

**Assessment of Hooded Plover (*Thinornis rubricollis*)
breeding success and threats on the Fleurieu
Peninsula 2006/07**



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Report produced June 2009

Cover: Hooded Plover nest, Tunkalilla
This page: Hooded Plover track, Tunkalilla
Photos: Emma Stephens

Acknowledgements

This project was conducted on a voluntary basis and would not have been possible without the dedication of all volunteers involved. The total number of voluntary survey hours for all 20 sites was 520 hours.

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1. Project Title

Assessment of Hooded Plover (*Thinornis rubricollis*) breeding success and threats on the Fleurieu Peninsula 2006/07.

2. Project Summary

Beaches are critical for the survival of beach nesting birds. The Hooded Plover breeding season coincides with the busiest time of year for beach recreation use (spring and summer). Beach nesting birds, such as the Hooded Plover, are readily disturbed by humans and dogs, often resulting in eggs and nests being inadvertently abandoned, crushed and/or exposed to predators. Furthermore, vehicles and increasing numbers of introduced predators such as foxes and cats are having an impact on breeding success. Consequently, managing the coexistence of both humans and beach nesting birds requires dedicated research, practical on-ground management, and community awareness raising and engagement.

Hooded Plovers are listed as Near Threatened on the IUCN Red List (2008) and Vulnerable under the South Australian *National Parks and Wildlife Act 1972*. The species is also rated as Endangered within the Gulf St Vincent IBRA subregion, in a South Australian Regional Status Assessment Project (Gillam and Urban 2008). The *Southern Fleurieu Coastal Action Plan and Conservation Priority Study* (Caton *et al.* 2007), has recorded the Hooded Plover in 19 of the 27 study cells, covering the majority of sandy beaches in the region. Due to the species' status and that it is found nesting on the Fleurieu Peninsula, the plan recommends that the Hooded Plover is adopted as a focal species for its high conservation value. The draft *Metropolitan and Northern Coastal Action Plan* (Caton *et al.* 2009 unpubl.) also lists the Hooded Plover as a focal species.

In South Australia (SA), Hooded Plovers are found on Eyre Peninsula, Yorke Peninsula, Kangaroo Island, Fleurieu Peninsula and the South-East. The total population in SA was estimated at approximately 540 birds in 1994 (Natt and Weston 1995), however, more recent surveys suggest that the total SA population could be around 750 – 800 (Mooney *et al.* 2009). Numbers on Kangaroo Island have declined by c.24% over the last 20 years with greatest declines (44%) on the more popular northern and eastern coastlines where human disturbance is at its greatest (Dennis and Masters 2006). The negative impacts to Hooded Plovers by human disturbance is correlated in a number of other studies (Buick and Paton 1989, Weston and Elgar 2005, Weston 2003).

This project focuses on a detailed assessment of Hooded Plover breeding success on the Fleurieu Peninsula and the associated threats at each of 20 selected study sites. The project aims are based on a number of the Primary Recovery Actions listed in the draft *South Australian Recovery Plan for the Hooded Plover* (Baker-Gabb and Weston 2006:13):

1. Establish current baselines on the following:
 - a). Hooded Plovers
 - General distribution: the extent of occurrence and area of occupancy;

- Specific distribution: on which beaches they do (?) and do not (?) occur.
- b). Threats
 - Establish/Define relative threat baselines
- 2. Identify gaps in knowledge/data
 - distribution – general and nesting;
 - relative recruitment rates; and
 - different threats.
- 3. Identify key locations for long-term monitoring based on:
 - ease of access/proximity to regular observer(s)/reliability of observers; and
 - different management regimes (target specific areas).

A further project aim was to instigate practical management to assist breeding success, such as the installation of temporary fencing and signage. This required extensive engagement of key stakeholders such as Local Government, Department for Environment and Heritage (DEH) and various community groups. It was also the aim of the project to raise community awareness by producing a monthly project report and providing updates in journals, newsletters and local papers.

This project was made possible by the efforts of 15 dedicated volunteers who: regularly surveyed their sites, assisted in installing and monitoring temporary fences and signage, and significantly raised community awareness by talking with beach recreationists. In addition, the volunteers have included their recommendations for future site management as part of this report (Appendix 2). The future of Hooded Plover conservation in SA will be made a success by the involvement of the community as a whole.

This report briefly summarises Hooded Plover distribution, abundance, breeding success, threat analysis and management, using basic statistical analysis. A more detailed analysis of all threats is yet to be completed.

3. Aims and objectives

3.1 Aim

The aim of this project is to establish a systematic regional monitoring program which will regularly assess Hooded Plover breeding activity and threats at sites on the Fleurieu Peninsula during the breeding season. Results will address a number of the primary recovery actions set out in the draft *SA Recovery Plan for the Hooded Plover* (Baker-Gabb and Weston 2006) and will lead to an improved understanding of threatening processes and an increase in practical management.

3.2 Objectives

1. Establish current baselines on Hooded Plover populations, breeding success, and threats at sites along the Fleurieu Peninsula coastline over the 2006/07 breeding season.
2. Instigate practical management options to enhance nesting success.

3. Provide recommendations regarding Hooded Plover management on the Fleurieu Peninsula.
4. Engage the community to facilitate long term monitoring of Hooded Plovers in the region.

4. Methodology

20 sites (Table 1) were established using the current Hooded Plover distribution map from the draft *SA Recovery Plan for the Hooded Plover* (Figure 1) and sightings from other reports. The number of volunteers available and proximity of volunteers to beach sites also had to be considered in the project design. The study sites comprised of 20 sandy beaches, the majority of which were backed completely or partially by sand dunes (in concordance with the preferred habitat noted by Smith 1964, Lane 1981, Schulz *et al* 1984, Murlis 1989, Weston 2003). Some sites were situated in close proximity to town centres and dense housing; others were remote; two sites were within a Conservation Park (CP) and one adjacent to a CP.

Table 1. Survey sites.

Site #	Site
1	Southport
2	Moana
3	Maslin Beach
4	Port Willunga
5	Aldinga Beach
6	Carrickalinga Head
7	Carrickalinga Beach
8	Normanville Beach
9	Normanville to Lady Bay
10	Monument - Lady Bay
11	Tunkalilla Beach
12	Parsons Beach
13	Waitpinga Beach
14	Inman River outlet
15	Hindmarsh River outlet
16	Bashams beach
17	Watsons Gap
18	Goolwa beach
19	Sir Richard Peninsula
20	Bird Island



Figure 1. Records of Hooded Plover (*Thinornis rubricollis*) on the Fleurieu Peninsula and south east coast of SA. Records are from the DEH Biological Database of SA and the SA Museum. Records are grouped in time periods, with more recent records overlaying older records (Baker-Gabb and Weston, 2006:6).

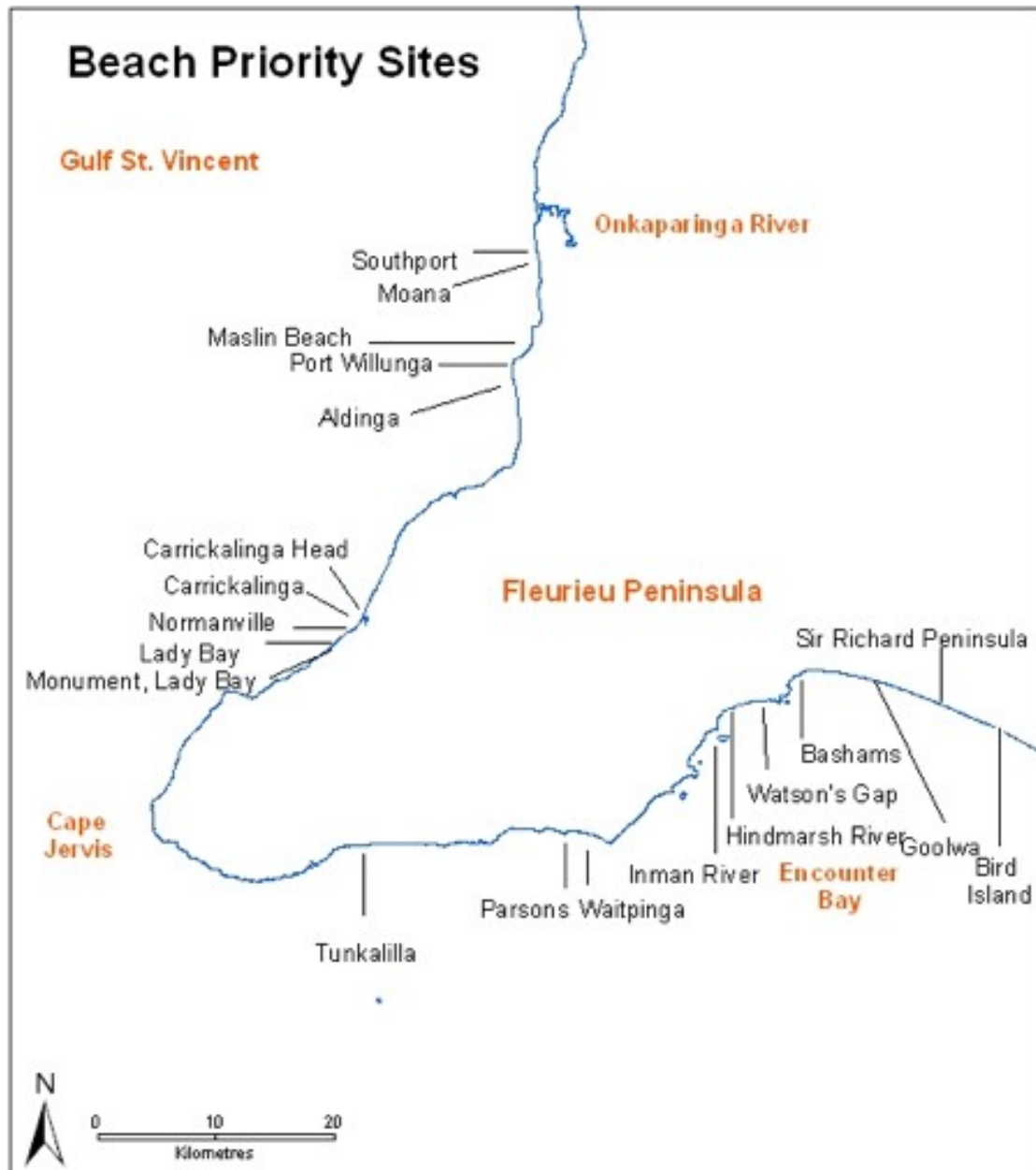


Figure 2. Map showing the 20 project sites.

Methods:

- Establish and co-ordinate a monitoring group of skilled volunteer bird watchers (15 volunteers) to survey 20 beach sites (Figure 2).
- Monitoring methodology:
 - a. Search the same stretch of beach once per fortnight (more regularly if possible) between September 2006 and March 2007.
 - b. Complete the Hooded Plover Monitoring Sheet* at each visit made to the site. Information regarding Hooded Plovers present at the site and any nesting activity is recorded on this datasheet.
 - c. Complete the Hooded Plover Territory Monitoring Sheet* at each visit made to the site. Information regarding the threats (abundance and density) at each site is recorded on this datasheet.
 - d. Guidelines* on methods of best practice regarding data collection will be provided to each volunteer.

- e. All data collected will be forwarded to the project co-ordinator at the end of each month. This data will be entered into an excel database.
- f. Data will be analysed and a report detailing the results, discussion and recommendations for future management of key sites along the Fleurieu Peninsula will be produced. This will involve interviewing each volunteer to gain their management recommendations.
- g. A scientific permit will be obtained from DEH.

* Both datasheets and guidelines are supplied by Birds Australia *Promoting Coexistence Between Recreationists and Beach-Nesting Birds* project, which is funded by the Natural Heritage Trust and hosted by Port Phillip and Westernport Catchment Management Authority (Appendix 1).

5. Results

5.1 Abundance

The maximum number of Hooded Plovers recorded at each site is shown in Figure 3. The total of these values comes to 49 Hooded Plovers. The 13 Hooded Plovers recorded on Normanville was an observation made very early in the season when winter non-breeding flocks were still present. Hooded Plovers were not recorded at 4 out of the 20 sites (Moana, Southport, Sir Richard Peninsula and Bird Island).

Maximum of 49 Hooded Plovers observed between 1/9/06 - 31/3/07

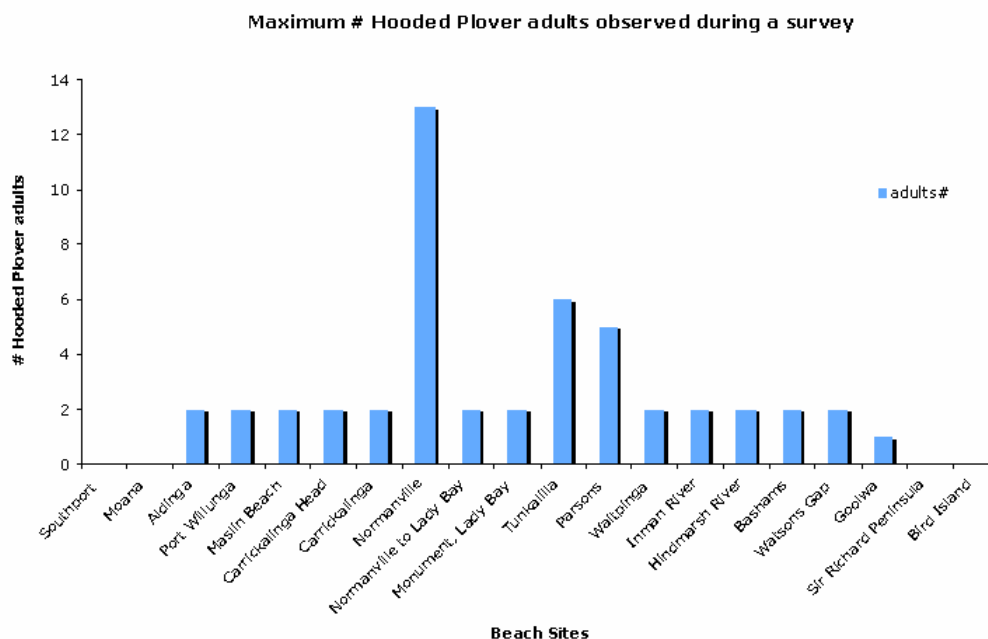


Figure 3. Maximum number of Hooded Plovers observed at each site.

5.2 Nest survival rate

A total of 24 nests were recorded throughout the breeding season. Of these nests, 66% failed and 33% were successful (i.e. chicks hatched) (Table 2 and Figure 4).

Table 2. Total number and percentage of nests, and number of successful and failed nests.

	Total	Survived	Failed
Total number (#)	24	8	16
Percentage (%)	100	33	67

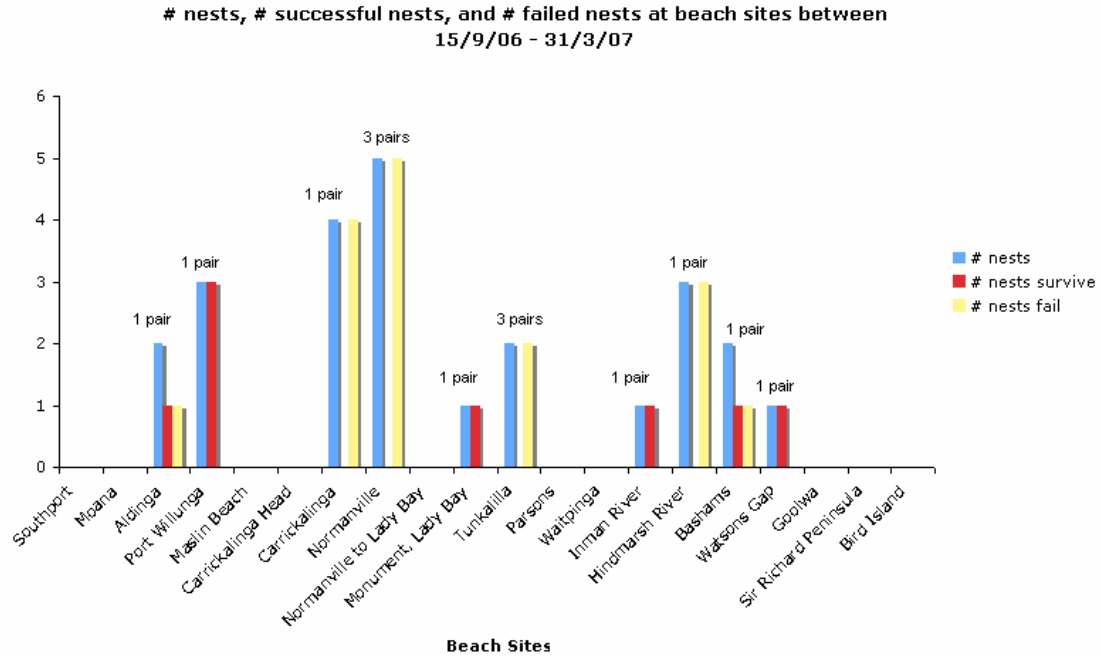


Figure 4. Number of nests, number of successful and failed nests, and number of pairs per site.

Table 3. A breakdown of the evidence for failure of each of the 16 failed nests.

Evidence for failure	# nests	% of total # failed nests
Washed away	3	18.75
Exposure	1	6.25
Evidence of tracks (<25cm from nest*)	5 (3 nests**)	31.25
Evidence of tracks (>25 cm from nest*)	4 (3 nests**)	25
Unknown	3 (one nest**)	18.75
Total	16	100

* Where tracks were evident <25cm from nest, in 4 out of 5 cases, tracks were actually <1cm from nest. In only one case were footprints (dog) 25cm from nest. Where tracks were evident >25cm from nest, in one case tracks were 0.5m away, and the remaining 3 had tracks approximately 2m from the nest.

** There is a possibility that the nest could have completed the full incubation time (i.e. 27-28 days)

As shown in Table 3, the most frequently observed evidence for nest failure was:

- evidence of tracks <25cm from nest;
- evidence of tracks > 25cm from the nest, and
- lack of evidence, i.e. unknown.

Table 4 shows the track type observed at each of the nests with tracks <25cm and >25cm from the nests.

Table 4. Track type observed at each of the 8 nests with evidence of tracks at <25cm and >25cm.

Track type at nests with tracks <25cm (site #)	Track type at nests with tracks >25cm (site #)
Human and dog tracks (site 7)	Human and dog tracks (site 8)
Human, dog and bicycle tracks (site 7)	Dog/fox (unsure whether dog or fox) (site 8)
Dog tracks (site 8)	Fox tracks (site 11)
Dog with raven tracks nearby (i.e. 1m away) (site 8)	Human and dog tracks (site 15).
Lizard tracks (site 15)	

It should also be noted that other tracks were observed during site surveys, for example lizard tracks were regularly observed at site 15, and in one case right up to the nest site and is believed to be the cause for nest failure (Jeffery pers. comm. 2009).

The next most common evidence for failure was flooding of the nest as 2 nests were washed away by a high tide and one was washed away by stormwater flowing over the dunes.

The least common evidence for failure was exposure. This refers to eggs which have been exposed beyond the normal incubation temperature range for a period of time which causes egg mortality (Baker-Gabb and Weston 2006). This is often a result of interrupted incubation due to the nest being close to an access point. This was the case at Bashams Beach (site 16) where the observer noted that due to the proximity of a popular access point, the birds frequently left the nest. Consequently, the nest was incubated for 48 days.

There was a possibility that 7 out of 16 failed nests may have completed the full 27-28 days of incubation without the observer's knowledge. This could result from not ascertaining the exact date the eggs were laid. This could mean that despite the evidence observed around the nest and the absence of adults and chicks, the eggs may have hatched and the adults could have moved the chicks on or be hiding them in the dunes.

5.3 Success of hatching and abundance of juveniles

A total number of 60 eggs and 16 chicks were observed (Table 5) therefore 26% of eggs hatched successfully.

Table 5. Total number of eggs, chicks and immature birds.

	Eggs	Chicks	Juvenile
Total number	60	16	17

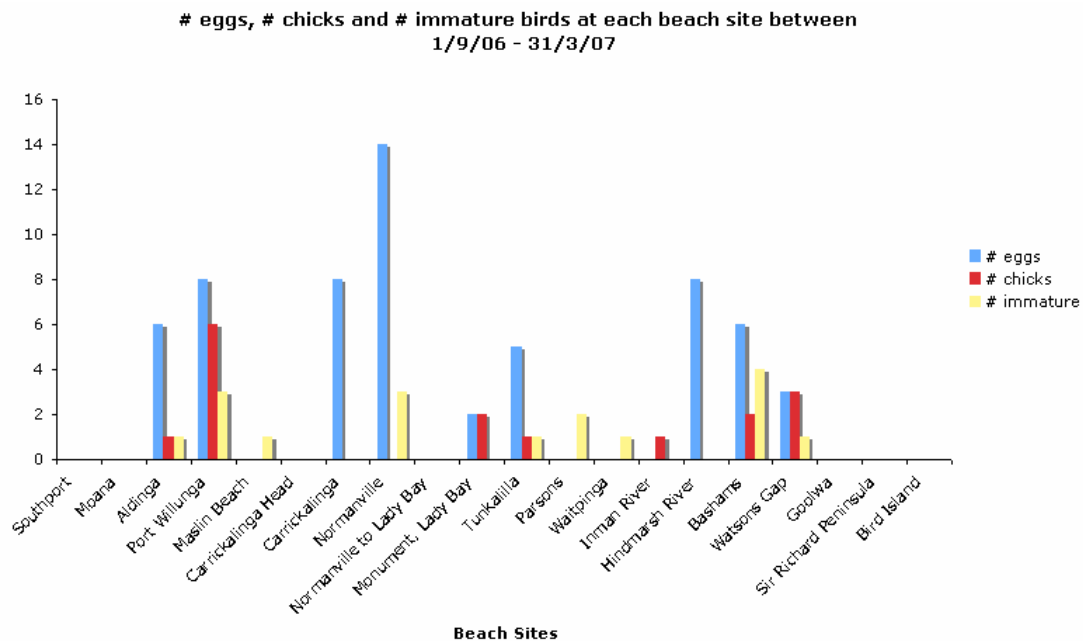


Figure 5. Number of eggs, chicks and immature birds at each site.

By the figures shown in Table 5 and Figure 5, it appears as though there is a 106% success rate of chicks fledging and becoming juveniles (16 chicks, 17 juveniles). However for this to be correct it would assume that every chick observed grew into the juvenile observed later on the same beach, plus one. In fact only 6 juveniles were observed regularly enough to confidently claim they were from the nest at that site. Almost daily observations were required to confirm this.

The remaining 11 juvenile birds which were not directly linked with the observed nests may have resulted from the following:

- Chicks may have been present but were not observed/were overlooked and were therefore not observed fledging and maturing into juveniles. If the 7 nests which may possibly having reached the full incubation period were successful, this could also contribute to the 11 juvenile birds observed.
- Juveniles can be highly mobile. The chicks will accompany the adults until they fledge 33-36 days later (Newman 1986, Marchant and Higgins 1993), and some juveniles remain until a subsequent nest is laid (Whitelaw *et al.* 2005). However some juveniles move over 100 km (MA Weston and T Dennis unpubl. data), and there is one extreme case of a juvenile moving at least 900 km (Cameron and Weston 1999). The propensity for juveniles to move around is exemplified in the case where they were observed on beaches which did not have any nests during the season, e.g. Waitpinga and Parsons.

There is also the likelihood of repeat observations of the same juvenile but on different sections of beach or on different sites.

5.4 Case Studies

5.4.1 Carrickalinga/Normanville

The stretch between Carrickalinga Head (site 6) and monument - Lady Bay (site 10) represents 4 of the 20 beach sites which were regularly surveyed as part of this project. A large proportion of the total number of nests were along this stretch of coastline, 10 nests or 41% of total nests (5 Hooded Plover pairs). Of these 10 nests, 9

failed. The following points describe the possible reasons, based on the evidence available, for nest failure:

- evidence of tracks <25cm from the nest was evident at 4 of the nests (refer to sites 7 and 8 in Table 4 for track type);
- evidence of tracks >25cm away from the nest was evident at 2 of the nests (refer to sites 7 and 8 in Table 4 for track type);
- two nests were washed away: one by a high tide and the other by stormwater flowing over the dunes; and
- the cause for failure of the remaining nest is unknown.

There was, however, the possibility that 5 out of 9 nests could have reached the full incubation time (due to the reason described above). The successful nest produced 2 chicks which were observed on only one occasion. This nest was at the more secluded beach near the monument (southern end of Lady Bay – Site 10).

5.4.2 Port Willunga/Inman River/Watsons Gap

The 3 nests at Port Willunga all hatched chicks (6 out of 8 eggs hatched), 3 of which successfully matured into juveniles (Figure 5). A result made more noteworthy by the fact that there was only one pair. In comparison, Inman River and Watsons Gap sites had similar hatching success, with only one nest per pair, however.

5.5 Threat analysis

Human and predator threat data is yet to be analysed. All data was recorded onto an Excel spreadsheet and a variety of simple statistics will be used to analyse both the numerical and categorical (i.e. density ratings) threat data.

Analysis of threat data will provide a knowledge base of density and distribution of threats at the 20 project sites. Any correlations between threats and Hooded Plover presence and/or breeding success, however, will not be apparent until the threat and Hooded Plover data is collectively analysed. This analysis will require the use of more sophisticated statistical analysis. Analysis could involve Spearman Rank correlations (*rs*), however this is limited as it can compare only two variables at one time and thus does not reveal patterns where more than two variables are implicated. In environmental data, often more than two variables are involved in any one pattern, and consequently Spearman Rank correlations are limited in what they can reveal. A more powerful approach to detecting pattern in complex data (i.e. multiple variables) is through ordination analysis (eg. Nonmetric Multidimensional Scaling) (Stephens 2004). Management recommendations will be more conclusive and holistic once this analysis has been completed. However until this analysis is completed, management will have to be guided on a site-by-site basis and by regular observations of Hooded Plovers and threats at the site.

The initial simple statistical analysis of dog data has been completed and has been included in this report. It is important to note however that there has been no further analysis to draw any correlations between the dog data and Hooded Plover presence and/or breeding success.

5.5.1 Dog data analysis

The total number of dogs observed at all sites throughout the project was 3122, 28% of which were leashed and 72% unleashed (Table 6).

Table 7 shows that of all dogs observed, most are at the water's edge (48.9%) followed closely by those at the beach (47.8%). Very few are found in the foredune area (3.2%) or dune/upper dune (0.1%). Water's edge is generally classed as wet sand, beach is dry sand, foredune/lower dune begins at the base of the first dune, dune/upper dune is the second dune at the rear of the foredune.

Table 8 shows that in each section of the beach there were more dogs unleashed than leashed.

Table 9 shows that of all leashed dogs, the majority are found at the water's edge (50%), followed closely by those on the beach (46%). Very few are found in the foredune (4%) and none were observed in the dune/upper dune.

Of all unleashed dogs nearly all are found at the water's edge and on the beach (48.6% and 48.4% respectively), with very few at the foredune and dune/upper dune (2.8% and 0.2% respectively).

Table 6. Total numbers of dogs leashed and unleashed.

	Total dogs	Dogs leashed	Dogs unleashed
#	3122	868	2254
%	100	28	72

Table 7. Number of dogs and the percentage of total number of dogs, at each section of the beach.

	Water's edge	Beach	Foredune/ lower dune	Dune/ upper dune	Total
#	1527	1493	99	3	3122
% of total # dogs	48.9	47.8	3.2	0.1	100

Table 8. Number of dogs leashed and unleashed on each section of the beach, and percentages of the total number of dogs at each section.

	Water's edge	Beach	Foredune/ lower dune	Dune/ upper dune
# Dogs leashed (%)	432 (28)	401 (27)	35 (35)	0 (0)
# Dogs unleashed (%)	1095 (72)	1092 (73)	64 (65)	3 (100)
Total # (%)	1527 (100)	1493 (100)	99 (100)	3 (100)

Table 9. Number of dogs leashed and unleashed on each section of the beach, and percentages of the total number of dogs leashed and unleashed at each section.

	Water's edge	Beach	Foredune/ lower dune	Dune/ upper dune	Total # (%)
Dogs leashed # (%)	432 (50)	401 (46)	35 (4)	0 (0)	868 (100)
Dogs unleashed # (%)	1095 (48.6)	1092 (48.4)	64 (2.8)	3 (0.2)	2254 (100)

5.6 Practical Management

As part of the project, a number of practical management options were also employed:

1. temporary fence construction around vulnerable nests (i.e. where there was a likelihood of being trampled);
2. temporary signage to accompany the fencing; and
3. permanent fencing at key sites.

Fences were constructed out of star-droppers and thin nylon rope tied around the top of the star-droppers. Fences consisted of four sides, the foredune often acting as one side depending on nest location, and the three remaining sides were of thin nylon rope. Figure 6 shows such a fence at Normanville.



Figure 6. Nest being fenced at Normanville (photo: Emma Stephens).

Each side of the fence was always at least 10m from the nest. The seaward side of the fence was a minimum of 25m long, running parallel to the water. The length of the sides depended on how close the nest was to the foredune but were approximately

20m long. Maguire (2008) provides details of fence dimensions for a variety of situations. In the case of the nest at Watsons Gap all four sides were fenced as the nest was in the middle of the beach. Thin nylon rope is recommended over bunting as the flapping can deter Hooded Plovers from the nest. Bunting was required in the case of the Watsons Gap fence. However, due to insufficient length of bunting, the fourth side was of thin nylon rope. Observations showed the Hooded Plovers would only use the nylon rope side for the first few days and over the course of a week began to use the bunting sides.

Fencing was accompanied by signage (Figure 7). Signs were attached to star-droppers and placed approximately 5-10m from the fence facing both directions. On one occasion (Watsons Gap) signs were attached to the four corners of the fence (due to lack of star-droppers). This was not ideal however the majority of walkers who approached the fence read the sign and then moved away.

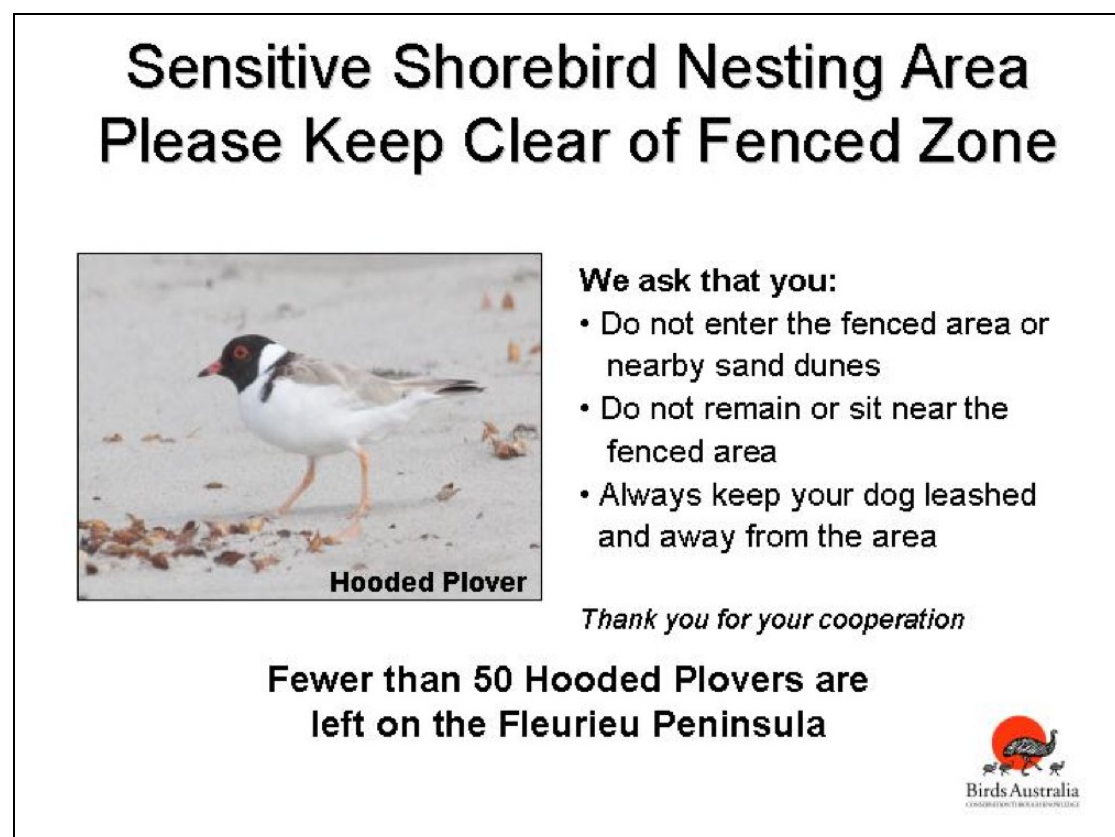


Figure 7. Signage which accompanied temporary fencing.

A total of four nests were fenced during the project (one at Site 5 Aldinga, two at Site 8 Normanville, and one at Site 7 Watsons Gap). Both nests fenced at Normanville failed and there was evidence of tracks (human/dog/fox). The nest fenced at Watsons Gap successfully hatched three chicks, and one survived to juvenile stage. The Aldinga nest hatched one chick and the fence was maintained to provide additional protection. However, the fence was found destroyed and chick trampled, seemingly as a result of vandalism.

6. Discussion

6.1 Objective 1 – *Establish current baselines on Hooded Plover populations, breeding success, and threats at sites along the Fleurieu Peninsula coastline over the 2006/07 breeding season.*

6.1.1 Populations – abundance and distribution

The maximum number of Hooded Plovers recorded on the Fleurieu Peninsula was 49. As this project was aimed at establishing a baseline for the 20 survey sites on the Fleurieu Peninsula it is difficult to establish whether this result is higher or lower than previous years. This particular monitoring project methodology would need to be repeated in subsequent years to establish any trends and variances. A number of volunteers have committed to repeating fortnightly surveys over the 2008/09 breeding season and this data needs to be entered and analysed in comparison with the 2006/07 data. However other surveys, such as the biennial Hooded Plover Count conducted by the Australasian Wader Studies Group (AWSG) of Birds Australia may provide some insight into population trends on the Fleurieu Peninsula. In 2006, 30 Hooded Plovers (including 7 juveniles) were observed on the Fleurieu Peninsula and a total of 27 (including 3 juveniles) in 2008 (Campbell *et al.* 2008) (the same sites were surveyed in 2006 and 2008 as those in this project). These figures are lower than the maximum recorded in this project. The numbers of Hooded Plovers observed in the biennial counts can be influenced, however, by variables such as extreme weather conditions experienced on the count weekend. However volunteers are now given at least a week in which to conduct the survey which enables people to survey on days of more suitable weather conditions.

Site-specific population trend analysis could be undertaken for Parsons Beach (site 12) and Waitpinga (site 13) as regular monitoring at these sites has been conducted since 1988 (DEH unpubl. data 2007). The average number of Hooded Plovers observed between 1988 and 2006 (n=61) is 3.13 at Waitpinga and 3.13 at Parsons Beach (DEH unpubl. data 2007). However over recent years single birds have often been observed (Syson pers. Comm. 2009).

Hooded Plovers were not recorded at 4 out of the 20 sites (Moana, Southport, Sir Richard Peninsula and Bird Island). The heavy recreational use at Moana, Southport and Sir Richard Peninsula may go part way to explaining this result. Regular monitoring was conducted at Moana, Southport and Sir Richard Peninsula over the 2008/09 breeding season. Hooded Plovers were not observed at Moana and Southport, however one pair were observed on 30 April 2009 at Sir Richard Peninsula. The pair were observed foraging at the water's edge on a wide expanse of beach approximately 3.5km from the Goolwa Beach car park (Brittain pers. comm. 2009). There were vehicles driving past the pair but closer up towards the foredune. Considering the stretch of beach on the other side of the Murray Mouth, Younghusband Peninsula (Coorong ocean beach), has a very similar habitat type, it is conceivable that Sir Richard Peninsula could provide appropriate habitat for Hooded Plovers (Brittain pers. comm. 2009). Vehicles can also access the beach along Younghusband Peninsula however they are excluded along the northern 110km of the Coorong ocean beach from the 24 October to 24 December each year. Sir Richard Peninsula is also very accessible for people coming from Adelaide and hence is a very popular beach for off-road driving (Brittain pers. comm. 2009).

Future management of the 4 sites where Hooded Plovers were not observed must consider all threats present and implement actions that will provide suitable habitat for Hooded Plovers. However, any actions taken need to consider coexistence between Hooded Plovers and recreationists and as Maguire (2008:5) points out, management should be focused on “striking a balance between the protection of beach-nesting birds and the needs of beach recreationists”.

There are other sites of suitable Hooded Plover habitat on the Fleurieu Peninsula that were not included in this project, for example Morgans Beach (near Cape Jervis) where Hooded Plovers have been previously sighted. Future monitoring could include such sites.

6.1.2 Breeding success

Results show that 26% of eggs hatched successfully. This is comparable with 27% hatching success noted in Buick and Paton (1989) and Marchant and Higgins (1993). Hatching success in central Victoria was reported in 2000 (Weston 2000) as being 22-24%. This percentage of hatching success in Victoria is based on nests that have not been managed, whereas in recent years study has shown hatching success to be around 40% based on a combination of nests that have and have not been managed (G Maguire pers. comm. 2009). The 26% hatching success on the Fleurieu is also based on a combination of nests that have and have not been managed. Considering this, it would be worthwhile researching and implementing strategies Victoria have employed which has enabled hatching success to increase in Victoria from 22-24% to 40% over period of approximately 10 years.

There were 7 out of 16 cases (43%) where the nest was considered to have failed but, in actual fact, could possibly have completed the full incubation period (27-28 days) without the observer's knowledge, i.e. Table 3. Therefore chicks could have hatched but were not visible to the observer for a variety of reasons e.g. the chicks had moved on or were hidden in the dunes, etc. If the laying date was more accurately known then the hatching date could more accurately be predicted. If surveys were conducted on a more regular basis, this could be achieved. Additionally, during the expected hatching time, daily visits could enhance the likelihood of observing chicks. Accurately identifying the cause of nest failure is difficult, therefore reducing the influence of the variable of unknown number of incubation days, will aid in gaining a better understanding of nesting success. Frequent monitoring would also assist with making more accurate observations of evidence which may be the cause for failure. It may also help to reduce the percentage (18.75% in this case) of nests that have failed as a result of 'unknown' reasons.

Increasing surveying frequency may also enhance the likelihood of observing a chick mature into a juvenile. Thereby providing a greater degree of certainty that the juvenile observed at the site is a result of the nest at that site rather than a juvenile that has just flown in from elsewhere.

A number of volunteers live very close to their site which enabled frequent visitation and were therefore able to more accurately determine: the date eggs were laid, date of nest and/or chick failure, and whether the chick was observed maturing into a juvenile which was then able to survive on its own. However, it is time consuming and costly to visit these sites more than once per week or fortnight especially when volunteers

have to travel long distances to one or more sites. Perhaps any future opportunities to acquire grant funds could compensate volunteers for travel expenses to increase surveying frequency. Alternatively, more volunteers could be engaged and hence distribute the responsibilities across more people.

A banding program would also assist in gaining a plethora of knowledge such as movement of juveniles and adults, determining age, insight into where new pairs nest, and reduce the likelihood of repeat observation of adults and juveniles.

Each site is unique and therefore requires adaptive management. During the 06/07 breeding season breeding pairs were present at 10 out of the 16 sites that Hooded Plovers were observed at. These pairs had a variable success rate with nest and chick survival. Thus some sites require a focus on improving nest success, whereas other sites need a focus on methods to improve chick survival. Examples include the Normanville/Carrickalinga/Lady Bay sites which had 5 pairs and 10% nesting success rate (9 out of 10 nests failed). Continued efforts at fencing, threat abatement, public awareness raising, and an increase in responsible dog management could improve nesting success. Successful sites such as Port Willunga which had one pair with 3 nests, 8 eggs total, 6 chicks and 3 juveniles would perhaps benefit from management that provides added protection for chicks. Chick shelters have shown to be successful in the protection of chicks on Victorian beaches (Figure 8). They provide a refuge for the chicks in which to shelter from predators, from trampling and extreme weather conditions (Maguire 2008).



Figure 8. Chick utilising the chick shelter (photo: Glenn Emhke).

There could be a myriad of reasons as to why Hooded Plovers did not breed at the other sites, but if conditions were made as favourable as possible it may encourage nesting. Threat abatement, public awareness-raising, and an increase in responsible dog management, temporary closures of beach sections, etc., may assist this.

6.1.3 Threats

As mentioned in Section 5.5, analysis of threat data has not yet been completed. Therefore any correlations between threats and Hooded Plover presence and/or

breeding success, will not be apparent until the threat and Hooded Plover data has collectively analysed. This remains the case with the dog data results as it has been analysed in isolation (i.e. without any reference to the many other variables and Hooded Plover presence and/or breeding success).

Results show that the majority of leashed and unleashed dogs were observed at the water's edge and on the beach. The beach is classified as dry sand up to the base of the foredune. Considering the fact that nests are frequently found 1-6m in front of the foredune (Marchant and Higgins 1993) it is of concern that almost half the unleashed dogs were observed where Hooded Plovers commonly nest.

There is much evidence that dogs are a major threat to Hooded Plovers and their breeding success (Baker-Gabb and Weston 2006, and Maguire 2008). The draft *South Australian Recovery Plan for the Hooded Plover* (Baker-Gabb and Weston 2006) classes humans and their companion animals as a major threat. Maguire (2008: 45) discussed research conducted by Weston and Elgar (2005 and 2007):

The highest frequencies of Hooded Plover nest absences were in response to humans accompanied by unleashed dogs (Weston and Elgar 2007). Hooded Plovers appear to respond with higher rates of nest absences in response to encounters with unleashed dogs compared to leashed dogs. Incubating Hooded Plovers left the nest in 21% of encounters with leashed dogs, similar to that for encounters with walkers, while 38.4% of encounters with a walker accompanied by an unleashed dog caused the incubating bird to leave the nest for as long as 30 minutes (Weston and Elgar 2007). Furthermore, unleashed dogs (with walkers) caused the brooding of chicks to cease on 51.4% of encounters, compared with 33.3% for leashed dogs (Weston and Elgar 2005). This suggests that it is the behaviour of dogs rather than their mere presence that influences disturbance of breeding Hooded Plovers.

Baker-Gabb and Weston (2006) also note that eggs and chicks are vulnerable to predation from gulls and ravens when the adult is absent.

Furthermore, Maguire (2008: 45) notes that:

On the Victorian coast, 10% of known Hooded Plover nest failures were attributed to dogs crushing or predating eggs (n=121; Maguire unpubl. data), and on Phillip Island, at least 24% of nests over a four year period were lost to dogs (B. Baird unpubl. data). Dogs have been observed eating Hooded Plover eggs (Hanisch 1998) and mauling (Weston 1998c; Weston and Morrow 2000) and killing Hooded Plover chicks (B. Baird pers. comm.). Furthermore, domestic dogs are known to chase adult beach-nesting birds (Retallick and Bolitho 1993; Weston and Morrow 2000; Maguire pers. obsv.), which can lead to prolonged absences from the nest or brood.

It may be useful to initiate discussions with local Councils, volunteers and other key stakeholders on how to best encourage dog walkers to adhere to the dog leashing laws, and where leashing laws do not exist how best to encourage voluntary leashing or implementing leashing laws. This is most critical during the breeding season when nests and chicks are present. A number of volunteers involved with this project have spoken with dog owners and find most are willing to comply once they are informed of the reason.

Another effective way to engage dog owners is to hold a community information event such as a “Dog’s breakfast” (Maguire 2008: 138). The Normanville Natural Resource Centre hosted a Dog’s Breakfast in 2008 (Figure 9). A breakfast was provided for dogs and their owners and short presentations were provided about issues related to dogs and Hooded Plovers. Those who attended said they would be willing to leash their dogs around nests or chicks and said they would benefit from being pre-warned regarding their location.



Figure 9. Dog’s Breakfast at Normanville (photo: Emma Stephens)

Dogs are not permitted on beaches in the Pittwater Council area in New South Wales (refer to this link for more details:

http://www.pittwater.nsw.gov.au/recreation/parks_and_reserves/find_a_park/parks/avalon/careel_bay). One of the reasons behind this is the presence of endangered Bush Stone-Curlews at Careel Bay, as well as the regionally significant Mangrove Gerygone and international migratory species such as the Eastern Curlew, Whimbral and Bar-tailed Godwit. Dog walkers have been provided with an alternative in the form of a reserve behind the beach where dogs are free to run off the leash. Although it is a compromise for dog walkers, it has been accepted well by the local community

(Lamanna pers. comm. 2009). This is another option that could be open for discussion with key stakeholders.

6.2 Objective 2 - *Instigate practical management options to enhance nesting success.*

Maguire (2008:97) notes that “the fence has two purposes; first, to prevent people walking through the nest site and crushing the nest, and second, to provide a distance buffer between the incubating bird and beach visitors, so that disturbance is minimised” (Maguire, 2008:97). Given the fact that these fences can attract unwanted attention, and do not preclude unleashed dogs, foxes or any other such threats the above reasons should be considered carefully before installing a temporary fence.

A consistent result of all fenced nests was the almost complete absence of footprints within the fenced area. In particular, the area in which the Watsons Gap nest was located is a heavily trafficked area with two access points very near by. The likelihood of trampling was significantly reduced with fencing. This is evident in Figure 10 which shows dense footprints outside the fenced area, and almost clear of footprints within.



Figure 10. Fenced nest at Watsons Gap showing fenced area free of nearly all footprints (photo: Emma Stephens).

Fencing was also accompanied by signage which was considered effective as most people who read the sign moved away from the fenced area. The DEH has also installed permanent signage at a number of key sites around SA, including Watsons Gap (site 17) and Normanville (site 8) on the Fleurieu Peninsula (Figure 11).

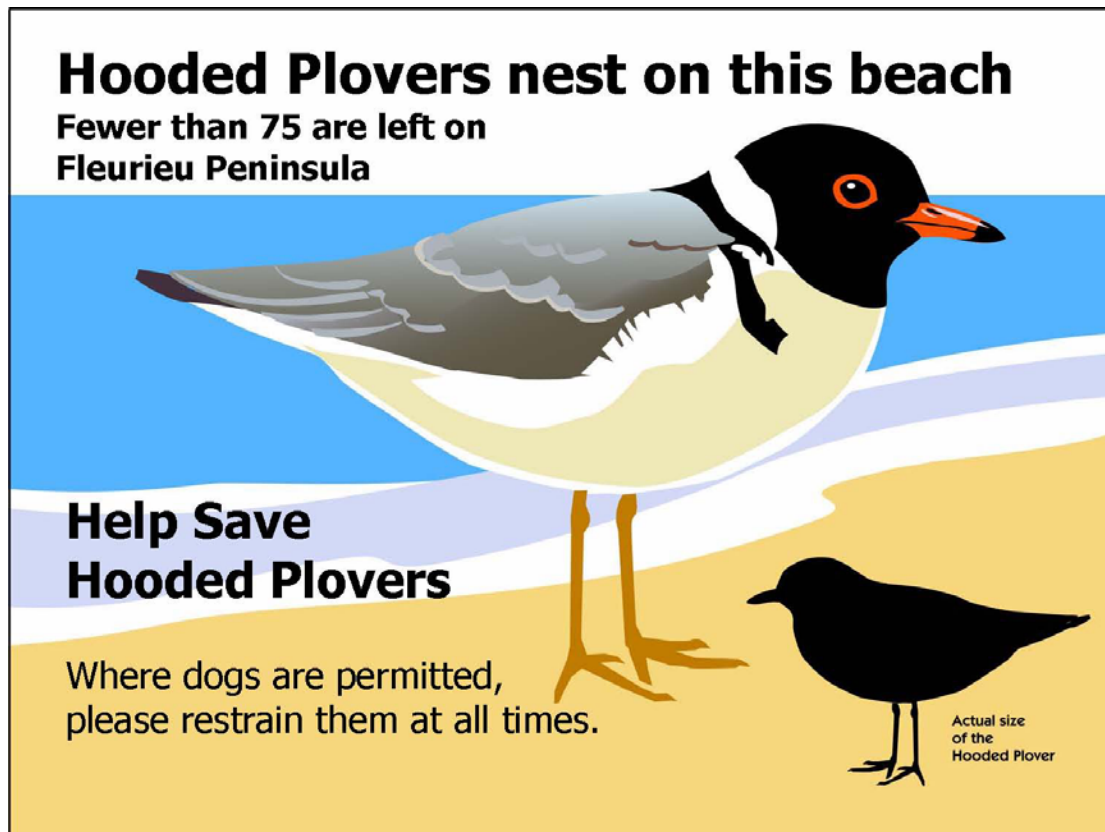


Figure 11. Permanent sign installed at Watsons Gap and Normanville (DEH).

6.3 Objective 3 - *Provide recommendations regarding Hooded Plover management on the Fleurieu Peninsula.*

Volunteers were provided with the following questions and asked to make comment in regard to the site they had monitored. Volunteer comments have been included in Appendix 2.

Questions:

1. Would temporary or permanent signage be effective?
2. How many access points are there, and how does this impact on Hooded Plover breeding success?
3. Would temporary or permanent fencing assist in improving Hooded Plover breeding success?
4. Would Chick Shelters assist the survival rate of chicks?
5. Community Engagement
 - a. Would a “Dog’s breakfast” be an effective way to engage dog owners? (community event where people and their dogs are given breakfast and there are talks/discussions regarding Hooded Plovers).
 - b. Blackboards at access points have been used to keep the community informed regarding a nest (i.e. 10 days to go!) (Figure 12). Would this be effective?
 - c. Would regular articles in the local newspaper be an effective education tool?
6. Are foxes present at the site and is there any control?
7. Is there vehicle access to the beach? Comments.
8. Do you have any ideas for educating school children about Hooded Plovers?

9. How can the Hooded Plover volunteers be better supported? Would a Friends of Hooded Plover group be a good idea?
10. Any other comments?



Figure 12. Example of a blackboard used in Victoria (photo: Grainne Maguire)

6.4 Objective 4 - *Engage the community to facilitate long term monitoring of Hooded Plovers in the region*

Engaging the community was essential for this project to occur and be a success. The volunteers dedicated many volunteer hours (520 hours in total) to the monitoring of Hooded Plovers, assessing threats and helping to install practical management such as temporary fences. These volunteers have in turn engaged the community at their sites by speaking with beach recreationists. Many of the volunteers involved in this project are members of the Fleurieu Birdwatchers Group.

All four Councils in the project area (City of Onkaparinga, District Council of Yankalilla, City of Victor Harbor and Alexandrina Council) were engaged and actively supported the installation of temporary fences and signage and also assisted with monitoring. This support has continued on in subsequent years. The City of Onkaparinga compiled *Hooded Plover Recommendations for the City of Onkaparinga*, a document which is consulted when any coastal development or activity occurs within Hooded Plover territory.

The project co-ordinator was greatly assisted through regular communication with DEH staff within the Threatened Species Unit.

The results of the project were publicised in a variety of forms (monthly reports, regular media releases in local newspapers, journals and community newsletters), and

as a result stakeholders have been encouraged to, and have instigated methods to raise public awareness, provide protection measures and help mitigate the threats.

Birds Australia, supported by the Adelaide and Mount Lofty Ranges Natural Resources Management Board (AMLR NRM Board), are running a series of Hooded Plover monitoring and management workshops in SA in 2009. The workshop to be held at Yankalilla in June 2009 will provide coastal managers and volunteers with an insight into the monitoring and management techniques employed in Victoria. It will also provide an opportunity for the participants to discuss local issues and strategies for future monitoring and management on the Fleurieu Peninsula.

Yankalilla Area School and the Normanville Surf Life Saving Club nippers are very proud to have Hooded Plovers on their local beach. The nippers have adopted a new name and logo “Tiny Tot Plovers”. The logo (Figure 13) will be placed on all t-shirts and windcheaters next season. This provides a great step forward for educational awareness in the community. A teacher from the Yankalilla Area School will be attending the Hooded Plover workshop by Birds Australia. There will be many opportunities to involve both groups in the monitoring, management and community awareness-raising of Hooded Plovers. The Normanville Natural Resource Centre is also very actively involved in engaging the community and raising community awareness of the Hooded Plover. The Normanville Dog’s Breakfast held in 2008 was organised by the Normanville Natural Resource Centre with assistance from the District Council of Yankalilla, the AMLR NRM Board and the DEH.



Figure 13. Normanville Nippers new logo.

6.5 Future recommendations

- Continue to monitor Hooded Plovers, breeding success and threats at the 20 sites on the Fleurieu Peninsula and look at increasing the volunteer base so that additional sites can be included, for example Morgans Beach.
- Involve school children in Hooded Plover monitoring and management.
- Trial chick shelters with assistance from experts in Victoria.
- Continue to run Dog's Breakfast workshops where appropriate.
- Continue to keep the community, Councils, AMLR NRM Board, DEH and other key stakeholders aware of monitoring and management results. Work closely with these stakeholders to discuss the best options for future threat management.
- Engage with key stakeholders to carry out the proposed actions recommended as a high priority in *The Southern Fleurieu Coastal Action Plan and Conservation Priority Study* (Caton *et al.* 2007) and draft *Metropolitan and Northern Coastal Action Plan* (Caton *et al.* 2009 unpubl.). These recommendations are: to continue community monitoring of bird nesting sites; provide education for dog owners; and increase the number of signs.
- Collectively analyse the threat and Hooded Plover data collected in this project using sophisticated statistical analysis.
- Attend workshops help by Birds Australia (supported by the AMLR NRM Board) in SA, and continually link in with Birds Australia to gain assistance, advice and support.
- Apply for grant funding to implement projects such as:
 - a banding program;
 - various community engagement initiatives;
 - a video surveillance kit to continuously video a number of nests to gain footage of Hooded Plover behaviour and evidence of nest failure; and
 - to reimburse volunteer travel costs.
- The draft *South Australian Recovery Plan for the Hooded Plover* recommends the employment of a part-time Shorebird Co-ordinator to implement all Primary and Secondary Actions listed in the plan. Grant funds could be applied for to fund this position.

7. Conclusion

It is evident that the Fleurieu Peninsula is a highly significant stretch of coastline for the Hooded Plovers. Despite high levels of beach use by recreationists coinciding with the breeding season, Hooded Plovers continue to inhabit and breed along this coastline. Continued monitoring and implementation of practical management is required to contribute significantly to the long term protection and conservation of this vulnerable species. It is also imperative that the community is engaged so that Hooded Plovers and beach recreationists can successfully co-exist.

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Appendix 1. Datasheets supplied by Birds Australia *Promoting Coexistence Between Recreationists and Beach-Nesting Birds* project, which is funded by the Natural Heritage Trust and hosted by Port Phillip and Westernport Catchment Management Authority

HOODED PLOVER TERRITORY MONITORING SHEET

PLEASE CIRCLE OR FILL IN THE BLANKS WHERE APPROPRIATE

Site location name:			
Group name:			
Start:		End:	
Date:	Time start:	AM / PM	Time finish: AM / PM
Estimated temperature °C:		Wind: none / light / medium / heavy	
Rain: none / light / medium / heavy		Cloud cover: 0% / 25% / 50% / 75% / 100%	

UPON SIGHTING A HOODED PLOVER – Your observations

Number adults					
Habitat	Beach	Foredune	Dune	Rocky platform	Estuary
Notes (including IHP location – co-ordinates, description, and beach habitat description):					
Is there any evidence of nesting?					YES / NO
Is this the first day evidence of nesting was observed?					YES / NO
Adult Behaviour	Distraction display		Leading behaviour		Vigilant / Calling
	Incubating		Brooding		
a. Nest building?	Fresh scrape		Sitting in scrape		
Nest location co-ordinates and description:					
b. Eggs	0	1	2	3	
Date laid:			Date hatched:		
c. Chicks	0	1	2	3	
Chick behaviour	Crouching/hiding		Foraging	Running away	

NEST FAILURE

Is there evidence of nest failure?		YES / NO		Date failed:		
a. Nest	Gone	Deserted		Damaged/flooded	Buried	
b. Eggs	Gone	Broken		Out of nest	Unhatched	
c. Chicks	Gone	Injured		Dead in nest	Dead near nest	
Cause of failure	Flooding	Egg roll-out	Abandoned	Crushed	Fox	Dog
	Person	Horse	Gull Raven	Other predator	Vehicle	Unknown
Evidence	Observation		Prints/tracks	Egg damage		
Notes:						

AT THE TERRITORY LOCATION, PLEASE FILL IN THIS SHEET. PLEASE TICK THE BOX OR FILL IN WITH A NUMBER/AMOUNT WHERE APPROPRIATE.

THREAT ASSESSMENT

Potential threat	Present? (tick)	In which habitat? * (please write estimated number/amount in category)				
		Water's edge	Beach	Foredune/ lower dune	Dune/ upper dune	Estuary
Human Footprints						
Walkers/Joggers						
Sunbaking / Sitting						
Tourist / Viewing only						
Surfers / Swimmers						
Fishers						
Games (frisbie, cricket, etc...)						
Dune-boards / races down dune						
Dog walkers (# people)						
- Dogs on leash (# dogs)						
- Dogs off leash (# dogs)						
Dog prints						
Trail bike (or tracks)						
Quad bike or 4WD (or tracks)						
Ravens						
Silver Gulls						
Kelp or Pacific Gulls						
Foxes (or prints)						
Horses (or prints)						
Litter						

[Other threats might include people flying kites, cats, stock (cows/sheep), emus, birds of prey]

***Density ratings (# sets of tracks over the site area):**

Sparse = 1-3 sets of tracks, **Medium** = 4-10 sets of tracks, **Dense** = 11+ sets of tracks

Appendix 2. Volunteer responses to questions regarding management in Section 6.3

Moana – Site 1

1-Would temporary or permanent signage be effective?

- To have a permanent sign at the southern end of Moana would be a good idea to try and encourage people to keep their dog on a lead.
- Temporary signage – if there was a nest then it would be good to give temporary signage a go (you have to do something).

2-How many access points are there, and how does this impact on Hooded Plover breeding success?

- There are 2 designated walking tracks at the southern end of Moana and others come over the cliff.
- Vehicles can access the northern section of Moana, but a fence across the beach prevents access to the southern stretch of beach.

3-Would temporary or permanent fencing assist in improving Hooded Plover breeding success?

- Temporary fencing of nests:
 - If Hooded Plovers nested along Moana it could be helpful. Majority of people would accept it for its purpose.
- Permanent fencing:
 - Not sure permanent fencing would be very effective as there is so much activity and may interfere with this.

4-Would Chick Shelters assist the survival rate of chicks?

- If Hooded Plovers nested along Moana beach chick shelters could be helpful. Would need to engage the community and raise awareness regarding chick shelters.

5-Community Engagement

a-Would a “Dog’s breakfast” (DB) be effective way to engage dog owners?

- May get an interesting reaction from the public. A lot of people walk their dogs on the beach early in the morning especially between December and February.
- Would be a good opportunity to make people aware of the variety of species that exist on a beach.

b-Blackboards at access points have been used to keep the community informed regarding a nest (ie. 10 days to go!). Would this be effective?

- Good idea if there was a breeding pair with nest observed.

c-Would regular articles in the local newspaper be an effective education tool?

- It would be a good tool to spread the word if Hooded Plovers visited the site.

6-Are foxes present at the site and is there any control?

Unsure whether foxes are present, however if they are they would be difficult to control due to the highly populated urban environment.

7-Is there vehicle access? Comments.

- Nashwauk street – there isn't enough parking provided to encourage people to park and walk onto beach.
- The entire width of the beach is used by cars as the high tide forces vehicles towards the rear of the beach.

8-Ideas for educating school children

Involve school children in observing Hooded Plovers, perhaps create posters on Hooded Plovers and discuss the threats faced by Hooded Plovers. Moana Primary School is actually quite a distance from the beach, not walking distance.

9-How can the Hooded Plover volunteers be better supported? Would a Friends of Hooded Plover group be a good idea?

To have a meeting once per year would be a good way to provide feedback to volunteers and enable the volunteers to connect and meet other key stakeholders. This opportunity was provided at the Hooded Plover management and monitoring workshop held by Birds Australia (supported by the AMLR NRM Board) in June 2009. Some of the volunteers work in isolation and therefore it would be a good opportunity to meet and gather feedback from others. Other volunteers are part of the Fleurieu Birdwatchers group and therefore are connected to a greater extent.

10-Any comments?

- Dogs need to go for a run, but also need to be called back and put on a lead when there are Hooded Plovers present.
- Local Government need to be involved with ensuring that Hooded Plovers are provided with the best possible opportunity to breed successfully.
- Need to look at vehicles on beaches. Need to look at vehicles on beaches. Cannot see how the Council can organise enough car parks if they were to look at closing vehicle access to the beach.
- The Hooded Plover monitoring on Southport was worth doing despite not observing any Hooded Plovers. It was a useful exercise to observe activities and threats at the site.
- Moana Sands Conservation Park provide a significant sand dune at the rear of the beach.

Southport – Site 2

1-Would temporary or permanent signage be effective?

- Temporary signage – if there was a nest then it would be good to give temporary signage a go (you have to do something).
- Dog and human traffic is so heavy at this site that if Hooded Plovers were to breed, they may not have much of a chance.

2-How many access points are there, and how does this impact on Hooded Plover breeding success?

- There is the main access to Southport at the Southport Surf Life Saving Club (SLSC), people also access the beach along the river during low tide.

3-Would temporary or permanent fencing assist in improving Hooded Plovers breeding success?

- Temporary fencing of nests:
 - If Hooded Plovers nested along Southport beach it could be helpful. Majority of people would accept it for its purpose.
- Permanent fencing:
 - Not sure permanent fencing would be very effective as there is so much activity and may interfere with this.

4-Would Chick Shelters assist the survival rate of chicks?

- If Hooded Plovers nested along Southport beach chick shelters could be helpful. Would need to engage the community and raise awareness regarding chick shelters.

5-Community Engagement

a-Would a “Dog’s breakfast” (DB) be effective way to engage dog owners?

- May get an interesting reaction from the public. A lot of people walk their dogs on the beach early in the morning especially between December and February. The Southport SLSC may be a good spot to host the Dog’s Breakfast.
- Would be a good opportunity to make people aware of the variety of species that exist on a beach.

b-Blackboards at access points have been used to keep the community informed regarding a nest (ie. 10 days to go!). Would this be effective?

- Good idea if there was a breeding pair with nest observed – assistance may be provided with updating the board by the Southport SLSC.

c-Would regular articles in the local newspaper be an effective education tool?

- It would be a good tool to spread the word if Hooded Plovers visited the site.

6-Are foxes present at the site and is there any control?

Have heard that foxes are present in the Port Noarlunga dunes from observations made by the Friends of Port Noarlunga Dunecare Group. However they would be difficult to control due to the highly populated urban environment.

7-Is there vehicle access? Comments.

- There is no vehicle access to Southport beach.

8-Do you have any ideas for educating school children?

The Port Noarlunga SLSC is an aquatic centre and many schools participate in their aquatic activities. Perhaps Hooded Plover could be incorporated into their program.

9-How can the Hooded Plover volunteers be better supported? Would a Friends of Hooded Plover group be a good idea?

To have a meeting once per year would be a good way to provide feedback to volunteers and enable the volunteers to connect and meet other key stakeholders. This opportunity was provided at the Hooded Plover management and monitoring workshop held by Birds Australia (supported by the AMLR NRM Board) in June 2009. Some of the volunteers work in isolation and therefore it would be a good opportunity to meet and gather feedback from others. Other volunteers are part of the Fleurieu Birdwatchers group and therefore are connected to a greater extent.

10-Any comments?

- Dogs need to go for a run, but also need to be called back and put on a lead when there are Hooded Plovers present.
- Local Government need to be involved with ensuring that Hooded Plovers are provided with the best possible opportunity to breed successfully.
- The Hooded Plover monitoring on Southport was worth doing despite not observing any Hooded Plovers. It was a useful exercise to observe activities and threats at the site.

Maslin Beach – Site 3

1-Would temporary or permanent signage be effective?

- A permanent sign would be useful to educate the community and inform them of the Hooded Plover presence at the site.
- If there was a nest that was likely to be trampled and required fencing, temporary signage to accompany the fencing would be required. People will most likely walk up to the fence to see what it is all about, so it would be good to inform people and ask them to please move away from the fenced area.

2-How many access points are there, and how does this impact on Hooded Plover breeding success?

- There are two access points to the site, one which enters at the estuary and the other over the dunes. If there was to be a nest south of the estuary access point it may cause a problem as people walk diagonally across that area heading south.

3-Would temporary or permanent fencing assist in improving Hooded Plovers breeding success?

- Temporary fencing of nests:
 - If there was a nest that was very likely to be trampled temporary fencing accompanied by signage would be worth trying,
- Permanent fencing:
 - Would not foresee it being useful at this point. If there were more surveys done of the site to establish if there was a regular nesting site, it might be worth considering. However it would have to be placed in such a way as to not impinge on beach recreationists. The community would need to endorse the idea for it to work.

4-Would Chick Shelters assist the survival rate of chicks?

- If chicks were present at this site, it would be worth trying based on guidance from those who have already used them in Victoria.

5-Community Engagement

a-Would a “Dog’s breakfast” be effective way to engage dog owners?

- This would be an effective way to engage the regular dog walkers and it would be good to hold it at the central car park.

b-Blackboards at access points have been used to keep the community informed regarding a nest (ie. 10 days to go!). Would this be effective?

- It would be worthwhile gauging the community's attitude towards Hooded Plovers before advertising the fact that there is a nest. However it would most likely be well received and hence a good indicator for dog walkers as to when they need to put their dog on a lead.

c- Would regular articles in the local newsletter be an effective education tool?

- It would be very useful and would increase the community's awareness. It would be good to alert the local community that Hooded Plovers are nesting but perhaps not give out the exact location.

6-Are there foxes at the site and are they being controlled?

Not sure if there are foxes present.

7-Is there vehicle access to the site? Comments.

- Not really, there used to be the icecream van which would drive along the beach.

8-Do you have any ideas for educating school children on Hooded Plovers?

- Involve school children in observing sites where HPs are observed versus where they are not, or very rarely observed (ie. Sir Richard Peninsula). This would provide the students with an opportunity to observe the differences in activities on the beach and how this may influence the presence/absence of Hooded Plovers (as per Sir Richard Peninsula site). Ensure that only small groups are taken at a time. Prior to field trip ensure that students receive a presentation showing footage of Hooded Plovers and information so that they can gain an understanding and appreciation for how important the species is, and how careful they need to be in the vicinity of Hooded Plovers and in particular nests and chicks.

9-How can the Hooded Plovers volunteers be better supported? Would a Friends of Hooded Plover group be helpful?

Regular newsletters with a summary of all sites should be regularly produced (as was the case in this project). This means that volunteers can see their significant contribution to the project and are kept informed of how Hooded Plovers are fairing at other sites and what management is being implemented.

Volunteers could be better supported if there was a paid (even at least part-time) officer to:

- run the monitoring project and assist with analysing historical data,
- help implement practical management and focus on strategically engaging the community and other key stakeholders,
- look to engaging and training more volunteers,
- apply for funding, and
- engage Honours students to conduct further research.

There would be many other tasks a paid officer could achieve. Discussions with Birds Australia (who have paid staff) would be very helpful.

10-Any comments?

Maslin beach needs to be surveyed more regularly. It may be a more significant site for Hooded Plover breeding success than we realise. This project needs to keep up momentum by keeping key stakeholders, especially volunteers, engaged.

Management to improve nesting success needs to be refined and a there now needs to be a focus on management to improve chick survival.

Port Willunga – Site 4

1-Would temporary or permanent signage be effective?

- Temporary signage – may be useful when there is a nest present to encourage dog owners to put their dogs on a lead. The sign would need to be placed to capture the main flow of traffic which heads from the southern access point in a northerly direction. Therefore a sign could be placed at the ‘headland’ which partially divides the beach into two, the northern and southern beaches. If walkers were asked to voluntarily leash their dogs, this may generate a willingness on behalf of the walkers.
- Permanent signage – A permanent sign has been provided by DEH. Would anticipate that it may annoy dog owners to have to put their dog on a lead during the non-breeding season.

2-How many access points are there, and how does this impact on Hooded Plover breeding success?

- There is one access point at the northern end of the site, and one at the southern. The northerly access point is far enough away from the usual nest site to prevent disturbance of the adult of the nest. The volunteer never observed the HP leaving the nest when accessing the beach from the northerly access point.

3-Would temporary or permanent fencing assist in improving Hooded Plover breeding success?

- Temporary fencing of nests:
 - Temporary fencing is not recommended at this site. People would most likely walk up to see why it is there and thereby potentially disturb the Hooded Plover adult from the nest.
- Permanent fencing: not required at this site.

4-Would Chick Shelters assist the survival rate of chicks?

- It would be good to trial the chick shelters. Hooded Plover chicks often use the beach wrack for shelter and it also works very well to camouflage the chicks. Perhaps the chick shelters could be draped with beach wrack or sand to help camouflage it.

5-Community Engagement

a-Would a “Dog’s breakfast” (DB) be effective way to engage dog owners?

- It would be a really good idea for the Port Willunga locals. People who turn up to such an event are usually willing to learn and act on the recommendations made.

b-Blackboards at access points have been used to keep the community informed regarding a nest (ie. 10 days to go!). Would this be effective?

- This would be a good idea and would also increase community involvement. It may bring in a sense of community ownership and responsibility for the Hooded Plovers.

c-Would regular articles in the local newspaper be an effective education tool?

- For those who visit the site it would be more effective to have a sign on the beach. Advertising the fact that there is a nest at the site may draw more attention.

6-Are foxes present at the site and is there any control?

Have not seen any foxes at the site or fox tracks.

7-Is there vehicle access to the site? Comments.

- There may be a boat ramp at the southern end of the site, however cars do not usually drive along the beach.

8-Do you have any ideas for educating school children?

Target Primary School age children.

9-How can the Hooded Plover volunteers be better supported? Would a Friends of Hooded Plover group be a good idea?

- If there were a Friends of Hooded Plover it may assist with providing a bigger picture rather than just your own site. It would be worth trying.

10-Any comments?

- Port Willunga site is unique in that the adult pair have had considerable breeding success. As such, any moves to implement management to improve breeding success at the site may not be necessary and may even prove to be detrimental. It is advised that until an issue suddenly arises and becomes a problem for HP breeding, that did not previously exist, then take action.
- Experiment: If this site was not actively managed (beyond community monitoring), there would need to be a number of other sites that also did not receive management to determine whether it is the implementation of management that is effective (ie. Improves breeding success) or whether it is another factor driving breeding success/failure. There are, however, a number of other variables which would also differ from site to site and would need to be taken into account.
- During the 06/07 breeding season the only nest that did not produce chicks was washed away by a high tide.
- Community monitoring of sites should definitely continue to gather data on populations and breeding success, and assist in the identification of potential future hazards.
- A colour banding program would be a good idea.

Aldinga – Site 5

1-Would temporary or permanent signage be effective?

- Signs that are of educational benefit may be effective. Signs need to be quickly absorbed by the public. Signs could convey information on the following:
 - The fact that Hooded Plovers frequent the Aldinga beach (and once used it as a breeding area during summer).
 - Their status and map of distribution showing the part of SA without Eyre Peninsula would be best (i.e. Yorke Peninsula, Kangaroo Island, Fleurieu and the SE).

- An image of a Hooded Plover and a Masked Lapwing so that people can see they are different birds.
- A permanent sign has been provided by DEH.

2-How many access points are there, and how does this impact on Hooded Plover breeding success?

- Vehicular access to Aldinga beach is made possible by entry via Aldinga Beach boat ramp. There is also a ramp at Sellicks Beach. In the past people were able, and allowed, to drive along the beach from Aldinga to Sellicks. At low tide it is still possible, although against the rules, to drive down one ramp along the beach and up the other.
- Continuous vehicular access from Aldinga to Sellicks is broken by the car-free zone. It would be good if this could be maintained when the Onkaparinga Council makes its decision about vehicles on the beach some time this year.
- Pedestrian access points from the Esplanade to the beach occur approximately every 60-100m, therefore approximately 15 access points over a 2km distance from Aldinga Beach boat ramp to Sellicks.
- There is a long walk to the vehicle-free zone. If, in the future, this zone was to be widened and they want people to use it, it would be best to make it easily accessible from the road.

3-Would temporary or permanent fencing assist in improving Hooded Plover breeding success?

- Temporary fencing of nests:
 - Any form of fencing may possibly be destroyed, and it is best not to draw attention to the nest.
- Permanent fencing:
 - If the landward edge of the sandy beach, where the sand is usually soft, could be made permanently car free there would be less damage to the beach ecology, create a refuge for any shore birds, reduce the wind-blown sand level. Control of vehicles here is difficult. Options for consideration include:
 - (1) An earlier ban on cars on the beach. The problem is most acute in February and March when there are high tides in the late afternoon while there are many visitors to the beach taking advantage of the warm extended evenings during daylight saving hours. Banning cars from the beach at this time would not be popular, perhaps not at all acceptable to many, many locals. This would need a lot of policing or monitoring.
 - (2) Bollards or fencing. Not sure if this is practical.
 - (3) Large rocks high on the beach. (possible – could create a small sand dune (foredune) that could assist with beach preservation as global warming increases sea levels. *Needs an engineer's comment*).

4-Would Chick Shelters assist the survival rate of chicks?

- These would not be successful at Aldinga as they would draw unwanted attention to the chicks. Possible at Port Willunga with a lot of positive community education.

5-Community Engagement

a-Would a “Dog’s breakfast” be effective way to engage dog owners?

- Dog’s Breakfast has potential in the Aldinga area. The following may more effectively engage dog owners in the Aldinga area:
 - Sunday morning – popular dog-walking time and would be a good opportunity to engage these people. The Sunday morning people may be more receptive to the cause. A good starting point.
 - Possible “Dog’s dinner” – late afternoon/early evening is a popular time for people to bring their dogs to the beach after work. A sausage sizzle would be appropriate.

b-Blackboards at access points have been used to keep the community informed regarding a nest (ie. 10 days to go!). Would this be effective?

- What would be more effective would be communication between regular walkers who take time to observe Hooded Plovers. This could be in the form of an email or a bird record system such as Birdpedia (see <http://www.birdpedia.com/>). This involves entering a sighting into Birdpedia and then all members receive an email with the sighting details. The people who read and use this system would be those most interested.

c-Would regular articles in the local newspaper be an effective education tool?

- Possibly, if the education was subtle and informative.

6-Are foxes present at the site and is there any control?

Foxes have frequently been seen on the Esplanade and are known to take chickens etc from local back yards. Friends of Aldinga Scrub have an active fox eradication program but it has its limitations.

7-Is there vehicle access to the site? Comments.

- Yes. A very popular recreational activity at Aldinga and to completely ban access may put a negative slant on the community’s view of Hooded Plovers. This is under review by the Onkaparinga City Council who has been made aware of the plight of the Hooded Plover. However, their decision will be influenced by a very strong pro cars on the beach lobby.

8-Do you have any ideas for educating school children?

- Queenscliff Marine Discovery Centre (Victoria) make small playing cards for children. These cards have a picture of an animal on one side, with some facts about it on the other side. They have made a HP card and it would be good to order 5000 of these and hand them out to children at schools or at the boat ramp etc. The cards referred to are perhaps part of a series “Connies Collectables”. It appears that it was sponsored by Landcare Australia, Coast Action and the photo was credited to Glenn Ehmke. It has the web site www.dse.vic.au/coast - we would need to create our own for this area or perhaps the Fleurieu Peninsula.

9- How can the HP volunteers be better supported? Would a Friends of Hooded Plover group be helpful?

- Possibly more seminars like the one we had (Hooded Plover Monitoring and Management Workshop provided by Birds Australia and supported by the AMLR NRM Board).

- A Friends of Hooded Plover has possibilities but this needs dedication and commitment. If it is not done properly it loses credibility. There can be nothing worse than a set of broken signs and infrastructure on a beach left by the "do-gooders" who were going to save the birds but didn't stay the distance.

10-Any comments?

I am afraid that the Hooded Plover will be limited to a winter time visitor to the Aldinga Beach. The pressure from the people use of the beach throughout the year means the Hooded Plover will not be successful in breeding on the beach before perhaps climate change takes the beach away.

I was really interested in the Dogs Breakfast on the beach. It is a good idea to promote responsible dog behaviour on the beach not just caring for the welfare of the Hooded Plovers.

To be successful at Aldinga I think it would need the full cooperation of the government instrumentalities that control dogs on beaches. This would include the body responsible for the Aldinga Marine Reserve. i.e the section near the reef. Locally known as Evans Beach.

No cars go here, people walk their dogs there quite a lot because it is an area where dogs are free to run without a leash. It seems crazy to me that this is a Marine Reserve [Aldinga Reef Aquatic Reserve - PIRSA] and dogs can walk and run freely there messing up the beach, scaring the birds, often at the encouragement of the people. The talk at Yankalilla pointed out that Hooded Plover like a beach near a reef because there are good pickings in such places. I wasn't aware of the importance of a reef or rocky area to HPs.

It would be good if some rationalisation of the dog leash free areas could be made. This would involve the City of Onkaparinga I believe.

The dogs' breakfast could be a good opportunity to talk with people who walk this area. Generally the people on Evans Beach appreciate the beach, reef etc and probably would listen. There used to be several different species of birds on the beaches where the reef is. This includes the area that extends down to Snapper Point. The Red Capped Plover numbers, I am sure, have dropped in recent years with more people here. With a Dog's Breakfast, community education and a sensible dog free area for the birds there is the possibility that there could be an increase in the bird population in the reef-beach area and that could include Hooded Plover. I have a theory that juvenile Hooded Plover from Port Willunga come to the reef in autumn.

There could be a section of the Aldinga Beach that is open to dogs within specific hours. However the dogs should not be in the reef area.

To me the area to concentrate on making a large effort to encourage successful breeding of Hooded Plovers in this area is Port Willunga. The beach is more appropriate, has a history of some success, has no cars and has a fairly large group of "sympathetic" people. A dog's breakfast, community education and support and involvement from local government and environmental groups could work.

My concern at Aldinga is that the Hooded Plover is tending to be used as a "weapon" against the pro Cars on the Beach Group. This could be a no win for the plover.

It would seem that the Washpool Area to the south of Aldinga is a visiting spot for Hooded Plover in winter. More so than in the past. Worth watching in future.

Carrickalinga Head/Carrickalinga/Normanville/Normanville to Lady Bay/Monument –Lady Bay (Sites 6-10)

1-Would temporary or permanent signage be effective?

- A permanent sign has been placed at Normanville (DEH). If more could be placed at key entrances that would be helpful.
- If there was a nest that was likely to be trampled and required fencing, temporary signage to accompany the fencing would be required. People will most likely walk up to the fence to see what it is all about, so it would be good to inform people and ask them to please move away from the fenced area.

2-How many access points are there, and how does this impact on Hooded Plover breeding success?

- Carrickalinga Head – one access point (from beach to the south), Carrickalinga has 11 access points (including a formal boardwalk at the northern end of the bay), Normanville has 8 access points, Normanville to Lady Bay has 3 access points and Monument-Lady Bay has 1 access point.
- Nests on Carrickalinga beach were always very close to one or more access points, resulting in copious numbers of tracks very nearby the nest. So was the case for a few of the nests on Normanville, there was one nest which was at least 200m from an access point. It would be worthwhile temporarily closing access to the informal access points when nests are very close by.

3-Would temporary or permanent fencing assist in improving Hooded Plover breeding success?

- Temporary fencing of nests:
 - If there was a nest that was very likely to be trampled temporary fencing accompanied by signage would be worth trying.
- Permanent fencing:
 - Would not foresee it being useful at this point. If there were more surveys done of the site to establish if there was a regular nesting site, it might be worth considering. However it would have to be placed in such a way as to not impinge on beach recreationists. The community would need to endorse the idea for it to work.

4-Would Chick Shelters assist the survival rate of chicks?

- It would be worth trying based on guidance from those who have already used them in Victoria.

5-Community Engagement

a-Would a “Dog’s breakfast” be effective way to engage dog owners?

- This has already been done at Normanville with success. A repeat dog breakfast would be useful, perhaps further north at Carrickalinga.

b-Blackboards at access points have been used to keep the community informed regarding a nest (ie. 10 days to go!). Would this be effective?

- Having already had a Dog’s Breakfast the community may be ready for something like this and find it helpful.

c-Would regular articles in the local newsletter be an effective education tool?

- It would be very useful and would increase the community's awareness. It would be good to alert the local community that Hooded Plovers are nesting but perhaps not give out the exact location.

6-Are there foxes at the site and are they being controlled?

Fox tracks have been observe. Unsure whether there is fox baiting. Would be unlikely due to residential surrounding and many dogs.

7-Is there vehicle access to the site? Comments.

- There is vehicle access for boat launching just south of the Normanville Jetty. Most vehicles keep to this area.

8-Do you have any ideas for educating school children on Hooded Plovers?

- Involve school children in observing sites where Hooded Plovers are observed versus where they are not, or very rarely observed (ie. Sir Richard Peninsula). This would provide the students with an opportunity to observe the differences in activities on the beach and how this may influence the presence/absence of Hooded Plovers (as per Sir Richard Peninsula site). Ensure that only small groups are taken at a time. Prior to field trip ensure that students receive a presentation showing footage of Hooded Plovers and information so that they can gain an understanding and appreciation for how important the species is, and how careful they need to be in the vicinity of Hooded Plovers and in particular nests and chicks.
- Yankalilla Area School and the Surf Life Saving Club nippers are very proud of having Hooded Plovers on their local beach. The nippers have named themselves after the Hooded Plovers and a teacher from the Yankalilla Area School will be attending the Hooded Plover workshop by Birds Australia. There would be many opportunities to involve both groups in the monitoring and management of Hooded Plovers. They could also be significantly involved with making the community aware of the species.
- The Normanville Natural Resource Centre also plays a pivotal role in engaging and educating the community on these matters. The Centre applied for a Federal Caring For Our Country Community Coastcare Grant in 2008 which unfortunately was not funded. The Centre was willing to host a paid officer, and if this were to be a possibility in the future, the Centre would be very supportive of the incumbent.

9-How can the HP volunteers be better supported? Would a Friends of Hooded Plover group be helpful?

Regular newsletters with a summary of all sites should be regularly produced (as was the case in this project). This means that volunteers can see their significant contribution to the project and are kept informed of how Hooded Plovers are fairing at other sites and what management is being implemented.

Volunteers could be better supported if there was a paid (even at least part-time) officer to:

- run the monitoring project and assist with analysing historical data,
- help implement practical management and focus on strategically engaging the community and other key stakeholders,
- look to engaging and training more volunteers,
- apply for funding, and

- engage Honours students to conduct further research.

There would be many other tasks a paid officer could achieve. Discussions with Birds Australia (who have paid staff) would be very helpful.

10-Any comments?

This project needs to keep up momentum by keeping key stakeholders, especially volunteers, engaged. Management to improve nesting success needs to be refined and a there now needs to be a focus on management to improve chick survival.

There also needs to be ways of engaging the holiday makers, temporary and permanent residents. Such as:

- A regular newsletter dropped to all residents,
- Fridge magnet (picture of a Hooded Plover and some information) so that anyone who hires the house for a week's holiday etc will see it.

Very encouraging to see the Surf Life Saving Club Nippers being named after the Hooded Plovers and the Yankalilla Area School becoming interested in Hooded Plover management/monitoring.

This stretch of beach is incredibly significant to the Fleurieu Peninsula Hooded Plover population and every effort possible needs to be made to maintain the current population and improve breeding success.

Tunkalilla – Site 11

1-Would temporary or permanent signage be effective?

- A permanent sign at the most popular access point for visitors may be of use. A permanent sign could also be placed at the top car park.
- It is very unlikely that a temporary fence that required temporary signage would need to be constructed at this site due to its remote location.

2-How many access points are there, and how does this impact on Hooded Plover breeding success?

- This site is very unique in that it is quite remote, and people wishing to access the beach have a very long walk from the car park up on the hill, down through a paddock. There is a private road which runs along behind the beach.
- There is one main access point for walkers.

3-Would temporary or permanent fencing assist in improving Hooded Plover breeding success?

- Temporary fencing of nests:
 - If there was a nest right at the most popular access point, there may need to be a fence to prevent accidental trampling. A chick was observed right at this access point.
- Permanent fencing of nests:
 - Would not foresee it being useful at this point. If there were more surveys done of the site to establish if there was a regular nesting site, it might be worth considering. However it would have to be placed in such a way as to not impinge on beach recreationists. The community would need to endorse the idea for it to work.

4-Would Chick Shelters assist the survival rate of chicks?

- It would be worth trying based on guidance from those who have already used them in Victoria. There are complex dune systems along sections of the beach and would provide plenty of suitable habitat for adults to shelter their chick amongst.

5-Community Engagement

a-Would a “Dog’s breakfast” be effective way to engage dog owners?

- It is a unique situation in that the most regular visitors to the site are likely to be the few property owners along the beach front. Therefore there is a good opportunity to engage these property owners to inform them about how they can best help the Hooded Plover succeed. Many property owners there are most likely already aware of the species and could provide information on sightings etc. Therefore an informal get together (perhaps not under the title of a dog’s breakfast) would be more appropriate.

b-Blackboards at access points have been used to keep the community informed regarding a nest (ie. 10 days to go!). Would this be effective?

- As this site is very remote, this would not be so effective. It would be more effective to keep in contact with the property owners and to share information on when nests/chicks are observed etc.

c-Would regular articles in the local newsletter be an effective education tool?

- It would be useful, however a site-specific newsletter throughout the breeding season may be more appropriate.

6-Are there foxes at the site and are they being controlled?

Foxes are present at the site. Unsure whether property owners are controlling them. This is such a remote site that foxes may be one of the biggest threats to Hooded Plovers. It would be wise to get a better idea of the number of foxes and look at ways of controlling them.

7-Is there vehicle access to the site? Comments.

- No vehicle access.

8-Do you have any ideas for educating school children on Hooded Plovers?

- Involve school children in observing sites where Hooded Plovers are observed versus where they are not, or very rarely observed (ie. Sir Richard Peninsula). This would provide the students with an opportunity to observe the differences in activities on the beach and how this may influence the presence/absence of Hooded Plovers (as per Sir Richard Peninsula site). Ensure that only small groups are taken at a time. Prior to field trip ensure that students receive a presentation showing footage of Hooded Plovers and information so that they can gain an understanding and appreciation for how important the species is, and how careful they need to be in the vicinity of Hooded Plovers and in particular nests and chicks.
- The site is very remote and as such it may be too far for primary school students. It may be more appropriate for high school students conducting a research assignment, or getting involved with regular monitoring.

9-How can the Hooded Plover volunteers be better supported? Would a Friends of Hooded Plover group be helpful?

Regular newsletters with a summary of all sites should be regularly produced (as was the case in this project). This means that volunteers can see their significant contribution to the project and are kept informed of how Hooded Plovers are fairing at other sites and what management is being implemented.

Volunteers could be better supported if there was a paid (even at least part-time) officer to:

- run the monitoring project and assist with analysing historical data,
- help implement practical management and focus on strategically engaging the community and other key stakeholders,
- look to engaging and training more volunteers,
- apply for funding, and
- engage Honours students to conduct further research.

There would be many other tasks a paid officer could achieve. Discussions with Birds Australia (who have paid staff) would be very helpful.

10-Any comments?

This project needs to keep up momentum by keeping key stakeholders, especially volunteers, engaged. Management to improve nesting success needs to be refined and a there now needs to be a focus on management to improve chick survival.

Producing a newsletter with regular updates to the property owners would be useful. It would also be good to have the property owners' input into the newsletter regarding their observations.

This stretch of beach is incredibly significant to the Fleurieu Peninsula Hooded Plover population and every effort possible needs to be made to maintain the current population and improve breeding success.

Parsons Beach – Site 12

1-Would temporary or permanent signage be effective?

Signs would help although they could attract attention from some undesirable elements of the public who could seek to locate the nest(s).

2-How many access points are there, and how does this impact on HP breeding success?

There are 2 access points to the beach area (one at each end) with the NE end having the greatest concentration of people because it had the easier access. The Hooded Plovers were generally always located around the middle of the beach.

3-Would temporary or permanent fencing assist in improving HP breeding success?

Some sort of chain-mesh enclosure say 3 by 3 meters could be beneficial. I recently saw a similar enclosure setup at Whitefish Pt, Michigan (adjacent to Lake Superior) for a nesting Piping Plover (an endangered species). The enclosure was surrounded by a single rope placed about 50 m away with appropriate signage. This probably is only suitable for just one pair nesting.

4-Would Chick Shelters assist the survival rate of chicks?

Not sure what such a shelter would achieve.

5-Community Engagement

a-Would a "Dog's breakfast" (DB) be an effective way to engage dog owners?
(community event where people and their dogs are given breakfast and there are talks/discussions regarding HP)
Since dog owners often don't control their dogs this might be a way to get through to them. I don't think dog owners really think that Parson's Beach is part of a CP. There are no signs to indicate this.

b-Blackboards at access points have been used to keep the community informed regarding a nest (ie. 10 days to go!). Would this be effective?
I don't know. Has there been any feedback where it has been tried?

c-Would regular articles in the local newspaper be an effective education tool?
Any publicity wouldn't go amiss.

6-Are foxes present at the site and is there any control?

Yes. However, since the beach is part of a conservation park baiting has been used to control fox numbers.

7-Is there vehicle access to the beach? Comments.

No vehicular access.

8-Do you have any ideas for educating school children?

Yes some form of education would be useful starting in the elementary classes.

9-How can the HP volunteers be better supported? Would a Friends of HP be a good idea?

Don't know on that one.

10- Any other comments?

Waitpinga – Site 13

1-Would temporary or permanent signage be effective?

- Temporary signage – If there were a nest it may be useful (i.e. if there were to be a nest in the estuary region where the beach is wider), but at this stage it does not seem appropriate because as far as the volunteer knows, there has not been any nests observed along the beach.
- Permanent signage – Every access point should have a permanent sign saying that they are on this beach. A big sign with greater detail could be placed at the boardwalk at the central access point, one sign could be placed at the estuary access, and the other at the western end of the beach where mostly surfers access the site.

2-How many access points are there, and how does this impact on Hooded Plover breeding success?

- There are 3 access points, one main entrance via a boardwalk, another path down towards the estuary and a third access point at the western end of the beach which surfers often use. On the western 'half' of the beach (between the boardwalk access and the western access point) there are fishers however they usually remain close to the water's edge. There are lots of surfers at the western end. If Hooded Plovers are observed they are usually seen in the

western section. To the east of the central boardwalk there are also fishers who mostly stick to the water's edge.

3-Would temporary or permanent fencing assist in improving Hooded Plover breeding success?

- Temporary fencing of nests:
 - If there were a nest it may be useful (i.e. if there were to be a nest in the estuary region where the beach is wider), but at this stage it does not seem appropriate because as far as the volunteer knows, there has not been any nests observed along the beach.
- Permanent fencing: not necessarily required at this site.

4-Would Chick Shelters assist the survival rate of chicks?

- It would be good to trial the chick shelters. Location of the chick shelters would need to be considered carefully. It would assist with reducing possible predation from prevalent silvergulls. Nests and chicks have not been observed at this site however.

5-Community Engagement

a-Would a "Dog's breakfast" be effective way to engage dog owners?

- As this is a Conservation Park dogs are not allowed on the beaches and therefore the workshop would not really be necessary. Dogs are seen very rarely so not a problem.

b-Blackboards at access points have been used to keep the community informed regarding a nest (ie. 10 days to go!). Would this be effective?

- This would be a good idea and would help to increase community support. There are examples of such community response in the UK.

c-Would regular articles in the local newspaper be an effective education tool?

- Many simply do not know that Hooded Plovers exist so this would be a great opportunity to raise awareness as it is all about education. If there is a nest it would be good to follow it through with updates in the newspaper. For example, put an article in if chicks hatch etc.

6-Are there foxes at the site and are they controlled?

Unsure whether there is current fox control. If the Friends group were to find a fox den they would alert DEH who would deal with the situation. There is rabbit control currently being employed.

7-Is there vehicle access to the site? Comments.

- There is no vehicle access to Waitpinga beach.

8-Do you have any ideas for educating school children on Hooded Plovers?

Get out to the schools and provide presentations etc. Sites such as the Inman River and Hindmarsh River would probably be more appropriate sites to study rather than Waitpinga however.

9-How can the Hooded Plover volunteers be better supported? Would a Friends of the Hooded Plover group help?

- The more people are involved the more the message gets out to the public.

- If there were to be a group you could share results and try to enthuse each other to keep on especially when nests/chicks fail etc.

10-Any comments?

- Nests have not been observed at this site – there is a possibility however that Hooded Plovers may be nesting behind the dunes. The beach is narrow in places and steep and nests on the beach itself may very easily be washed away. The most appropriate, wider stretch of beach to nest would be around the estuary.
- Dense Marram Grass along the dunes has contributed to extremely steep foredunes which would most likely be one of the reasons as to why Hooded Plovers do not nest at the site.
- The public would like to be a part of saving the Hooded Plover.
- Brochures containing information on Hooded Plovers need to be distributed to dog walkers (at sites where dogs are allowed).
- Birds SA can provide funds to produce signs etc where appropriate.

Inman River – Site 14

1-Would temporary or permanent signage be effective?

- Temporary signage – is certainly useful when the Hooded Plovers are there over the breeding season. It would be worthwhile attaching a water-proof brochure rack to a sign. This could hold copies of the Birds Australia beach nesting birds brochure which people could take if they were interested in further detail.
- Permanent signage – this would be useful. However the placement of the sign would need to be carefully considered. Perhaps one at each access point either side of the usual nesting site.

2-How many access points are there, and how does this impact on Hooded Plover breeding success?

- There are 2 access points one on each side of the usual nesting site. If they nest in the middle of the 2 access points there is minimal disturbance. The nest has been laid within the same 10-15m over the last 3 or 4 years.

3-Would temporary or permanent fencing assist in improving Hooded Plover breeding success?

- Temporary fencing of nests:
 - Temporary fencing has been effective at this site. In the 08/09 breeding season bunting was placed each end of the nest site (4m length, 20m from either side of the nest) and it worked well. Most walkers stick to the water's edge, however dogs run all over the beach and through the seaweed piles at the back of the beach near where the Hooded Plovers nest etc.
- Permanent fencing: not recommended at this site as there would probably be significant protest from the residents.

4-Would Chick Shelters assist the survival rate of chicks?

- It would be good to trial the chick shelters. HP chicks often use the bountiful beach wrack for shelter and it also works very well to camouflage the chicks.

It would be interesting to find out when they install the chick shelters. The site where the Hooded Plovers nest is backed by an area being revegetated by a Coastcare group. This provides a good area of cover also.

5-Community Engagement

a-Would a “Dog’s breakfast” be effective way to engage dog owners?

- Yes this would be useful. Anything to draw the public’s attention to the problem of a disappearing species is worth it. Such an event requires paid staff to manage with dedication and professional handling. Volunteers could be involved however there is a limit to what volunteers can do.

b-Blackboards at access points have been used to keep the community informed regarding a nest (ie. 10 days to go!). Would this be effective?

- Unsure as to its effectiveness. Imagine it would be subject to vandalism. It may be more useful in a community where there are more regular visitors – many of the visitors come for only 1 or 2 weeks a year. The Yilki Store would be a possible site to mount such an ongoing vehicle of communication, especially as this is a more frequently trafficked area and possibly less tempting to vandals.

c-Would regular articles in the local newspaper be an effective education tool?

- This would be useful, especially considering that the majority of people in the region read the Victor Times avidly, especially the “Community Pages” section. A photo with a short caption/article.

6-Are there foxes present at the site and are they controlled?

Have not seen any foxes at the site or fox tracks however there have been reports of foxes in the suburban areas.

7-Is there vehicle access to the site? Comments.

- There is no vehicle access to this site.

8-Do you have any ideas for educating school children about Hooded Plovers?

There would be many ideas. School children could be asked how they should go about learning more about the Hooded Plover. The topic would no doubt slot into the curriculum. A dedicated teacher could provide stimulus and the children themselves would probably have many imaginative ideas.

9-How can the Hooded Plover volunteers be better supported? Would a Friends of Hooded Plover group help?

- A Friends of Hooded Plover group could be good as it would give weight to what each of the volunteers are doing and provides a focus for the volunteers. Everyone would be kept up-to-date with what is happening at each other’s sites. Such a Friends group needs a dedicated leader.

10-Any comments?

- Council staff need to more regularly patrol the beaches and hand out warnings/fines to those who are not obeying leashing laws.
- Groups of magpies at Kent Reserve will often group up around the Hooded Plover site. They could be a threat to Hooded Plovers, in particular the chicks.

Hindmarsh River – Site 15

1-Would temporary or permanent signage be effective?

- Temporary signage – not necessarily needed. To close off the access point in line with usual nest site would be more effective.
- Permanent signage – there are already 3 signs with HP information at this site. There is one at the boardwalk entrance onto the beach at the mouth, another at the end of Bridge Terrace and Hayward street 400m west of Oliver's Reef (near where the nest site is). The Bridge Terrace and Hayward Street signs were installed earlier this year. The access point off Hayward street 100m west of Oliver's reef also needs a sign. They are effective signs, however the sign at the boardwalk is angled in such a way that makes it difficult to read. It would be better to have it directly facing people entering the beach.

2-How many access points are there, and how does this impact on Hooded Plover breeding success?

- Access points:
 - Western side of the Hindmarsh River mouth at Bridge Terrace. This is a fair distance from the usual nesting site however and many of people access the beach from this point.
 - The boardwalk enters onto the beach on the eastern side of the river mouth.
 - Two formal access points through the sand dunes east of the river mouth, one approximately 400m west of Oliver's reef, and another 100m west of Oliver's Reef. The nesting site is very close to the access point 400m west of Oliver's reef.
 - Formal access point (steps) 100m west of Oliver's reef.
 - East of Oliver's reef to the Investigator carpark, there are 4 formal access points. This section of beach is often where the adult pair take chicks to forage for food.
 - Many of the access points have signs which ask "dogs to be under effective control at all times and are to be on a leash during daylight saving between 10am and 8pm".

3-Would temporary or permanent fencing assist in improving Hooded Plover breeding success?

- Temporary fencing of nests: this is not necessarily required at this site as although it may keep the majority of people away it may also attract vandalism. It would always be worth considering however. Blocking the access to the track which leads down to the nesting area would be more effective at reducing disturbance to the nesting pair. The access track could be blocked using bunting. This would not draw undue attention to the nest.
- Permanent fencing: not recommended at this site.

4-Would Chick Shelters assist the survival rate of chicks?

- It would be good to trial the chick shelters especially if they have been effective in Victoria.

5-Community Engagement

a-Would a "Dog's breakfast" be effective way to engage dog owners?

- Would not be useful here. It would be difficult to get all the dog walkers together at the same time. Many of the regular dog walkers are now aware of Hooded Plovers and are willing to keep their dogs on leads or down by the water's edge. Therefore it may be more useful to pamphlets to these dog walkers to provide them with information on Hooded Plovers (similar to the information on the signs).

b-Blackboards at access points have been used to keep the community informed regarding a nest (ie. 10 days to go!). Would this be effective?

- Perhaps not so useful at this site as there are numerous access points. However if there was just one central access point to a beach the blackboard may be useful.

c-Would regular articles in the local rag be an effective education tool?

- This would be useful and could be easily done as there are close connections between community groups and the local newspaper. It would be wise to create awareness without drawing attention specifically to the actual nest site.

6-Fox control

Foxes are in the dunes behind the beach and have been observed in the vicinity of Hayward street. There are lots of rabbits which are attracting the foxes. Rubbish and food scraps are also attracting the foxes.

7-Vehicles

- There is no vehicle access to this site.

8-Do you have any ideas for educating school children on Hooded Plovers?

Someone could go out to schools and provide presentations to students similar to what the Whale Centre staff do. It is not recommended to take school groups to view a nest as the risk is too great.

9-How can the Hooded Plover volunteers be better supported?

- A Friends of HP group would not necessarily be required. A number of the volunteers are already a member of the Fleurieu Birdwatcher group. Therefore support of HP volunteers via this group would be a better option.

10-Any comments?

- Strongly suggest developing and distributing a pamphlet to dog walkers and other members of the community.
- Do not believe it is the dogs who are eating/damaging eggs, rather there has been evidence of lizard and gull tracks around nests. Lizards, ravens, masked lapwings and gulls are more of a threat to Hooded Plovers at this site.

Bashams Beach – Site 16

1-Would temporary or permanent signage be effective?

- Temporary signage – 4 or 5 corflute signs were placed in the vicinity of a nest in the 08/09 breeding season which were effective in keeping people away from the nest site. The signs had a picture of the HP, asked people to keep their dogs on a lead and asked people to keep a certain distance from the nest.
- Permanent signage – there is one sign at the Bashams Beach carpark which states dogs must be on a lead. If there were signs placed at all access points

that would be very helpful. It would also be useful to have Local Government staff police the site at regular intervals. The more signs the better.

2-How many access points are there, and how does this impact on Hooded Plover breeding success?

- There are 4 access points onto Bashams Beach and one less formal pathway at either end of the beach (Middleton and the Port Elliot Caravan Park). All of these access points need signs asking walkers to keep their dogs on the lead and how this will assist HP breeding success.

3-Would temporary or permanent fencing assist in improving Hooded Plover breeding success?

- Temporary fencing of nests:
 - The Hooded Plover pair always nest within the same 200m stretch. If this area were to be closed when a nest was present this may reduce disturbance to the adults who are incubating or protecting chicks. The beach can still be easily accessed either side of the 200m stretch, and a pathway behind the dunes would act as an alternative for the 200m stretch of beach. Chicks will often remain within the 200m nesting zone however when disturbed they will move larger distances over the rest of the beach.
- Permanent fencing: not necessarily required at this site.

4-Would Chick Shelters assist the survival rate of chicks?

- It would be good to trial the chick shelters. Regular monitoring would assist its effectiveness.

5-Community Engagement

a-Would a “Dog’s breakfast” be effective way to engage dog owners?

- There are a lot of dog walkers at this site and a Dog’s Breakfast may be a good event to raise awareness and encourage people to keep their dog on a lead.

b-Blackboards at access points have been used to keep the community informed regarding a nest (ie. 10 days to go!). Would this be effective?

- This would be a good idea and would also help improve chick survival.

c-Would regular articles in the local newspaper be an effective education tool?

- The more of this the better, especially during holidays when there are visitors to the region who would not know of the Hooded Plover.

6-Are there foxes at the site and are they controlled?

Fox tracks have been observed on the beach. It is assumed that foxes would be more likely to prey on chicks than dogs. Fox control is difficult however as it is a residential area with many dogs.

7-Is there vehicle access to the site? Comments.

- There is no vehicle access to Bashams Beach. There is the occasional bicycle rider on the beach during the summer months and occasional horse.

8-Do you have any ideas for educating school children on Hooded Plovers?

The Fleurieu Birdwatcher group has been to schools to provide presentations on a variety of birds (not Hooded Plovers). Perhaps this is something that could be done.

9-How can the Hooded Plover volunteers be better supported? Would a Friends of the Hooded Plover group help?

- If there were a Friends of Hooded Plover affiliated with a government agency this would provide volunteers with greater support and purpose and encourage more to get involved.
- It would be good to discuss a Friends group at the workshop being held by Birds Australia.

10-Any comments?

- Look at what management techniques are being employed by Birds Australia in Victoria.
- Climate change is a bigger threat to Hooded Plovers than dogs.
- There seem to be a greater frequency of high tides which mean that nests are very susceptible to being washed away.
- A pamphlet with information on them and their plight to hand out to beach users would be helpful.
- The whale watching season can coincide with Hooded Plover breeding season (i.e. August). Where the public stands to watch the whales was where the pair attempted to nest in 08/09. Consideration should be given by the Council to build a viewing platform to prevent people from standing on the beach and foredune area. A sign should also be put up in the car park to direct people to the current viewing platform which is accessed along the bicycle path as many people do not know it exists.

Watsons Gap – Site 17

1-Would temporary or permanent signage be effective?

- Temporary signage – was very effective when used in conjunction with temporary fencing of a nest. People would read the sign and step away from the fenced area. The wording was effective.
- Permanent signage – there is a good sign placed at the bottom of the steps however the sign is facing the wrong way. The sign faces people who have walked across beach and are about to exit the beach via the steps. The sign should face people as they head down the steps and before they enter onto the beach. There needs to be a second sign further onto the beach too.

2-How many access points are there, and how does this impact on Hooded Plover breeding success?

- There are 3 access points all within approximately 150m of the usual nesting site. The access point closest to the nesting site should be closed during a nesting event. The next nearest access point is only 50m to the left, so it would not disrupt the flow of people on and off the beach to a great extent. However would provide a much less disturbed environment for adults incubating eggs or protecting chicks.
- An underpass has been suggested by “Beyond” to connect the new development to the beach. This is of concern as it would increase numbers of

people visiting the nesting site. The proposed underpass should be discussed with all key stakeholders.

3-Would temporary or permanent fencing assist in improving Hooded Plover breeding success?

- Temporary fencing of nests:
 - Is a must due to the location of the nest site (in the middle of the beach in direct line with the access point). It has been very effective on two occasions. The fences have generally been well respected by recreationists.
- Permanent fencing:
 - Permanent fencing of this area would be too restrictive to beach recreationists, especially during the non-breeding season when there aren't any nests present.

4-Would Chick Shelters assist the survival rate of chicks?

- It would be good to trial the chick shelters, however first it would be useful to hear how effective they have been in Victoria. There is concern that it may draw unwanted attention from dogs/foxes. Regular monitoring would assist its effectiveness. They would provide protection from birds of prey.

5-Community Engagement

a-Would a "Dog's breakfast" be effective way to engage dog owners?

- There are a lot of dog walkers between 7 and 9.30am. If there were to be a Dog's Breakfast it would need to be followed up by monitoring and signage.

b-Blackboards at access points have been used to keep the community informed regarding a nest (ie. 10 days to go!). Would this be effective?

- This would be a good idea if it was mentioned at the Dog's Breakfast as a follow on. It could also be used to say that the access point is closed as there is a nest, and direct people 50m to the left to the next access point. It would be good to ask the attendees of the Dog's Breakfast if they think a blackboard providing nest location and updates would be worthwhile.

c-Would regular articles in the local newspaper be an effective education tool?

- Yes and it would be of interest to those who have an interest in such matters.

6-Are there foxes at the site and are they being controlled?

There are foxes in the dunes, control is difficult however as it is a residential area with many dogs.

7-Is there vehicle access to the site? Comments.

- There is no vehicle access to Watsons Gap.

8-Do you have any ideas for educating school children about Hooded Plovers?

It would be good to show the school children an adult pair and their nest. However to minimise disturbance only small groups should be taken to view the nest. Students could stand further back on the steps and use binoculars or a telescope to view the nest. There are school aquatic activities at Horseshoe Bay and the schools could drop in on the way to or from these events to view the Hooded Plovers.

9-How can the Hooded Plover volunteers be better supported? Would a Friends of Hooded Plover group be helpful?

- Volunteers should be provided with a jacket which clearly displays the fact that they are a Hooded Plover volunteer. This way it is clear what the volunteer's purpose is, and the public can approach and ask questions and alternatively, when approaching a member of the public to inform them of the presence of a nest/chicks the public may be more receptive to the volunteer's comments.
- If there were a Friends of Hooded Plover affiliated with a government agency this would provide volunteers with greater support and purpose.
- During the breeding season it would be very helpful to have Local Government staff occasionally patrol the beach and enforce leashing laws.

10-Any comments?

No, have covered at all points in the above.

Sir Richard Peninsula and Bird Island – Sites 19 and 20

Sir Richard Peninsula

1-Would temporary or permanent signage be effective?

- A permanent sign is installed at the vehicular entrance to the beach. People who are already aware of the birds would notice the sign. However those who do not may not read the finer print. The main points need to be in larger.
- There are some older signs at the beginning of the pedestrian access points which mention Hooded Plovers but are very faded.

2-How many access points are there, and how does this impact on Hooded Plover breeding success?

- There are three designated pedestrian access points, all approximately 3 km apart. One of the 3 is used frequently (a boardwalk), the other two are not used as frequently. These access points would not likely have an impact on breeding success as there were no nests observed during the 06/07 breeding season (neither has there since during the 08/09 breeding season).

3-Would temporary or permanent fencing assist in improving Hooded Plover breeding success?

- Temporary fencing of nests:
 - If Hooded Plovers nested along Sir Richard Peninsula it would be helpful if it did not block vehicular access to the Murray mouth (also at high tide).
- Permanent fencing:
 - At the Murray mouth, the majority of cars park at the water's edge. The area closer to the dunes is rarely used and could potentially be an area suitable for permanent fencing to encourage Hooded Plovers to use the area as habitat for nesting. Ring lock fencing may also help to keep dogs out.
 - There is a small excluded area (approximately 1 Hectare) in place a few hundred metres from the mouth where the outlet from the dredge emptied onto the beach and during one survey a Red Capped Plover

was found nesting within this area (sitting on two eggs). 4WD did eventually begin to use the area again however. Maybe this shows that beach nesting birds will use fenced off areas if nothing else is available and permanent fencing at the mouth could be worth a try.

- There are wider sections of the beach where permanent fencing could be used, however this may block access to the Murray mouth during a high tide. It would be worth trialing at another site where vehicular or pedestrian access would not be blocked.

4-Would Chick Shelters assist the survival rate of chicks?

- Due to the heavy recreational use at this site, especially during the summer months, it is not anticipated that chick shelters would be required as there are no nests. However they would be of use at other sites where HPs nest.

5-Community Engagement

a-Would a “Dog’s breakfast” be effective way to engage dog owners?

- Dogs are walked within the 1km east of the vehicular access point. Dogs are driven along the beach and let out for a run. The DB may not be so successful as people will question why they need to keep their dog on a lead if there are no Hooded Plovers, or rarely observed, along Sir Richard Peninsula.

b-Blackboards at access points have been used to keep the community informed regarding a nest (ie. 10 days to go!). Would this be effective?

- Good idea if there was a breeding pair with nest observed.

c-Would regular articles in the local rag be an effective education tool?

- It would be good to increase the community’s awareness.

6-Are there foxes at the site and are they being controlled?

There are foxes present but unsure whether there is baiting done along Sir Richard Peninsula.

7-Is there vehicle access to the site? Comments.

- Yes, access if from the Goolwa Beach car park.
- A similar stretch of beach on the other side of the Murray mouth, the Younghusband Peninsula, has a number of HP pairs. The northern 110km of the Coorong ocean beach is closed to vehicles from the 24 October to 24 December each year. It would be interesting to see if this is an indicator of what could happen on a similar beach.
- While there is vehicle access for the entire beach, all year round, the Hooded Plover most likely will never be able to get an undisturbed breeding season. I would have been good to see if they took advantage of the beach closure back when the mouth dredging first started and vehicles were stopped from going all the way to the mouth. It may be useful to contact the DEH staff at Wyngate to see if they have any recollections of this event.

8-Do you have any ideas for educating school children?

- Involve school children in observing sites where Hooded Plovers are observed versus where they are not, or very rarely observed (ie. Sir Richard Peninsula). This would provide the students with an opportunity to observe the differences

in activities on the beach and how this may influence the presence/absence of Hooded Plovers.

9-How can the Hooded Plover volunteers be better supported? Would a Friends of Hooded Plover group be helpful?

Not sure about volunteer support, it seems that those organising these projects need the extra support. The volunteer survey work is quite easy as volunteers have been allocated their patch and given a form to follow, so not a lot to organise. It might be a bit different if there were a few Hooded Plovers present at Sir Richard Peninsula. This would probably be a good question to ask when a few of the volunteers are together. A Friends group might be useful to have as there would always be someone around to draw on to assist with hands on tasks and to cover others who may be away from their site when nests or young are found.

10-Any Comments?

Bird Island

Bird Island is a sandy island situated within the Murray mouth. Due to siltation of the channel the island is now accessible to cats, foxes and dogs and low tide. The presence of such predators may reduce breeding success were there Hooded Plovers nesting on the island.