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A RESOURCE KIT FOR LAND MANAGERS

August 2025

Protecting beach-nesting birds in the southwest of Western Australia

Yalgorup National Park – Busselton Region



Photo credit: Natalie Bell

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natural resource
management program



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Purpose of this resource kit

Beach-nesting birds, such as the Western Hooded Plover (*Thinornis cucullatus tregellasi*), breed during spring and summer when coastal areas typically experience their highest levels of human recreational activity from holidaymakers and beach users. These unique birds lay their highly camouflaged eggs in shallow scrapes directly on beaches or salt lake margins. If their nests survive, they raise their vulnerable chicks on the shore for five weeks, before the chicks are old enough to fly. Therefore, these birds face a multitude of different threats, some of which are natural to their ecology, but the bulk of threats are now human-related.

Beach-nesting birds suffer poor breeding success and consequently, their populations experience declines. For the Hooded Plover (Eastern subspecies *Thinornis cucullatus*), these declines have been severe enough to trigger listing as 'Vulnerable' under national legislation (The Environment Protection and Biodiversity Conservation Act 1999) as well as various status of threatened, vulnerable or critically endangered in their range states. The Department of Biodiversity, Conservation and Attractions (DBCA) has assigned them Priority 4 status in WA - a classification system designed for species warranting conservation attention but not meeting the criteria for formal threatened status under the Biodiversity Conservation Act 2016. Despite this classification, the 2020 Action Plan for Australian Birds recommends endangered listing for the Western subspecies.

Since 2006, BirdLife Australia's Beach-nesting Birds Program has been working toward improving the breeding success and population trajectory of Hooded Plovers and other beach-nesting birds by mitigating threats to breeding birds through on-ground management and beach user education. Other threatened beach-nesting shorebirds that occur in the southwest of WA are the Red-capped Plover (*Charadrius ruficapillus*), Australian Pied Oystercatcher (*Haematopus longirostris*), and Australian Sooty Oystercatcher (*Haematopus fuliginosus*).

Land managers, including local councils and the DBCA, exercise stewardship over habitat that support key breeding sites for beach-nesting birds. Land managers therefore have a pivotal role to play in the conservation of these threatened beach-nesting birds. This resource kit serves as a comprehensive reference for land managers, environmental organisations, volunteers and other stakeholders outlining evidence-based strategies to protect Hooded Plovers and other beach-nesting shorebirds from key threats and highlighting management scenarios where species conservation requirements must be integrated into decision-making.

Quick reference guide to key issues

This quick reference guide to key issues enables the reader to get a short overview of the main issues relevant to beach-nesting bird management, the impacts those issues can have (both negatives and opportunities if relevant), ways to mitigate negative impacts of those issues, and a page reference for more detailed information further within the document.

Issue	Negatives for beach-nesting birds	Opportunities for beach-nesting birds	Key considerations for management	Quick reference page numbers
Recreational beach use	<p>Eggs and chicks can get crushed.</p> <p>Disturbance of incubating birds can lead to exposure of the eggs to lethal temperatures and predators.</p> <p>Disturbance of chicks can lead to starvation and increased predation risk.</p> <p>Not following best practice can lead to nest failure or increased predation risk.</p>	<p>Signage and fencing of vulnerable breeding sites increase breeding success by mitigating crushing and beach user disturbance.</p> <p>Well-formed response plan means rapid and appropriate protections are put in place.</p> <p>Education and raising awareness can increase compliance and influence behaviour change in beach users.</p>	<p>Follow best practice protocols to implement nest protection.</p> <p>Prioritise breeding sites that are most at risk of impact.</p> <p>Seek expert help if unsure.</p> <p>Rapid implementation needed.</p> <p>Education and awareness-raising activities to coincide with on-ground management.</p> <p>Adapt management post hatching.</p>	<p>16 - 22 and Appendix 1 Breeding site protection response plan 48</p>
Dogs on beaches	<p>Off leash dogs can crush eggs, kill chicks, and disturb incubating birds and chicks leading to failure.</p> <p>If dog regulations are changed with poor public consultation, there can be poor uptake.</p>	<p>If dogs are leashed and compliance is high, this can eliminate most major impacts and promote coexistence.</p> <p>Targeted enforcement controls can improve compliance.</p>	<p>Identify breeding sites that are most at risk.</p> <p>Explore alternative locations for off-leash areas.</p> <p>Consistent, integrated approach and messaging across the region.</p>	<p>23 - 25</p>

Issue	Negatives for beach-nesting birds	Opportunities for beach-nesting birds	Key considerations for management	Quick reference page numbers
	Compliance is low with many regulations.	<p>Dogs breakfast events can relay information in a positive way.</p> <p>Alternative off leash access areas can reduce dog visitation to beaches with breeding sites.</p>	<p>Regular reviews of compliance and adapt where compliance is low.</p> <p>Enforcement; targeted within active nest or chick period to maximise use of limited resources.</p> <p>Consistent education messaging.</p>	
Vehicles on beaches	<p>Direct strike of adults, crushing of nests and chicks.</p> <p>Sand compaction which depletes their invertebrate (food) resources.</p> <p>Severe sediment disruption and erosion leading to habitat loss.</p> <p>Destruction of dune vegetation.</p>	<p>Driving slowly, below high-tide mark, and only at low tide, can minimise risk of crushing eggs and chicks.</p> <p>Harm to birds can be minimised if best practice protocols are followed.</p>	<p>Beaches with key breeding sites are reviewed for potential changes to vehicle access (including seasonal restrictions or vehicle-free zones).</p> <p>Access only via designated tracks.</p> <p>Drivers exercise extreme caution.</p> <p>Only drive at water's edge and at low speeds.</p> <p>No night driving and in poor weather.</p> <p>Education and raising awareness are a critical component of any proposed changes or on-ground actions.</p>	26
Events on or adjacent to beaches	<p>Some event types are incompatible with breeding birds.</p> <p>Large crowds can lead to lethal disturbance for eggs and chicks.</p> <p>Crushing of the eggs or chicks during event set up or the event itself.</p>	<p>Event can be held with less harm to birds if best practice event protocols are followed.</p> <p>Can be used as an education and awareness-raising opportunity.</p>	<p>Explore alternative locations to hold event.</p> <p>Hold event in non-breeding months.</p> <p>Avoid sites with chicks – communication with an experienced site monitor is critical.</p> <p>Adhere to buffer zones for nests.</p>	27 - 30

Issue	Negatives for beach-nesting birds	Opportunities for beach-nesting birds	Key considerations for management	Quick reference page numbers
	<p>Increasing predators at the site if the event leaves behind litter.</p> <p>Large crowds can crush dune vegetation and compact beach.</p>		<p>Event staff are made aware of and need to follow best practice event protocols.</p> <p>Vehicles to adhere to best practice vehicle access protocols.</p>	
Predators	<p>Predators prey on adults, chicks, and eggs.</p> <p>Can lead to loss of breeding pairs and declines in numbers.</p> <p>Can lead to abandonment of breeding sites due to constant failure.</p>	<p>Predator control can improve breeding success.</p> <p>Where predators have been controlled, birds re-establish breeding territories.</p>	<p>Targeted control at key breeding sites.</p> <p>Multiple types of control are engaged.</p> <p>Timing of control programs is important.</p> <p>Engage public in reporting predators.</p> <p>Responsible pet ownership to tackle cat predation.</p> <p>Education campaigns.</p>	31
Weeds	<p>Limits nesting habitat availability.</p> <p>Outcompetes native grasses which the birds use for protective cover.</p> <p>Alters the beach profile, creating cliffing of foredunes leading to loss of habitat.</p> <p>Cliffing can intensify coastal erosion</p>	<p>Weed control can improve and restore nesting habitat availability.</p> <p>Where weeds have been controlled, birds re-establish breeding territories.</p> <p>Weed control can create resilience to rising sea levels and allow for dune retreat.</p>	<p>Map distribution of major weeds.</p> <p>Targeted control at key breeding sites where weeds limit habitat availability or resilience.</p> <p>Timing of control programs to avoid breeding season.</p> <p>Monitoring for follow-up control.</p>	32 - 33

Issue	Negatives for beach-nesting birds	Opportunities for beach-nesting birds	Key considerations for management	Quick reference page numbers
Coastal residential development	<p>In the wrong location, can distribute beach users to bird habitats having significant, broadscale impacts.</p> <p>Can lead to direct loss of habitat.</p> <p>Can lead to loss of habitat resilience.</p> <p>Can lead to introduction of predators.</p>	<p>In the right location, can distribute beach users to alternative locations away from key breeding sites.</p> <p>Residential developments could have pet caveats.</p>	<p>Proximity to key breeding sites to be considered.</p> <p>Size of development.</p> <p>Formalising beach access to reduce creation of informal tracks.</p> <p>Alternative dog off-leash areas.</p> <p>Responsible pet ownership.</p> <p>Education campaigns.</p>	<p>33 - 34</p>
Coastal armouring	<p>Degradation and loss of available habitat.</p> <p>Can impact food availability.</p> <p>Loss of vegetation which the birds use for protective cover.</p> <p>Can lead to loss of habitat resilience.</p>	<p>Alternative options may be less impactful to key breeding sites.</p>	<p>Explore long-term alternatives.</p> <p>Proximity to key breeding sites.</p> <p>Expert advice/modelling changes to landscape/habitat.</p> <p>Timing of on-ground works to avoid breeding season.</p> <p>Follow best practice vehicle access protocols.</p>	<p>34 - 35</p>
Sand carting and extraction	<p>Direct loss of available habitat.</p> <p>Increase risk of tidal inundation of nests.</p> <p>Can impact food availability.</p> <p>Can lead to loss of breeding territories.</p> <p>Egg and chick loss due to works.</p>	<p>Dredge spoil can be used to create or enhance nesting habitat.</p>	<p>Proximity to key breeding sites.</p> <p>Alternative locations.</p> <p>Expert advice/modelling changes to landscape/habitat.</p> <p>Timing of on-ground works to avoid breeding season.</p>	<p>35 - 36</p>

Issue	Negatives for beach-nesting birds	Opportunities for beach-nesting birds	Key considerations for management	Quick reference page numbers
			<p>Follow best practice vehicle access protocols.</p> <p>Consider using dredge spoil to improve habitat.</p>	
Dune stabilisation works	<p>Reduces habitat suitability.</p> <p>Restricts birds' access to the dunes.</p> <p>Loss of nesting habitat in the dunes.</p> <p>Increases chick vulnerability to predators.</p>	<p>Can restore dune habitat with regeneration of native plants.</p>	<p>Proximity to key breeding sites.</p> <p>Alternative locations.</p> <p>Timing of on-ground works to avoid breeding season.</p> <p>Gaps in sand drift fencing created for birds.</p> <p>Appropriate plant selection for revegetation including low lying natives for upper beach/foredune areas.</p>	<p>36 - 37</p>
Beach clean-ups	<p>Eggs/chicks can get crushed by participants.</p> <p>Incubating birds and chicks can be disturbed by participants.</p>	<p>Removing a key threat (litter/marine debris).</p> <p>Reductions in predator (gull, raven, magpie) numbers.</p> <p>Increase nesting habitat availability.</p>	<p>Proximity to key breeding sites.</p> <p>Alternative locations.</p> <p>Timing of clean-ups to avoid breeding season.</p> <p>Educate all participants.</p>	<p>37 - 38</p>
Beach Wrack Removal	<p>Direct loss of available habitat</p> <p>Eggs/chicks can get crushed by the works, especially with machinery on the beach.</p>	<p>Alternative options may be less impactful to key breeding sites.</p>	<p>Proximity to key breeding sites.</p> <p>Timing of on-ground works to avoid breeding season.</p> <p>Educate all participants.</p>	<p>37 - 38</p>

Issue	Negatives for beach-nesting birds	Opportunities for beach-nesting birds	Key considerations for management	Quick reference page numbers
	<p>Incubating birds and chicks can be disturbed by the works.</p> <p>Removal/reduction of the birds food source and habitat.</p>		<p>Follow best practice vehicle access protocols.</p>	
Communications	<p>Can lead to breeding failure if antagonistic behaviour is induced through improper communication.</p> <p>Can lead to misunderstandings if proper facts are not used in communications.</p>	<p>Raise the profile of beach-nesting birds and their plight.</p> <p>Raise awareness among the general public.</p> <p>Influence behaviour change for positive outcomes.</p> <p>Improve breeding success.</p>	<p>Target the user group/audience.</p> <p>Participate in existing/organised events to take advantage of a cross section of community.</p> <p>Organise events on long weekends or during school holidays.</p> <p>Media releases leading up to holidays and key stages of the breeding season.</p>	<p>40 - 47</p>

Beach-nesting Shorebird Overview

Beach-nesting birds in the southwest of Western Australia

Four species of resident beach-nesting shorebirds breed in the southwest of WA:

Common name	Latin name
Western Hooded Plover	<i>Thinornis cucullatus tregellasi</i>
Red-capped Plover	<i>Charadrius ruficapillus</i>
Australian Pied Oystercatcher	<i>Haematopus longirostris</i>
Sooty Oystercatcher	<i>Haematopus fuliginosus</i>



Hooded Plover (Photo credit: Glenn Ehmke)



Red-capped Plover (Photo credit: Tegan Knowles)



Sooty Oystercatcher (Photo credit: Dan Lees)



Pied Oystercatcher (Photo credit: Andrew Silcocks)

Figure 1: The four species of beach-nesting shorebirds that occur within the southwest of Western Australia.

All the above species nest in exposed beach habitats, have camouflaged eggs and chicks, and face similar threats. Their breeding seasons fall within spring and summer which coincides with the

time when beaches are most used by people leading to human-wildlife conflict. The most sensitive species out of all is the Hooded Plover and it has been heavily studied and used as a flagship for beach-nesting bird conservation. Hence, most of the information in this guide is specific to Hooded Plovers, but it is applicable to the other species owing to their similarities.

Western Hooded Plover *Thinornis cucullatus tregellasi*

Hooded Plovers are endemic to southern Australia, with Western Australian populations genetically distinct from their eastern counterparts, constituting a separate subspecies. Western Hooded Plovers exhibit notable ecological differences from Eastern Hooded Plovers, particularly their utilisation of both coastal beach habitats and inland saline lake systems for breeding. The salt lake environments within Yalgorup National Park serve as significant nesting habitat for regional populations. While they will flock in groups in the non-breeding, winter months, they typically occur as highly territorial pairs, where each pair will occupy their own stretch of beach (approximately 1km, varying in size).

Red-capped Plover *Charadrius ruficapillus*

Red-capped Plovers are the smallest resident shorebird that nest on beaches in Australia. The male birds have a bright red head whereas the female looks duller with a pale orangish head. Like Hooded Plovers, they breed from late winter through to summer (late July to March) and typically lay two eggs. They not only nest on beaches but also on the shorelines of inland waterbodies. Between the Yalgorup National Park and Busselton, Red-capped Plovers are found along beaches, within estuaries and inland salt lakes. Breeding Red-capped Plovers have been recorded on beaches along the coast including Busselton, Leschenault estuary and within the salt lakes of the Yalgorup National Park.

Australian Pied Oystercatcher *Haematopus longirostris*

Pied Oystercatchers are black and white birds with a striking red bill, eye-rings, and legs. In southern Australia, they breed during spring and summer (September to January) and typically lay two eggs. They nest only on beaches and can be found foraging on sandy ocean beaches, tidal mudflats, sandbanks and estuaries. Pied Oystercatchers have been recorded at many sites between the Yalgorup National Park and Busselton.

Sooty Oystercatcher *Haematopus fuliginosus*

Similar to Pied Oystercatchers, Sooty Oystercatchers have a striking red bill, eye-rings, and legs but they have an all-black body. In southern Australia, they breed during spring and summer (September to January) and typically lay two eggs. They usually forage on rocky shelves/platforms and on adjacent sandy beaches but prefer to nest on isolated rocky headlands and offshore islands away from human habitation.

Hooded Plover Breeding Ecology

Hooded Plovers, along with other beach-nesting bird species, breed during spring and summer (August to March), which coincides with the time when most people visit the beach. They make simple nest-scrapes in the sand and typically lay three eggs. Adult birds can nest anywhere above the high-tide mark, including the mid to upper beach with seagrass deposits, and on bare to sparsely vegetated dune habitats and on the margins of salt lakes. Their well-camouflaged eggs are extremely difficult to spot and take 28 days to hatch. Once chicks hatch, they cannot fly for five weeks and need to forage on the beach and intertidal rock platforms to survive. The parents do not feed the chicks but accompany them closely, warning them in to hiding if threats approach.

People, unleashed dogs, horses and vehicles on beaches not only pose a direct threat of crushing, but they also disturb incubating and brooding adults that will temporarily leave the nest and chicks to maximise camouflage and wait for the threat to depart the area. As a result, eggs and chicks are exposed to harsh temperatures, and to predators such as ravens, magpies, foxes, and gulls. This is particularly true of disturbances caused by unleashed dogs, where adults can spend long periods away from the nest and chicks.

While the birds can re-nest multiple times in a given season, even up to seven times, the likelihood of the eggs or chicks surviving is so low in the absence of conservation efforts, that pairs can have zero breeding success in their lifetime. Even birds occupying beaches that might be considered remote, are still within human reach, especially in the light of off-road vehicle access, coastal development and weed and pest animal spread.

Beach-nesting Bird Program Overview

BirdLife Australia's National Beach-nesting Bird Program

In 2006, BirdLife Australia embarked on a project to promote coexistence between recreationists and beach-nesting birds, focusing mainly on the threatened Hooded Plover. Key to conservation success has been the coordinated and consistent approach to monitoring, threat mitigation responses, stakeholder engagement and public education messaging over this time.

BirdLife Australia coordinates the recovery of beach-nesting birds and its stakeholders. The aims of this collaborative recovery approach are to:

1. Improve breeding success and population resilience of beach-nesting birds. This is via:
 - On-ground threat mitigation at priority sites across the species range.
 - Research to overcome key knowledge gaps to advance our success in recovery. This includes evaluation, improvement, and adaptation of best practice actions for conservation.
 - Education to shape sustainable beach use behaviours.
2. Protect and restore critical habitat so that the current (and recent historical) distribution is maintained and protected, and
3. Develop tools, resources, capacity, and supportive policy to ensure long-term sustainability and consistent delivery of recovery actions.

WA Beach-nesting Bird Program

While BirdLife Australia's Beach-nesting Bird Program formally expanded to include southwest Western Australia in 2023, this region has maintained a substantial commitment to beach-nesting bird conservation for nearly three decades. Active conservation and monitoring of beach-nesting bird habitat has been undertaken by various volunteer bird groups affiliated with BirdLife Australia and the Department of Biodiversity Conservation and Attractions (DBCA). Initial surveys commenced as early as 1994, supported by periodic stakeholder consultations, culminating in the release of a collaborative *Hooded Plover Ten Year Management Plan for Western Australia* in 2002.

The Peel-Yalgorup System within Yalgorup National Park has been subject to long-term monitoring efforts. The Peel Harvey Catchment Council currently coordinates monitoring programs, including Annual Shorebird Counts and ongoing Hooded Plover population assessments, building on extensive volunteer-conducted research. A targeted banding program from 2002-2004 provided insights into how these birds interact with the wetland environment.

In 2012, BirdLife Australia's Dr Grainne Maguire facilitated a series of Hooded Plover Workshops, introducing Western Australia to the online portal system for systematic BNB sighting documentation. Since 2016 DBCA South-west Region, in partnership with the national BNB Team using the regional model that began in Victoria, has coordinated volunteers to monitor beaches and nesting efforts of these species, particularly within the Margaret River region. BNB program reach and volunteer recruitment has steadily expanded over the subsequent decade, with notable acceleration in recent years following the establishment of a dedicated BirdLife Australia Beach-nesting Bird staff position in Western Australia.

Key Online Resources

There are four main online locations where you can source further information about beach-nesting shorebirds. These are:

Online resource	Link	Material found here
BirdLife Australia Website	www.birdlife.org.au/beach	BNB Program videos General information Volunteering information
Beach-nesting Birds Hub	https://beachvol.birdlife.org.au/	Signing up for our biannual e-newsletter Registering to become a volunteer or land manager connected to the program Access to training materials and inductions, research papers and reports, and educational resources Identifying key points of contact
MyBeachBird Portal	https://portal.mybeachbird.com.au/	Entering breeding data for all beach-nesting bird species Viewing breeding data for all beach-nesting bird species Viewing your own surveys and others' surveys Management Alerts are sent from the system to the 'site protectors' to inform them of sites in need of an immediate protection response
Birdata	https://birdata.birdlife.org.au/	Entering general beach survey and biennial count data (within Record Survey, select 'Beach-nesting Birds') Viewing your own surveys and summary data

Key Findings: Yalgorup National Park – Busselton Region

Species Distribution

Birddata is a BirdLife Australia citizen science tool that enables people across the country to collect scientific data that help to understand and protect Australia's birds. The below regional map in Figure 2 highlights the locations where beach-nesting shorebirds have been sighted over a 5-year period between 2020 and 2025.

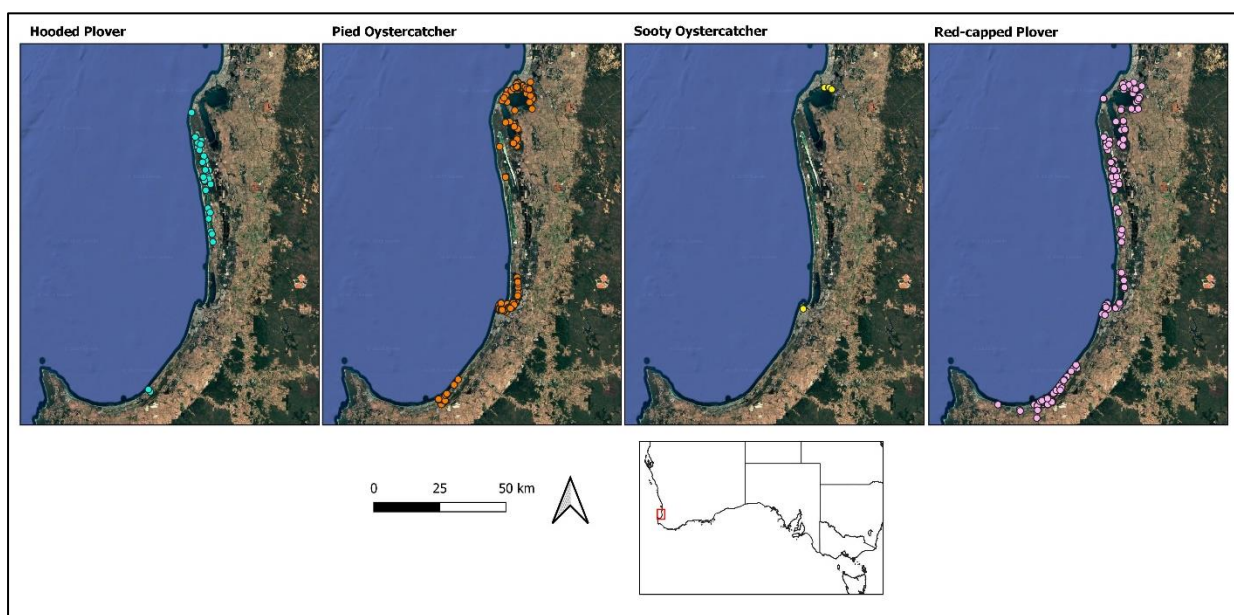


Figure 2: Beach-nesting shorebird distribution from 2020-2025 as recorded on Birddata.

Figure 2 indicates that Hooded Plovers (blue dots) exhibit the most restricted distribution, with populations concentrated in the salt lakes within the Yalgorup National Park in the northern section of the region. Red-capped Plovers (marked in the pink dots) demonstrates the most extensive distribution, with sightings recorded along virtually the entire region. The region also supports populations of both Pied Oystercatcher and Sooty Oystercatcher.

This distribution data is valuable for understanding habitat preferences, identifying critical areas for protection, and informing management strategies for these beach-nesting species. It is important to note that the lack of bird records in certain areas does not necessarily indicate the absence of these species but may simply reflect insufficient survey coverage in those locations.

Population Trends

Annual Shorebird Counts of the Peel-Yalgorup System have been coordinated by the Peel Harvey Catchment Council (PHCC) since 2008 and prior to that locally in the Yalgorup Lakes region by dedicated volunteers. Many thanks to Jennie Beeson from the PHCC and the committed volunteers who have collected this data including Bill Russell, Tony France, Colin Prickett, Mark Kennedy, Dick Rule, and Bill Smart. Survey periods were conducted in late December through to 2019, with timing subsequently modified to late January/early February from 2020. Critical Western Hooded Plover habitat is provided by the salt lake systems within Yalgorup National Park, including the Yalgorup Lakes and Lake Preston. The comprehensive 24-year dataset presented in Figure 3 demonstrates severe local population decline, with recent counts declining to less than 25% of the maximum abundance recorded during the early 2000s.

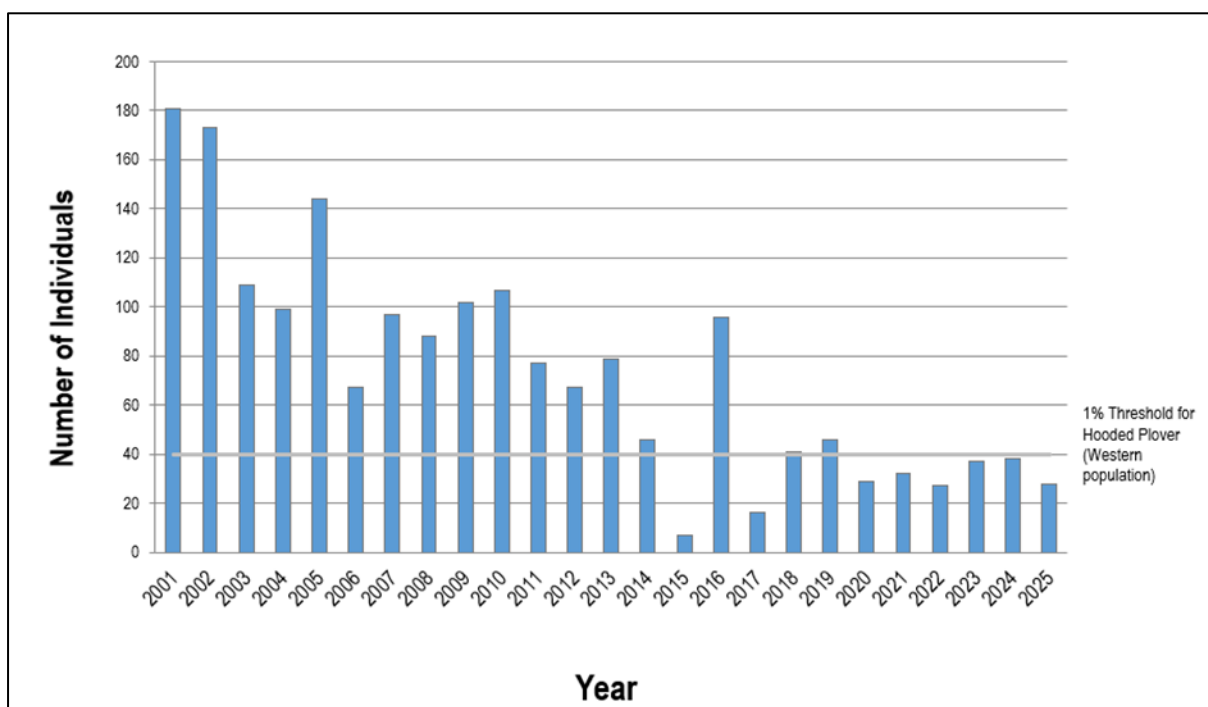


Figure 3: Annual Summer Hooded Plover Count data from the Yalgorup National Park (Collated and provided by the Peel Harvey Catchment Council).

The 1% threshold for species abundance is one of the criteria used under the Ramsar Convention on Wetlands to identify wetlands of international importance for waterbird conservation. Rather than focusing solely on habitat characteristics, this criterion emphasises the importance of a site to the survival of specific species or subspecies. Recent Peel-Yalgorup counts of Hooded Plovers consistently fall below this critical threshold of about 40 individuals, highlighting the species' vulnerability and the need for comprehensive monitoring and management of Hooded Plovers at these sites.

Threats and Management

Comprehensive reviews of threats (including references) and more detailed information about management options for each threat can be found in “A practical guide for managing beach-nesting birds in Australia” (hereafter referred to as the BNB Management Manual). The BNB Management Manual is available to download from the ‘Land managers, professionals and on-ground protection’ section of the BNB Hub:

<https://beachvol.birdlife.org.au/login/index.php?pathway=4>.

Below are the most critical management prescriptions set out for land managers along the southwest of Western Australia.

Recreational beach use

Recreational beach use can have one of the greatest impacts on beach-nesting bird breeding success, due to the impacts of:

- Egg and chick crushing.
- Disturbance of incubating birds leading to exposure of the eggs to lethal temperatures and to predators.
- Disturbance of chicks leading to increased energy expenditure (running to and from cover), starvation and exposure to extreme temperatures, and increased exposure to predators.

It has been shown that when breeding sites on beaches used by people (and their dogs/horses/vehicles) are signed and fenced, beach-nesting bird breeding success is greatly improved– to the equivalent of pairs which breed on remote beaches with very little exposure to human-based threats. The chances of egg and chick crushing are reduced, and people have a visual buffer that they can adhere to, thus reducing disturbance impacts.

Appendix 1 outlines the current breeding site protection response plan to be followed when there are reports of vulnerable beach-nesting bird nests or chicks in the southwest of WA. This provides a chain of response and the steps that should be followed.

For staff implementing the on-ground management, basic steps for installing signage and fencing around vulnerable beach-nesting bird breeding sites are found below. Note we adapt the protective set up around nesting sites once the eggs have hatched, as chicks are then highly mobile and thus the 'fencing' does not encompass the full area they will use – they will roam around and feed below the high-tide mark.

If you are looking for advice on, or templates for, beach-nesting bird signage contact BirdLife Australia's BNB Team at beachnestingbirds@birdlife.org.au.

Protection of the breeding site during the egg phase

Materials needed

- Minimum of 8-10 star pickets/stakes (plastic caps needed if using metal pickets). Plastic stakes such as [these](#) are recommended as they are relatively light-weight and easy to put into sand. It is a good idea to choose bright coloured stakes for sites where vehicles are permitted.
- 50-60 m of colourful nylon rope (4-6 mm diameter).
- Mallet or flat rock for hammering in pickets/stakes.
- 2-4 signs affixed on pickets/stakes (2 at either end and option of 2 facing water along front).
 - Laminated signs – Need to be affixed to plyboard backing (need tacks or staple gun, plus wood glue to affix sign to board; nails/cable ties to affix board to stake/picket).
 - Corflute signs - Need cable ties to affix sign to stake/picket. Corflute signs last longer than laminated ones in most conditions.
- Tape or cable ties to fasten rope to pickets/stakes and to strengthen at ends.
- Knife/scissors to cut rope.
- Binoculars.

Instructions for installation

- The fence needs to be big enough to keep the nest's location secret – leave at least 10-15 m either side of nest.
- Signs need to be at least 10 m out from edge of fences (so people approaching to read signs do not disturb incubating bird). Erect signs as low on beach as the high tide allows.

- Avoid extreme weather (heat, cold, rain, strong wind) – unless nest has been found in heat and fence needs to urgently go up – then work very quickly or put it up in sections allowing for time in between for the bird to incubate.
- Do not spend more than 35-40 minutes putting it up - and this is in good, mild conditions.
- The trick to fencing quickly is to lay your stakes out first – spacing them out and making sure you have enough to cover area. Then hammer them in solidly, they should roughly be 1.4 m high. Then start from one end and unravel and tie/fix rope to each stake as you go (make sure your rope is not in a knot prior to getting to site, or have it on a reel for ease of unravelling).
- If very hot (between 27 to 32°C) but fence must go up because at immediate risk, then spend 10 minutes maximum installing the fence. If hotter than 32°C, put up multiple signs quickly and come back in better conditions for fence. If very windy, assess how quickly eggs are getting buried. Abandon fencing if this is beginning to happen and just put signs up. Come back in better conditions.
- Look around for predators before putting up fence, if ravens or gulls are close by, wait till they go or carefully redirect and disperse them from the area first and make sure they are gone before you approach nesting spot. Make sure there are no off-leash dogs approaching area.
- Make sure you never lose sight of eggs as you go about putting fence up.
- Once fence is complete, walk away along water's edge so birds see you leaving. Once about 60-80 m away, see if birds are going back on nest. If they still are reluctant to return, place yourself at about 100 m and bob down and watch through binoculars. Make sure they come back to nest! If not, you might have to walk well away (1 km), wait for 30 minutes, walk back and if still not back on, fence needs to come down and just leave signs up. [This should not happen if you have used the right materials and the fence is big enough!]



Figure 4: Examples of beach-nesting bird breeding signage: Red-capped Plover nesting signage (left) and Hooded Plover chick signage (right).



Figure 5: Hooded Plover signage and protective fencing installed at the beach.

Protection of the breeding site during the chick phase

After hatching, the signage and fencing need to be adapted as the chicks use a bigger area and do not stay in the nest or in the fenced area. Chicks will run about below the high-tide mark and on the beach to find food. The steps to follow in protecting a site with chicks are:

- If possible, arrange to meet a volunteer on site who knows where birds are and the area they use to help locate the family of birds.
- Before moving signs/fences, you must know where the chicks have hidden and be very careful not to walk into this area – keep an eye on them while you are there in case they move.

- You may need to move signs to encompass new foraging area – if this is a large area, you will need two signs at either end and extra signs along the beach, marking an area of upper beach.
- Switch from a standard nesting sign to a ‘chicks on the beach’ sign.
- If the birds are using a small area, you can consider fencing this off – as fences can be a great refuge for chicks to run within.
- If the chicks are using a bigger area of beach (i.e. greater than 100-150 m), then the fence might not be feasible. Consider fencing two ends of the area.
- A large canvas banner ‘chicks on the beach, dogs on a leash’ (see below) is very useful for wide beaches or sites with lots of visitors.
- If native cover is limited, place 3-4 A-frame ‘chick shelters’ along length of beach the birds are using; these need to be dug in 10-15 cm deep, sand evened out so there are no big crevices inside, and camouflaged on outside with sand (not seaweed – this could attract predators).
- When placing each shelter, do not travel along upper beach, move down to water’s edge each time.
- Shelters need to face water and are best on the upper beach, halfway between dune base and high-tide mark.
- It is useful if a chick update sign can be used at the access points with updates and key dates outlined in a permanent marker.



Figure 6: Large 'Chicks on the beach!' canvas banner (left), Hooded Plover chicks sheltering under 'chick shelters' (right).



Figure 7: Temporary rope ends demarking the area the chicks use with chick shelters placed within and signs at either end of the fenced area.



Figure 8: Temporary rope ends demarking the area the chicks use on a busy beach, with chick shelters placed within and signs at either end of the fenced area.

Regulating dog access

Off-leash dogs on beaches are considered one of the greatest threats to beach-nesting birds, due to:

- Depredation or capture/maiming of flightless chicks
- Depredation of eggs
- Crushing of nests
- Disturbance of incubating birds leading to exposure of the eggs to lethal temperatures and to predators
- Disturbance of chicks leading to increased energy expenditure (running to and from cover), starvation and exposure to extreme temperatures, and increased exposure to predators

Dog access is one of the more difficult areas of management for conserving beach-nesting birds due to the need for an integrated approach across multiple agencies, high levels of resources to implement and enforce regulations, and polarised views often present within local communities.

Changes to or introduction of dog regulations can be met with public outcry from local dog walkers, and it is important that consistent steps be taken when reviewing whether change is warranted and how to tackle this change. More damage can be done than good by implementing major changes to access with limited public consultation and where there has been no prior investment in education or improving compliance. If dog regulations are to be reviewed, breeding data and site-specific advice in relation to beach-nesting birds can be provided by BirdLife Australia's BNB team.

Steps to reviewing dog access and improving compliance

- 1) Overlaying current dog regulations, where they exist, against the distribution of breeding beach-nesting birds: are pairs sufficiently protected within their range? If breeding pairs are failing within off-leash areas or unregulated areas, there needs to be consideration of changing/introducing the current zoning to be at least seasonal (permitted during the non-breeding months, between April and July) on leash access.
- 2) Determining the availability of off-leash areas in the region of interest:
 - Are there adequate off-leash areas available across the region?
 - Can an alternative off-leash areas be created if needed? E.g. dog parks.
- 3) Identifying all the land managers and ensuring a consistent, integrated approach within a given region.
- 4) Investigating current levels of compliance with dog regulations where they exist: poor compliance will need to be addressed.
- 5) Seeking resources to carry out the below steps to improve compliance:
 - a) Education campaign: In order to bring about change there needs to be motivation for this change. This can be achieved by using the Hooded Plover as a flagship species (described in 'Communications and outreach' section on page 40) and educating dog walkers about the threats that off-leash dogs pose to these birds. There are multiple ways to tackle education:
 - Targeted brochures and website information.
 - Local maps that clearly define the different zones of dog access and provide interpretation about threatened wildlife.
 - Signage at beaches which provides information about the ways dogs impact the birds
 - Provision of dog leashes with conservation messaging (as an incentive to change).
 - Face to face education via ranger patrols (step one should not be to fine dog walkers, instead to explain why poor compliance is such an issue of concern), trained volunteers, and events such as Dog's Breakfasts (see 'Communications and outreach' section on page 40).
 - Newspaper articles to publicly debate and explain the issue.
 - b) Targeted enforcement: Without any perceived consequences, regulations can be viewed as unimportant and irrelevant to beach users, and thus ignored. Enforcement of regulations can have a flow-on effect, as other beach users may observe compliance with regulations and follow suit.

- Regular patrol and enforcement of regulations where a log of hours expended patrolling, rates of compliance and identity of offenders is maintained in order to implement a two-step approach to enforcement: step 1: education/warning, step 2: fine/penalty.
 - If resources are limited, it can be beneficial to dedicate specific periods within the breeding season to intensive patrol. This can be timed around when pairs are actively nesting or have chicks.
 - Patrols out of normal business hours as research into beach use has revealed a distinct dichotomy in beach use where locals tend to use the beach outside of work hours, either early morning or evening.
 - Documenting and publicising enforcement results will reinforce perceived consequences and assist with changing social norms.
- 6) If the above steps to improving compliance have not been effective over time (maximum 5 years), and the breeding success of the birds has not improved, then stricter restrictions to access need to be implemented, that is, either seasonal dog prohibition or year-round dog prohibition.

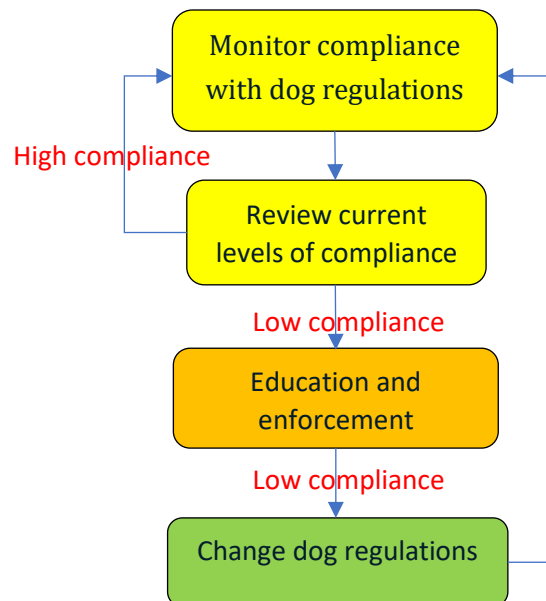


Figure 9: Flowchart showing the step-by-step guide approach toward reviewing dog access and improving compliance.

Full access to 'Review of Dog Impacts to Beach-nesting Birds and Management Solutions' can be downloaded here: <https://beachvol.birdlife.org.au/login/index.php?pathway=4>

Vehicle access

Vehicles pose a direct and major threat to beach-nesting birds via:

- Direct strike of adults, crushing of nests and chicks
- Compaction of the lower beach, which depletes their invertebrate (food) resources
- Severe sediment disruption and erosion leading to habitat loss
- Destruction of dune vegetation

Best practice protocols for beach access by vehicles

The following steps are recommended for mitigating the risks of driving on beaches. These were primarily established for off-road vehicle access by critical user groups, such as rangers, council staff, contractors, and researchers:

- Vehicle users should be made aware of the threats to beach-nesting birds and if possible, of the current nest/chick locations
- Drivers must exercise extreme caution when traversing the area
- Access to the site is via designated tracks and pathways only
- The beach is not accessed in the period one hour either side of high tides. Access should only occur at times of low or medium tide where there is enough room for the vehicle or machinery to move along the beach and keep below the high-tide mark. Consideration must be given to how many hours the vehicle will be out on the beach, leaving enough time to return along the beach before the tide has risen
- All machinery, vehicles and equipment are driven along the water's edge to minimise the likelihood of crushing flightless chicks and disturbing nesting birds and chicks
- All machinery, vehicles and equipment are driven at low speeds (~25 km/h)
- Drivers slow down further when passing signed nesting areas
- Night driving and driving in poor weather or low light conditions should be avoided where possible. In conditions of poor visibility, speeds must be further reduced, and extreme caution exercised

Other recreational activities

Horse riding, hang gliding, use of drones and other recreational activities on beaches can negatively impact beach-nesting birds during the breeding season. Please contact BirdLife Australia's Beach-nesting Birds team for more advice around these less widespread activities. Recommendations for managing horse riding can be found on page 152 of the BNB Management Manual: <https://beachvol.birdlife.org.au/login/index.php?pathway=4>.

Event management

Events on the beach or adjacent to the beach, can have impacts on beach-nesting birds via:

- Increasing the number of people near an active breeding site, leading to lethal disturbance for eggs and chicks.
- Crushing of the eggs or chicks during event set up or the event itself.
- Increasing predators at the site if the event leaves behind litter.
- Crushing of dune vegetation and/or intense disruption/compaction of beach habitat by large crowds of people.

Key event management considerations:

- An alternative location should be sought wherever possible to avoid events occurring at priority beach-nesting bird breeding locations.
- If an alternative location cannot be sought, altering the timing of the event to avoid the breeding season is the next most ideal response, that is opting for early April to late July.
- If neither a change of location or date is possible, land managers should contact BirdLife Australia's Beach-nesting Birds team or local volunteers to seek current information on the breeding status of the birds at the proposed location.
- If eggs are present, contact local volunteers or Birdlife Australia's Beach-nesting Birds team to see if there is enough data to predict a hatching date. This is to ensure there will not be chicks present on the proposed dates of the event.
- If chicks are present, the event should not occur at this site due to impossible nature of predicting where chicks will be at the precise time of the event. They can roam up to several kilometres and this can occur within the space of a day.

- For nests with eggs, a buffer zone shown in Figure 10 should be adhered to. A 'buffer' is defined as the required distance you need to be away from the active nest. This area can be passed by along the water's edge only, but no activity can be carried out within or in front of the buffer zone. Typically, signage and rope fencing plus additional volunteer wardens to steer people away from the buffer zone are effective at protecting the birds during an event.

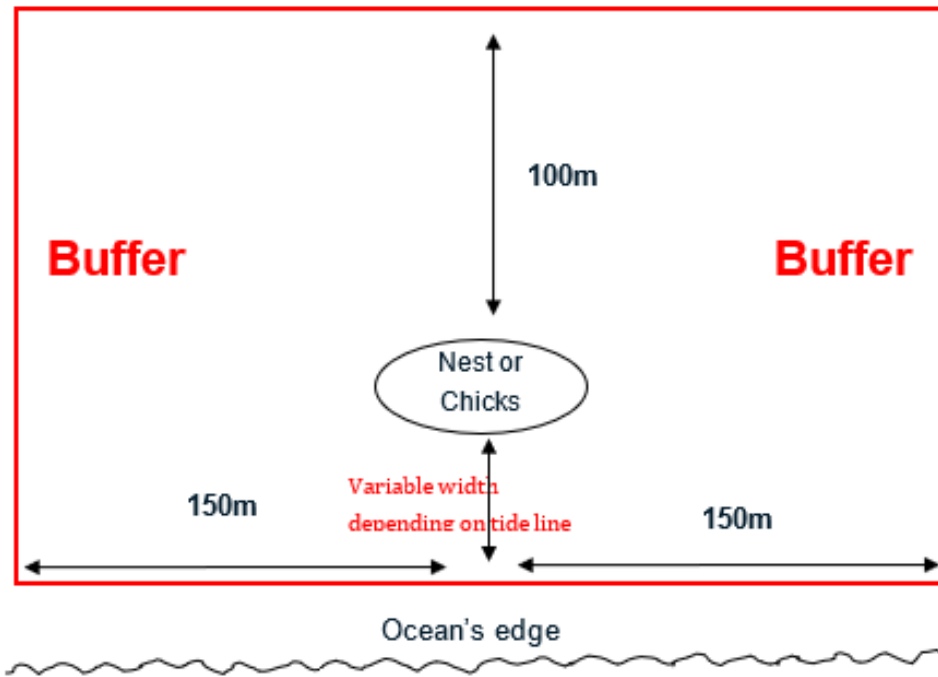


Figure 10: Diagram indicating the buffer zone (highlighted in red) around nests or chicks during an event.

Recommended best practice event protocols

1. Event personnel setting up, packing up and present during the event

Event staff walking on the beach can adversely affect the survival of nests and chicks of beach-nesting birds in direct ways (crushing) and indirect ways (disturbance). Furthermore, if the event personnel are too close to breeding sites, there are added risks of prolonged disturbance.

Any event staff using the beach must ensure that:

- They are aware of the current nesting situation on the beach so as to exercise extreme caution when traversing the area – this condition can be met by briefing all staff prior to the day about the location of nesting birds and again on the morning of the event.

- Access to the event site is via designated tracks and pathways only.
- Ideally, the beach is not accessed in the period one hour either side of high tides, as when the tide is at its highest, the person has no choice but to walk above the high-tide mark.
- They walk along the water's edge on the wet sand, and they do not enter the upper beach or dune.
- They do not pause within the buffer zone/s around breeding birds but only pass by the area as is necessary.
- They act on the event day to ensure that the buffer zone is kept people-free and this may involve regularly conversing with event attendees to explain why.

2. Vehicles needing access to the beach

It is assumed that only event staff will require vehicle access to the beach. This protocol is designed for these staff using vehicles for setting up and packing up the event, as well as on the day of the event.

Event staff accessing the beach with vehicles must ensure that:

- They are aware of the current nesting situation so as to exercise extreme caution when traversing the area.
- Access to the site is via designated tracks only.
- The beach is not accessed in the period one hour either side of high tides, but only at times of low or medium tide level with enough room for the vehicle to be below the high-tide mark. In the case of emergency vehicles needing access to the site, this would not apply, however, care should still be taken to avoid the nesting areas and drive as close to the water's edge where possible.
- All vehicles are driven along the water's edge to avoid nest crushing and minimise disturbance of nesting birds.
- All vehicles are driven at low speeds (~25 km/h) and in poor weather or low light conditions, speeds are further reduced.
- Drivers remain vigilant for any movement of birds at the water's edge and slow down further if they spot birds or their chicks and wait for them to move out of the way.
- Vehicles and staff do not stop within 300 m of the birds.

3. Crowds traversing the beach and attending the event

- An announcement at the beginning of the event should be broadcasted to inform the public of the location of breeding birds and the need to keep well away from the signed areas.
- Event marshals need to remind attendees as the event progresses of the presence of breeding birds and the need to keep out of the buffer zone, particularly if they see attendees breaching the buffer zone.
- Volunteer wardens must be present on the day of the event, specifically set up at the edges of the buffer zone/s to reinforce signage and keep attendees out of the area. Wardens are also there to raise awareness about the birds and answer questions by the public.
- Signage around the buffer zone indicates that attendees are to walk past the area along the water's edge and not to linger in the signed area. They are asked not to enter the upper beach or dune.
- Beach access is encouraged via designated pathways and these are clearly demarked for attendees.
- Fencing around the breeding site is as wide as allows attendees to pass by the water's edge and this can be widened and shortened as the day progresses and the tide height changes, by having additional lengths of rope and stakes to bring the two sides out to the water's edge.



Figure 11: View from inside buffer zone of fence line, signage, wardens sitting nearby and crowd further behind the fenced area

Predator control

The benefits of landscape scale fox control to small mammals and ground-nesting birds are highly apparent from successful programs such as the Southern Ark Project in East Gippsland, Victoria and the Western Sheild conservation program in Western Australia. For the benefits to transfer to beach-nesting birds, programs such as these need to encompass the foreshore environment. Small-scale or isolated control programs don't work because they fail to reduce the overall predator population that continuously threatens these vulnerable species. Therefore, effective predator control must cover large, connected areas to ensure beach-nesting birds can survive and recover.

Avian predator control is less clear as all identified avian predators are native species, hence are a protected part of the ecosystem. Ravens, magpies, and gulls have become overabundant as they thrive on human habitation and urbanisation. Unfortunately, these species have also been identified as major egg and chick predators. One recommendation to controlling these avian predators is to keep our beaches clear of litter including food scraps.

Recommendations

- Targeted fox control is carried out near key beach-nesting bird sites.
- If adequate resources are available, carry out fox control once before the breeding season commences (July/August) and once in the middle of the season (November/December).
- Encourage the public to report fox and/or fox den sightings to the land managers.
- To determine the effectiveness of predator management, liaise with BirdLife Australia's BNB team about installing a remote camera at nest/s to detect and identify predators in the area. Please be aware that camera installation is subject to acquiring appropriate permits and regulatory approvals.
- Conduct an education campaign on free roaming cats and their impacts on wildlife to encourage pet owners to confine cats to their premises.
- If feeding of wildlife is an issue, conduct an education campaign on the negative impacts on feeding wildlife to encourage people to refrain from feeding birds such as gulls, magpies, and ravens.
- Provide bins for beachgoers to dispose of their rubbish and ensure these are firm closing and emptied regularly. Access to rubbish can increase the presence of some predators, such as ravens.

Weed control

Weed invasions of the dunes can impact beach-nesting birds by:

- Limiting nesting habitat availability, whereby the dunes become covered in dense weeds and birds are left with only a narrow strip of upper beach available for nesting.
- Altering the beach profile; some weeds particularly Marram Grass (*Ammophila arenaria*) and Sea Wheat-grass (*Thinopyrum junceiforme*), create cliffing of foredunes and bind sand so greatly that the incoming sea then takes sand from the beach as dune sand is inaccessible.
- Intensifying impacts of rising sea levels and storm surges, as birds are forced to nest on the beach where nest losses to tidal inundation are more likely.
- Outcompete native grasses which the birds are adapted to utilising for protective cover.

Recommendations

General coastal weed removal activities

- If weed control is planned for the coastal environment, ensure current maps of beach-nesting bird breeding locations are sought from BirdLife Australia's BNB team to look for any overlap between planned activities and location of vulnerable breeding sites.
- Ensure weed control is carried out during the **non-breeding** months (April – July).
- If weed control needs to occur during the spring or summer months, only hand pulling or spraying will be appropriate, no mechanical removal should occur during breeding months.
- For any planned weed control during spring or summer, it will be critical to liaise with BirdLife Australia's BNB team to establish a work plan that accounts for any active nests or chicks in the area. This will mean that an experienced observer will need to check the area in the lead up to weed control.

Targeted weed removal to improve beach-nesting bird habitat

- Conduct mapping of major weeds [Marram Grass, Sea Wheat-grass, Sea Spurge (*Euphorbia paralias*), Sea Rocket (*Cakile maritima*), Pyp Grass (*Ehrharta villosa*), Beach Daisy (*Arctotheca populifolia*)] that threaten beach-nesting bird habitat resilience in the long term.
- Overlay maps of beach-nesting bird distribution to select priority sites for weed removal.
- Ensure funding is available for the initial weed control project and follow up removal for at least 3 years to ensure the project is viable.

- Carry out targeted control at breeding sites where weeds have greatly reduced nesting habitat availability – note timing below!
- Ensure weed control is carried out during the **non-breeding** months (April – July).
- If weed control needs to occur during the spring or summer months, only hand pulling or spraying will be appropriate, no mechanical removal should occur during breeding months.
- Liaise with BirdLife Australia’s BNB team to establish a work plan that accounts for any active nests or chicks in the area. This will mean that an experienced observer will need to check the area in the lead up to weed control.
- Ensure follow up monitoring is carried out after weed control to remove seedlings.
- Replant with native grasses that are beach-nesting bird friendly (e.g. Hairy Spinifex *Spinifex hirsutus* and Beach Spinifex *Spinifex longifolius*) and maintain habitat suitability.
- Consider impacts of removing weeds near areas where people access the beach. The resultant areas of bare sand may become attractive to human/vehicle intrusions, so that some protection (signage, temporary fencing, re-plantings) of these newly created habitat areas may need to occur promptly.

Coastal planning and coastal on-ground works

Coastal residential development

Residential developments on the coast can result in:

- Direct loss of habitat (and loss of future habitat resilience, i.e. capacity to retreat) if development occurs in the dune system or immediately behind the dune.
- Increased visitation to beaches resulting in greater need to protect breeding sites, carry out education and enforcement patrols, and to attempt to mitigate human-based threats.
- Formalising access to beaches and addition of infrastructure in the primary dune which limits nesting habitat and resilience to climate change, as there is little room for inland retreat.
- Residents creating their own informal access points (if formal access is not provided) which leads to trampling of habitat (and nests and chicks in situ). This can then prompt erosion control measures which can further reduce nesting habitat availability.
- Increases in domestic animals (cats and/or dogs) exacerbating predation pressures on nearby nesting sites.

Recommendations

- Ensure council planners have access to spatial layers of key beach-nesting bird breeding territories.
- Consider proximity to beach-nesting bird breeding locations in all facets of coastal planning.
- Plan alternative beach access for residents from developments.
- Ensure residential developments close to the coast are pet free and if this is not appropriate, ensure there are alternative areas for off-leash dog walking (e.g. dog exercise parks and implement cat curfews).
- Ensure all new residents are given an educational pack to increase their awareness of local threatened birds and how to do no harm.

Coastal armouring

Armouring the coast by creating sea walls, groins, and placing rocks/boulders on the beach to protect coastal infrastructure and assets, can result in:

- Reduction of available habitat to beach-nesting birds due to modifications of beaches.
- Altered natural dune mobility and sand replenishment processes affecting current and future habitat availability for beach-nesting birds.
- Potential impacts on food availability if marine processes are impacted, e.g. wrack deposits.
- Loss of breeding sites due to addition of structures that do not naturally belong at the site (e.g. rocks/boulders).
- Loss of vegetation on the upper beach and/or dune resulting in the loss of natural hiding places for chicks of beach-nesting birds.

Recommendations

- Explore alternatives to coastal armouring and long-term solutions compared with short term fixes.
- Seek expert advice (including from coastal geomorphologists) on modelling the changes to beaches in the short and long term before commencing armouring works.
- Ensure armouring is not carried out directly within key beach-nesting bird breeding sites.
- Carry out the works only during the non-breeding months (April-July).

- Encourage works crew to adhere to “Best practice vehicle beach access protocols” prescribed on page 26 during construction works.
- Explore ways of carrying out the armouring that result in minimal changes to the natural setup of the beach.

Sand carting and extraction

Extraction and carting of sand from some beaches to replenish sand at other beaches has been identified as highly detrimental to beach-nesting bird habitat. It can result in:

- Direct loss of beach-nesting bird habitat due to removal of sand.
- Increases in tidal inundation of nests at sites where sand has been removed.
- Reduction of food availability to beach-nesting birds if sand is extracted from below the low water mark or dredge spoil dumped on current foraging area.
- Loss of beach-nesting bird breeding sites due to excessive disturbance caused by the on-ground works.
- Altered natural dune mobility and sand replenishment processes affecting habitat availability for beach-nesting birds.
- Direct impacts of nest and chick loss due to machinery and works on beaches.

Recommendations

- Seek expert advice on modelling the changes to beaches in the short and long term before commencing sand extraction and carting works.
- Seek alternative locations to ensure that sand carting or dredge spoil dumping is not carried out on key beach-nesting bird breeding sites.
- Where dredging occurs in proximity to known breeding sites, seek to carry out the on-ground works only during the non-breeding months (April-July).
- If dredging needs to occur during the spring or summer months, ensure dredge spoil dumping is not carried out on key beach-nesting bird breeding sites.
- Liaise with BirdLife Australia’s BNB team to establish a work plan that accounts for any active nests or chicks in the area. This will mean that an experienced observer will need to check the area in the lead up to the works.
- If working in a location adjacent to or passing by known breeding sites, ensure works crew adhere to “Best practice vehicle beach access protocols” prescribed on page 26 during construction works.

- Explore uses of dredge spoil for improving habitat for beach-nesting birds.

Dune stabilisation works

Efforts to stabilise dunes by controlling erosion are carried out using three main methods in Australia. They are sand drift fencing where fences with a fine mesh/netting material are erected along the base of the dune or at angles within the dune to hold sand in place and stop the natural sand drift, brush matting which involves laying of dense mats of dry, cut brush (or dune matting) over bare patches of sand, and, by revegetating the upper beach and dunes with plants. These methods can impact beach-nesting birds in the following ways.

- Sand drift fencing:
 - Restricts birds from accessing the dunes, as Hooded Plovers in particular, prefer to walk and run, and rarely fly. They will be unlikely to nest behind the fence in the dunes as flying to and from the nest alerts predators to the nest location. Thus, dune nesting habitat becomes lost.
 - Creates a barrier for flightless chicks who cannot access dune vegetation to hide in and cannot escape predators and become easier prey as they are trapped at the base of the fence line.
- Brush matting:
 - Reduces habitat suitability by covering all bare patches of sand, particularly dune blowouts which are the favoured nesting habitat of Hooded Plovers.
 - Pushes beach-nesting birds to nest on the upper beach which is more prone to disturbance and direct crushing compared with the dune, as well as being more prone to inundation.
- Revegetation:
 - Altering beach habitat if the inappropriate species are selected for revegetation. Past dune stabilisation efforts using introduced grasses such as Marram Grass have resulted in severe ecological consequences, with these species now recognised as invasive weeds. Appropriate revegetation should focus on low-profile native vegetation characteristic of the upper beach and primary dune zones within the specific site.

Recommendations

- Ensure works are not carried out on key beach-nesting bird breeding sites.
- If brush matting is essential, then it should be used strategically and sparingly. It should not be used to cover bare sand patches or blowouts at beach-nesting bird sites, particularly on the foredune and base of the dune.
- Ensure brush matting is removed once native plants have regenerated underneath to help return habitat to its original condition.
- If sand drift fencing is needed for dune stabilisation, ensure long sections within bird territories do not have the mesh fabric installed to enable nesting and chick access behind fencing.
- Carry out dune stabilisation works during the non-breeding months (April – July).
- If vehicles are involved, ensure works crew adhere to “Best practice vehicle beach access protocols” prescribed on page 26 during stabilisation works.
- Ensure selected plants are suitable for the site, such as native grasses that are beach-nesting bird friendly (e.g. Hairy Spinifex *Spinifex hirsutus* and Beach Spinifex *Spinifex longifolius*) and maintain habitat suitability.

Beach clean-ups

Litter, discarded fishing line and other marine debris can pose a risk to beach-nesting birds through:

- Direct entanglements that can lead to injury or death.
- Attraction of predators, e.g. scavenging silver gulls, ravens, foxes.

Beach clean-ups carried out to remove litter and debris are beneficial to beach-nesting birds, however if conducted during the breeding season, they can:

- lead to high risks of egg or chick crushing (as cleaners approach the upper beach and dune to collect debris).
- disturbance of nesting birds and their chicks.

Recommendations

- Carry out beach clean-ups during the non-breeding months (April - July).

- If clean-ups are essential during spring and summer, all crew or participants must be informed of the risks to beach-nesting birds and warned to stay below the high-tide mark.
- Maps of known beach-nesting bird breeding sites can be provided to participants, as well as pictures of the birds to help with identification.
- Contact can be made with the BNB Team to check if there are active nests/chicks in the planned beach clean-up location.

Beach wrack removal

Beach wrack refers to the natural material that washes up from the sea into the surf zone and onto our beaches. Beach wrack is made up of seagrass, seaweed, and other organic material including both living and dead animals. Beach-nesting birds feed on invertebrates associated with beach wrack. Beach-nesting birds often select breeding sites based on this food availability. Studies have shown that beaches with more wrack tend to have higher densities and diversity of invertebrates, directly correlating with increased food availability for birds. Along with foraging opportunities, beach wrack also provides critical resting microhabitat for the birds and their chicks.

Removal of wrack from the beach, usually for aesthetic and recreational value, regularly involves large earthmoving equipment. Beach wrack removal can negatively impact beach-nesting birds by:

- Disrupting their habitat and taking away critical resting microhabitat.
- Increasing disturbance of nesting birds and their chicks.
- Increasing chances of direct crushing of eggs or chicks, especially with machinery on the beach.
- Removal/reduction of their food sources.

Recommendations

If wrack removal is necessary for specific reasons (e.g., safety concerns, access), it should be done in a targeted and limited manner, and consider the following:

- Ensure works are not carried out on key beach-nesting bird breeding sites.
- Contact can be made with the BNB Team to check if there are active nests/chicks in the planned wrack removal area.

- Where wrack removal occurs in proximity to known breeding sites, seek to carry out the on-ground works only during the non-breeding months (April-July).
- Liaise with BirdLife Australia's BNB team to establish a work plan that accounts for any active nests or chicks in the area. This will mean that an experienced observer will need to check the area in the lead up to the works.
- If vehicles are involved, ensure works crew to adhere to "Best practice vehicle beach access protocols" prescribed on page 26 during works.

Communications and Outreach

Beach-nesting birds make great flagships for raising awareness about coastal habitats and conservation. They are indicators of how healthy the coastal environment is, and if these birds are declining or failing to breed, this can demonstrate to the public that change is needed.

BirdLife Australia has developed a range of educational resources that are either available online or as printed materials. Contact BirdLife Australia’s BNB team (beachnestingbirds@birdlife.org.au) to find out what is currently available.

Key educational resources

Name of resource	Type of resource	Purpose	Focal Species	Audience
Birds and Beaches, Dogs and Leashes	Brochure	Raise awareness of beach-nesting birds and threats posed by off leash dogs; provide guidance on bird-safe dog walking behaviours	Hooded Plover, Red-capped Plover, Pied Oystercatcher, Sooty Oystercatcher	Dog walkers, general public, Australia wide
Protecting Australia’s Beach-nesting Birds	Brochure	Raise awareness of beach-nesting birds and threats posed by recreation; provide guidance on minimising impacts of recreational beach use	All beach-nesting bird species	General public, beach users, Australia wide

Name of resource	Type of resource	Purpose	Focal Species	Audience
Dropping in on the Hood? Surfers share the beach with one of Australia's most threatened birds.	Brochure	Highlight the accumulative threats and minimal chance of survival and how surfers can help and avoid disturbance/ accidents	Hooded Plover	Surfers - recreational beach users
Taking conservation by the reins	Brochure	Raise awareness to share the beach with threatened beach-nesting bird species. Outlines the low chance of survival, the threats they face and how horse riders can help	Hooded Plover	Horse riders-recreational beach users
Getting Airtime in the Hood? Paragliders and kitesurfers share the beach with one of Australia's most threatened birds	Brochure	Highlight the accumulative threats and minimal chance of survival and how paragliders and kitesurfers can help and avoid disturbance/ accidents	Hooded Plovers	Paragliders and kitesurfers
Chicks on the beach! Stay out of reach	Sticker	Fun reminder	Hooded Plover	General public, beach users
Flightless Hooded Plover chicks on the sand! Make space to give them a hand.	Magnet	Fun reminder	Hooded Plover	General public, beach users
The Wing Thing – Beach-nesting Birds https://beachvol.birdlife.org.au/login/index.php?pathway=2	Kids Activity Booklet	Available online or as hard copies. This contains crosswords, games and fun information about beach-	All beach-nesting bird species	Children aged 5-15

Name of resource	Type of resource	Purpose	Focal Species	Audience
		nesting shorebirds and seabirds!		
Beach-nesting Birds Education Kit https://beachvol.birdlife.org.au/login/index.php?pathway=2	Education Kit	Meets the National Curriculum. Contains seven detailed activities. These include classroom activities and presentations, conservation actions such as building chick shelters and tips for how to run a beach visit	All beach-nesting bird species	Aimed at primary school and early secondary school students. Kit is for Educators, teachers, schools, councils, volunteers, home schooling.
My Hoodie guide	Pocket Field Guide	Field companion booklet that contains the key information needed to know whether Hoodies are breeding, how to monitor and frequently asked questions	Hooded Plover	Land managers, volunteers, ecologists, conservation practitioners, councils, rangers, communicators, educators
Threats to My Hoodie guide	Pocket Field Guide	Field companion booklet that contains tips on identifying and assessing threats that endanger the future survival of beach-nesting birds	Hooded Plover	Land managers, volunteers, ecologists, conservation practitioners, councils, rangers, communicators, educators



Targeted educational events



BirdLife Australia's BNB team has also developed events/activities specifically to educate key user groups about the birds and how to do no harm when visiting the beach. These include:




Type of Event	Key User Groups	Description
Dog's Breakfast	Dog walkers	These events create a positive environment to raise awareness of the impact dogs can have on the breeding success of beach-nesting birds. A free BBQ is provided to dog owners (plus a dog treat for their pets), with information and give-aways ('birds and beaches, dogs and leashes' brochure, dog leads with a printed conservation message).
Activity Booklet, craft, colour-in sheets and flick-flack activity	Families	These activities are an easy, low cost and effective way to convey beach-nesting birds conservation messages to families who might not necessarily be typically 'environmentally' minded. This activity can be done as part of a stall within an organised market or as a stand-alone activity at a busy location. These activities can be printed from https://beachvol.birdlife.org.au/login/index.php?pathway=2
Guided Beach Walk	Community members	A guided beach walk represents an exceptionally valuable educational tool for community members seeking to learn more about beach-nesting birds and their conservation. The immersive nature of beach walks provides families with direct exposure to the habitat where these vulnerable species live and breed. This hands-on experience enables community members to develop an understanding of the environmental requirements and challenges faced by beach-nesting birds.



Communications Plan

Land managers can assist in raising awareness about these special birds, the threats they face and assist with promoting coexistence between beach users and beach-nesting birds. Below is a communications plan with key dates throughout the breeding season and examples of messages. This could engage a range of audiences through various channels, including media releases, council and community websites and blogs, and different social media platforms. Land managers can ‘follow’ some of the BNB Teams’ social media platforms including [Hooded Plover Facebook](#) and [Beach-nesting Birds Facebook](#) for inspiration.

Date	Focus of messaging	Examples of messages	Photo
16 th September (or prior)	16 th of September is ‘Plover Appreciation Day’ and the Breeding Season has begun.	<ul style="list-style-type: none"> - Beach-nesting bird breeding season has begun. You will find threatened species nesting on beaches until March. - Signs and temporary fencing will be installed along the beach when these birds have a nest, please give them some space. 	 <p>Photo credit: Glenn Ehmke</p>  <p>Photo Credit: Tegan Knowles</p>

Date	Focus of messaging	Examples of messages	Photo
Kings Birthday long weekend – end of September, or prior.	Nests are starting to hatch! There are likely to be chicks on the beach from now and during summer.	<ul style="list-style-type: none"> - Nests are starting to hatch and there will be chicks now appearing on the beaches from this month and into summer! - Chicks are extremely vulnerable, they need to move up and down the beach and along the water's edge finding food. If a threat comes along, for example an off-leash dog or a fox, they cannot fly away to escape. It takes 5 weeks for them to grow and be able to fly. - Look out for signs, banners and fencing, and for the birds themselves! Help protect these tiny chicks by observing these signs. 	 <p>Photo credit: Glenn Ehmke</p>  <p>Photo credit: Mark Lethlean</p>

Date	Focus of messaging	Examples of messages	Photo
1 st of Dec or just before WA school holidays begin	Target summer visitors	<ul style="list-style-type: none"> - This summer when you visit the beach keep an eye out for beach-nesting birds that make the beach their home. - Look out for signs, banners and fencing, and for the birds themselves! Help protect these tiny chicks by observing these signs. 	  <p>Photo credit: Glenn Ehmke</p>
Early in the new year	Target summer visitors	<ul style="list-style-type: none"> - When you visit the beach keep an eye out for the small and secretive beach-nesting birds that make the beach their home. - The local community is also looking out for these birds, you may see some fences or signs on the beach 	

Date	Focus of messaging	Examples of messages	Photo
		or even be lucky enough to chat with one of the local volunteers who help look after these birds.	Photo credit: Glenn Ehmke
Australia Day Weekend (or prior)	Reminder that the birds are still breeding and targeting late summer visitors	<p>- The summer holidays are almost over for most, but our beach-nesting birds spend their entire lives on the beach. They have spent this summer sharing their home with throngs of people and still need a bit of space to keep raising their young before the weather turns cold. This is our last chance to help our beach-nesting birds succeed.</p>	 <p>Photo credit: Mark Lethlean</p>
Second week of April	Mark the end of the breeding season with results and message of gratitude to communities and volunteers	<p>- The beach-nesting bird breeding season is now over and (<i>insert number*</i>) chicks have survived or 'fledged' (which means they reached flying age).</p> <p>* You could ask BirdLife to supply how many chicks have survived through to fledging this season. BirdLife could provide some context around whether this is a pleasing or concerning result and some comparison with other parts of the state.</p> <p>- Include a thank you to the volunteers for their wonderful efforts and to everyone who helped these birds by leashing their dogs and doing the right thing!</p>	 <p>Photo credit: Mark Lethlean</p>

Appendix 1. Breeding site protection response plan

Nests in vulnerable locations, or chicks on busy beaches, can fail rapidly. A well-defined response plan is required to ensure a timely response and effective breeding site protection. Below outlines the current steps for protecting breeding sites in the southwest of WA:

- Volunteer or land manager locates a new nest or observes chicks at a site. If a community member or volunteer locates a nest or observes chicks they are to contact the land manager.
- Land manager consults “A Practical Guide for managing Beach-nesting Birds in Australia” (BNB Management Manual) and uses the flowcharts within the manual (pages 77-79) to assess whether management is required or not, and if required, what type of management is recommended (signage at access point, signage on beach flanking nest site, temporary fence around nest site, or a combination of these). The BNB Management Manual is available to download here: <https://beachvol.birdlife.org.au/login/index.php?pathway=4>.
- If there are any variances to management protocols outlined in the BNB Management Manual or if the birds occur at a new site that has not previously been managed, contact BirdLife Australia’s BNB team (beachnestingbirds@birdlife.org.au) to discuss options and seek approval in line with permit conditions and best practice methodology.
- Land managers and/or trained volunteers may install the determined site management (fencing/signage/chick shelters).
- Land managers and/or trained volunteers are responsible for checking and maintaining signage and fencing.
- Once the nest has failed or chicks are no longer using the site, management will be removed. For chick sites, at least 3 visits where chicks have not been sighted are required before removal of the management to ensure this is a true breeding failure.



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Photo credit: Tegan Knowles

Thank you



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