BIRDLIFE AUSTRALIA'S BEACH-NESTING BIRDS PROJECT

MONITORING HOODED PLOVERS ON THE FLEURIEU PENINSULA: DISTRIBUTION, BREEDING SUCCESS AND MANAGEMENT IN THE 2011-2012 SEASON

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CARING FOR OUR COUNTRY

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

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Executive Summary

The 2011/2012 Hooded Plovers breeding seasons on the Fleurieu Peninsula has had the greatest input from volunteer nest monitors since the program began in 2009, this season 456 observations were made, increasing from 381 and 183 in the years previous. The results in confirmed fledgling numbers have been similar over the three monitoring seasons. Eight confirmed fledglings were recorded in the 2011/2012 seasons, with nine and seven in the previous seasons. Hatching success has increased by 2.8% from the 2010/2011 to the 2011/2012 season, which is likely to have been influenced by the increased number of nests being managed in the region. Chick survival was similar in the last two seasons on the Fleurieu Peninsula, with 34% of chicks surviving to fledge in 2010/11 and 34.6% in 2011/12. These results indicate the importance of the program of monitoring and nest management, yet highlight the need for additional research into the development of further management practices to increase the success rate of fledging in Hooded Plovers.

Introduction

The pressures placed on the Australian coast by over 80% 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. 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 the red-capped plover can also breed around wetlands and low energy beaches. Colonial seabirds, such as Little Terns (*Vulnerable,* NPWS Act; rare west of Corner Inlet in Victoria and into South Australia) and Fairy Terns (*Vulnerable,* NPWS Act; breed in South Australia), are also beach-nesters, and suffer similar threats to the Hooded Plover.

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 developments 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 harms 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'. This project is funded by the Australian Government's Caring for our Country, the Victorian Government and Adelaide and Mount Lofty Ranges (AMLR) Natural Resources Management (NRM) Board. 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.

The main aim of the beach-nesting birds' (BNB) project is to involve coastal communities and land managers in best practice management of breeding sites to see an overall improvement in breeding success of beach-nesters. The project uses the Hooded Plover in Victoria and South Australia as a case study for developing and improving on-ground management strategies and community awareness methods. The results will be applicable in a broader sense to other beach-nesting birds around Australia. The outline of the project is as follows:

1. Maintain a distribution map and database of location of breeding pairs of Hooded Plovers along the Victorian, South Australian and NSW Coast, updated every two years and comparable over time.
2. Estimate state and regional population numbers of Hooded Plovers in Victoria, South Australia and NSW every two years.
3. At the time of each biennial count, assess the threats to each pair and any management in place to alleviate these threats.
4. Assess gravity of threats at breeding sites from data collected during the biennial count and map sites according to threat status.
5. Choose sites in Victoria and South Australia for monitoring of breeding success 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 monitoring sites selected, develop site profiles that assess threats in more detail and describe management of the site (e.g. identify land managers; identify full suite of management regulations for sites in relation to access, dog, horse and vehicle restrictions; assess weed infestations and availability of suitable nesting habitat).
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. Compare threats and breeding success at managed and unmanaged sites.
9. Coordinate student research projects investigating the effectiveness of new management techniques and investigating attitudes and values held by people regarding beaches and conservation of beach-nesting birds.
10. Trial nest cameras to detect and identify nest predators and to determine nest fates. With large enough sample sizes, predation risk could be compared across habitat types and the probability of predation compared to the density of predators at sites.
11. Assess success of managements and make modifications for subsequent seasons. Managements need to adapt to local site and beach user specifications.
12. 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. This is critical to effective population conservation and management.

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

- BirdLife Australia Staff provide advice, workshops, training and technical support, as well as data analysis and maintenance of a national database.
- On the Fleurieu peninsula, Adelaide and Mount Lofty Ranges Natural Resources Management (AMLR NRM) Board officers support the project and volunteers, and local council and Department of Environment and Natural Resources (DENR) staff assist with nest protection responses.
- The Normanville Natural Resources Centre 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 DENR. 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.

An overview of the 2011-2012 Breeding Season

Victoria

The BNB project has been running since 2006 in Victoria, with breeding success and threats at breeding sites monitored over 6 successive breeding seasons for up to 126 pairs.

This season was one of mixed success, with most sites being affected by erratic and severe weather and resulting beach erosion. Results to date indicate a low fledging success rate however we expect this to increase once all data has been analysised. Along with high tides and storms, avian predators were a significant cause of egg/chick failure however, chick fates

continue to remain the biggest knowledge gap that we have. Below are summary tables of breeding success over the six successive breeding seasons:

Table 3. Number of pairs monitored, nests found and their fate. Data for the 2011/12 is incomplete at this stage as it takes several months after the season ends to collate data. Estimates are included to provide an indication of the season. Phillip Island data has not been included in this table.

Season	Pairs monitored	Total nests	Nests fail egg	Nests Hatched	Nests fledged	# 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	109	160	-	-	-	26	375	91

Table 4. Number of fledglings produced by pairs in Victoria (including additional pairs monitored by Phillip Island Nature Park) according to the different regions of the coast:

Region	2006/07 106 pairs	2007/08 100 pairs	2008/09 96 pairs	2009/10 119 pairs	2010/11 123 pairs	2011/12 126 pairs
Far West Vic	2	6	11	31	5	8
Shipwreck coast	7	3	0	4	0	-
Otway coast	0	1	3	0	1	0
Surf coast	2	4	2	2	2	2
Bellarine	3	3	4	4	3	2
Mornington Peninsula	10	6	6	7	10	3
Phillip Island	8	4	6	9	7	12
Bass Coast	4	2	4	20	17	7
Venus Bay	1	0	0	2	0	0
Lakes area, EG	2	0	0	0	-	4
Croajingalong (Marlo-Mallacoota)	4	7	0	1	0	-
Total fledglings	43	36	36	80	45	38
# fledglings per pair monitored	0.41	0.36	0.38	0.67	0.37	0.31

Figure 1. Images of predators from Victorian nest cameras in 2011/2012 breeding season.

South Australia

Monitoring of breeding pairs was carried out on the Eyre and Fleurieu Peninsulas in South Australia as part of the BNB project in the 2011/2012 breeding season. 456 data records have been sent to BirdLife Australia for a total of 27 sites (see figure 2) on the Fleurieu Peninsula (a minimum of 238.7 hours of observation, data for survey times was available for 341 of the completed data sheets). During the 2011/2012 season only two pairs on were surveyed on the Eyre Peninsula, with two nests and three successful fledglings.

Table 5 shows the breakdown of visits and volunteers visiting sites on the Fleurieu Peninsula; there were 3 sites where Hooded Plovers were not sighted on any visit (Coolawang, Silver Sands/Sellicks Beach and Moana Beach), plus sites where Hooded Plovers were seen during the breeding season, with no nesting attempts reported (Aldinga, Middleton/Goolwa, Chrisites Beach, O'Sullivan Beach, Normanville North, Parsons Beach and Snapper Point).

There was incomplete monitoring at Lands End, with no nest found, but chicks suspected during one December visit and a single juvenile sighted in January. Sheepies Beach recorded three chicks over three visits in November and December, with no nest or chick fate information for the following three visits (January-March). The next bay from Sheepies Beach; Parsons Beach, sighted six juveniles in February, but it cannot be confirmed that any of these are the three chicks from Sheepies Beach. Two chicks were also spotted at Normanville North; the origin of the chicks remains unknown, as does the fate.

At Morgans Beach, Hooded Plovers were often absent from their sites during the breeding season. Monitoring of 18 pairs was undertaken this season, with 16 active breeding pairs for which we have sufficient data on breeding attempts during the season. The AMLR NRM Coast Estuary and Marine officers also carried out many visits through their role facilitating and supporting volunteers, and implementing nest site protection.

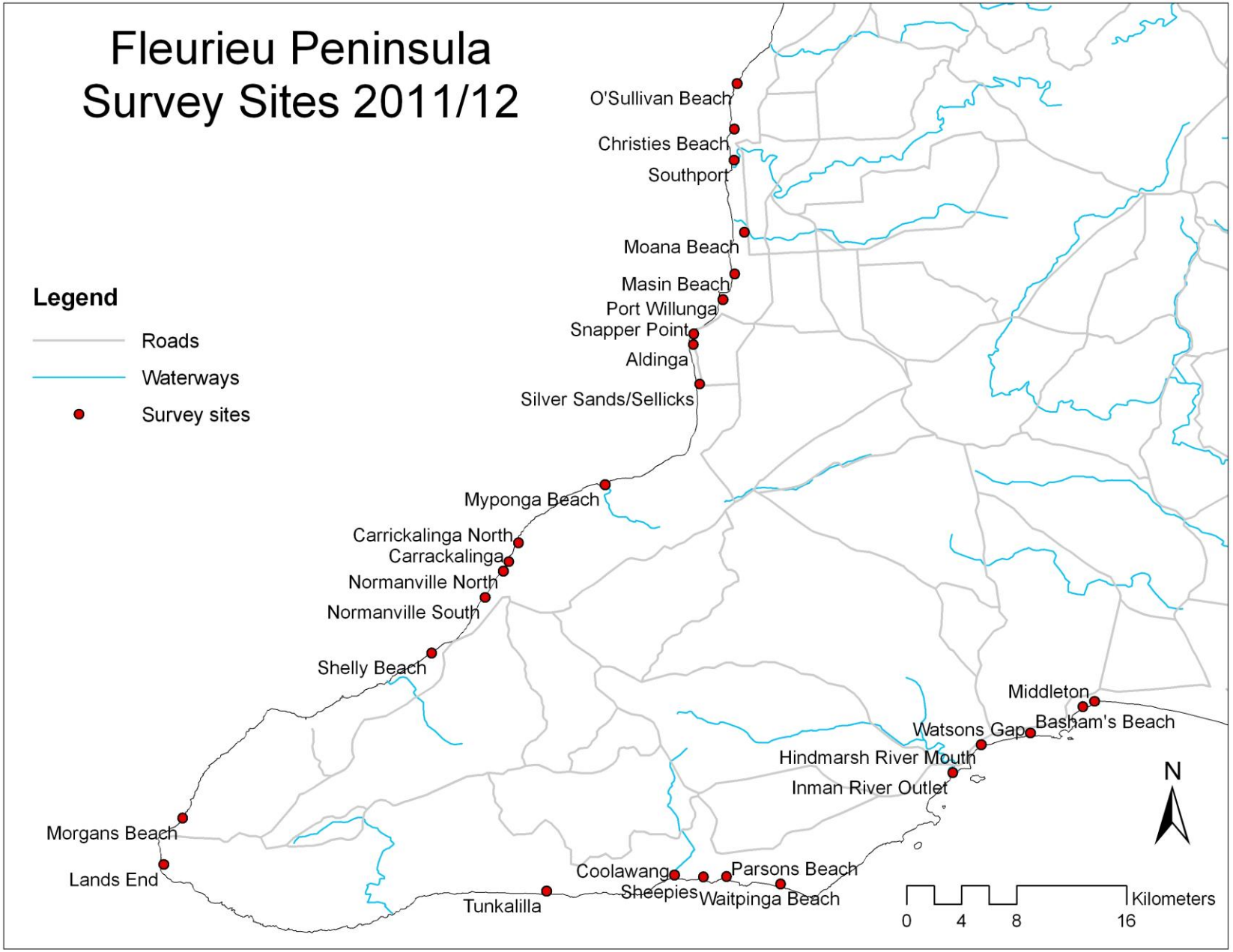
Table 5. Visits to pairs on the Fleurieu Peninsula during the 2011/12 breeding season, visits when the pair was present and names of monitors (as taken from data sheets submitted). An asterisk depicts that insufficient data was collected to assess threats and a cross depicts insufficient data to detect breeding or breeding fate.

Pair	Visitation period (breeding season)	Total visits	Visits pres.	Main monitor/s	Additional observers
Southport	17/09/11-20/02/12	14	9	Charles Simmons	Claire Francis, Corey Jackson, John Cobb, Laura Ruykys, Michele Sawyer, Gary Sawyer, Emma Stephens
Moana beach *	02/11/11-24/03/12	14	0	Robert Hill	Michele Sawyer, Gary Sawyer, John Cobb
Silver Sands/Sellick Beach *	14/08/11-25/11/11, 05/01/12-19/03/12	5,3	0,0	Julie Turner	Jean Tucker

Pair	Visitation period (breeding season)	Total visits	Visits pres.	Main monitor/s	Additional observers
Maslin Beach	23/08/11-24/04/12	46	45	Ashley Read, Sue Read, Michele Sawyer	Claire Francis, Gary Sawyer
Port Willunga	17/08/11-10/04/12	57	53	Ashley Read, Sue Read, Dylan Braund	
Myponga Beach *	22/10/11-22/11/11	4	4	Michele/Gary Sawyer, Mike Fairbairn	
Carrickalinga North	08/08-2011-20/03/12	16	11	Lauren Davis	Wendy White, Emma Stephens
Carrickalinga	06/08/11-19/03/12	16	12	Wendy White	Jack James, Emma Stephens, Lauren Davis
Normanville North * +	01/10/11-16/10/11, 08/02/12	2,1	1,1	Pia Pilcher	Jack James
Normanville South *	05/09/11-01/10/11, 20/12/11-24/12/11, 25/03/12	2,2,1	1,2,1	Pia Pilcher	Lauren Davis, Emma Stephens
Shelly Beach (Lady Bay)	15/08/11-30/03/12	19	11	Lauren Davis	Dylan Braund, Russell Garner, Edan Garner, Brynn Garner, Emma Stephens
Morgans Beach *	08/08/11-31/03/12	15	3	David Woollard	
Lands End +	28/08/11-09/09/11, 07/12/11-28/02/11	2, 4	1, 3	Bill Page	
Tunkalilla *	24/08/11, 06/10/11-24/10/11, 13/03/12-17/04/12	1,2,2	1,2,1	Emma Stephens, James Ellis	Janis Haynes, Peter Stawhan
Coolawang Beach *	15/09/11, 23/11/11	1,1	0,0	Brenton Lush, Faye Lush, Julie Turner	
Parsons Beach	05/08/11-06/03/12	11	8	Dean Cutten	
Waitpinga Beach	30/09/11-29/12/11, 02/02/12	7,1	5,1	Terry Dennis	Winston Syson
Inman River outlet, Kent Reserve, Victor Harbor	11/08/11-26/03/12	57	43	Ross Brittain	Verle, Wood, Dean Cutten, Janette Diment, Emma Stephens
Hindmarsh River outlet, Victor Harbor	8/08/11- 18/08/11, 28/11/11	6, 1	6, 0	Richard Edwards	Ross Brittain, Janette Diment, Emma Stephens, Andrew Jeffery
Watsons Gap, Port Elliot	09/08/11-31/03/12	84	51	Ann Turner	Michele Foster, Helen West
Bashams Beach, Port Elliot	27/10/11-15/03/12	14	12	Winston Syson	
Middleton/Goolwa *	21/08/11-15/11/11, 15/01/12-29/03/12	6,4	0,1	Michelle Foster	Janis Haynes
Chrisites Beach	02/11/11-13/02/12	4	1	John Cobb	

Pair	Visitation period (breeding season)	Total visits	Visits pres.	Main monitor/s	Additional observers
O'Sullivan Beach	29/10/11-13/02/12	7	1	John Cobb, Michele Sawyer, Gary Sawyer	
Sheepies Beach * +	30/08/11, 13/10/11-06/03/12	1,7	1,4	Dean Cutten	
Aldinga	28/8/11-19/03/12	8	1	Faye Lush, Joyce West	Charlotte Atkin, Julie Turner
Snapper+	16/01/2012	1	1	Julie Turner	

Figure 2. Hooded Plover monitoring sites on the Fleurieu Peninsula over the 2011/12 breeding season.



Nesting success

Overall, there were 24 nesting attempts monitored on the Fleurieu Peninsula. Most pairs had one or two nesting attempts that were detected (see figure 3), and Maslin Beach, Shelly Beach and Inman River Outlet recorded three nesting attempts each, with only one of these attempts produced fledglings. Table 7 summarises nesting activity of pairs according to data sheets submitted and Table 8 expands this into more detail.

Of the 24 nests monitored, 58.3% failed during the egg stage (a loss of 38 eggs). The following causes of egg failure were suspected: dogs or foxes (at Bashams, Carrickalinga, Hindmarsh River mouth and two nests at Maslin Beach), humans were suspected of crushing two clutches (Normanville South and Inman, where one egg hatched and the two crushed eggs had fully formed chicks inside), abandonment (Tunkalilla) and partial abandonment (Port Willunga, one egg was abandoned after two eggs hatched), avian predators; raven (Shelly Beach), pacific gull (Shelly Beach), and possible infertile eggs, where the eggs were being incubated ~39 days after they were laid and then taken by a fox (Bashams).

Of the 41.7% of nests that hatched, 22 chicks were observed (two of which were never seen, but strongly suspected of hatching and are tentatively counted as hatched; Carrickalinga Beach), 8 of these chicks were confirmed as fledglings from 4 separate nesting attempts (3 fledglings in mid Oct, 2 in late Nov, 2 in early Jan and 1 in late Jan). Two young chicks where found in Nov/Dec (Sheepies Beach) and 6 juveniles were located on an adjacent beach (Parsons) in February, but due to no sightings of the chicks from Dec to Feb, they have not been included in the total numbers. See figure 4 for nesting attempt fates.

All of the confirmed 8 fledglings were from actively managed sites (figure 5), all of which had fencing. Of the 10 successfully hatched nests, 9 had active management (8 had fences and signs and 1 had signs at the nesting site only) and only one nest had no active management recorded (Sheepies Beach, although the nest was never reported at this site, just the presence of chicks). Chick fates were difficult to ascertain, with all reported missing due to unknown cause, or not sighted after several days of consecutive observations. Port Willunga reported a dead adult, the same day chicks were first sighted. The cause of death was investigated via an autopsy by SA museum. Initial results showed no sign of injury- no broken bones, no bruising, and no scorch marks. The only note was that the kidneys look decidedly odd, very speckled instead of a uniform brownish pink, which may have indicated a kidney disease. The chicks at this site went missing 5 days after the adults' body was found.

Overall, an egg had a 13.3% chance of fledging a chick successfully (based on 8 confirmed fledglings and 60 eggs) and a nest had a 16.7% (4 of 24 nests produced fledglings) chance of fledging at least one chick.

Over the last three years of nest monitoring on the Fleurieu Peninula has increased its range from 18 sites in 2009/2010 breeding season to 27 sites in the 2011/2012 breeding season. The

number of nests monitors in these years has also varied, with the largest number (36) being monitored during 2010/2011 (Table 6).

In comparison to the 2010/2011 season, breeding pairs had a higher chance of an egg successfully fledging (13.3% compared to 10.8% in 2010/11) and a nest had a 16.7% chance of producing at least one fledgling, which is the same last breeding season. There were 1.5 nests per breeding pair (24 nests recorded for 16 actively breeding pairs), with the 2010/11 season also having 1.5 nests per pair. Hatching success was 2.8% higher this season, but only 22 chicks were recorded as hatched compared to 26 last season. Last season had 9 fledge from 7 separate nesting attempts whereas this season has similar fledgling numbers (8), but only from 4 nesting attempts. Chick survival was similar in the two seasons on the Fleurieu Peninsula, with 34% of chicks surviving to fledge in 2010/11 and 34.6% in 2011/12.

Suspected egg losses were predominately from high tide/storm surges (3 nests) and ravens (3 nests) in 2010/11 season, whereas this season recorded more fox/dog (5) takes and humans crushing eggs (2). The number of unknown nest failures was relatively high in both seasons; 9 in 2010/11 and 6 in 2011/12.

Table 6. 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 three breeding seasons.

Pair	# nests	# hatch	# fail at egg stage	total eggs	total chicks obsv.	total fledged
2009/2010 (12 sites)	18	9	9	49	19	7
2010/2011 (25 sites)	36	14	22	83	26	9
2011/2012 (27 sites)	24	10	14	60	22	8

Figure 3. Nests found on the Fleurieu Peninsula in the 2011/12 breeding season.

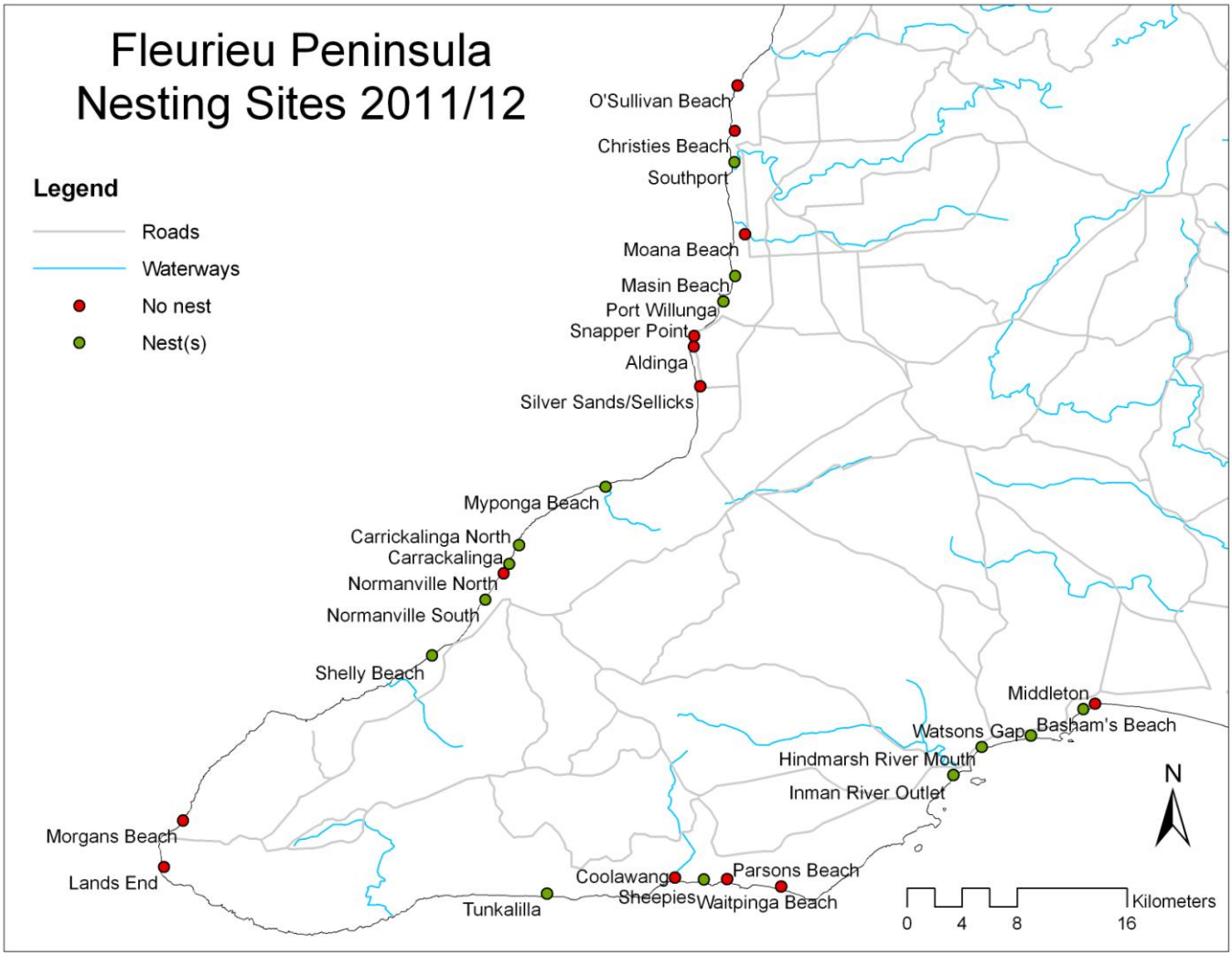
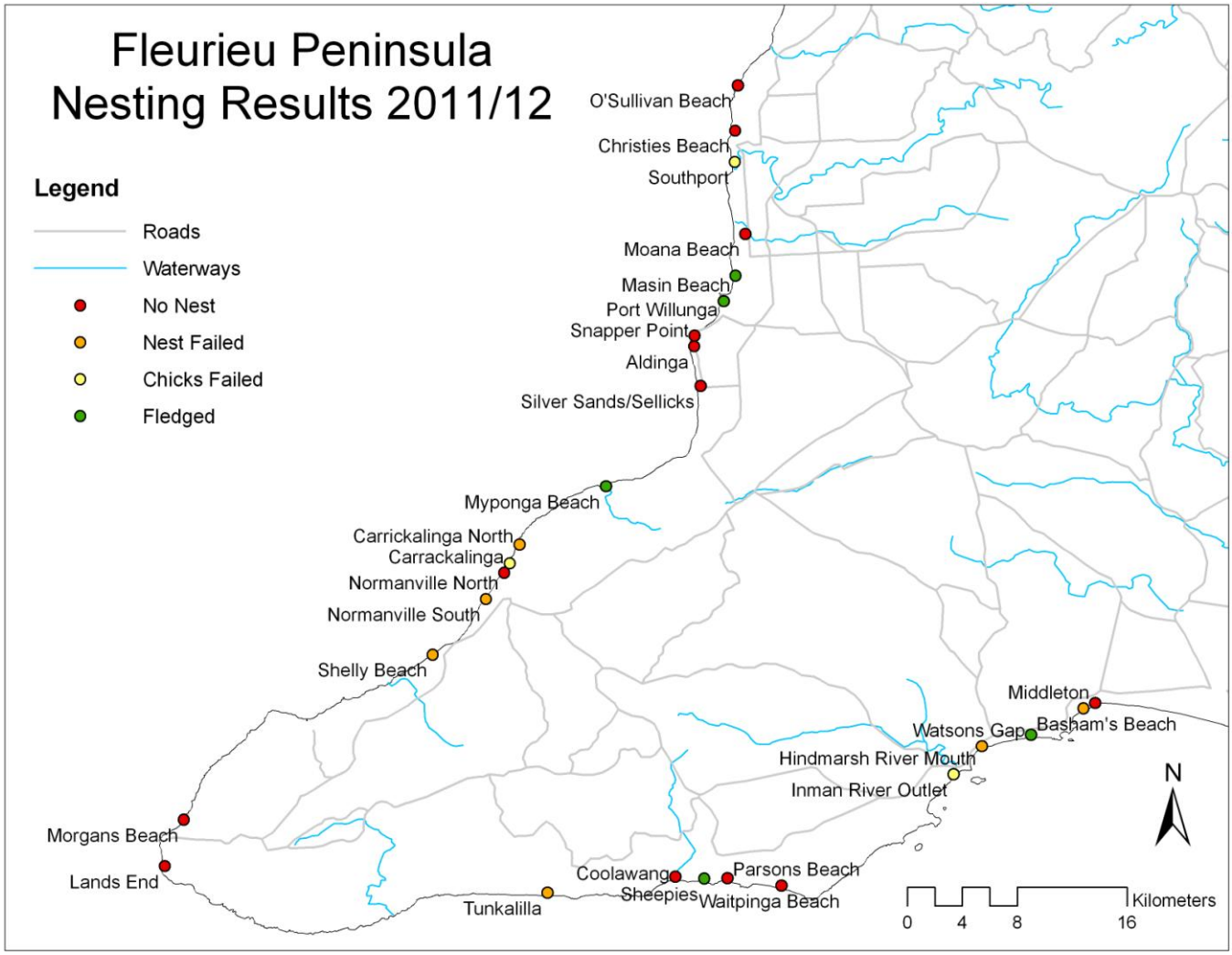
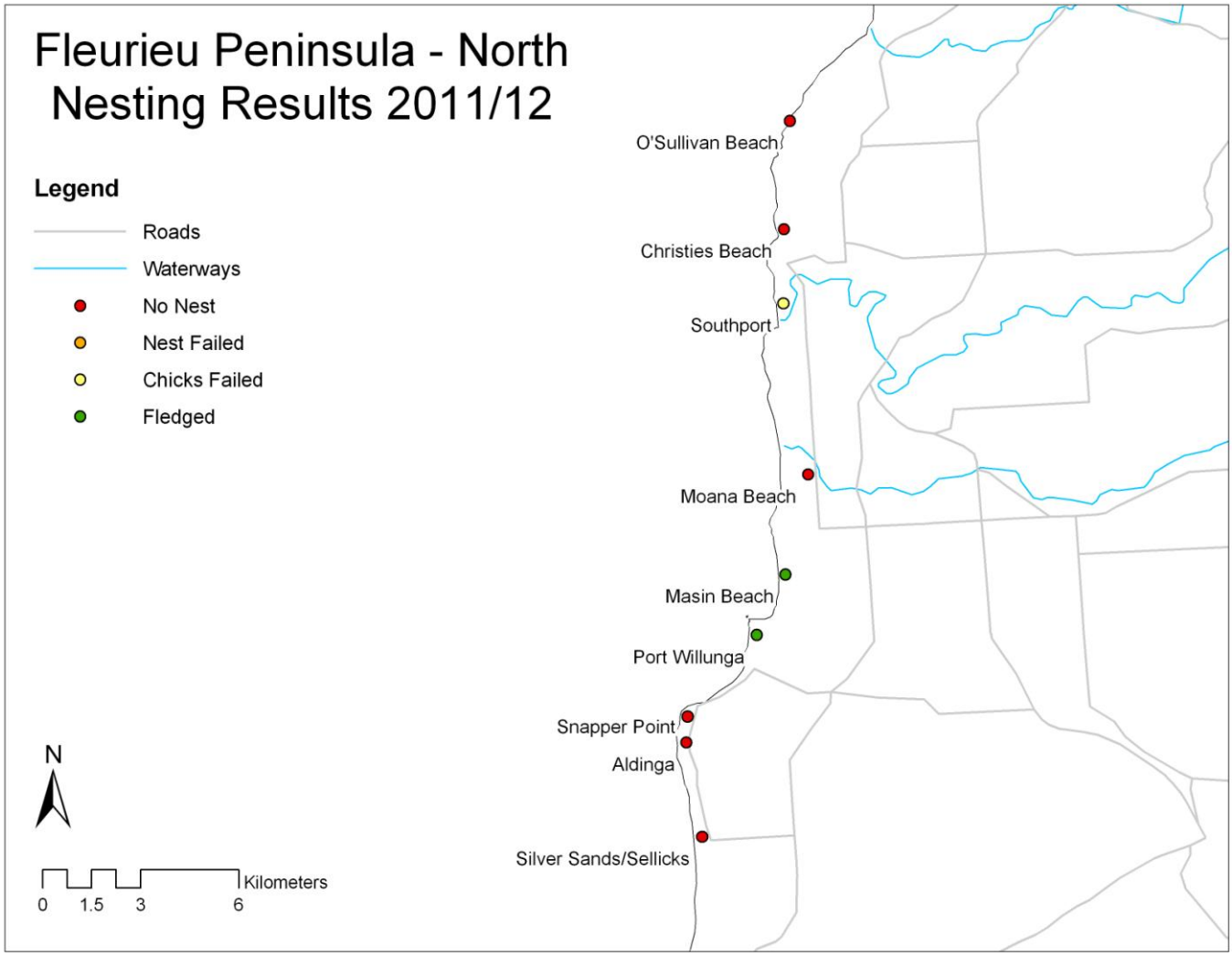
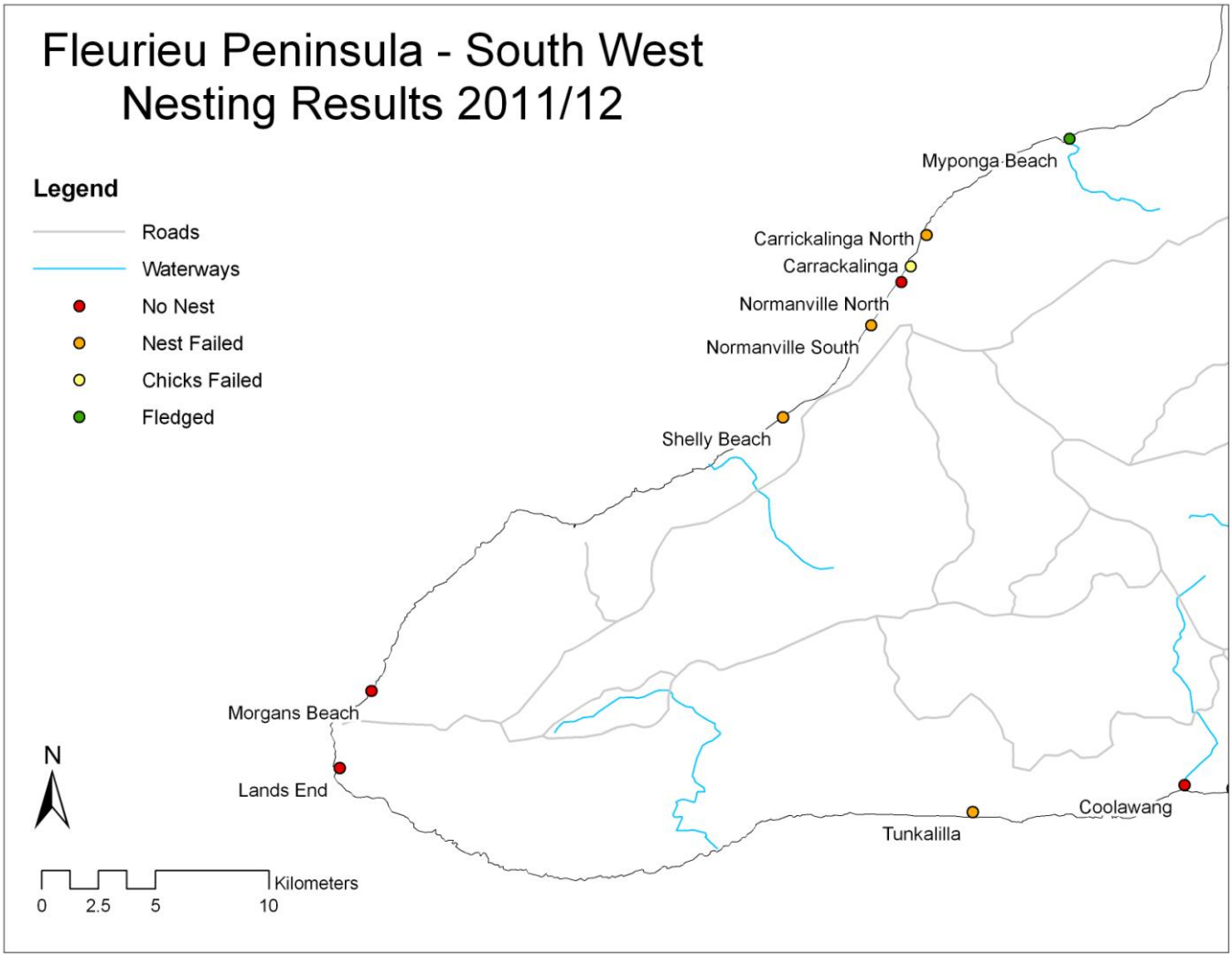


Figure 4. Map of nests according to success/failure; further below are zoomed in maps of areas with multiple nests which may not be clear on the map of the whole peninsula.




Fleurieu Peninsula - North
Nesting Results 2011/12
Legend
Roads
Waterways
No Nest
Nest Failed
Chicks Failed
Fledged
N
0
1.5
3
6
Kilometers
O'Sullivan Beach
Christies Beach
Southport
Moana Beach
Masin Beach
Port Willunga
Snapper Point
Aldinga
Silver Sands/Sellicks


Fleurieu Peninsula - South West
Nesting Results 2011/12
Legend
Roads
Waterways
No Nest
Nest Failed
Chicks Failed
Fledged
Myponga Beach
Carrickalinga North
Carrackalinga
Normanville North
Normanville South
Shelly Beach
Morgans Beach
Lands End
Tunkalilla
Coolawang
N
0
2.5
5
10
Kilometers

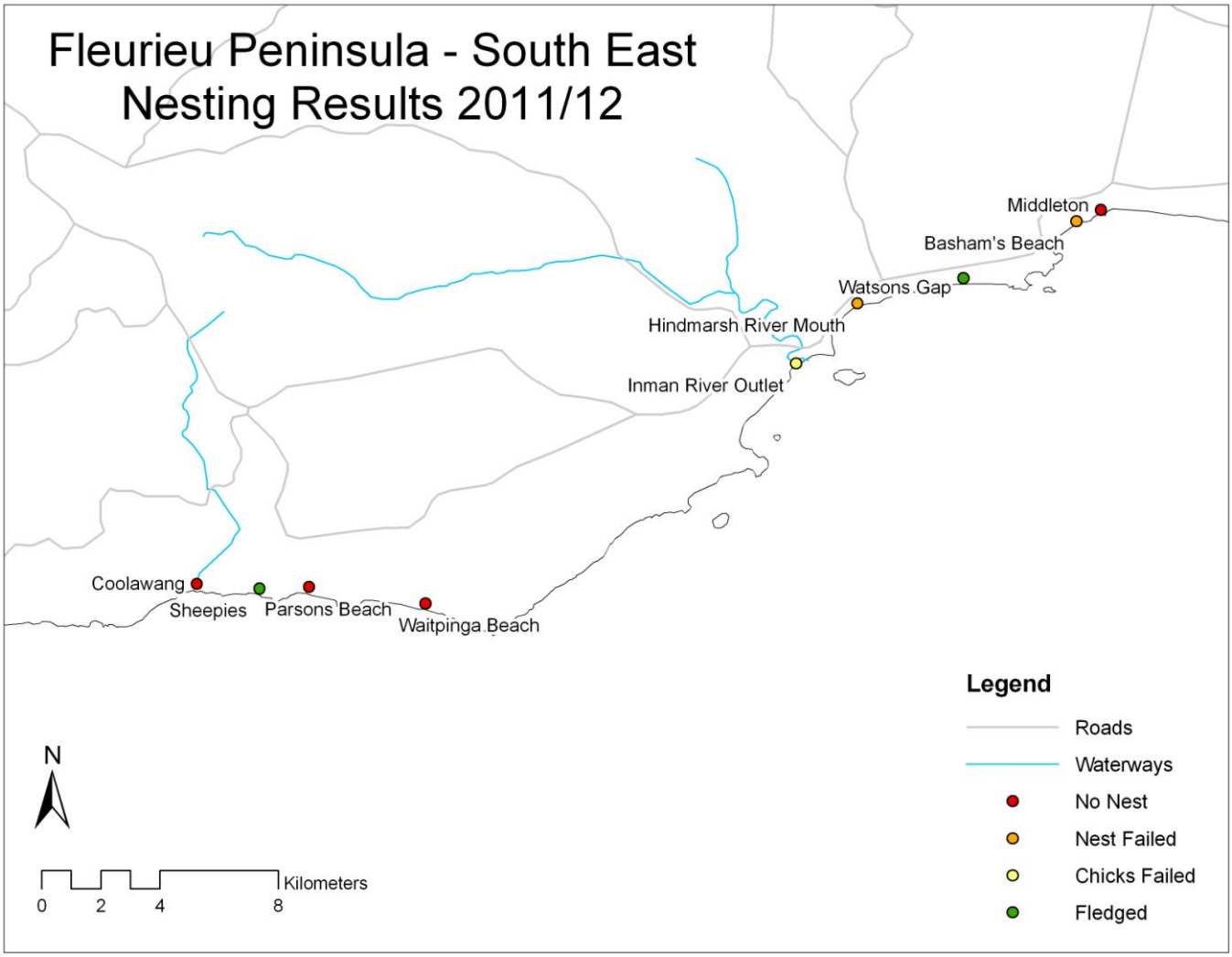

Fleurieu Peninsula - South East
Nesting Results 2011/12
Middleton
Basham's Beach
Watsons Gap
Hindmarsh River Mouth
Inman River Outlet
Coolawang
Sheepies
Parsons Beach
Waitpinga Beach
N
0
2
4
8
Kilometers
Legend
Roads
Waterways
No Nest
Nest Failed
Chicks Failed
Fledged

Table 7. 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 2011/12 breeding season.

Pair	# nests	# nests managed	# hatch	# fail at egg stage	total eggs	total chicks obsv.	total fledged
Aldinga	0	0	0	0	0	0	0
Bashams Beach	2	2	0	2	5	0	0
Carrickalinga	2	2	1	1	6	2^	0
Carrickalinga North	1	1	0	1	1	0	0
Christies Beach	0	0	0	0	0	0	0
Coolawang	0	0	0	0	0	0	0
Hindmarsh River Mouth	1	1	0	1	3	0	0
Inman River Outlet	3	3	2*	1	7	4	0
Lands End	0	0	0	0	0	0	0
Maslin Beach	3	3	1	2	9	3	2
Middleton	0	0	0	0	0	0	0
Moana Beach	0	0	0	0	0	0	0
Morgans Beach	0	0	0	0	0	0	0
Myponga Beach	1	1	1	0	2+	2	2
Normanville North	0	0	0	0	0	0	0
Normanville South	1	1	0	1	3	0	0
O'Sullivan Beach	0	0	0	0	0	0	0
Parsons Beach	0	0	0	0	0	0	0
Port Willunga	2	2	2*	0	6	5	3
Snapper Point	0	0	0	0	0	0	0
Sheepies	1	0	1	0	3+	3	3!
Shelly Beach (Lady Bay)	3	2	0	3	6	0	0
Silver Sands/Sellick Beach	0	0	0	0	0	0	0
Southport	1	1	1	0	2	2	0
Tunkalilla	1	1	0	1	2	0	0
Waitpinga Beach	0	0	0	0	0	0	0
Watsons Gap	2	2	1	1	5	1	1
TOTALS	24	22	10	14	60	22	8

* Chicks hatched and eggs failed from the same clutch. + nests were not found, egg number was assumed based on the number of chicks sighted. ^ chicks were not sighted from one nest here, however, one observer had a strong indication that there were chicks on several visits (after the eggs were no longer seen) based on the adult behaviour, so we are tentatively counting this as hatched. ! Indication that chicks may have fledged, very few sightings and cannot be confirmed, so is not counted in the totals.

Table 8. Detailed summary of nest progress for each pair according to data sheets sent in to BirdLife Australia for the 2011/12 breeding season.

Pair/location	Date	Nest update	Nest #
Aldinga	Aug – Jan	No nesting attempts recorded	
Bashams Beach	1/11/2011	Nest found, 3 eggs	1
Bashams Beach	12-18/11/2011	Nest failed during timeframe (suspect dog or fox; prints near nest)	1
Bashams Beach	26/12/2011	Nest found, 2 eggs	2
Bashams Beach	3/02/2012	Nest failed (2 eggs still being incubated, eggs ~39days old; suspect infertile eggs)	2
Bashams Beach	07/02/2012	Eggs from abandoned nest suspected taken by fox	2
Carrickalinga	10/11/2011	Nest found, 3 eggs	1
Carrickalinga	18/11/2011	Nest failed (unknown cause; nest and eggs gone)	1
Carrickalinga	12/12/2011	Scrape found, no eggs	2
Carrickalinga	10/01/2012	Nest found, 3 eggs	2
Carrickalinga	19/01/2012	2 chicks strongly suspected as hatched, one egg was abandoned	2
Carrickalinga	13/02/2012	Chicks not observed, suspect failure (unknown cause)	
Carrickalinga North	05/09/2011	Nest found, 1 egg	1
Carrickalinga North	6/09/2011	Nest failed (suspect dog; dog prints through nest)	1
Carrickalinga North	Oct – Dec	Multiple scrapes (4) found during timeframe, no eggs. No further nesting attempts	
Chrisites Beach	Nov – Feb	No nesting attempts	
Coolawang	Sept, Nov	No Hooded Plovers seen at location	
Hindmarsh River Mouth	08/08/2011	Nest found, 1 egg	1
Hindmarsh River Mouth	09/08/2011	Second egg laid	1
Hindmarsh River Mouth	12/08/2011	Third egg laid	1
Hindmarsh River Mouth	17/08/2011	Nest washed away by high tide, eggs reclaimed by adults and incubation continued	1
Hindmarsh River Mouth	18/08/2011	Nest failed (suspect dog or fox; prints near nest)	1
Inman River Outlet	11/08/2011	Scrape found, no eggs	1
Inman River Outlet	23/08/2011	Scrape no longer present	1
Inman River Outlet	06/10/2011	Nest found, 3 eggs	1
Inman River Outlet	26/10/2011	2 chicks hatch, 1 egg still present in nest	1
Inman River Outlet	27/10/2011	Remaining egg hatched, three chicks present	1
Inman River Outlet	03/11/2011	One chick missing, two remain	1
Inman River Outlet	10/11/2011	One chick missing, one remains	1
Inman River Outlet	13/11/2011	All chicks missing (unknown cause)	1
Inman River Outlet	06/12/2011	Nest found, 3 eggs	2
Inman River Outlet	03/01/2012	One egg hatched, two eggs failed (suspect crushed by human). Single chick not seen	2

		after this date (unknown cause)	
Inman River Outlet	18/01/2012	Nest found, 1 egg	3
Inman River Outlet	19-20/01/2012	Nest failed (unknown cause; many human prints through nesting area)	3
Lands End	07/12/2011	Chicks suspected, not seen	
Lands End	18/01/2012	Juvenile seen, but cannot confirm if from suspected chicks (chicks never seen)	
Maslin Beach	23/08/2011	Nest found, 3 eggs	1
Maslin Beach	29/08/2011	Eggs failed (suspect dog or fox)	1
Maslin Beach	18/09/2011	Nest found, 3 eggs	2
Maslin Beach	~24/09/2011	Nest failed around this date (suspect dog or fox)	2
Maslin Beach	22/10/2011	Nest suspected	3
Maslin Beach	30/10/2011	Nest found, number of eggs unchecked	3
Maslin Beach	07/11/2011	Nest confirmed to have 3 eggs	3
Maslin Beach	27/11/2011	Three chicks hatch	3
Maslin Beach	03/12/2011	One chick missing (unknown cause), two chicks remain	3
Maslin Beach	01/01/2012	Two chicks fledge	3
Middleton Beach	Aug – Nov, Jan, Mar	No nesting attempts recorded	
Moana Beach	Nov – Mar	No Hooded Plovers seen at location	
Morgans Beach	05/10/2011	Nest suspected, no further information available	
Myponga Beach	22/10/2011	2 chicks located (1/3 adult size, fluffy), nesting information not available	1
Myponga Beach	22/11/2011	2 chicks fledged	1
Normanville North	Oct, Feb	No nesting attempts recorded	
Normanville South	20/12/2011	Nest found, 3 eggs	1
Normanville South	24/12/2011	Nest failed (suspect crushed by human)	1
O'Sullivan Beach	Oct – Feb	No nesting attempts recorded	
Parsons Beach	08/02/2012	No nesting attempts recorded. Flock of 6 juveniles and 2 adults sighted (see Sheepies Beach)	
Port Willunga	17/08/2011	Nest found, 3 eggs	1
Port Willunga	11/09/2011	Three chicks hatch	1
Port Willunga	16/10/2011	Three chicks fledge	1
Port Willunga	15/11/2011	Nest found, 1 egg	2
Port Willunga	18/11/2011	Second egg laid	2
Port Willunga	02/12/2011	First record of third egg presence	2
Port Willunga	18/12/2011	Two chicks hatch, 1 egg remains in nest. Adult hooded plover was found dead on the	2

		beach	
Port Willunga	23/12/2011	Two chicks missing (unknown cause), single egg remains in nest (abandoned)	2
Port Willunga	6/01/2012	Single egg collected for education purposes	2
Sheepies Beach	27/11/2011	Two chicks sighted	1
Sheepies Beach	23/12/2011	Three chicks sighted	1
Sheepies Beach	08/02/2012	Flock of 6 juveniles and 3 adults sighted on adjacent beach (Parsons). Cannot be confidently confirmed these are the chicks from Sheepies	1
Shelly Beach (Lady Bay)	03/09/2011	Nest found, 2 eggs	1
Shelly Beach (Lady Bay)	05/09/2011	Nest failed (suspect Raven)	1
Shelly Beach (Lady Bay)	11/10/2011	Scrape found, no eggs	
Shelly Beach (Lady Bay)	29/11/2011	Nest found, 3 eggs	2
Shelly Beach (Lady Bay)	1/12/2011	Nest failed (suspect Pacific Gull)	2
Shelly Beach (Lady Bay)	01/01/2012	Nest found, 1 egg	2
Shelly Beach (Lady Bay)	2/01/2012	Nest failed (unknown cause)	2
Silver Sands/Sellick	Aug – Sep, Nov, Jan – Mar	No Hooded Plovers located during breeding season	
Southport	08/11/2011	Nest found, 2 eggs	1
Southport	28/11/2011	Two chicks hatched	1
Southport	29/11/2011	One chick missing, one chick present	1
Southport	02/12/2011	No chicks seen (unknown cause)	1
Snapper Point	16/01/2012	No nesting attempt recorded	
Tunkalilla	24/08/2011	Scrape found, no eggs	
Tunkalilla	06/10/2011	Nest found, 2 eggs	1
Tunkalilla	24/10/2011	Nest failed (abandoned; scrape gone, no prints at nest, adult behaviour showed no breeding behaviours)	1
Waitpinga	Oct – Dec, Feb	No nests recorded during breeding season	
Watsons Gap	21/08/2011	Scrape found, no eggs	
Watsons Gap	27/09/2011	Nest found, 2 eggs	1
Watsons Gap	01/10/2011	Nest failed (unknown; one egg was broken)	1
Watsons Gap	08/11/2011	Nest found, 3 eggs	2
Watsons Gap	10/12/2011	One chick confirmed hatched, no further information on remaining 2 eggs	2
Watsons Gap	23/01/2012	One chick fledged	2

Threats to breeding pairs

Of the potential threats to Hooded Plovers monitored by volunteers during the breeding season, people, dogs off lead and silver gulls were most prevalent at sites on the Fleurieu Peninsula from 313 threat assessments at 26 sites. Dogs on lead, vehicles and ravens were also commonly seen. See Tables 9-11 below for summaries of the proportion of visits and sites where each threat was observed, and a snapshot of what activities people were commonly using the beaches for. Table 12 assesses the prevalence and intensity of threats at each site separately and Table 13 provides average number of people and dogs on and off lead sighted. Please note that these figures should be interpreted with caution as some are based on small sample sizes across a broad time frame, making these less representative of the actual prevalence and intensity of threats at these sites (sites with infrequent threat assessments are denoted by an asterisk; namely Chrisites Beach, Coolawang, Hindmarsh River Mouth, Myponga Beach and Normanville North).

This season we were able to get a comprehensive threat profile for most sites due to a high number of visits where threat assessments were carried out. This gave us greater understanding of the visitor activities which occurred, and we were able to see distinct differences in the visitor base for sites. Waitpinga and Watsons Gap were most frequented by fishermen; Southport, Parsons and Sheepies beaches by surfers/swimmers; and Tunkalilla, Middleton, O'Sullivan and Shelly beaches, by dog walkers. The remaining sites were predominantly visited by walkers.

Silver gulls, and evidence of vehicles and horses were present at more sites than last season. Foxes records were fewer, and sightings of dogs both on and off the lead were similar to last season. Additional sites were monitored this season Sheepies, O'Sullivan, Chrisites and Aldinga beaches.

Table 9. Proportion of visits where threats were observed (this includes evidence of tracks unless specified).

Threat	**Prop. visits present (total visits=313)**
Evidence of people (prints &/or sightings)	93.0% (291)
Evidence of dogs (prints &/or sightings)	80.5% (252)
People sighted	70.9% (222)
Silver gulls	57.2% (178)
Dogs sighted	47.0% (147)
Dogs off lead	42.5% (133)
Dogs on lead	26.2% (82)
Vehicles	20.1% (63)
Ravens	9.9% (31)
Foxes	8.0% (25)
Bird of Prey	8.0% (25)
Pacific gulls	7.3% (23)
Horses	5.4% (17)
Magpies	3.2% (10)

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

Threat	Prop sites present (26)	Detected at:	Not detected at:
Foot prints	100%	All	
People	100%	All	
Dog prints	96.2%		Coolawang
Silver gulls	96.2%		Normanville North
Dogs sighted	76.9%		Coolawang, Normanville North, Parsons, Sheepies, Waitpinga, Watsons Gap
Dogs off	65.4%		Carrickalinga, Coolawang, Lands End, Normanville North, Parsons, Sheepies, Tunkalilla, Waitpinga, Watsons Gap
Dogs on	61.5%		Bashams, Carrickalinga North, Coolawang, Morgans, Normanville North, Parsons, Sheepies, Shelly, Waitpinga, Watsons Gap
Vehicles *	53.8%	Aldinga, Carrickalinga, Inman, Maslin, Middleton, Moana, Morgans, Myponga, Normanville North, Normanville South, Port Willunga, Shelly, Silver Sands, Southport	
Ravens	46.2%	Aldinga, Bashams, Carrickalinga, Carrickalinga North, Coolawang, Inman, Middleton, Parsons, Port Willunga, Shelly, Silver Sands, Waitpinga	Chrisites, Hindmarsh, Lands End, Maslin, Moana, Morgans, Myponga, Normanville North, Normanville South, O'Sullivan, Sheepies, Southport, Tunkalilla, Watsons Gap
Pacific gulls	42.3%	Bashams, Carrickalinga, Coolawang, Inman, Middleton, Moana, Morgans, Sheepies, Shelly, Silver Sands, Tunkalilla	Aldinga, Carrickalinga North, Chrisites, Hindmarsh, Land End, Maslin, Myponga, Normanville North, Normanville South, O'Sullivan, Parsons, Port Willunga, Southport, Waitpinga, Watsons Gap
Foxes	30.8%	Coolawang, Inman, Lands End, Parsons, Sheepies, Tunkalilla, Waitpinga, Watsons Gap	
BOP	30.8%	Carrickalinga North, Inman, Maslin, Middleton, Moana, Port Willunga, Sheepies, Shelly	
Horses	26.9%	Aldinga, Inman, Maslin, Normanville North, Normanville South, Silver Sands, Southport	
Magpies	19.2%	Bashams, Inman, Morgans, O'Sullivan, Silver Sands	

* Vehicles detected on beaches where vehicles are not permitted can sometimes be management vehicles.

Table 11. The main activities people were observed using the beaches for. In total, there were 1897 people at the water's edge, 442 on the beach, 4 observed inside signed/fenced areas and 31 in the dune.

Human recreational activity (of 2396people observed)	**% intensity**
Walking	46.6% (1,117)
Dog walking	30.7% (735)
Surfing/swimming	16.2% (389)
Fishing	4.5% (107)
Sitting/sun-baking	2.0% (48)

Table 12. 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 here). 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.

Site (number of threat assessments)	**Heavy threats (>50%)**	**Moderate threats (20-50)**	**Sparse threats (<20%)**	**Rare threats (<6%)**	**Common activity**
Southport (13)	People, Dog prints, Silver gulls, Dogs off, Evidence of vehicles	Dogs on,	Evidence of horses		Walk, Surf/swim, Dogs walk
Moana beach (13)	People, Dog prints, Silver gull, Dogs off	Dogs on, Raptors	Pacific gulls, Vehicles		Walk, Dogs walk, Drive
Silver Sands/Sellick Beach (9)	People, Dog prints, Silver gulls, Dogs off, Evidence of vehicles	Ravens, Magpies, Evidence of horses	Pacific gulls		Walk, Dogs walk, Drive, Surf/swim
Maslin Beach (28)	People, Dog prints, Dogs off	Silver gulls, Dogs on	Evidence of horses	Evidence of vehicles, Raptors	Walk, Dog walk, Fish
Port Willunga (43)	Dog prints, People, Dogs off,	Dogs on, Silver gulls	Raptors	Ravens, Evidence of vehicles	Dog walk, Walk
Myponga Beach (3) *	Dog prints, People, Evidence of vehicles	Silver gulls, Dogs on, Dogs off			Walk, Dog walk, Drive
Carrickalinga North (16)	Dog prints, People	Silver gulls, Dogs off	Ravens, Raptors		Walk, Dog walk, Sit/sunbake

Site (number of threat assessments)	Heavy threats (>50%)	Moderate threats (20-50)	Sparse threats (<20%)	Rare threats (<6%)	Common activity
Carrickalinga (11)	Dog prints, People, Silver gulls	Evidence of vehicles, Ravens	Pacific gulls, Dogs on		Walk, Surf/swim, Sit/sunbake, Fish, Dog walk
Normanville North (2) *		People, Dog prints, Evidence of horses, Evidence of vehicles			Walk
Normanville South (5) *	Dog prints, Evidence of vehicles, Evidence of horses, People, Dogs off, Dogs on	Silver gulls			Walk, Dog walk, Surf/swim, Drive
Shelly beach (14)	Dog prints, Evidence of vehicles	People, Silver gulls, Dogs off, Pacific gulls	Ravens, Raptors		Dog walk, Surf/swim
Morgans Beach (15)	Evidence of vehicles, Dog prints	People, Silver gulls, Dogs off, Magpies			Drive, walk, Fish, Sit/sunbake
Lands End (5) *	People, Foxes, Dog prints	Dogs on, Silver gulls			Walk, Dog walk
Tunkalilla (11)	Foxes	Pacific gulls	Silver gulls, People, Dogs on, Dogs off		Dog walk
Coolawang (1) *	People, Pacific gulls, Silver gulls, Ravens, Foxes				Walk
Parsons beach (10)	Silver gulls, People	Foxes, Ravens, Dog prints			Surf/swim, walk, Fish
Waitpinga Beach (8)	People, Ravens, Foxes	Silver gulls	Dog prints		Fish, Surf/swim
Inman River outlet (54)	Dog prints, Silver gulls, People	Dogs off, Dogs on	Raptors, Pacific gull	Evidence of vehicles, Evidence of horses, Foxes, Ravens, Magpies	Walk, Dog walk, Surf/swim, Fish

Hindmarsh River mouth (2) *	People, Dog prints, Dogs off, Silver gulls	Dogs on			Walk, Dog walk
Watsons Gap (5) *		Foxes, Silver gulls, Dog prints, People			Fish
Bashams Beach (10)	People, Dog prints, Silver gulls	Ravens, Pacific gulls, Dogs off	Magpies		Walk, Dog walk, Surf/swim, Fish
Aldinga Beach (7)	Evidence of vehicles, Silver gulls, Dogs off, Dog prints, People, Dogs on, Evidence of horses	Ravens			Walk, Drive, Dog walk, Surf/swim
Chrisites Beach (4) *	People, Dog prints, Dogs off	Silver gulls, Dogs on			Walk, Dog walk, Surf/swim
Middleton Beach (8)	People, Dog prints, Silver gulls, Dogs off, Dogs on	Raptors, Ravens	Evidence of vehicles, Pacific gulls		Dog walk, Surf/swim, walk
O'Sullivan Beach (7)	People, Silver gulls, Dogs off, Dog prints,	Magpies, Dogs on			Dog walk, Surf/swim, walk
Sheepies Beach (8)	Silver gulls	Foxes, People	Pacific gulls, Raptors, Dog prints		Surf/swim

Table 13. Mean (± 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 (number of assessments)	Number of people	Number dogs off lead	Number dogs on lead
Southport (13)	31.08 ± 7.24	2.54 ± 0.82	1.54 ± 0.81
Moana beach (13)	7.08 ± 2.14	2.54 ± 0.69	1.00 ± 0.38
Silver Sands/Sellick beach (9)	47.11 ± 19.73	6.44 ± 1.70	3.22 ± 1.26
Maslin Beach (28)	6.57 ± 1.04	1.32 ± 0.39	0.50 ± 0.15
Port Willunga (43)	8.77 ± 1.20	3.05 ± 0.51	1.16 ± 0.25
Myponga Beach (3) *	4.00 ± 2.00	0.67 ±0.67	0.67 ±0.67
Carrickalinga North (16)	2.56 ± 0.60	0.38 ± 0.18	0
Carrickalinga (11)	21.55 ± 17.93	0	0.18 ± 0.18
Normanville North (2) *	1.50 ± 1.50	0	0
Normanville South (5) *	7.00 ± 3.77	1.00 ± 0.45	0.60 ± 0.24
Shelly beach (14)	0.93 ± 0.38	0.47 ± 0.20	0
Morgans Beach (15)	3.87 ± 1.66	0.60 ± 0.27	0
Lands End (5) *	2.20 ± 1.50	0	0.60 ± 0.40
Tunkalilla (11)	0.09 ± 0.09	0	0.09 ± 0.09
Parsons beach (10)	5.20 ± 2.00	0	0
Waitpinga Beach (8)	9.00 ± 3.18	0	0
Inman River outlet (54)	4.91 ± 1.96	0.59 ± 0.13	0.35 ± 0.11
Hindmarsh River mouth (2) *	9.50 ± 6.50	5.00 ± 0.00	1.00 ± 1.00
Watsons Gap (5) *	0.40 ± 0.40	0	0
Bashams beach (10)	1.70 ± 0.83	1 ± 0.54	0
Aldinga (7)	35.00 ± 9.48	7.43 ± 1.78	2.43 ± 0.61
Chrisites Beach (4) *	60.00 ± 41.13	7.75 ± 5.79	0.75 ± 0.75
Coolawang (1) *	5.00 ± 0.00	0	0
Middleton Beach (8)	14.75 ± 3.64	3.13 ± 1.19	1.13 ± 0.30
O'Sullivan (7)	30.14 ± 14.25	7.71 ± 3.39	0.43 ± 0.43
Sheepies Beach (8)	0.38 ± 0.26	0	0

Management of breeding pairs during the 2011/12 breeding season

The majority of nests/chick sites were managed in the 2011/2012 breeding season (91.7% of 24 recorded nesting attempts), increasing from previous years. 18 of the managed nests consisted of fencing and signs, the remaining nests consisted of signs at access points and/or signs at the nesting site. Chick management was undertaken at 4 sites, with shelters and/or chicks on the beach signs.

The first nest in the foredune from the pair at Shelly Beach was recorded as unmanaged, which failed (suspected by a raven) within two days of the eggs being found. Sheepies Beach was also unmanaged, as the nest was not located, but three young chicks were located in late November.

During the 2010/11 breeding season, only one unmanaged nest site to fledged chicks (Tunkalilla; which was not managed due to it's remoteness), otherwise, all other fledglings were from managed sites (signs and/or fencing). All of the confirmed 8 fledglings (from 4 nests) this season were from actively managed sites, all of which had fencing. Of the 10 successfully hatched nests, 9 had active management (8 had fences and signs and 1 had signs at the nesting site only) and only one nest had no form of active management recorded (Sheepies; where the nest was never located). Table 14 provides details of site managements. There is insufficient data to correlate management with success as most sites with human threats were managed for the purposes of protecting the eggs/chicks.

Nest/chick management and community engagement activities over the 2011/12 season:

- The Hooded Plover Council Response Plans continue to guide the step by step process of management once a nest is found.
- Permanent signs at access points.
- Temporary fencing and signage around nests and chicks.
- Temporary signs communicating nest failure or chick hatching success.
- Wooden A-frame chick shelters (however no observations have been made of chicks using them yet).
- The 12 fencing and 12 signage kits distributed across the Fleurieu enable management to occur in an efficient manner.
- Chick banners are now available for use where required.
- Victor Harbor Beachside Caravan Park were notified when nests or chicks were present at the Inman River outlet.
- A nest at South Port was observed for the first time. The nest was fenced and signed, the eggs hatched however the chicks survived a few days only. South Port Surf Life Saving Club, Port Noarlunga Aquatics and Surfing SA were all notified and were happy to assist and work around the area.
- 9 new volunteers joined the monitoring program over the 2011/12 season. There is now a total of 36 volunteers monitoring 22 pairs across the Fleurieu.
- All permits and approvals have been provided for capture and banding of Hooded Plovers on the Fleurieu Peninsula. The permit applications were undertaken by Grainne Maguire. The purpose of the program is to train relevant staff and volunteers in the methods of capture in the event of an oil spill or entanglement. In addition, birds will also be banded so more can be learnt about the species, survivorship and movement on the Fleurieu Peninsula and beyond. Grainne Maguire and Mike Weston ran a Hooded Plover capture and banding workshop on 8th May. A theory session was followed by a practical session capturing and banding of 2 Hooded Plovers. One at Maslin Beach (XY) and one at Myponga Beach (EY). Approximately 30 people attended (DENR, NRM Board staff and volunteers).

- One of the adult breeding pair at Port Willunga was found dead on the beach (2 days after chicks had hatched). The specimen was taken to the SA Museum and examined by a veterinary pathologist and it was determined that there were no physical injuries, and all organs were healthy except for the kidneys which had a very speckled appearance. Pathology tests will help to determine if there was kidney disease. The specimen was a male.
- HP breeding locations were mapped on the Board's asset mapping program which will ensure this information is included in the revised Regional Plan for the AMLR NRM Board region.
- Hooded Plover breeding pair locations were provided to the Marine Parks program (DENR).
- All data up to and including 2010/11 season has been entered into the Biological Database of South Australia (BDBSA). Data from the 2011/12 season will also be entered.
- Emma Stephens attended the Eastern Mainland Hooded Plover Recovery Workshop on Phillip Island Victoria (25 May) and presented on the Fleurieu Peninsula Hooded Plover Monitoring and Management Program. There were 110 attendees (BirdLife Australia staff, land managers and volunteers), and 8 Fleurieu volunteers attended. The Fleurieu program received a lot of positive feedback particularly regarding the Hooded Plover Council Response Plans and Hooded Plover Fencing and Signage Kits and have subsequently had 3 people contact the NRM Board to discuss these plans (volunteers and Team Leader for Parks Victoria on the Mornington Peninsula). It also provided the opportunity for coastal land managers from Kangaroo Island, Eyre Peninsula, Yorke Peninsula and the South-East to discuss the Hooded Plover programs occurring in each region.
- Meg Cullen (BirdLife Australia) ran a Hooded Plover Professional Development workshop for local teachers at the Victor Harbor Whale Centre. BirdLife Australia has developed an Education Kit which was the focus of the workshop.
- Emma Stephens provided a presentation on Beach-Nesting Birds to the NRM Board's Coastal Ambassadors program.
- Meg Cullen presented at a Beach Nesting Birds workshop at the NRM Board's Coastal Community Forum.
- 10 Dogs' Breakfast workshops and kids activities were run by the NRM board over the summer with 438 people and 102 dogs attending. Wendy White from the Normanville Natural Resource Centre organised and attended the workshops with Emma Stephens and volunteers attended all workshops and assisted with setting up/packing up and talking with the beach-goers. Sites targeted for workshops included those which have breeding pairs present and which experience high visitor numbers over the breeding season.
- The Board funded the production of a short video on Hooded Plovers. The Hooded Plover pair at Maslin Beach were in the limelight and the local volunteers were invited to take part – Ashley Read did a fantastic job of talking about the birds, and his role as a volunteer. There is a link to the video on the NRM Board's website:

http://www.amlrnrm.sa.gov.au/Coast/Marineandcoastalwildlife/HoodedPlovers/AboutHoodedPlovers.aspx

- Hooded Plover breeding updates are now made available on the Board's website and facebook page.
- A Hooded Plover pamphlet was developed specifically for the Fleurieu Peninsula and distributed at all events including Dogs Breakfast workshops.
- Media coverage included: radio, newspapers (The Advertiser, On the Coast, Victor Harbor Times), the NRM Board's E-News, and the program and volunteers were featured in the first issue of BirdLife Australia's new magazine "Australian Birdlife".
- NRM staff attended the Yankalilla show and provided a display on Hooded Plovers.
- The Hooded Plover program and volunteers were selected as Finalists in the Coastcare category of the 2011 SA Landcare Awards.

Decisions re. management at some sites and not others:
Most sites where nests and chicks were present were managed with the use of fencing, signage and chick shelters. The only sites that were not managed were the more remote sites of Lands End, Sheepies and Tunkalilla. However these sites do still receive some visitation so it may be considered for the next breeding season if required.

At Maslin Beach the Hooded Plovers often nest well back from the beach on the face of the secondary dune (this is very rare behavior on the Fleurieu). During the 2009/10 season we only installed signs presuming the nest would be safe back in the dunes, however when a recently hatched chick was accidentally crushed in a nest it was decided to fence along the base of the dunes. This management practice has continued, and fencing also stretches across the creek outlet as this provides further protection for the chicks which use this area as a refuge and feeding area during busy days on the beach.

Roles of each participating group in the coming breeding season:

BirdLife Australia:

- Provide Technical advice as needed
- On-site liaisons with volunteers (one-on-one and workshops)
- Implementation of the online data portal including training sessions
- Hooded Plover Banding
- Coordinating 2012 Hooded Plover biennial count
- Red-capped Plover workshops for staff and volunteers

NRM Board:

- Continued support of volunteers from NRM Coast, Estuary and Marine Officers.
- Visit volunteers to provide on-site training relevant to their sites.
- Actively engage new volunteers for sites not being monitored, and to provide additional support at sites currently being monitored.

- Expansion of project and on-ground works (continue to trial nest cameras to detect and identify nest predators and to determine nest fates).
- Funding support and resourcing of program equipment (signage and fencing kits etc)
- Continue to band Hooded Plovers on the Fleurieu Peninsula in consultation with BirdLife Australia.
- Community awareness efforts, e.g. media, events, targeting local schools or community centres.
- Continue to work with DENR, Local councils and other project partners.

DEWNR:

- Oversee and administer the Hooded Plover Recovery Plan for South Australia (currently still on in draft form, awaiting Ministerial approval).
- Assisting with policy and planning changes, e.g. Dog and Cat Management Plan.
- Threatened species officers - providing 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 District Council of Alexandrina.

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

Volunteers:

- Monitoring pairs at nominated sites.
- Collecting data using data sheets until the online data portal is running (e.g. for each nest keeping records that follow through the fate of a nest; recording threats at sites; noting when birds were absent).
- The potential to liaise with the public when visiting the birds.
- Attending training events.
- Letting us know about your needs and sharing ideas/concerns about conservation of the species.

Figure 5. Map of sites according to whether they were managed or unmanaged.

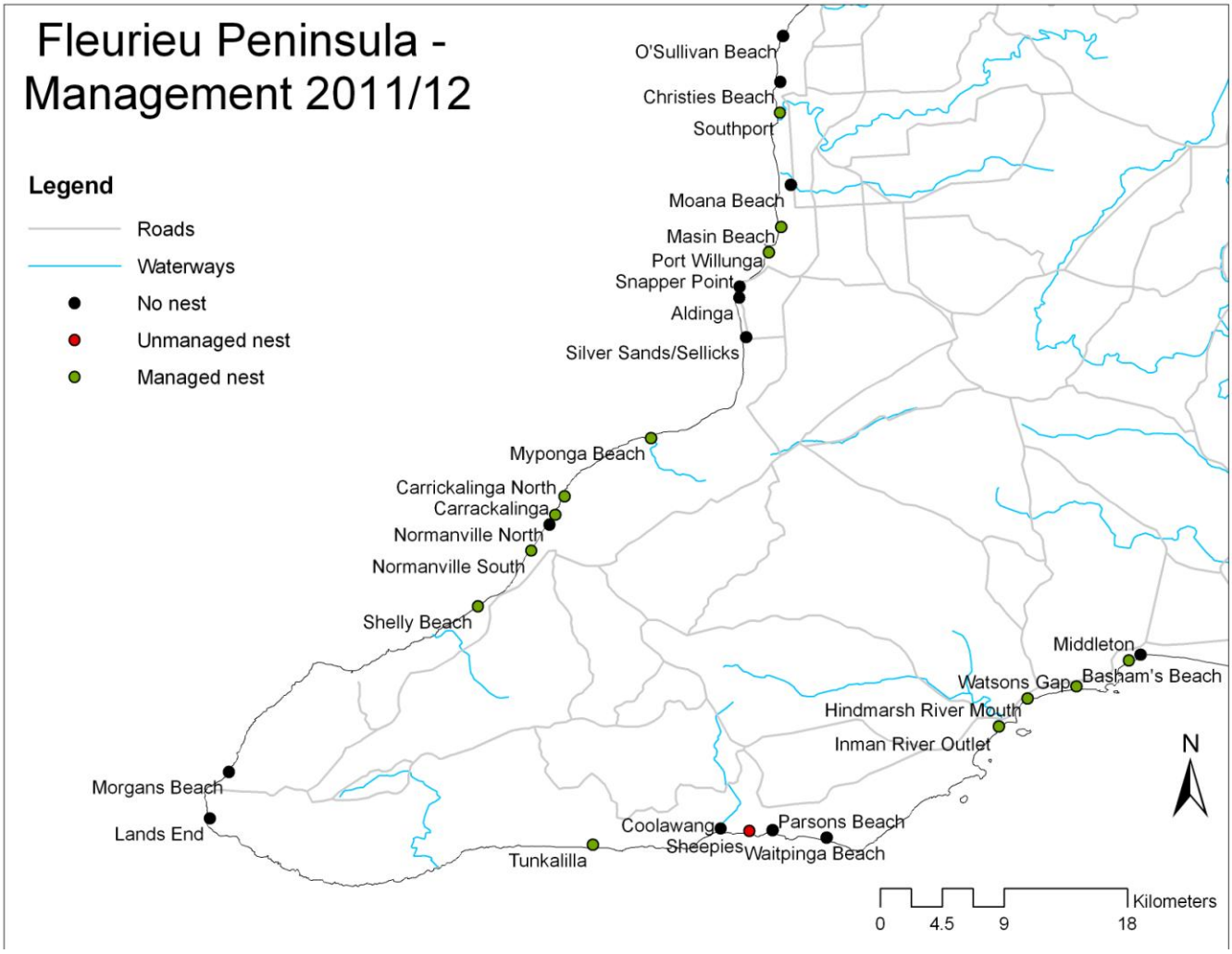


Table 14. Summary of managements across sites during the 2011/12 breeding season. An asterisk denotes nests that were never located and here an assumption of the number of eggs was made (based on the number of chicks sighted). ^ denotes suspected chicks, which were not sighted, however, one observer had a strong indication that there were chicks on several visits (after the eggs were no longer seen) based on the adult behaviour, so we are tentatively counting this as hatched. + Indication that 3 chicks fledged, very few sightings and cannot be confirmed, so are not counted in the total.

Site	date found	egg #	hatched	chick #	fledge #	location	cause of failure?	mgmt	chick mgmt
Bashams Beach	1/11/11	3				dune	suspect dog or fox	Signs at nesting site	
Bashams Beach	26/12/11	2				dune	Suspect infertile eggs	Signs access	
Carrickalinga	10/11/11	3				beach	unknown	Signs access, signs at nesting site, fence	
Carrickalinga	10/01/12	3	19/01/12	2^	0	50m north of first access point north of toilet block		Signs at nesting site, fence	
Carrickalinga North	05/09/11	1				3m from base of low foredune	suspect dog	Signs access, signs at nesting site	
Hindmarsh River Mouth	08/08/11	1				centre of large spit		Signs access, signs at nesting site, fence	
Hindmarsh River Mouth	09/08/11	2				centre of large spit		Signs access, signs at nesting site, fence	
Hindmarsh River Mouth	12/08/11	3				centre of large spit	suspect dog or fox	Signs access, signs at nesting site, fence	
Inman River Outlet	06/10/11	3	27/10/11	3	0	upper beach	chicks unknown	Signs at nesting site, fence	chicks on beach sign
Inman River Outlet	06/12/11	3		1	0	upper beach	two eggs suspected crushed by human; chick unknown	Signs at nesting site	
Inman River Outlet	18/01/12	1				upper beach	unknown	Signs at nesting site	
Maslin Beach	23/08/11	3				ledge on dune face	suspect dog or fox	Signs access, signs at nesting site, fence	
Maslin Beach	18/09/11	3				dune face	suspect dog or fox	Signs access, signs at nesting site, fence	

Site	date found	egg #	hatched	chick #	fledge #	location	cause of failure?	mgmt	chick mgmt
Maslin Beach	30/10/11	3	27/11/11	3	2	ledge on foredune face	one chick; unknown	Signs access, signs at nesting site, fence	
Myponga Beach	22/10/11	2*	before 22/10/11	2	2			Signs access, signs at nesting site, fence	
Normanville South	20/12/11	3				south of Bungala River outlet	suspect crushed by human	Signs at nesting site, fence	
Port Willunga	17/08/11	3	11/09/11	3	3	raised area top of beach		Signs access, signs at nesting site, fence	chick shelters, chicks on beach sign
Port Willunga	15/11/11	3	18/12/11	2	0	upper beach	egg abandoned; chicks unknown	Signs access, signs at nesting site, fence	chick shelters
Sheepies	27/11/11	2*	before 27/11/11	2	3+		unknown		
Shelly Beach	03/09/11	2				foredune	suspect raven		
Shelly Beach	29/11/11	3				8m from dune base	suspect pacific gull	Signs access, signs at nesting site, fence	
Shelly Beach	01/01/12	1				10m from base of dune	unknown	Signs access, signs at nesting site, fence	
Southport	08/11/11	2	21-28/11/11	2	0	on spit, in foredune	unknown	Signs at nesting site, fence	chick shelters
Tunkalilla	06/10/11	2				dune	abandoned	Signs access, fence	
Watsons Gap	27/09/11	2				unknown	unknown	Signs	
Watsons Gap	08/11/11	3	1-10/12/11	1	1	unknown	two eggs unknown	Signs at nesting site, fence	

Chick sign at Myponga beach; Emma with Channel 10 presenter; Dogs Breakfast at Bashams beach (courtesy AMLR NRMB Ben Grant)

Student research projects

BirdLife Australia has also been supervising several student projects utilizing nest cameras to gain a greater understanding of nest predators and to investigate new predator control methods.

Honours theses with their abstracts:

Clutch fate and success of the hooded plover (*Thinornis Rubricollis*).
Renée Mead, Deakin University, 2012.

Egg depredation is one of the most significant causes of reproductive failure among groundnesting birds, which use a variety of anti-predator adaptations such as placing nests where predators are rare and/or detected early, and laying cryptic eggs. However, studies of egg fate of shorebirds commonly use circumstantial evidence to infer fate. This study uses remote sensing cameras to confidently assign fate to 64 hooded plover (Thinornis rubricollis) clutches, of which 40.6% hatched. The primary cause of clutch failure was depredation by European red fox (Vulpes vulpes; 26.3% of clutches), raven (Corvus sp.; 23.7%) and Australian magpie (Gymnorhina tibicen; 15.8%), which occurred in beach, foredune and dune habitats. High tide was a major cause of clutch failure in beach habitats (29.2%). Suspected causes of failure (trampling by humans and depredation by dogs) were rare or not evident. Magpie, water rat (Hydromys chrysogaster) and swamp harrier (Circus approximans) were not previously identified and confirmed as egg predators for the first time. Habitat surveys were undertaken to determine factors which may influence clutch success, however variables (distance to dead object, habitat type, management, age of eggs at time of discovery and breeding season) were not associated with the probability of depredation or hatching, or whether a clutch was preyed upon by mammalian or avian predators. A positive relationship between the age of eggs and clutch survival occurred. This study suggests that several native predators, hitherto unrecognised as plover egg predators, may warrant consideration in management.

An assessment of the efficacy of using conditioned aversion of foxes to the eggs of beach-nesting birds; a broad scale test.

Aimie Cribbin, Deakin University, 2012.

Predators are a major evolutionary force, and can suppress the reproduction of threatened species such as the ground-nesting, beach-dwelling hooded plover Thinornis rubricollis, for which clutch depredation by red foxes Vulpes vulpes is considered a conservation threat. Conditioned aversion (CA) relies on creating an aversion to a prey type (i.e. eggs), through inducing a negative experience (i.e. sickness) among intelligent, territorial predators. On Victorian beaches, a low species-specificity of predators taking CA-treated eggs was found (foxes took 9.7% of arrays, ravens and rodents took 80.0%; n = 145 'arrays'). None of three CA strategies tested (one nest with 28 and 42 day training periods, and a six nest 'saturation' array) produced a detectable aversion by avian or mammalian predators. The probability of model eggs being preyed upon was positively correlated with the grassiness of a nest site, and negatively by the distance of the nest from a dead object. Compared with the randomly placed false nests, hooded plover nests were situated in less grassy areas, but were no further from dead objects. The probability of model egg loss was not influenced by the distance of an array from the dune base, however real nests were 6.03 m closer to the dune base on average (though power was low, 44.7%). Thus, hooded plovers appear to select nesting sites on the basis of at least one variable which is associated with reduced depredation rates (little grass). The efficacy of CA as a broad-scale management solution to high rates of clutch depredation is questionable, but the management of grass on dunes may serve to reduce clutch depredation rates.

Acknowledgements
The volunteers are the people who spend hours on the beach collecting all of this information, braving all kinds of weather and human encounters, and feeling all the highs and lows their pair of birds experience. Sincerest thanks to everyone for their efforts and also for their patience when it comes to recognising that some changes to conservation management can take a long time to come about. 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 District Council of Alexandrina.

Thanks to Mike Weston, Deakin University, for running the Hooded Plover capture and banding workshop on the Fleurieu Peninsula. Sincere thanks to Keith, Tom, Jacob, Allen and Mary for assisting with data entry at the BirdLife Australia national office.

This project receives financial support from the Australian Government's Caring for our Country and Adelaide and Mount Lofty Ranges NRM Board.

The release of a flagged Hooded Plover on the Fleurieu Peninsula.