

Self-guided tour of Cattana Wetlands Environmental Park with explanatory notes

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Introduction

This document explains the soils, ecology, flora and fauna of Cattana Wetlands; and is formatted as a self-guided tour with stations based on interpretative signage. Photographs of signs are included to assist your progress. Basic definitions of terminology are noted for each station.

The tour starts at the car park, proceeds to the signboard shelter, and then travels past the iconic Jabiru Lake and jetty, finishing with a circuit along the Franco Cattana Boardwalk.

Duration is approximately one hour on accessible, friendly shaded pathways with seating and water bubblers. You may wish to use mosquito repellent, particularly during the wet season.

Three basic issues shape Cattana Wetlands:

1. Sandy, low-nutrient soils have a marked impact on flora and fauna. Sand was deposited by ancient migratory beds of the Barron River, and / or by the sea during the Holocene period (6000-4000 years ago) when sea levels were 1.5m to 2m above present. Sand ridges and a large dune adjacent to Cattana's western boundary and running parallel to the Captain Cook Highway, may have been formed by Holocene sea levels.
2. The significance of remnant Feather Palm Forest, and how its flora has adapted to wet, sandy soils with low levels of oxygen and nutrients.
3. Much of the site has been farmed for sugarcane and mined for sand, followed by rehabilitation and natural regrowth. The success of this rehabilitation is measured by the diversity of animal species visiting or inhabiting the site. To this extent, over 200 bird species have been recorded, and Sugar-gliders and Striped Possums are reproducing.

Tour

Station 1: Carpark

Adjacent to the toilet block in the carpark. A water bubbler and shelter are available.

Directions: Enter the Park along the concrete pathway to reach Cattana Creek.

Station 2: Cattana Creek

Cattana Creek is spring fed in the Feather Palm Forest, but here it is tidal. It is vegetated by *riparian forest dominated by native Hibiscus (Hibiscus tiliaceus) and Weeping Paperbarks (Melaleuca leucadendra)*, the most common species of paperbark at Cattana, both of which are tolerant of some salt.

Hibiscus flowers open yellow and deepen to red before falling. Fibers from their stems were traditionally used to make ropes. Note how mature Hibiscus trees lower their branches which may take root and form thickets – this feature may be compared to younger Hibiscus observed later in the Tour.

Cattana Creek connects the Wetlands to the Coral Sea during the wet season, providing a means of fish exchange - the wetlands are an important fish-breeding habitat.

In Australia wetlands are especially valuable because our continent is one of the hottest and driest on Earth, and they are places of refuge in hot weather and drought.

Terminology:

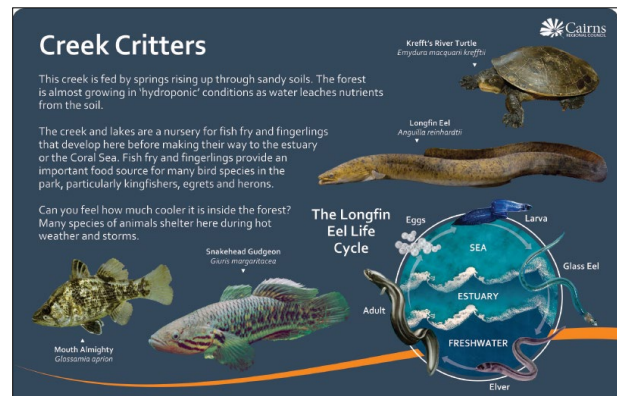
- *Riparian forest*: related to the banks of a river or wetland.
- *Dominated by*: most common.
- *Remnant forest*: remaining or natural, as opposed to revegetated or rehabilitated forest.
- *Remnant v.s revegetated*: Remnant vegetation such as parts of the Feather Palm Forest are in a more advanced or stable state of ecological balance, with many mature trees, a significant understorey and fewer weeds. They are still evolving over time, and have probably survived because it was not commercially viable to clear them for farming.

Rehabilitated or revegetated forests are in a young stage of evolution. They are characterised by juvenile trees with fewer tree or nesting hollows; and the understorey is often sparse with many weeds.

Most rehabilitated forests at Cattana have been planted but some have developed naturally starting with *early coloniser* or *pioneer species*, which are first to establish evolving habitats after disturbance by farming, logging or cyclones. Three common pioneer species at Cattana are Weeping Paperbarks, native Hibiscus and Leichardt Trees (*Nauclea orientalis*).

Directions: Proceed along the path to the signboard shelter.

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Station 3: Signboard shelter
(lat. 16.49.49; long. 145.42.11)



'Cattana Wetlands, a Changing Landscape'

The site was formerly a sugarcane farm owned by Franco Cattana. It was purchased by Mulgrave Shire Council in 1993 and included the Feather Palm Forest. Council then used the site as a sand-mine for local construction and formation of the beach on the Cairns Esplanade.

In 2009 Mayor Val Schier officially opened the Park for passive recreation. Since then, it has grown into a significant site for bird watching.

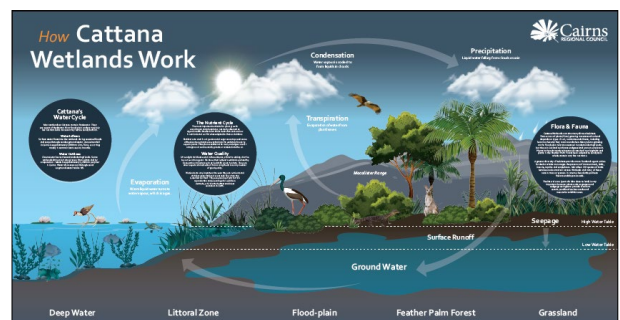
Terminology: Rainforest was historically referred to as 'scrub'.



'How Cattana Wetlands Works'

Note the 'water cycle' – evaporation, condensation, precipitation (rainfall), and flow of surface and ground water.

Lakes and swamps at Cattana have a sand base with similar levels of ground water during the dry season. Sandy soils are naturally low in nutrients. This has a profound effect on plants and animals. For example, a floating carnivorous plant called Bladderwort (*Utricularia*) feeds on microscopic animals to acquire nutrients; and *Salvinia* weevils (*Cyrtobagous salviniae*) are unable to reproduce in sufficient numbers to remove floating *Salvinia* (a Weed of National Significance, or WoNS) because of poor nutrition.



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Terminology:

- **Nutrient cycle:** The Wetlands and Cattana Creek are biological filters of nutrients from upstream urbanisation and farming, preventing them from reaching the Great Barrier Reef. Phosphorus settles in wetland soils (eg. mud), and nitrogen is converted by microbes (microscopic animals) for use by plants and algae.
- **Water quality:** UV light disinfects water. We know that Cattana's water is of good quality because bio-indicators such as Caddisfly larvae are present.
- **Carnivorous:** feeding on animals.

'Birds of the Cattana Wetlands'

More than 200 species of birds have been recorded at Cattana. Their diversity is considered as a measure of our management. Some species of birds are resident, but most are migratory, which may occur in response to weather or seasons, feeding or breeding. For example, many water birds migrate and breed west of the Great Dividing Range when water is available. The best online sites for bird lists are the 'Cattana Wetlands Birdlist' or search online at 'Cattana Wetlands ebird Hotspot'.

An 'air bee n bee' (or artificial nesting site) for insects and a native beehive are also located in this shelter. These Aussie Stingless Bees (*Tetragonula clypearis*) are important because they pollinate Australian plants more efficiently than introduced honeybees. Note: a tube at the hive's entrance to prevent intrusion by Green Ants – bees naturally construct these tubes with wax if not provided for them.

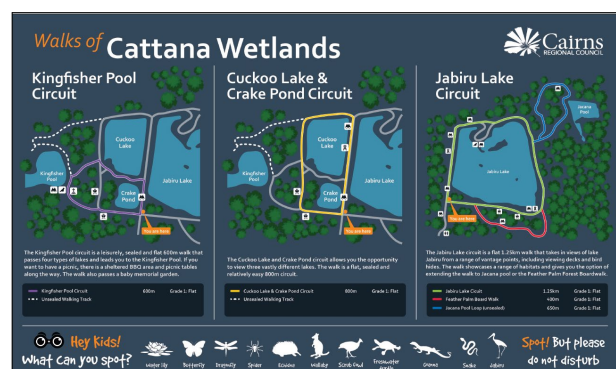
The number of insect species is also increasing at Cattana despite global declines, probably because of evolving vegetation, but hopefully also because of our management.

Directions: proceed to the sign 'Walks of Cattana Wetlands', a few metres on your right.

Station 4: Walks of Cattana Wetlands

Directions: This tour is based on part of the Jabiru Lake Circuit, so head west (to your right) along the north bank of Jabiru Lake towards the Franco Cattana Boardwalk.

Proceed to the sign 'Nurturing a Transforming Landscape', a few metres to your right.



Station 5: 'Nurturing a Transforming Landscape'

One of the best methods of reducing the threat of introduced pests is to maintain healthy ecosystems. Some measurements of good management at Cattana include increasing species of birds and insects. Sugar-gliders and Striped Possums are reproducing in revegetated juvenile forests - they have been observed in nest boxes (note references) provided for them to compensate for a lack of tree hollows which take 100 years or more to develop.

There are several ongoing threats to Cattana. Constant vigilance is maintained for pests introduced by wind, animals and floods. The most serious threats are the weeds *Navua* sedge, Paragrass and Sensitive weed (*Mimosa*); Tilapia fish and Electric ants.

Directions: follow the path to the entry of Franco Cattana Boardwalk.



Station 6: Evolving Paperbark Forest

(No sign, opposite entry to Franco Cattana Boardwalk)

This juvenile section of Paperbark forest (*Melaleuca leucadendra*) has naturally evolved since the 1990s from thousands of seedlings. Paperbarks are more tolerant of poor soils and flooding than most wetland species, and are aided by *aerial roots* growing on their lower trunk.

They stabilise the wetland's banks and are an important source of nectar for birds, fruit bats and insects, including butterflies and bees. Their fallen leaves are *allelopathic* and restrict the development of shade tolerant understorey plants. Nevertheless some plants such as *Pandanus* and sedges establish themselves. Stronger Paperbarks dominate weaker plants (which eventually die) in their race for sunlight.



Terminology:

- *Aerial roots* are roots growing above the ground. Paperbarks growing in wet soils develop aerial roots above water so they can breathe.
- *Allelopathic plants*: a plant that produces biochemicals that influence the germination and growth of other plants.

Directions: continue along the pathway – do not enter the boardwalk; you will return along it. Proceed past the barbecue shelter (no. 3) with a seat, water bubbler and tap.

You are passing Jabiru Lake, which is a former sand quarry, 5m to 6m deep, filled with surface water and maintained by ground water. The water is of good quality before

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overflowing to the Great Barrier Reef during the wet season. Sand from this quarry was used for general construction and formed the Cairns Esplanade.

Directions: Continue past the barbecue shelter (no. 4) with a seat, water bubbler and tap.

Station 7: Optional walk on the jetty

Green Pygmy geese are often seen here, seasonally. They are *herbivores*, feeding on seeds and other vegetation; including Snowflake waterlilies which attract insects eaten by Welcome Swallows and Comb-crested Jacanas.

Jacanas are *adapted* to a *niche*. Their ecological *niche* is floating vegetation, and their *adaptations* include elongated toes and toenails allowing them to spread their weight while foraging on waterlilies and an ability to carry their young for security. Another good place to see Jacanas is from the Cuckoo Lake viewing deck.

Terminology:

- *Herbivores*: predominantly eat vegetation (herbs / plants).
- *Adaptation*: how animals and plants have changed or adjusted to changes in their environment.
- *Niche*: the physical and environmental conditions an animal or plant requires, and its interactions with other species.

Directions: enter the Feather Palm Forest, on the Franco Cattana Boardwalk over an old cane-drain.

Drains such as this were constructed to drain swamps and wetlands for sugarcane farming. The water level in this drain, and the Forest, is subject to ground water during the dry season.

Station 8: Feather Palm Forest to 'Fantastic Feather Palms', (no sign until station 9)

Proceed along the boardwalk to the edge of one of the few remnant (original or natural) Feather Palm Forests between Port Douglas and Gordonvale. Has the temperature changed?

Not all of the rainforest we observe is original - much of Franco Cattana's donation was regrowth in various stages of development. This type of rainforest is dominated by Alexandra Palms (*Archontophoenix alexandrae*), sometimes called Feather Palms; Weeping Paperbarks; Fig trees; and *Pandanus*.

Rainforests are generally composed of four 'layers' – scattered emergent trees, a continuous canopy like a roof, an understorey and a forest floor. Examples of *emergent* trees protruding through the canopy are Feather Palms (up to 30m tall) and Kauri Pines (up to 40m tall).

Paperbarks are part of the canopy, and *Pandanus* grow in the understorey, searching for sunlight in the canopy.

A sedge called Dwarf Pandan Sedge (*Hypolytrum*) can be observed in several places. It is an understorey clumping plant about a metre high with dark green leaves.

Station 9: 'Fantastic Feather Palms'

Rainforests are dependent on high rainfall, most of which is absorbed by canopy trees. There is abundant water in the Feather Palm Forest during the wet-season, originating from springs in low-lying sandy soils. These soils are related to sands deposited by migration of the Barron River and water levels during the Holocene period (6 – 4,000 years ago) when sea levels were

1.5m-2m above present. They are naturally low in nutrients and lack oxygen when wet.

Feather Palms and other plants have adapted to this niche with aerial roots which assist breathing. Forests such as this provide shade, shelter and food for many species, including Torresian Imperial Pigeons.

Directions: continue along the boardwalk.



Station 10: 'Full of Figs'

The boardwalk crosses over Cattana Creek which flows from springs most of the year. Animals living in this forest include Sugar gliders and Striped possums; and Amethystine Pythons ('Scrubbies', *Simalia amethystina*) which are Australia's biggest snake and Cattana's largest predator.

Fig trees, and in particular the Cluster fig (*Ficus racemosa*) are *keystone species*. They produce masses of fruit which is eaten by birds (eg. Fig bird and Fig-Parrot) and fruit bats (eg. Spectacled Flying-fox and Eastern Tube-nosed Bat).

These animals are also important *seed-dispersers*.

Terminology:

- **Keystone species:** Fig trees, for example, are a keystone species because they provide food and shelter to more animal species than most plants.
- **Seed-dispersers:** Many species of birds and bats disperse seeds, transporting them to new sites. Other mechanisms of seed-dispersal include water and wind.

Directions: Continue along the boardwalk.



Station 11: 'What's in a Soil?'

(lat. 16.49.48; long. 145.42.8)

Buttress roots are typically found in nutrient-poor shallow soils, helping to support the tree and gather nutrients. Microscopic fungi grow on tree roots and assist with food collection. In return the plant provides a home for fungi and supplies it with food in the form of sugars. This is called a *symbiotic relationship*.

Nutrients also collect in cracks in the bark of *host* trees, providing nutrition for plants such as Climbing Swamp Fern (*Stenochlaena palustris*).

Terminology:

- *Symbiotic relationship*: a mutual relationship between two organisms (eg. fungi and plants).
- *Host tree*: a tree which provides nutrition, support or shelter, but may not be in a symbiotic or mutual relationship. For example, butterflies lay their eggs on a host plant which may not receive any benefit.

Directions: continue along the boardwalk.

As you progress downstream the forest gradually changes to riparian vegetation similar to that at the entrance to the park.

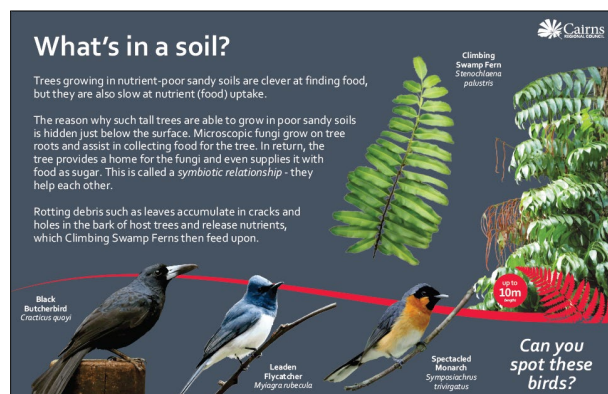
The forest shows signs of past disturbance - large Paperbarks are dominant but the canopy is fragmented allowing more sunlight to penetrate to the forest floor, which is dominated by Climbing Swamp Fern.

Many Alexandra Palms and Hibiscus have not attained maturity – Palms are smaller and Hibiscus do not have large spreading branches or a collapsing structure. In addition to this, the bed of Cattana Creek appears to have been modified by man.

Directions: At the end of the boardwalk, turn left on the concrete pathway and proceed back to the sign 'Walks of Cattana Wetlands', adjacent to the signboards.

You may wish to visit other tracks.

End of Tour - we hope you have enjoyed your walk!



References

'Coastal Palm Swamps', available online at:

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Wong, S. (2018), 'A Walking Guide to the Trees of Cattana Wetland', privately published: sharrenwong@gmail.com