Phillip Island
NATURE
PARKS

PHILLIP ISLAND (*MILAWUL*) NESTING SHOREBIRD BREEDING REPORT 2023/24

We acknowledge the Traditional Custodians of the land on which we live, work and learn, the Bunurong people. We pay our respects to their Elders past and present.

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All photos taken by Phillip Island Nature Parks staff

Introduction

Phillip Island Nature Parks nesting shorebird program aims to monitor breeding sites for shorebirds who nest on Phillip Island (Milawul) and improve breeding success through management practices and research. Hooded plovers (*Thinornis cucullatus cucullatus*) are the focus of this report as one of the priority species listed in the Department of Climate Change, Energy, the Environment and Water (DCCEEW) 2022, Threatened Species Strategy Action Plan 2022–2032. They are categorised as 'Threatened' under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 and 'Vulnerable' under the Victorian Flora and Fauna Guarantee Act 1988 Threatened List. Since active management of the hooded plover population on Phillip Island (*Milawul*) began in 1998 the population increased from around 20 individuals to a stable plateau of 40-47 between 2012 and 2021 and has since declined to 33 in the past two November Coastal Bird Surveys.

Hooded plovers are monitored year-round through four Coastal Bird Surveys while active management with a higher allocation of staffing and resources occurs over the breeding season between August and April. Active management includes the installation of wildlife refuges, nest cameras, egg floating, banding of chicks, and beach patrols. Complimenting the active management is the habitat management which is done throughout the year, this involves pest plant and animal control, revegetation and dune stabilisation. This report focuses on the active management and research aspects of shorebird management.

Disturbance by potential threats often result in hooded plovers leaving the nest and is thought to lead to lower breeding success on beaches used extensively for recreation (Weston 2000). Phillips Island (Milawul) is a high tourism area and therefore shorebirds are exposed to additional disturbances as people visit beaches, especially around school holidays, weekends and public holidays. Temporary site protection in the form of roped off wildlife refuges are installed around nests to inform visitors of their presence and ensure the camouflaged nests are protected from accidental trampling.

All the other species of shorebirds included in this report are monitored through the four Coastal Bird Surveys at a minimum. Pied oystercatchers (*Haematopus longirostris*), sooty oystercatchers (*Haematopus fuliginosus*) and red-capped plovers (*Charadrius ruficapillus*) are all listed as 'least concern' on the International Union for Conservation of Nature Red List of Threatened Species (IUCN Red List) and monitored via the MyBeachBird portal but to a lesser extent due to limited resources and their tendency to nest on more isolated beaches. Fairy terns (*Sternula nereis*) are listed as 'critically endangered' under the Victorian Flora and Fauna Guarantee Act 1988 Threatened List and are closely monitored and managed for when and if they breed on Phillip Island (Milawul). Far eastern curlews (*Numenius madagascariensis*) are listed as 'critically endangered' under the Victorian Flora and Fauna Guarantee Act 1988 Threatened List and are one of the priority species listed in the DCCEEW 2022, Threatened Species Strategy Action Plan 2022–2032. While they don't nest on Phillip Island (Milawul) they are a migratory shorebird which winters here from around August to March.

Summary

Hooded plovers

- A total of 10 hooded plover chicks fledged this season from 12 breeding pairs. This is amongst the highest fledged per pair rates in Victoria, however fewer birds participated in breeding compared with recent trends.
    - The number of nests (21), eggs (51) and chicks (21) are below the previous 10 years average of nests (36), eggs (83) and chicks (31).
    - There was a good percentage of eggs hatched (41%), and a higher-than-average number of chicks surviving to fledge (48%) resulting in a successful fledged per pair rate of 0.83.
- Egg failures were due to unknown causes (37%), severe weather or high tides (30%) and being addled, or unviable (10%). The high number of unknown causes of egg failure is the focus of the camera trap study.
- Camera traps captured 1 instances of nest failure and 17 instances of disturbance by potential threats while hooded plovers were incubating.
    - Tidal inundation at Flynns Reef
- The four Coastal Bird Surveys have recorded lower than the average hooded plover numbers over the past 10 years with questions arising as to whether this is due to natural population variance or local population decline.
    - The November 2023 count recorded a total of 33 compared to the average of 42 seen over the last 10 years
    - BirdLife Australia's biennial count 2022 noted an overall increase in the hooded plover population in Victoria.

Other shorebirds

- Pied oystercatchers, sooty oystercatchers and red-capped plovers were monitored less actively than hooded plovers using the MyBeachBird portal, with active monitoring occurring and wildlife refuges installed for two pairs of red-capped plovers who nested on busy beaches.
- Fairy terns attempted to nest at Observation Point, but those nests were washed away by high tides.
- Two far eastern curlew were sighted at Observation point during the February Coastal Bird Survey.

Figure 1: Hooded plover incubating eggs at Anchorage Road

Methods

Hooded plovers are monitored according to the 'BirdLife Australia's guidelines for monitoring nesting success of Hooded Plovers' (2017) with staffing and resources increasing over the peak of the breeding season which starts around September and ends around April. Volunteers also contribute to monitoring through the Hooded Plover Watch using the MyBeachBird portal. The MyBeachBird portal also acts as a communication tool between everyone monitoring these birds increasing efficiencies in time management and collaboration. Through the breeding season staff and volunteers are given weekly email updates on nest and chick locations which informs both monitoring efforts and beach patrols.

Four Coastal Bird Surveys are conducted by staff and volunteers around the same time each year (February, April, July and November) where all beaches on Phillip Island (*Milawul*) are surveyed and observations of all bird species are recorded. The February survey is when the hooded plover breeding season is well underway and all the migratory shorebirds should be settled into their nonbreeding sites. The April survey captures the end of the hooded plover breeding season as well as the end of the migration as many migratory shorebirds prepare to leave Australia. The July survey provides data on winter flocking behaviour of hooded plovers as well as overwintering migratory shorebirds. The November survey is used to give us the most accurate number of hooded plovers on Phillip Island (Milawul) as that is when most birds should be on territory.

Site protection, also known as refuges, are made of temporary rope fences, signage and sometimes chick shelters. They are used to protect hooded plover nesting sites in accordance with BirdLife Australia's 'Important reminders about Hooded Plover site protection' 2021, See Figure 2 for an example from Surf Beach. When nests are located on Bass Coast Shire Council (BCSC) managed land, Nature Parks staff and volunteers will monitor the birds while the BCSC Natural Resources Manager will implement site protection. Figure 3 shows which beaches are managed by Nature Parks and by BCSC. Site protection is also considered on a case by case basis for red-capped plovers, sooty oystercatchers and pied oystercatchers depending on the location and potential threats to the nest.

Figure 2: Photo of a refuge at Surf Beach demonstrates signage in the foreground and temporary rope fencing in the background

Nest cameras are installed, and eggs are floated according to the 'Protocols for use of motion-sensing infra-red cameras at Hooded Plover, Pied Oystercatcher and Red-capped Plover nests' (BirdLife Australia 2020). Cameras are installed on up to five nests each season to investigate the cause of nest failures. When the age of eggs cannot be accurately determined, eggs are floated to provide an age estimate,

allowing for more efficient management (i.e. readying refuges and chick shelters in preparation for chicks hatching). Flotation of eggs is a common method for estimating embryo development. Knowing when chicks will hatch allows for timely management, such as extending refuges, chick shelters, and increased monitoring and patrols. All of which is critical when chicks are at their youngest and most vulnerable.

Chicks are banded with a metal band on their tarsus (lower leg) engraved with a unique number as part of the Australian Bird and Bat Banding Scheme (ABBBS), as well as a leg flag engraved with a combination of two letters and/or numbers on their tibia (upper leg). These provide each bird with unique identification and the engraved leg flags enable these birds to be identified from a distance. Being able to identify individual birds provides insight on hooded plover movements, ages, changes in breeding pairs etc. The Nature Parks are the only organisation to use yellow engraved leg flags on hooded plovers which allows us to easily note how many birds leave and stay on Phillip Island (Milawul). Other flag colours on hooded plovers in Victoria are orange, white and more recently green.

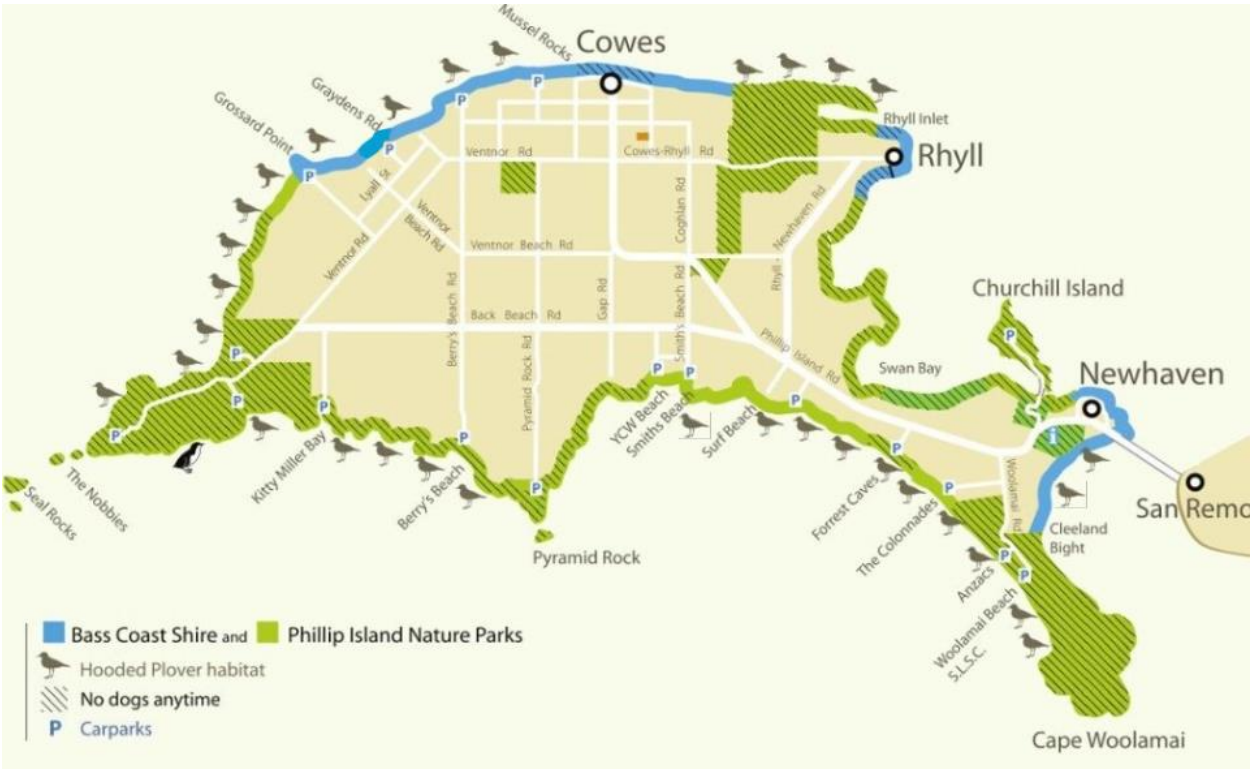

Figure 3: Map of Phillip Island (Milawul) showing which beaches are managed by Phillip Island Nature Parks and by Bass Coast Shire Council as well as which ones are hooded plover habitat.

Hooded plover breeding season 2023/24 results

Table 1: Breeding metrics from this season, last season, the previous 10-year averages and historic averages.

	Historic average (1992/93-2023/24)	10-year average (2013/14-2022/23)	2022/23	2023/24
Number of breeding pairs	17*	18	14	12
Number of nests	30	36	31	21
Number of eggs	69	83	70	51
Number of chicks	20	31	21	21
Number of fledglings	8	11	8	10
Fledged per pair	0.54*	0.63	0.57	0.83
Egg to chick survivorship	29%	37%	30%	41%
Chicks to fledge survivorship	40%	38%	38%	48%
Egg to fledge survivorship	11%	14%	11%	20%

*Number of breeding pairs recorded from 2002/03 onwards

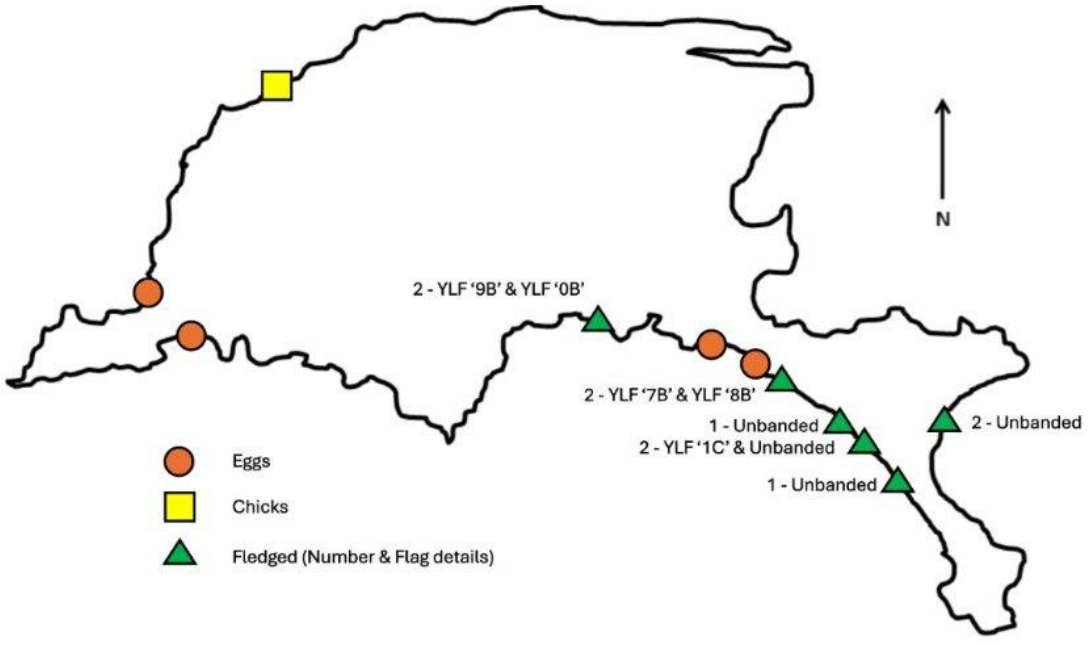

Figure 4: Summary map of hooded plover nesting sites (n=11) distributed on Phillip Island (Milawul) during the 2023/24 breeding season, the best breeding outcome at each site (eggs, chicks, or fledged) and the flag/band status of each chick fledged. YLF: yellow leg flag

Nesting Success

The 2023/24 hooded plover breeding season resulted in 10 fledglings from 12 pairs. 21 nests were distributed across 11 breeding sites, six of which successfully produced fledglings (Figure 4). One of the hooded plovers, an unbanded bird at Anchorage Road, changed partner in the middle of the season which is why there are only 11 sites for 12 pairs.

This season also saw nesting along Cleeland Bight for the first time in five years (unpublished data), the pair went on to make two more nesting attempting after raising two fledglings. A detailed summary of each nests outcome can be found in Appendix A.

Hatching Success

This season's egg to chick survivorship was 41% which is similar to the average over the previous 10 years of 37%. A total of 30 eggs failed to hatch, 38% (n=11) of these were due to unknown causes, 31% (n=9) to severe weather or high tides, 10% (n=3) eggs were addled (non viable) and another 10% (n=3) were suspected to be predated on by ravens (Figure 6). Eggs were determined to be addled and not abandoned if the adults incubated them to within a week of their expected hatch date. Two eggs at Cleeland Road were moved by a well-meaning member of public who noticed the eggs were at imminent risk of being inundated by the tide and placed higher up the beach next to some vegetation. The hooded plover pair didn't continue incubation in this new location.

Figure 5: Hooded plover nest at Colonnades West

Fledging Success

The 2023/24 breeding season produced 10 hooded plover fledglings from 21 chicks over six nests (Appendix A). The egg to fledge survivorship was 20% which is higher than 14% from the previous 10 years, and the chick to fledge survivorship was 48% compared to 38% for over that 10-year period (Table 1).

Despite regular monitoring of chicks nine (82%) of the 11 failed chicks had an unknown cause (Figure 6). Two of the chicks failed to thrive which was evidenced by their small size and weight during banding at 4 weeks of age (Appendix B) and then not being seen after the age of 5 weeks where they were still not developed enough to fly.

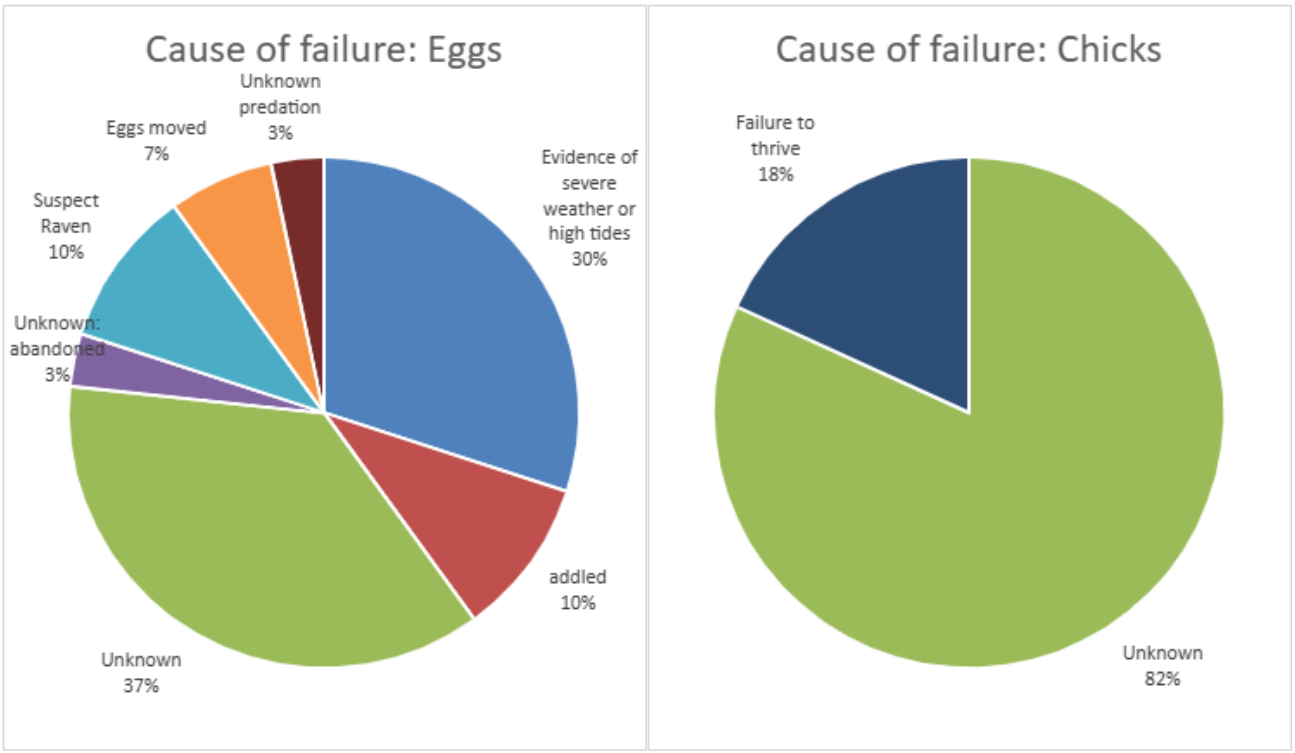

Figure 6: Causes of hooded plover egg and chick failures during the 2023/24 breeding season. Note: the eggs moved were by a member of public who though they were at imminent risk at being taken by the high tide and the hooded plover pair didn't continue incubation

Breeding Success

Breeding success, defined as the average number of fledglings produced per breeding pair, was 0.83 this season, the second highest on record after0.94 in 2015/16, and higher than the historical average of 0.53. BirdLife Australia's benchmark (0.5 fledglings per pair) for fledgling production to evaluate success and maintain population numbers over time has been reached again this season and continues to trend upwards overall. (Figure 7).

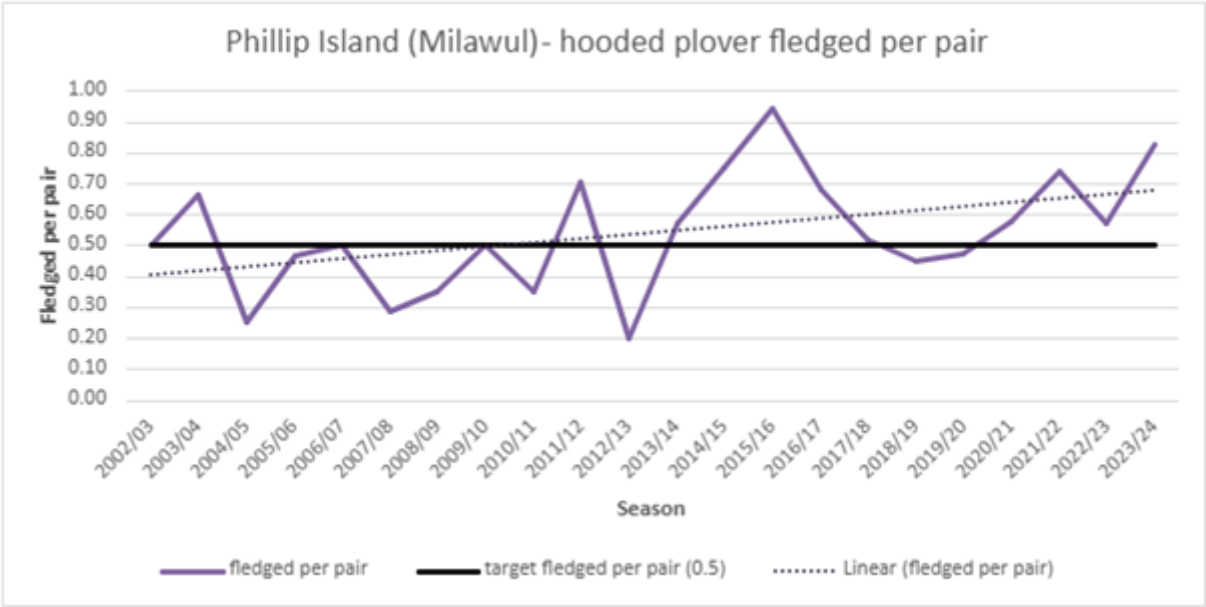

Figure 7: The fledged per pair for each breeding season since 2002/03 with a linear trendline against the target fledged per pair rate of 0.5 suggested by Birdlife Australia.

Banding and Flagging

This season seven chicks banded, given a unique leg flag, had morphometric features measured, and had feather samples taken for sexing. Of this seven two did not survive to fledge due to failure to thrive. See Appendix B for a summary of banding details.

A total of 36 banded adults were recorded during the Coastal Bird Surveys and via the MyBeachBird portal over the season, 22 (61%) of those were originally flagged and banded on Phillip Island, with five (14%) banded in the 2022/23 season. Weston (2000) estimated that 55% of hooded plover fledglings survive for 9 months after their first flight which is their potential first age to breed. Of the eight chicks flagged and fledged in 2022/23, seven, or 88%, have been recorded in the 2023/24 breeding season around Victoria at over 9 months of age, exceeding published survival estimates (Appendix C).

Population count

The November 2023 Coastal Bird Survey recorded 33 hooded plovers (excluding chicks) for the second consecutive year which is also the lowest in over 10 years (Figure 9). In July 2023 Birdlife Australia published a report on the 2022 Biennial Hooded Plover Population Count which recorded more hooded plovers in Victoria than the 2020 count (761 compared to 710). These results highlight that there are multiple regions experiencing an increase or decrease in hooded plover numbers, resulting in an overall increase.

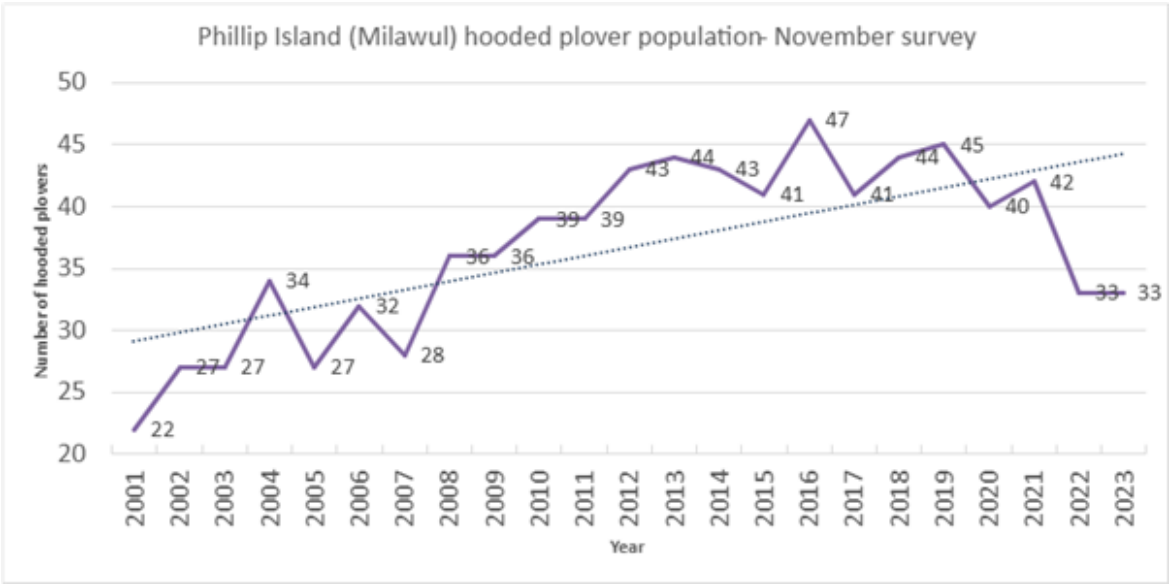

Figure 8: The number of hooded plovers (excluding chicks) counted during Novembers Coastal Bird Survey from 2001-2023 with trendline showing overall increase in the population over time.

Volunteer Activities

Volunteers collect important data throughout the breeding season each year by monitoring hooded plover pairs, habitat and threats and putting that data into the BirdLife Australias MyBeachBird portal, as well as contributing to the Coastal Bird Surveys. The MyBeachBird portal data is visible to all users and works as a communication tool that helps direct staff from both the Nature Parks and Bass Coast Shire Council in where to install refuges and what beaches need monitoring. Volunteers put in a massive 320 hours over the course of the 2023/24 season (Table 2) and made up 42% of all MyBeachBird portal entries on Phillip Island (Milawul) (Figure 9).

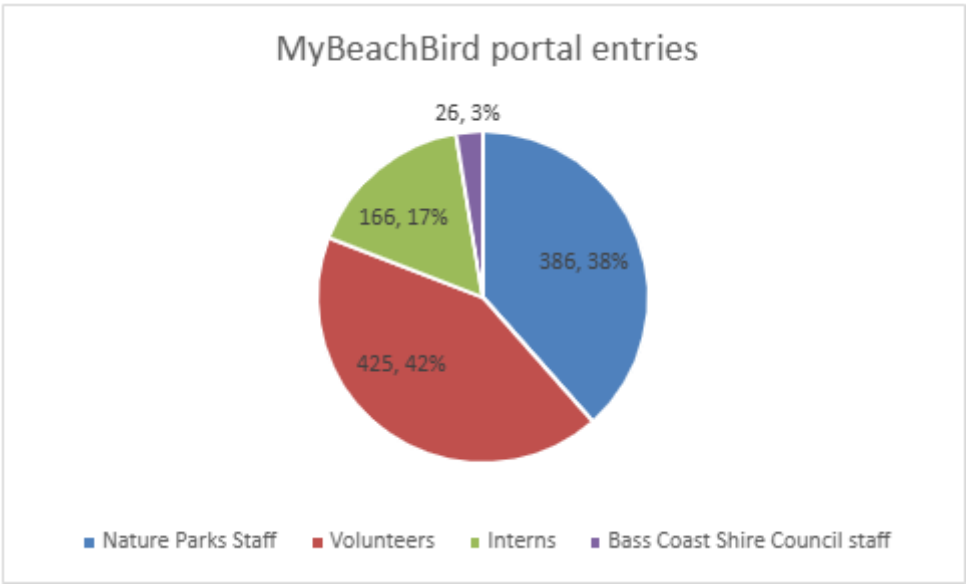

Figure 9: Number of MyBeachBird portal entries by contributors

Table 2: Summary of hooded plover related volunteer activities hours for the 2020/21 - 2023/24 breeding seasons.

Activity	2020/21	2021/22	2022/23	2023/24
General Monitoring/Citizen Scientist hours	75.81	154.84	143.77	238.01
Coastal Bird Survey hours	6.5	45.20	61.83	82.46
Total Volunteer hours	**82.31**	**172.84**	**205.6**	**320.47**
Internship hours	205.25	228.90	301.6	357.92
Number of General Monitoring/Citizen Scientist Volunteers	3	10	11	9
Number of Coastal Bird Survey Volunteers	2	9	16	15

Internships and Camera trap study

Table 3: Summary of cameras places on hooded plover nests in the 2023/24 breeding season and the nests fate

Location	Hooded plover pair details	Nest Fate	Camera deployed date	Camera retrieved date
Colonnades West	YLF '31' and YLF '49'	1 fledged (UB)	28/11/2023	12/04/2024
Crazy birds	YLF '19' and YLF '86'	2 fledged (YLF '7B' & YLF '8B')	05/12/2023	27/06/2024
Summerland Beach	YLF '84' and YLF '93'	Nest failed – Evidence of high tides seen in person not in images	01/01/2024	10/01/2024
Flynns Reef	YLF '12' and UB	Nest failed – Evidence of high tides in images from camera	01/01/2024	26/02/2024
Cleeland Rd	WLF 'ZT' and UB	Nest failed as chicks – no evidence on camera	07/02/2024	30/04/2024

A camera trapping study commenced in the 2020/21 season, aiming to provide insight into the causes of hooded plover nest failures. In the 2023/24 season five cameras were deployed with the help of the Nature Parks interns, Lily Pagels and Luke Ward, over hooded plover nests around Phillip Island (Milawul). Additionally, Luke and Lily assisted in monitoring beaches and installing wildlife refuges for hooded plovers during their internships. Between the two of them they contributed a huge 357 hours to supporting the beach nesting bird program (Table 2).

Unfortunately, one of the five cameras faced technical difficulties and failed to take any photos. Between the other four cameras 21,373 images were collected over 154 days, with 14,891 of those images collected after the nests had failed of fledged. Many of these images did not contain useful information as vegetation or other natural movement triggered the camera, more careful placement next season will hopefully prevent this issue. The cameras confirmed the cause of failure of the Flynns reef nest, with a photo of the nest at 5:29am on 18/01/24 and another at 6:24am the same day with the nest gone, clearly confirming the cause as tidal inundation (Figure 10). The hooded plovers were in many images until 10:28am the day the nest failed appearing to 'search' for their nest.

Figure 10: Images from the Flynn's reef camera trap on 18/01/24 at 5:29am (left) and 6:24am (right). The sand in the right image has been smoothed out having been washed over by the tide with the eggs gone.

Cameras have captured some of the disturbances that hooded plovers face while nesting, notably including one dog who narrowly avoided trampling the eggs (Figure 11). Images of cats seen on one of the cameras prompted Bass Coast Shire Council to put cat traps in the area to reduce the risk to the hooded plovers.

Figure 11: Camera trap image of a dog almost trampling the two-egg nest circled in red at Cleeland rd.

Other Shorebirds

Pied oystercatchers, sooty oystercatchers and red-capped plovers had 17, 38 and 37 entries into the MyBeachBird portal respectively compared to the 911 hooded plover entries which highlights the difference in monitoring efforts. Nests and chicks were found for each of these species, but most pairs were not monitored regularly enough to get accurate nesting outcomes. Two pairs of red-capped plovers were actively monitored at Elizabeth Cove and Justice Road as those beaches see a lot of visitation. Site protection was installed by Bass Coast Shire Council over three nests which all failed to produce any fledglings. No site protection was installed for nesting oystercatchers as all nests found were in isolated areas with no consistent monitoring occurring.

Fairy terns

In collaboration with the Bunurong Land Council Aboriginal Corporation, we conducted bird surveys, implemented weed control measures, and created optimal breeding environments to contribute to the ongoing success of fairy terns on Milawul. Additionally, native revegetation efforts are underway, complemented using surveillance cameras to monitor the species and enhance our responsiveness to potential threats. During November 2023, up to 20 fairy terns were observed returning to the breeding site with observations of aerial displays, feeding and roosting behaviour. At least three pairs of fairy terns established nests, unfortunately these were destroyed by high tides in December 2023. The project has received funding from the Department of Energy, Environment and Climate Action (DEECA) Nature Fund, which will complement co-investment from Phillip Island Nature Parks, the Penguin Foundation and Melbourne Water. More information can be found on this project in the Threatened-Species-Report-2023.pdf.

Far eastern curlews

Two Far eastern curlews were seen at Observation point in the February 2024 Coastal Bird Survey, compared to 20 in 2023 after two years of no sightings. Figure 12 shows that the number of Far eastern curlews being recorded on Phillip Island (Milawul) is declining over time.

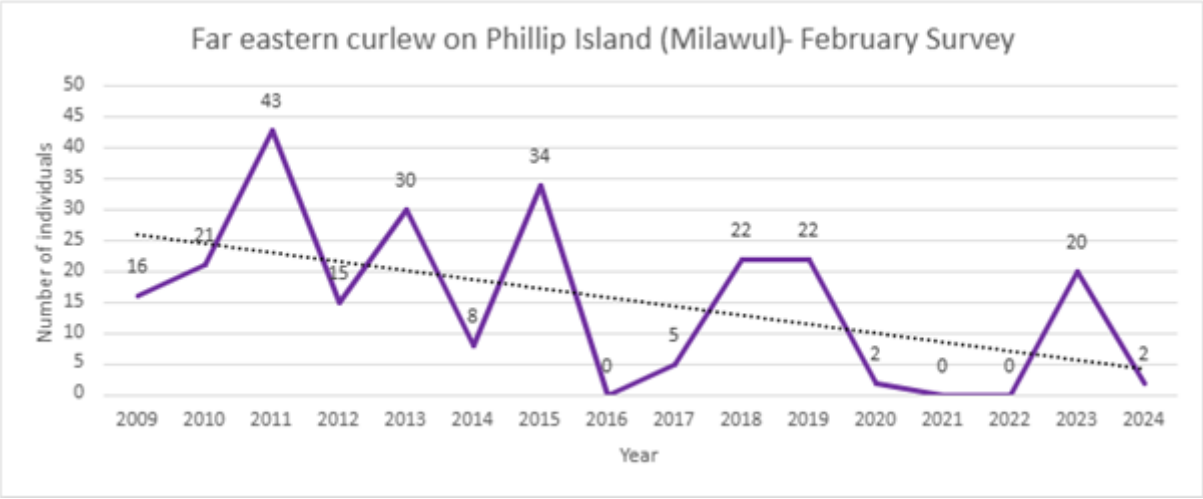

Figure 12: Far eastern curlews recorded during the February Coastal Bird Surveys since 2009 with a trendline showing a decrease over time

Discussion

Hooded plovers

The 2023/24 hooded plover breeding season again saw fewer breeding pairs nest on Phillip Island (Milawul) than in previous years, yet has still followed the desired trend heading towards what would be an ideal breeding season for hooded plovers on Phillip Island (Milawul): a high proportion of eggs laid surviving to fledge successfully (Table 1).

The lower number of breeding pairs (12 compared to the 2013/14-2022/23 average of 18 pairs) is explained by the lower population counts, but we can't yet know if the change away from the plateau in 2010-20 (Figure 8) is a trend to be concerned about or natural population fluctuations, as seen in Bass Coast due to localised mortality detected from flagged bird monitoring (BirdLife Australia's Biennial Hooded Plover Count 2020). Phillip Island (Milawul) supports a small percentage of the Victorian hooded plover population which has seen an overall increase over time in BirdLife Australia's Biennial Hooded Plover Count. Overall hooded plovers on Phillip Island (Milawul) recorded a successful breeding season by exceeding BirdLife Australia's target of 0.5 fledged per pair as the standardised way of measuring breeding success.

Cause of egg and chick failures continue to remain largely unknown with nest cameras helping provide evidence for some of the egg losses. Cameras are also proving useful in predator management as demonstrated by the quick response by Bass Coast Shire Council in attempting to trap the cats seen at the Cleeland rd. nest.

The number of volunteer hours has been steadily increasing each year since 2020/21 when many volunteer activities were suspended due to the Covid 19 pandemic. This season saw almost 100 more volunteer hours contribute to the Hooded Plover Watch through the General Monitoring/Citizen Scientist role despite having two less volunteers than last season, this is due to a handful of extremely dedicated volunteers who went above and beyond in their monitoring.

Other shorebirds

Oystercatchers and red-capped plovers continue to be monitored incidentally with nests receiving site protection if deemed necessary by Nature Parks and Bass Coast Shire Council staff. Observation Point remains critical habitat for many species which has been highlighted by the fairy tern breeding activity seen this season as well as the observations of far eastern curlews.

Figure 13: Red capped plover at Justice Road

Recommendations

Hooded plovers

- It is recommended that Nature Parks continue to monitor the hooded plover population of Phillip Island (Milawul) through the Coastal Bird Surveys to investigate whether the population is in decline or not.
- It is recommended site assessment is undertaken at all current and historic breeding sites to investigate habitat suitability (e.g. abundance of food source, pest plants, dune profile, presence of predators etc) to inform targeted management strategies.
- The BirdLife Australia's MyBeachBird portal remains a vital tool in the management of Phillip Island's (Milawul) hooded plover population. Threat related data are vital to the tailoring of management strategies implemented for Phillip Island's hooded plover population, so it is recommended that training days are organised by Nature Parks or Birdlife staff for staff and volunteers who use the Birdlife portal to reiterate the importance of collecting these data and what to record.
- Data from the nest camera trap study over the past four years demonstrated the efficacy and validity of remote camera traps at nesting sites to capture evidence of nest failure causes. This evidence supports proactive predator management, which has been noted as a useful management strategy in the past. It is recommended that this study continues along with opportunities for interns to participate
- Identifying the causes of hooded plover chick failure remains an important yet challenging task (Lees et al. 2019). Despite the difficulties in definitively determining chick failure causes, it should remain a high priority for staff and volunteers into the future to be extra attentive whilst chicks are around. Frequent checking of nest sites where chicks are active is imperative, and where it is suspected a chick has failed, extra attention to details/evidence/tracks should be exercised around the area and any/all data recorded in the Birdlife portal.

    - Additionally investigating the cause of chicks failing to thrive and being a smaller size could assist in better understanding the causes of failures and inform management practices.
- Volunteers and the community make important contributions through identifying nests and informing resource allocation. It is recommended that the volunteering program continues with consideration of recommencing Community events – Dogs breakfasts, Community open days, Summer by the Sea Volunteering program walk and talk, Clean Up Australia Day, etc.

Other Shorebirds

- It is unknown if or how the effects of climate change are impacting pied oystercatcher, sooty oystercatcher and red-capped plover nesting behaviours or recruitment on Phillip Island (Milawul). Furthermore, the current extent and status of their populations on the Island largely remains unknown as well. It is, therefore, recommended that active and continued monitoring of these species' nesting sites be continued for subsequent breeding seasons.
- Though fairy terns did not breed successfully on Phillip Island (Milawul) in 2023/24, ongoing monitoring of the 2019/20 breeding site is recommended. If the birds return next season, signage and covert monitoring should be implemented.
- Continued monitoring of far eastern curlews through the Coastal Bird Surveys is recommended alongside consideration of targeted management strategies.
- Observation point remains important habitat and management efforts should continue including pest plant and animal control.

Figure 14: Pied oystercatcher at Hutchinson Beach

Acknowledgements

We would like to firstly acknowledge and thank Phillip Island Nature Parks' volunteers for their dedication which contributed to the successful outcomes of the 2023/24 breeding season on Phillip Island (Milawul).

Lily Pagels and Luke Ward for conducting the nest camera trap study for this season as interns for the Nature Parks and for assisting with all facets of the hooded plover monitoring program.

David Martin (Bass Coast Shire Council) for his help in managing the hooded plovers nesting activities and supporting the camera trap study on Bass Coast Shire beaches

The Beach Nesting Bird team at BirdLife Australia for their support and for access to the MyBeachBird portal.

Bunurong Land Council Aboriginal Corporation for their contributions to the Coastal Bird Surveys and many hours of habitat restoration, thank you for your partnership as we work together on Bunurong country.

Phillip Island Nature Parks' staff for their contributions towards logistics, banding, research, marketing and communications and Coastal Bird Surveys as well as the Nature Parks Board of Management for their continuing support of threatened species conservation on Phillip Island (Milawul).

DEECA and the Penguin Foundation for funding the habitat restoration to create a safe haven for fairy terns at Observation Point.

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Appendices

Appendix A: *Hooded plover nesting site summary table*

Nest	Location	Find Date	Adult Bands	Clutch No.	Eggs	Chicks	Fledged	Chick Bands	Comment
1	Surf Beach (Park St)	17/09/2023	WLF 'CU' UB	1	2			failed	Found as 2 egg nest Bec Hayward 17/9/23. 1 egg 10/10/23 egg abandoned.
2	Crazy Birds	18/09/2023	YLF '19' YLF '86'	1	1			failed	Found as 1 egg nest BH 18/9/23. Egg may be left from tide washout as not in good scrape. Egg tide washed 21/09/23.
3	Anchorage Rd	19/09/2023	WLF 'EL' UB	1	3			failed	Found as 1 egg nest Dave Martin 19/09/23. 3 eggs 25/9/23. 19/10/23 egg found cracked open 8m in from of nest. WLF EL may be missing? Y1A and Y85 hanging around with unbanded. DM found predated egg 19/10/23 other 2 eggs left in nest.
4	Cleeland Rd (Broadwater Ave)	21/10/2023	WLF 'ZT' UB	1	3	3	2	UB UB	Alerted by local Melissa Drager of scrape. 1 egg 21/10/23. 2 eggs 24/10/23, 3 eggs 26/10/23, 3 chicks 23/11/23. Lily saw boy throwing ball in refuge, hoodies moved towards Cleeland Rd 27/11/23 Melissa only saw 2 chicks. Attempt to band chicks 27/12/23 but they had fledged early.
5	Surf Beach (Park St)	9/11/2023	WLF 'CU' UB	2	3			failed	No nest photos. Found as 3 egg nest 9/11/23. Birds last seen 11/11/23. Kay Nair 13/11/23 no birds. Lily Pagels 14/11/23 strong winds probably the cause however raven prints indicate possible predation.
6	Colonnades west	10/11/2023	YLF '31' YLF '49'	1	3	3	1	UB	Found as 3 egg nest 9/11/23, possibly worth a float. Camera 'C9' deployed 28/11/23 2:50pm 1-2m W of nest. 3 chicks 4/12/23. 2 chicks 13/12/23. 19/12/23 1 chick. Attempted to band chick 9/1/24 after very wet conditions but it was well fledged.
7	Crazy Birds	18/11/2023	YLF '19' YLF '86'	2	2	2	2	YLF '7B' YLF '8B'	Found as 2 egg nest BH 18/11/23. 2 chicks seen 19/12/23. Banded 19/01/24. 2-1 chicks between 23-30/1/24. Y7B seen 05/04/24 at Summerland Beach in flock of 13 and 20/4/24 then 12 days later at Point Impossible Estuary, West end of Breamlea 2/05/24.
8	Anchorage Rd	21/11/2023	YLF '85' UB	1	3			failed	Found as 3 egg nest 23/11/23. Suspect chicks 13/12 based on behaviour but chicks never seen, and would have been a week early, suspect no chicks actually hatched.
9	Colonnades	24/11/2023	YLF '03' UB	1	2			failed	Found as 2 egg nest 24/11/23. Unknown failure.

10	Smiths Beach far east	25/11/2023	WLF 'KB' UB	1	3			failed	Found as 3 egg nest 25/11/23. On 30/11/23 raven dropped into refuge almost on nest, didnt take egg.
11	Woolamai SLSC	12/12/2023	WLF 'JL' WLF 'RL'	1	3	1	1	UB	Possibly laid ~5/12/23. 1 chick seen 30/12/23 not sure if 2nd egg hatched? 1 addled egg in nest 4/1/24.
12	Smiths Beach far east	20/12/2023	WLF 'KB' UB	2	3	3	2	YLF '9B' YLF '0B'	Found as 3 egg nest 20/12/23. 3 chicks sighted 13/01/24. 2 chicks seen 14/01/24. Banded 2 chicks 8/2/24, confirmed to fledge by Harriet on 20/02/2024.
13	Anchorage Rd	28/12/2023	YLF '85' UB	2	3	3		failed	Found as 3 egg nest 28/12/2023. 3 chicks seen by Kay Schroer and Meg Anderson 20/1/24. Chicks last sighted 23/1/24.
14	Forrest Caves centre	29/12/2023	OLF 'BR' WLF 'TS'	1	1			failed	Found as 1 egg 29/12/2023.
15	Summerland Beach centre	1/01/2024	YLF '84' YLF '93'	1	2			failed	Found as 1 egg nest 1/1/24, 2 eggs 2/1/24, then 1 egg 4/1/24 and camera set up, failed 7/1/24 due to tide inundation, 10/01/24 camera collected.
16	Flynns Reef	4/01/2024	YLF '12' UB	1	2			failed	Found as 2 egg nest 4/1/24. Washed out by tide 18/01/24. Camera set up 04/01/24.
17	Cleeland Rd	18/01/2024	WLF 'ZT' UB	2	2			failed	Found as 2 egg nest 18/01/24. Eggs moved from upper beach 6m into dune by MOP as they determined the huge tide was going to take the nest. It appears that the adults couldn't find the nest so abandoned.
18	Colonnades	21/01/2024	YLF '03' UB	2	3	2	2	YLF '1C' UB	Found as 3 egg nest 21/01/24. Wing refuge set up 22/01/24. 2 chicks 29/01/24. Unsure if 3rd egg hatched. On banding day 1/3/24 both chicks flew over water with small flock, caught one chick on second attempt.
19	Cleeland Road	4/02/2024	WLF 'ZT' UB	3	2	2	0	YLF '2C' failed	Found as 2 egg nest BH 4/02/24. Refuge set up with camera and floated 2 eggs 7/2/24. Near miss with high tide on the 14/02/24. Cat caught on remote camera (RC) two nights 12&17/2/24. 2 chicks on RC 27/02/24, only 1 chick 1/03/24. Banded YLF 2C on 26/3/24 but it was much smaller than expected for four weeks (34g) so expect a late fledge. Not fledged at 6 weeks and disappeared
20	Flynns Centre	7/02/2024	YLF '12' UB	2	3			failed	Found as 3 egg nest 07/02/24 and present 08/02/24. Nest failed by14/02/24 suspect tide.
21	Anchorage Rd	16/02/2024	YLF '85' UB	3	2	2	0	YLF '3C' failed	Found as 2 egg nest Meagan T 16/02/24. 2 chicks 14/3/24. 1 chick by 18/03/24. Banded 11/04/24. Dave Martin saw chick 22/04/24 but didn't see wing stretching. Viv suspect chick failed by 26/04/24

Appendix B: *Summary of hooded plover chick band and flag details 2023/24*

Date banded	Nesting site	Band no.	Band location	Leg flag details	Flag location	Bird status	Weight (g)	Notes
19/01/2024	Crazy Birds	052-78606	Left tarsus	Yellow 7B	Left tibia	Chick	62	
19/01/2024	Crazy Birds	052-78607	Left tarsus	Yellow 8B	Left tibia	Chick	59	Suspect failed soon after fledged
08/02/2024	Smiths Beach far east	052-78608	Left tarsus	Yellow 9B	Left tibia	Chick	42	
08/02/2024	Smiths Beach far east	052-78609	Left tarsus	Yellow 0B	Left tibia	Chick	45	
01/03/2024	Colonnades	052-78610	Left tarsus	Yellow 1C	Left tibia	Chick	72	Sibling UB as it flew off

26/03/2024	Cleeland Rd	052-78611	Left tarsus	Yellow 2C	Left tibia	Chick	34	Small for age, Failed to fledge
11/04/2024	Anchorage Rd	052-78612	Left tarsus	Yellow 3C	Left tibia	Chick	34	Small for age, Failed to fledge

Appendix C: *Band details of birds recorded in MyBeachBird portal and in Coastal Bird Survey in the 2023/24 season on Phillip Island* (Milawul) *as well as fledglings from 2022/23 who have been sighted elsewhere. Incomplete data for hooded plovers banded elsewhere*

Date banded	Band number	Colour combination	Location banded	Age at banding	Sex	2022/23 fledglings sighted at 9 months of age (yes/no)	Notes
13/02/2013	05248057	03 Left (Yellow)	Silverleaves	Juvenile	Unknown		
16/02/2023	05268700	0A Left (Yellow)	Colonnades West	Juvenile	Male	Yes	
5/01/2015	05268605	12 Left (Yellow)	Anchorage Rd	Juvenile	Female		
29/07/2015	05268612	19 Left (Yellow)	Surf Beach	Adult	Male		
02/02/2022	05268691	1A Left (Yellow)	Ventnor, Devon Av	Juvenile	Male		
04/03/2022	05268692	1B Left (Yellow)	Kitty Miller Bay	Juvenile	Unknown		
16/02/2023	05278601	2B Left (yellow)	Summerland Beach	Juvenile	Male	Yes	
23/01/2017	05268623	31 Left (Yellow)	Surf Beach	Juvenile	Male		
24/02/2017	05268631	39 Left (Yellow)	Elizabeth Cove	Juvenile	Male		
24/01/2018	05268641	49 Left (Yellow)	Woolshed Bight	Juvenile	Female		

02/03/2023	05278603	4B Left (Yellow)	Crazy Birds	Juvenile	Male	Yes
22/02/2019	05268658	66 Left (Yellow)	Surf Beach	Juvenile	Male	
06/01/2023	05268697	6A Left (Yellow)	Anchorage Rd	Juvenile	Male	Yes
27/10/2020	05268670	78 Left (Yellow)	Anchorage Rd	Juvenile	Female	
08/12/2020	05268676	84 Left (Yellow)	Ventnor, Devon Av	Juvenile	Male	
29/12/2020	05268677	85 Left (Yellow)	Cape Woolamai	Juvenile	Female	
14/01/2021	05268678	86 Left (Yellow)	Crazy Birds	Adult	Female	
06/01/2023	05268698	8A Left (Yellow)	Anchorage rd	Juvenile	Male	Yes
18/01/2022	05268685	93 Left (Yellow)	Anchorage Rd	Juvenile	Female	
02/02/2022	05268688	97 Left (Yellow)	Smiths Beach	Juvenile	Unknown	
02/02/2022	05268690	99 Left (Yellow)	Ventnor, Devon Av	Juvenile	Male	
4/04/2014	05306135	BR Right (Orange)	Boags Rocks	Juvenile	Male	
20/03/2017	05280592	CU Right (White)	Cape Patterson	Juvenile	Male	

18/02/2011	05248036	Gm/YR (m/_ _)	Crazy Birds	Juvenile	Unknown	Coloured bands missing, now metal only (confirmed through photo of the band)
05/03/2020	05287991	EL Right (White)	Rye Big Rock	Juvenile	Unknown	
		EU Left (White)				
13/02/2019	05287997	JL Right (White)	Gunnamatta Fingal Track	Juvenile	Female	
12/02/2020	05306194	KB Left (White)	Williamsons Beach west	Juvenile	Unknown	
		KU Left (White)				
		KX Left (White)			Unknown	
26/07/2010	05245490	PX Right (Orange)	Forrest Caves	Sub Adult	Unknown	
7/02/2018	05306191	RL Left (White)	Twin Reefs	Juvenile	Male	
		TS Left (White)				
		WE Right (White)				
8/01/2016	05280577	YU Right (Orange)	Sandy Waterhole	Juvenile	Male	

31/01/2023		ZT Left (White)	San Remo	Adult	Male		
02/03/2023	05278602	3B Left (Yellow)	Summerland Beach Centre	Juvenile	Female	Yes	Sighted in Bass Coast
18/04/2023	05278604	5B Left (Yellow)	Surf Beach	Juvenile	Female	Yes	Sighted in Bass Coast