

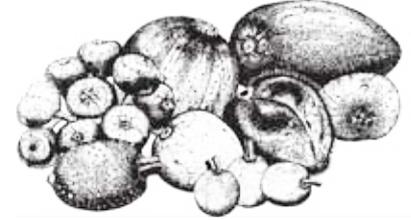
TROPICAL TOPICS

AN INFORMATIVE NEWSLETTER ABOUT THE ENVIRONMENT



www.wettropics.gov.au

Cassowaries



Cagey Cassowaries

Participants in a Wet Tropics Community Attitudes Survey were asked the question 'What particular plant or animal do you associate with the Wet Tropics World Heritage area?' Of those surveyed, 37% nominated the cassowary. The decisiveness of the survey (ferns, which came second, polled only 14% of the votes) showed that the largest and most spectacular vertebrate of the Wet Tropic forests holds a special place for its fellow (human) inhabitants.

Unfortunately the cassowary is endangered. A 1988 CSIRO survey found that the population had declined and that the cassowary was a 'candidate for extinction'. Its official status at the moment is 'endangered'. This means that it is presently considered at risk because it exists in areas likely to experience changes which will in the near future threaten the survival of the species in the wild. With rapid deforestation in Papua New Guinea, it is particularly important that we protect this extraordinary bird from extinction in Australia.

Cassowary quiz

How much do you know about cassowaries? Which of these statements are true and which are false? Answers on page 4-5.

- The male is smaller than the female.
- The casque is not bone.
- The bird attacks with its feet.
- The male incubates the eggs.
- Cassowaries sometimes kill and eat small animals.

Rainforest

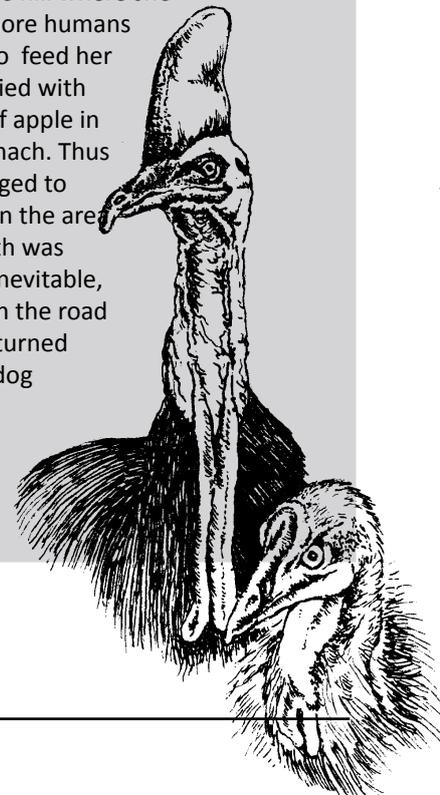
How did the mango trees get to the top of Mount Whitfield, in Cairns? In their natural home, India, monkeys and elephants eat the fruits and carry the heavy seeds to spots where they can germinate. Without these animals the trees could only migrate downhill as the force of gravity moved the fruits. So how did the seeds get to the top of the hill without the help of monkeys or elephants? Although flying foxes or bushwalkers may have been responsible, the cause was probably cassowaries, sadly now extinct on Mt Whitfield.

Some fruit-eating birds use grit in their digestive systems to break up the more protein-rich seeds as well as the less nutritious flesh. Cassowaries, however, have a 'gentle' digestive system which passes the seeds, unharmed and often with flesh still attached, into a pile of compost. The smell from the pile apparently protects the seeds from predators such as white-tailed rats, while keeping the seeds moist. In this way the cassowaries 'cultivate' the forest, dispersing only those seeds which are useful to them.

It has been estimated that seeds remain in a cassowary's gut for ten hours or longer. At a slow pace the bird could cover as much as 30-40km before expelling the seeds so, at the very least, it is likely to carry them a few kilometres. As many of the rainforest fruits are large they are unlikely to be moved far by any other animals, except, perhaps, flying foxes. It has been estimated that 70 to 100 species of plant are heavily dependent on the cassowary to disperse their seeds. This means that the bird plays a key part in the ecology of the rainforests of the Wet Tropics and there is growing concern that as cassowaries disappear the forests will lose many species of plants as well as the other animals which, in turn, depend on them.

Tragic postscript

The last known cassowary on Mt Whitfield died on 2 November 1996, when attacked by two dogs. Blue Arrow, as she was sometimes called, had earned a reputation for pursuing walkers on the Mt Whitfield track. Having been thoughtlessly fed by people she had come to associate humans with food, and to demand it with persistence, her large size adding weight to her argument. Eventually Blue Arrow moved down the hill where she found more humans willing to feed her — she died with pieces of apple in her stomach. Thus encouraged to remain in the area her death was almost inevitable, either on the road or, as it turned out, by dog attack.





Where are they?

Cassowaries are widely but patchily distributed in a narrow strip on the east coast between Townsville and the tip of Cape York. In the past they probably occurred in relatively high densities between the Russell and Murray Rivers but much of this land has been cleared for agriculture. There may now be as few as 1500-2000 cassowaries left in Australia. You are most likely to encounter a cassowary at Mission Beach, Elly Bay, Coquette Point, Kuranda, Cape Tribulation and the Daintree, Edmund Kennedy National Park and Wallaman Falls.

It has been suggested that different genetic populations may exist and extraction of cassowary DNA from scats (poo) by scientists at CSIRO may help to confirm this.



Cassowary homes



© Aussie nomad

Cassowaries are associated with rainforest but many move into other habitats which are important sources of food at certain times of year. A mosaic of vegetation types may provide the ideal habitat. The birds tend to be solitary and operate within a home range which changes in size and shape according to season, food availability and whether the cassowary is caring for chicks or not. Female territories may be surrounded or overlapped by male territories through which the females are allowed to wander at will. On the other hand, males defend their territories from each other.

Generally adult cassowaries avoid each other. Although it is not unusual for several individuals from adjacent territories to visit an abundantly fruiting tree, they will usually do so at different times. However, cassowaries have been known to congregate at times of food shortages, such as in the aftermath of Cyclones. Food shortages occur in most years. There is a general pattern of peaks and troughs with weather acting as the main environmental trigger for flowering and fruiting. However, events such as cyclones can disrupt this pattern.

Water is also very important. Cassowaries need to drink frequently and in areas of recent clearing have been observed crossing open paddocks to reach watering points. At Edmund Kennedy National Park 13 cassowary territories overlap at a swamp area, possibly the only permanent water source.

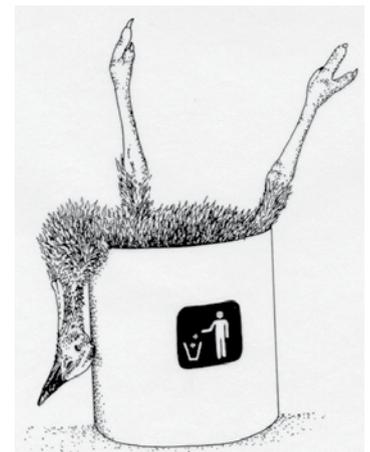
Cassowary casualties

Natural predators of cassowaries include crocodiles, pythons, dingos, and quolls. However, the effects of these animals are minimal when compared with threats introduced over the last two hundred years.

Pigs are a big problem. They probably destroy nests and eggs but their worst effect is as competitors for food which could be catastrophic for the cassowaries during lean times. They also use and contaminate water sources. Dogs are a major risk. An adult cassowary could usually get the better of a single dog but young are at risk and even older birds succumb to packs of dogs. Dogs also chase the birds away from potential food sources in suburban areas.

In a survey of 24 known cassowary deaths in the Mission Beach area between February 1986 and September 1988, only two were attributed to natural causes, namely disease. There are growing concerns, however, that diseases are being spread to the birds from domestic animals. Five were the victims of dog attacks and 17 died as a result of road accidents — the greatest single cause of death. Roads cut through their habitat making it necessary for the birds to travel across them when moving around looking for food. Unfortunately people often hand-feed birds from cars thereby attracting them to the roads sometimes with fatal results.

Through the efforts of the local community and conservation groups, road deaths have been reduced. Strategies include media releases and signs erected at current cassowary road crossings. However, road deaths increased dramatically after cyclones Larry (2006) and Yasi (2011) as cassowaries moved around more in search of food.



If you find an injured cassowary, please call Qld Parks and Wildlife Service Wildlife Hotline 1300 130 372



Cassowary corridors



The biggest threat of extinction comes from loss of habitat and isolation in small fragments of forest. An accident such as fire, drought or cyclone which devastates a local population, is not a disaster if more animals can repopulate the area, but if they are isolated it could lead to permanent local extinctions. It is also important for populations to mix to maintain genetic diversity.

Human activity has had its greatest impact on cassowaries by isolating them in forest 'islands'. The most important thing we can do is to stop clearing and retain any remnant pockets of original vegetation. These often act as stepping stones enabling larger areas to be used. We can also plant corridors of vegetation linking these pockets of vegetation. We know that although cassowaries will cross open paddocks, they will more readily use vegetated corridors.

A list of recommended food plants for Cassowaries is available on the Cassowary Recovery Team website. <http://cassowaryrecoveryteam.org/get-involved/food-plants/>

If you (or friends) have a block of land which could be used by cassowaries you might like to grow some of these plants*. Please note, however, that

cassowaries prefer the safe cover of weedy scrub to a neat well-mown plantation of young trees. Removing a protective cover in order to plant 'cassowary trees' could actually be more detrimental to the immediate well-being of the animals! It would be better to add to existing scrub than to remove it.

Cassowaries need a variety of plants which fruit at different times of the year. Studies have shown that members of the Myrtaceae family provide about 30 percent of the cassowaries' food but these fruits are low in nutrients. On the other hand members of the Lauraceae family, though making up only 19 percent of the diet of the cassowaries studied, provide much more nutritious fruits and are very important. Lawyer vine can be vital in times of shortage and made up 11 percent of the food source of the birds studied.

**Even if you don't live in an area where cassowaries are likely to roam, consider native plants for your garden. Many will attract other birds and butterflies. There is a fascinating variety and planting them will help you learn much more about our native flora.*



Facts and stats on cassowaries

 Cassowaries are good swimmers and can cross deep rivers. It is also possible that cassowaries enter the water to go fishing. A nineteenth century scientist observed a Dwarf cassowary in New Guinea immersing itself in a river with its feathers spread. After 15 minutes it closed up its plumage and walked on to the bank. It then shook its feathers and ate several fish which dropped out! There is also one report of this happening at Mission Beach after Cyclone Winifred. It is quite possible that the cassowary's feathers resemble water weed in which the fish normally hide.

 The first cassowary seen in Europe arrived in Amsterdam in 1597 having been given to a Dutch sea captain in Banda (Indonesia).

 The only recorded human fatality in Australia was a 16- year-old boy near Mossman in 1926. While running away from a bird which he (and/or his dogs) had been trying to attack he tripped and fell. The cassowary ran over him, unfortunately severing his jugular vein with its foot. Deaths in New Guinea are more common.

 CSIRO scientists studying cassowaries discovered that of the 78 plant species they found in cassowary droppings, 70 species germinated. It has been suggested this success may be because something in the cassowary's digestive system removes a germination-inhibitor or breaks down the seed coat.

 In New Guinea cassowaries are used by some groups to settle disputes. Traditionally opposing parties settled arguments with 'races', or competitions which involved killing equivalent numbers of pigs until one side ran out of stock. In relatively recent years cassowaries were introduced as items with rarity value. (Over 40 cassowaries were killed at a race north of Mendi in 1974.) The value of a cassowary has been equated with eight pigs or one woman!

 Cassowaries were a traditional food for Aborigines. Explorers with the Kennedy expedition of 1848 shot one and 'the flesh was eaten and found to be delicious; a single leg afforded more substantial food than 10 or 12 hungry men could dispose of at a single meal'.

Want to know more about how you can help cassowaries go to:
<http://cassowaryrecoveryteam.org/>

The cassowary - rainforest gardener

The name cassowary comes from two Papuan words, *kasu* which means horned, and *weri* which means head. There are three species of cassowary in New Guinea, one of which is also found in Australia — *Casuaris casuaris*. The distinct Australian subspecies is known as *C.c. johnsonii* — the southern, or double wattled, cassowary. (Fossil records show that a dwarf cassowary also existed in Australia when conditions were moister.)

Family

The cassowary is a member of the ratite family, one of the most primitive groups of birds, which includes the flightless kiwi, emu, ostrich and rhea. The now extinct Moas of New Zealand, the elephant bird of Madagascar were also ratites. Cassowaries and emus are closely related. It is thought that they both evolved from forest-dwelling ancestors and that the strong running legs of the emu developed later.

Casque

The casque is made up of a tough keratinous skin over a core of firm, cellular foam-like material (similar in structure to styrofoam). It is longitudinally rigid, but can be compressed at the sides, and continues to grow throughout a cassowary's life. The shape and markings of every casque are unique and help cassowaries (and their human observers) to recognise individuals. It was once thought that the casque serves as a crash helmet when cassowaries are fighting, or running through the forest, but recent research shows that it assists cassowaries in 'hearing' the sounds made by other cassowaries. Unlike sound itself, the vibrations of low frequency sounds (infrasound) can travel long distances through obstacles like trees and water. Cassowaries' casques allow them to pick up these vibrations and 'hear' one another through dense forest. Some dinosaurs were also able to do this, and whales, elephants, giraffes, and other African mammals also communicate using infrasound.

Senses

As well as being able to communicate with infrasound, the part of the brain that processes smell is very large in cassowaries (and also kiwis) giving them a much keener sense of smell than most modern birds. This probably helps them to locate food more easily in leaf litter and dense forest. Many birds, including cassowaries, are also able to see ultraviolet light, not visible to the human eye. This may help cassowaries to find food in the forest, as many fruits, flowers, and seeds stand out more strongly from the background in ultraviolet wavelengths.

Wings

The cassowary's wings are reduced to about six long quills which curve round the side of the body, probably serving to protect its body as it moves through rainforest vegetation.

Tail

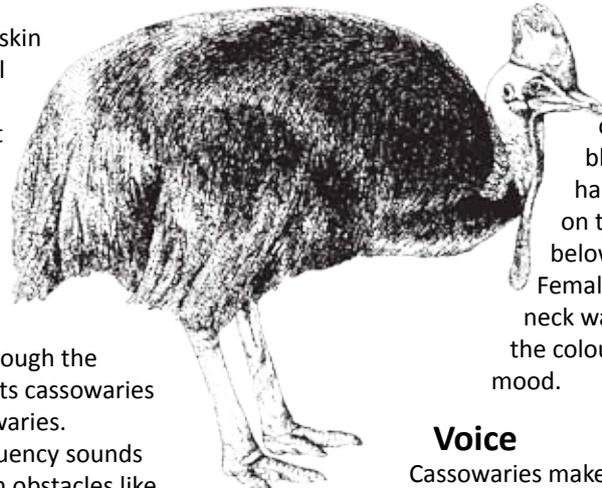
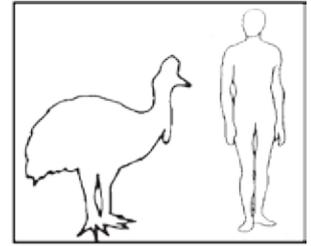
Male birds have a slightly drooping 'tail' which looks a bit like a skirt, and females have none. However, it is difficult to tell the sexes apart.

Feet

The cassowary's foot can be up to 180mm long with the middle one of its three forward-pointing toes reaching 120mm in length. When confronted, the bird can use them as a weapon, jumping up and kicking forward with both feet at once.

Size

An adult cassowary can reach 1.8-2m in height although most are about 1.5m. Females are bigger than males. The largest on record weighed 85kg, making it Australia's largest land animal. Weights of 60kg are not unusual for females while males weigh in at 35kg.



Wattles

The naked skin around the cassowary's neck is bright blue and a pair of red wattles hang from the front. The blue on the back of the neck grades below to bright red at the nape. Females often have brighter neck wattles but the intensity of the colour in all birds changes with mood.

Voice

Cassowaries make a variety of noises. One may produce a rumbling when approached in the forest. Then, when threatened, it may stand upright with plumage raised to give as large an impression as possible and hiss in its throat. When it is very angry and/or about to attack it puts its head down with the bill pointing to the ground and produces a deep booming noise. At the same time the colourful skin inflates and its body trembles.

Food

Cassowaries have been recorded eating over 238 species of plants. Although they prefer fallen fruit, cassowaries also eat snails, insects, fungi, flowers and some dead animals. Captive birds have been fed live and dead mice and have been known to catch, kill and eat birds and eggs. Although a small part of their diet, these protein supplements may be important additions to low-nutrient fruits. At times of food shortages some birds eat earth — some droppings have contained nothing else. Captive birds have occasionally displayed a craving for it. Presumably it is a source of minerals.





Encounters

Cassowaries are generally solitary and interactions with other birds are usually avoided. Males maintain foraging territories and will challenge other birds coming into their areas. Females may move across the territory of several males and use their bigger size to dominate males outside the breeding season. Males rarely fight, preferring to try and intimidate their rivals by stretching, raising their feathers, making low rumbling noises, or stamping their feet. However, if that fails, they may charge at each other, kicking with both feet. During the breeding season, males and females court over several days or even weeks before the female indicates she's ready to mate. It is not uncommon for both males and females to mate with multiple partners during a breeding season.

Nests

Clutches usually consist of about three to five eggs (up to eight have been recorded). Each egg weighs 500-600g (equal to about 10 domestic chicken's eggs) and is pale green with an uneven surface. The female deposits them on the forest floor and then departs, leaving the male to incubate the eggs and raise the chicks for a further nine months. The female may then mate with other males and lay more clutches. However, the male may also mate with more than one female so the eggs in one clutch may be the product of different mothers.

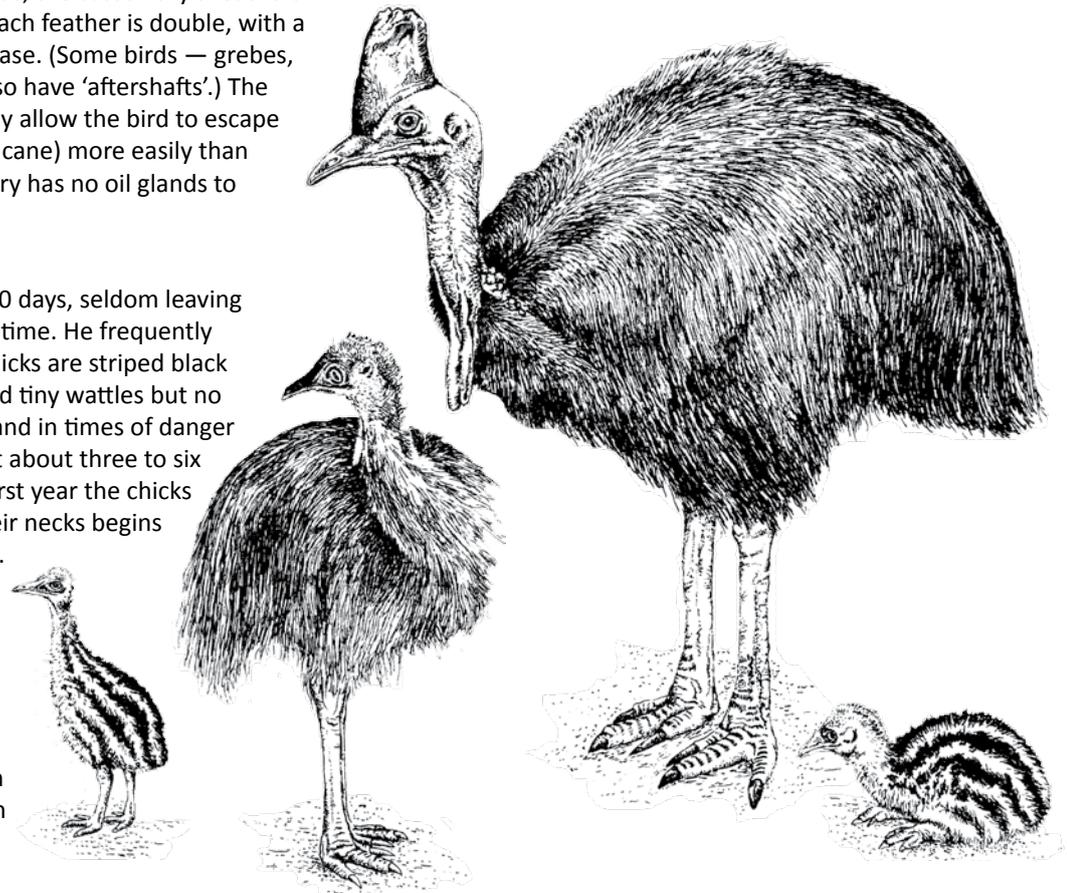
Plumage

Unlike the plumage of most other birds, the cassowary's feathers have no barbs and very little down. Each feather is double, with a secondary shaft sprouting from the base. (Some birds — grebes, pheasants and some song birds — also have 'aftershafts'.) The result is a stout 'hairy' coat which may allow the bird to escape the clutches of 'waita- while' (lawyer cane) more easily than most! Unlike other birds the cassowary has no oil glands to groom and waterproof the feathers.

Chicks

The male sits on the eggs for about 50 days, seldom leaving the nest, except to drink, during that time. He frequently turns the eggs. The newly hatched chicks are striped black and cream with pale brown heads and tiny wattles but no casque. The male is very protective, and in times of danger the chicks hide under his plumage. At about three to six months the stripes fade and by the first year the chicks are a dull brown. The skin around their necks begins to colour at about six to nine months. At this stage, the beginning of the new mating season (June-Oct), the male chases his chicks away.

It takes about three years to acquire full adult plumage. Cassowaries have been known to live up to 60 years (in captivity) but their average lifespan in the wild is unknown.



The cassowary year

January — March

Adult males are seen with large young while females are solitary. Birds roam extensively because food is scarce and eat almost anything they can find, including dried droppings.

April — June

This is still a difficult time for the birds. Adults begin courting in May/June and the young are evicted from the home range. This is a hazardous time for immature birds learning to fend for themselves in competition with intolerant breeding adults. Many juveniles die during this period.

July — September

Fruiting trees in the lowlands are producing reliable food — many favoured species are in full fruit at this time. Eggs hatch during the maximum fruiting period. Males are very protective of their chicks and humans should give them a wide berth.

October — December

Males are moving around with their striped or brown young. There is no shortage of food. This is a very important period when birds build up reserves to cope with inevitable shortages in the new year.

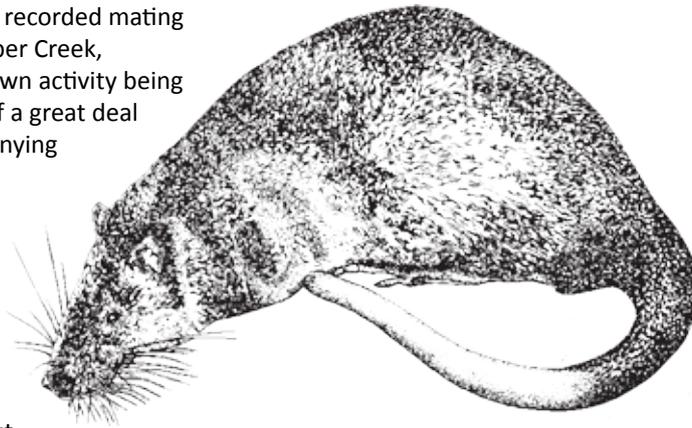
Acknowledgments to the Community for Coastal and Cassowary Conservation (C4)



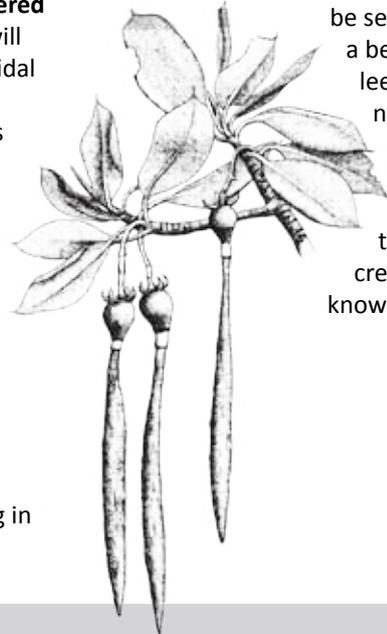
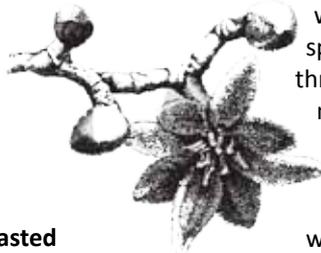
Nature notes - February

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.

Water rats have been recorded mating in February near Cooper Creek, Daintree, their pre-dawn activity being discovered because of a great deal of squealing accompanying the procedure. These handsome rats - predominantly carnivorous rather than vegetarian - are one of the few Australian animals which has learned to eat cane toads without ill effects. It is not unusual to find several disembowelled cane toads littering a pool used by a water rat. The rodent seems to have learned how to eat internal organs of the toad by opening the abdomen, without ingesting the skin toxins for which the toad is notorious.



The lovely, but short-lived, flowers of a mangrove known as the **red-flowered pornupan** (*Sonneratia caseolaris*) will be scattering long red stamens on tidal waters. Flowering in this species frequently extends throughout the warmer months. This pornupan is considered to have the most handsome flower of all mangroves, with a mass of stamens each about four centimetres long.



Noisy pittas, birds with a distinctive 'walk to work' call but secretive manners, will be busy raising nestlings this month. The nest is an igloo of sticks built between buttress roots in rainforest. The domed construction is sometimes supplied with a doormat of moss or dung, but young are successfully raised even when nests do not have this sophistication. In one photograph, by naturalists Clifford and Dawn Frith, an adult noisy pitta can

be seen carrying a beakful of leeches to its nestlings, but how the parent bird subdued the wriggly creatures is not known.

Nestlings of the **Buff-breasted Paradise Kingfisher** will be squawking vociferously from within termite mounds in rainforest, urging their parents to keep up the food supply. Fledglings will emerge from the nursery now or early next month, gaining size and flying skills before setting off for New Guinea in April.

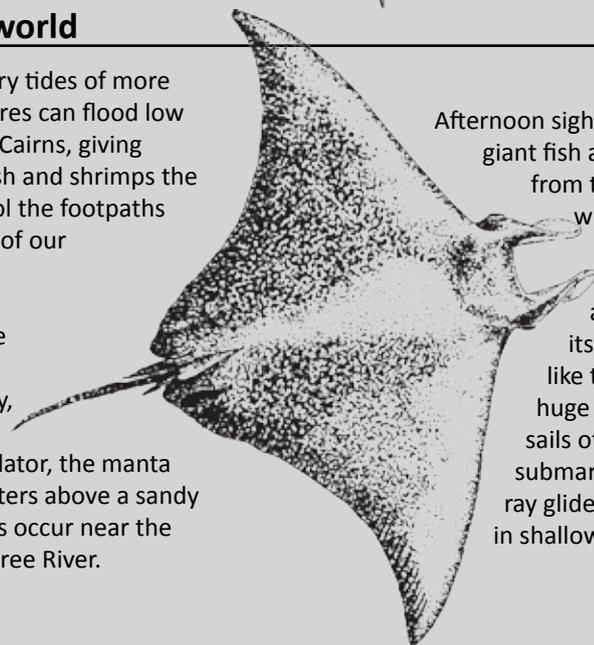


image: Dr Martin Cohen

A strange world

In early February tides of more than three metres can flood low lying streets in Cairns, giving adventurous fish and shrimps the chance to patrol the footpaths and view parts of our strange world.

Tiny prawns are often numerous during February, attracting a wonderful predator, the manta ray, to calm waters above a sandy bottom, such as occur near the mouth of Daintree River.



Afternoon sightings of this giant fish are possible from the beach, when the manta roves back and forth, its wings rising like the fins of a huge shark or the sails of a strange submarine as the ray glides and swirls in shallow water