

## Bookshelf

### Reader's Digest Book of the Great Barrier Reef

Reader's Digest Services Pty Ltd (1984)

Good sections on development of cays and continental islands and on seabirds.

### Reader's Digest Complete Book of Australian Birds

Reader's Digest Services Pty Ltd (1986)

Seabirds are included in all bird field guides. However, this book, though much too big for the pocket or backpack, provides a great deal of detail matched with excellent colour photos.

### The handbook of Australian Seabirds

D.L.Serventy, Vincent Serventy and John Warham

A.H. and A.W. Reed (1971)

Although rather old, this book has some interesting information.

### Corella: Journal of the Australian Bird Study Association Vol 17 No 3 July 1993 The Status of Queensland Seabirds

B.R. King

The sole article in this particular issue of Corella, this review of the region discusses where breeding colonies are found, the distribution of each species, the influence of island types and vegetation, breeding seasons and conservation.

### The conservation and management of seabird populations on the Great Barrier Reef

P.S. Ogilvie and B.R. King

in: **Birds and their Habitats: Status and Conservation in Queensland**  
C.P. Catterall et al. (eds)  
Queensland Ornithological Society Inc. (1993)

The focus of this article is natural and human-related factors affecting seabird populations and conservation management.

**Reef Notes on Seabirds and Coral cays** published by the Great Barrier Reef Marine Park Authority (1985) are available from GBRMPA at PO Box 1379, Townsville, QLD 4810 and from DEH offices.



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Opinions expressed in *Tropical Topics* are not necessarily those of the Department of Environment and Heritage.

While all efforts have been made to verify facts, the Department of Environment and Heritage takes no responsibility for the accuracy of information supplied in *Tropical Topics*.

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## Tropical Topics

An interpretive newsletter for the tourism industry



**Where land meets sea — islands, cays and seabirds**

**No. 28 June 1995**

### Notes from the Editor

This is the second in the series *Where land meets sea*. Much of this issue is devoted to seabirds. This has been restricted to those birds which feed on the ocean; waders which are common on the shores of islands have not been included partly because of lack of space and partly because so many are absent on their winter migration at the moment. Hopefully we will be able to look at them in a future issue.

Thank you to those who have taken the trouble to inform us of changes of address and so on. It is difficult to keep the mailing list up to date, particularly when new tour companies open up and others close or are taken over. We greatly appreciate being kept informed of changes.

If you are the only member of your company who receives *Tropical Topics* (and you can order more for other public contact staff) please bear in mind that if you leave the company your copy may be returned to us and your name deleted from the list. If possible, could you please ask us to change the name of the recipient (perhaps simply to 'The Manager') so that your company can continue to receive the newsletters.

**Cairns Wet Tropics Volunteers  
Information night  
Thursday 6 July 7.30-9pm  
Cominos House, Greenslopes St  
Call (070) 51 5428 for details**

### Nesting in all seasons

Seabird breeding is usually associated with summertime but a closer look shows that the pattern is much more complex, depending not only on species but also on location.

An interesting example is the common noddy which nests in summer in the south, but all year round with a summer peak on Michaelmas Cay, near Cairns. Further north it nests only in winter — except on Bramble Cay, on the northern extremity of the Reef, where large numbers breed in summer!

Among seabirds on the Reef, only wedge-tailed shearwaters and lesser crested terns restrict their breeding to summer. Silver gulls and pelicans seem to prefer winter while frigatebirds nest only at that time. Most species have variable seasons, many, particularly terns, nesting all year with a preference for summer in the south. By and large it tends to be those birds which feed on the open ocean which prefer winter breeding in the north while the inshore feeders nest mainly in summer.

The time of nesting depends on the bird's breeding cycle. Many species have annual breeding cycles (most birds fit in an energy-demanding moult between breeding periods). Depending on species (and location) they may have synchronised breeding with all birds nesting together, once a year, in

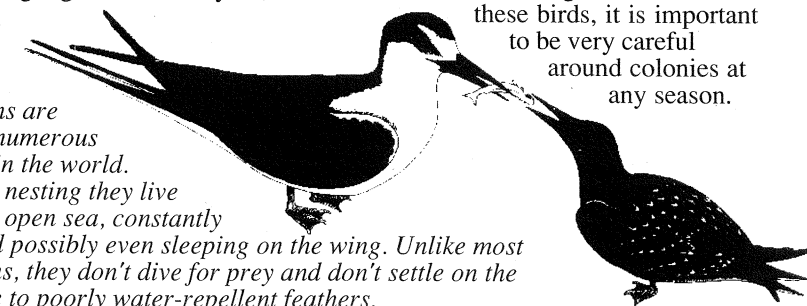
the same season. Others are less synchronised, leading to longer seasons, each bird going through its individual one-year cycle and nesting at almost any time of the year.

Some birds, however, have cycles shorter than a year. Studies of sooty terns on Michaelmas Cay have shown those birds to have an average breeding cycle of 8.5 months. This means that there are sooty terns nesting there in all months of the year. Further north, however, they seem to breed once a year, in winter, while on Bramble Cay they again appear to breed all year round.

The reasons for this are unknown and researchers are still trying to work out breeding patterns. For many bird species lengthening days or rainfall or rising water levels are the cue to start breeding so that the young hatch at a time of optimum food availability. Breeding in Great Barrier Reef seabirds may be triggered by more complex cues. Whatever the reasons, it seems that nesting may be going on at any time and, since human disturbance is considered to be one of the main reasons for declining numbers of

these birds, it is important to be very careful around colonies at any season.

*Sooty terns are the most numerous seabirds in the world. When not nesting they live out in the open sea, constantly flying and possibly even sleeping on the wing. Unlike most other terns, they don't dive for prey and don't settle on the water due to poorly water-repellent feathers.*



## Marine Parks



**Great Barrier Reef Marine Park Authority**



**Queensland Department of Environment and Heritage**

# Islands

There are two main types of islands on the Great Barrier Reef — continental islands and cays.

**Continental islands** were once part of the mainland. They are the remains of hill and mountain tops of that part of the continent which was submerged as sea levels rose and land sank at the end of last Ice Age. They are composed of the same rocks as the mainland and have similar vegetation, this and the animals having become 'stranded' when they were cut off. Most continental islands are fairly close to the coast and, unlike cays, are more common in the central section. The Whitsundays, Fitzroy, the Franklands, Dunk and Hinchinbrook are just a few of the 540 continental islands on the Reef.

**Cays** are much younger, no more than 4000 to 6000 years old, unable to form until sea levels stabilised. They had to start from scratch with their flora and fauna collections.

Cays are a product of the reef, accumulations of marine sediments derived particularly from the calcium skeletons of corals, shells, coralline algae and forams (single-celled animals which produce circular skeletons, often in huge numbers). When they die, or are smashed by storms, skeletons break into pieces and are washed around by waves.

Most of these sediments are washed into deep water but on oval platform reefs, where the wave action is broken, sediments may be concentrated on a section of reef flat. Storms may contribute larger chunks of rubble on the seaward side while finer grains build up in their lee.

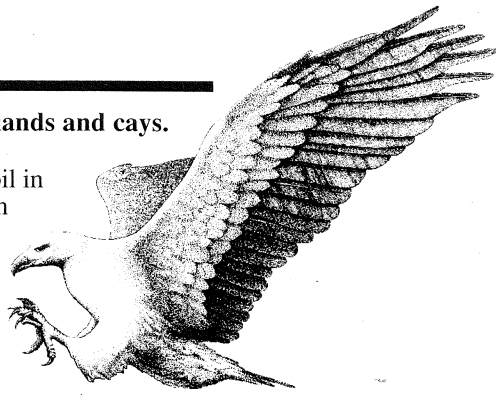
Young cays are easily destroyed by storms or cyclones, perhaps taking years to reform. However, if vegetation, particularly creepers, becomes established a cay becomes much more stable. Organic matter and bird droppings

(guano) help create soil in which other vegetation types become established. The original handful of colonising species may increase to 40 or more on a densely forested cay such as Heron Island.

The cay is further protected from erosion and movement by the formation of beach rock. Calcium carbonate, dissolved by rain, runs into the sand in the body of the cay where a chemical reaction causes it to cement sand fragments together in a hard pavement. This is eventually exposed if sand above is removed.

There are at least 240 cays on the Reef. Different types depend on the conditions which form them. There are very few cays, none of them vegetated, in the central section, possibly because reef shapes are irregular, tidal range great and cyclone damage strong there. Low wooded islands which require low wave energy conditions and mangroves, are unique to the Great Barrier Reef and are found only from Low Isles north. Other conditions give rise to vegetated shingle cays (such as One Tree Island) found only on southern reefs.

Cays are extremely important for nesting seabirds, hosting 40 of the 54 main Great Barrier Reef colonies. Ten are on continental islands and the remaining four on low wooded islands.

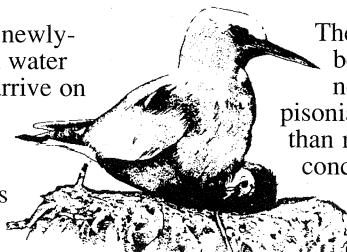


Birds of prey patrol the skies above Great Barrier Reef islands. White-bellied sea eagles feed on fish and seabirds.

## The birds and the trees

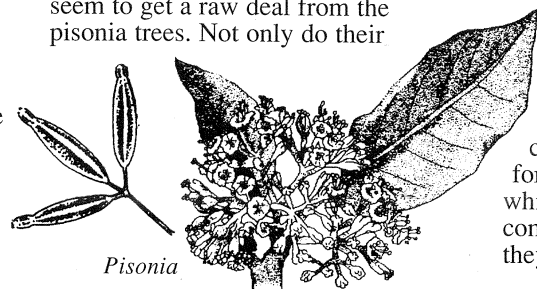
Some plants find their way to newly-developing cays by floating in water but an estimated 50 per cent arrive on birds' feathers or in their guts. The relationship between birds and islands is a close one. Once vegetation has become established seabirds are encouraged to build nests there. Their droppings provide rich nutrients (guano has been mined on many islands for agricultural fertiliser) which in turn feed other plants. Guano also contributes to the stabilisation of cays; washed into the sand by rain it cements it into a hard 'cay sandstone', similar, but of different origins, to beach rock.

Birds may have a negative impact on vegetation, high concentrations of guano and trampling feet destroying plants. Seabird presence may create vegetation cycles. Increased nutrients derived from birds nesting on bare sand may cause plants to grow. These attract birds which prefer vegetated sites but their trampling may destroy the plants, the cay reverting to bare sand on which the original birds nest... and so on.



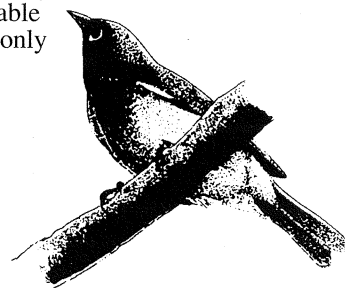
The relationship between the black noddie (left) and pisonia trees is closer than most, the greatest concentrations of both occurring together, in the Capricorn-Bunker Group. The trees, common on vegetated cays, are the main nesting site for the noddies but at the time of the breeding season they produce a death trap for some birds.

Exceptionally sticky pisonia fruits cling to their feathers, sometimes in such large numbers that the noddies are unable to fly. They fall to the ground and die, their decaying bodies providing fertiliser for the germinating seedlings. The noddies seem to get a raw deal from the pisonia trees. Not only do their



Pisonia

droppings provide good fertiliser but, when not overwhelmed by them, the birds carry the sticky fruits to other islands. Curiously, in the northern region black noddies nest in mangroves, using the few available pisonia trees only for roosting.



Seabirds are by no means the only birds found on Great Barrier Reef islands. Over 200 other species have been recorded, mainly on continental islands where the vegetation is more varied. Most of them are also found on the mainland, many arriving on islands for short times in transit. Silvereyes (above) are particularly common residents of islands and forested cays in the south of the reef while variable honeyeaters are more common on northern islands where they frequent mangroves.

## Do you care for our island national parks?

The islands within the Great Barrier Reef Marine Park are a popular destination for tourists, schools and locals. Most people visiting the islands seek a solitude experience where they can appreciate a true natural setting. This experience can be diminished by the presence of rubbish, polluted water and damage to natural surroundings. Please assist us in managing and protecting our island national parks by following these guidelines:

- Take any litter or rubbish with you when leaving the islands. *This includes cigarette butts which are plastic and not biodegradable.*

- Do not use detergents, toothpaste and soap in creeks or streams. Always wash at least 50m away from a water source and scatter wash water well after use.

- When cleaning dishes use sand and a scourer to remove waste.

- Use only gas or liquid spirit stoves on any island national park. Open campfires are not encouraged and are not permitted at some locations.

- Where toilets are not provided, select a spot at least 100m away from campsites and water courses. Dig a hole at least 15cm deep and bury all faecal waste.

- Check clothing and shoes for seeds of introduced plants before landing.

- Do not remove soil, rocks or sand from islands.

- Camp only at designated camping areas and do not disturb vegetation or break branches.

- Check on Marine Park zoning requirements before fishing and collecting around islands.

- Do not disturb nesting seabirds and carefully avoid standing on camouflaged seabird eggs on the beach.

- Do not feed animals as this can upset the balance in animal populations and can cause severe disease.

- Do not take pets or other animals on to national parks and island beaches.

- Avoid making too much noise or using strong lights near to where turtles are laying or hatching.

- Do not write/place graffiti anywhere.

- Do not use generators or compressors unless you have special permission and do not play amplified music on island national parks.

### Reef walking

Many people, when on islands, take the opportunity to go reef walking. Although this is enjoyable and educational, it is important to realise that careless trampling by people poses a very real threat to reef organisms, while some animals living on the reef flat are dangerous and can also pose a threat to people. For injuries and fatalities on both sides to be avoided it is advisable to:

- Wear protective footwear and allow one hour either side of the predicted low tide for walking.

- Stay on sand or follow regularly used trails where possible.

- Avoid treading on coral or any other living matter. Many plants and animals are frail and can die on initial impact.

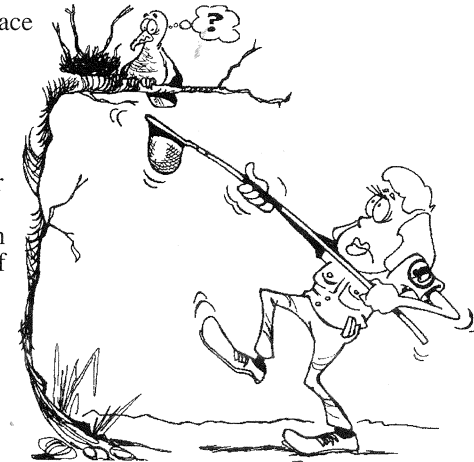
- Avoid picking up or touching marine organisms and be particularly careful not to expose them to dry atmospheric conditions. Do not remove organisms from their home.

### Checking out the TIP poo

Not everyone is delighted to receive a parcel of pigeon poo but a DEH researcher was heard to say, "she could hardly wait to open it up". Over the past summer (Dec. to April) droppings were collected below Torresian imperial-pigeon (TIP) nests on Low Isles and analysed. Researchers wanted to know what they were eating.

A total of 68 different plant species were recorded during the four-month period. Identification from seeds alone was almost impossible, so they were germinated, the seedlings allowing identification of 24 species. The most popular items on the pigeons' diet seemed to be *Syzygium angophoroides* (Yarrabah satinash), *Euroschinus falcata* (ribbonwood/pink poplar), *Terminalia sericocarpa* (damson), *Buchanania arborescens* (little gooseberry tree), *Canarium vitiense* (canarium), *C. acutifolium* (Melville Island white beech) and *Calamus australis* (hairy Mary lawyer cane) — good plants to grow in your garden if you want to feed these lovely birds.

Seed traps will be put in place again in August, when the pigeons return from New Guinea. It is hoped that collections can be made from the entire nesting range, from Lockhart River to the Whitsundays. Eventually, researchers aim to establish the main diet of the birds, how it fluctuates throughout the year and between years, and how it affects nesting success. Here, in the Cairns office, we are holding our breath for the next season.



### Take a HIT course

Applications for enrolment in the second semester intake of the Certificate in Heritage and Interpretive Tourism course are now being accepted at the Faculty of Tourism and Hospitality of the Cairns College of the Far North Queensland Institute of TAFE.

This industry-designed and driven 17-week full-time course commences on 17 July and finishes on 26 November 1995. Application is open to anyone wanting to work at the operations level of tourism, who has an interest in the environmental and cultural interpretation.

Acceptance into the course is by way of an interview process which takes into consideration an applicant's personal and group participation and performance, general numeracy and literacy, problem-solving ability and general knowledge, comprehension and language aptitude.

The application deadline is 30 June. For further information contact Veronica Lee, Cairns College, Far North Queensland Institute of TAFE, PMB 1, Cairns 4870. Tel: (070) 42 2438.

Full-time HIT courses are also held at Mossman and Airlie Beach. Contact local TAFE colleges for details. A longer part-time evening course will be starting in Townsville at the same time. Call (077) 71 8243 for details.



# Birds of the ocean

Forty species of seabirds have been recorded on the Great Barrier Reef, 24 of them breeding in the region. An estimated 70 percent of these migrate or disperse after breeding, but as nesting occurs in all months of the year the area is always host to very large numbers of birds.

## Least (lesser) frigatebird

The pirate of the oceans, the frigatebird catches all its food on the wing. Its hooked bill has been compared with sterilising forceps, employed to grasp round smooth objects. Males have red throat patches which they inflate for display. Lesser frigatebirds nest in colonies on the ground on several offshore islands. Like great frigatebirds, which breed only rarely in the northern Great Barrier Reef, they nest in winter, individuals breeding only every two years because the chicks remain dependent on the adults for at least a year. They are very susceptible to disturbance.

## Wedge-tailed shearwater (muttonbird)

This is the most numerous seabird species on the Great Barrier Reef. Shearwaters nest in burrows, usually under pisonia trees, forming huge colonies, especially on southern Great Barrier Reef islands. Ninety-five percent, an estimated 1.5 million, breed on 11 cays in the Capricorn-Bunker Group, their noisy courtship and excavations making them unpopular on resort islands. They are strictly summer nesters in both northern and southern sections.

Seabirds have salt glands near their eyes which can get rid of the excess salt taken in with their food.

## Black noddy (white-capped noddy)

The second most numerous seabird species on the Reef, the black noddy is more common in the southern region, with an estimated half a million breeding on seven cays in Capricornia. Some also breed in the far north, but none in between. They build shallow nests in trees (see page 2) in closely-packed colonies. They do not move much, usually roosting at their breeding sites. Birds in the south breed mainly in summer and those in the north all year round, with a summer peak.

Noddies are terns, but with reverse colouring — dark bodies with white caps rather than pale bodies with black caps.

## Black-naped tern

This small tern is pale with a distinctive black nape. It associates, noisily, with other terns and is a nomadic breeder. Small colonies nesting in scrapes in sand above highwater mark are common on islands all along the Reef. Egg losses to silver gulls, floods and human disturbance are high. Summer breeding is the norm in the south with all-year breeding in the north. When not breeding, the birds tend to fish and roost around nesting islands although they may leave the area for short periods.

## Little tern

This is Australia's smallest tern. Numbers vary seasonally as different groups move around. In summer, northern Australian ones may move south while Asian ones fly to northern Australia to breed, returning in winter. They breed in small colonies on bare sand, abandoning nesting sites if they become too vegetated or if they are disturbed by humans.

## Bridled tern

This tern looks similar to the sooty tern (see page 1) but has a brownish rather than black back and a puppy-like yapping call. Colonies of nests are concealed in thick vegetation; nesting is in summer in the south and all year in the north. When not breeding they tend to move north and out to sea.

## Nesting

Good fishing and diverse, largely predator-free habitats make the Great Barrier Reef region the breeding choice for millions of seabirds. Some 75 of the 950 islands and rocks support known breeding colonies, many with several species together. The main colonies tend to be concentrated in the north and south of the Reef.

Seabirds will nest where there is suitable habitat — some may require bare sand, others low vegetation or shrubs and others trees. The majority nest on the ground in large colonies of sometimes thousands of birds packed closely together. It is thought that some species can only breed when large numbers gather together, this providing some sort of hormonal cue. Some islands have been used by these birds for thousands of years, although the actual nesting site usually moves regularly, a strategy which allows vegetation to recover and may prevent harmful diseases building up in the sand.

Tern nests vary from a simple scrape in the sand to clumps of vegetation lined with bits of coral, shells and coralline algal remains. Usually only one egg is laid and incubated for about 20-30 days depending on species. At first one adult at a time will remain to guard the chick while the other collects food. After a week or so most chicks join wandering creches of youngsters, the parents locating them at feeding time by calling. The timing of independence for the fledged young

varies; for sooty terns it is 70 days.

## Problems

Nesting seabirds are vulnerable to a number of factors. Storms, particularly cyclones, cause eggs and chicks to die from exposure, inundation and erosion of nest sites, and desertion by adults. Seabirds usually forage within 10km of the nesting site but during bad weather may not be able to see their prey because of disturbed surface water, or be able to reach fish which have moved to deeper or distant waters. On a number of occasions the presence of large numbers of weak and dying seabirds have led to some being examined in case of disease. Usually they were found to have starved to death. Entire colonies of eggs and chicks may be deserted at times of bad weather.

While cyclones and storms cause obvious and dramatic damage to nesting colonies, these natural events are irregular. Far more damaging may be the regular, perhaps daily, low-level disruption by visitors. Eggs and chicks abandoned when their parents fly off as visitors approach, or aircraft fly

low overhead, may die from exposure to heat or cold. They are also easy prey for silver gulls, numbers of these scavengers having increased in association with human activities such as rubbish dumping and fish feeding. Well-camouflaged eggs and chicks may even be crushed underfoot; shearwater burrows collapse easily. Frequent disturbance may lead to the nests being completely deserted and in some cases sites which have been in use for thousands of years may be abandoned. The presence of people may also inhibit birds from starting to breed.

Please be very careful near seabird colonies and avoid them as much as possible. The presence of large numbers of birds does not mean that they are not vulnerable. Numbers of tropical seabirds are declining throughout the world and the Great Barrier Reef has one of the last, and possibly largest, remaining undisturbed stocks. Preserving them is an international obligation; it is up to tour operators to explain this to their visitors.

## Crested tern

This large tern (right) is abundant in inshore areas. Breeding colonies can number several thousand, the birds nesting in depressions in the sand among low plants. Like lesser crested terns, they are nomadic breeders, changing nesting sites from season to season. They are summer nesters in the south but may breed all year in the north. When not breeding, like lesser crested terns, their crowns, are streaked with white.

## Lesser crested tern

Smaller than the crested tern, with a bright orange rather than pale yellow beak, this is a more exclusively tropical tern. Nesting is similar to the crested tern though this species is notable for its determination to sit tight on eggs in the face of hungry gulls. It breeds, strictly in summer, mainly on the southern reef and from Cairns north.

## Red-tailed tropicbird

Like the frigatebird, this superb aerialist cannot walk (though it can swim). Small groups nest on cliffs, in summer in the south and mainly winter in the north. Nomadic white-tailed tropicbirds are sometimes seen, but do not nest in Australia.

## Roseate tern

A pink flush on breast feathers in the breeding season gives this tern its name. It is thought that approximately 20 percent of the world's population breeds on the Great Barrier Reef, with concentrations in the south where they breed in summer and the north where there is all-year breeding. Nesting in scrapes in sand, coral or rock, these birds are very easily disturbed by humans.

## Brown booby

This is more common than the masked and red-footed boobies. Although often seen inshore, it breeds at a distance from the coast, nesting in clearings between low plants. Like the masked booby, which breeds on remote southern and northern islands, it nests throughout the year with a summer peak. The red-footed booby nests only in the north, in all months.

Main food sources for seabirds are small (bait) fish and squid, an estimated 2000 tonnes of which are consumed each month.

## Silver gull

This gull frequents beaches, bays, parks and rubbish tips, scavenging almost anything and benefiting greatly from human activity. It nests on islands and spits with low vegetation, preferring to build near an object such as coral. It attacks disturbers but itself has a taste for other birds' eggs. Silver gulls normally breed in low numbers on undisturbed islands where their predation on other birds is sustainable. However, human activity increases their numbers. They have been blamed for the failure of black-naped terns to produce any young at all during a 6-year study on Michaelmas Cay. They breed in most months (mainly winter) in the south and winter in the north.

## Silhouettes at sea

Terns are slim, streamlined birds which wheel and swoop, picking food from the surface of the sea while flying. Many species also hover and plummet almost vertically on prey

from several metres, although noddies (left) and sooty terns seldom if ever do this. Many species participate in 'dread flights' when the entire breeding colony suddenly rises together and swirls around before returning to the ground.

Gulls are more thick-set than terns with a buoyant and elegant flight. They rarely dive.

Frigatebirds have huge broad wings and long forked tails, ideal for flying — but they cannot walk or swim. They will soar in circles for hours, riding thermals sometimes several hundred metres up, rarely flapping their wings. They feed by picking prey from the water surface and by harassing and outmanoeuvring other birds, forcing them to drop or disgorge their catch, which the frigates then snatch up in mid-air.

Shearwaters are graceful, strong fliers with broad wings. They like to glide up into the wind, flapping leisurely, before banking down across a wave. They often paddle on the surface, catching prey while swimming or from shallow dives in flight. They are very clumsy on land.

Boobies are large cigar-shaped birds with long narrow wings, long tails and pointed bills. Clumsy at take-off and landing, they glide and wheel in the air, plummeting down on prey sometimes from heights of 100m. Air sacs under the skin of the head cushion the impact. They take most food from near the surface and can pursue prey underwater, using both feet and wings for propulsion.

Pelicans carry their necks tucked back as they leisurely flap and glide, soaring very high. When in groups, they fly in line or loose V-formation.

Tropicbirds look rather like terns in flight except for their very distinctive, long tail streamers. They fly well above the water with fluttering wing-beats and soaring glides, plunge-diving for food or picking prey from the surface.



# Questions & Answers

**Q** After reading the article on 'Lethal jetsam' (Issue 26), I am wondering who the public can report offenders to. While working on the Reef, out of Cairns, I have personally seen many offenders dumping rubbish.

**A** When a member of the public witnesses any incident involving the dumping of any type of waste product in the Marine Park, they should make short notes about:

1. The name of the vessel the waste has come from.
  2. If possible, the identity of the person dumping the waste.
  3. The date, time, location and type of waste being dumped.
- If possible, they should obtain some form of photographic or video footage of the dumping.

Once this has been done the Coastal Management Enforcement Co-ordinator, at the Department of Environment and Heritage, should be contacted as soon as possible. (Call 52 3092, if in the Cairns area.) The above particulars will be important in forming the basis of any subsequent interview the investigators from this department will have with the alleged offender/s.

In most instances, a formal statement will be obtained from witnesses. This is necessary, as it gives the Co-ordinator a formal account of the event which can be used in the interview of suspects, and it is also required if such a matter were to be put before a magistrate for adjudication.

The intentional discharge of waste within our Marine Parks is a problem which can only be controlled with the help of the public and enforcement in this area is only as effective as the assistance it receives from you.

*Editor's note: Another interesting follow-up from the thong article was the observation by one of our Marine Park Rangers that not only thongs but pieces of rubber with thong-shaped holes were turning up on remote islands. It seems that some Asian boats carry these thong offcuts to use as fenders instead of the more usual old tyres. Some, however, are lost at sea and are cast up on islands.*

**Q** What months are the stinger season, the cyclone season and the wet season and when do winds blow from different directions?

**A** As with all things natural, there are no hard and fast rules or dates. The stinger season is about the end of October to the beginning of May, because the adult box jellyfish spawn in the autumn and die. The young develop as tiny polyps in the estuaries during the winter and are washed out to sea at the beginning of summer at which time they grow rapidly to dangerous sizes. The cyclone season is December to April with a peak in February and the wet season is the same, normally with a peak in March. Wind varies, of course, but 14-year records from Low Isles showed half the winds blowing from the east-south-east, at an average speed of 15 knots. These winds occur throughout the year but are more prevalent in the afternoons and in winter. Most winds from the north-east occur in summer afternoons, averaging seven knots. Almost half of morning records are of offshore breezes which blow throughout the year, with an average speed below 10 knots. Summer mornings are most likely to be calm - but that is pretty rare! (Data from *Mulgrave Shire Northern Beaches* by the Beach Protection Authority of Queensland, 1984.)

# Facts and stats

Green Island is the southernmost of the northern vegetated cays (there are no more for 640km to the south).

There are 54 substantial seabird breeding colonies in the Great Barrier Reef, 26 of them, with 23 species, in the northern region and 22 (18 species) in the southern region.

**The five islands with the greatest numbers of nesting seabirds are, in order, North West Island, in the Capricorn section, nearby Masthead and Heron Islands, Raine Island, near to the tip of Cape York, and Michaelmas Cay, near Cairns.**

The island with the greatest number of nesting species (17) is Raine Island. It is the northernmost breeding island for wedge-tailed shearwaters and the only Australian breeding site for herald petrels. It was the only breeding island for red-tailed tropicbirds in eastern Australia until a few pairs began nesting on Lady Elliot Island in 1983.

**Pelicans nest on islands of the northern and southern Great Barrier Reef, breeding in winter in the south and all year, mainly in winter, in the north. Of all seabirds, they are the most easily disturbed, the entire colony sometimes deserting. Please do not approach nesting pelicans. Roseate terns, black-naped terns, little terns and frigatebirds are also very easily disturbed.**

Michaelmas Cay is one of the most important seabird nesting sites of the northern Great Barrier Reef and the southern limit of sooty tern breeding on the Reef. Main breeding species, in order of numbers, are sooty terns, common noddies, crested and lesser crested terns. Silver gulls, black-naped terns, bridled terns, black noddies and roseate terns have also nested there.

**Terns live for about 20 years.**

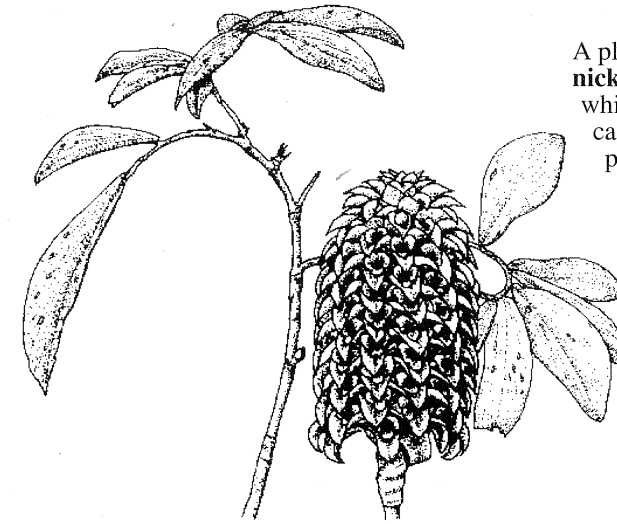
Wedge-tailed shearwaters have been known to travel 716km and boobies 724km. A silver gull banded in Rockhampton was sighted nine months later in Tasmania, a direct distance of 2186km. An experiment with common noddies breeding in the Gulf of Mexico showed them able to return to their nests when released 1900km away, in just five days.

**Sooty terns nest between clumps of grass while common noddies prefer to be on top of the grass and avoid bare sand, a good compromise in places like Michaelmas Cay where both species nest closely together.**

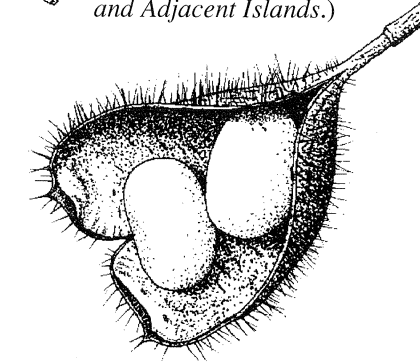
# Nature notes

A diary of natural events creates a pleasing journal which grows richer with the passage of time. Watching for the recurrence of an event after noting it in a previous year, and trying to understand what could have caused changes in timing, is intriguing.

These notes are from the author's own notebook, or were offered by researchers and fellow naturalists. Readers will, inevitably, note variations between their observations and those appearing here. The editor will be delighted to hear your news. If you do not keep a nature diary perhaps this will inspire you to begin one. This column will be enriched by your contributions. Items published will be fully acknowledged.

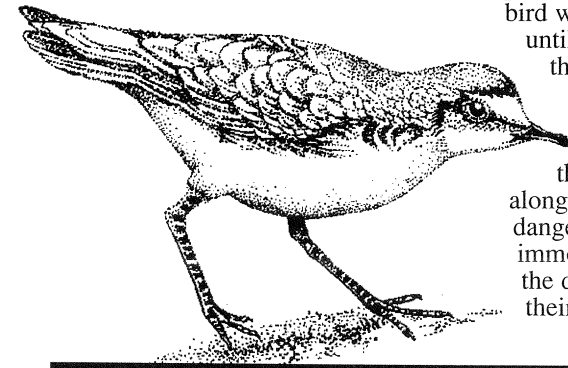


A plant of foreshore vegetation, the **nicker nut**, will be producing seeds which look like hugely engorged cattle ticks. These develop in a prickly pod on a very prickly plant, (*Caesalpinia bonduc*), a legume which is found in many parts of the world. This is not surprisingly when the buoyant seeds are known to survive for 30 months in salt water. (Acknowledgments to A.B. and J.W.Cribb, *Plant Life of the Great Barrier Reef and Adjacent Islands*.)



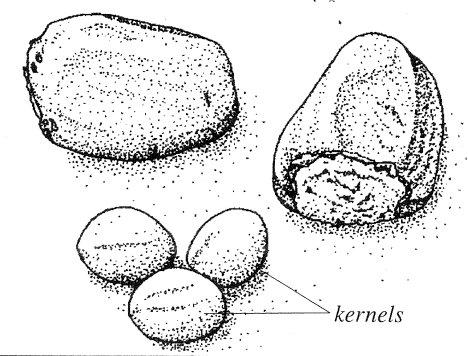
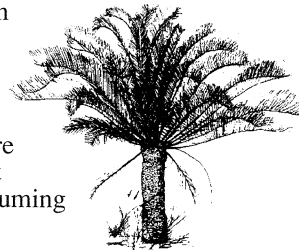
The striking **backscratcher ginger**, the floral emblem of Cairns, often puts up bright red flower spikes in the cool months and may respond to good March rains with liberal flowering this winter. Backscratcher ginger may be one of the species which suffers from the attention of feral pigs, as clumps often seem to grow on sites where fallen logs or steep banks protect the rhizomes from being dug up. Backscratcher ginger (*Tapeinocheilos ananassae*), also known as torch ginger and pineapple ginger, is no longer classified in the ginger family but is now in the family Costaceae.

Winter along the Wet Tropics coastline is no deterrent to breeding by a small Australian wader known as the **red-capped plover** or red-capped dotterel (left). These birds build a small scrape in foreshore vegetation where two or three eggs are laid. If disturbed while brooding the eggs, an incubating red-capped plover will attempt to distract the intruder by pretending to be wounded. The little bird will limp and flap quite piteously until the ruse succeeds in drawing the intruder a safe distance from the nest. Baby plovers leave the nest soon after hatching and are able to run so fast that they look like balls of fluff blown along the beach by the wind. When danger threatens, the babies rely on immobility, cryptic colouration and the distraction displays put on by their parents.



A flush of bright red foliage will appear on **rose marara** trees as they declare spring time in midwinter. Rose marara (*Pseudoweinmannia lachnocarpa*) is a member of the family Cunoniaceae, which is well known for putting on bright red new leaves. Rose marara also displays big buttresses, another feature of trees in this family which includes the handsome brush mahogany (*Geissois biagiana*) and rose alder (*Caldcluvia australiensis*). These two are restricted to Queensland rainforests, but rose marara extends southwards into New South Wales.

If bright red leaves are designed to discourage predation, as some theorists have suggested, why do bright red fruits seem designed to attract consumers? Some of these will serve to disperse the seed but why are some seeds bright red when predation results in their destruction? Such questions are never likely to gain satisfying answers, but toying with them can be pleasurable. The red seeds in mind at present are those of a rainforest **cycad** or 'zamia palm' *Lepidozamia hopei*, which are ripe and falling at present. Rats chew into the kernels, perhaps oblivious to the colour of the seeds, and may help dispersal on the occasions when they run off with them but are distracted by some forest adventure before they get around to consuming the booty.



# Tourist talk

ENGLISH	GERMAN	JAPANESE
island	insel	shima
cay	kay/	sa shu
	korallen insel	島砂州
seabird	seevogel	umi dori
nest	nest	su
egg	ei	tamago
chick	jungvogel	hina
disturb	stören	jama suru
fly	fleigen	tobu
exposure	ausgesetzt	sarasu koto
predator	arubtier	hoshoku dobutsu
		捕食動物