# Adele Island Bird Survey Report

## 19th to 24th November 2004

**Adrian Boyle PO Box 3089 Broome WA 6725**
**George Swann PO Box 220 Broome WA 6725**
**Tim Willing PO Box 2838 Broome WA 6725**
**Tim Gale PO Box 175 Mareeba Qld 4880**
**Lisa Collins PO Box 175 Mareeba Qld 4880**

***Great Knot, One of the most numerous shorebirds recorded during the survey.***

# Contents

## Introduction

Adele Island lies 150km north of Cape Leveque on Dampier Peninsula Western Australia 15° 31' S 123° 09' E. In 2001, Adele Island was transferred from Commonwealth to State tenure and vested as a Class A Nature Reserve (No. 44675) for conservation of Flora and Fauna. It is regarded as a very important seabird nesting island supporting large numbers of birds including the Lesser Frigatebird, Brown Boobies, and Common Noddies. Since 1989, naturalist Kevin Coate (with various associates) has participated in a number of dry season expeditions to the island and published important papers on Adele Islands seabirds (1994, 1995 & 1997).

Adele Island is also home to thousands of Polynesian rats (*Rattus exulans*). Rats were first recorded by Europeans when J.J .Walker, Royal Navy landed on Adele Island on 2 May 1891. They were likely introduced onto the island by a ship wreck or a boat landing as the genetics prove that the rats are of Indonesian origin. These rats are thought to have a large impact on the nesting birds by eating eggs and nestlings.

In late November 2004, the Department of Conservation and Land Management (CALM) obtained funding to lay 10,000 baits on the island to eradicate the rats. This provided an opportunity for four ornithologists to conduct an accurate count of all shorebirds along with counts of most of the other bird species present.

In 2000 and 2002 Adele Island was visited by George Swann, who noted the presence of large number of migratory shorebirds (Swann 2002 unpublished). It was thought that Adele Island might hold nationally and internationally important numbers and hence the island could meet the criteria for Ramsar nomination. Due to problems with tides, time and lack of counters, an accurate count of shorebirds had not taken place previously.

The timing of the baiting and therefore the shorebird survey was chosen due to November being the only available time when CALM was able to charter the tourist vessel *Kimberley Quest 2*. However, November is a good time to count shorebirds as the large majority of migration has already occurred and this would allow surveyors to be sure that the birds being counted at this time of year would be sedentary at least until northward migration in March and April.

Accordingly, this ornithological survey was the first to be conducted at Adele Island during summer months with a specific focus on migratory shorebirds.

## Site description

Adele Island is approximately 3km by 1.6km. It is a very low lying island that is surrounded by extensive sand flats. These sand flats extend up to 25km out from the island at low tide. The extensive sand flats are broken up by many sea water channels which are best developed at Fraser Inlet. The shallower channels can quickly fill with water on incoming tides and people can easily be cut off from the island.

In the south and particularly towards the North West of the island several large sand bars have formed and provide roosting areas for many birds during the lower tides. These sand bars are devoid of vegetation.

The main island itself is shaped like a large fish hook with a wide base towards the south. On the NNE side of the island an inlet has formed that opens up to a large tidal lagoon. This lagoon takes up approximately one quarter of the island and water is only present during or just after high tides. (See appendix A)

The island is covered by unusually dense Beach Spinifex *(Spinifex longifolius)* but in and around the lagoon there are large amounts of Saltwater Couch Grass (*Sporobolus virginicus)*. At the southern end of the lagoon there are a few stands of Lantern Flower *(Abutilon indicum).* These bushes are where the Red-footed Boobies were recorded breeding. Around the island, where only very extreme tides reach, are dotted Prickly Saltwort (*Salsola kali*) bushes. They become more numerous on the western side of the island where they form a hedge like structure along the upper beach.

During the survey, the sky was generally clear with cloud build up in the distance. Generally, the temperatures over the survey period were in the high 30's and humidity was high. On the first evening a large storm arrived with medium to heavy rain and strong winds. By the morning it had passed and only light cloud cover remained. On the 22$^{nd}$ November another storm arrived at about midday. The rain was very heavy and was combined with heavy thunder and lightning. The temperature remained unusually cool for the rest of that day.

## Methods

### Counts

Access to the island was made daily via dinghy trips from the main vessel *Kimberley Quest 2*. The timing of our arrival each day was governed by the tides, so each day the survey started later by approximately 40 minutes. As access to the island could only be made via dinghy on the incoming tide, this affected the amount of time spent undertaking the survey. With the high tides occurring 12 hours apart, this enabled the surveyors to spend most of the day on the island.

As the island is too large for one team to survey team and accurately count, the team was split up into two groups and different areas of the island were counted simultaneously.

Shorebirds are easiest to count at high tide, when their feeding area is covered and the birds gather in large flocks for safety in numbers. During the first 3 days, the tides were low and therefore the shorebirds were generally dispersed and difficult to count. The surveyors counted as best they could over the large expanses of sand flat. Accordingly, the counts therefore in the first 3 days were not considered as accurate as those undertaken in the last 2 days.

The totals listed for the birds are the maximum number counted at a single time during the four days of survey, rather than a cumulative total.

The principal counters for the survey were:
Adrian Boyle (Ornithologist)
George Swann (Ornithologist)
Tim Gale (Broome Bird Observatory staff)
Lisa Collins (Broome Bird Observatory staff)

### Equipment used

The observers used the following equipment to record their observations:

Leica 10x42 Binoculars.
Leica 8x32 Binoculars.
Nikon 8x25 AP 051016 Binoculars
Kowa TSN-1 Telescopes
Swarovski Habicht ST80 Telescope

## Key Findings

The key findings of the survey count are summarized below:

**Shorebirds**

- Twenty six species of shorebird were recorded, of which twenty four were migratory.

- The total number of migratory shorebirds recorded during the survey period exceeded the 20,000 required to signify an area as being of international importance under the Ramsar Convention.

- Nine species exceed the 1% criteria for international importance:

    - 4819 Bar-tailed Godwit exceed the current 1% criteria of 3300;
    - 604 Terek Sandpiper exceed the current 1% criteria of 360;
    - 5489 Grey Tailed Tattler exceed the current 1% criteria of 480;
    - 1250 Ruddy Turnstone exceed the current 1% criteria of 280;
    - 449 Sanderling exceed the current 1% criteria of 110;
    - 564 Grey Plover exceed the current 1% criteria of 160;
    - 2046 Greater Sand-plovers exceed the current 1% criteria of 990;
    - 671 Lesser-Sand Plover exceed the current 1% criteria of 270;
    - 1366 Little Terns exceed the current 1% criteria of 1000;

**CAMBA**

- Forty species of birds recorded during the survey are part of the agreement between the Governments of Australia and the People's Republic of China for the Protection of Migratory Birds and their Environment, (the China-Australia Migratory Bird Agreement-CAMBA) of 20 October 1986.

**JAMBA**

- Thirty seven species of birds recorded during the survey are part of the agreement between the Governments of Australia and Japan for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment, (the Japan-Australia Migratory Bird Agreement-JAMBA) of 6 February 1974.

**Turtle sightings**

During the circumnavigation of the island 8 fresh turtle nests were counted. These were presumed to be Green Turtles (*Chelonia mydas*). Green Turtles were also seen mating close to shore on several occasions.

### Flag sightings

Flagging of migratory shorebirds has been conducted in Victoria since January 1990, and at Broome and the Eighty Mile Beach (situated between Broome and Port Hedland) and Port Hedland Salt Works since August 1992. The first two projects are ongoing, whilst research finished at Port Hedland in October 2001. More recently, this research marking method has been used in the countries of the East Asian-Australasian Flyway. This method of marking birds allows data collection to be made without having to catch a bird more than once. The small plastic coloured 'flags' are placed on the bird's upper leg and can be readily viewed with a telescope by experienced observers. The unique colour combinations used by each country then identify where these individuals were banded.

One **Pied Oystercatcher** (*Haematopus longirostris)* was seen on the 20/11/04 with a yellow leg flag on the right tibia which had been placed on the bird sometime since August 1992 in North West Australia (most likely at Broome as this is where the majority of this species had been flagged.) This is a movement of at least 406km from its original banding location and is so far the greatest known movement by this species in North West Australia.

One **Grey-tailed Tattler (***Heteroscelus brevipes)* was sighted on 20/11/04 with a blue leg flag on the left tibia. This bird had been banded at Furen Lake, Nemuro City, Hokkaido, Japan sometime since August 1997. This is a movement of at least 6922km.

One **Bar-tailed Godwit (***Limosa lapponica)* was seen on the 20/11/04 with a white flag over a black flag on the right tibia. This bird had been banded at Chongming Island, Shanghai, China sometime since April 2003. This is a movement of at least 5225km.

One **Bar-tailed Godwit (***Limosa lapponica)* was seen on the 22/11/04 with a white flag on the left tibia (orange flag presumed missing). By a process of elimination, this bird is thought to have been banded on the Korean peninsula sometime since 1998. This is a movement of at least 5741km.

## Conclusion

This survey supported the initial observations made by George Swann in Oct 2000 and Oct 2002 that large numbers of migratory shorebirds use Adele Island. The populations suggest that Adele Island is an internationally important site for shorebirds with at least nine species exceeding the 1% criteria required under the Ramsar Convention.

## Recommendations

1. Adele Island is recommended for recognition as a Ramsar site due to it meeting the Ramsar criteria, as detailed below:

    - ❑ Criterion 5: Waterbird or Seabird concentrations. Site known or thought to hold, on a regular basis, more than 20,000 waterbirds or 10,000 pairs of seabirds of one or more species. Adele Island fulfills this criterion with 24,070 shorebirds and 29,884 terns recorded in this survey.
    - ❑ Criterion 6: A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of waterbird. On Adele Island nine species were found to be in internationally significant numbers.

    The terrestrial area of Adele Island has been a Class A Nature Reserve (No.44675) for conservation of Flora and Fauna since 2001. From a Ramsar perspective, it is still important to reserve the surrounding intertidal and marine habitat. The authors accordingly support previous recommendations by Burbidge (1991) and CALM (1994) for either a Class A Marine Nature Reserve (Burbidge) or its equivalent under Commonwealth legislation (CALM 1994).

2. Further survey counts of shorebirds and terns should be conducted on Adele Island as the island may play a significant role as a staging post for many migratory shorebirds during Northward (March and April) and Southward (September and October) migration. This may increase several species counts for the island. Further surveys have the potential to increase species counts for the island.

    It is also recommended that any future counts should be conducted on tide heights greater than 5.6m and that dinghy rides should be made available for some counters to focus attention on several sandbars located on the North West side of the island particularly, on the lower tides.

3. Silver Gull numbers need to be closely monitored as gull numbers on adjacent seabird breeding islands (eg Lacepede Islands) have rapidly increased in recent years and intensified predation on the nesting seabirds and nesting turtles.

4. Further counts of non-shorebird species should be undertaken on the island to see if the rat baiting program has had any effect on breeding numbers of birds, due to reduced predation rates.

5. Sampling of benthic invertebrates should be taken to identify food sources for the shorebirds. Adele Island is prone to cyclones due to its exposure and location off the North West coast and therefore cyclones may have a huge impact on sediment, food and formation of sand banks. Cyclone impacts could possibly help explain fluctuations of shorebird numbers in future counts.

## Acknowledgements

Department of Conservation and Land Management, West Kimberley, for organizing and providing this valuable opportunity to get an accurate count of the bird life on Adele Island.

Pearl Sea Coastal Cruises for being extremely professional, flexible and enthusiastic towards the research. Without their great cooperation, the trip would not have been half as enjoyable. Capt Neil Harding and his crew Ben Bonnet, Wayne Harling and Jarrad Butt provided numerous dinghy shuttle runs for surveyors to and from the island. Ona Klova, Natalie Jones and Amelia Grant provided breakfasts and packed meals at uncivilized hours. Anouk and Thomas Harding assisted with the bird survey.

Andrea Spencer and Chris Hassell is thanked for commenting on a draft of this report.

## Participants on the expedition

**CALM staff**
Tim Willing (Acting Nature Conservation Leader West Kimberley District)
Kirsten Pearce (Nature Conservation Officer, Kimberley Region)
Kevin Lockyer (National Park Ranger, West Kimberley District)
Mitch Hunter (National Park Ranger, West Kimberley District)
Brad Rushforth (Wildlife Officer, East Kimberley District)

## Volunteers

Adrian Boyle (Ornithologist)
George Swann (Ornithologist)
Timothy Gale (Broome Bird Observatory staff)
Lisa Collins (Broome Bird Observatory staff)
Shayne Thomson (Video/film producer)
Nicole Power (Student, Lands Parks and Wildlife Mgmt Cert 3, Kimberley College of TAFE)
Chris Hill (Artist, botanical interest)
Samudra Sarubin (Surveying student - Curtin University)
Pamela Jennings (CALM Seasonal Ranger and Photographer)
Gayle Keys (Environmental Officer, Kimberley Diamonds, Ellendale Mine)

## Annotated List of the bird species

**Brown Quail *(Coturnix ypsilophora)***
This species was generally observed in pairs, being flushed from Salt-water couch grass (*Sporobolus virginicus)* on the edges of the lagoon. A maximum count of 6 was recorded.

**Streaked Shearwater *(Calonectris leucomelas)***
Only a single bird was observed on the first day feeding with a large flock of Noddies approx 200m off the Island.

**Red-footed Booby *(Sula sula)***
An uncommon species with a maximum of 14 individuals counted at one time. Adults had nearly finished nesting with only 2 large chicks remaining, unable to fly. All nests, both those in use and abandoned ones, were in Lantern Flower (*Abutilon indicum)* bushes on the Southwestern side of the lagoon.

**Masked Booby *(Sula dactylatra)***
This species was extremely common, loafing on the southern side of the island and this is where majority of the individuals were found. There were many recently fledged young on the beaches. However, one semi-naked chick was being brooded inside the lagoon and a single fluffy white chick on the western side of the island. A total of 694 individuals were counted.

**Brown Booby *(Sula leucogaster)***
This species was very common and was very hard to accurately count, due to many individuals being in the air at one time. A count of 2935 birds is a great underestimate of the individuals present. The only breeding seen during the survey was several nearly fledged young, amongst Beach Spinifex grass. Many old nests were visible in bare areas of the island, particularly around the lagoon. Hundreds of recently fledged young were repeatedly seen around the island.

**Pied Cormorant *(Phalacrocorax varius)***
This species was always present around the island but the largest concentrations occurred at high tide, particularly on the sand bars to the north west of the Island. A total of 723 birds were recorded during the survey.

**Australian Pelican *(Pelecanus conspicillatus)***
A count of 143 was recorded. Adult birds were sighted fishing in the shallows or roosting on the island itself at high tide. No breeding was observed during the visit.

**Lesser Frigatebird *(Fregata ariel)***
This species was extremely common and was found nesting in several perimeter areas on the island.
The largest nesting colony was on the southern end of the lagoon. All nesting colonies were feeding fledging or recently fledged chicks.

As birds were constantly arriving, departing, feeding or sitting with chicks, it was very hard to get an accurate population estimate. 2210 birds were counted, but is a very conservative count.

**Greater Frigatebird (*Fregata minor)***
This species was probably more common than the count of 6 suggests. Due to the similarities between the Lesser Frigatebird, they are easily overlooked. No confirmed nesting was recorded during the survey.

**White-faced Heron *(Egretta novaehollandiae)***
Two individuals were recorded during the survey at high tides, roosting with Eastern Reef Egrets.

**Eastern Reef Egret *(Egretta sacra)***
Generally seen feeding scattered across the large sand flats at low tide, but were also seen to congregate at high tide. This was when we were able to obtain a count of 315 individuals. One nest containing two eggs was found on the island.

**Great Egret *(Ardrea alba)***
This species was more common than anticipated on the island as it does not seem ideal habitat for them. A count of 41 was obtained.
Many of the birds were in full breeding plumage and some appeared to be displaying.
Despite searching, no nests were located.

**Little Egret *(Egretta garzetta)***
This species was not common with a total of only two being counted during the survey.

**Nankeen Night Heron *(Nycticorax caledonicus)***
This species was generally observed early in the morning on exposed sand banks, as the tide was rising.
The herons were also seen flying during the day when they were accidentally flushed from their roosts, whilst the rat baiting program continued. A count of 52 individuals was obtained.

**Buff-banded Rail *(Gallirallus philippensis)***
A species easily over-looked due to the shy nature of this species. The count of 14 would be surely a huge underestimate. Individuals were observed briefly across the whole island in the thick Beach Spinifex *(Spinifex longifolius).*

**Black-tailed Godwit *(Limosa limosa)***
Only 2 individuals were encountered. This species prefers fresh water or very muddy estuarine creeks to feed in. Accordingly, it was not expected to count a large number of this species on this island.

**Bar-tailed Godwit *(Limosa lapponica)***
4819 birds were recorded during the survey and this easily exceeds the 1650 birds required for national significance; the count also exceeds the 3300, or 1% required for international importance.

**Whimbrel *(Numenius phaeopus)***
A total of 69 Whimbrel were counted. This species feeds mostly on shrimps and crabs. Having vast areas of sand exposed at low tide, one would expect there to be ample food for this species. A total of 69 is not an exceptionally large number. It may be that this species peaks in numbers at other times of the year on Adele.

**Eastern Curlew *(Numenius madagascariensis)***
Similar to Whimbrel in regards to its food source, it is not surprising that we also only recorded a low number of individuals, 57 in total.

**Common Redshank *(Tringa totanus)***
A species that is rare in Australia, but locally common in small areas in North West Australia. During the survey a single individual was counted.

**Marsh Sandpiper *(Tringa stagnatilis)***
A small count of four was counted during the survey. This is a species that prefers brackish or fresh water habitats. Accordingly, it was not expected to record large numbers of this species.

**Common Greenshank *(Tringa nebularia)***
A large count of 239 was made, making it a national area of importance for this species.
This species was evenly distributed around the island.

**Terek Sandpiper *(Xenus cinereus)***
It was expected to record a large number of this species, as sand flats are a favoured feeding habitat.
A total count of 604, which is quite large, nearly doubles the required number to signify it as an area of international importance.
This species was evenly spread around the island when feeding, but quite a few individuals stayed out on the exposed sandbanks on the northern end of the island during the lower high tides.

**Common Sandpiper *(Actitis hypoleucos)***
Unlike its name, this species is never common at least in numbers, rather than its worldwide distribution. This species is usually solitary when feeding and roosting and is never recorded in large numbers. It is not surprising that we only recorded four individuals.

**Grey-tailed Tattler *(Tringa brevipes)***
This was the most numerous shorebird species on the island. A count of nearly 5500 was recorded and clearly outnumbers the 480 required to indicate an internationally important area for this species. It is interesting that there are such

a large number present on Adele, as this species usually favours rocky shorelines: particularly when roosting.

**Ruddy Turnstone *(Arenaria interpres)***
This species was very common on Adele Island during the survey. A count of 1250 clearly outnumbers the 280 bird requirement to signify the area for international importance.

**Great Knot *(Calidris tenuirostris)***
This species was also common on the island during our survey. Although not enough individuals were recorded to signify the area for international importance, the total was only 245 short of the 3190 required. This is still a significant count that could well be higher at other times of the year, when birds would be migrating either north or south.

**Red Knot *(Calidris canutus)***
This species is clearly declining in numbers world wide. A count of 51 was made which is well below national and international threshold numbers. However these figures may need to be revised, due to its recent decline. Red Knots feed on bivalves and these are most numerous in a muddy substrate. Accordingly, it was expected to only find a relative small population using the sandy areas of the island.

**Sanderling *(Calidris alba)***
This species favours areas with sandy areas, particularly edges where surf breaks. Adele Island is ideal habitat and it is not surprising to have recorded nearly 450 individuals. This is more than four times the requirement for international recognition. It is known that this species transits in large numbers through the North West on their journey to Southern Australia (as per flag sightings). Counts in the North West indicate that early to mid October is the peak time for this species to pass through. It is predicted that Sanderling numbers would be even higher, if surveyed during this period.

**Red-necked Stint *(Calidris ruficollis)***
Adele Island is an ideal habitat for this species and a total of nearly 4110 birds recorded illustrates this. This total is slightly under the requirement for international status, but still enough to warrant national recognition.

**Pectoral Sandpiper *(Calidris melanotos)***
A single adult of this species was recorded on the 21/11/04, feeding on the mudflats on the north east side of the island.

**Curlew Sandpiper *(Calidris ferruginea)***
This species (just like the Red Knot) seems to be experiencing a decline in its population. 493 individuals were counted. This was not unexpected, due to low numbers being recorded in other survey areas across Australia in the recent years.

**Broad-billed Sandpiper (*Limicola falcinellus)***
This species is rarely recorded in large numbers so a count of 21 is not unexpected.
Individuals were evenly spread throughout the loafing flocks.

**Pied Oystercatcher *(Haematopus longirostris)***
This species probably breeds on the island, but no breeding was recorded during the survey. Nearly 50 individuals were counted. One leg-flagged individual, most likely flagged at Broome, was observed on the island.
This is the first evidence of movements of individuals from the mainland to Adele Island.

**Black winged Stilt (*Himantopus himantopus)***
A pair of adults was recorded on all survey days. Although not surprising to see on an offshore island, it is not a preferred habitat. These individuals were most likely searching for feeding areas, as at this time of the year most of the fresh water lakes in the Kimberley are dry. It was expected that these individuals would depart once regular rain occurred on the mainland.

**Grey Plover *(Pluvialis squatarola)***
564 of this species were counted. This is an unexpectedly large number to be located in such a small area, as 160 birds in one area is considered internationally important. Sand flats are ideal habitats for plovers.

**Golden Plover *(Pluvialis fulva)***
Good numbers of this species were observed evenly around the island, with a total of 120 being recorded. This number is nationally significant.

**Red-capped Plover *(Charadrius ruficapillus)***
A low count of 14 was made, despite what seems a huge expanse of ideal habitat around the island. This species often associates with Lesser Sand Plovers, which were most numerous, so there appears to be no obvious explanation for their scarcity.

**Lesser Sand Plover *(Charadrius mongolus)***
This species seems to have declined in many areas around north west Australia. It is therefore encouraging to have a count of 671, which is well over double the requirement to signify an area for international importance. It is also worth mentioning that 90% of the individuals were recorded on the north western side of the island, with the rest of the birds being evenly spread around the island.

**Greater Sand Plover *(Charadrius leschenaultii)***
2046 individuals were recorded. As with the other plovers mentioned above, this habitat must be ideal. This total is more than double the required total to signify an area of international importance. Unlike the Lesser Sand Plover, this species was not concentrated in any particular areas around the island.

**Oriental Pratincole *(Stiltia maldivarum)***
A single adult of this species was seen on most days at the northern end of the island. Oriental Pratincole is a species which rarely over-winters, due to the whole population en masse moving north into Asia during the northern summer. This is a species that often arrives in massive numbers once the summertime monsoonal trough reaches Northern Australia. Small numbers are known to arrive earlier into Australia and this is thought to be one of these.

**Silver Gull *(Larus novaehollandiae)***
A total of 174 birds were counted. This is higher than previous counts. George estimated 100 in Oct 2002 (Swann unpublished). It is thought that gulls would be higher in numbers during the dry season, when most Brown Boobies would be nesting. Monitoring of the gull population with possible control of numbers may need to be looked at in the future.

**Gull-billed Tern *(Sterna nilotica)***
100 individuals were counted with the majority loafing at the northern end of the island.
Unfortunately the exact race of these individuals could not be determined.

**Caspian Tern *(Sterna caspia)***
The totals on the island were 43 individuals. No breeding was observed although on other surveys it has been recorded, but these records were all from May (Coates 1997).

**Lesser Crested Tern *(Sterna bengalensis)***
A total of 32 were recorded. This species has been recorded breeding in the past on Adele, but no evidence was found on this visit. On 25/11/04 the same survey team visited the Lacepede Islands and recorded over 250 chicks there, suggesting that this species could possibly have changed its breeding site.

**Crested Tern *(Sterna bergii)***
A total of 38 birds were recorded with the majority being recorded on the northern end of the island. No breeding activity was witnessed during our visit.

**Roseate Tern *(Sterna dougallii)***
It was surprising that only 30 individuals were counted on Adele Island. With the large number of other terns in the vicinity, lack of food would clearly not explain this. Generally in October-November this species occurs in thousands on the relatively close Lacepede Islands, and also at various sites along the Dampier Peninsula. After the survey on Adele Island, the survey team spent one day on the Lacepede Islands, where a total of 13,000 Roseate Terns were counted. This could perhaps explain the lack of numbers on Adele Island.

**Common Tern *(Sterna hirundo)***
This species was generally seen loafing on sand at the northern end of the island. A count of 313 was recorded. This is a surprisingly low count. Common Terns often associate with Roseate Terns and, as shown above, they were also in low numbers. It can only be assumed that this species was at the time of the

count feeding along the coast of the Dampier Peninsula. This species was expected on the Lacepede Islands during the 25/11/04 survey, but none could be found, despite a count of 13,000 Roseate Terns being present.

**Little Tern *(Sterna albifrons)***
1366 Little Terns were counted, which is an exceptionally large count and exceeds the 1% international criteria required for Ramsar status. The terns were found most commonly on the North West side of the island, generally in two flocks, mixed with shorebirds. As all the Little Terns were in non-breeding plumage it indicates that the birds are not resident breeding birds in Australia but are part of the migrant population that visits Australia. No flagged birds were identified to indicate from where these birds had originated but banding studies in Broome have shown North West birds originate from or pass through Japan and Taiwan.

**Sooty Tern *(Sterna fuscata)***
A species which can be easily overlooked, due to its plumage closely resembling Bridled Tern. A total of 40 individuals were recorded, but as mentioned above, more individuals could have been easily overlooked. Most individuals recorded were identified by their diagnostic 'wide awake' call. No breeding could be confirmed.

**Bridled Tern *(Sterna anaethetus)***
This species was very common on and around the island. A total of 168 adult birds were recorded, but this is an extreme underestimate and only accounts for birds loafing on sand. Nests were not often seen, but due to numbers of birds constantly flying over the island, were suspected to be numerous. The nests discovered comprised small scrapes underneath clumps of Beach Spinifex *(Spinifex longifolius)*. Such nests were generally only discovered by accident, when an adult was flushed from its nest. Inspections of nests revealed the presence of single eggs. Sometimes the nests could not be located, as they were well hidden amongst the mass of vegetation. It was also suspected that some chicks may have avoided detection by moving into denser vegetation. Another reason for lack of nest data is due to the survey being primarily focused on migratory shorebirds and intertidal habitat. This is the first substantiated breeding record for this species at Adele Island.

**White-winged Black Tern (*Chilidonias leucopterus)***
Whilst scanning the loafing flocks of terns, a total of 10 individuals were recorded.
It would not be surprising if these individuals left Adele Island once rain increased on the mainland creating fresh water habitats for them to feed.

**Common Noddy *(Anous stolidus)***
This species was extremely common, being present all over the island. Common Noddies were at all stages of breeding in the Beach Spinifex *(Spinifex longifolius)* Nest building, eggs and small chick's as well as recently fledged chicks were all recorded. A minimum count of 26,930 individuals was made during a walk around the island; this count comprised mostly loafing individuals

on the bare sand particularly, around the northern end of the island. This count is by no means an accurate count of birds using the Island, as this did not take into account inland breeding and feeding birds which probably double this count.

Coate (1997) cites Common Noddy records as one (7/6/52), one (08/07/90), and approx 2-300 on 28/05/92 with no mention of breeding. Based on these records, it may be concluded that Common Noddy has either recently increased in numbers around the island or that they are only present towards the end of the dry season, when none of the previous surveys have taken place. Based on Higgins et al. (1996), incubation to fledging takes approximately 75 days. Due to the large number of recently fledged chicks present, adult Common Noddies would have had to arrive no later than the middle of August to produce these. The same authors surprisingly also do not mention Adele Island for number of birds or a breeding location for this species. This again is most likely due to the previous lack of surveys conducted at this time of year.

**Black Noddy *(Anous stolidus)***
This species was restricted to the narrow shore line and exposed mudflats on the north east side of the island. These birds were spread out and although there were often small numbers of Common Noddies mixed in with the flocks of Black Noddy, they generally loafed with their own species. This species appears to be on the increase and has only been recorded on the island in recent years. The first record being in October 2003 by G Swann. A conservative count of 600 was obtained but as with several of the counts made during the survey, birds were constantly coming and going. All individuals appeared to be adults with no immature or recently fledged birds identified. Breeding could not be confirmed during the survey period.

**Peregrine Falcon *(Falco peregrinus)***
The only sighting of this species was a lone individual, which circled the boat as we were about to drop anchor on the 19/11/04 while approaching the island from the south. This individual was a very heavily blotched juvenile.

**Horsfield's-Bronze-Cuckoo *(Chalcites basalis)***
4 birds were observed feeding together in Prickly Saltwort (*Salsola kali*) bushes on the 23/11/04. These birds, however, could not be located the next day when a search was made of the same area.

**Fork-tailed Swift *(Apus pacificus)***
A single of this species was observed hawking low over the island on both the 20$^{th}$ & 24th /11/04.

**Sacred Kingfisher *(Todiramphus sanctus)***
This species was observed on all survey days, generally on the edge of the vegetation line around the island, or feeding on open sand flats. The maximum daily count was 5.
One individual was found freshly dead with no obvious injury on the 23/11/04.

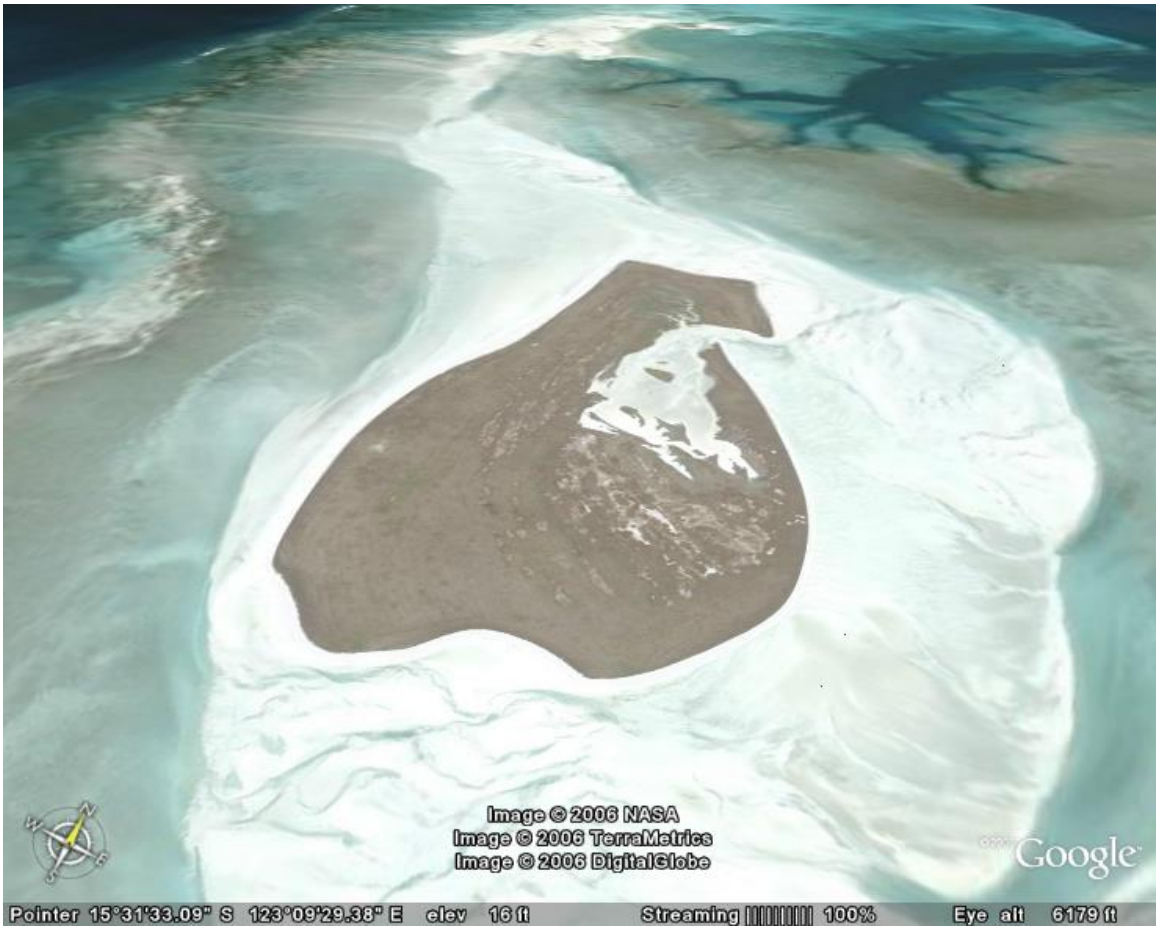
**Yellow Wagtail *(Motacilla flava)***
A lone Yellow Wagtail was seen feeding closely with a Grey Wagtail along a tide line on the 20/11/04 but could not be located again over the following four days.

**Grey Wagtail *(Motacilla cinerea)***
A lone Grey Wagtail was observed on the 20/11/04 on the western side of the island. As with the Yellow Wagtail, this species unfortunately could be not located again. This bird is very common in most parts of Asia: generally near creeks and rivers. It is however, a very rare bird in Australia. A full report of this sighting was submitted to the Birds Australia Rarities Committee (BARC) and has been assigned case number 461. This case was unanimously accepted by the committee and is the 16th record for Australia and the 3rd for WA.

**Tawny Grassbird *(Megalurus gramineus)***
This species inhabits Beach Spinifex *(Spinifex longifolius)* and appears to be very common on the island. Due to the density and height of the Spinifex, it was hard to obtain an accurate count. Whilst helping to lay rat bait across the island, 80 individuals were recorded.

**Oriental Reed-warbler *(Acrocephalus orientalis)***
This species is a vagrant to Australia and a species that is very hard to separate from Australian Reed Warbler, unless it is heard calling or very good views are obtained. A individual was recorded on the 23/11/04 feeding in Prickly Saltwort (*Salsola kali*) bushes, in association with Horsfield's Bronze-Cuckoos. Identification was not certain on this date and so on the 24th a successful attempt to catch this individual proceeded. Plumage characteristics and measurements confirm this identification and a report to the Birds Australia Rarities Committee (BARC) is being prepared.

## Appendix A




The above satellite image shows Adele Island, its lagoon and its extensive surrounding sand banks. These features have developed on top of a major coral reef platform with significant deep channels in the north east visible at Fraser Inlet.

## Appendix B

### SHOREBIRD TOTALS

**This table details the number of shorebirds and indicates the minimum requirement for a location to be designated a site of national or international importance under the Ramsar Convention.**

| English Name | Latin Name | Totals | National | International |
|---|---|---|---|---|
| Black-tailed Godwit | *Limosa limosa* | 2 | 810 | 1620 |
| Bar-tailed Godwit | *Limosa lapponica* | 4819 | 1650 | 3300 |
| Whimbrel | *Numenius phaeopus* | 69 | 100 | 400 |
| Eastern Curlew | *Numenius madagascariensis* | 57 | 190 | 210 |
| Common Redshank | *Tringa totanus* | 1 | # | # |
| Marsh Sandpiper | *Tringa stagnatilis* | 4 | 90 | 900 |
| Common Greenshank | *Tringa nebularia* | 239 | 200 | 400 |
| Terek Sandpiper | *Xenus cinereus* | 604 | 180 | 360 |
| Common Sandpiper | *Actitis hypoleucos* | 4 | 30 | 300 |
| Grey-tailed Tattler | *Heteroscelus brevipes* | 5489 | 360 | 480 |
| Ruddy Turnstone | *Arenaria interpres* | 1250 | 140 | 280 |
| Great Knot | *Calidris tenuirostris* | 2945 | 3190 | 3190 |
| Red Knot | *Calidris canutus* | 51 | 1530 | 2550 |
| Sanderling | *Calidris alba* | 449 | 80 | 110 |
| Red-necked Stint | *Calidris ruficollis* | 4107 | 3530 | 4710 |
| Pectoral Sandpiper | *Calidris melanotos* | 1 | # | # |
| Curlew Sandpiper | *Calidris ferruginea* | 493 | 1880 | 2550 |
| Broad-billed Sandpiper | *Limicola falcinellus* | 21 | 80 | 160 |
| Oriental Pratincole | *Glareola maldivarum* | 1 | 600 | 670 |
| Pied Oystercatcher | *Haematopus longirostris* | 48 | 100 | 110 |
| Black-winged Stilt | *Himantopus himantopus* | 2 | 2660 | 5320 |
| Grey Plover | *Pluvialis squatarola* | 564 | 120 | 160 |
| Pacific Golden Plover | *Pluvialis fulva* | 120 | 90 | 900 |
| Red-capped Plover | *Charidrius ruficapillus* | 14 | 950 | 950 |
| Lesser Sand Plover | *Charadrius mongolus* | 671 | 200 | 270 |
| Greater Sand Plover | *Charadrius leschenaultii* | 2046 | 740 | 990 |
| | | | | |
| **TOTAL** | | **24070** | | |

# No totals are given of national and international significance, as this species is classed as a vagrant to Australia.
Figures based on Watkins, D. RAOU report No.90.

## Appendix C

### TERN, NODDY AND GULL TOTALS

| English Name | Latin Name | Totals |
|---|---|---|
| Silver Gull | *Larus novaehollandiae* | 174 |
| Caspian Tern | *Sterna caspia* | 43 |
| Gull-billed Tern | *Sterna nilotica* | 100 |
| Common Tern | *Sterna hirundo* | 313 |
| Roseate Tern | *Sterna dougallii* | 30 |
| Sooty Tern | *Sterna fuscata* | 40 |
| Bridled Tern | *Sterna anaethetus* | 168 |
| Little Tern | *Sterna albifrons* | 1366 |
| Crested Tern | *Sterna bergii* | 78 |
| Lesser-crested Tern | *Sterna bengalensis* | 32 |
| White-winged Black Tern | *Chilidonias leucopterus* | 10 |
| Common Noddy | *Anous stolidus* | 26930 |
| Black Noddy | *Anous minutus* | 600 |
| **TOTAL** | | 29884 |

## Appendix D

**Shorebird and tern species with nationally or internationally important numbers**

| English Name | Latin Name | Count Totals | Nationally Important | Internationally Important |
|---|---|---|---|---|
| | | | | |
| Bar-tailed Godwit | *Limosa lapponica* | 4819 | * | * |
| Common Greenshank | *Tringa nebularia* | 239 | * | _ |
| Terek Sandpiper | *Xenus cinereus* | 604 | * | * |
| Grey-tailed Tattler | *Heteroscelus brevipes* | 5489 | * | * |
| Ruddy Turnstone | *Arenaria interpres* | 1250 | * | * |
| Sanderling | *Calidris alba* | 449 | * | * |
| Red-necked Stint | *Calidris ruficollis* | 4107 | * | _ |
| Grey Plover | *Pluvialis squatarola* | 564 | * | * |
| Pacific Golden Plover | *Pluvialis fulva* | 120 | * | _ |
| Lesser Sand Plover | *Charadrius mongolus* | 671 | * | * |
| Greater Sand Plover | *Charadrius leschenaultii* | 2046 | * | * |
| Little Tern | *Sterna albifrons* | 1366 | * | * |

## Appendix E

**Table showing species and type of breeding witnessed during visit**

| Species | Nest Building | Eggs | Chicks | Fledged Young |
|---|---|---|---|---|
| Lesser Frigatebird | | | * | * |
| Masked Booby | | | * | * |
| Brown Booby | | | | * |
| Red-footed Booby | | | * | * |
| Eastern Reef Egret | | * | | |
| Bridled Tern | | * | | |
| Common Noddy | * | * | * | * |

Note: The fledged young of both Lesser Frigatebirds and Red-footed Boobies were still on nests, being fed by parents but could already fly.

# Appendix F

## CAMBA/JAMBA

All birds listed in the table below were recorded during this survey and show which agreement or agreements they are listed under. (CAMBA) China and Australia Migratory Bird agreement and (JAMBA) Japan and Australia Migratory Bird Agreement.

| SPECIES | **CAMBA** | **JAMBA** |
|---|---|---|
| Streaked Shearwater | **X** | **X** |
| Masked Booby | **-** | **X** |
| Red-footed Booby | **X** | **X** |
| Brown Booby | **X** | **X** |
| Greater Frigatebird | **X** | **X** |
| Lesser Frigatebird | **X** | **X** |
| Eastern-reef Egret | **X** | **-** |
| Great Egret | **X** | **X** |
| Bar-tailed Godwit | **X** | **X** |
| Black-tailed Godwit | **X** | **X** |
| Whimbrel | **X** | **X** |
| Eastern Curlew | **X** | **X** |
| Common Redshank | **X** | **-** |
| Marsh Sandpiper | **X** | **X** |
| Common Greenshank | **X** | **X** |
| Terek Sandpiper | **X** | **X** |
| Common Sandpiper | **X** | **X** |
| Grey-tailed Tattler | **X** | **X** |
| Ruddy Turnstone | **X** | **X** |
| Great Knot | **X** | **X** |
| Red Knot | **X** | **X** |
| Sanderling | **X** | **X** |
| Red-necked Stint | **X** | **X** |
| Pectoral Sandpiper | **-** | **X** |
| Curlew Sandpiper | **X** | **X** |
| Broad-billed Sandpiper | **X** | **X** |
| Grey Plover | **X** | **X** |
| Pacific Golden Plover | **X** | **X** |
| Lesser Sand Plover | **X** | **X** |
| Greater Sand Plover | **X** | **X** |
| Oriental Pratincole | **X** | **X** |
| Common Tern | **X** | **X** |
| White-winged Black Tern | **X** | **X** |
| Lesser-crested Tern | **X** | **-** |
| Caspian tern | **X** | **X** |
| Little Tern | **X** | **X** |
| Bridled Tern | **X** | **X** |
| Common Noddy | **X** | **X** |
| Oriental Reed Warbler | **X** | **-** |
| Grey Wagtail | **X** | **-** |
| Yellow Wagtail | **X** | **X** |
| Fork-tailed Swift | **X** | **X** |
| **TOTALS** | **40** | **37** |

## Appendix G

**Table showing tide heights at Adele Island during the actual days the survey was conducted.**

| Date | Time | Height |
|---|---|---|
| | | |
| **20 November 04** | | |
| | 04.14 | 5.3m |
| | 10.32 | 2.2m |
| | 17.08 | 5.0m |
| | 23.08 | 3.0m |
| **21 November 04** | | |
| | 05.43 | 5.0m |
| | 12.03 | 2.5m |
| | 18.32 | 5.1m |
| **22 November 04** | | |
| | 01.39 | 2.7m |
| | 07.10 | 5.1m |
| | 13.52 | 2.3m |
| | 19.53 | 5.4m |
| **23 November 04** | | |
| | 02.43 | 2.1m |
| | 08.23 | 5.4m |
| | 14.52 | 2.0m |
| | 20.51 | 5.9m |
| **24 November 04** | | |
| | 03.27 | 1.5m |
| | 09.16 | 5.7m |
| | 15.35 | 1.7m |
| | 21.33 | 6.4m |
| | | |

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