

Tweed Sand Bypassing

Shorebird Baseline Assessment and
Monitoring 2025-2026



Sandpiper
Ecological
Surveys

July 2026

Document Distribution

Date	Version	Status	Sent to	Represent	Delivered Format	Dispatched By
14 May 2026	A	Internal draft	L. Andrews	Sandpiper	MSW	D. Rohweder
18 May 2026	1	Draft	S. Dobe	TfNSW	MSW	D. Rohweder
22 July 2026	2	Final	S. Dobe	TfNSW	MSW & PDF	D. Rohweder

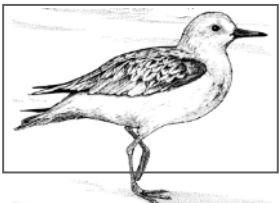
Project Team:

Dr D. Rohweder (field survey, reporting)

Mr L. Andrews (report review, mapping)

Report prepared for:

Transport for New South Wales



© Sandpiper Ecological Surveys 2026

ABN: 82 084 096 828

260 Backmede Road, Backmede
david@sandpipereco.com.au

4 Somervale Road, Sandy Beach
luke@sandpipereco.com.au

Cover Photo: Flock of eastern curlew and bar-tailed godwit roosting on Fingal Head Beach, 11 December 2025.

Disclaimer:

This report has been prepared in accordance with the scope of services described in the contract or agreement between Sandpiper Ecological Surveys (ABN 82 084 096 828) and TfNSW. The report relies upon data, surveys and measurement obtained at the times and locations specified herein. The report has been prepared solely for use by TfNSW and Sandpiper Ecological Surveys accepts no responsibility for its use by other parties. Sandpiper Ecological Surveys accepts no responsibility or liability for changes in context, meaning, conclusions or omissions caused by cutting, pasting, or editing the report.

Table of contents

1	Introduction	1
1.1	Background information	1
2	Study area.....	2
3	Methods.....	4
3.1	Habitat assessment.....	4
3.2	Bird surveys.....	4
3.2.1	Monitoring considerations	4
3.2.2	Survey method	4
3.2.3	Survey effort and timing	5
4	Results	6
4.1	Bird habitat in the study area	6
4.2	Bird surveys.....	7
4.2.1	Weather conditions	7
4.2.2	Human activity and pest species	7
4.2.3	Bird species richness and abundance	8
4.3	Shorebird habitat.....	12
4.3.1	Evidence of breeding and breeding habitat.....	12
4.3.2	Important habitats and habitat use.....	12
4.4	Kerosene Inlet	13
5	Discussion	14
5.1	Significance of Fingal Head Beach for shorebirds	15
5.2	Habitat use.....	16
5.3	Future monitoring	17
6	Recommendations	18
7	References	18

List of tables

Table 1: List of priority target species for the Fingal Head Beach baseline shorebird surveys, as per Sandpiper Ecological 2025. E = endangered, V = vulnerable, CE – critically endangered, J – Japan-Australia Migratory Bird Agreement (JAMBA), C – China-Australia Migratory Bird Agreement (CAMBA), K – Korea-Australia Migratory Bird Agreement (ROKAMBA).....2

Table 2: Dates and effort for the Fingal Head Beach shorebird surveys. * survey excluded from analysis due to poor survey conditions.5

Table 3: Species of bird recorded during the 2025/2026 baseline surveys on Fingal Head Beach.
P=present, detected by signs; R = roosting, F = foraging, T = transit, E = endangered, MB = migratory bird agreement, CE = critically endangered.....9

Table 4: Species of shorebird and waterbird recorded in Kerosene Inlet during mid-tide surveys in January 2026..... 13

Table 5: Legislative status of seven species recorded during the 2025/26 bird surveys at Fingal Head Beach. E = endangered, V = vulnerable, CE – critically endangered, J – Japan-Australia Migratory Bird Agreement (JAMBA), C – China-Australia Migratory Bird Agreement (CAMBA), K – Korea-Australia Migratory Bird Agreement (ROKAMBA).	15
---	----

Table 6: Suggested monitoring program for Fingal Head Beach.	17
---	----

List of Plates

Plate 1: Northern end of the study area viewed from the southern breakwater to the sand pumping jetty (left) and south of the jetty (right). Date 11/11/25	6
Plate 2: Southern end of the study area. Note the narrower beach width (i.e. distance from high water mark to base of foredune) and presence of fallen vegetation on the foredune. Date 11/11/25	7
Plate 3: Beach profile viewed south from the sand pumping jetty. A = 11/11/25, B = 18/12/25, C = 14/1/26, D = 6/2/26, E = 16/2/26, F = 16/3/26.....	8
Plate 4: Bar-tailed godwit (<i>Limosa lapponica</i>), non-breeding plumage with leg flag and band (left), breeding plumage (right).....	9
Plate 5: Eastern curlew (<i>Numenius madagascariensis</i>) roosting on Fingal head Beach.	10
Plate 6: Pied oystercatcher (<i>Haematopus longirostris</i>) left picture (adult left & juvenile right, note darker bill tip), and sooty oystercatcher (<i>H. fuliginosus</i>) right picture.....	10
Plate 7: Beach stone-curlew (<i>Esacus magnirostris</i>) right picture, resting on rocks in Kerosene Inlet and bush stone-curlew (<i>Burhinus grallarius</i>) roosting in the site compound at Fingal Head Beach.....	10
Plate 8: Pipi (<i>Donax deltoides</i>) with evidence of being opened by a pied oystercatcher (note the chiseling on top right edge) and beach stone-curlew tracks with two small ghost crab (<i>Ocypode</i> spp) legs (centre and right). Shorebirds often discard undigestible parts of crabs.....	10
Plate 9: Silver gull (<i>Chroicocephalus novaehollandiae</i>) roosting (left) and in flight (right).....	11
Plate 10: Crested tern (<i>Thalasseus bergii</i>) adults displaying (left) and adult in flight (right).	11
Plate 11: Roosting eastern curlew and bar-tailed godwits are often flushed by walkers on Fingal Head Beach This flock was flushed on four occasions during the survey period.	16

List of figures

Figure 1: Location of study site.....	3
Figure 2: Scatterplot showing the number of bar-tailed godwit and eastern curlew recorded at different tide heights.....	13
Figure 3: Scatterplot showing the number of bar-tailed godwit and eastern curlew and wind speed..	13
Figure 4: Location of important shorebird habitat on Fingal Head Beach and threatened species records in Kerosene Inlet.....	14

1 Introduction

Tweed Sand Bypassing is a joint New South Wales and Queensland Government project that aims to maintain a safe entrance to the Tweed River and restore the coastal sand drift to the beaches of the southern Gold Coast. The project collects sand from Letitia Spit, situated south of the Tweed River and pumps it, via a series of permanent and temporary pipelines, to the northern side of the river. The project has been operational since 2001 and has successfully replenished the southern Gold Coast beaches. As predicted, the project has caused shoreline recession of Letitia Spit, reversing the earlier shoreline expansion caused by the Tweed River breakwater. Monitoring has shown that the northern and central sections of the Letitia Spit shoreline have been stable since 2015 (NSW Government 2025). The southern section of shoreline experiences periodic fluctuations due to natural sand movement around Fingal Head and storm swells.

The Tweed Sand Bypassing Environmental Management Plan commits to establishing the baseline condition of avifauna along the new stable shoreline of Letitia Spit. Data collected would provide an indication of species richness and available habitat for comparison with future surveys should changes or impacts occur. The primary focus of surveys would be shorebirds belonging to the order *Charadriiformes*.

The purpose of the work is to:

- Provide advice on the potential bird species that may be associated with the beach and dune system in the Tweed Sand Bypassing influence area at Letitia Spit, including the extent of available habitats, species seasonality and likelihood of occurrence.
- Provide a snapshot for the 2025/2026 breeding seasons of the species present at Letitia Spit beach and dune system in the Tweed Sand Bypassing influence area, including the approximate number of individuals present, locations and breeding status.
- Provide advice on the legal status of all identified species, including if they are threatened species under the NSW *Biodiversity Conservation Act 2016* and/or protected matters under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and international conventions and agreements.
- Document any current management activities being undertaken by Transport for identified species and provide advice on additional feasible management measures as required.

The following report provides an overview of methods and results of monitoring surveys and discusses results in the context of shorebird habitat use in the locality. Recommendations for future monitoring and management are included.

1.1 Background information

Prior to field surveys a desktop assessment was undertaken to develop a list of target species (Sandpiper Ecological 2025). The assessment identified 23 species with a moderate or high likelihood of occurring in the study area (Table 1). This group was further refined by excluding those species that would primarily occur during migration and are not regular summer residents in the Tweed estuary (i.e. red-necked stint, lesser and greater sand plover), are winter migrants (i.e. double-banded plover), are common habitat generalists with no legislative status (i.e. masked lapwing, silver gull, crested tern) or which despite a known presence on Letitia Spit are

unlikely to regularly utilise the beach (i.e. bush stone-curlew). Of the remaining species, beach stone-curlew, bar-tailed godwit, eastern curlew, whimbrel, Pacific golden plover, Australian pied oystercatcher, common tern and little tern were assessed as having a high probability of being recorded during baseline surveys and are classed as priority target species (Table 1). The remaining species, grey-tailed tattler, ruddy turnstone, great knot, sooty oystercatcher, red-capped plover, Caspian tern and Australian tern, whilst likely to use the study area at times would not be regular visitors.

Table 1: List of priority target species for the Fingal Head Beach baseline shorebird surveys, as per Sandpiper Ecological 2025. E = endangered, V = vulnerable, CE – critically endangered, J – Japan-Australia Migratory Bird Agreement (JAMBA), C – China-Australia Migratory Bird Agreement (CAMBA), K – Korea-Australia Migratory Bird Agreement (ROKAMBA).

Common Name	Scientific Name	Likelihood of occurrence	NSW status	Commonwealth status	Priority target species
Bush Stone-curlew	<i>Burhinus grallarius</i>	Moderate	E		
Beach Stone-curlew	<i>Esacus magnirostris</i>	High	CE		Yes
Bar-tailed Godwit	<i>Limosa lapponica</i>	High	E	V, C, J, K	Yes
Eastern Curlew	<i>Numenius madagascariensis</i>	High	E	CE, C, J, K	Yes
Whimbrel	<i>Numenius phaeopus</i>	Moderate		C, J, K	Yes
Grey-tailed Tattler	<i>Tringa brevipes</i>	Moderate		C, J, K	
Ruddy Turnstone	<i>Arenaria interpres</i>	Moderate	V	V, C, J, K	
Great Knot	<i>Calidris tenuirostris</i>	Moderate	V	V, C, J, K	
Red-necked Stint	<i>Calidris ruficollis</i>	Moderate		C, J, K	
Pied Oystercatcher	<i>Haematopus longirostris</i>	High	E		Yes
Sooty Oystercatcher	<i>Haematopus fuliginosus</i>	High	V		
Pacific Golden Plover	<i>Pluvialis fulva</i>	High		C, J, K	Yes
Red-capped Plover	<i>Charadrius ruficapillus</i>	Moderate			
Double-banded Plover	<i>Charadrius bicinctus</i>	High			
Lesser Sand-plover	<i>Charadrius mongolus</i>	Moderate	V	E, C, J, K	
Greater Sand-plover	<i>Charadrius leschenaultii</i>	Moderate	V	V, C, J, K	
Masked Lapwing	<i>Vanellus miles</i>	High			
Silver Gull	<i>Chroicocephalus novaehollandiae</i>	High			
Caspian Tern	<i>Hydroprogne caspia</i>	Moderate			
Australian Tern	<i>Gelochelidon nilotica</i>	High			
Crested Tern	<i>Thalasseus bergii</i>	High			
Common Tern	<i>Sterna hirundo</i>	High		C, J, K	Yes
Little Tern	<i>Sternula albifrons</i>	High	E	C, J, K	Yes

2 Study area

The study area includes nearshore waters, the littoral zone and foredune of Fingal Head Beach from the southern breakwater of the Tweed River to 1000 metres (m) south of the sand pumping

jetty, a total distance of 1250 metres (Figure 1). The beach from the southern breakwater to Fingal Head is referred to in this report as Fingal Head Beach and the area between Fingal Head Beach and the Tweed River is referred to as Letitia Spit. Historically the beach was known as South Head Beach and is also referred to as Letitia Spit Beach in some literature.

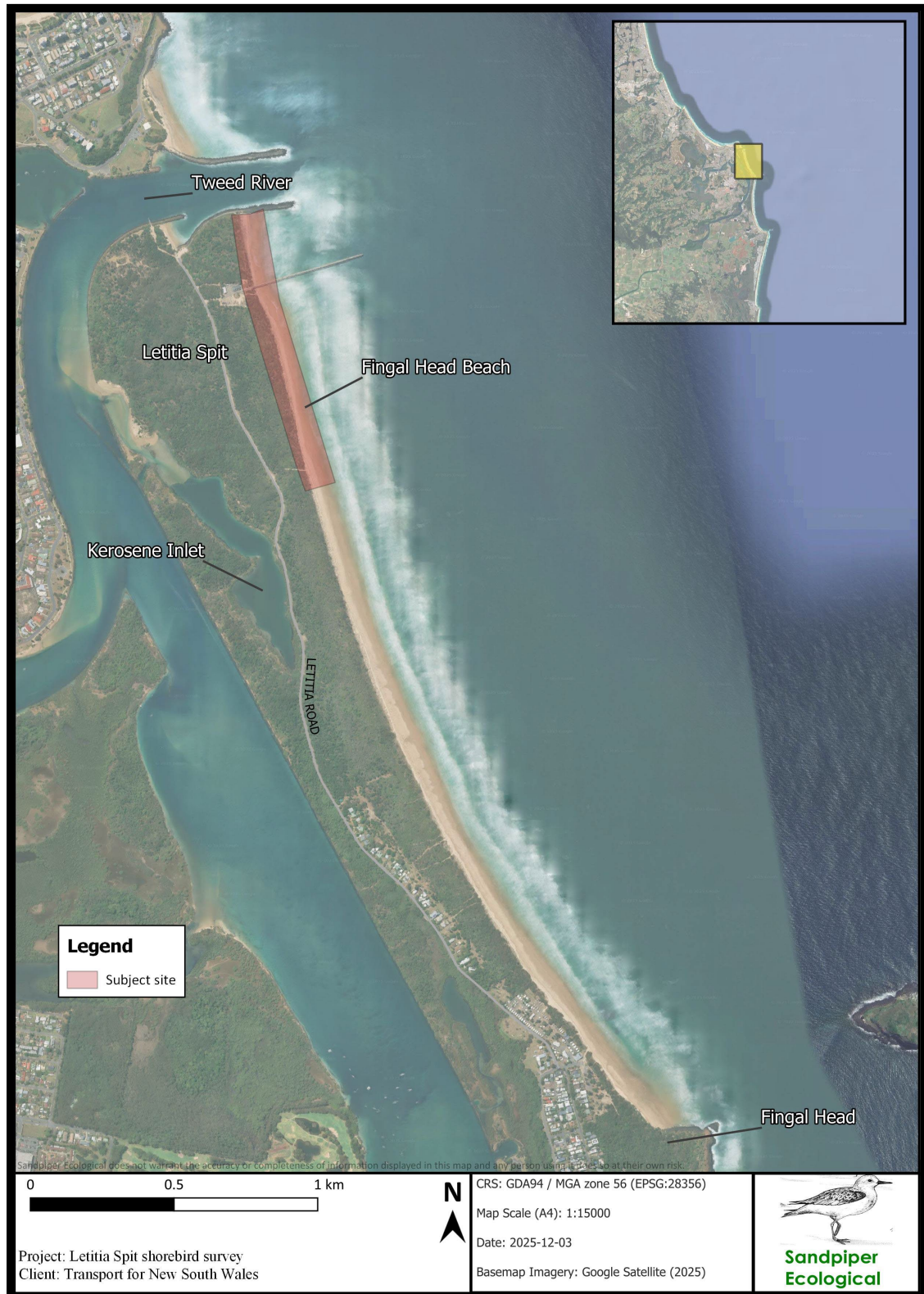


Figure 1: Location of study site.

3 Methods

3.1 Habitat assessment

An inception meeting and habitat assessment was conducted on Tuesday 11 November 2025. The assessment occurred during the later stages of a spring tidal phase and coincided with a 1.73m high tide at 1345 hours (Transport for NSW 2025). During the inspection, a foot-based traverse of the study area was undertaken between 1330 and 1530 hours. Data collected included: beach structure (width, slope, presence/absence of erosion), type and extent of foredune vegetation, presence/absence of roost and foraging habitat, and presence/absence of shorebird nesting habitat. Notes on the beach profile, erosion and width of exposed sand from the foredune to the water's edge were made during each survey.

3.2 Bird surveys

3.2.1 Monitoring considerations

The behaviour of non-breeding shorebirds in coastal areas is primarily driven by the tides, with birds roosting at high tide and foraging at low tide. Terns are an exception to this pattern as they often forage in nearshore coastal waters and roost on beaches at high or low tide. Breeding introduces more behavioral complexity, although in intertidal habitats breeding shorebirds like oystercatchers are still restricted to foraging at low tide, and incubating birds are present regardless of the tidal stage. Changes in the use of roost and foraging sites are likely between day and night (Rogers et al. 2006). A monitoring program must consider the primary drivers of habitat use, which at Fingal Head Beach is the tidal cycle. Consideration of nocturnal behaviour is beyond the scope of this study, yet it should be acknowledged as a factor that may influence site choice at tidal, lunar and seasonal scales.

Survey methods for shorebirds are well-established (DotEE 2017) and generally include surveys within two hours of mean high or low water with sites systematically surveyed from the lower estuary, moving upstream with the tide. Survey coverage should include all the habitat thought to be used by the shorebird population and surveys should occur when most shorebirds are present in the study area. A monitoring program should also include high and low tides during spring and neap tide phases.

As this study is focused on a 1250 m section of Fingal Head Beach it is not feasible to cover the area used by the local shorebird population, which in this case would be the Tweed River Estuary. Nonetheless, results of monitoring at Fingal Head Beach must be considered in the broader context of how shorebirds use the Tweed River estuary. Sporadic use of the study area may be due to tide height, lunar phase, disturbance, weather conditions, or a combination of these factors and is not evidence that the site is of low value to shorebirds.

3.2.2 Survey method

The two hours around mean high or low water, as shown on the NSW Tide Chart (TfNSW 2025), was targeted. Each survey commenced at the southern breakwater and involved a foot-based traverse of the study area from north to south and return. All shorebirds encountered during the survey were identified and counted using a pair of 10 x 42 mm binoculars. Each target species was photographed over the survey period. To avoid disturbing roosting flocks the walk traverse

was often paused or re-routed around flocks. Due to frequent disturbance by humans, roosting birds were often disturbed during a survey. During each traverse the three main habitat areas (foredune, beach & intertidal zone, & nearshore waters) were constantly scanned for signs of birds. Each survey included an inspection of the sand pumping jetty.

Data collected during each survey included: date, survey start and end time, number of individuals of each species, number of breeding and non-breeding birds, behaviour (foraging, roosting, transit, breeding, aggression), GPS location of significant sites and species, the number of people, dogs and vehicles on the beach, and the proportion of the beach used. Dogs and foxes were also identified from scats and tracks. The presence of some shorebird species, such as beach stone-curlews may be determined from tracks in the sand, whilst Australian pied oystercatcher can be identified by the presence of open pipi (*Donax deltoides*) shells. Beach stone-curlews often move to ocean beaches to forage on ghost crabs (*Ocypode* species) at night and can be difficult to detect by daytime surveys alone. Identification of their distinctive tracks is a reliable method of confirming habitat use.

To confirm the local presence of beach stone-curlew and Australian pied oystercatcher and place Fingal Head Beach into a broader context the sandspit and rock walls in Kerosene Inlet were inspected at mid-tide on 14 and 19 January 2026. The inspection involved a foot-based traverse of the inlet from Letitia Road to the Tweed River. All raptors encountered during the surveys were identified and counted.

3.2.3 Survey effort and timing

Eleven surveys were undertaken between 11 November 2025 and 16 March 2026. This included two low-tide surveys and nine high tide surveys (Table 2). An additional high tide survey was conducted on 13 February 2026. This survey was excluded from analysis due to extremely poor weather conditions that included strong wind and heavy rain. The survey program attempted to sample a variety of weather conditions and tide heights to gain an understanding of when birds utilise the study area.

No surveys occurred during the peak summer holiday period between 20 December and 11 January. Proposed survey effort and timing was broadly equivalent to the effort recommended by DotEE (2017). The primary differences being additional high tide surveys due to the low suitability of habitat at low tide. Survey duration ranged from 60 to 140 minutes, with duration influenced by the number of birds present, the extent of human disturbance and weather conditions. When no birds were present and human disturbance was high surveys were completed quicker than when birds were present and human disturbance was low.

Table 2: Dates and effort for the Fingal Head Beach shorebird surveys. * survey excluded from analysis due to poor survey conditions.

Date	Tide stage	Tidal phase	Tide height	Time	Duration
11/11/2025	High	Spring	1.73m	1330-1530	120 mins
11/12/2025	High	Neap	1.59m	1400-1620	140 mins
18/12/2025	High	Spring	1.75m	0815-1005	110 mins
14/1/2026	Low	Neap	0.66m	1300-1430	90 mins
14/1/2026	High	Neap	1.16m	1700-1825	85 mins
19/1/2026	High	Spring	1.83m	0850-1040	105 mins

Date	Tide stage	Tidal phase	Tide height	Time	Duration
19/1/2026	Low	Spring	0.37m	1445-1545	60 mins
23/1/2026	High	Spring	1.73m	1100-1245	105 mins
6/2/2026	High	Neap	1.60m	1130-1245	75 mins
16/2/2026	High	Spring	1.78m	0830-1030	120 mins
16/3/2026	High	Spring	1.68m	0750-0950	120 mins

4 Results

4.1 Bird habitat in the study area

The site inspection occurred during high tide in the latter stages of a spring tide cycle, and the observations of beach profile reflect this timing. At the time of the site inspection Fingal Head Beach tapered in width from north to south with beach slope increasing in the same direction. Fallen vegetation on the dune face was present throughout the study area. The northern 500 m of beach (i.e. 250 m north and south of the jetty) was characterised by a 30-40m wide flat to gently sloping profile (3-5 degrees) that was predominantly east facing. The beach slope increased at the wash zone and there was a 0.5-2 m tall erosion scarp at the foredune, which was vegetated with a mix of native and exotic species (Plates 1 & 2).

Approximately 650 m south of the jetty the beach narrowed to 10-15 m of dry sand with a total flat width of 20m. This section was also characterised by a gentle slope from the foredune to the wash zone where the profile steepened. The foredune was well vegetated and there was a 1m erosion scarp. At the southern end of the study area (approximately 800-1000 m south of the jetty) the beach narrowed considerably and the profile steepened. In this section there was 5-10 m of sand above high water, a well-vegetated fore dune and a 1-2m erosion scarp (Plate 2). The beach continued as a narrow strip of dry sand until the orientation changed to north-east towards the southern end.



Plate 1: Northern end of the study area viewed from the southern breakwater to the sand pumping jetty (left) and south of the jetty (right). Date 11/11/25



Plate 2: Southern end of the study area. Note the narrower beach width (i.e. distance from high water mark to base of foredune) and presence of fallen vegetation on the foredune. Date 11/11/25

The beach profile, and consequently the quality of roosting habitat, changed slightly throughout the survey period. Over the course of monitoring the beach slope south of the sand pumping jetty increased and a small erosion scarp formed. Towards the end of the survey period sand began to accrete causing the beach profile to flatten and the small erosion scarp disappeared. Evidence of the slight changes in beach profile is shown in Plate 3. A flat beach profile is evident in pictures A and B, with evidence of erosion occurring in picture C – note the bare steel becoming exposed at the base of the marker pole. A steeper beach profile is evident in pictures D and E – note exposed base of pole and small erosion scarp on right side of pictures. Noticeable accretion and a flatter beach profile is evident during the last survey (picture F) on 16 March.

The changes in beach profile were likely caused by a combination of high tides and large swell in January. Whilst subtle, these changes had a negative impact on habitat suitability as they reduced the space above high tide for roosting. Having sufficient space at a high tide roost is critical for shorebirds so they can see approaching predators. At Fingal Head Beach shorebirds appeared to favour sites with at least 30-40 m of sand between the foredune and tide line.

4.2 Bird surveys

4.2.1 Weather conditions

Weather conditions varied over the survey period (Table A1, Appendix A). Temperature ranged from 21 to 27 °C, relative humidity from 57 to 82%, and cloud cover from 10-90%. Wind speed was variable ranging from 7 kph on 16 March to 50 kph on 19 January. Wind speed was less than 20 kph during six of the 11 surveys. Wind direction was predominantly from the south or southeast.

4.2.2 Human activity and pest species

Humans were active within the study area during eight of the 11 surveys with dogs present during seven surveys. The highest concentration of humans and dogs occurred between the sand pumping jetty and southern breakwater, although tracks and direct observation indicates that both groups occur throughout the study area on most days. Likely fox tracks were recorded on 19 January 2026.



Plate 3: Beach profile viewed south from the sand pumping jetty. A = 11/11/25, B = 18/12/25, C = 14/1/26, D = 6/2/26, E = 16/2/26, F = 16/3/26.

4.2.3 Bird species richness and abundance

Ten species of shorebird (i.e. species belonging to the order Charadriiformes) were recorded in the study area during the baseline surveys (Table 3). A further six species of raptor, waterbird and seabird were also recorded. Shorebirds can be separated into two groups “true shorebirds” in the sub-order Charadrii, and gulls and terns in the sub-order Lari.

Sub-order Charadrii

Six species in the sub-order Charadrii were recorded, bush stone-curlew, beach stone-curlew, bar-tailed godwit, eastern curlew, Australian pied oystercatcher and sooty oystercatcher (Table 3). All of which are listed as threatened by NSW and/or Commonwealth legislation and bar-tailed godwit and eastern curlew are listed on International Migratory Bird Agreements. The stone-

curlews and oystercatchers are classed as resident shorebirds and the godwit and curlew as migratory shorebirds.

Table 3: Species of bird recorded during the 2025/2026 baseline surveys on Fingal Head Beach. P=present, detected by signs; R = roosting, F = foraging, T = transit, E = endangered, MB = migratory bird agreement, CE = critically endangered.

Species	Number of individuals & Behaviour in each survey										
	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11
Bush stone-curlew ^E			1/R	1/R	4/R			3/R			
Beach stone-curlew ^{CE}			P/F					P/F	P/F		P/F
Bar-tailed godwit ^{E, MB}	33/R	28/R							32/R		15/F
Eastern curlew ^{CE, MB}	22/R	23/R							23/R		
Pied oystercatcher ^E			P/F								P/F
Sooty oystercatcher ^V						2/F					
Silver gull	P/R,F	59/R,F,T	15/R,T	10/R,T	18/R,F,T	38/F	7/T	24/R,F	140/R	80/R,F	75/R,F
Australian tern		1/F									
Crested tern	P/R,F	85/R,F,T	5/F,T	15/F,T	30/F,T	33/F	3/T	6/T	5/R,T	100/F	
Common tern ^{MB}		1/R									
Eastern osprey ^V	1/R	1/T	2/R	1/F	1/R	2/R	2/R	1/R		2/R	
Pied cormorant		2/F	1/T	1/T		2/T		1/T		1/T	
Little-pied cormorant										2/T	
Wedge-tailed shearwater ^{MB}		3/F								100/F	
Brahminy kite									1/F		
White-faced heron									1/R		

Bar-tailed godwit (Plate 4) was recorded on four occasions with abundance ranging from 15 to 33 individuals. Eastern curlew (Plate 5) was recorded on three occasions with abundance ranging from 22-23 individuals. Pied oystercatcher (Plate 6) and beach stone-curlew (Plate 7) were identified from signs, the former species by opened pipi shells (Plate 8) and the latter by characteristic tracks in the sand (Plate 8). The absence of sightings for either species is attributed to the nocturnal behaviour of beach stone-curlew and infrequent beach use by pied oystercatcher.



Plate 4: Bar-tailed godwit (*Limosa lapponica*), non-breeding plumage with leg flag and band (left), breeding plumage (right).



Plate 5: Eastern curlew (*Numenius madagascariensis*) roosting on Fingal Head Beach.



Plate 6: Pied oystercatcher (*Haematopus longirostris*) left picture (adult left & juvenile right, note darker bill tip), and sooty oystercatcher (*H. fuliginosus*) right picture.



Plate 7: Beach stone-curlew (*Esacus magnirostris*) left picture, resting on rocks in Kerosene Inlet and bush stone-curlew (*Burhinus grallarius*) roosting in the site compound at Fingal Head Beach.



Plate 8: Pipi (*Donax deltooides*) with evidence of being opened by a pied oystercatcher (note the chiseling on top right edge) and beach stone-curlew tracks with two small ghost crab (*Ocypode* spp) legs (centre and right). Shorebirds often discard undigestible parts of crabs.

A pair of sooty oystercatchers (Plate 6) was recorded foraging on beach cast cunjevoi (*Pyura praeputialis*) in survey 6, and up to four bush-stone-curlews (2 adults and 2 chicks, Plate 7) were recorded in the sand bypass site compound on four occasions. There is no evidence that bush-stone-curlews utilise the beach within the study area, although the species has been recorded at the south end of Fingal Head Beach (D. Charley pers comm).

Sub-order Lari

Four species belonging to the sub-order Lari were recorded in the study area (Table 3). None of which are listed as threatened in Australia, although the common tern is listed on International Migratory Bird Agreements. Silver gull (Plate 9) and crested tern (Plate 10) were the most common species, with gulls present during each survey and crested terns present during 91% of surveys. The number of silver gulls ranged from 7 to 140 with individuals displaying a range of behaviours (i.e. roosting, foraging and in transit) during each survey. Silver gulls were often distributed in a loose flock throughout the entire study area. In contrast, crested terns were most abundant in nearshore waters where they were observed foraging. A single common tern was recorded roosting with gulls and crested tern, and a single Australian tern was recorded foraging in the study area during survey 2.



Plate 9: Silver gull (*Chroicocephalus novaehollandiae*) roosting (left) and in flight (right).



Plate 10: Crested tern (*Thalasseus bergii*) adults displaying (left) and adult in flight (right).

Other species

The six other species recorded were eastern osprey (*Pandion cristatus*), brahmyn kite (*Haliastur indus*), pied cormorant (*Phalacrocorax varius*), little pied cormorant (*Microcarbo melanoleucos*),

wedge-tailed shearwater (*Ardenna pacifica*) and white-faced heron (*Egretta novaehollandiae*). Eastern osprey is listed as threatened in NSW and wedge-tailed shearwater is listed on the Japan-Australia Migratory Bird Agreement (JAMBA). A pair of eastern osprey nest on the sand pumping jetty and 1-2 individuals were recorded in nine of 11 surveys. Pied cormorant was recorded transiting the study area, moving between Cook Island and the Tweed River during six surveys with little pied cormorant observed making the same movement once. Between three and 100 wedge-tailed shearwaters were recorded foraging in nearshore waters on two occasions. Brahminy kite and white-faced heron were recorded during one survey.

4.3 Shorebird habitat

4.3.1 Evidence of breeding and breeding habitat

Eastern osprey and bush stone-curlew displayed evidence of breeding in the study area. A pair of ospreys have a nest on the sand pumping jetty, although it was not active during the survey. Bush stone-curlews nest in the sand pumping site compound and in 2025 fledged two chicks. The study area does not contain potential breeding habitat for any resident shorebirds (i.e. pied oystercatcher, beach stone-curlew) or breeding migratory species such as the little tern. A well-vegetated foredune, high levels of human and dog activity and the absence of an expansive sandy area above spring high water with a shingle and sand substrate render the site unsuitable for breeding shorebirds.

4.3.2 Important habitats and habitat use

Observations of shorebird habitat use during the surveys enable some general comments on important sites within the study area (Figure 2). The distribution of beach stone-curlew tracks shows that this species prefers the area between the sand pumping jetty and southern breakwater. Bar-tailed godwit and eastern curlew prefer to roost at sites with the widest area of dry sand and due to frequent disturbance utilise multiple sites within the southern 2/3rds of the study area. The closest either species was recorded to the sand pumping jetty was 100 m to the south. Pied and sooty oystercatchers, common tern and Australian tern were not recorded in sufficient frequency to determine preferred habitat.

The distribution of roosting habitat for bar-tailed godwit and eastern curlew changed throughout the survey period due to erosion and changes in the beach profile. Tide height had a major influence on the availability of roosting habitat. The four surveys when bar-tailed godwit and/or eastern curlew were recorded coincided with high tides between 1.59 and 1.73 m AHD when sections of the beach had 30-40m wide areas of sand above high water. The width of dry sand during the two surveys with tides higher than 1.73m was reduced to 15-20 m.

Whilst more exposed sand was present during lower tides there would also be more alternate roosting habitat available in the estuary during these tides and those sites may be used preferentially to Fingal Head Beach. Results suggest that during the conditions experienced in summer/autumn 2025/2026 the beach was unsuitable for roosting during tides greater than 1.73 m and less than 1.59 m. This pattern is shown in Figure 2, which plots tide height against abundance of bar-tailed godwit and eastern curlew. A possible effect of wind speed on abundance of godwits and curlews is also evident (Figure 3), and Pearson Product Moment correlation analysis identified a slight negative correlation (-0.41) between these variables. Another factor that may influence use of the study area is disturbance at other high tide roosts in the Tweed Estuary, particularly Kerosene Inlet.

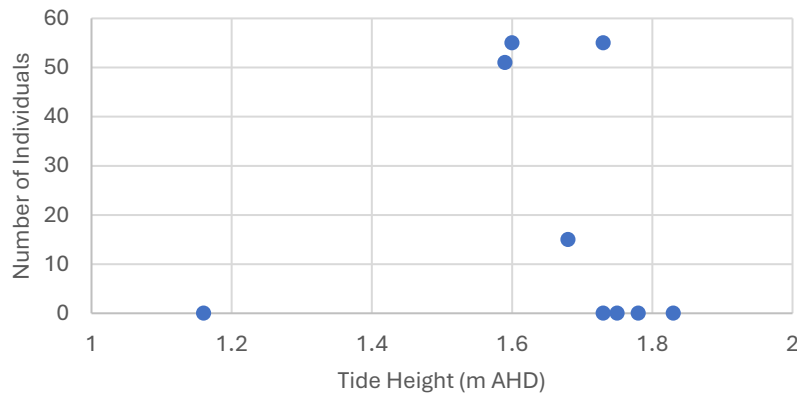


Figure 2: Scatterplot showing the number of bar-tailed godwit and eastern curlew recorded at different tide heights.

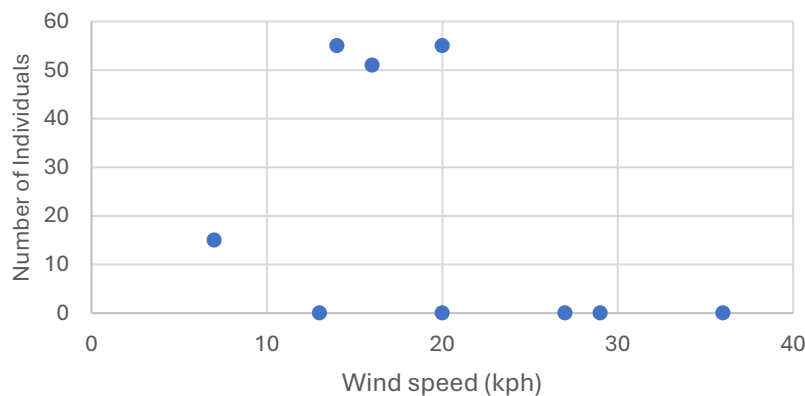


Figure 3: Scatterplot showing the number of bar-tailed godwit and eastern curlew and wind speed.

4.4 Kerosene Inlet

Five species of shorebird and two species of waterbird were recorded in Kerosene Inlet during mid-tide surveys on 14 and 19 January 2026 (Table 4). A pair of beach stone-curlews were recorded during both surveys and four pied oystercatchers, including two juveniles, were recorded on 19 January (Figure 4). Both the pied oystercatcher and beach stone-curlew are likely to breed in Kerosene Inlet. Migratory shorebirds recorded in Kerosene Inlet included Pacific golden plover (4 individuals), bar-tailed godwit (33 individuals) and whimbrel (1 individual).

Table 4: Species of shorebird and waterbird recorded in Kerosene Inlet during mid-tide surveys in January 2026.

Species	14 January 2026 (neap tide)	19 January 2026 (spring tide)
Beach stone-curlew	2	2
Australian pied oystercatcher	1	4 (1 juvenile)
Pacific Golden Plover	4	4
Bar-tailed godwit	0	33
Whimbrel	0	1
Little egret	1	0
Striated heron	1	0

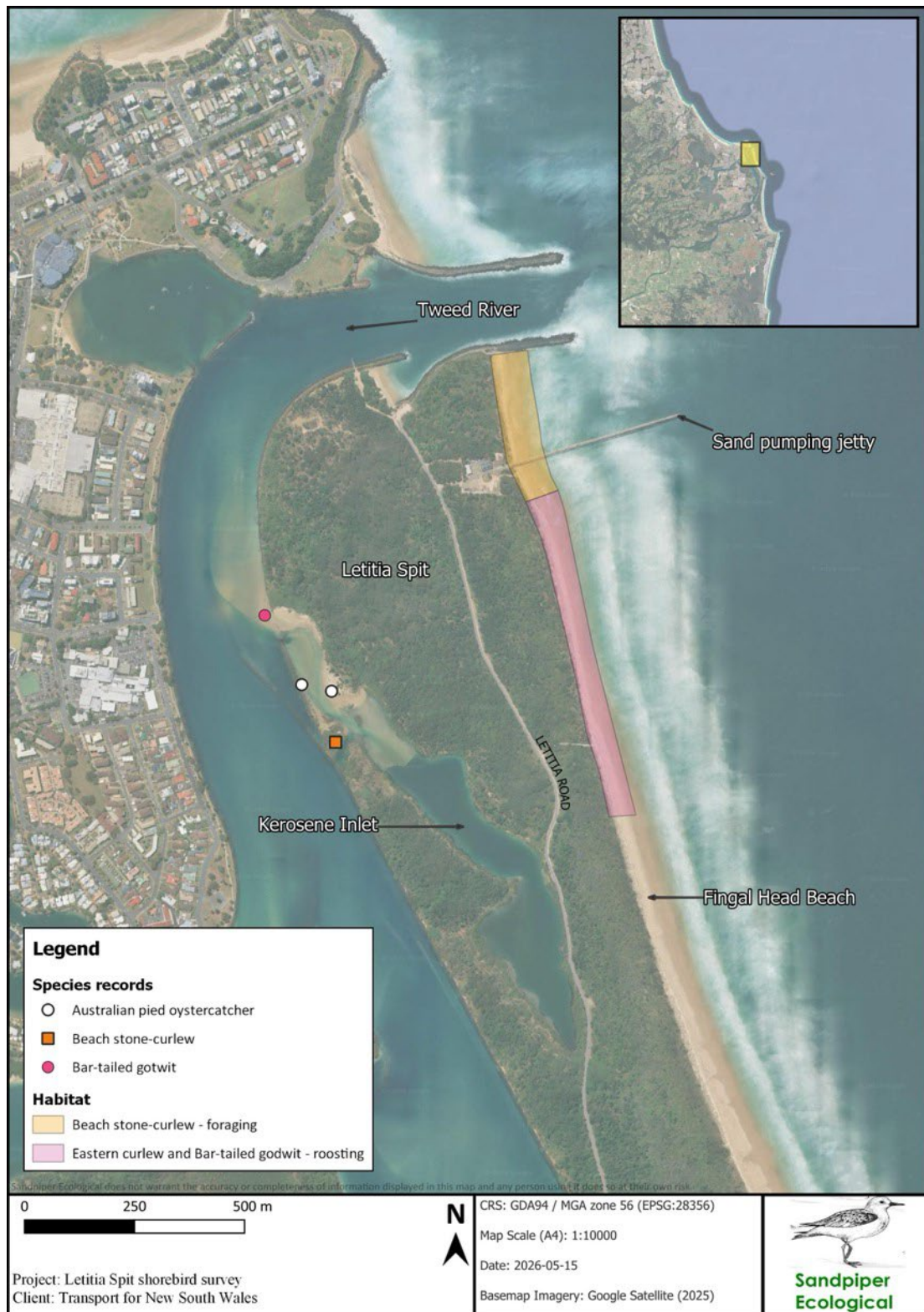


Figure 4: Location of important shorebird habitat on Fingal Head Beach and threatened species records in Kerosene Inlet.

5 Discussion

5.1 Significance of Fingal Head Beach for shorebirds

Five of the eight priority species identified by the desktop assessment (Sandpiper Ecological 2025) were recorded in the study area during the 2025/2026 surveys. Two of the three species not recorded, whimbrel and Pacific golden plover, were recorded in Kerosene Inlet and have a moderate probability of using the study area. The third species, little tern (*Sterna albifrons*) may occasionally roost on Fingal Head Beach during southern or northern migration. Importantly, five of the species recorded are listed as threatened on either or both the NSW *Biodiversity Conservation Act 2016* or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (Table 5).

Table 5: Legislative status of seven species recorded during the 2025/26 bird surveys at Fingal Head Beach. E = endangered, V = vulnerable, CE – critically endangered, J – Japan-Australia Migratory Bird Agreement (JAMBA), C – China-Australia Migratory Bird Agreement (CAMBA), K – Korea-Australia Migratory Bird Agreement (ROKAMBA).

Common Name	Scientific Name	NSW status	Commonwealth status
Sub-order Charadrii			
Bush Stone-curlew	<i>Burhinus grallarius</i>	E	
Beach Stone-curlew	<i>Esacus magnirostris</i>	CE	
Bar-tailed Godwit	<i>Limosa lapponica</i>	E	V, C, J, K
Eastern Curlew	<i>Numenius madagascariensis</i>	CE	CE, C, J, K
Pied Oystercatcher	<i>Haematopus longirostris</i>	E	
Sooty Oystercatcher	<i>Haematopus fuliginosus</i>	V	
Sub-order Lari			
Common Tern	<i>Sterna hirundo</i>		C, J, K

Consistent use of Fingal Head Beach by bar-tailed godwit, eastern curlew and beach stone-curlew in 2025/26 is a positive outcome for their respective local populations and the sand bypassing project. Benefits to local populations accrue from having multiple high tide roosts to use as required, and their presence on the beach shows that despite initial recession shorebirds have returned to roost there. The value of Fingal Head Beach as a high tide roost is likely to have benefited from stable shoreline conditions in recent years. Despite the presence of a stable shoreline, birds roosting on the beach are subject to high levels of disturbance from humans and dogs (Plate 11), which reduces the sites value.

In summer/autumn 2025/26 the maximum count (i.e. sum of highest count for each species) of shorebirds (sub-order Charadrii) using the beach was 60 with five species recorded. This is substantially less than numbers in the late 1990's/early 2000's when peak counts of 195 bar-tailed godwit, 37 eastern curlew, and 26 whimbrels were recorded (Sandpiper Ecological 1997, 1999). At that time a pair of Australian pied oystercatcher was consistently recorded on the beach. Species richness in 2025/26 was also lower than during targeted surveys in 2009/10 when seven species were recorded including red-necked stint (*Calidris ruficollis*), red-capped plover (*Charadrius ruficapillus*) and wandering tattler (*Tringa incana*) (Sandpiper Ecological

2010). The maximum count of bar-tailed godwit in 2009/10 was 103 individuals, although no eastern curlew was recorded at that time.



Plate 11: Roosting eastern curlew and bar-tailed godwits are often flushed by walkers on Fingal Head Beach. This flock was flushed on four occasions by the same walker.

Confirming the value of Fingal Head Beach for the local shorebird population is impossible without data on the number of shorebirds using the Tweed River Estuary as the sites are interconnected. Fingal Head Beach forms part of the matrix of roost and foraging areas for the local shorebird population that inhabits the Tweed River Estuary. Some general conclusions include:

1. Fingal Head Beach may provide roosting habitat for the majority of eastern curlew and bar-tailed godwit that forage in the lower estuary, that is, in the main river channel downstream of Chinderah, and the lower reaches of Terranora Creek. More expansive surveys are required to confirm the importance of the beach to the local populations of both species. Based on historical survey data (i.e. Sandpiper Ecological 2003), patterns of population decline at other north coast estuaries and discussion with a local ornithologist the number of birds using the study area may represent 50% of the local eastern curlew population and 25% of the local bar-tailed godwit population.
2. Fingal Head Beach provides foraging habitat for the local breeding pair of beach stone-curlews and a breeding pair of Australian pied oystercatchers.

Use of the beach by a substantial proportion of the local population of the critically endangered eastern curlew and endangered bar-tailed godwit, and beach stone-curlew means the study area is of local conservation significance. Based on the most recent East-Asian Australasian Flyway population estimates the site is not of international significance (van Swinderen *et al.* 2025).

5.2 Habitat use

Habitat use by migratory shorebirds in north coast estuaries is complex with birds moving throughout an estuarine system in response to daily and monthly tidal regimes. Overlaying these regular patterns of movement are the energetic demands of migration, lunar phases, and human

activity. Put simply, migratory shorebirds seek to maximise their food intake and minimise energy expenditure whilst moving between roost and feeding sites. They do this daily by selecting the most profitable feeding areas, in the prevailing conditions, and roosts that are close to these areas (Rogers 2003). In the lower Tweed Estuary key foraging habitat occurs around Ukerebagh Island, Tony's Bar/Shallow Bay and Chinderah Bay, with key roosts at Kerosene Inlet and Fingal Head Beach. Tony's Bar is likely to provide roosting habitat during neap tides and there are several mangrove roosts.

Determining the relationship between Fingal Head Beach and the estuary is difficult without comparative surveys of the estuary. Based on data collected in 2025/26 and historical surveys of the estuary (see Sandpiper Ecological 2003) it seems that eastern curlew and bar-tailed godwit utilise Fingal Head Beach during lower spring high tides with use likely to be influenced by disturbance at the Kerosene Inlet roost and wind speed. Regular use of the beach at low tide is unlikely due to high levels of disturbance and distance to feeding grounds.

5.3 Future monitoring

A suggested program to monitor shorebirds at Fingal Head Beach is provided in Table 6. Recommended target species are bar-tailed godwit, eastern curlew and beach stone-curlew, although all members of the order Charadriiformes should be recorded. Surveys should occur between October and February for three consecutive years, with seven surveys each year. Inclusion of Kerosene Inlet as a reference site is recommended to enable Fingal Head Beach to be considered in a local context.

Table 6: Suggested monitoring program for Fingal Head Beach.

Component	Recommendation
Target group	Order Charadriiformes
Priority species	Eastern curlew, bar-tailed godwit, beach stone-curlew. All shorebirds identified and counted
Benchmark	Beach stone-curlew – presence of tracks Bar-tailed godwit –20-35 individuals during 50% of surveys Eastern Curlew-15-30 individuals during 50% of surveys
Effort	Seven surveys between October and February, one each in October, November and February and two each in December and January.
Timing	Target medium level high tides i.e. 1.5 m to 1.75 m AHD – consider beach profile when determining preferred tide heights Avoid days with rain and wind exceeding 20 kph
Duration	Annual surveys for three consecutive years with program reviewed at the end of the third year.
Study area	Northern 1.25 km of Fingal Head Beach and Kerosene Inlet
Reference site	Kerosene Inlet
Method	Walk traverse of Fingal Head Beach continually scanning the beach and nearshore waters for birds. Survey the sandspit, rock walls and nearby mangrove islands in Kerosene Inlet. Surveys undertaken within two hours of mean high water. All species recorded, number of individuals counted and location of important habitats recorded. Record bird behaviour (roosting, foraging or in transit) during each survey. Take general notes on habitat condition, particularly space above high water and beach profile, during each survey.

6 Recommendations

The following actions are recommended to improve management of threatened species habitat on Fingal Head Beach.

Tweed Sand Bypassing project recommendations:

1. Manage the Tweed Sand Bypassing program to maintain a stable equilibrium at the shoreline and whenever possible retain a 30-40m wide area of exposed sand during tides up to 1.75 m AHD.
2. Additional monitoring to be undertaken in accordance with Table 6 to establish a more rigorous baseline for shorebird presence on and use of the northern extent of Fingal Head Beach, at its current managed shoreline. The program would provide 3 additional years of data to support assessments of any future works.
3. Future monitoring must consider the dynamic nature of the beach environment and the effect that large swells and high tides can have on habitat suitability.
4. The Tweed Sand Bypassing operational environmental management plan should be updated to ensure noisy works and other disturbances to the beach from project activities are minimised between September and March.
5. Erect signage on the Tweed Sand Bypassing compound beach access and sand pumping jetty informing workers to avoid roosting flocks of birds on the beach, and to minimise noisy works between September and March.

Additional recommendations for land managers:

6. Signage should be installed at key beach access points at the northern and southern ends of Fingal Head Beach informing beach users to avoid roosting flocks of birds, particularly migratory shorebirds between September and March.
7. Dog use should be restricted on Fingal Head Beach for the southern 1600 m extending north from Fingal Head, and between the southern breakwater and sand pumping jetty.

7 References

Department of the Environment and Energy (2017). EPBC Act Policy Statement 3.21 – Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species. Commonwealth of Australia.

NSW Government (2025). Tweed Sand Bypassing: Environmental Monitoring Report May 2023 to April 2024. NSW Government.

Rogers, D. (2003). High-tide roost choice by coastal waders. *Wader Study Group Bulletin*: **100**: 73-79.

Rogers D.I. Battley P.F. Piersma T. Van Gils J.A. Rogers K. (2006). High-tide habitat choice: insights from modelling roost selection by shorebirds around a tropical bay. *Animal Behaviour*: **72**, 563-575.

Sandpiper Ecological (1997). Monitoring of estuarine birds in the Tweed River Estuary, report 3. Prepared for the Tweed River Management Committee.

Sandpiper Ecological (1999). Monitoring of estuarine birds in the Tweed River Estuary, report 8. Prepared for the Tweed River Management Committee.

Sandpiper Ecological Surveys (2025). Tweed Sand Bypass shorebird surveys desktop assessment. Report prepared for transport for NSW.

Sandpiper Ecological Surveys (2003). Monitoring estuarine birds in the Tweed River Estuary 1997-2002. Summary Report. Unpublished report prepared by Sandpiper Ecological Surveys for Tweed Shire Council.

Sandpiper Ecological (2010). Tweed River Entrance Sand Bypassing Project Little Tern Monitoring – 2009/2010. Report prepared for NSW Land and Property Management Authority.

Transport for NSW (2025). NSW Tides 2025/2026. NSW Government.

van Swinderen, L., Hansen, B.D., Fuller, R.A., Watkins, D., Rogers, D.I., Clemens, R.S., Newman, M., Woehler, E.J., Weller, D.R. and LeClair, S. (2025). Revision of the East Asian – Australasian Flyway Population Estimates for 37 listed Migratory Shorebird Species. Report for the Department of Climate Change, Energy, the Environment and Water. BirdLife Australia, Melbourne

Appendix A

Table A1: Survey timing and weather conditions

Date	Start	End	Temp	RH	Wind	Rain	CC	Tide	No people	No dogs	Foxes	Notes
11/11/2025	1330	1530	24	66	20 kph, NNE	Nil	NR	HT	NR	NR	NR	
11/12/2025	1400	1620	26	64	16 kph, east	Nil	60	HT	17 on beach, 17 in surf	2	0	Baitfish in wave zone many gulls, terns foraging offshore; dog tracks recorded throughout study area
19/12/2025	0815	1005	22	68	13 kph, Sth	Nil	40	HT	3 on beach, 3 in surf	0	0	Dog tracks throughout study area, substantially smaller area of dry sand available, 20m wide at main roost site
14/1/2026	1300	1430	27	64	31 kph, SE	Nil	10	LT	5 on beach	1	0	4wd tracks, beach is 50-60m wide nth & Sth of jetty
14/1/2026	1700	1825	27	66	29 kph, SE	Nil	10	HT	2 on beach; kite surfer at roost	1	0	Large expanse of sand 200-300m Sth of jetty
19/1/2026	0850	1040	23	82	36 kph, SSE	Nil	90	HT	Nil	Nil	0	Dog & fox tracks, max of 15-20m exposed sand in main roost area, 10-15m elsewhere
19/1/2026	1445	1545	25	70	50 kph, SSE	Nil	75	LT	Nil	Nil	0	Beach 65m wide at main roost
23/1/2026	1100	1245	25	74	27 kph, SE	Nil	60	HT	Nil	Nil	0	Tide is 1.73m, minimal beach exposed, only 10m of dry sand at main roost; beach profile has steepened due to combination of big tides & large swell
6/2/2026	1130	1245	27	57	14 kph, E	Nil	25	HT	15 (incl 8 surfers)	1	0	Beach profile steeper sand building near dune face. Roosting birds flushed repeatedly by walker

Date	Start	End	Temp	RH	Wind	Rain	CC	Tide	No people	No dogs	Foxes	Notes
16/2/2026	0830	1030	22	77	20kph, SSW	Nil	75	HT	5 on beach, 2 jet ski's	1	0	Survey conditions suitable, tide height has limited roosting space; approximately 20-30 of exposed sand from base of foredune
16/3/2026	0750	0950	21	75	7kph, SE	Nil	40	HT	2 people walking	3	0	Good survey conditions; beach profile flattened with evidence of sand accretion at base of foredune, beach 30-40m wide south of jetty, nil evidence of breeding.