

Middle Island Little Penguin Monitoring Program 2014-15 Season Report

By Jess Bouchier



18 May 2015

Project Partners:



Citation:

Bourchier, J. (2015) Middle Island Little Penguin Monitoring Program 2014-15 Season Report. Report to the Warrnambool Coastcare Landcare Group. Nature Glenelg Trust, Mount Gambier, South Australia.

Correspondence in relation to this report contact

Ms Jess Bourchier

Project Ecologist

Nature Glenelg Trust

(08) 8797 8596

jess.bourchier@natureglenelg.org.au

Cover photos (left to right):

Adult Little Penguin, Middle Island, 2-3 week old chick, 8 week old chick, Sunset at Middle Island

Disclaimer

This report was commissioned by Warrnambool Coastcare Landcare. Although all efforts were made to ensure quality, it was based on the best information available at the time and no warranty express or implied is provided for any errors or omissions, nor in the event of its use for any other purposes or by any other parties.

Acknowledgements

I would like to acknowledge and thank the following people for their assistance during the monitoring program:

- Warrnambool Coastcare Landcare Group
- Little Penguin Monitoring Program volunteers, with particular thanks to Melanie Wells, John Sutherland, Vince Haberfield and Kristie King
- Middle Island Working Group
- Warrnambool City Council
- Philip Island Nature Park

SUMMARY

Arrival counts and breeding surveys, undertaken at Middle Island in western Victoria, indicate a recovery of Little Penguin numbers following observed declines during the previous season. The estimated colony size, calculated from the peak arrival count figures for the 2014/2015 season was 130 compared to 103 for 2013/2014. Based on existing methods, six breeding pairs were detected, with 12 eggs laid and a 100% hatch rate. This is in contrast to 2013/2014 when only three chicks hatched, demonstrating that recruitment has improved from the poor breeding activity observed over the previous breeding season.

During the time of monitoring, the Middle Island Little Penguin monitoring program received 250 hours of voluntary support and also attracted three separate film crews producing short documentaries and a commercial morning show segment highlighting conservation efforts on the island.

The trialling of alternative survey methods, to allow access to more natural burrows, is warranted in order to better inform recruitment estimates. This is particularly relevant for the upper vegetated surface of Middle Island where access to burrows is impeded by a high risk of burrow collapse. Some of the artificial burrows on the island are damaged and should be removed, while others that are still in good condition would benefit from having a second roof fitted to improve temperature regulation through shading in the summer.

Table of Contents

| | |
|---|-----|
| SUMMARY | iii |
| 1. BACKGROUND | 1 |
| 2. OVERVIEW OF THE 2014-15 MONITORING PROGRAM | 1 |
| 2.1. Arrival Counts | 1 |
| 2.2. Breeding Surveys | 5 |
| 2.3. Additional Observations | 8 |
| 2.4. Community Engagement and Media Coverage..... | 9 |
| 3. Recommendations..... | 9 |
| 4. REFERENCES..... | 10 |

1. BACKGROUND

The Middle Island Little Penguin (*Eudyptula minor*) monitoring program began in 2006 with the aim of monitoring penguin population abundance and recruitment in response to a guardian dog trial using Maremmas. The introduction of Maremma dogs was undertaken as a novel attempt to reduce fox predation on the Middle Island penguin population following observations of a number of penguin kills during the breeding seasons between 1993 and 2005, a majority of which were attributed to foxes. The most severe predation event was recorded in 2005 with 268 carcasses found during a single visit to Middle Island (Overeem & Wallis, 2007).

In the breeding season of 1999/2000 Overeem & Wallis (2003) found 342 active burrows with a peak arrival count of 502 in early January. Monitoring was continued again at the start of the 2005/2006 breeding season (September). At this time 52 active burrows were recorded, only four adult penguins were counted during the dusk arrival count and no evidence of breeding was found (Overeem & Wallis, 2007).

The first arrival count of the following breeding season (October 2006), with commencement of the Maremma guardian dog trial, recorded 29 adult penguins, with a peak of 70 adults in late December. October surveys also found six breeding pairs and over the course of the 2006/2007 breeding season, no Little Penguin kills were observed which could be attributed to fox predation. As a result of this successful outcome, the Maremma project has continued and now serves as a world first conservation project using the guardian-dog technique to protect native seabirds.

To this day no observed fox kills on Middle Island have been recorded following the initiation of the Maremma project and, with the exception of the 2013-14 season, arrival counts have generally indicated a steady increase in both colony size and breeding success on Middle Island.

2. OVERVIEW OF THE 2014-15 MONITORING PROGRAM

2.1. Arrival Counts

Fortnightly arrival counts were undertaken at dusk by volunteers on Middle Island during the breeding season, from September to early March. The procedure is based on methods used at Phillip Island Nature Park (Dann, 1992) and as implemented at Middle Island by Overeem & Wallis (2003).

During arrival counts volunteers counted penguins from five known landing sites as they arrived from feeding at sea, for one hour after the first penguin arrival. Studies have shown at least 60% of a penguin colony comes ashore during this time (Dann, 1992). These counts were then used as a basis to generate the population estimate. Historically, volunteers have been positioned at six landing sites (Overeem & Wallis, 2003) but, due to safety reasons, only five sites were used this season.

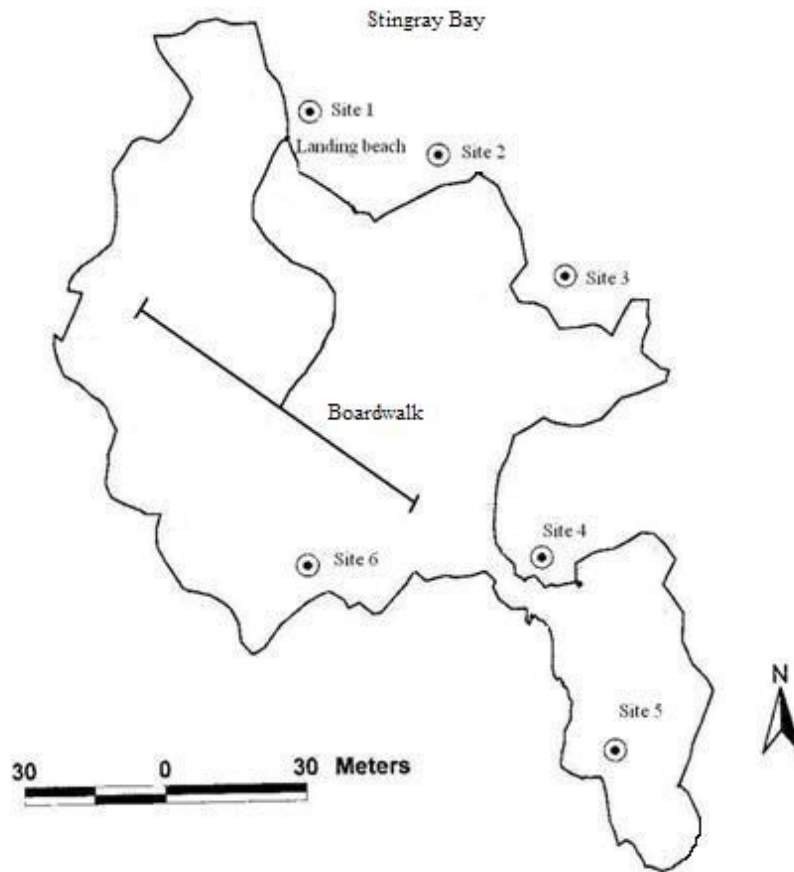


Figure 1: Trace map of Middle Island showing the historical six landing sites (Overeem & Wallis, 2003). Site 4 was excluded during the current surveys due to safety reasons.

During the 2014/2015 breeding season, seven arrival counts were undertaken between the 23rd of October 2014 and 5th of February 2015. Three arrival counts were cancelled due to adverse weather and shortening of the season due to early moulting of adult birds.

A variation in inter-seasonal count estimates is annually recorded and the current season is consistent with previous years (Figure 2). This natural variation is representative of the adult penguins breeding activities. For example, a lower arrival number in September and October is seen as one adult stays to guard the chicks while the other feeds; therefore only one adult of the pair is counted. During the peak of the season (December and January) both adults will be counted as the chicks have reached the post guard stage and both adults feed during the day and return at night. The decline in arrival numbers after the majority of chicks have fledged is due to adults feeding for longer at sea to build fat stores in preparation for the annual moult.

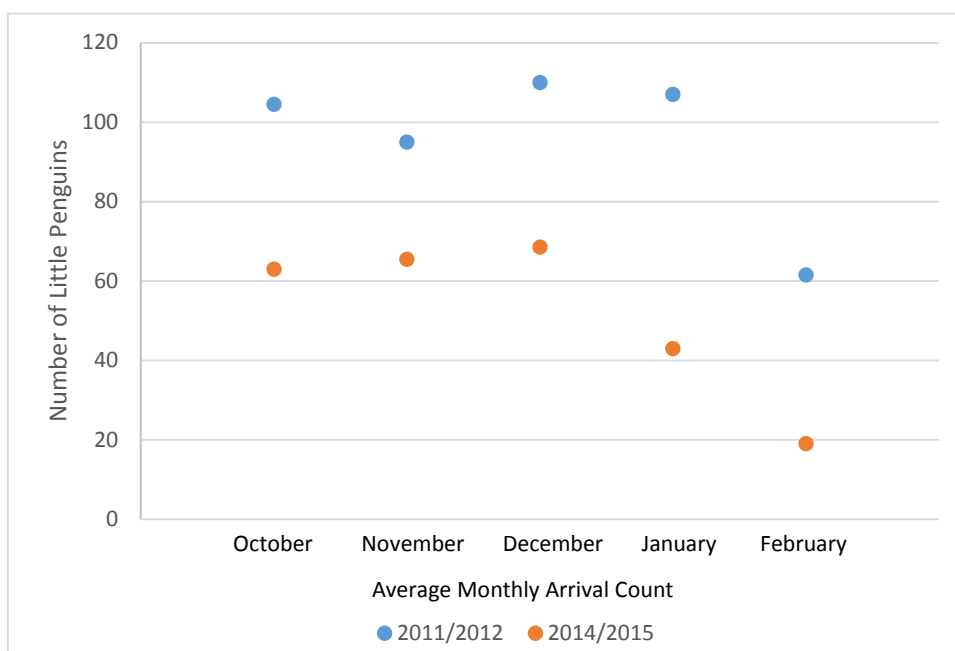


Figure 2: Variation in inter-seasonal count estimates, examples of the 2011/2012 and 2014/2015 seasons

The peak count for each season is used to derive a ‘proxy’ or estimated colony size over time (Figure 3). This is based on previous observations of only a proportion of adults belonging to the colony returning to their land based nest sites at night (Dann, 1992). The peak count during this season occurred on 23 December 2014 with 78 arrivals, giving an estimated colony size of 130. This is an increase on the estimate from the last breeding season of 103, and shows the Middle Island Little Penguin colony is recovering from an observed decline last season which may have been linked to adverse sea conditions and food shortages (Kivisalu, 2014).

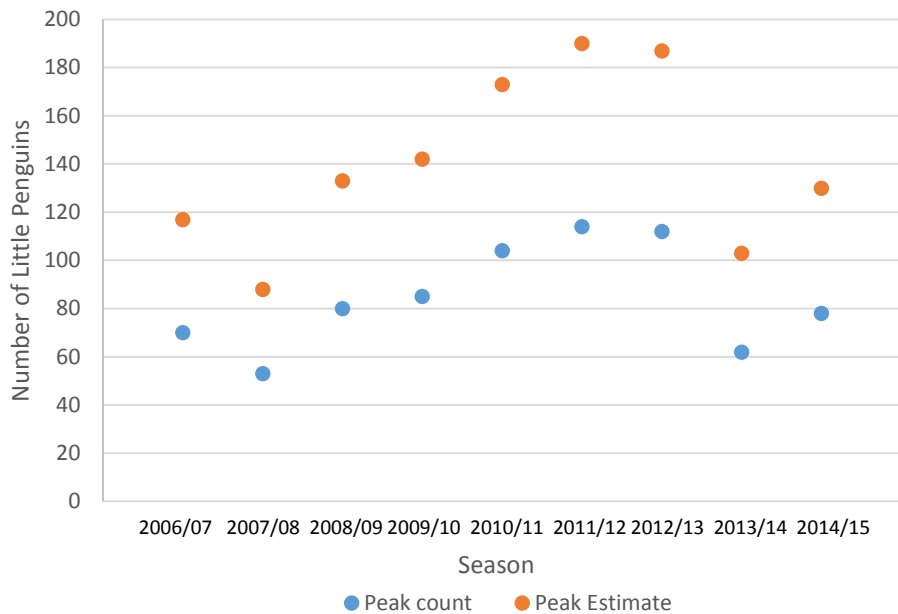


Figure 3: Peak arrivals counted and peak estimates of colony size at Middle Island since the 2006/07 breeding season.

2.2. Breeding Surveys

Breeding surveys, aimed at measuring breeding success, were completed by specifically trained volunteers on a fortnightly basis. Data was collected on the number of eggs laid and chicks raised and fledged per breeding pair. A defined area of nesting habitat on Middle Island was routinely checked for the presence of breeding adults, as completed in previous breeding seasons and used by Philip Island Nature Park.

The first survey was carried out on 21 August 2014. Four eggs and two chicks in the post guard stage were recorded, indicating one pair had started breeding as early as May, while the other two pairs had started in July.

Salton *et. al* (2014) have found that in years when a pair of little penguins were heavier than average in winter, they are more likely to start breeding earlier in that year. In the case of Middle Island, the previous breeding season saw a decline in the number of breeding pairs and subsequently, a decline in the number of chicks fledged, potentially due to a displacement of prey species caused by high sea surface temperatures (Kivisalu, 2014). It is likely that a return to regular conditions after the 2013/2014 breeding season has provided an increase in food availability, allowing mature adults to regain condition and re-commence breeding.

A thorough active nest check was completed on 12 November, slightly later than past years due to inclement weather and volunteer availability. All artificial nest boxes were checked, numbered and selected for regular inspections (40 in total). A number of natural burrows on the upper vegetated surface and southern surface of the island outside the routinely monitored area were also checked but no active burrows were found.

Key measures of breeding success are:

- **Hatching success:** number of chicks hatched / eggs laid
- **Fledging success:** number of chicks fledged / chicks hatched
- **Egg success:** number of chicks fledged / eggs laid
- **Fledging rate:** Number of chicks fledged / breeding pairs (range = 0 to 6 including multiple clutches)

Six breeding pairs were recorded over seven surveys, with 12 eggs laid. All of the eggs hatched (hatching success = 100%) and all of the chicks fledged (fledging success = 100%), resulting in a fledging rate of two chicks per breeding pair and an egg success of 100%.

In comparison with other breeding seasons, only three chicks fledged in 2013/2014, while 13 chicks fledged in the 2006/07 breeding season, when the Maremma dogs were first introduced to Middle Island (Table 1). This is an indication of breeding population recovery after the severe decline in the 2013/14 season.

It should be noted that only artificial burrows were regularly checked on the upper vegetated surface, as the natural burrows on the upper vegetated surface were considered to pose a high risk of burrow collapse. Opportunistic observations during dusk arrival counts reported a number of post guard chicks on the upper vegetated surface, indicating a larger number of breeding pairs than was recorded. This is also supported by the peak population estimate of 130, suggesting that a greater proportion of breeding pairs may have been present on Middle Island at this time.

Table 1: Statistics of the Little Penguin breeding surveys conducted on Middle Island for the 1999/2000, 2006/2007, 2009/2010, 2010/11, 2011/12, 2013/14 and 2014/15 breeding season (source 1999/2000: Overeem & Wallis, 2003; source 2006-2015: WCLG, unpublished data)

| Breeding Parameters | 1999/2000 | 2006/2007 | 2009/2010 | 2011/12 | 2012/13 | 2013/14 | 2014/15 |
|--|-------------|-------------|-------------|-------------|-------------------|-----------------|-------------|
| Breeding pairs | 57 | 6 | 17 | 16 | 10 | 2 | 6 |
| Eggs laid | 126 | 15 | 30 | 37 | 16 | 4 | 12 |
| Eggs hatched | 95 | 13 | 22 | 27 | 12 | 3 | 12 |
| Chicks failed | 7 | 0 | 5 | 6 | 1 | 0 | 0 |
| Chicks tagged | | 6 | 17 | | 5 | 3 | 0 |
| Chicks fledged | 88 | 13 | 17 | 21 | 11 | 3 | 12 |
| Clutches laid | | | | | 10 | 2 | 6 |
| <hr/> | | | | | | | |
| Egg/pair | 2.2 | 2.16 | 1.76 | 2.31 | 1.6 | 2 | 2 |
| Eggs hatched/pair | 1.67 | 2.17 | 1.29 | 1.29 | 1.2 | 1.5 | 2 |
| Eggs hatched/egg laid | 0.85 | 0.87 | 0.73 | 0.73 | 0.75 | 0.75 | 1.00 |
| Chicks tagged/pair | | | 1 | | 0.5 | 1.5 | 0 |
| Chicks fledged/egg laid | 0.7 | 0.87 | 0.57 | 0.57 | 0.68 | 0.75 | 1 |
| chicks fledged/egg hatched | 0.93 | 1 | 0.77 | 0.78 | 0.92 | 1 | 1 |
| Chicks fledged/pair | 1.49 | 2.17 | 1 | 1.31 | 1.1 | 1.5 | 2 |
| <hr/> | | | | | | | |
| Mean weight -chicks at tagging | 1081 | | 1075 | | 1120 | | |
| standard error (s.e.) | 50.9 | | 51.84 | | 53 | | |
| standard deviation (s.d) | 114 | | 115.9 | | 106 | | |
| <hr/> | | | | | | | |
| Mean date of first clutch | (November) | | | | 29th September | 1st December | July |
| Decimal mean date | 11 | | | | 9.98 | 12.01 | 7.8 |
| number of burrows checked (<i>n</i>) | 50 | | 41 | | 55 | 26 | 40 |

2.3. Additional Observations

Vandalism and unauthorised access is an ongoing issue. Public access to Middle Island has been prohibited since 2006, although there have been reports of people crossing to the island and walking through the nesting area (Figure 4). Trampling of natural burrows is of particular concern during the breeding season, as this is the time when they are most likely to be occupied by eggs and young chicks. The local community are active in calling authorities when unauthorised access is observed. Fortunately no vandalism of artificial nest boxes was observed during the 2014/2015 breeding season.

THE STANDARD

News

Trespassers crush penguin burrows on Warrnambool's Middle Island

By EVERARD HIMMELREICH Jan. 5, 2015, 4 a.m.

PEOPLE making unauthorised visits to Warrnambool's Middle Island are causing headaches for authorities trying to protect penguin chicks.



Visitors have been warned to keep off Middle Island. Picture: AARON SAWALL

Figure 4: Article from *The Standard* reporting on unauthorised access to Middle Island in January 2015.

2.4. Community Engagement and Media Coverage

Volunteers are essential to the Middle Island Little Penguin monitoring program and this season the project has received approximately 250 hours of in-kind support from volunteers. Fifteen new subscribers signed on to the email distribution list and project updates were posted and shared via the Nature Glenelg Trust website and blog.

The volunteer committee of Warrnambool Coastcare Landcare Group manages the Little Penguin monitoring project. This includes seeking and managing funding, participating on the Middle Island Project Working Group, promoting the opportunity for the community to participate in the monitoring counts, marketing the project and keeping project partners informed of project progress and issues.

Three film crews also visited Middle Island over the breeding season with one of these filming five short documentaries for National Geographic and another for a three part series of documentaries for a French and German TV Channel. Channel 9's "Today Show" also filmed a segment on Middle Island with volunteers.

3. Recommendations

This season an opportunistic breeding survey was conducted in August with the use of a motorised boat to gain access to Middle Island and recorded two post guard chicks and 4 eggs. It would be advantageous for breeding surveys to be conducted throughout winter, with the use of a boat, to monitor early starts to the breeding season.

Regular and thorough burrow checks should be conducted throughout the breeding season. Due to restricted access to natural burrows on the upper vegetated surface of Middle Island resulting in incomplete breeding surveys, it is recommended that alternative survey methods be investigated. It was observed on the ABC documentary "Life on the Reef" that researchers and volunteers from Queensland Parks and Wildlife service use snow shoes to walk around North West Island in the Capricorn and Bunker Group of islands while conducting surveys on Wedge-tailed Shearwaters and Black Noddies. This method could be used on Middle Island to gain access to areas prone to burrow collapse. Burrow scopes are an additional potential method that may reduce disturbance when conducting regular burrow checks after the identification of breeding adults.

During the breeding season it was observed that some artificial burrows on Middle Island have been damaged by either vandalism or through weathering. These artificial burrows should be replaced. It is also recommended that the artificial burrows in good condition should be fitted with a second roof to aid in sun and heat protection during summer. This would mean attaching another roof over the existing one, but still enabling the roof to be hinged for easy access.

4. REFERENCES

- Dann, P. (1992). Distribution, population trends and factors influencing the population size of Little Penguins *Eudyptula minor* on Phillip Island, Victoria. *Emu*. **91**(5):263-272.
- Kivisalu, L. (2014). Middle Island Little Penguin Monitoring Program 2013-2014 Season Summary Report. Report to Warrnambool Coastcare Landcare Group. Warrnambool, Victoria.
- Overeem, R. L. & Wallis, R. L. (2003). Little Penguin *Eudyptula minor* at Middle Island Western Victoria: Current Status. *The Victorian Naturalist*. **123**(3):76-83.
- Overeem, R. L. & Wallis, R. L. (2007). Decline in numbers of Little Penguin *Eudyptula minor* at Middle Island Western Victoria. *The Victorian Naturalist*. **120**(3):76-83.
- Robinson, N. (2014) *Life on the Reef* [DVD]. Eye Spy Productions Pty Ltd, Australia.
- Salton, M., Saraux, C., Dunn, P. and Chiaradia A. (2014). Carry-over body mass effect from winter to breeding in a resident seabird, the little penguin. *Royal Society Open Science*. Accessed online: <https://rsos.royalsocietypublishing.org> on 7 April, 2015.