs)	4	2		YB & unb
Tunkalilla east	8/03/17	Chicks sighted (one egg still in nest, never hatched)	4		1	YB & unb
Tunkalilla east	19/04/17	Fledged (x1)	4		1	YB & unb
Tunkalilla midway	4/01/17	Scrape (no eggs)				
Tunkalilla midway	13/01/17	Nest (with eggs)	1	3		ME & MT
Tunkalilla midway	24/01/17	Failed since last visit (tide)	1			ME & MT
Tunkalilla shed caravan		Not used for nesting				
Tunkalilla West	1/09/16	Scrape (no eggs)				LA & unb
Tunkalilla West	9/11/16	Nest (with eggs)	1	3		LA & unb
Tunkalilla West	10/12/16	Chicks sighted			2	LA & unb
Tunkalilla West	30/12/16	Suspect chicks failed (LA adult found dead)				unb (LA deceased)
Tunkalilla West	13/01/17	Fledged (x2)			2	unb (LA deceased)
Waitpinga Beach (east)	15/11/16	Scrape (no eggs)				KP & unb
Waitpinga Beach (east)	19/11/16	Scrape (no eggs)				KP & unb
Waitpinga Beach (east)	24/11/16	Nest (with eggs)	1	3		KP & unb
Waitpinga Beach (east)	21/12/16	Chicks sighted	1		3	KP & unb
Waitpinga Beach (east)	3/01/17	Chicks sighted (one chick failed)	1		2	KP & unb
Waitpinga Beach (east)	29/01/17	Fledged (x2)	1			
Waitpinga Beach (west)	7/09/16	Scrape (no eggs)				EV & unb
Waitpinga Beach (west)	15/09/16	Scrape (no eggs)				EV & unb
Waitpinga Estuary		Not used for nesting				
Watsons Gap	19/08/16	Nest (with eggs)	1	3		BX & AU
Watsons Gap	24/08/16	Failed since last visit (suspect fox, tracks go through nest site)	1			BX & AU
Watsons Gap	17/10/16	Scrape (no eggs)				BX & AU
Watsons Gap	21/10/16	Scrape (no eggs)				BX & AU

Site	Date	Nesting stage	Attempt #	egg #	chick #	band ID
Watsons Gap	22/10/16	Nest (with eggs)	2	1		BX & AU
Watsons Gap	25/10/16	Second egg confirmed	2	2		BX & AU
Watsons Gap	27/10/16	third egg confirmed	2	3		BX & AU
Watsons Gap	6/11/16	Failed since last visit (unknown: dog prints through site)	2			BX & AU
Watsons Gap	8/11/16	Scrape (no eggs)				BX & AU
Watsons Gap	13/11/16	Scrape (no eggs)				BX & AU
Watsons Gap	15/11/16	Nest (with eggs)	3	1		BX & AU
Watsons Gap	17/11/16	Second egg confirmed	3	2		BX & AU
Watsons Gap	28/11/16	Failed since last visit (suspect dog/human - prints)	3			BX & AU
Watsons Gap	6/12/16	Nest (with eggs)	4	1		BX & AU
Watsons Gap	9/12/16	Egg failed	4			BX & AU
Watsons Gap	11/12/16	New Scrape				BX & AU
Watsons Gap	13/12/16	Birds laid second egg of this clutch in a new scrape after first egg failed	4	1		BX & AU
Watsons Gap	7/01/17	Failed since last visit (egg abandoned)	4			BX & AU
Watsons Gap	16/01/17	Nest (with eggs)	5	1		BX & AU
Watsons Gap	25/01/17	Failed since last visit (suspect Gulls from prints and presence)	5			BX & AU
Watsons Gap	28/01/17	Scrape (no eggs)				BX & AU
Watsons Gap	29/01/17	Scrape (no eggs)				BX & AU
Watsons Gap	3/02/17	Scrape (no eggs)				BX & AU
Watsons Gap	10/02/17	Nest (with eggs)	6	2		BX & AU
Watsons Gap	6/03/17	Chicks sighted	6		1	BX & AU
Watsons Gap	30/03/17	Chicks sighted (taken into care after this sighting due to injury after being attacked by an intruder HP)	6		1	BX & AU
Watsons Gap	31/03/17	Chicks sighted (chick survived the night)	6		1	BX & AU
Watsons Gap	1/04/17	Failed since last visit (after being treated by an expert exotics vet, unfortunately this	6			BX & AU

Site	Date	Nesting stage	Attempt #	egg #	chick #	band ID
		chick did not survive from its injuries sustained)				
Watsons Gap	2/4/17	Adult AU found dead on the beach				BX & AU
Yankalilla River Mouth		Not used for nesting				
Yilki	6/09/16	Nest (with eggs)	1	2		KV & VH
Yilki	9/09/16	third egg confirmed	1	3		KV & VH
Yilki	23/09/16	Failed since last visit (suspect dog, prints present)				KV & VH
Yilki	23/09/16	Scrape (no eggs)				KV & VH
Yilki	1/10/16	Nest (with eggs)	2	1		KV & VH
Yilki	5/10/16	Second egg confirmed	2	2		KV & VH
Yilki	6/10/16	third egg confirmed	2	3		KV & VH
Yilki	11/10/16	Failed since last visit (suspect dog - prints around nest)	2			KV & VH
Yilki	21/10/16	Nest (with eggs)	3	2		KV & VH
Yilki	24/10/16	third egg confirmed	3	3		KV & VH
Yilki	12/11/16	Failed since last visit (unknown)	3			KV & VH
Yilki	25/11/16	Nest (with eggs)	4	3		KV & VH
Yilki	23/12/16	Chicks sighted	4		3	KV & VH
Yilki	31/01/17	Fledged (x3)	4		3	KV & VH

Flagging

In total, 105 birds have been banded as part of BirdLife Australia's research program in South Australia since 2012. On the Fleurieu, there are 53 birds with engraved leg flags, seven of these are white engraved flags and 46 orange engraved flags. 29 were flagged as adults, 1 as a subadult, 17 as fledglings/juveniles and 8 as flightless chicks (Table 6).

We rely on reportings of these birds once they have been flagged in order to build up a 'history' for each flagged individual and learn about their movements, breeding partner/s and longevity. There are five completely unbanded pairs on the Fleurieu Peninsula, and 12 pairs where only one member of the pair is identifiable. There are seven pairs where both individuals of a pair are flagged.

There have been two partner swaps this season, both of which occurred at Tunkalilla. In 2015/2016, LA was partnered with UB, and had been since UB was flagged in 2014/2015 season, but this season LA was partnered with an unbanded bird. The second partnership change was with DK that nested at Tunkalilla East with an unbanded bird, but was not sighted after 27 October 2016 after their one and only nesting attempt failed. Subsequent to this, YB and an unbanded bird were seen on this same territory with a nest in November 2016. It is possible this unbanded bird was DK's partner but we cannot be certain.

The loss of birds at Tunkalilla has raised serious concerns, especially at a time where volunteers have not been granted access to the gate to adequately and regularly monitor the most important stretch of coastline for Hooded Plovers on the Fleurieu Peninsula. Table 7 summarises changes to occupancy at Tunkalilla. We know that some flagged birds have gone missing, as we are able to identify them. They have not been sighted elsewhere on the Fleurieu and no reports from neighbouring regions (KI, Yorke Peninsula, Coorong). We don't know the same level of detail for unbanded birds, and cannot assume that they are the same individuals coming back each season. There have been six flagged birds missing: ST, WE, KW, UB, LA, DK. The only flagged birds which have remained consistent over since the 2013-2014 season, are MT and ME.

Table 6. A summary of leg flagged Hooded Plovers captured and banded on the Fleurieu Peninsula to April 2017. All birds were captured by qualified and licensed banders (Grainne Maguire, Terry Dennis, Meg Cullen and Emma Stephens). Partner at the time of banding is displayed.

Beach	Date	Age	Sex	Right tarsus	Right tibia	Left tibia	Notes on breeding status	Partner or parent
Myponga Beach	8/05/12	Adult	Female	metal	EY (orange)		Non-breeding	Partner unbanded
Maslin Beach	8/05/12	Adult	Female	metal	MX (orange)		Non-breeding	Partner unbanded
Watsons Gap	18/01/13	Adult	Female	metal	AU (orange)		with recently fledged chick	Partner unbanded (on 20/1/13 banded as BX)
Parsons Beach (far SW end)	18/01/13	Adult	Female	metal	CL (orange)		Not nesting	Partner EV
Waitpinga Beach (E end)	18/01/13	Adult	Female	metal	KJ (orange)		Not nesting	Partner unbanded
Parsons Beach (far SW end)	18/01/13	Adult		metal		EV (orange)	Not nesting	Partner CL
Tunkalilla Beach 3rd house East	19/01/13	Juvenile	Male	metal	DK (orange)		1 of 3 chicks that fledged from Western end	Sibling of EM
Tunkalilla Beach 3rd house East	19/01/13	Juvenile	Male	metal	EM (orange)		1 of 3 chicks that fledged from Western end	Sibling of DK
Watsons Gap estuary	20/01/13	Adult		metal		BX (orange)	With recently fledged chick (7 days ago)	Partner AU
Carrickalinga estuary	21/01/13	Adult	Male	metal	CK (orange)		no nesting	Unknown, caught with LP
Carrickalinga estuary	21/01/13	Adult		metal		LP (orange)	With 2 other adults, aggression, no nesting	Unknown, caught with CK
Snapper Point (Pt Willunga end)	22/01/13	Adult	Male	metal	HV (orange)		Port Willunga pair, not nesting	Partner unbanded
Carrickalinga North (N end)	22/01/13	Adult		metal	NA (orange)		not nesting	Suspect partner AR
Carrickalinga North (N end)	22/01/13	Adult	Male	metal		AR (orange)	not nesting	Suspect partner NA
Carrickalinga (toilet block)	27/09/13	Subadult	Male	metal	DJ (orange)		Alone	
Lady Bay Shelley Beach	27/09/13	Adult		metal	SB (orange)		not nesting	Partner LD
Carrickalinga Pitmans leap access	27/09/13	Adult	Male	metal	SS (orange)		not nesting, with 1 other bird	Partner CK
Lady Bay Shelley Beach	27/09/13	Adult		metal		LD (orange)	not nesting	Partner SB
Inman River outlet	13/11/13	Adult		metal	KV (orange)		mating, no scrapes found	Partner unbanded

Beach	Date	Age	Sex	Right tarsus	Right tibia	Left tibia	Notes on breeding status	Partner or parent
Bashams Beach	13/11/13	Adult	Male	metal		SA (orange)	lone bird, no partner seen for months	
Tunkalilla Western estuary	14/11/13	Adult		metal	KW (orange)		fresh scrapes	Partner unbanded
Tunkalilla far West	14/11/13	Adult	Female	metal	LA (orange)		new nest, recently laid, 3 eggs	Partner unbanded
Tunkalilla creek/3rd house East	14/11/13	Adult		metal	ST (orange)		lone bird, suspect nest	
Tunkalilla mid-west estuary	14/11/13	Adult		metal		MT (orange)	new nest, 2 eggs, due to hatch late Nov/early Dec	Partner unbanded
Callawonga Beach	10/02/14	Chick		metal	KP (orange)		25 days old	
Waitpinga Beach East	10/02/14	Chick		metal	PD (orange)		30 days old	Parents KJ and unbanded
Waitpinga Beach East	10/02/14	Chick		metal	PR (orange)		30 days old	Parents KJ and unbanded
Waitpinga Beach West	25/02/14	Juvenile	Female	metal	TZ (orange)			
Waitpinga Beach West	25/02/14	Juvenile	Male	metal	YN (orange)			
Waitpinga Beach West	26/02/14	Juvenile	Male	metal	HX (orange)			
Waitpinga Beach West	26/02/14	Juvenile	Female	metal	UE (orange)			
Tunkalilla far West	28/04/14	Adult	Male	metal	UB (orange)			Partner 'LA'
Port Willunga North	29/08/14	Adult		metal		DP (orange)		With LP at time of banding
Ochre cove, Maslins Beach	16/10/14	Chick	Male	metal	SR (orange)			Parents TJ and NA
Ochre cove, Maslins Beach	16/10/14	Adult	Male	metal	TJ (orange)		Chicks	Partner NA
Tunkalilla Beach mid-west estuary	17/10/14	Adult	Female	metal	ME (orange)		On territory	Partner MT
Tunkalilla Beach Western estuary	17/10/14	Adult	Female	metal		WE (orange)	Scrape no eggs	Partner KW
Waitpinga East	21/01/15	Chick		metal	RR (orange)			
Heyson East - Tunkalilla Beach	25/03/15	Chick	Female	metal	HT (orange)			
Myponga Beach	21/08/15	Adult	Male	metal		US (orange)		Partner of EY
Lands End	24/11/15	Juvenile		metal	EW (orange)			Parents JW and unb
Lands End	24/11/15	Adult		metal	JW (orange)		Fledgling chick	Partner unbanded

Beach	Date	Age	Sex	Right tarsus	Right tibia	Left tibia	Notes on breeding status	Partner or parent
Normanville North/Carrickalinga Sands	28/11/15	Juvenile		metal	MV (orange)			One parent unbanded
Myponga Beach	28/11/15	Juvenile		metal	UV (orange)			Parents EY and US
Carrickalinga North/rotunda	23/02/16	Juvenile	Female	metal	RV (orange)			Parents LP and unbanded
Yilki	29/02/16	Juvenile	Female	metal	VH (white)			Parents KV and VH (orange)
Lands End	29/02/16	Juvenile	Female	metal	ZW (white)			Parents JW and unbanded
Lands End	29/02/16	Juvenile	Male	metal		JZ (white)		Parents JW and unbanded
Yilki	29/02/16	Adult		metal		VH (orange)	Fledgling chick	Parent of VH (white)
Waitpinga Beach East	23/03/16	Juvenile	Male	metal		YB (white)		Parents KP and unbanded
Kent Reserve, Victor Harbor	6/03/17	Juvenile		metal	DT (white)			RR and unb
Yilki	6/03/17	Juvenile		metal	JY (white)			
Yilki	6/03/17	Juvenile		metal	YV (white)			Parents: VH (orange) and KV (orange)

Newly flagged Hooded Plover Juvenile, "YV" white. Photo: Grainne Maguire

Table 7. A summary of Tunkalilla pairs occupying territories since 2013/14.

2013-2014: KW & unb (West estuary) LA & unb (Far west) MT & unb (mid) ST & unb: *ST Last seen 18/4/2014. Not in any data in next seasons.*
2014-2015: LA & UB (west) DK & unb (east) MT & ME (mid) KW & unb – suspect nest and suspect chicks WE & unb – scrapes When WE banded, KW was put as partner. Appears WE and KW have paired up during the season. KW, WE & unb (all on same territory) were booted out by LA and UB *WE last seen 8/2/2015. Not in any data in next seasons.* *KW last seen 17/10/2014. Not in any data in next seasons.*
2015-2016: LA & UB (west) – *UB last seen 21/1/2016 – Not in any data in next seasons.* DK & unb (east) MT & ME (mid)
2016-2017: LA & unb (west) *LA found deceased* DK & unb (East - heysen). *DK Last seen 27/10/2017. No more sightings in portal.* YB & unb (Also nested at East - heysen) MT & ME (mid)

Breeding Site Management

Of the 56 nests on the Fleurieu Peninsula, 51 nests had some form of management (Table 8). Some sites were more remote than others, and at the time deemed not at high risk of human impacts, so active management on the beach was limited. Nine nests had signs at the access points only, and the remaining 42 nests had a rope fence (with either sign at access, sign at nest or both). Of the 19 hatched nests, 14 had rope fencing, four had signs at access points only (Sheepies, Tunkalilla east, Tunkalilla west and Waitpinga east) and one site had no management at all (Callawonga). Of the 9 sites that successfully produced fledglings, 1 site had no management (due to remoteness), 4 had signage at access points only (again due to remoteness) and 4 high threat sites had on the beach management in place (e.g. fences and signs around the nest/chick site).

One management issue that was encountered was a group of people who had let off fireworks in the nesting fence area at Yilki Beach. There were chicks at the time, which survived the incident, but follow up with the local council, mayor and police resulted in the offenders being charged with fireworks offences and vandalism of public property.

Photo: Elizabeth Steele-Collins. Remnants of fireworks inside the fenced area at Yilki

Port Stanvac has no public access and hence given its past breeding success, several Exxon-Mobil staff were trained to monitor the nesting behaviours of the Hooded Plover, implement management where required and record sightings in the MyBeachBird Data Portal.

Table 8. Summary of management across sites during the 2016/17 breeding season. An asterisk denotes nests that were never located and here an assumption of the number of eggs was made (based on the number of chicks sighted or if no chicks sighted, eggs were assumed to be clutches of 3 which is the most common clutch size).

site/territory	date found	# eggs	date chick sighted	chicks obsv	# fledge	nest habitat	cause of failure	management
Aldinga (nth)	30/10/16	2	28/11/16	2		Beach	unknown	Sign Access, Sign Nest, Rope fence
Aldinga (sth)/ Silver Sands	16/09/16	3				Other, Pebble bank/dune	unknown	Sign Access, Sign Nest, Rope fence
Aldinga (sth)/ Silver Sands	11/11/16	3	8/12/16	3		Beach	unknown, one chick body located in wheel rut	Sign Access, Sign Nest, Rope fence
Callawonga	28/11/16	1				Beach	unknown	None
Callawonga	nest not sighted	3*	5/02/17	3	3	unknown		None
Carrickalinga North (Northern End)	16/12/16	2				Foredune/face	unknown	Sign Access, Sign Nest, Rope fence
Carrickalinga Rotunda/Nth	14/12/16	2				Beach	unknown	Sign Access, Sign Nest, Rope fence
Hindmarsh River Mouth	22/08/16	3				Dune	suspect fox (fox prints <10cm)	Sign Access, Sign Nest, Rope fence
Hindmarsh River Mouth	27/09/16	3	23/11/16	3		Foredune/face and beach	eggs washed out, reclaimed. unknown chick failure	Sign Access, Sign Nest, Rope fence, Shelters, Wardens
Hindmarsh River Mouth	23/12/16	3				Foredune/face	suspect: raven/magpie prints around nest	Sign Access, Sign Nest, Rope fence
Hindmarsh River Mouth	15/01/17	3				Beach	suspect gull: gulls in fenced area	Sign Access, Sign Nest, Rope fence
Inman River Outlet	24/12/16	2	23/01/17	2	1	unknown		Sign Access, Sign Nest, Rope fence, Shelters, Wardens
Middleton	22/09/16	3				Foredune/face	tide	Sign Access, Sign Nest, Rope fence
Middleton	13/10/16	3	15/11/16	2	2	Dune		Sign Access, Sign Nest, Rope fence, Wardens, Banners
Middleton	3/01/17	3	4/02/17	1		Beach	unknown	Sign Access, Sign Nest, Rope fence

site/territory	date found	# eggs	date chick sighted	chicks obsv	# fledge	nest habitat	cause of failure	management
Normanville South	16/09/16	3				Beach	tide	Sign Nest, Rope fence
Normanville South	26/10/16	3				Estuary/spit	raven	Sign Access, Sign Nest, Rope fence
Normanville South	15/11/16	2				Estuary/spit	unknown	Sign Nest, Rope fence
Normanville South	11/12/16	3				Beach	tide	Sign Nest, Rope fence
Ochre Cove, Maslins	19/08/16	3	23/09/16	3		Foredune/face	suspect magpie (7 magpies harassing hoodies)	Sign Access, Sign Nest, Rope fence
Ochre Cove, Maslins	23/10/16	3				Beach	tide	Sign Access, Sign Nest, Rope fence
Ochre Cove, Maslins	14/11/16	3				Beach	assume fox	Sign Access, Sign Nest, Rope fence
Ochre Cove, Maslins	6/12/16	3				Beach	unknown, heavy rain washed away any evidence	Sign Access, Sign Nest, Rope fence
Ochre Cove, Maslins	8/01/17	2	10/02/17	1		Foredune/face	unknown, persistent encroachment of fox into Hooded Plover territory	Sign Access, Sign Nest, Banners, Rope fence
Olivers Reef	6/12/16	2				Foredune/face	abandoned	Sign Access, Sign Nest, Rope fence
Parsons Beach	6/12/16	3				Estuary/spit	suspect raven/magpie/fox	Sign Access
Parsons Beach	3/01/17	3				Beach	tide	Sign Access, Sign Nest, Rope fence
Port Stanvac	10/11/16	2	28/11/16	2	1	Beach		Sign Access, Rope fence, Shelters, site closed to the public
Port Willunga	8/09/16	1				Beach	unknown	Sign Access, Sign Nest, Rope fence
Port Willunga	16/11/16	2	17/12/16	2		Beach	unknown	Sign Access, Sign Nest, Banners, Rope fence, Shelters
Seacliff	14/10/16	3	14/11/16	2		Dune	unknown	Sign Access, Sign Nest, Banners, Rope fence, Wardens
Seacliff	7/12/16	3				Dune	unknown	Sign Access, Sign Nest, Banners, Rope fence

site/territory	date found	# eggs	date chick sighted	chicks obsv	# fledge	nest habitat	cause of failure	management
Seacliff	3/01/17	2				unknown	abandoned	Sign Access, Sign Nest, Banners, Rope fence
Sheepies beach	nest not sighted	1*	8/01/17	1	1	unknown		Sign Access
Shelley Beach (lady bay)	23/11/16	2	21/12/16	2		Foredune/face	unknown	Sign Access, Sign Nest, Rope fence
Snapper Point	30/08/16	3				Other: At top of pebble bank	unknown	None
Snapper Point	17/09/16	2				Beach	suspect person has cracked eggs with cuttlefish bone	Sign Access, Sign Nest, Rope fence
Tunkalilla east	9/11/16	2				Dune	unknown	None
Tunkalilla east	1/12/16	3				Beach	unknown	Sign Access
Tunkalilla east	13/01/17	3				Foredune/face	tide	Sign Access
Tunkalilla east	7/02/17	2	8/03/17	1	1	Foredune/face		Sign Access
Tunkalilla east	1/09/16	3				Dune	assumed failed, unknown	Sign Access
Tunkalilla midway	13/01/17	3				Beach	tide	Sign Access
Tunkalilla west	9/11/16	3	10/12/16	2	2	Foredune/face	note* banded adult LA found dead on beach before chicks fledged. Unknown cause of LA death	Sign Access
Waitpinga (east)	24/11/16	3	21/12/16	3	2	Beach	unknown chick failure	Sign Access
Watsons Gap	19/08/16	3				Beach	suspect fox, tracks go through nest site	Sign Access, Sign Nest, Rope fence
Watsons Gap	22/10/16	3				Beach	unknown: dog prints through site	Sign Access, Sign Nest, Rope fence
Watsons Gap	15/11/16	2				Beach	suspect dog/human - prints	Sign Access, Sign Nest, Rope fence
Watsons Gap	6/12/16	2				Beach	first egg failed, pair laid second egg of clutch in a new scrape. Same nesting attempt. Second egg	Sign Access, Sign Nest, Rope fence

site/territory	date found	# eggs	date chick sighted	chicks obsv	# fledge	nest habitat	cause of failure	management
							abandoned.	
Watsons Gap	16/01/17	1				Beach	suspect gulls from prints and presence	Sign Access, Sign Nest, Rope fence
Watsons Gap	10/02/17	2	6/03/17	1		Beach	chick attacked from intruder adult Hooded Plover. Chick taken into care, but did not survive from injuries sustained	Sign Access, Sign Nest, Banners, Rope fence, Shelters
Yilki	6/09/16	3				Foredune/face	suspect dog, prints present	Sign Access, Rope fence
Yilki	1/10/16	3				Foredune/face	suspect dog - prints around nest)	Sign Access, Sign Nest, Rope fence
Yilki	21/10/16	3				Beach	unknown	Sign Access, Sign Nest, Rope fence
Yilki	25/11/16	3	23/12/16	3	3	Beach		Sign Access, Sign Nest, Rope fence

Threats to breeding pairs

Of the 2,246 data entries in the MyBeachBird portal, 80.1% (1,815) had a degree of threat data entered. There are two separate threat assessments that can be completed in the data portal, one that tallies observed threats and one that considers prints/tracks present during the visit that can offer insight in to threats that are difficult to detect, infrequent or nocturnal for example. Preferably, both threat assessments are completed so that we don't overlook difficult to detect threats, can account for temporal variation in threat detection (time of day and season), and so that we can calculate more accurate data on the prevalence and intensity of threats the birds experience (i.e. you may visit the beach and see 1-2 people, but the beach may have evidence of recent high visitation by the number of human footprints).

Full threat assessments (which include observational data and print data), counted for 65% of all data, with 1,476 full assessments completed. This is 81% of all threat data completed. There were 339 portal entries which had observational data only (no print data completed). This is an improvement on last season, where 70% full threat assessments were completed.

In some cases, observations for two distinct pairs/territories was included in the same portal entry. Where possible, the sites have been separated to use the appropriate threat data for each specific site, but in other cases, this data could not be used, as the threat assessment was combined to cover two separate sites and we cannot assume these threats were evenly spread across the two sites.

Any sites which had fewer than 15 threat assessments were not included in the threat analysis below. Preferably, sites should a minimum of 28 full threat assessments to obtain a robust dataset that accounts for temporal variation. We have used 15 as the cut off, as otherwise we would only be able to assess 37% of the data for threats. Sites not included in threat analyses are: Waitpinga Beach West, Waitpinga Estuary, Tunkalilla Base/Mid west gully, Myponga Beach, Moana Beach, Moana Beach South, Bashams Beach, Southport, Lands End, Yankalilla River Mouth, Tunkalilla 1st Alcove far east, Coolawang, Callawonga, Ballaparudda, Goolwa, Tunkalilla shed caravan, Maslin beach, Morgans beach, Tunkalilla Tunk Head Alcove, O'Sullivans Beach and Christies Beach.

Carrickalinga South, Normanville North, and Port Stanvac have been included in the analysis where possible, as these sites contained limited assessments of print data. For example, Carrickalinga South had 30 assessments of observed threats, and only 5 with full threat assessments including prints. Rather than lose that data, we have included them where possible, and some tables/data below will have explanations as to where and how this data has been used.

The sites with the highest number of full threat assessments received were: Ochre Cove Maslins (175), Middleton (163), Yilki (129), Seacliff (98) and Hindmarsh River Mouth (93).

The threat data entered into the data portal assists BirdLife Australia with targeted management for each beach. Hooded Plovers and their beach habitats have a variety of threats and by gathering sufficient information on the threats at each site, we can assess whether human-based threats are the most dominant and can even determine the main user groups and target awareness raising activities to that particular group. The data that is collected from this citizen science project has enabled us to learn about ongoing trends and adapt our management over time. Having sound data also means we can influence policy. The Hooded Plover (eastern subspecies) was listed under the EPBC Act (1999) in November 2014, and this was largely due to the body of research and monitoring that has occurred in the past decade. We need to continue collecting this data in order to make successful long-term conservation management decisions.

The most prevalent threats at sites on the Fleurieu Peninsula for the 2016/17 season were people, silver gulls, dogs and pacific gulls (Table 9), which were also the top threats in 2015/16. From 2009, when detailed monitoring began on the Fleurieu Peninsula, the presence of people on beaches has been recorded more than any other threat type, which is the same as last season and unsurprising given most of South Australia's human population resides within the AMLR region.

For the last seven seasons, dogs off lead have always been more prevalent than dogs on lead. But for the first time since monitoring began on the Fleurieu Peninsula, dogs on leash were more prevalent than dogs off leash. The disparity is small, 31.4% (455) dogs on leash and 30.5% (442) of dogs off leash for the proportion of visits present. However, this is a change in the right direction. This is extremely encouraging and a testament to the awareness raising and presence of volunteers on beaches over the last seven years.

Stock, illegal vehicles, native mammal prints, ravens and birds of prey were the least prevalent threats, with stock being recorded at remote sites along Tunkalilla and Sheepies Beach.

Table 9. Proportion of visits where threats were observed (this includes evidence of tracks unless specified). * represents a different data set: Proportion of visits present from partial threat assessments (observations and prints, and observation only, n=1448)

Threat	**Prop. visits present from full threat assessments (observations and prints, n=1348) except where marked with ***
Human beach use (footprints &/or sightings)*	92.3% (1,336)*
Dog use (footprints &/or sightings)*	78.2% (1,132)*
Humans sighted (no prints)	64.6% (936)*
Silver Gulls	56.3% (759)
Dogs sighted	51.1% (740)*
Dogs on lead	31.4% (455)*
Dogs off lead	30.5% (442)*
Pacific gulls	24.0% (323)
Foxes (prints)*	14.5% (195)
Vehicles (all types, including sightings &/or tracks)*	13.0% (175)
Passerine Prints	10.2% (137)
Magpies	9.1% (122)
Horses (sightings &/or prints)	5.5% (74)
Permitted vehicle sighted	4.0% (54)
Birds of Prey	3.4% (46)
Ravens	3.2% (43)
Native animals (prints)	1.3% (17)
Non-permitted vehicle sighted	0.5% (7)
Stock (prints)	0.4% (6)

Table 10 provides a summary of the proportion of sites where given threats were detected. People were the only threat recorded at all sites. Silver gulls were recorded at all but one site (Normanville South). Dogs, both through direct observation and prints, were recorded at 18 of the 23 sites used for data analysis. Dogs were not recorded at the remote sites (Tunkalilla and Sheepies), but these sites also only had the minimum of 15 threat assessments completed for the season. Tunkalilla has been inaccessible to volunteers for regular monitoring, and as it is such an important site for fledging success

for the entire Peninsula, more monitoring is essential to monitor the health of the population on the Fleurieu, and better understand the threats at these sites.

Table 10. Proportion of sites where threats were observed (sites are named in abbreviated form). Tracks and prints are included as evidence of threats, unless categorised separately.

Threat	**Prop sites present (23)**	**Detected at:**	**Not detected at:**
People	100% (23)	All sites	
Silver Gulls	95.7% (22)		Normanville South
Pacific Gulls	87.0% (20)		Normanville South, Shelley Beach (lady Bay), Tunkalilla East
Magpies	78.3% (18)		Carrickalnga North, Hindmarsh River Mouth, Normanville South, Shelley Beach (lady bay), Tunkalilla West
Dogs	78.3% (18)		Sheepies Beach, Tunkalilla East, Tunkalilla Midway, Tunkalilla West, Waitpinga East
Vehicles	73.9% (17)		Carrickalinga North, Parsons Beach, Port Willunga, Sheepies Beach, Waitpinga East, Watsons Gap
Dogs off	73.9% (17)		Parsons Beach, Sheepies beach, Tunkalilla East, Tunkalilla Midway, Tunkalilla West, Waitpinga East
Dogs on	73.9% (17)		Parsons Beach, Sheepies beach, Tunkalilla East, Tunkalilla Midway, Tunkalilla West, Waitpinga East
Ravens	60.9% (14)		Aldinga North, Aldinga South, Olivers Reef, Port Willunga, Seacliff, Sheepies Beach, Shelley Beach (lady bay), Watsons Gap, Yilki
Birds of prey	56.5% (13)		Aldinga South, Carrickalinga North, Carrickalinga Rotunda, Normanville South, Olivers Reef, Seacliff, Tunkalilla East, Tunkalilla Midway, Tunkalilla West, Waitpinga East
Fox	52.2% (12)	Carrickalinga Rotunda, Hindmarsh River Mouth, Ochre Cove Maslins, Olivers Reef, Parsons Beach, Port Willunga, Sheepies Beach, Tunkalilla East, Tunkalilla Midway, Tunkalilla West, Waitpinga East, Watsons Gap	
Horses	34.8% (8)	Aldinga North, Aldinga South, Hindmarsh River Mouth, Ochre Cove Maslins, Olivers Reef, Parsons Beach, Port Willunga, Silver Sands	
Permitted vehicles	30.4% (7)	Aldinga North, Aldinga South, Hindmarsh River Mouth, Normanville South, Olivers Reef, Seacliff, Silver Sands	
Illegal Vehicles	21.7% (5)	Aldinga North, Aldinga South, Shelley Beach (lady bay), Silver Sands, Tunkalilla West	
Stock	17.4% (4)	Sheepies Beach, Tunkalilla East, Tunkalilla Midway, Tunkalilla West	

The recreational activities that people were observed participating in at sites is summarised in Table 11. The most frequently recorded recreational activity was walking/jogging, followed by dog walking, and surfing/swimming. Recreational activities have shifted in relative frequency since last season, with observations of vehicles on beaches decreasing from 12.4% in the 2015/2016 season to 2.9% in 2016/2017. Both walking/jogging and dog walking have increased by 6.9% since the 2015/2016 season.

Table 12 provides a site by site summary of prevalence of potential threats, which allows us to identify beach user groups across sites and determine necessary management responses needed at sites (e.g. fox control). Some sites have more static recreational users, such as anglers and people sitting/sunbaking (Carrickalinga North, Tunkalilla East and Midway, and Waitpinga East), while most other sites are dominated by mobile recreationalists (e.g. Olivers reef, Aldinga North and Seacliff). Some sites have a range of user types (e.g. Parsons Beach).

Table 11. The main activities people were observed using the beaches for. In total, there were 7,420 (76.86%) people at the water's edge, 2,137 (22.14%) on the beach, 5 (0.05%) observed inside signed/fenced areas and 92 (0.95%) in the dune.

Human recreational activity (of 9,654 people observed)	% intensity
Walking/jogging	38.5% (3,716)
Dog walking	27.0% (2,609)
Surfing/swimming	12.8% (1,222)
Sitting/sunbaking	11.8% (1,143)
Playing games	5.0% (481)
Driving	2.9% (282)
Fishing	1.6% (153)
Horse Riding	0.5% (48)

Photo: Debbie Prestwood. UE protecting chicks from a Silver Gull at Middleton Beach

Table 12. The prevalence of potential threats to Hooded Plover at sites monitored. Prevalence refers to how frequently the threat was observed (number times observed/number visits). Threat prevalence is categorised as heavy, moderate, sparse or rare according to the percentage of times recorded. Common activity is derived from observations of the most common recreational activities at sites. Note, Carrickalinga Rotunda, Carrickalinga South, Normanville North, Normanville South and Tunkalilla West do not include any print data for threats such as dogs, due to partial completion of threat assessments

Site (number of threat assessments)	**Heavy threats (>50%)**	**Moderate threats (20-50)**	**Sparse threats (<20%)**	**Rare threats (<6%)**	**Common activity (Percent intensity)**
Aldinga North (58)	People, dogs, dogs off, silver gulls	Dogs on, pacific gulls, vehicles, magpies	Birds of prey	Horses	Dog walking (36.5%), walking (24.5%)
Aldinga South (39)	People, Vehicles, dogs, dogs off	Horses, dogs on, silver gulls	Pacific gulls	Magpies	Driving (24.6%), sitting/sunbaking (20.8%)
Carrickalinga North (22)	People, dogs	Dogs off, silver gulls	Dogs on, ravens	Pacific gull	Sitting/sunbaking (31.7%), Walking (21.5%)
Carrickalinga Rotunda (32) does not include print data		People, dogs off, silver gulls	Pacific gulls, ravens, dogs on	Magpies, birds of prey	Walking (25.7%), Dog walking (22.8%)
Carrickalinga South (35) does not include print data	People	Dogs on, silver gulls, ravens	Dogs off	Pacific gulls, magpies	Dog walking (54.8%), Sitting/sunbaking (24.7%)
Hindmarsh River Mouth (93)	People, dogs, silver gulls	Dogs off, dogs on, pacific gulls	Horses	Ravens, vehicles, Birds of prey, fox	Dog walking (42.6%), Walking (33.5%)
Inman River Mouth (76)	People, silver gulls, dogs	Pacific gulls, dogs on, dogs off, magpies	Ravens	Vehicles, birds of prey	Walking (50.8%), Dog walking (19.7%)
Middleton Beach (163)	People, silver gulls, dogs, dogs on	Pacific gulls	Dogs off	Magpies, birds of prey, vehicles, ravens	Walking (49.0%), Surfing/swimming (26.5%)
Normanville North (23) does not include print data	Dogs on, people, silver gulls		Dogs off, pacific gulls, birds of prey		Dog walking (52.6%), Walking (43.3%)
Normanville South (46) does not include print data		People	Dogs off, ravens, dogs on, permitted vehicles seen	Silver gulls, magpies, pacific gulls	Dog walker (35.5%), Walker (40.2%)
Ochre Cove, Maslins (175)	People, dogs, fox, silver gulls	Dogs off	Magpies, pacific gulls	Dogs on, birds of prey, vehicles, ravens,	Dog walking (53.8%), Walking (22.8%)

Site (number of threat assessments)	Heavy threats (>50%)	Moderate threats (20-50)	Sparse threats (<20%)	Rare threats (<6%)	Common activity (Percent intensity)
				horses	
Olivers Reef (55)	Dogs, People, Dogs off, silver gulls	Dogs on	Fox, pacific gulls	Vehicles, horses, magpies	Dog walking (43.1%), Walking (34.9%)
Parsons Beach (22)	People, silver gulls, fox	Pacific gulls	Dogs, ravens, magpies	Horses, birds of prey	Sitting/sunbaking (34.8%), Walking (26.1%) Surfing/swimming (26.1%)
Port Willunga (69)	People, dogs, dogs off		Dogs on, Birds of prey, silver gull, pacific gulls	Magpies, fox, horses	Dog walking (52.6%), Walking (37.3%)
Seacliff (98)	People, dogs, dogs on	Silver gulls, dogs off	Vehicles (permitted), pacific gulls	Magpies,	Walking (37.5%), Dog walking (26.8%)
Sheepies (15)	Fox	People, silver gulls, magpies	Pacific gulls, birds of prey	Stock	Surfing/swimming (100%)
Shelley Beach (lady bay) (15)	People, dogs, vehicles	Dogs off, silver gulls		Dogs on, birds of prey	Walking (40.4%) Sitting/sunbaking (24.6%)
Silver Sands (85)	Dogs, people, vehicles	Horses, dogs off, silver gulls, dogs on	Pacific gulls	Ravens, birds of prey, magpies	Walking (34.4%), Dog walking (31.4%)
Snapper Point (46)	Dogs, People	Silver gulls, dogs off, pacific gulls	Dogs on, birds of prey, vehicles^	Ravens, magpies	Dog walking (43.7%), Walking (38.4%)
Tunkalilla East (15)	Fox	People, ravens	Silver gulls, stock, vehicles, magpies		Sitting/sunbaking (100%)
Tunkalilla Midway (16)	Fox	People, magpies, silver gulls	Ravens, stock, vehicles, pacific gulls		Sitting/sunbaking (100%)
Tunkalilla West (15)	Fox, people	Silver gulls	Vehicles, ravens, pacific gulls	Stock	Walker (94.7%), Illegal vehicle (5.3%)
Waitpinga Beach (east) (15)	People, silver gulls	Fox, pacific gulls	Ravens, magpies		Fishing (100%)
Watsons Gap (85)	People	Silver gulls, dogs	Dogs on, pacific gulls, magpies	Fox, dogs off, birds of prey	Walking (50.2%), Surfing/ swimming (16.8%)
Yilki (129)	People, dogs, silver gulls, pacific gulls, dogs on	Dogs off, magpies		Vehicles, birds of prey	Walking (52.3%), Dog walking (32.4%)

^ There is no vehicle access at Snapper Point and it is believed that that this may be a reference to Council machinery while they were rebuilding the steps that had been washed out. As this happened during the off season they presented no threat to the hoodies.

Table 13 provides the average number of people and dogs sighted, both off and on lead. Seacliff Beach had the highest average number of people and highest average number of dogs (on leash), which is unsurprising given this is a metropolitan beach. Middleton Beach and both Aldinga sites had a high number of people present on average. Middleton, Normanville North, Aldinga North and Yilki also had the highest number of dogs on lead on average, and Port Willunga had the highest average of dogs off leash, followed by Seacliff, both Aldinga sites, and Snapper Point.

Port Willunga, Seacliff and Silver Sands are all under the current regulations of 'Dogs on Leash 10am-8pm,' yet these are the sites with the highest averaged of dogs off leash.

Table 13. Mean (± standard error) number of people and dogs on and off leash observed at sites.

Site (number of assessments)	Number of people	Number dogs on lead	Number dogs off lead
Aldinga (nth)	8.32 ± 2.15	1.39 ± 0.22	1.85 ± 0.28
Aldinga (sth)	12.83 ± 6.29	0.75 ± 0.22	2.13 ± 0.68
Carrickalinga North	8.79 ± 2.70	0.11 ± 0.06	0.82 ± 0.43
Carrickalinga Rotunda	3.16 ± 0.99	0.09 ± 0.05	0.84 ± 0.36
Carrickalinga South	2.09 ± 0.62	0.60 ± 0.10	0.23 ± 0.10
Hindmarsh River Mouth	3.76 ± 0.63	0.50 ± 0.09	1.24 ± 0.22
Inman River Outlet	4.52 ± 0.60	0.72 ± 0.15	0.36 ± 0.09
Middleton beach	11.31 ± 3.40	1.56 ± 0.24	0.47 ± 0.13
Normanville North	4.22 ± 1.14	1.39 ± 0.24	0.30 ± 0.17
Normanville South	1.76 ± 0.38	0.50 ± 0.18	0.39 ± 0.15
Ochre Cove, Maslins	0.91 ± 0.16	0.09 ± 0.05	0.47 ± 0.07
Olivers Reef	4.70 ± 0.66	0.61 ± 0.14	1.58 ± 0.25
Parsons Beach	0.92 ± 0.26	0.00 ± 0.00	0.00 ± 0.00
Port Willunga	7.50 ± 0.89	0.24 ± 0.07	3.36 ± 0.42
Seacliff	17.44 ± 2.50	2.19 ± 0.32	2.84 ± 0.60
Sheepies beach	0.10 ± 0.10	0.00 ± 0.00	0.00 ± 0.00
Shelley Beach (lady bay)	3.00 ± 1.29	0.06 ± 0.06	0.39 ± 0.22
Silver Sands	4.88 ± 0.70	0.35 ± 0.08	1.56 ± 0.25
Snapper Point	4.77 ± 0.88	0.21 ± 0.07	1.65 ± 0.46
Tunkalilla East	0.11 ± 0.11	0.00 ± 0.00	0.00 ± 0.00
Tunkalilla Midway	0.10 ± 0.10	0.00 ± 0.00	0.00 ± 0.00
Tunkalilla West	0.86 ± 0.76	0.00 ± 0.00	0.10 ± 0.10
Waitpinga Beach (east)	1.11 ± 0.53	0.00 ± 0.00	0.00 ± 0.00
Watsons Gap	1.91 ± 0.26	0.13 ± 0.03	0.06 ± 0.03
Yilki	4.61 ± 0.70	1.22 ± 0.16	0.49 ± 0.10

Site Management and Awareness Raising activities during 2016/17

In the 2016/17 breeding season, the following activities were carried out:

Site Management

- Chick wardening was increased during the festive season on the south coast of the Fleurieu particularly during schoolies and during a surf carnival in January
- Temporary fencing and signage around nests and chicks
- Temporary signs communicating nest failure or chick hatching success.
- Schoolies signs at specific sites.
- Yankalilla, Victor Harbor and Alexandrina Councils all reviewed their dog by-laws
- A padlock was put on the gate onto Shelley Beach to stop unwanted vehicles

Photo: Renee Mead.
Training workshop at Victor Harbor

Volunteer and Community Engagement

- BirdLife Australia ran a training workshop at Victor Harbor to recruit new volunteers and refresher training for current volunteers. Over 30 people attended the event at the South Australian Whale Centre
- BirdLife Australia's Renee Mead and Meg Cullen did a day of educational sessions at Scotch College in Adelaide
- Normanville Natural Resource Centre organized a Hooded Plover stall at the Yankalilla show in October 2016
- Emma Stephens present to the local community at Normanville on 15th September 2016
- Normanville Natural Resource Centre unveiled a Hooded Plover display outside the centre on Plover Appreciation Day 2016

Photo: Renee Mead. Beach visit to Yilki as part of the training workshop

- Wendy White talked to 2 school classes on Plover Appreciation Day in September
- Wendy White presented to the NRM Board's Coastal Ambassadors program participants
- Wendy White presented to the Encounter Bay and Beaches meeting
- The Seacliff volunteer monitors held a stall at the Seacliff Twilight Markets just before Christmas trying to attract new volunteers

- Friends of the Hooded Plover Fleurieu Peninsula were successful with an application to purchase 3 scopes and tri-pods to be kept by the volunteer coordinators for use by all volunteer monitors
- Friends of Hooded Plover Fleurieu Peninsula Volunteer Regional Coordinators Sue and Ash Read were successful in their application for a City of Onkaparinga Environmental Grant. This enabled the group to purchase a badge machine and components for awareness raising activities for children, and also some 3D printed hooded plover models for educational purposes.
- A volunteer regional co-ordinators meeting was held in March with Grainne Maguire and Meg Cullen from BirdLife and Linda Durham and Corey Jackson form AMLR NRM Board
- Laura Tan from BirdLife Australia conducted a banding trip with Kasun Ekanayake and Jean Turner for Red-capped Plovers on the Samphire Coast
- End of Season event for all Hooded Plover volunteers was held at the Aldinga Surf Life Saving Club in May 2017. Presentations were given by Kasun Ekanayake, Wendy White, Ashley Read and David Thorn
- Grainne Maguire and Meg Cullen (BirdLife Australia) visited in March to conduct banding on a couple of the beaches at Victor Harbor and made contact with Wildlife Carers
- Manned a stall at the Victor Harbor Micro-chipping day
- Awareness raising event at the Seaford Library from Sue and Ash Read
- In conjunction with the Coastal and Marine team from AMLR NRM manned a stall at the World Environment Fair at the Adelaide Showground

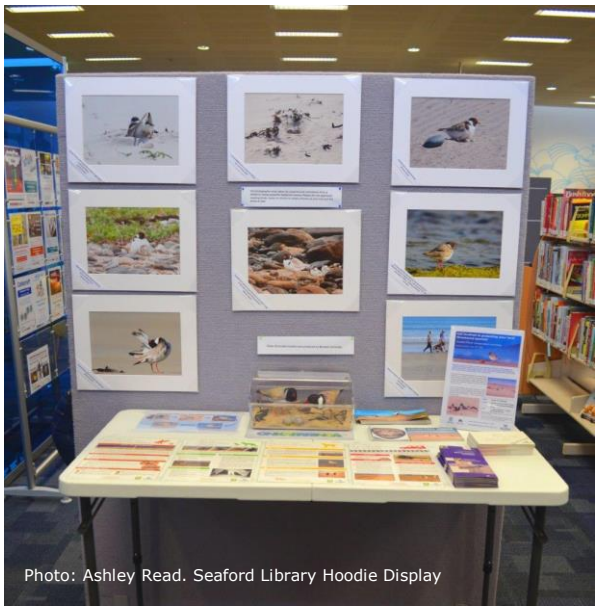

Photo: Ashley Read. Seaford Library Hoodie Display

- Had a Hooded Plover display at the Natural Resources centre's stall at the World Environment Day expo.
- Regional volunteer coordinators met to discuss how the local volunteers could help at the biennial Beach-nesting Bird Conference
- Local volunteers helped to collect prizes for the silent auction at the conference
- Wendy White represented the Hooded Plover program at the NRM boards program evaluation day

- The 6th National Beach-nesting Birds Conference was held in Willunga on the Fleurieu Peninsula over two days May 26th - 27th, 2017. This was the first time the conference has been held in South Australia and we were thrilled at the response, with over 140 participants from a diversity of regions across multiple states. The main objectives of the Friday were to provide an overview of coastal management and in particular resident shorebird management from around Australia, an update on the efforts that are currently undertaken as part of BirdLife Australia's Beach-nesting Birds project, and snapshots of recent research projects into the behavioural ecology and survival of beach-nesting bird species. Additionally, there were contributions on broader coastal ecology including coastal raptors, threatened beach-nesting seabirds and harvesting of beach-cast marine algae. All presentations are briefly summarised in the report. We involved the entire conference group in discussions about key threats and issues for beach-nesting birds, and summaries of these discussions are available in the report. On Day two of the conference, we ran specialist training workshops and key summaries are available of the workshops that could be summarised i.e. weren't hands-on/practical training sessions. And field trips that were run by local volunteers, highlighting the Fleurieu Peninsula. Downloadable report: http://www.birdlife.org.au/documents/BNB-Overview_of_Beach-nesting_Birds_Conference-2017.pdf

Photo: Glenn Ehmke. National Beach-nesting Birds Conference in Willunga

Photo: Grainne Maguire. L>R Emma Stephens, Linda Durham, Aleisa Lamanna, Warrick Barnes, Kerri Bartley, Emma's gorgeous baby Zoe, Luke Price at the National Beach-nesting Birds Conference in Willunga, May 2017

Media Engagement

- Southern Messenger printed a couple of articles about the new pair of Hooded Plovers that nested at Seacliff – the first pair of metro Hoodies
- John Cobb – Seacliff volunteer was interviewed on the ABC radio on two occasions
- The Seacliff pair also made it to Channel 7 news with info presented by Wendy White
- Emma Stephens did a radio interview with Jane Reilly 5AA regarding the Hooded Plovers breeding at Seacliff, Mike Hemus also did a radio interview with ABC 891 Adelaide breakfast show.
- Tony Flaherty also did a live interview with Channel 9 weather reporter re the Seacliff nest.
- Wendy White has contributed articles to the monthly Yankalilla Regional Newsletter and to the NNRC's quarterly newsletter
- The Hooded Plover and Natural Resources Adelaide and Mount Lofty Ranges Facebook pages posted regular updates
- The Victor Harbor Times has also printed a few articles including one about fireworks being let off inside a fenced nest area on New Year's Eve at Yilki

Acknowledgements

A huge thank you to all of the amazing volunteers who participate in Hooded Plover monitoring. The data collected is invaluable and helps us put into perspective how threatened each pair is and to adapt our managements accordingly. It also will help in future with any proposed planning or changes to regulations: statistics lend great weight to our submissions and recommendations.

Big thanks to the Volunteer Regional Coordinators: Sue and Ash Read, Wendy White and Elizabeth Steele-Collins for their efforts on the Fleurieu Peninsula, and to Wendy White (acting as Emma Stephens who was on maternity leave), Corey Jackson, Kerri Bartley and Tony Flaherty and the Adelaide and Mount Lofty Ranges NRM Board for their support and for their dedication to protecting coastal biodiversity. Special thanks to the councils and rangers involved in protecting nesting sites and supporting the project and its

volunteers: City of Onkaparinga, District Council of Yankalilla, DEWNR (Newland Head Conservation Park - National Parks and Wildlife SA), City of Victor Harbor, Alexandrina Council and City of Holdfast Bay.

A special thanks to the Normanville Natural Resource Centre Coordinator and volunteers for assisting with awareness raising events.

And a big thank you to all those who assisted with organising, setting up, providing equipment, cleaning up, and all the jobs that helped make the 6th National Beach-nesting birds Conference happen. Wendy White, Ash and Sue Read, David and Sue Thorn and Jean Turner assisted greatly in the lead up to the event, not to mention all the work they did during and after the event. An enormous thank you to them! We also had so many helpers from the Fleurieu during the event who even came late at night to help set up, were always doing dishes, clearing up and helping everything run smoothly: Jan and Graham Thomas, Dudley Corbett, Debbie Prestwood, Janette Diment, David Potter, Ligita Bligzna, Joy Whellum, Rhonda Smith, Caroline Weatherstone, Angela Parker, John Cobb, Neville Hudson and all the others who pitched in on the day. And to the local presenters, workshop leaders and field trip leaders – you provided so much interesting content and had everyone enthralled!

Photo: Richard Edwards. Juvenile and Adult hooded plover sighted at Bashams Beach