

# **Monitoring Hooded Plovers on the Fleurieu Peninsula:** Distribution, breeding success and management in the 2013/2014 season

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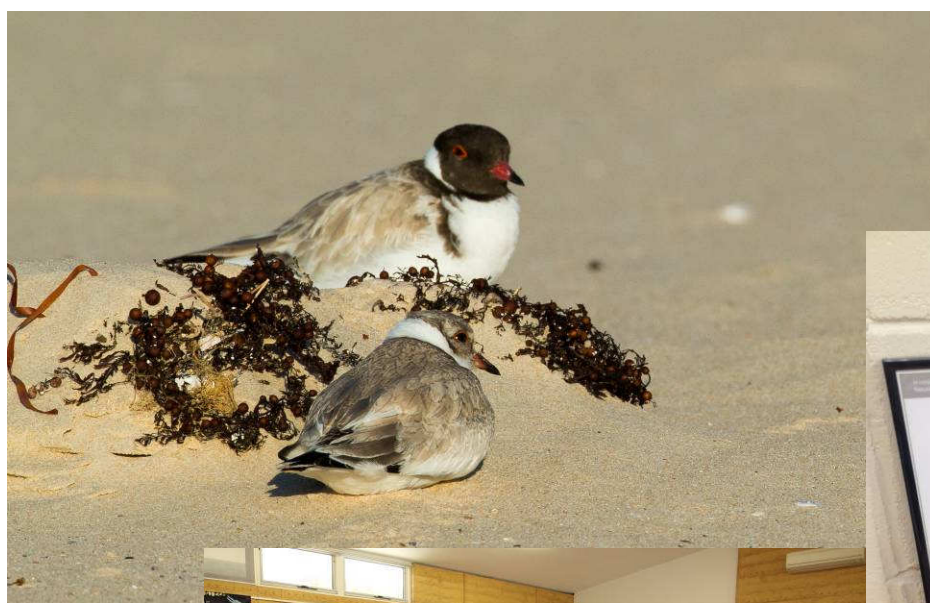
**Government of South Australia**  
Adelaide and Mount Lofty Ranges  
Natural Resources Management Board

birds are in our nature



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Adult with older chick at Port Stanvac (photo Michele Sawyer); Volunteers at a hoodie workshop in September 2013 (photo Grainne Maguire); 2013 SA Landcare Awards – Coastcare Award Winner: Hoodie Helpers (photo Emma Stephens).

## 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. The Hooded Plovers are most threatened because 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 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, Victorian State government and several NRM Boards throughout South Australia. Currently, funding is from a range of sources including the Hugh D. T. Williamson Foundation, Natural Resources Adelaide and Mount Lofty Ranges, Natural Resources Northern and Yorke, and the Victorian Environmental Partnership Program.

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 count every two years (e.g. November 2012, November 2014);
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 to detect and identify nest predators and to determine nest fates. This is done to a limited degree to avoid any potential for training predators to associate cameras with nests;
10. Band Hooded Plovers 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;
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.

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, advice, workshops, training and technical support, as well as data analysis and maintenance of a national database.
- On the Fleurieu peninsula, Natural Resources Adelaide and Mount Lofty Ranges Coast, Marine and Estuary managers and officers support the project and volunteers, and local council and Department of Environment, Water and Natural Resources (DEWNR) staff assist with nest protection responses.
- The Normanville Natural Resources Centre, through AMLR NRM funding, facilitates school and public awareness of the project including chick shelter construction and dogs breakfast awareness events.

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 our 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.

Relevant actions and priorities of the (draft) South Australian Recovery Plan for the Hooded Plover (Baker-Gabb and Weston 2006) 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 and Natural Resources, councils, community and the Natural Resources Management Board.

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.

In 2013, the Hooded Plover (eastern subspecies) was nominated for listing as Nationally Vulnerable under the Environment Protection and Biodiversity Conservation (EPBC) Act 1999. The process takes over 18 months and to-date, the species has been assessed as eligible for listing and has undergone the public comment phase. A decision will be announced in 2015.

## An overview of the 2013-2014 Breeding Season

### Victoria

The BNB project has been running since 2006 in Victoria, with breeding success and threats at breeding sites monitored over 8 successive breeding seasons for up to 132 pairs (see summary in Table 1).

Similar to last season, the 2013/14 season began later than usual due to poor and erratic weather conditions in spring. Table 2 summarises fledgling production according to regions along the Victorian coast. Success was highly variable across the regions, with the west of the state, particularly between Warrnambool and Yambuk producing many fledglings, while the Mornington Peninsula for example had its worst season to date, with only one fledgling from 28 breeding pairs. Overall, breeding success was at 0.42 fledglings per pair which is assessed as an average season for Victoria.

Table 1. Number of pairs monitored, nests found and their fate. Data for the 2012/13 and 2013/14 seasons is incomplete at this stage as vetting of the data is a slow process and BirdLife Australia is currently understaffed due to funding cuts. Estimates are included to provide an indication of the season. [Phillip Island data has not been included in this table as monitoring here is not coordinated by BirdLife Australia].

| Season  | Pairs monitored | Total nests | Nests fail egg | Nests Hatched | Nests fledged | # confirmed fledglings | # eggs laid | # chicks hatched |
|---------|-----------------|-------------|----------------|---------------|---------------|------------------------|-------------|------------------|
| 2006/07 | 90              | 147         | 86             | 61            | 24            | 35                     | 353         | 145              |
| 2007/08 | 86              | 157         | 100            | 57            | 24            | 32                     | 372         | 140              |
| 2008/09 | 79              | 119         | 74             | 45            | 23            | 30                     | 290         | 102              |
| 2009/10 | 103             | 167         | 96             | 70            | 43            | 69                     | 386         | 139              |
| 2010/11 | 114             | 208         | 140            | 67            | 29            | 38                     | 469         | 175              |
| 2011/12 | 120             | 224         | 165            | 51            | 19            | 24                     | 474         | 94               |
| 2012/13 | 132             |             |                |               |               | 59                     |             |                  |
| 2013/14 | 130             |             |                |               |               | 53                     |             |                  |

Table 2. Number of confirmed fledglings produced by pairs in Victoria (based on data received; including additional pairs monitored by Phillip Island Nature Park) according to the different regions of the coast:

| <b>Region</b>                           | <b>2006/07<br/>106 pairs</b> | <b>2007/08<br/>100 pairs</b> | <b>2008/09<br/>96 pairs</b> | <b>2009/10<br/>119 pairs</b> | <b>2010/11<br/>123 pairs</b> | <b>2011/12<br/>137 pairs</b> | <b>2012/13<br/>141 pairs</b> | <b>2013/14<br/>144 pairs</b> |
|---|------------------------------|------------------------------|-----------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| Far West Vic                            | 2                            | 6                            | 11                          | 31                           | 5                            | 1                            | 28                           | 32                           |
| Shipwreck coast                         | 7                            | 3                            | 0                           | 4                            | 0                            | 1                            | -                            | -                            |
| Otway coast                             | 0                            | 1                            | 3                           | 0                            | 1                            | 0                            | 2                            | 1                            |
| Surf coast                              | 2                            | 4                            | 2                           | 2                            | 2                            | 2                            | 0                            | 2                            |
| Bellarine                               | 3                            | 3                            | 4                           | 4                            | 3                            | 2                            | 2                            | 4                            |
| Mornington Peninsula                    | 10                           | 6                            | 6                           | 7                            | 10                           | 3                            | 9                            | 1                            |
| Phillip Island                          | 8                            | 4                            | 6                           | 9                            | 7                            | 12                           | 4                            | 8                            |
| Bass Coast                              | 4                            | 2                            | 4                           | 20                           | 17                           | 6                            | 10                           | 7                            |
| Venus Bay-Waratah Bay (South Gippsland) | 1                            | 0                            | 0                           | 2                            | 0                            | 7                            | 8                            | 6                            |
| Lakes area, EG                          | 2                            | 0                            | 0                           | 0                            | -                            | -                            | -                            | -                            |
| Croajingalong (Marlo-Mallacoota)        | 4                            | 7                            | 0                           | 1                            | 0                            | -                            | -                            | -                            |
| <b>Total fledglings</b>                 | 43                           | 36                           | 36                          | 80                           | 45                           | 34                           | 63                           | 61                           |
| <b># fledglings per pair monitored</b>  | 0.41                         | 0.36                         | 0.38                        | 0.67                         | 0.37                         | 0.25                         | 0.45                         | 0.42                         |



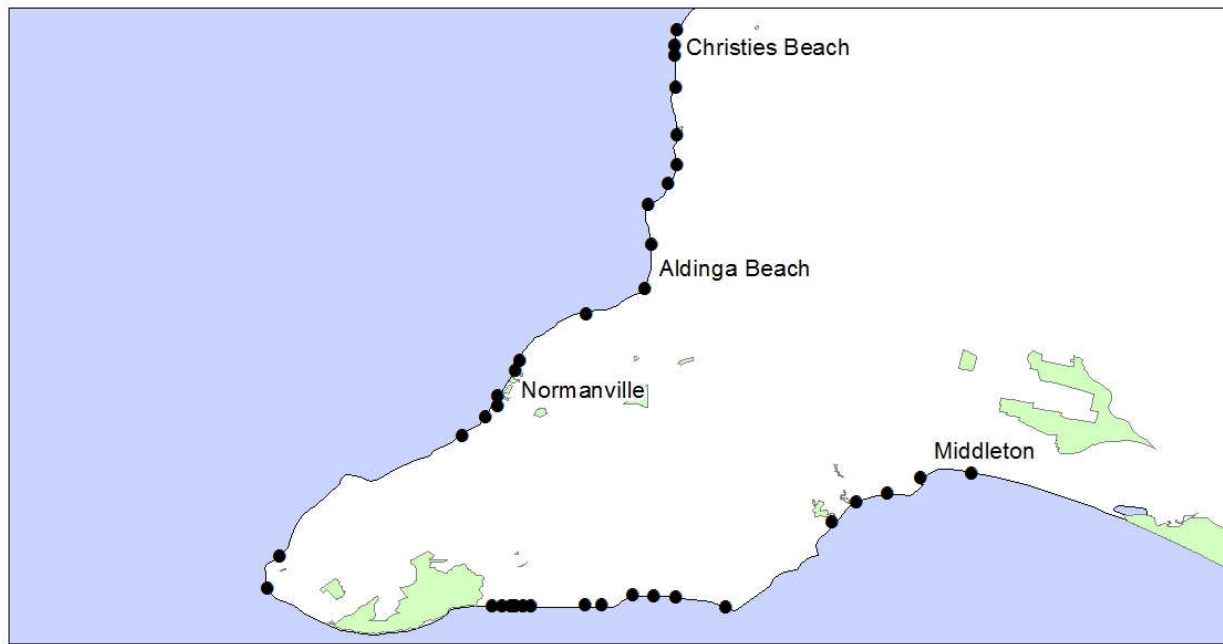
## **South Australia**

Monitoring of breeding pairs was carried out on the Fleurieu Peninsula as part of the Beach-nesting Birds project in the 2013/2014 breeding season. During the 2013/2014 season, 626 data records were completed for a total of 38 sites. A minimum of 168 hours of observation, data for survey times was available for 394 (63%) of the completed data sheets. Figure 1 reveals the sites that were monitored during 2013/14 on the Fleurieu Peninsula.

Table 3 shows the breakdown of visits and volunteers visiting sites on the Fleurieu Peninsula. Overall, twelve sites were well monitored, that is monitored across at least 5 months of the breeding season.

There were 8 beaches where Hooded Plovers were not sighted on any visit (Aldinga, Christies beach, Coolawang, Middleton, Moana, Normanville South, O'Sullivan's beach and Silver Sands). There were also sites where Hooded Plovers were seen during the breeding season, but no nesting attempts were detected (Bashams beach, Carrickalinga North, Hindmarsh river mouth, Lands End, Morgans beach, Snapper Point, Southport, Tunkalilla first house east, Tunkalilla shed caravan, Yankalilla River mouth). This may partly be because there was incomplete monitoring for the breeding season at some sites (see Table 3), but at other sites it is likely that these are stepping stone beaches or foraging sites for non-breeders.

Figure 1. Hooded Plover monitoring sites on the Fleurieu Peninsula over the 2013/14 breeding season.



**Fleurieu Peninsula 2013/2014**

Survey locations



0 5 10 20 Kilometers

● Survey locations  
■ Parks and Reserves



Table 3. Summary of visits to pairs on the Fleurieu Peninsula during the 2013/14 breeding season. Total visits and total visits (days) are presented separately as multiple visits were sometimes made on the same day by the same or different volunteers. Visits where adult birds were present are given as a percentage of total visits. Coverage refers to the proportion of the breeding season that pairs were monitored across (out of the peak 7 months where breeding usually occurs, August-February; note at some sites this extends into March-April).

| <b>Pair</b>           | <b>Visitation period<br/>(breeding season)</b> | <b>Total<br/>visits<br/>(days)</b> | <b>#<br/>Visits</b> | <b>Visits HP<br/>adults<br/>present</b> | <b>Coverage</b> | <b>Main monitor/s</b>            | <b>Additional observers</b>   |
|-----------------------|--|------------------------------------|---------------------|---|-----------------|----------------------------------|---|
| Aldinga               | Sept, Oct, Dec                                 | 4                                  | 4                   | 0 (0%)                                  | 33%             | Faye Lush & Joyce West           |   |
| Ballaparudda          | Oct - April                                    | 11                                 | 11                  | 4 (36%)                                 | 78%             | Elizabeth Steele-Collins         | Geoff Schmidt   |
| Bashams Beach         | Aug - Jan, March, April                        | 13                                 | 13                  | 6 (46%)                                 | 89%             | Win Syson                        | Grainne Maguire   |
| Callawonga            | Oct, Dec- April                                | 15                                 | 15                  | 12 (80%)                                | 67%             | Elizabeth Steele-Collins         | Geoff Schmidt, David Thorn, Terry Dennis  |
| Carrickalinga         | Aug - March                                    | 31                                 | 35                  | 29 (83%)                                | 89%             | Wendy White                      | Tony Flaherty, Sheryn Pitman, Mike Heard, Michele & Gary Sawyer, Margaret Moxon, Grainne Maguire, Emma Stephens, David Thorn, Dan Monceaux, Corey Jackson |
| Carrickalinga North   | Sept - Nov, Jan                                | 10                                 | 10                  | 4 (40%)                                 | 44%             | Lauren Davis                     | Dan Monceaux, Corey Jackson, David Thorn, Margaret Moxon  |
| Christies Beach       | Aug, Oct, Dec                                  | 3                                  | 3                   | 0 (0%)                                  | 33%             | Angela Parker                    |   |
| Coolawang             | Feb  | 1                                  | 1                   | 0 (0%)                                  | 11%             | Elizabeth Steele-Collins         | Brenton Lush, Chris Halstead  |
| Hindmarsh River Mouth | Aug - Oct, Dec - April                         | 13                                 | 13                  | 9 (69%)                                 | 89%             | Andrew Jeffery                   | Carol Cooney, David Thorn, Richard Edwards  |
| Inman River Outlet    | Aug - Feb                                      | 44                                 | 44                  | 33 (75%)                                | 78%             | Ross Brittain & Janette Diment   | Grainne Maguire, David Thorn, Brian Doman, Andrew Jeffery, Verle Wood   |
| Lands End             | Aug - March                                    | 11                                 | 11                  | 1 (9%)                                  | 89%             | David Woollard                   | Bill Page, David Thorn  |
| Maslin Beach          | Aug - April                                    | 66                                 | 67                  | 61 (91%)                                | 100%            | Sue & Ashley Read, Angela Parker | Emma Stephens, Gillian Rayment, Michelle & Gary Sawyer  |
| Middleton Beach       | Sept, Feb                                      | 3                                  | 3                   | 0 (0%)                                  | 22%             | Win Syson                        | David Thorn   |
| Moana Beach           | Aug - Feb                                      | 16                                 | 16                  | 16 (100%)                               | 78%             | Angela Parker, Robert Hill       |   |
| Morgans Beach         | Aug - March                                    | 10                                 | 10                  | 3 (30%)                                 | 89%             | David Woollard                   | Bill Page, Corey Jackson  |
| Myponga Beach         | Aug - Feb, April                               | 22                                 | 23                  | 20 (84%)                                | 89%             | Michele & Gary Sawyer            | Linda & Jim Stacey, John Cobb, Mike Heard, Emma Stephens  |

|   |                             |    |    |           |      |   |  |
|---|-----------------------------|----|----|-----------|------|---|--|
| Normanville North                             | Sept - Nov, Jan, Feb, April | 9  | 10 | 8 (80%)   | 67%  | Pia Pilcher                             | David Thorn, Mike Heard, Dan Monceaux, Corey Jackson   |
| Normanville South                             | Feb                         | 1  | 1  | 0 (0%)    | 11%  | David Thorn                             |  |
| O'Sullivan's Beach                            | Aug, Oct, Dec               | 3  | 3  | 0 (0%)    | 33%  | Angela Parker                           |  |
| Parsons Beach                                 | Aug- April                  | 16 | 16 | 14 (88%)  | 100% | Dean Cutten                             | Lauren Davis   |
| Port Stanvac                                  | Aug - Feb, April            | 23 | 23 | 20 (87%)  | 89%  | Michele & Gary Sawyer                   |  |
| Port Willunga                                 | Aug - April                 | 35 | 36 | 26 (72%)  | 100% | Sue & Ashley Read                       | Dylan Braund, Angela Parker  |
| Sheepies Beach                                | Aug - March                 | 14 | 14 | 10 (71%)  | 89%  | Dean Cutten                             |  |
| Shelley Bay (lady bay)                        | Aug - March                 | 25 | 26 | 17 (65%)  | 89%  | Lauren Davis, David Thorn               | Grainne Maguire, Dan Monceaux  |
| Silver Sands                                  | Sept, Oct                   | 2  | 2  | 0 (0%)    | 22%  | Angela Parker                           |  |
| Snapper Point                                 | Sept, Oct, Dec, Jan, March  | 7  | 7  | 0 (0%)    | 56%  | Faye Lush & Joyce West                  | Angela Parker, Sue & Ashley Read   |
| Southport                                     | Aug - April                 | 32 | 32 | 4 (13%)   | 100% | John Cobb, Michele & Gary Sawyer        | Angela Parker, Charles Simmons, Claire Francis, Corey Jackson, Sue & Ashley Read, Trevor Cowie |
| Tunkalilla 1st alcove far east                | Dec, Feb - April            | 4  | 4  | 0 (0%)    | 44%  | Elizabeth Steele-Collins                | Geoff Schmidt  |
| Tunkalilla creek/3rd house east & Heysen east | Nov - April                 | 17 | 17 | 16 (94%)  | 67%  | Elizabeth Steele-Collins                | David Thorn, Thirza & Piers, Grainne Maguire, Geoff Schmidt                                    |
| Tunkalilla far west                           | Nov- April                  | 11 | 11 | 11 (100%) | 67%  | Elizabeth Steele-Collins                | Grainne Maguire, Geoff Schmidt, David Thorn  |
| Tunkalilla first house east                   | Aug, Nov - April            | 9  | 9  | 4 (44%)   | 78%  | Elizabeth Steele-Collins                | Janis Haynes, Geoff Schmidt  |
| Tunkalilla mid west estuary                   | Nov - April                 | 11 | 11 | 8 (73%)   | 67%  | Elizabeth Steele-Collins                | Grainne Maguire, Geoff Schmidt, David Thorn  |
| Tunkalilla shed caravan                       | Nov - April                 | 9  | 9  | 6 (67%)   | 67%  | Elizabeth Steele-Collins                | Geoff Schmidt, David Thorn   |
| Tunkalilla western estuary                    | Nov - April                 | 11 | 11 | 11 (100%) | 67%  | Elizabeth Steele-Collins                | Grainne Maguire, Geoff Schmidt, David Thorn  |
| Waitpinga Beach                               | Aug, Sept, Nov - April      | 23 | 23 | 21 (91%)  | 89%  | David Thorn, Terry Dennis, Wayne Forbes | Dean Cutten, Elizabeth Steele-Collins, Ross Brittain & Janette Diment, Win Syson               |
| Watsons Gap                                   | Aug - March                 | 31 | 31 | 28 (90%)  | 89%  | Ann Turner                              | Andrew Jeffery, Emma Stephens, Corey Jackson   |
| Yankalilla river mouth                        | Nov - March                 | 13 | 13 | 10 (77%)  | 56%  | David Thorn                             | Lauren Davis, Grainne Maguire  |

## Nesting success

Overall, there were 35 nesting attempts by 18 breeding pairs on the Fleurieu Peninsula, which was similar to last season's tally of 34 nests by 20 breeding pairs. The number of fledglings is also comparable to other seasons (between 7-9 fledglings and 0.45-0.58 fledglings per pair) and represents the same proportion of chicks surviving of the total eggs hatching as for the 2012/13 season (39.1%), but a slightly higher proportion (~3%) compared to seasons prior to 2012/13 (see Table 4).

Table 4. Overall summary of nests, hatching or failing at egg stage, total number of eggs and chicks observed and total chicks that fledged from the Fleurieu Peninsula during the last five breeding seasons monitored as part of BirdLife Australia's Beach-nesting Birds program.

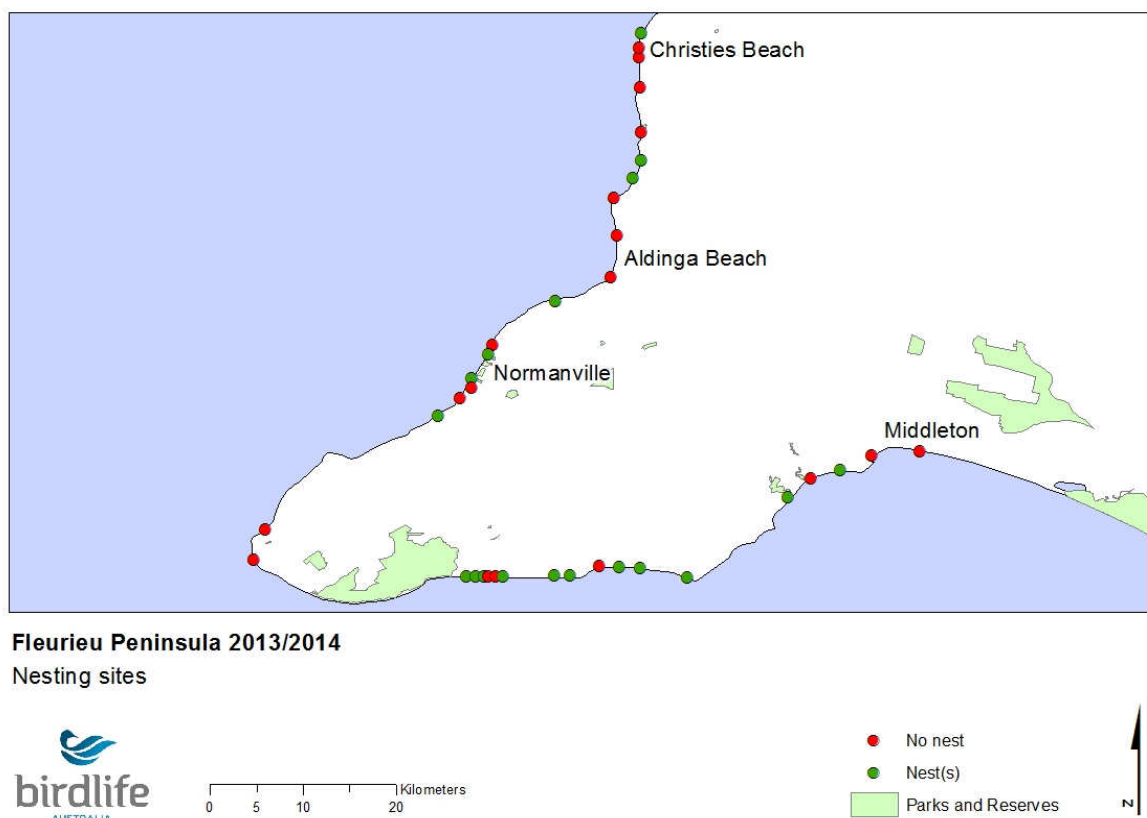
| Season                                     | # nests | # nests hatch | # fail at egg stage | total eggs | total chicks obsv. (% of eggs) | total fledged (% of chicks) | Fledgl. /pair |
|--|---------|---------------|---------------------|------------|--------------------------------|-----------------------------|---------------|
| 2009/2010<br>(12 sites, 12 breeding pairs) | 18      | 9             | 9                   | 49         | 19 (38.8%)                     | 7 (36.8%)                   | 0.58          |
| 2010/2011<br>(23 sites, 19 breeding pairs) | 36      | 14            | 22                  | 83         | 26 (31.3%)                     | 9 (34.6%)                   | 0.47          |
| 2011/2012<br>(26 sites, 14 breeding pairs) | 24      | 10            | 14                  | 60         | 22 (36.7%)                     | 8 (36.4%)                   | 0.57          |
| 2012/2013<br>(38 sites, 20 breeding pairs) | 34      | 11            | 23                  | 76         | 23 (30.3%)                     | 9 (39.1%)                   | 0.45          |
| 2013/2014<br>(35 sites, 18 breeding pairs) | 35      | 12            | 23                  | 84         | 23 (27.4%)                     | 9 (39.1%)                   | 0.50          |

Figure 2 shows where (detected) nests were distributed across the Fleurieu Peninsula in the 2013/14 season. For the first time, breeding was observed at Callawonga. This was the second season running where no breeding occurred at Bashams beach or Carrickalinga North, and the first season where nesting was not detected at Hindmarsh river mouth. There was no nesting this season at Moana or Southport compared to last season, however these sites haven't been predictable nesting sites as has been Hindmarsh in the past. There has been no nesting at Morgans beach since the 2009/10 season. While nesting was recorded at Sheepies for the first time.

Most pairs had one or two nesting attempts that were detected (Table 5), with Watsons Gap, and Tunkalilla creek/3<sup>rd</sup> house east & Heysen East having three nesting attempts each. The pair that utilise habitat at both Callawonga and Ballaparudda also recorded three nesting attempts (two at Callawonga and one at Ballaparudda). Both Maslin Beach and Inman River Outlet had five nesting attempts, none of which successfully hatched. A nest camera at Maslin Beach showed fox predation on the eggs (see image page 38).

Table 5 summarises nesting activity of pairs according to entries in the MyHoodie Data Porta and Table 6 expands this into more detail about each nest. The earliest nests recorded were during late August at Port Willunga, Watsons Gap and Maslin Beach. Breeding started to slow during February, with some sites along the southern coastline continuing into March.

Figure 2. The below map indicates which survey sites had observed breeding versus those where no nesting was observed during the season.



Of the 35 nests monitored, 65.7% failed during the egg stage (a loss of 53 eggs). This is almost identical to last season. The following causes of egg failure were suspected: fox (at Callawonga, Tunkalilla creek/3<sup>rd</sup> house & Heysen East, 2 nests at Maslin beach), tide (Inman River Outlet, Maslin Beach, Shelley Beach (Lady Bay) and Port Willunga), avian predator (Maslin Beach), dog (Inman River), cattle or fox (Ballaparudda and Callawonga), eggs that went beyond their expected hatch date and were unviable (Myponga Beach and Sheepies). For another 8 nests, there were no obvious clues as to the cause of failure.

Of the 34.8% of nests that hatched, 23 chicks were observed (see Figure 3). Last year, no nesting at Port Stanvac was recorded, but this year there was nesting and a successful hatching – this is a new pair consisting of one of the banded birds (AR).

Nine chicks were confirmed as fledglings from 6 separate nesting attempts by 6 pairs (see Figure 3). It must be noted that 6 of the 9 fledglings produced this season were from four pairs occupying one beach (Tunkalilla), and the other 3 fledglings came from Waitpinga and Callawonga. This is the first season where all fledglings have come only from beaches along the southern coast of the Peninsula. Over time, it appears that many of the previously successful sites on the Fleurieu have now not produced fledglings for at least two seasons.

Pairs that have had success in previous seasons such as Maslins, Watsons Gap, and Myponga have now not had success for several seasons. Foxes have become a major concern at Maslins, accounting for at least two nest losses in each of the past two seasons. Targeted fox control is recommended as this predator must now be cued into searching for eggs in the dune here. High tides at Port Willunga have become an issue as habitat is becoming degraded due to Sea-wheat Grass infestation of the foredune.

Figure 3. Map of nests according to success/failure; further below are zoomed in maps of areas with multiple nests which may not be clear on the map of the whole peninsula.



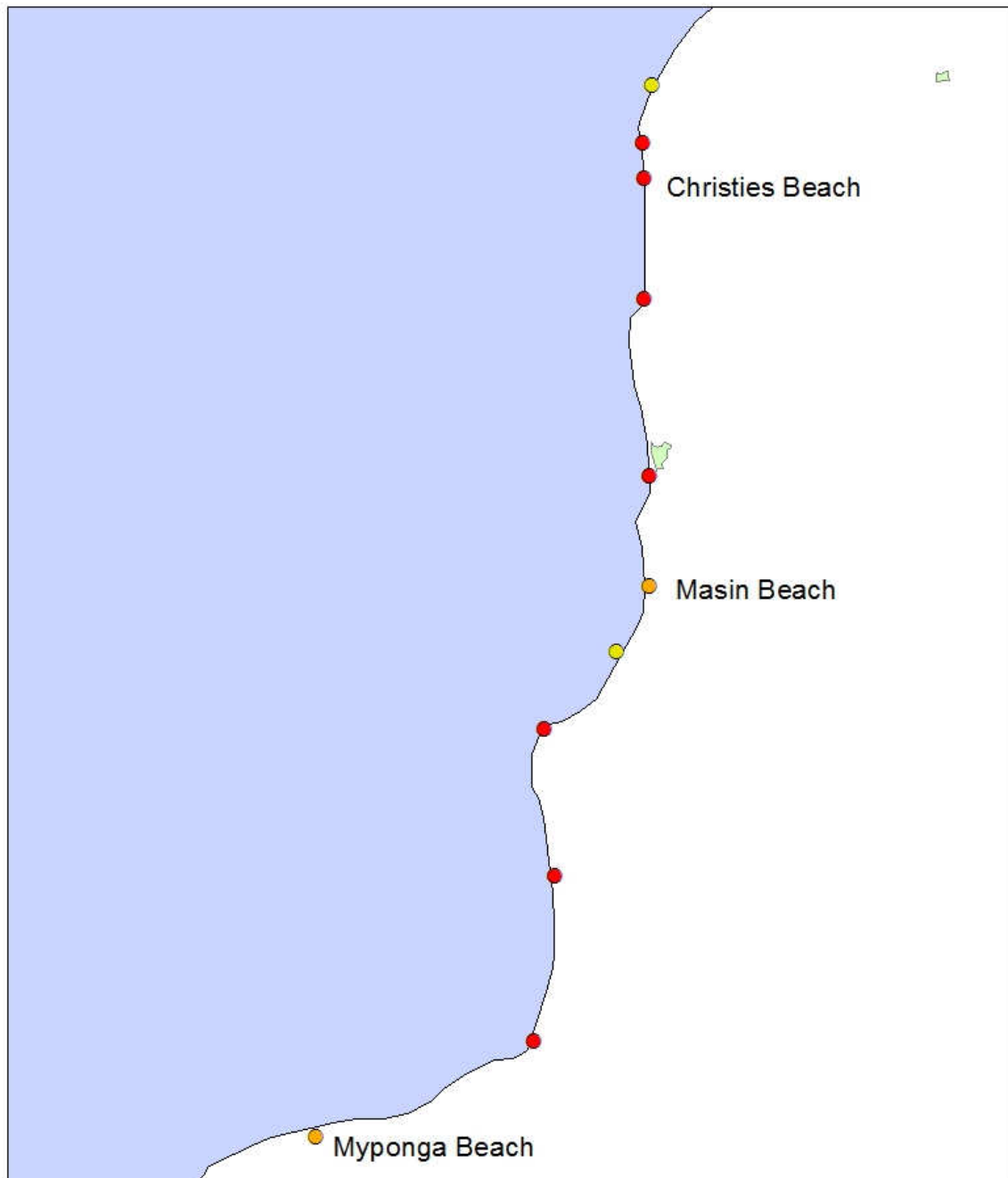
**Fleurieu Peninsula 2013/2014**  
Nesting Results



0 5 10 20 Kilometers

- No nest
- Nest(s) failed
- Chicks failed
- Fledged
- Parks and Reserves





# Fleurieu Peninsula 2013/2014

## Nesting Results - North

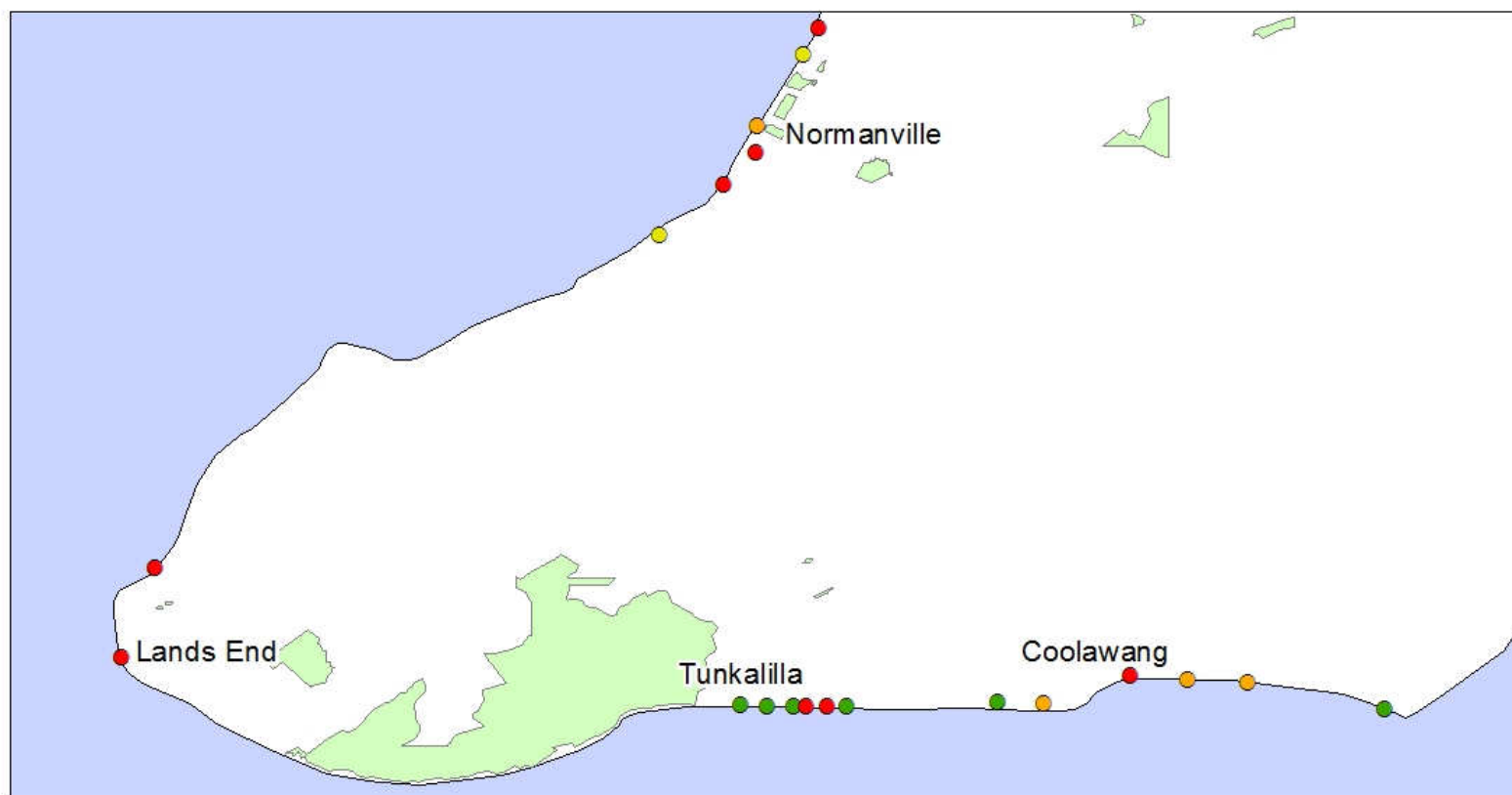


0 1.5 3 6 Kilometers

- No nest
- Nest(s) failed
- Chicks failed
- Fledged
- Parks and Reserves







# Fleurieu Peninsula 2013/2014

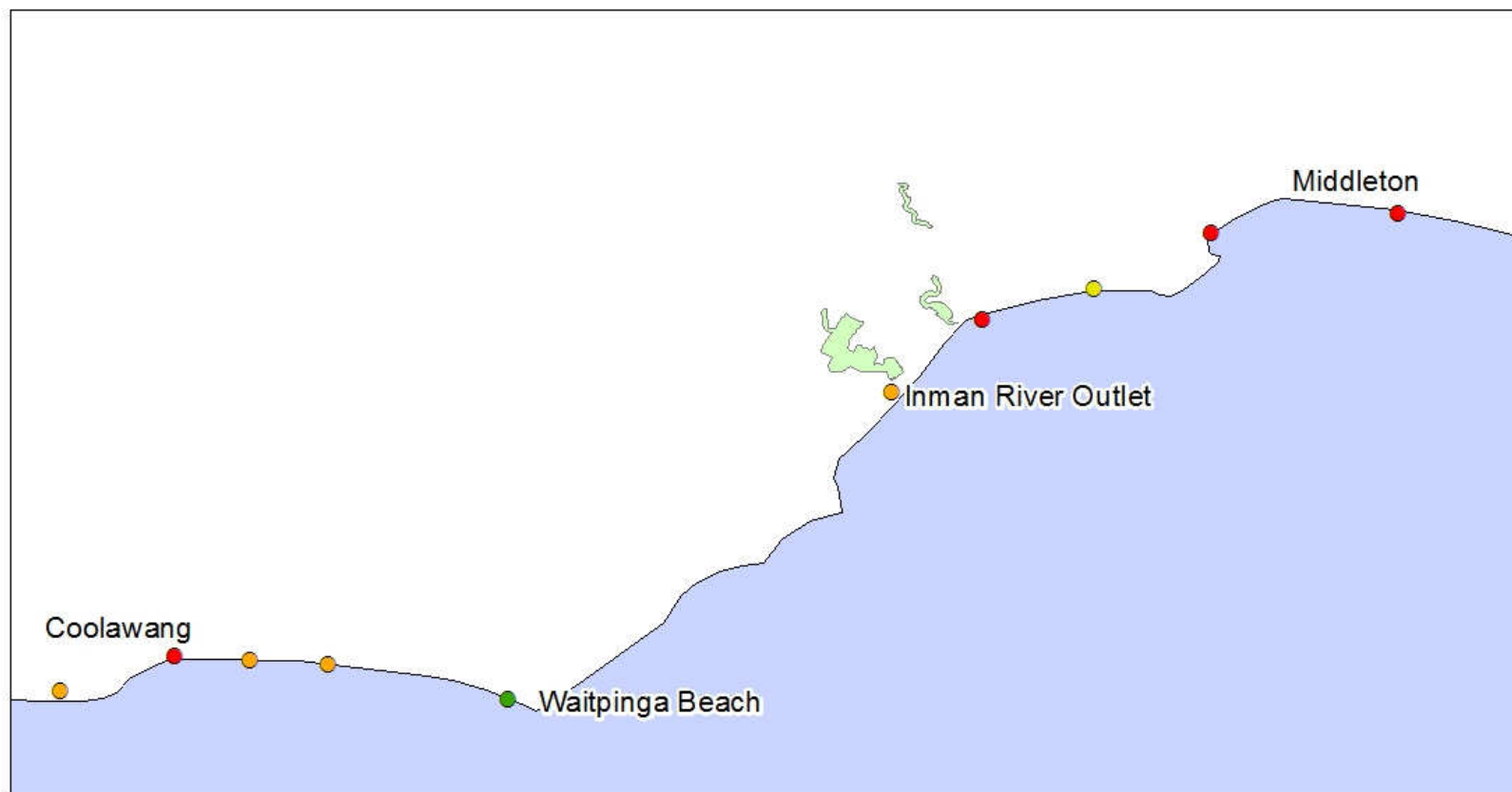
## Nesting Results - South West



0 2 4 8 Kilometers

- No nest
- Nest(s) failed
- Chicks failed
- Fledged
- Parks and Reserves





### Fleurieu Peninsula 2013/2014

Nesting Results - South East



0 1.5 3 6 Kilometers

- No nest
  - Nest(s) failed
  - Chicks failed
  - Fledged
  - Parks and Reserves
- N ↑

The earliest confirmed fledgling was from Tunkalilla creek/3rd house east & Heysen East (December), with Tunkalilla mid west estuary having two fledglings by 9th January and Tunkalilla far west also had two fledglings confirmed by late January. In late February, Callawonga fledged at least one chick (which was banded KP), Waitpinga fledged two chicks (banded PD and PR), and Tunkalilla western estuary fledged one chick (Table 4).

Overall, an egg had a 10.7% chance of fledging a chick successfully (9 fledglings out of 84 eggs; 1.1% less than in the previous season) and a nest had a 17.1% chance of fledging at least one chick (6 nests that fledged out of 35 nests in total; 2.4% higher than the previous season). In comparison to last season, chick survival was the same (39.1%) and there was little difference between the rates of nests hatching (34.2%, which is 1.9% higher than 2012/13 season).

Table 5. Overall summary of nests, number of nests managed, hatching or failing at egg stage, total number of eggs and chicks observed and total chicks that fledged from that site in the 2013/14 breeding season. Managed access point was for sites which only had temporary signs at the access point.

| Site                    | # nest attempt | # managed access point | # managed on beach | # nests hatch | # nests fail at egg stage | Total eggs | total chicks obsv. | total fledged |
|-------------------------|----------------|------------------------|--------------------|---------------|---------------------------|------------|--------------------|---------------|
| Aldinga                 | 0              | 0                      | 0                  | 0             | 0                         | 0          | 0                  | 0             |
| Ballaparudda            | 1              | 0                      | 0                  | 0             | 1                         | 2          | 0                  | 0             |
| Callawonga              | 2              | 0                      | 0                  | 1             | 1                         | 6          | 3                  | 1             |
| Bashams Beach           | 0              | 0                      | 0                  | 0             | 0                         | 0          | 0                  | 0             |
| Carrickalinga North     | 0              | 0                      | 0                  | 0             | 0                         | 0          | 0                  | 0             |
| Carrickalinga           | 1              | 0                      | 1                  | 1             | 0                         | 3          | 1                  | 0             |
| Christies Beach         | 0              | 0                      | 0                  | 0             | 0                         | 0          | 0                  | 0             |
| Coolawang               | 0              | 0                      | 0                  | 0             | 0                         | 0          | 0                  | 0             |
| Hindmarsh River Mouth   | 0              | 0                      | 0                  | 0             | 0                         | 0          | 0                  | 0             |
| Inman River Outlet      | 5              | 1                      | 4                  | 0             | 5                         | 11         | 0                  | 0             |
| Lands End               | 0              | 0                      | 0                  | 0             | 0                         | 0          | 0                  | 0             |
| Maslin Beach            | 5              | 0                      | 5                  | 0             | 5                         | 13         | 0                  | 0             |
| Middleton beach         | 0              | 0                      | 0                  | 0             | 0                         | 0          | 0                  | 0             |
| Moana Beach             | 0              | 0                      | 0                  | 0             | 0                         | 0          | 0                  | 0             |
| Morgan's beach Fleurieu | 0              | 0                      | 0                  | 0             | 0                         | 0          | 0                  | 0             |
| Myponga Beach           | 2              | 0                      | 2                  | 0             | 2                         | 6          | 0                  | 0             |
| Normanville North       | 1              | 0                      | 1                  | 0             | 1                         | 2          | 0                  | 0             |

| Site  | # nest attempt | # managed access point | # managed on beach | # nests hatch | # nests fail at egg stage | Total eggs | total chicks obsv. | total fledged |
|---|----------------|------------------------|--------------------|---------------|---------------------------|------------|--------------------|---------------|
| Normanville South                             | 0              | 0                      | 0                  | 0             | 0                         | 0          | 0                  | 0             |
| O'Sullivan's Beach                            | 0              | 0                      | 0                  | 0             | 0                         | 0          | 0                  | 0             |
| Parsons Beach                                 | 2              | 0                      | 0                  | 0             | 2                         | 4          | 0                  | 0             |
| Port Stanvac                                  | 1              | 0                      | 0                  | 1             | 0                         | 2          | 2                  | 0             |
| Port Willunga                                 | 2              | 0                      | 2                  | 1             | 1                         | 5          | 2                  | 0             |
| Sheepies beach                                | 1              | 0                      | 0                  | 0             | 1                         | 3          | 0                  | 0             |
| Shelley Beach (lady bay)                      | 2              | 1                      | 1                  | 1             | 1                         | 4          | 2                  | 0             |
| Silver Sands                                  | 0              | 0                      | 0                  | 0             | 0                         | 0          | 0                  | 0             |
| Snapper Point                                 | 0              | 0                      | 0                  | 0             | 0                         | 0          | 0                  | 0             |
| Southport                                     | 0              | 0                      | 0                  | 0             | 0                         | 0          | 0                  | 0             |
| Tunkalilla far west                           | 1              | 0                      | 0                  | 1             | 0                         | 3          | 3                  | 2             |
| Tunkalilla western estuary                    | 1              | 0                      | 1                  | 1             | 0                         | 3          | 1                  | 1             |
| Tunkalilla mid west estuary                   | 1              | 0                      | 1                  | 1             | 0                         | 2          | 2                  | 2             |
| Tunkalilla first house east                   | 0              | 0                      | 0                  | 0             | 0                         | 0          | 0                  | 0             |
| Tunkalilla shed caravan                       | 0              | 0                      | 0                  | 0             | 0                         | 0          | 0                  | 0             |
| Tunkalilla creek/3rd house east & Heysen East | 3              | 3                      | 0                  | 1             | 2                         | 8          | 1                  | 1             |
| Waitpinga Beach                               | 1              | 0                      | 0                  | 1             | 0                         | 2          | 2                  | 2             |
| Watsons Gap                                   | 3              | 0                      | 3                  | 2             | 1                         | 5          | 4                  | 0             |
| Yankalilla river mouth                        | 0              | 0                      | 0                  | 0             | 0                         | 0          | 0                  | 0             |
| <b>Total</b>                                  | <b>35</b>      | <b>5</b>               | <b>21</b>          | <b>12</b>     | <b>23</b>                 | <b>84</b>  | <b>23</b>          | <b>9</b>      |

**Table 6.** Detailed summary of nest progress for each site according to data entered in the MyHoodie data portal and sent to BirdLife Australia for the 2013/14 breeding season.

| Site                  | Date                  | Nest update  | #<br>eggs | #<br>chicks | Nest<br># |
|-----------------------|-----------------------|--|-----------|-------------|-----------|
| Aldinga               | Sept, Oct, Dec        | no nesting, no birds on territory  |           |             | 0         |
| Ballaparudda          | 27/11/2013            | Nest(with eggs)  | 2         |             | 1         |
| Ballaparudda          | 4/12/2013             | Failed since last visit  | 0         |             | 1         |
| Callawonga            | 19/10/2013            | Nest(with eggs)  | 3         |             | 1         |
| Callawonga            | 27/10/2013            | Failed since last visit  |           |             | 1         |
| Callawonga            | 4/12/2013             | Scrape(no eggs)  |           |             | 0         |
| Callawonga            | 1/01/2013             | Nest(with eggs)  | 3         |             | 2         |
| Callawonga            | 23/01/2014            | Chicks   |           | 3           | 2         |
| Callawonga            | 3/2/2014              | One chick failed   |           | 2           | 2         |
| Callawonga            | 10/02/2014            | x1 Chick flagged "KP" by Terry Dennis (second chick banded with metal only, too light to receive leg flag) |           |             | 2         |
| Callawonga            | 9/03/2014             | KP seen at Tunkalilla mid west estuary, confirming x1 fledgling  |           |             | 0         |
| Bashams Beach         | Aug-Jan, March, April | no nesting, only one adult on territory  |           |             | 0         |
| Carrickalinga North   | Sept-Nov, Jan         | no nesting, yes on territory   |           |             | 0         |
| Carrickalinga         | 22/09/2013            | Suspect nest   |           |             | 0         |
| Carrickalinga         | 13/12/2013            | Nest(with eggs)  | 3         |             | 1         |
| Carrickalinga         | 6/01/2014             | Chick  |           | 1           | 1         |
| Carrickalinga         | 9/01/2014             | Chick  |           |             | 1         |
| Carrickalinga         | 9/01/2014             | Failed since last visit  |           |             | 1         |
| Christies Beach       | Aug, Oct, Dec         | no nesting, no birds on territory  |           |             | 0         |
| Coolawang             | Feb                   | no nesting, no birds on territory  |           |             | 0         |
| Hindmarsh River Mouth | Aug-Oct, Dec-April    | no nesting, yes on territory   |           |             | 0         |
| Inman River Outlet    | 11/09/2013            | Nest(with eggs)  | 2         |             | 1         |
| Inman River Outlet    | 27/09/2013            | Failed since last visit  |           |             | 1         |
| Inman River Outlet    | 28/09/2013            | Scrape(no eggs)  |           |             | 0         |
| Inman River Outlet    | 26/10/2013            | Nest(with eggs)  | 3         |             | 2         |
| Inman River Outlet    | 6/11/2013             | Failed since last visit  |           |             | 2         |
| Inman River Outlet    | 19/11/2013            | Nest(with eggs)  | 2         |             | 3         |
| Inman River Outlet    | 30/11/2013            | Failed since last visit  |           |             | 3         |
| Inman River Outlet    | 10/12/2013            | Nest(with eggs)  | 3         |             | 4         |
| Inman River Outlet    | 27/12/2013            | Failed since last visit  |           |             | 4         |

|                    |               |   |   |   |
|--------------------|---------------|---|---|---|
| Inman River Outlet | 7/01/2014     | Scrape(no eggs)                                 |   | 0 |
| Inman River Outlet | 11/01/2014    | Nest(with eggs)                                 | 1 | 5 |
| Inman River Outlet | 16/01/2014    | Failed since last visit                         |   | 5 |
| Lands End          | Aug-March     | no nesting, only single bird sighted on 1 visit |   | 0 |
| Maslin Beach       | 30/08/2013    | Nest(with eggs)                                 | 3 | 1 |
| Maslin Beach       | 10/09/2013    | Failed since last visit                         |   | 1 |
| Maslin Beach       | 18/09/2013    | Suspect nest                                    |   | 0 |
| Maslin Beach       | 20/09/2013    | Nest(with eggs)                                 | 2 | 2 |
| Maslin Beach       | 27/09/2013    | Failed since last visit                         |   | 2 |
| Maslin Beach       | 10/10/2013    | Nest(with eggs)                                 | 2 | 3 |
| Maslin Beach       | 14/10/2013    | Failed since last visit                         |   | 3 |
| Maslin Beach       | 27/10/2013    | Nest(with eggs)                                 | 3 | 4 |
| Maslin Beach       | 29/10/2013    | Nest(with eggs), camera installed               |   | 4 |
| Maslin Beach       | 20/11/2013    | Failed since last visit                         |   | 4 |
| Maslin Beach       | 3/12/2013     | Nest(with eggs)                                 | 3 | 5 |
| Maslin Beach       | 31/12/2013    | Failed since last visit                         |   | 5 |
| Middleton beach    | Sept, Feb     | no nesting, no birds on territory               |   | 0 |
| Moana Beach        | Aug-Feb       | no nesting, no birds on territory               |   | 0 |
| Morgan's beach     | Aug-March     | no nesting, yes on territory                    |   | 0 |
| Myponga Beach      | 28/10/2013    | Nest(with eggs)                                 | 3 | 1 |
| Myponga Beach      | 29/10/2013    | Failed since last visit                         |   | 1 |
| Myponga Beach      | 4/11/2013     | Scrape(no eggs)                                 |   | 0 |
| Myponga Beach      | 17/12/2013    | Nest(with eggs)                                 | 1 | 2 |
| Myponga Beach      | 6/01/2014     | Nest(with eggs) second egg laid                 | 2 | 2 |
| Myponga Beach      | 11/01/2014    | Nest(with eggs)third egg laid                   | 3 | 2 |
| Myponga Beach      | 5/02/2014     | Failed since last visit                         |   | 0 |
| Normanville North  | 3/01/2014     | Nest(with eggs)                                 | 2 | 1 |
| Normanville North  | 21/01/2014    | Failed since last visit                         |   | 1 |
| Normanville South  | Feb           | no nesting, no birds on territory               |   | 0 |
| O'Sullivan's Beach | Aug, Oct, Dec | no nesting, no birds on territory               |   | 0 |
| Parsons Beach      | 9/01/2014     | Nest(with eggs)                                 | 3 | 1 |
| Parsons Beach      | 22/01/2014    | Failed since last visit/ Scrape no eggs         |   | 1 |
| Parsons Beach      | 31/01/2014    | Nest(with eggs)                                 | 1 | 2 |
| Parsons Beach      | 11/02/2014    | Failed since last visit                         |   | 2 |

|                             |                            |  |   |   |   |
|-----------------------------|----------------------------|--|---|---|---|
| Port Stanvac                | 14/12/2013                 | Suspect nest   |   |   | 0 |
| Port Stanvac                | 20/12/2013                 | Nest(with eggs)                                      | 2 |   | 1 |
| Port Stanvac                | 14/01/2014                 | Chicks   |   | 2 | 1 |
| Port Stanvac                | 18/01/2014                 | one chick failed                                     |   | 1 | 1 |
| Port Stanvac                | 7/02/2014                  | Chick suspected failed                               |   |   | 1 |
| Port Stanvac                | 11/02/2014                 | chick confirmed failed                               |   |   | 1 |
| Port Willunga               | 25/08/2013                 | Nest(with eggs)                                      | 3 |   | 1 |
| Port Willunga               | 25/09/2013                 | Chicks   |   | 2 | 1 |
| Port Willunga               | 28/09/2013                 | Failed since last visit                              |   |   | 1 |
| Port Willunga               | 14/10/2013                 | Nest(with eggs)                                      | 2 |   | 2 |
| Port Willunga               | 18/10/2013                 | Failed since last visit                              |   |   | 2 |
| Sheepies beach              | 9/01/2014                  | Nest(with eggs)                                      | 3 |   | 1 |
| Sheepies beach              | 22/02/2014                 | Failed since last visit                              | 2 |   | 1 |
| Shelley Beach (lady bay)    | 30/11/2013                 | Nest(with eggs)                                      | 2 |   | 1 |
| Shelley Beach (lady bay)    | 10/12/2013                 | Failed since last visit                              |   |   | 1 |
| Shelley Beach (lady bay)    | 30/01/2014                 | Chicks   | 2 | 2 | 2 |
| Shelley Beach (lady bay)    | 9/02/2014                  | Chick  |   | 1 | 2 |
| Shelley Beach (lady bay)    | 17/02/2014                 | Failed since last visit                              |   |   | 2 |
| Silver Sands                | Sept, Oct                  | no nesting, no birds on territory                    |   |   | 0 |
| Snapper Point               | Sept, Oct, Dec, Jan, March | no nesting, yes on territory (only for one sighting) |   |   | 0 |
| Southport                   | Aug - April                | no nesting, yes on territory                         |   |   | 0 |
| Tunkalilla far west         | 15/11/2013                 | Nest(with eggs)                                      | 3 |   | 1 |
| Tunkalilla far west         | 14/12/2013                 | Chicks   |   | 3 | 1 |
| Tunkalilla far west         | 10/01/2014                 | one chick failed                                     |   | 2 | 1 |
| Tunkalilla far west         | 23/01/2014                 | Fledged (x2)   |   |   | 1 |
| Tunkalilla western estuary  | 15/11/2013                 | Scrape(no eggs)                                      |   |   | 0 |
| Tunkalilla western estuary  | 23/11/2013                 | Scrape(no eggs)                                      |   |   | 0 |
| Tunkalilla western estuary  | 14/12/2013                 | Nest(with eggs)                                      | 3 |   | 1 |
| Tunkalilla western estuary  | 10/01/2014                 | Suspect chicks                                       |   |   | 1 |
| Tunkalilla western estuary  | 23/01/2014                 | Chick  |   | 1 | 1 |
| Tunkalilla western estuary  | 18/02/2014                 | Fledged (x1)   |   |   | 1 |
| Tunkalilla mid west estuary | 15/11/2013                 | Nest(with eggs)                                      | 2 |   | 1 |
| Tunkalilla mid west estuary | 23/11/2013                 | Nest(with eggs)                                      | 2 |   | 1 |
| Tunkalilla mid west estuary | 4/12/2013                  | Chicks   |   | 2 | 1 |

|   |            |  |   |   |
|---|------------|--|---|---|
| Tunkalilla mid west estuary                   | 10/01/2014 | Fledged (x2)                                   |   | 1 |
| Tunkalilla first house east                   | 27/08/2013 | Suspect nest                                   |   | 0 |
| Tunkalilla shed caravan                       | Nov-April  | On territory                                   |   | 0 |
| Tunkalilla creek/3rd house east & Heysen East | 15/11/2013 | Suspect nest                                   |   |   |
| Tunkalilla creek/3rd house east & Heysen East | 23/11/2013 | Chick  | 1 | 1 |
| Tunkalilla creek/3rd house east & Heysen East | 4/12/2013  | Suspect chicks                                 |   | 1 |
| Tunkalilla creek/3rd house east & Heysen East | 14/12/2013 | Chick  | 1 | 1 |
| Tunkalilla creek/3rd house east & Heysen East | 26/12/2013 | Fledged (x1)                                   |   | 1 |
| Tunkalilla creek/3rd house east & Heysen East | 10/01/2014 | Nest(with eggs)                                | 3 | 2 |
| Tunkalilla creek/3rd house east & Heysen East | 27/01/2014 | Failed since last visit                        |   | 2 |
| Tunkalilla creek/3rd house east & Heysen East | 8/02/2014  | Nest(with eggs)                                | 2 | 3 |
| Tunkalilla creek/3rd house east & Heysen East | 9/03/2014  | Failed since last visit                        |   | 3 |
| Waitpinga Beach                               | 19/12/2013 | Suspect nest                                   |   | 0 |
| Waitpinga Beach                               | 20/01/2014 | Chicks   | 2 | 1 |
| Waitpinga Beach                               | 10/02/2014 | Chicks flagged PD & PR                         | 2 | 1 |
| Waitpinga Beach                               | 24/02/2014 | PD & PR Fledged                                |   | 1 |
| Watsons Gap                                   | 26/08/2013 | Suspect nest                                   |   | 0 |
| Watsons Gap                                   | 30/08/2013 | Nest(with eggs)                                | 2 | 1 |
| Watsons Gap                                   | 27/09/2013 | Chicks   | 2 | 1 |
| Watsons Gap                                   | 7/10/2013  | Chicks failed since last visit/Scrape(no eggs) |   | 1 |
| Watsons Gap                                   | 25/10/2013 | Nest(with eggs)                                | 2 | 2 |
| Watsons Gap                                   | 13/11/2013 | Failed since last visit                        |   | 2 |
| Watsons Gap                                   | 16/11/2013 | Nest(with eggs)                                | 1 | 3 |
| Watsons Gap                                   | 19/11/2013 | Nest(with eggs) second egg laid                | 2 | 3 |
| Watsons Gap                                   | 24/11/2013 | Nest(with eggs) third egg laid                 | 3 | 3 |
| Watsons Gap                                   | 19/12/2013 | Chicks   | 2 | 3 |
| Watsons Gap                                   | 31/12/2013 | Failed since last visit                        |   | 3 |
| Yankalilla river mouth                        | Nov-March  | no nesting, yes on territory                   |   | 0 |



### *Breeding Site Management*

Of the 12 successfully hatched nests, 4 nests had no active management, but 3 of these nests were located in very remote sites and were assessed at the time as not being at risk of human impacts (Callawonga, Waitpinga and Tunkalilla far west). The other 8 nests which successfully hatched were actively protected, with two of these only having temporary signs at the access points, and the other 6 having active management on the beach (Table 7). There was only one record of a failed nest with eggs where a dog was implicated (Inman River Outlet). This indicates that management is effective at reducing human-based threats at most sites. Temporary update signs at the access point may assist with human-based threats at sites such as the Inman River Outlet. Chick fates are notoriously difficult to ascertain, only at Port Willunga was the suspected cause of failure for the 3-5 day old chicks a major storm surge which covered the entire beach. At all other sites, the chicks were reported missing due to an unknown cause.

Table 7. Summary of managements across sites during the 2013/14 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; if no chicks sighted eggs were assumed to be clutches of 2).

| site               | date found | # eggs | chick (s) sighted | # chicks | # fledge | nest location | cause of failure                    | management                                       |
|--------------------|------------|--------|-------------------|----------|----------|---------------|-------------------------------------|--|
| Ballaparudda       | 27/11/13   | 2      |                   | 0        | 0        | beach         | cattle                              | none   |
| Callawonga         | 19/10/13   | 3      |                   |          |          | Foredune face | fox                                 | none   |
| Callawonga         | 31/12/13   | 3      | 23/01/14          | 3        | 1 (KP)   | beach         | fledged                             | none   |
| Carrickalinga      | 13/12/13   | 3      | 6/01/14           | 1        |          | beach         | unknown (chick)                     | sign access, sign nest, rope fence               |
| Inman River Outlet | 11/09/13   | 2      |                   |          |          | beach         | tide                                | sign access, sign nest, rope fence               |
| Inman River Outlet | 26/10/13   | 3      |                   |          |          | Foredune face | dog                                 | sign nest, rope fence                            |
| Inman River Outlet | 19/11/13   | 2      |                   |          |          | beach         | unknown                             | sign access, sign nest, rope fence               |
| Inman River Outlet | 10/12/13   | 3      |                   |          |          | beach         | unknown                             | sign nest, rope fence                            |
| Inman River Outlet | 11/01/14   | 1      |                   |          |          | beach         | unknown                             | sign access                                      |
| Maslin Beach       | 30/08/13   | 3      |                   |          |          | Dune          | unknown                             | sign access, sign nest, rope fence               |
| Maslin Beach       | 20/09/13   | 2      |                   |          |          | Foredune face | tide                                | sign access, sign nest, rope fence               |
| Maslin Beach       | 10/10/13   | 2      |                   |          |          | dune          | raven                               | sign access, sign nest, rope fence               |
| Maslin Beach       | 27/10/13   | 3      |                   |          |          | dune          | fox                                 | sign access, sign nest, rope fence remote camera |
| Maslin Beach       | 3/12/13    | 3      |                   |          |          | Foredune face | fox                                 | sign access, sign nest, rope fence               |
| Myponga Beach      | 28/10/13   | 3      |                   |          |          | Estuary/spit  | unknown                             | sign access, sign nest, rope fence               |
| Myponga Beach      | 17/12/13   | 3      |                   |          |          | Foredune face | Eggs exceeded hatch date (unviable) | sign access, sign nest, rope fence               |
| Normanville North  | 3/01/14    | 2      |                   |          |          | Foredune face | unknown                             | sign nest, rope fence                            |

| site  | date found | # eggs | chick (s) sighted | # chicks | # fledge    | nest location | cause of failure | management                         |
|---|------------|--------|-------------------|----------|-------------|---------------|------------------|------------------------------------|
| Parsons Beach                                 | 9/01/14    | 3      |                   |          |             | beach         | unknown          | none                               |
| Parsons Beach                                 | 31/01/14   | 1      |                   |          |             | beach         | unknown          | none                               |
| Port Stanvac                                  | 20/12/13   | 2      | 14/01/14          | 2        |             | Foredune face | unknown (chicks) | none                               |
| Port Willunga                                 | 25/08/13   | 3      | 25/09/13          | 2        |             | Foredune face | tide (chicks)    | sign access, sign nest, rope fence |
| Port Willunga                                 | 14/10/13   | 2      |                   |          |             | beach         | tide             | sign access, sign nest, rope fence |
| Sheepies beach                                | 9/01/14    | 3      |                   |          |             | beach         | abandoned        | none                               |
| Shelley Beach (lady bay)                      | 30/11/13   | 2      |                   |          |             | beach         | tide             | sign access, sign nest, rope fence |
| Shelley Beach (lady bay)                      | 30/01/14   | 2*     | 30/01/14          | 2        |             | never found   | unknown          | sign access                        |
| Waitpinga Beach                               | 20/01/14   | 2*     | 20/01/14          | 2        | 2 (PD & PR) | suspect dune  | fledged          | none                               |
| Watsons Gap                                   | 30/08/13   | 2      | 30/08/13          | 2        |             | estuary/spit  | unknown (chicks) | Sign Access, Sign Nest, Rope fence |
| Watsons Gap                                   | 25/10/13   | 2      |                   |          |             | estuary/spit  | unknown          | sign access, sign nest, rope fence |
| Watsons Gap                                   | 16/11/13   | 3      | 19/12/13          | 2        |             | beach         | unknown (chicks) | sign access, sign nest, rope fence |
| Tunkalilla far west                           | 15/11/13   | 3      | 14/12/13          | 3        | 2           | beach         | fledged          | none                               |
| Tunkalilla western estuary                    | 14/12/13   | 3      | 23/01/14          | 1        | 1           | beach         | fledged          | sign access, sign nest             |
| Tunkalilla mid west estuary                   | 15/11/13   | 2      | 4/12/13           | 2        | 2           | beach         | fledged          | sign nest                          |
| Tunkalilla creek/3rd house east & Heysen East | 23/11/13   | 1*     | 23/11/13          | 1        | 1           | never found   | fledged          | sign access                        |
| Tunkalilla creek/3rd house east & Heysen East | 10/01/14   | 3      |                   |          |             | beach         | unknown          | sign access                        |
| Tunkalilla creek/3rd house east & Heysen East | 8/02/14    | 2      |                   |          |             | dune          | fox              | sign access                        |

## Threats to breeding pairs

Of 627 sightings, 452 of these used the full update form. Of these, 396 (63%) had threat assessments attached (across 36 sites; Tables 8-12). Sites with less than four threat assessments were not included in any summary tables; Aldinga, Bashams Beach, Carrickalinga North, Coolawang, Hindmarsh River Mouth, Middleton, Moana beach, Normanville South, and Tunkalilla 1st alcove far east. Sites with infrequent threat assessments (>4 assessments) are denoted by an asterisk throughout tables below; Morgans beach, Normanville North, Snapper Point and Watsons Gap with between 5 and 8 threat records each. Accordingly, this data should be treated with caution due to the small sample sizes.

It was great to see more threat data coming in this season and for the first time we received substantial threat assessments for several sites that have lacked historical data, so this is a great improvement and helps us understand those sites more.

Of the potential threats to Hooded Plovers monitored by volunteers during the breeding season, people, dogs, silver gulls and foxes were most prevalent at sites on the Fleurieu (Table 8). This year the prevalence of threats differed to previous years, however this was due to the range of sites being assessed for threats, whereby on some of the southern peninsula sites, foxes, cattle and sheep were prevalent threats. Ravens appeared to be more prevalent this season. The disparity between dogs off and on lead was not as great this season which is a positive result (2012/13 data revealed 40.8% frequency of dogs off lead sightings versus 7.2% dogs on lead sightings). Horses and cats were two of the least prevalent threat types recorded. There were less than ten sightings of non-permitted vehicles on sites.

Table 8. Proportion of visits where threats were observed (this includes evidence of tracks unless specified).

| Threat  | Prop. visits present<br>(threat records = 380) |
|---|--|
| Evidence of human beach use (footprints &/or sightings) | 67.63% (257)                                   |
| Beach users observed                                    | 56.32% (214)                                   |
| Evidence of dog use (dog prints)                        | 47.37% (180)                                   |
| Silver gulls  | 45.79% (174)                                   |
| Foxes (prints)  | 39.74% (151)                                   |
| Dogs sighted  | 34.21% (130)                                   |
| Dogs off lead   | 27.11% (103)                                   |
| Dogs on lead  | 17.11% (65)                                    |
| Pacific gulls   | 16.05% (61)                                    |
| Vehicles (all vehicle types, incl. tracks)              | 13.68% (52)                                    |

| <b>Threat</b>         | <b>Prop. visits present<br/>(threat records = 380)</b> |
|-----------------------|--|
| Cattle                | 13.68% (52)  |
| Ravens                | 13.16% (50)  |
| Magpies               | 11.84% (45)  |
| Sheep                 | 11.05% (42)  |
| Bird of Prey          | 9.21% (35)   |
| Non-permitted vehicle | 2.76% (9)  |
| Permitted vehicle     | 1.58% (6)  |
| Horses                | 1.32% (5)  |
| Cat prints            | 1.32% (5)  |

Table 9 provides a summary of the proportion of sites where given threats were observed. Dogs were not sighted at Parks sites (Parsons and Waitpinga) as well as the more remote sites. Cattle and sheep were present at Tunkalilla sites, Ballaparudda and Callawonga, roaming onto the beach due to unrepaired fences.

Table 9. 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.

| <b>Threat</b> | <b>Prop sites present<br/>(26)</b> | <b>Detected at:</b>    | <b>Not detected at:</b>   |
|---------------|------------------------------------|------------------------|---|
| Silver gulls  | 96.2% (25)                         | All sites, except for: | Lands End   |
| Footprints    | 92.3% (24)                         | All sites, except for: | Ballaparudda, Port Stanvac  |
| People        | 88.5% (23)                         | All sites, except for: | Ballaparudda, Port Stanvac, Sheepies  |
| Dog prints    | 69.2% (18)                         | All sites, except for: | Ballaparudda, Parsons beach, Port Stanvac, Sheepies, Tunkalilla far west, Tunkalilla western estuary, Tunkalilla mid west estuary, Waitpinga beach                        |
| Foxes         | 69.2% (18)                         | All sites, except for: | Carrickalinga, Inman River outlet, Morgans beach*, Myponga beach, Port Willunga, Snapper Point*, Southport, Watsons Gap*  |
| Pacific gulls | 65.4% (17)                         | All sites, except for: | Ballaparudda, Callawonga, Morgans beach*, Normanville North*, Sheepies beach, all Tunkalilla (except mid west estuary and western estuary)                                |
| Dogs sighted  | 61.5% (16)                         | All sites, except for: | Ballaparudda, Callawonga, Lands End, Parsons beach, Port Stanvac, Sheepies, Tunkalilla far west, Tunkalilla western estuary, Tunkalilla mid west estuary, Waitpinga beach |

| <b>Threat</b>                   | <b>Prop sites present (26)</b> | <b>Detected at:</b>  | <b>Not detected at:</b>  |
|---------------------------------|--------------------------------|--|--|
| Magpies                         | 61.5% (16)                     | Callawonga, Inman river outlet, Lands end, Maslin beach, Normanville North*, Port Willunga, Shelley beach (lady bay), All Tunkalilla sites, Waitpinga beach, Yankalilla river mouth  | All other sites  |
| Dogs off                        | 57.7% (15)                     | All sites, except for:   | Ballaparudda, Callawonga, Lands End, Parsons beach, Port Stanvac, Sheepies beach, Tunkalilla far west, Tunkalilla western estuary, Tunkalilla mid west estuary, Tunkalilla creek/3 <sup>rd</sup> house east, Waitpinga beach |
| Ravens                          | 57.7% (15)                     | Carrickalinga, Inman river outlet, Lands end, Morgans beach*, Normanville North*, Parsons beach, Shelley beach (lady bay), All Tunkalilla sites except far west, Waitpinga beach, Yankalilla river mouth   | All other sites  |
| Birds of Prey                   | 57.7% (15)                     | Ballaparudda, Callawonga, Carrickalinga, Inman river outlet, Lands end, Maslin beach, Port Willunga, Shelley beach (lady bay), Snapper point*, Southport, Tunkalilla creek/3 <sup>rd</sup> house east, Tunkalilla first house east, Tunkalilla western estuary, Watsons gap*, Yankalilla river mouth | All other sites  |
| Vehicles (tracks and sightings) | 50.0% (13)                     | Callawonga, Inman river outlet, Maslin beach, Morgans beach*, Myponga beach, Shelley beach (lady bay), Southport, Tunkalilla creek/3 <sup>rd</sup> house east, Tunkalilla far west, Tunkalilla first house east, Tunkalilla shed caravan, Tunkalilla western estuary, Yankalilla river mouth         | All other sites  |
| Dogs on                         | 42.3% (11)                     | Carrickalinga, Inman river outlet, Maslin beach, Myponga beach, Normanville North*, Port Willunga, Snapper Point*, Southport, Tunkalilla creek/3 <sup>rd</sup> house east, Watsons Gap*, Yankalilla river mouth  | All other sites  |
| Cattle                          | 34.6% (9)                      | Ballaparudda, Callawonga, All Tunkalilla   | All other sites  |
| Sheep                           | 34.6% (9)                      | Ballaparudda, Callawonga, All Tunkalilla   | All other sites  |

| <b>Threat</b>          | <b>Prop sites present (26)</b> | <b>Detected at:</b>  | <b>Not detected at:</b> |
|------------------------|--------------------------------|--|-------------------------|
| Non-permitted vehicles | 26.9% (7)                      | Callawonga, Morgans beach*, Myponga beach, Shelley beach (lady bay), Tunkalilla far west, Tunkalilla western estuary, Yankalilla river mouth | All other sites         |
| Horses                 | 19.2% (5)                      | Ballaparudda, Callawonga, Inman river outlet, Maslin beach, Yankalilla river mouth   | All other sites         |
| Permitted vehicles     | 11.5% (3)                      | Maslin beach, Myponga beach, Southport,  | All other sites         |
| Cat prints             | 11.5% (3)                      | Maslin beach, Port Stanvac, Tunkalilla first house east  | All other sites         |

Table 10 summarises the activities that recreationists were observed participating in. This season observations of surfing/swimming moved from third to second place, and dog walking from second to third. Table 11 reveals that there were distinct differences in the visitor base for sites and this can assist in tailoring and distributing awareness raising materials at the identified key stakeholder groups. There are sites dominated by mobile recreationists, that is mainly walkers and dog walkers (e.g. Inman River outlet), while at some sites static recreationists such as anglers (Waitpinga) or people sitting/swimming (Myponga) are more common, and at others a whole suite of recreationists use the beach (e.g. Carrickalinga). Table 11 further summarises the prevalence and intensity of threats at each site separately revealing that sites have distinct threat profiles and can differ radically from one another. At some sites, foxes and livestock wandering onto the beach are the greatest concern; at others, avian predators dominate (e.g. ravens at Yankalilla river mouth and Shelley beach), while at others dogs off lead and people dominate the threat profile (e.g. Maslin beach and Carrickalinga) or vehicles dominate (e.g. Morgans beach).

Table 10. The main activities people were observed using the beaches for. In total, there were 1,861 people at the water's edge, 496 on the beach, 2 observed inside signed/fenced areas and 21 in the dune.

| <b>Human recreational activity (of 2,380 people observed)</b> | <b>% intensity</b> |
|---|--------------------|
| Walking   | 41.3% (984)        |
| Surfing/swimming  | 18.1% (431)        |
| Dog walking   | 16.4% (390)        |
| Sitting/sun-baking  | 13.7% (327)        |
| Fishing   | 5.3% (126)         |
| People playing games  | 3.9% (93)          |
| Driving/using vehicles  | 0.9% (29)          |

Table 11. The prevalence of potential threats to Hooded Plover at sites monitored (those with an asterisk have so few threat assessments, data should be treated with caution). Prevalence refers to the how frequently that threat was observed (# times/# visits). Threat prevalence is categorised as heavy, moderate, sparse or rare according to the percentage of time recorded. Common activity is derived from observations of the most common recreational activities at sites.

| <b>Site<br/>(number of threat<br/>assessments)</b> | <b>Heavy threats<br/>(&gt;50%)</b>  | <b>Moderate<br/>threats (20-<br/>50)</b>           | <b>Sparse<br/>threats<br/>(&lt;20%)</b>                            | <b>Rare<br/>threats<br/>(&lt;6%)</b> | <b>Common<br/>activity</b>                  |
|--|-------------------------------------|--|--|--------------------------------------|---|
| Ballaparudda (12)                                  | Foxes, Cattle                       | Sheep, silver gulls, birds of prey                 |  |                                      | No people observed                          |
| Callawonga (18)                                    | Foxes, Cattle, Sheep                | Birds of prey, Vehicles                            | Dog prints, Silver gulls   | People, Magpies                      | Fish, Drive                                 |
| Carrickalinga (14)                                 | People, Dog prints                  | Dogs off, Silver gulls, Ravens                     | Dogs on, Birds of prey, Pacific gulls                              |                                      | Walk, Sit, Play games, Dog walk, Surf/ swim |
| Inman River Outlet (44)                            | People, Silver gulls, Dog prints    | Dogs off, Dogs on                                  | Pacific gulls, Ravens, Magpies, Birds of prey                      | Horses, Vehicles                     | Walk, Dog walk                              |
| Lands End (9)                                      | Dog prints                          | Foxes  | People, Birds of prey, Pacific gulls, Ravens, Magpies              |                                      | Walk  |
| Maslin Beach (44)                                  | People, Dog prints, Dogs off        | Foxes, Dogs on, Silver gulls                       | Pacific gulls, Horses  | Birds of prey, Magpies, Cat prints,  | Walk, Dog walk, Sit, Fish                   |
| Morgans beach (8)*                                 | People, Dogs prints, Vehicle tracks | Non-permitted vehicles                             | Dogs off, Silver gulls, Ravens,                                    |                                      | Sit, Drive                                  |
| Myponga Beach (14)                                 | People                              | Silver gulls, Dog prints, Dogs off, Vehicle tracks | Dogs on, Pacific gulls, Permitted vehicles, Non-permitted vehicles |                                      | Sit, Swim, Walk, Play games                 |
| Normanville North (6)*                             | People, Dog prints, Dogs off        | Dogs on, Silver gulls                              | Foxes, Ravens, Magpies   |                                      | Walk, Dog walk, Play games                  |
| Parsons Beach (16)                                 | Silver gulls, Foxes                 | People, Pacific gulls                              |  | Ravens                               | Walk, Fish, Surf                            |
| Port Stanvac (10)                                  | Foxes                               | Cat prints   | Pacific gulls, Silver gulls  |                                      | Closed to public                            |
| Port Willunga (26)                                 | People, Dog prints, Dogs off        | Dogs on, Silver gulls                              | Pacific gulls  | Birds of prey, Magpies               | Dog walk, Walk, Fish                        |
| Sheepies beach (13)                                |                                     | Foxes, People, Silver gulls                        |  |                                      | No people observed                          |



| <b>Site<br/>(number of threat<br/>assessments)</b> | <b>Heavy threats<br/>(&gt;50%)</b>                  | <b>Moderate<br/>threats (20-<br/>50)</b>                     | <b>Sparse<br/>threats<br/>(&lt;20%)</b>                                      | <b>Rare<br/>threats<br/>(&lt;6%)</b> | <b>Common<br/>activity</b>     |
|--|---|--|--|--------------------------------------|--------------------------------|
| Shelley Beach (lady bay) (17)                      | Ravens, Dog prints                                  | People, Birds of prey, Silver gulls, Vehicle tracks          | Foxes, Dogs off, Pacific gulls,  | Magpies, Non-permitted vehicles      | Walk, Fish, Drive              |
| Snapper Point (5)*                                 | People, Dog prints, Dogs off, Dogs on, Silver gulls | Pacific gulls  | Birds of prey  |                                      | Walk, Dog walk, Sit            |
| Southport (22)                                     | Dog prints, People, Dogs off, Dogs on, Silver gulls | Vehicle tracks   | Pacific gulls, Birds of prey, Permitted vehicles                             |                                      | Surf/swim, Walk, Sit, Dog walk |
| Tunkalilla creek/3rd house east (11)               | Foxes, Cattle, Magpies                              | Sheep, People, Silver gulls, Ravens                          | Birds of prey, Vehicle tracks, Dog prints, Dogs on, Pacific gulls            |                                      | Walk                           |
| Tunkalilla far west (11)                           | Foxes   | Silver gulls, Cattle, People                                 | Sheep, Magpies, vehicle tracks, non-permitted vehicles                       |                                      | Walk                           |
| Tunkalilla first house east (9)                    | Foxes   | People, Sheep, Cattle, Silver gulls                          | Dogs off, Birds of prey, Ravens, Magpies, Cat prints, Vehicle tracks         |                                      | Walk                           |
| Tunkalilla Heysen east (12)                        | Foxes, Magpies                                      | Silver gulls, People, Sheep, Cattle                          | Dog prints, Dogs off, Ravens   |                                      | Walk                           |
| Tunkalilla mid west estuary (11)                   | Foxes, Sheep  | Magpies, Cattle, Silver gulls, People, Pacific gulls, Ravens |  |                                      | Walk, Surf/swim, Sit           |
| Tunkalilla shed caravan (9)                        | Foxes   | Magpies, People, Sheep, Ravens                               | Cattle, Dog prints, Dogs off, Silver gulls, Vehicle tracks                   |                                      | Walk, Fish                     |
| Tunkalilla western estuary (11)                    | Foxes, Sheep  | Cattle, People, Silver gulls, Magpies                        | Birds of prey, Pacific gulls, Ravens, Non-permitted vehicles, vehicle tracks |                                      | Walk, Surf/swim                |
| Waitpinga Beach (10)                               | Pacific gulls, Silver gulls, Ravens, People         | Foxes, Magpies   |  |                                      | Fish, Walk                     |

| Site<br>(number of threat<br>assessments) | Heavy threats<br>(>50%)   | Moderate<br>threats (20-<br>50)        | Sparse<br>threats<br>(<20%)   | Rare<br>threats<br>(<6%) | Common<br>activity              |
|---|---|--|---|--------------------------|---------------------------------|
| Watsons Gap (8)*                          | People, Dog<br>prints   | Pacific gulls,<br>Silver gulls         | Dogs off,<br>Dogs on,<br>Birds of prey                              |                          | Walk,<br>Surf/swim,<br>Dog walk |
| Yankalilla river mouth<br>(10)            | Ravens, Silver<br>gulls, Dog<br>prints, Pacific<br>gulls, Vehicle<br>tracks | People, Foxes,<br>Dogs off, Dogs<br>on | Birds of prey,<br>Magpies,<br>Horses, Non-<br>permitted<br>vehicles |                          | Dog walk,<br>Walk, Sit          |

Table 12 provides the average number of people, and dogs on and off lead sighted. Maslin beach, Carrickalinga, Myponga, Snapper Point and Southport had the most number of people. At Port Willunga, the number of dogs off lead is highest and is roughly four times greater than the number of dogs on lead. This season, the difference between dogs off and on lead is not as extreme.

Table 12. Mean ( $\pm$  standard error) number of people and dogs on and off leash observed at sites. Sites with an asterisk have too few threat assessments to provide accurate data.

| Site<br>(number of assessments)    | Number of<br>people | Number dogs<br>off lead | Number dogs<br>on lead |
|------------------------------------|---------------------|-------------------------|------------------------|
| Ballaparudda                       | 0                   | 0                       | 0                      |
| Callawonga                         | 0.22 $\pm$ 0.22     | 0                       | 0                      |
| Carrickalinga                      | 8.14 $\pm$ 3.10     | 0.57 $\pm$ 0.50         | 0.57 $\pm$ 0.31        |
| Inman River Outlet                 | 4.14 $\pm$ 0.70     | 0.95 $\pm$ 0.19         | 0.64 $\pm$ 0.23        |
| Lands End                          | 0.11 $\pm$ 0.11     | 0                       | 0                      |
| Maslin Beach                       | 7.05 $\pm$ 0.77     | 1.23 $\pm$ 0.18         | 0.70 $\pm$ 0.21        |
| Morgans beach*                     | 4.38 $\pm$ 2.55     | 0.13                    | 0                      |
| Myponga Beach                      | 8.43 $\pm$ 2.29     | 0.64 $\pm$ 0.10         | 0.14 $\pm$ 0.31        |
| Normanville North*                 | 6.50 $\pm$ 2.96     | 1.83 $\pm$ 0.98         | 1.17 $\pm$ 1.08        |
| Parsons Beach                      | 6.75 $\pm$ 5.45     | 0                       | 0                      |
| Port Stanvac                       | 0                   | 0                       | 0                      |
| Port Willunga                      | 9.77 $\pm$ 1.89     | 4.04 $\pm$ 0.27         | 1.12 $\pm$ 0.96        |
| Sheepies beach                     | 0                   | 0                       | 0                      |
| Shelley Beach (lady bay)           | 1.82 $\pm$ 0.71     | 0.18                    | 0                      |
| Snapper Point*                     | 8.40 $\pm$ 3.08     | 1.60 $\pm$ 0.75         | 1.40 $\pm$ 0.68        |
| Southport                          | 39.86 $\pm$ 15.32   | 1.36 $\pm$ 0.21         | 0.86 $\pm$ 0.35        |
| Tunkalilla creek/3rd house<br>east | 0.91 $\pm$ 0.51     | 0 $\pm$ 0.09            | 0.09 $\pm$ 0           |
| Tunkalilla far west                | 1.18 $\pm$ 0.75     | 0                       | 0                      |
| Tunkalilla first house east        | 2.78 $\pm$ 1.05     | 0.11 $\pm$ 0            | 0                      |
| Tunkalilla Heyden east             | 2.58 $\pm$ 1.34     | 0.50 $\pm$ 0            | 0                      |
| Tunkalilla mid west estuary        | 1.36 $\pm$ 0.72     | 0                       | 0                      |
| Tunkalilla shed caravan            | 2.22 $\pm$ 1.54     | 0.22 $\pm$ 0            | 0                      |

| Site<br>(number of assessments) | Number of<br>people | Number dogs<br>off lead | Number dogs<br>on lead |
|---------------------------------|---------------------|-------------------------|------------------------|
| Tunkalilla western estuary      | 2.64 ± 1.27         | 0                       | 0                      |
| Waitpinga Beach                 | 3.60 ± 1.36         | 0                       | 0                      |
| Watsons Gap*                    | 3.25 ± 1.31         | 0.38 ± 0.13             | 0.13 ± 0.38            |
| Yankalilla river mouth          | 2.10 ± 0.80         | 0.50 ± 0.15             | 0.30 ± 0.31            |

## Site Management and Awareness Raising activities during 2013/14

**In the 2013/14 breeding season, the following management and community engagement activities were carried out:**

### *Management:*

- The Hooded Plover Council Response Plans continue to guide the step by step process of management once a nest is found.
- New interpretive, permanent signs have been developed for access points. These will gradually be installed at key locations across the Fleurieu working with Councils and land managers.
- Temporary fencing and signage around nests and chicks.
- Temporary signs communicating nest failure or chick hatching success.
- Permanent fencing was installed at Ballaparudda and Callawonga to assist with keeping cattle and sheep off the beaches, thanks to the amazing efforts of Elizabeth Steele-Collins and her fundraising via her calendar 'Birds of the Fleurieu'. She also generously donated an additional \$1000 of calendar profits to Hooded Plover conservation.
- Nest camera installation at Maslin Beach recorded for predation of eggs. See image on page 38.
- Scientific Research Permit with NPWSA for monitoring, and BirdLife Australia have permits for capture and banding on the Fleurieu Peninsula, and for the biennial count and use of remote cameras on the Fleurieu.

### *Volunteer and Community Engagement:*

- 6 new volunteers joined the program this season.
- BirdLife Australia and AMLR NRM Coast, Estuary and Marine Officers held a volunteer workshop in September 2013 where BirdLife updated participants on the latest research findings and results from the previous season. We then had comprehensive discussions between new and longer term volunteers, land

managers and AMLR Natural Resources staff about future directions the program should take. Afterwards a selection of training workshops ran including coastal dune plant ID, monitoring breeding behaviours, protecting nest sites and using the portal.

- The BirdLife team made several field visits (September and November 2013) to capture and flag Hooded Plovers for the purpose of learning more about their site use and fidelity to sites on the Fleurieu, their dispersal to other parts of SA (particularly juveniles), to help with identifying pairs and following their nesting, and for later genetic analysis to explore population differences.
- In January 2014 Deakin University and BirdLife Australia hosted a week long training visit to Melbourne for two AMLR Natural Resources staff (Emma Stephens and Warrick Barnes) and two BirdLife Australia staff working on the Samphire Coast project (Aleisa Lamanna and Jean Turner). During the week, staff were trained in identification of shorebirds in particular red-capped plovers (males, females, juveniles), nest searching and monitoring, capture, handling and banding of red-capped plover adults and chicks, egg measurements and nest management (including installation of nest exclosures), as well as management of a decommissioned saltworks and how Parks Victoria has improved and maintained the habitat value of the Cheetham wetlands, Victoria.
- BirdLife Australia ran the Beach-nesting Birds National Conference in Warrnambool/Port Fairy in June 2014 where NRM and BirdLife staff from Adelaide attended this two-day event along with 4 volunteers from the Fleurieu Peninsula.
- The Hooded Plover volunteers won the City of Onkaparinga Environment Award and received a \$100 cheque.
- The Hooded Plover volunteers also won the Coastcare Award category of the 2013 SA Landcare Awards, and are now in the running for the National Coastcare Award at the 2014 Landcare Conference and Awards in September 2014. The volunteers were given a \$500 cheque as part of the SA Coastcare award which will go towards buying hats and vests with the "Friends of the Hooded Plover Fleurieu Peninsula" logo on them.
- 3 Dog's Breakfast workshops (approx. 130 people attending) were held, each at Normanville, Port Elliot and the Victor Harbor Farmer's Market. Volunteers assisted with each of these events (see image below)
- NRM and Normanville NRC centre staff attended the City of Onkaparinga's "Paws on the Shores" event which 500+ people attended. Staff spoke to 150+ people and gave their 4-legged friends Wendy White's home-made "pup cakes"...and

delicious Hooded Plover biscuits for the humans! City of Onkaparinga contributed 500 "birds on beaches, dogs on leashes" brochures for the give-away bags.

- AMLR NRM Board engaged Wendy White, Coordinator of the Normanville Natural Resource Centre to undertake the following community engagement activities:
  - 6 Hooded Plover School talks (Rapid Bay PS, Yankalilla Area School and Port Elliot PS). These talks and activities were based on BirdLife Australia's Education Kit.
  - Engage Fleurieu Peninsula Real Estate agents and provide them with Hooded Plover brochures and magnets (see image below) to supply their holiday rental homes with. 6 real estate agents have enthusiastically agreed to undertake this.
- Media: numerous articles in various magazines & newspapers, and radio interviews etc – promoting Hoodies, banding, Dogs Breakfast workshops etc
- Emma Stephens presented to the NRM Board's Coastal Ambassadors program on beach nesting birds, focusing on the Hooded Plover.



Left: Wendy White at the Victor Harbor Farmer's Market (photo by Elizabeth Steele-Collins). Above: Magnets, developed by BirdLife Australia, that will be distributed to Fleurieu Peninsula real estate agents in the 2014/15 season.

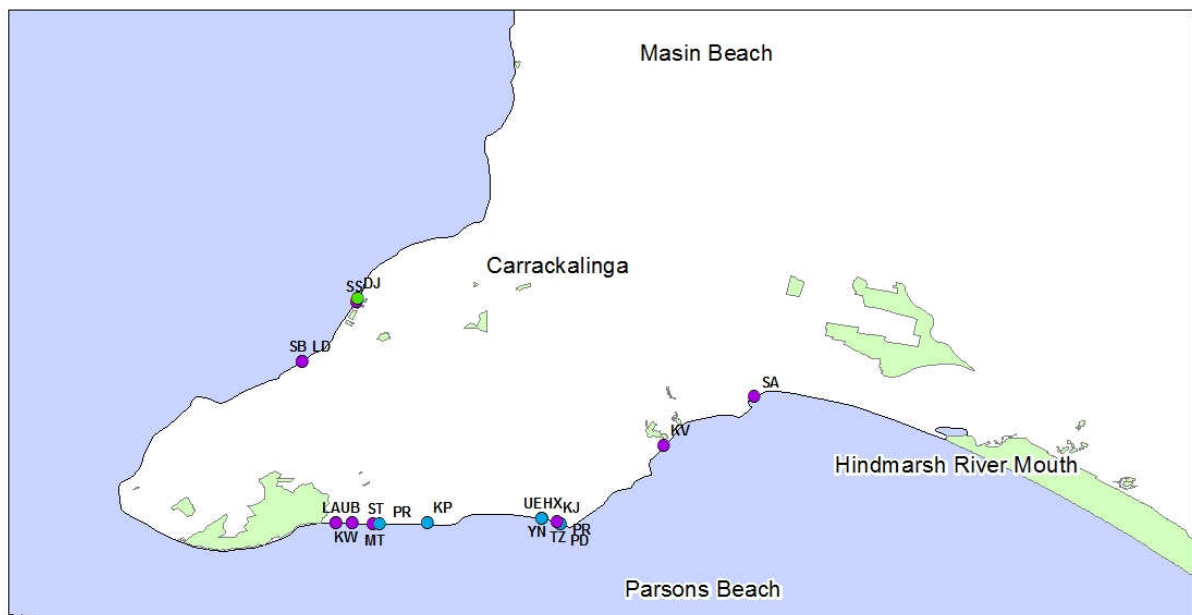


Nest camera images at Maslin Beach – fox taking eggs.

### Hooded Plover leg flagging on the Fleurieu Peninsula

In total, 279 birds have been banded through BirdLife Australia's program in Victoria and South Australia since 2010. On the Fleurieu, we have now banded 33 banded birds: 22 adults, 4 chicks, 7 flying juveniles (see Table 13; Figure 4 shows birds banded in 2013/14).

Figure 4. Hooded Plovers flagged during the 2013/14 breeding season.



**Fleurieu Peninsula 2013/2014**

Flagging Sites

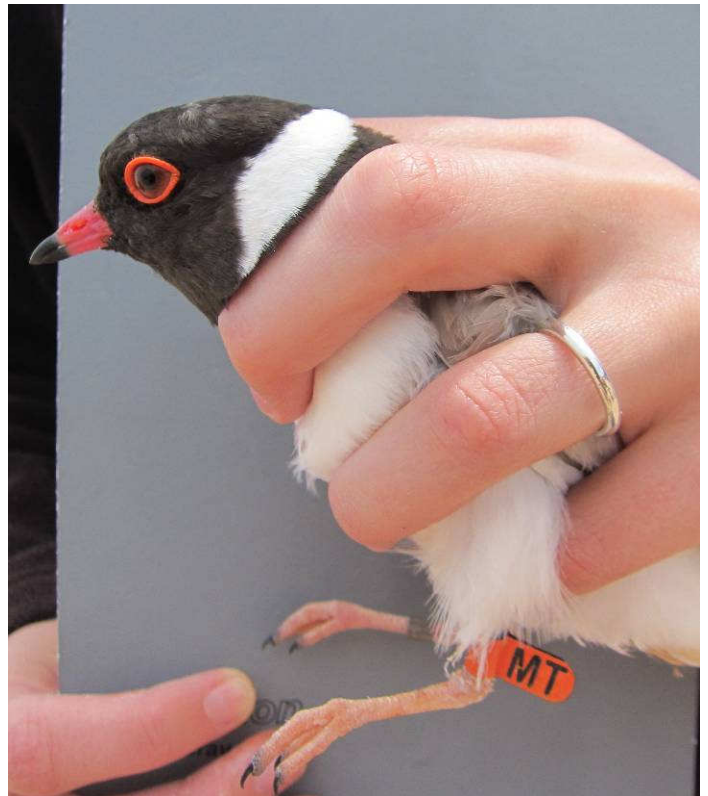
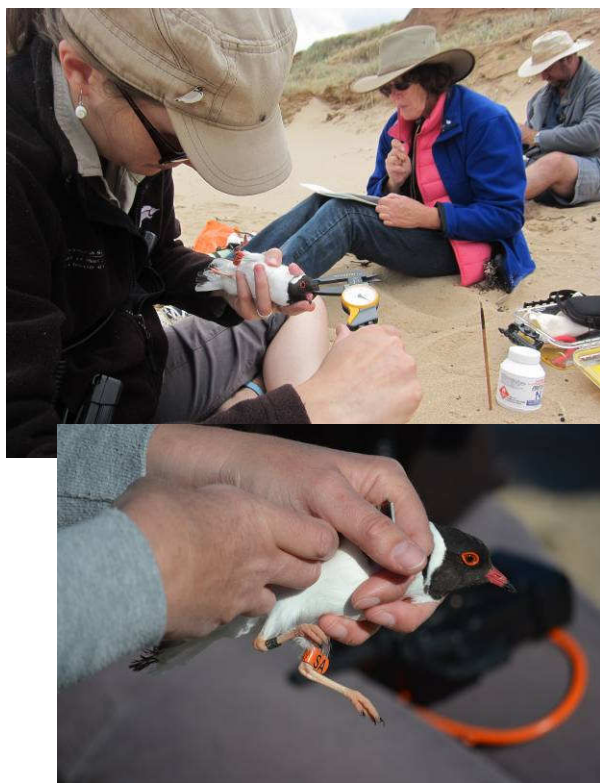


0 3 6 12 Kilometers

- Parks and Reserves
- Flagged Hooded plover (adult)
- Flagged Hooded plover (subadult)
- Flagged Hooded plover (chick)



There have been 2,747 resightings of the birds by volunteers and members of the public across Victoria and South Australia. Most sightings have come from the Bellarine Peninsula, representing 31% of resighting reports, however the Bellarine has only 6% of the birds that have been banded. Similarly reports on the Mornington Peninsula represent 24% of resightings, much higher than the proportion of birds banded (11%). This may in part be because birds from other regions disperse through this area. Resightings have also been high on the Bass Coast (16% of resightings, 27% of birds banded), Surf Coast (14% of resightings, 3% of birds banded) and on the Fleurieu Peninsula (6% of resightings, 11% of birds banded). In areas such as South Gippsland and Far West Victoria we have had very few resightings, 3% and 2% respectively, despite having banded many birds in these areas, representing 14% and 16% of the birds banded through the project so far.



Emma training to band Hoodies with Janette and Ross diligently recording information (photo Grainne Maguire); 'MT' at Tunkalilla (photo Grainne Maguire); 'SA' caught at Bashams Beach, which was later spotted in The Coorong (photo Ash Read).



Emma, Grainne and Ash Read at Bashams Beach, releasing 'SA' (photo Sue Read).

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 its movements, breeding partner/s and longevity.

On the Fleurieu birds have been resighted at an average of 2.1 locations. Only 11 birds have been seen at more than one location. While it is very early days in terms of detecting dispersal movements or making conclusions about site and pair fidelity, but already we have some interesting resightings such as:

- One of the long-term breeding pair, MX, at Maslin beach disappeared at the end of the 2013 breeding season and has not been seen since. It is likely that this bird died (we do not know how old it was as it was captured as an adult, but it may have been at this site for many years). It has now been replaced by NA from Carrickalinga North.
- NA was originally captured with AR at Carrickalinga North. AR then went on to visit the far southern end of Maslin beach together with an unbanded bird. It has then been seen at Aldinga and Port Willunga. It became a breeder at Port Stanvac from Nov/Dec 2013 with an unbanded bird. See Figure 5 below for an overview of AR's movements.

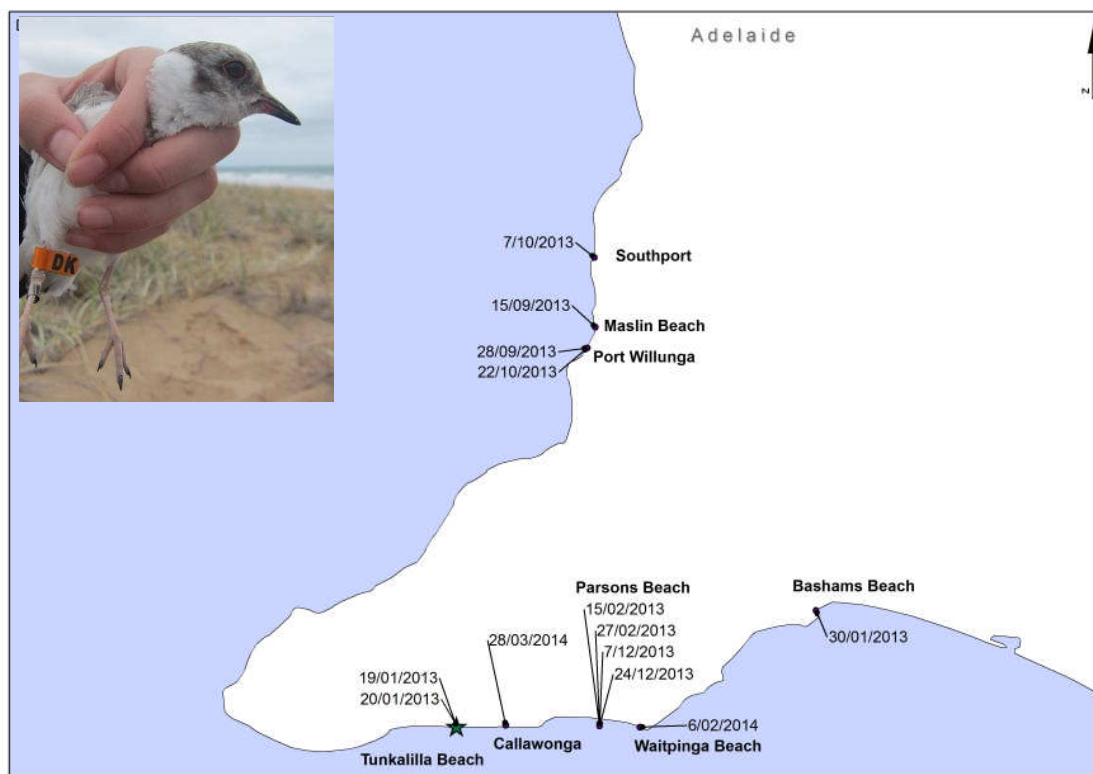


Figure 5. Movements of adult AR. Maps have been created from data portal entries, sightings from other sources have not been included at this time.



- Movement of juvenile DK (male) banded at Tunkalilla 3<sup>rd</sup> house east (19<sup>th</sup> Jan 2013) dispersed to Bashams beach within 8 days of being banded, then was seen at Port Elliot (27<sup>th</sup> Jan 2013)! Since then, DK has been seen at Hindmarsh river outlet, Parsons, Waitpinga, Maslin beach, Port Willunga, Southport, along Normanville, back to Parsons, Tunkalilla, Waitpinga and then Callawonga and Ballaparudda. See Figure 6 below for detailed movements of DK.

Figure 6. Movements of juvenile DK. Maps have been created from data portal entries, sightings from other sources have not been included at this time.



- EM (male) fledgling captured at Tunkalilla 3<sup>rd</sup> house east (from nest at Tunkalilla far west), sibling of DK above, fledged in Dec 2012 was spotted on Kangaroo Island at Antechamber Bay in Nov 2013.
- SA, the adult caught at Bashams (Nov 2013), was seen in the Coorong (Jan 2014).
- DJ was banded as a subadult (unknown origin) at Carrickalinga in Sept 2013. Next seen in 2014 at Normanville South, Tunkalilla western estuary, Waitpinga and Parsons, mostly observed as a 'floater' that is seen with birds such as KJ and unbanded partner, EV and DK. See Figure 7 below.

Figure 7. Movements of subadult DJ. Maps have been created from data portal entries, sightings from other sources have not been included at this time.



Table 13. A summary of leg flagged Hooded Plovers captured and banded on the Fleurieu Peninsula. All birds were captured by qualified and licensed banders.

| Beach                                       | Date       | Age      | Sex    | Right tarsus | Right tibia | Left tibia | notes on breeding status                                   | partner or parent                          |
|---|------------|----------|--------|--------------|-------------|------------|--|--|
| Maslin Beach                                | 8/05/2012  | Adult    | Female | metal        | MX          |            | non-breeding   | Partner unbanded                           |
| Myponga Beach                               | 8/05/2012  | Adult    | Unk    | metal        | EY          |            | non-breeding   | Partner unbanded                           |
| Watsons Gap estuary                         | 18/01/2013 | Adult    | Female | metal        | AU          |            | with recently fledged chick                                | partner unbanded (on 20/1/13 banded as BX) |
| Parsons Beach (far SW end)                  | 18/01/2013 | Adult    | Female | metal        | CL          |            | not nesting  | partner EV                                 |
| Parsons Beach (far SW end)                  | 18/01/2013 | Adult    |        | metal        |             | EV         | not nesting  | partner CL                                 |
| Waitpinga Beach (E end)                     | 18/01/2013 | Adult    | Female | metal        | KJ          |            | not nesting (recent failure)                               | partner unbanded                           |
| Tunkalilla Beach 3 <sup>rd</sup> house east | 19/01/2013 | Juvenile | Male   | metal        | DK          |            | 1 of 3 chicks that fledged from Tunkalilla far western end | sibling of EM                              |
| Tunkalilla Beach 3 <sup>rd</sup> house east | 19/01/2013 | Juvenile | Male   | metal        | EM          |            | 1 of 3 chicks that fledged from Tunkalilla far western end | sibling of DK                              |
| Watsons Gap estuary                         | 20/01/2013 | Adult    |        | metal        |             | BX         | with recently fledged chick (7 days ago)                   | partner AU                                 |
| Carrickalinga estuary                       | 21/01/2013 | Adult    | Male   | metal        | CK          |            | with 2 other adults, aggression, no nesting                | unknown, caught with LP                    |
| Carrickalinga estuary                       | 21/01/2013 | Adult    |        | metal        |             | LP         | with 2 other adults, aggression, no nesting                | unknown, caught with CK                    |
| Carrickalinga North (N end)                 | 22/01/2013 | Adult    | Unk    | metal        | NA          |            | not nesting  | Suspect partner AR                         |
| Carrickalinga North (N end)                 | 22/01/2013 | Adult    |        | metal        |             | AR         | not nesting  | Suspect partner NA                         |
| Snapper Point (Pt Willunga end)             | 22/01/2013 | Adult    | Male   | metal        | HV          |            | Port Willunga pair, not nesting, recent failure            | partner unbanded                           |
| Carrickalinga Pitmans leap access           | 27/09/2013 | Adult    | Male   | metal        | SS          |            | not nesting, with 1 other bird                             | Partner CK                                 |
| Carrickalinga (toilet block)                | 27/09/2013 | Subadult | Male   | metal        | DJ          |            | Alone  |  |
| Lady Bay Shelley Beach                      | 27/09/2013 | Adult    | Unk    | metal        | SB          |            | not nesting  | Partner LD                                 |

| Beach                           | Date       | Age      | Sex    | Right tarsus | Right tibia | Left tibia | notes on breeding status                                   | partner or parent       |
|---------------------------------|------------|----------|--------|--------------|-------------|------------|--|-------------------------|
| Lady Bay Shelley Beach          | 27/09/2013 | Adult    | Unk    | metal        |             | LD         | not nesting  | Partner SB              |
| Inman River outlet              | 13/11/2013 | Adult    |        | metal        | KV          |            | mating, no scrapes found                                   | Partner unbanded        |
| Bashams Beach                   | 13/11/2013 | Adult    |        | metal        |             | SA         | lone bird, no partner seen for months                      |                         |
| Tunkalilla far west             | 14/11/2013 | Adult    |        | metal        | LA          |            | new nest, recently laid, 3 eggs                            | Partner unbanded        |
| Tunkalilla western estuary      | 14/11/2013 | Adult    |        | metal        | KW          |            | fresh scrapes  | Partner unbanded        |
| Tunkalilla mid west estuary     | 14/11/2013 | Adult    |        | metal        |             | MT         | new nest, 2 eggs, due to hatch late Nov/early Dec          | Partner unbanded        |
| Tunkalilla creek/3rd house east | 14/11/2013 | Adult    |        | metal        | ST          |            | lone bird, suspect nest                                    |                         |
| Waitpinga Beach east            | 10/02/2014 | Chick    |        | metal        | PD          |            | 30 days old  | Parents KJ and unbanded |
| Waitpinga Beach east            | 10/02/2014 | Chick    |        | metal        | PR          |            | 30 days old  | Parents KJ and unbanded |
| Callawonga Beach                | 10/02/2014 | Chick    |        | metal        | KP          |            | 25 days old  |                         |
| Callawonga Beach                | 10/02/2014 | Chick    |        | metal        |             |            | 25 days old, much lighter than sibling KP so no flag given |                         |
| Waitpinga Beach west            | 25/02/2014 | Juvenile |        | metal        | YN          |            |  |                         |
| Waitpinga Beach west            | 25/02/2014 | Juvenile |        | metal        | TZ          |            |  |                         |
| Waitpinga Beach west            | 26/02/2014 | Juvenile |        | metal        | UE          |            |  |                         |
| Waitpinga Beach west            | 26/02/2014 | Juvenile |        | metal        | HX          |            |  |                         |
| Tunkalilla Creek/3rd house east | 28/04/2014 | Juvenile |        | metal        | PR          |            | RECAPTURE  | Parents KJ and unbanded |
| Tunkalilla far west             | 28/04/2014 | Adult    |        | metal        | UB          |            |  | Partner 'LA'            |
| Waitpinga Beach east            | 30/04/2014 | Adult    | Female | metal        | KJ          |            |  |                         |

## Roles of each participating group in the coming breeding season:

### *BirdLife Australia:*

- Coordinate eastern mainland Hooded Plover recovery program.
- Managing the online data portal including development, upgrades and training.
- Hooded Plover banding and maintaining a resighting database.
- Workshops to build knowledge and skill sets of new and existing volunteers.
- Provide technical advice as needed.
- Provide OH&S information and volunteer induction.
- On-site liaisons with volunteers.
- Red-capped Plover workshops for staff and volunteers.
- Community awareness via development of new materials and activities for engaging the broader community.
- Advice regarding on-ground management.
- Connect Fleurieu program with other regions across SA active in Hooded Plover conservation and monitoring.

### *Natural Resources AMLR:*

- Continued support of volunteers from Coast, Estuary and Marine Officers.
- Visit volunteers to provide on-site training relevant to their sites, and assist with online MyHoodie Portal training.
- Actively recruit and engage new volunteers.
- Fund and carry out on-ground works including permanent signage at access points, maintenance of nest protection kits, pest and weed control.
- Assist BirdLife Australia with determining the breeding status of birds pre-banding visits, and for AMLR staff to undergo training in capture and handling.
- Continue to trial nest cameras to detect and identify nest predators and to determine nest fates.
- Community awareness efforts, e.g. media, events, etc.
- Continue to work with DEWNR, Local councils and other project partners to provide advice on on-ground response to nests being reported.

### *DEWNR:*

- Oversee and administer the Hooded Plover Recovery Plan for South Australia (currently still in draft form, awaiting Ministerial approval).

- Assist with policy and planning changes, e.g. Dog and Cat Management Plan.
- Threatened species officers provide technical advice and support (i.e. assistance with formulating council response plans, etc).

*Local councils, including City of Onkaparinga, District Council of Yankalilla, City of Victor Harbor and Alexandrina Council:*

- Council staff support for site management, fencing and signage.
- Enforcement of beach & dog regulations.
- Council support for awareness raising activities.

*Volunteers:*

- Monitoring pairs at nominated sites.
- Collecting data and entering sightings onto the online data portal (e.g. for each nest keeping records that follow through the fate of a nest; recording threats at sites; noting when birds were absent).
- Liaising with and assisting NR/Council staff with installing fences/signs.
- The potential to liaise with the public when visiting the birds.
- Forming four Friends of the Hooded Plover regional groups, each with a local volunteer coordinator to assist with coordinating site visits by volunteers, identifying monitoring gaps, recruiting new volunteers and raising awareness amongst the local community.
- Terry Dennis is carrying out banding under BirdLife Australia's permits and ABBBS approvals, to target chicks that are reaching fledging age – this assists the banding program as BirdLife staff are not necessarily able to come across to the Fleurieu in these narrow gaps in time.
- Attending training events.
- Letting us know about your needs and sharing ideas/concerns about conservation of the species.

## Acknowledgements

A big thank you to 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 to suit sites better. It also will help in future with

any proposed planning or changes to regulations: statistics lend great weight to our submissions and recommendations.

An enormous thanks to Emma Stephens who is the coordinator of the Hooded Plover efforts which take place on the Fleurieu Peninsula, to Corey Jackson and Emma for their site visits and assistance with site management, and to Tony Flaherty and the Adelaide and Mount Lofty Ranges NRM Board for their support and for recognising the importance of coastal biodiversity. Special thanks to the councils and rangers involved for protecting nesting sites and supporting the project: City of Onkaparinga, District Council of Yankalilla, DEWNR (Newland Head Conservation Park - National Parks and Wildlife SA), City of Victor Harbor and Alexandrina Council.

A special thanks to the Normanville Natural Resource Centre Coordinator and volunteers for assisting with schools education and awareness raising events. Also to the Yankalilla Youth and Community Centre for providing a wonderful venue for our yearly workshops.



The pair at Shelley Beach (Lady Bay), photo Grainne Maguire.