Self-Guided Secret Garden Rainforest Ecology Walk

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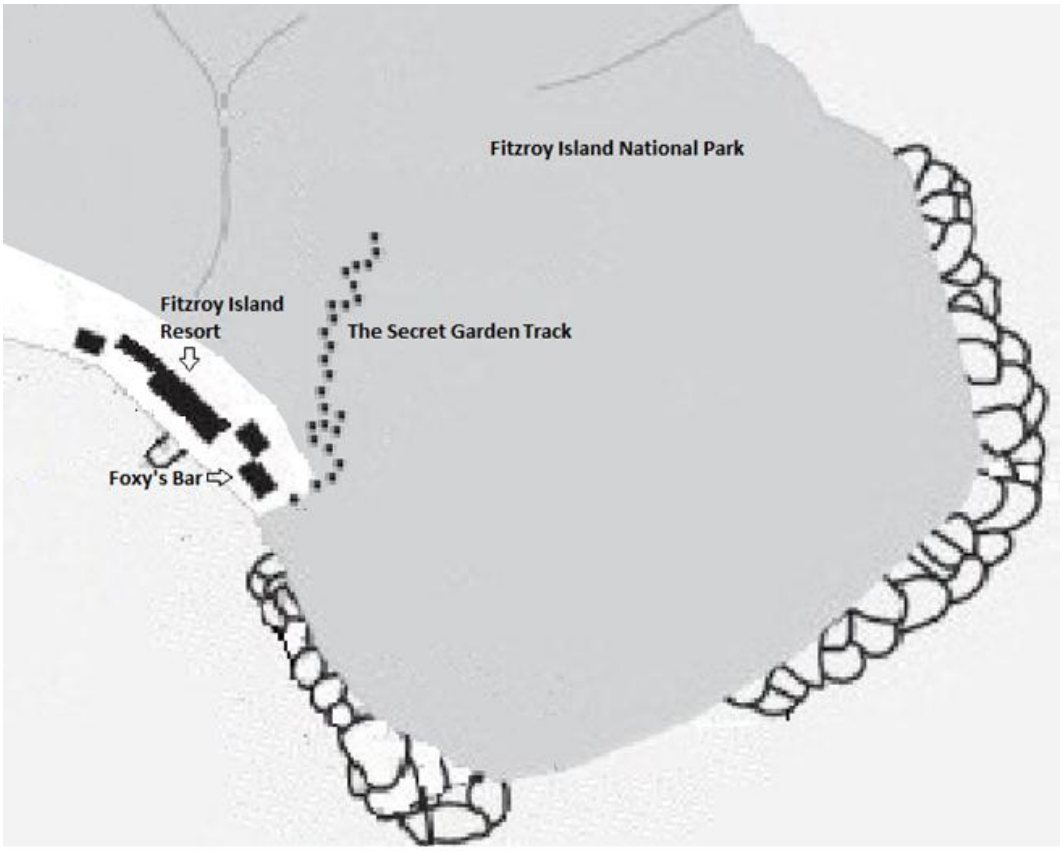

The track may not be exactly as it appears in this diagram

Take only photographs; leave only footprints

The Secret Garden: Rainforest Ecology at its Finest

Rainforests are incredible places. They cover a mere 6% of the Earth's surface and yet it is estimated that between 40% and 75% of all living flora and fauna are indigenous to their ecosystems. This includes two-thirds of the planet's flowering plants! A single hectare of rainforest can contain up to 42 000 different species of insects, 807 species of trees and 1500 species of higher plants. It is estimated that millions more have yet to be discovered, hidden in the deepest regions of the world's rainforests. These organisms live in a balanced ecosystem where individuals actively contribute to their surrounding environment. Their collective efforts are responsible for the splendour we see today. Because of their high levels of biodiversity, people expect rainforests to grow in nutritionally rich sediments. In fact, rainforests are the opposite. The soil is so nutrient-poor that it is almost barren. It is the collective effort of the plants and animals within all working together that create the abundance of life you see before you. Should any of the individual species making up the collective community be removed, the entire ecosystem could disappear from the loss of their fundamental relationships. The Secret Garden is a prime example of highly successful ecology at its best.

It is always recommended to stick to the walking track, bring water and wear insect repellent.

1. **Vines**

Visual Sighting: various vines intertwined alongside track (marker on the left hand side)

An incredible 90% of the world's vines grow in tropical rainforest ecosystems. Some vines begin life amongst the debris on the forest floor; others begin amongst the branches. The seedling's location is dependent on where the bird, bat or other animal 'deposited' their seed - which is a nice way to say "wherever the animal pooped it out". Once established, the vine quickly grows to the canopy so that it can access daylight. Once they can harvest that much-needed energy source, vines spread to other trees; threading them together in a large support network. This enables the vine to reinforce their host trees by providing a brace against strong winds. This is particularly important as most rainforest trees are typically shallow-rooted and top heavy; making them vulnerable to the impact of strong winds. But intertwined vines can also be detrimental. Should one host tree collapse, the well-established vine network will mean the weight of a fallen host is distributed amongst the surrounding trees; often causing others to collapse in its wake. It's the rainforest version of dominoes.

Vines can be detrimental to the health of their hosts in other ways as well. Vines ultimately compete for sunlight against their host plant; this is a competition they often win as they are able to dedicate a greater portion of their growth to leaf production as opposed to establishing a strong trunk. Trees that are heavily-burdened with excessive vine growth often have a reduced growth rate and produce significantly fewer fruits and/or seeds than their vine-free brethren. Vines also compete with their hosts for water and nutrients. Liana vines (long-stemmed, woody vines) often twist so tightly around the limbs of their host that they have been known to make some branches snap beneath their weight. Breaking limbs and felling hosts open gaps in the rainforest canopy. This phenomenon creates opportunities for saplings to establish themselves- without this opportunity most saplings perish. It is estimated that only one tree in 10 000 saplings will survive to reach the canopy.

Vines play an important role in rainforests by providing both food and shelter for animals. Their interlaced growth patterns provide canopy 'roads' to those that are not able to fly or glide great distances. This effectively opens greater portions of the rainforest to smaller creatures. It also minimises their travel time as they no longer have to descend to the ground in order to move across the forest. This ability to affectively 'modify' the distribution (and therefore the abundance) of animal populations identifies vines as ecosystem engineers. They create, alter and maintain vital habitat. Their ability to affect population densities within the rainforest surpasses the influence of most other elements you will encounter within the rainforest.

2. **Skinks**

Visual Sighting: forest debris habitat (marker on the left hand side)

Skinks are Australia's most successful family of lizards. 202 species are found in Queensland alone. As you walk along the track you should keep an eye peeled for their small forms propped against rocks and throughout the leaf litter. Fitzroy Island is home to countless skink species but the most commonly encountered is the large Major Skink, the striking Rainbow-Sided Skink (with a distinctive orange-red streak along its side) and the bespeckled Bar-Sided Skink. They dart about through the forest floor searching for small invertebrates to eat. Their typical prey includes flies, crickets, grasshoppers, beetles and caterpillars. But some will eat worms, millipedes, snails, slugs, woodlice and even other lizards. In turn, an unwary skink can fall prey to larger predators such as the monitors, snakes and of course, birds. In response to the threat of being eaten, most skink species have a long, detachable tail. This is especially useful against predators that attack from behind. This defensive move is called 'caudal autotomy' and it occurs in two separate forms. The first, intervertebral autotomy, is when the tail distinctly breaks between two weak vertebrae. The second (less-common) form, intravertebral autotomy, is when the skink deliberately fractures its own vertebrae (rather than utilising the space between bones) in the mid-section of the tail. In both cases the skink actively encourages the break by rapidly contracting muscles around the fracture plane. This swift movement works to both expel the vertebrae and simultaneously split the skin and muscle (to complete the ejection process). In the case of intra-vertebral autotomy the skink also activates specialised muscles around the caudal artery to minimise blood loss. Once

dropped, the tail will spasm in an attempt to fool the predator into focussing its attack on the wriggling, bloodied limb; thus allowing the skink to escape. The tails do this because the neural network is pre-programmed to direct the muscles in various frequently used movement patterns.

It can take up to four months to grow a new tail – and the end result is not an exact replicate. Skinks are not able to regenerate bone so the new growth is formed with cartilage. The newly formed skin has a different texture and colour and is generally considered to be 'less attractive' than the original. It's not known whether this impacts the skink's dating abilities. But without its tail a skink is especially vulnerable. Not only does it no longer have a distraction device, but the tail plays a pivotal role in locomotion, balance and energy storage. Many lizards will store fat deposits within their tails to help them weather the leaner months. It's like constantly carrying a packed grocery bag with you. For this reason, many will return to their dropped tail (if the predator opted not to eat it) and actually ingest it themselves. We've all heard the saying 'I'm so hungry I could eat a horse' but eating yourself is something else entirely! This remarkable display of self-cannibalism is actually an attempt to resupply their body with vital energy resources. It's actually pretty smart. Some take it even further. Some skinks have learned to deliberately attack a rivals' tail so they can sit down and enjoy a nice tail/ fat deposit meal. Brutal. Following the loss of the tail some skinks have been observed modifying their behaviour and restricting their movements specifically so they don't exhaust their depleted energy reserves. As the tail is so vitally important, skinks tend to only use this form of defence when they feel it is absolutely necessary – so please don't try to prompt a tail drop!

3. Tree Scars

Visual Sighting: tree with small scar (marker on the right hand side)

There are many potential causes of tree scarring. Disease and infection cause deep scars from the lesions that developed on the bark. Fire makes indentations within the tree itself. As the scar heals, bark may partially cover it. Other times the extent of the injury may be so severe that the bark is unable to regrow in the affected area. Typically, these scars will form on the trunk of the tree. Another common natural cause for scarring is a lightning strike. But by far the most common cause of tree scarring is breakage. When one tree is damaged by another falling tree, the resulting impact can leave severe damage. This is particularly so in cases when the main trunk was affected. Deep scars that penetrate the bark and reveal the wood (like on this tree) leave the tree exposed and vulnerable to damaging elements such as moisture and fungi. If fungal organisms successfully attach to the bark they can begin to break down the wood and gain access to the tree's nutrients. This renders the tree extremely vulnerable to decay and disease. The more heartwood is exposed in the scarred area; the higher the risk of developing further complications. Fortunately for this tree, its scarring is minimal.

4. Nutritional Recycling

Visual Sighting: fallen logs left alongside track (marker on the left hand side)

Rainforests are expected to be regions with nutritionally high soil owing to their lush canopies, giant trees, rich undergrowth and assortment of creatures living within. In fact the opposite is true – rainforest soil is virtually infertile. Very little essential nutrients are found within the soil itself; those that are generally don't remain for long. In fact, it's only the top soil that has any nutritional virtue. In this environment nutrients and carbon are locked inside the living vegetation. It's only when a plant dies that the nutrients within are discharged back into surrounding area. A similar effect is experienced when leaves decay. The sudden influx of nutrients includes nitrogen, phosphorous, potassium, calcium, sulfur, magnesium, iron, carbon, oxygen and hydrogen. Plants need these in substantial quantities in order to grow and be healthy. To a lesser degree, plants also require boron, chlorine, manganese, zinc, copper and molybdenum. Decomposers work hard to recycle these precious mineral back into the environment. This process is known as nutritional recycling. Very few of the nutrients actually penetrate the deeper soil. This is owing to the rapid rate of consumption by the surrounding living organisms. Decomposers include termites, fungi, bacteria and other microorganisms. Warm temperatures coupled with high rainfall increase the speed of decomposition. Decomposers convert the fallen organic matter into inorganic

carbon that can then be used by the surrounding plants. Nutrient recycling is essential because the growth rate and biodiversity of the surrounding forest is directly related to the availability of nutritional resources on the ground. Trees and plants cannot survive if they are unable to perform the necessary chemical reactions to both secure and release energy. For this reason trees, branches and leaves that fall within a National Park are left to break down where they lay (unless they lay on the path and then they are bunted to the side!).

Rotting materials are not the only useful organic material to be found in the forest. Faeces and sweat play an important role too. These materials might not seem so enchanting to us, but they are crucial to rainforest critters. Rainforests are typically characterised by periods of high rainfall followed by dry spells. During dry weather it is difficult for animals to find ready water. Insects such as butterflies, beetles and flies suck the moisture out of faeces and the flesh of a rotting fruit in order to survive. Think about that next time you look at a butterfly- that animal has likely been drinking poop. Faeces are in high demand for their energy value but they can also be rich sources of nutrients such as calcium salt. In fact, back to the delightful habits of butterflies - some species will even try to drink the sweat of the back of your neck. Tasty...

5. Ants

Visual Sighting: granite boulders and forest debris habitat (marker on the right hand side)

While they can be a pain if they penetrate your hotel room, ants play a pivotal role in the rainforest ecosystem. They account for up to 94% of arthropods (invertebrates with an exoskeleton) and 86% of the canopy biomass (biological material derived from living or freshly deceased organisms) found within a rainforest. Ants are responsible for clearing more than half of the fallen food resources from the forest floor. With their zeal for penetrating the furthest regions in their quest for tucker, this enthusiastic cleaning crew are vital in maintaining a healthy ecosystem. Ants consume and remove dead animals, fallen fruit and seeds with gusto. By removing the materials from where they fell (and bringing them back to their nests), ants actually create nutritional 'hotspots' where plants and microbes thrive. This filters into the soil and assists in delivering a nutrient injection vital for maintaining healthy substrate. We all know that ants are not the only ones that will remove waste products but research has revealed that they are far superior at it. No other animal is able to perform the same role to the same degree. Ant loss will result in in reduction of soil diversity and a marked increase in decomposing elements left to rot on the forest floor.

In addition to their architectural role as decomposers and nutritional redistributors, ants will consume pollen (aiding in pollination), fungi (and fungal spores- again, aiding in the reproduction process) and microscopic flora living on leaves. The nitrogen levels found in ants are comparable to those of plants and herbivores. This suggests that ants consume a significant amount of the rainforest's limited nitrogen and carbon. In some plants actively bribe ants to take an interest in their health and wellbeing. Roughly 1/3rd of tropical plants excrete small quantities of nectar from areas other than the flower. These sweet deposits can be positioned on the leaves, stems or even on the outside of the flower itself. The point is to attract ants, acting as a 'payment' (bribe) for defending the plant against grazers. These are not the only symbiotic relationships that ants enjoy. Sap-feeding aphids such as Green Fly and herbivores such as the Common Oakblue Caterpillar are known to 'bribe' certain ant species by excreting a honey-like substance in exchange for protection and continued grazing rights. Green ants vigorously protect Common Oakblue caterpillars. They even carry the caterpillar back to their nest at night for safety. The Green Ant is arguably the dominant ant species on the island. Also called Weaver Ants or Citrus Ants they are known for their unique nest building behaviour. Workers unite to sew individual leaves together using larval silk. The result is a tell-tale green 'football' hoisted high in the trees – see if you can spot any during your walk today. A single Green Ant colony can consist of more than a hundred nests, spanning numerous trees and contain more than half a million workers. These ants are highly territorial and workers aggressively defend their territories against intruders. Large colonies consume significant amounts of food and workers continuously kill unwary arthropods that venture too close to their nests. Trees that host a Green Ant nest can benefit from the situation as the workers hunt and kill insects that are potentially harmful pests; leading to decreased levels of plant predation from herbivores.

6. Predators of the Canopy

Visual Sighting: branches and leaves of the canopy (marker on the right hand side)

Look up! In a rainforest it is easy to keep your eyes at eye-level but so much rainforest life takes place both above and below! Keep your eyes peeled for the distinctive female Golden Orb Spider; a beauty that often grows to the size of your outstretched hand. In comparison, males of this species only grow to a maximum of 4-5mm. What a shrimp! Golden Orbs have a tendency to weave their web across the track so watch your step before you march unwarily into it! Golden Orbs are so named for the golden thread of their silk. These spiders feast on a barrage of flies, beetles, grasshoppers, moths, butterflies, cicadas and even occasionally snakes, birds and microbats if they are unfortunate enough to get caught. In short, she'll eat anything. So again, watch your step because some of them get big enough to eyeball a person... Golden Orbs often has to contend with a host of free-loaders living in their web and stealing their food. Rude. This includes males as well as other smaller species such as the Silver Drop Spiders. By stealing, these lazy spiders don't have to expend their own energy in creating a web. If their presence becomes too great an annoyance to the Golden Orb she will try to chase them away; the attempt is not always successful. She must be careful. If too many smaller spiders congregate on her web she runs the risk of being attacked herself or having her spiderling babies attacked. Basically, these are the worst kind of free-loaders imaginable. Some females will discreetly abandon a web to relocate away from too many unwanted squatters. The Golden Orb has other predators to be wary of as well. Several birds will readily swoop to snatch her from her web. In response Golden Orbs design their webs with protective 'barrier' threads. These threads are even stronger than those of the main body of the web itself (which is saying something as the normal thread is stronger than steel). Her thread is also incredibly flexible, capable of stretching to 40% its natural length before breaking. So it's basically elastic Kevlar. The spider will sometimes shake her web and use the vibrations to distract potential predators. On the island some Golden Orbs have been known to shot a quick burst of silk from their abdomen as another form of distraction. There are two known species of Golden Orb on Fitzroy Island – the Giant Golden Orb (whose legs are decorated attractively from behind with striking yellow joints) and the Australia Golden Orb (whose body is considerably darker and missing the distinctive joints). These are gentle giants that like to live and let live (unless you are prey) so if you see one, observe it from a distance and let her be.

Other canopy predators include the strikingly-beautiful Green Tree Snake – the blue variety has also been seen on the island. Green Tree Snakes are active during the day (the only species on Fitzroy Island to be so), and rest at night. They tend to sleep in hollow trees, logs, foliage, or within rock crevices. On Fitzroy Island they hunt for lizards, skinks, geckos, birds, bird eggs and melomys (a small, native mouse). While they are essentially harmless to humans, some tree snakes will defend themselves by producing a horrible odour. It's enough to make your nose hairs curl. There is also the chance of a bite (but their bite is not considered dangerous). Sometimes when approached, the snake inflates its body and neck to make it seem larger, a tactic used to scare prey. In general tree snakes will make a quick escape when they realise they are being watched. That said, they aren't always the smartest snakes and they have been known to fall from the trees and crash-land on unsuspecting passer byes- speaking from experience here; it hurts when they hit you. Though frankly I think the incident gave the snake a far bigger fright than myself because it darn near grew legs to run away. Green Tree Snakes are not the only species of snake on the island. The Brown Tree Snake is a nocturnal species with two small, grooved fangs located at the rear of the mouth. Though venomous, the venom is difficult to convey into a bite on a human due to the placement of the fangs and their grooved rather than hollow architecture. Brown Tree Snakes use their venom to subdue the birds, lizards, bats, frogs, arthropods and melomys they devour. These animals can be easily positioned in the rear of the mouth for a fluid venom delivery, as I discovered when I tried to rescue a fledgling Sunbird from the jaws of a Brown Tree Snake. Don't try this yourself; it was a spectacularly stupid move on my behalf (I smacked it with a thong- I was pretty mad as I had been watching the progress of the chick its entire life so finding a snake chewing on it was not cool). And it didn't save it- the snake spat it out, but it already had the tell-tale fang punctures across its abdomen and didn't make it through the night. The snake came back and ate it. In comparison to the tree snakes, pythons do not have fangs or venom; not even mild venom. Instead a python can have over 100 teeth inside its mouth that they use to grasp and retain prey while they slowly coil around and squeeze the life out of it. Group hug anyone? Carpet Pythons (also called Diamond Python) hide efficiently amongst the branches but they can also be found amongst the leaf litter. Carpet

Pythons are capable of reaching lengths up to 3m. However it is the Amethyst Python, or the 'Scrub Python' as they are also known, that is the heavy-weight champion on the island. Look through the section on the Summit and Lighthouse Historical Hike and you'll learn an interesting tale of a particularly hungry Scrub Python. Capable of growing 8.5m long, like all snakes their jaws are hinged so that Scrub Pythons are capable of swallowing animals much larger than their heads- even the Orange Footed Scrub Hens are not safe when one of these are about! As a nocturnal species they actively hunt melomys, bats, flying foxes, birds and of course - their fellow reptiles. Watch our Yellow Spotted Sand Monitors! Pythons can be found nestled across a variety of terrain from trees to rock faces, forest floors and even around buildings. You may be lucky enough to spot one basking in the sun.

While it is easy to demonise snakes for being scary, snakes make up a significant proportion of the middle-order predators that keep the natural ecosystems working. Without our tree snakes and pythons, their prey species would increase unchecked until they reached unnatural levels and start to disintegrate the perfect balance of the rainforest ecosystem. In turn, the Yellow Spotted Sand Monitors and Major Skinks (yes- this skink will kill and eat a snake three times its size!) that prey on the snakes would also struggle to find food.

7. Moss

Visual Sighting: moss encrusted boulder (marker on the right hand side)

Moss is classified as a true plant which means that it has its own chlorophyll and can perform its own photosynthesis. Individual mosses grow in close proximity to each other in clumps or mats. They always grow in damp, shady locations because they are highly vulnerable to drying out. Simple leaves cover their thin, wiry stems that not only perform the vital photosynthesis but allow the plant to absorb water and nutrients. This function is traditionally performed by the roots of other plants. Mosses do not have roots but instead are able to anchor to substrate through a series of thread-like rhizoids (picture sewing stitches and you have a general idea of how they work). Mosses additionally do not create flowers or seeds but rely on water for reproduction- the flagellates (tail) of the male moss sperm swim to find a female and create wind-dispersed spores. Moss play a subtle but important role in the ecosystem as their growth promotes localised water-retention, acts as a stabiliser on mobile surfaces and most importantly provide shelter and humidity for a variety of minute invertebrates.

8. Lichen Boulder

Visual Sighting: lichen covered boulder (marker on the left hand side)

Unlike moss, lichen is not a true plant. Instead, lichen is a community of fungi and a photobiont organisms (fungi's photosynthesis-performing partner) working in symbiosis. The most common photobiont found in lichen is green algae. The fungus protects the algae, enabling it to survive in sunny climates where it would ordinarily perish from lack of water. Safe inside the lichen, algae cells are able to withstand life outside of a constant water presence. Occasional rain is enough to enable the algae to store 'food' to last through the next dry spell. As the alga activates photosynthesis they convert atmospheric carbon into oxygen. This tiny little organism in front of you is actually creating the air you are breathing. In addition, lichen absorbs pollutants (including heavy metals) from the air and, thanks once again to its handy algal cells, converts atmospheric nitrogen into nitrates- a component that is paramount for growth. With each rain nitrates are leeched from the lichen to penetrate the dirt below. This allows the nearby rainforest plants to benefit from the lichen's hard-earned gains. During the day-to-day, the presence of lichen enriches the soil by trapping water, dust and silt. If the lichen dies its organics compounds are converted back into nutrients to replenish the soil. Incredibly, the cells of the photobiont are actually killed during the nutrient exchange between the fungi and the algae but the lichen survives as the photobiont cells reproduce as rapidly as they die.

The absence of a root system allows lichen to grow on bare rock as you can clearly see from this covered specimen. Lichen is also capable of growing in sterile soil and even on man-made object such as statues. That said, you will commonly find lichen growing on trees. There are three different forms of lichen: Crustose Lichen, Foliose Lichen and Fruticose Lichen. The Crustose form a rough 'crust' over the substrate as they grow. They are typically a greyish-green hue but can occasionally be yellow or red. Foliose Lichen grow flat; although they have a bumpy appearance. They grow with a distinct upper and lower surface. The final lichen, the Fruiticose Lichen, almost look like they are made from hair. They are often found growing from trees or shrubs. These grow upright and have no noticeable upper or lower surface.

9. Termites

Visual Sighting: rotting log habitat (marker on the right hand side)

Termites are vital nutritional recyclers as they feed on cellulose and soil. Tropical rainforests are warm and wet places with tall trees and an abundance of debris. As a decomposer termites are one of many (earthworms and fungi to name others) creatures that consume the dead organic matter (leaves, roots and fallen branches) and convert it back into nutrients. They are able to eat this material as they have an alkaline adaptation in their stomach allowing them to extract cellulose and other elements. Termites hold the record for the highest alkalinity levels within a living organism (their pH is 12; neutral pH is 7). Even with this adaptation however, the termites cannot digest the cellulose directly. They rely upon symbiotic bacteria and protozoa living within their intestines to supply most of the enzymes needed for cellulose digestion.

Termites are rarely seen as they mostly live within the soil or surrounding vegetation; only a few species construct mounds. You might spot some small mounds if you look about you- most tend to be either attached to a tree trunk or breaking the monotony of the forest floor. Within the colony the termites abide by a strict and complex caste system where they are divided into workers, soldiers and reproductive termites. The worker caste is the largest group. It consists entirely of immature termites that perform all of the hard labour in the colony. This group clean, maintain and repair the nest, gather food and water; care for the young and construct new tunnels/galleries as the colony grows. Members of the soldier caste are larger in size but fewer in number than the workers. Their job is to guard the nest site and protect it from attacking ants and the island's Short Beaked Echidnas. In some species termite soldiers lack jaws but have a large gland at the front of the head that shoots defensive chemicals like a crazy squirt gun. The soldiers are unable to care for themselves so they must be fed and groomed by the workers. The reproductive termites is the king (male) and queen (female) who are the produced the entire termite family and therefore started the colony. The termite's caste system is regulated by pheromones. The king and queen each produce special pheromones that circulate throughout the colony and inhibit workers of the same sex from moulting into reproductive adults.

10. Hairy Mary

Visual Sighting: spikey vines and palms growing near track (marker on the right hand side)

Hairy Mary **–** or *Calamus australis* – is a species of climbing palm endemic to Queensland. The first specimen was collected from Fitzroy Island by Botanist Alan Cunningham in 1819. As their name suggests, climbing palms physically manoeuvre their way to the top of the canopy by clawing up the limbs of their neighbours. They use a series of sharp hooks to grapple their way upwards. Their slim frame grows to a maximum of 2cm diameter. Once they are well established they lose the sharp spines in favour of a 'glassy' surface. Their fruit is consumed by fruit doves that then spread the seeds to the next location. On the island this role is performed by the Emerald Doves, Bar-Shouldered Doves, Rose-Crowned Doves, Pied Imperial Pigeons, Wompoo Fruit-Dove and the Peaceful Dove. Be warned- this is not a plant that you want to come into contact with; especially on the thin, hooked tendrils. They can deliver an extremely painful tear to the flesh that will bring tears to the eye and a few choice words to the lips.

11. Creepy Crawlies

Visual Sighting: forest debris habitat (marker on the right hand side)

The rainforest is home to an assortment of 'creepy crawlies'. With a possible 42 000 insect species to choose from, it is difficult to pick which particular insects we should focus on here. Each plays their part in maintaining the overall health of the ecosystem. But let's choose some of the more colourful characters to get to know better. Stick Insects are herbivores that graze on the leaves of the surrounding trees and shrubs. Their constant munching stimulates the trees to sprout new growth. In return, the Stick Insect consumes the tree's nutrients. They absorb most into their own body but convert the remaining portion into useful fertiliser for the forest floor. This recycles the nutrients and makes them available to other plants to consume. They can however be detrimental to the rainforest trees if too many of them congregate in the one area and strip the foliage. Their predators – birds, skinks and parasitic wasps- are vital to keeping the Stick Insect population at a manageable level across the island. Of course the Stick Insects don't see it that way. They rely on a combination of camouflage (in which they will slowly rock their bodies back and forth in an attempt to emulate a stick waving in the breeze) and a chemical defence (excreted from their abdomen) for protection. Depending on the species, some chemicals create an unpleasant odour while others can cause a burning, stinging sensation in the predator's mouth and eyes. Other species rely on a wing display to startle would-be-predators. Both males and females have wings but the females cannot fly as their wings are too small to support their body weight.

Another common sight in the rainforest is the Rhinoceros Beetle, so named for the distinctive horn sported by males. There are almost 200 species of Rhinoceros Beetles in Australia; and all belong to the scarab beetle family. Larvae is fat, 'C' shaped and lives in soil, dung or even decomposing plant material. There they forage and decompose the vegetation; actively converting the plant matter into compost. The larvae grow until it is ready to pupate. It will pupate underground inside a specially made cell lined with its own faeces that makes a tough, waterproof exterior. You have to be impressed with its mad house-building skills. Inside this protective pooh casing the larvae undergoes a complete transformation and morphs into an adult after a month. Adult beetle can live for four months. As adults they feed on the soft bark of young seedlings. In the rainforest world many of the trees do not survive to reach the canopy; some fall early victims to this beetle's strong jaws. Not only is this beetle visually exciting but their social lives are pretty entertaining too. When threatened, a Rhinoceros Beetle will make a loud hiss- the sound is produced by rubbing the abdomen against the ends of the wing covers. It's a bit disarming but this really is a case of bark being worse than its bite. Females emit a hormone to attract and excite males; when she is ready to mate the males will line up to win fair heart. They physically compete for her approval by jousting with their elongated horns; whichever beetles manages to dislodge the other from the branch is the winner. Provided the female was impressed of course!

Another common rainforest creepy crawly is the cockroach. There are many different species of cockroach. While they are extremely distasteful to find in your room, out here cockroaches are vital to maintaining the overall health of the rainforest ecosystem. They live in colonies inside rotting wood and act to speedily decompose logs and other fallen debris; reconverting the nutrients back into the rainforest top soil. Wood Cockroaches are particularly apt at this. Like termites, they have special micro-organisms living inside their gut (flagellate amoebae) that help digest the woods' cellulose. Some species are even able to break down decomposing organic matter faster than termites! In addition, cockroaches play an important ecological role as pollinators; they are directly responsible to fertilising numerous rainforest plants. Think of them as ugly little cupids (although if you have ever seen a Wood Cockroach you'd have to admit they are a wee bit endearing to look at; not at all like their hideous cousins). But if appreciating cockroaches is really not your thing than here is another fact that you will definitely welcome – cockroaches play an important role as a food source for rainforest predators. They are consumed with gusto by vertebrates and invertebrates alike; providing the core of predator diets (that's how many cockroaches are running around here!) It is unfortunate that cockroaches don't always recognise where their rainforest domain ends and human lodgings begin; but find a nice hungry skink and they'll happily oblige with pest control!

Speaking of rainforest predators, watch the forest carefully and you may spot a carefully camouflaged Praying Mantis lying in ambush. This phenomenal predator is capable of turning its head 180˚ while it scans its surroundings! A young Praying Mantis prefers to eat moths, butterflies, crickets, grasshoppers, flies – basically, anything small enough to catch, hold and eat. They use their barbed front legs to snatch unwary prey; their hooks hold onto the wriggling bodies while their large mandibles deliver a powerful bite. They strike with such speed that it is almost imperceptible to the eye. As a mantis grows, so too does its appetite. Large Praying Mantis have been observed hunting skinks, geckos, scorpions, small birds, melomys, frogs, spiders (including tarantulas) small fish and even snakes!!! These guys are the rainforest gladiators – and they wouldn't have it any other way. In return, a poorly timed attack can result in their demise. Tarantulas, bats, birds, spiders, frogs and large lizards will happily much down on a Praying Mantis that overplayed its hand. Here on Fitzroy Island they can also fall prey to Parasitic Wasps.

12. Epiphytes

Visual Sighting: A green valley of Bird Nest Ferns growing on every surface (marker on the left hand side)

The Bird Nest Ferns that you see here are an example of an epiphyte- a plant that grows using a host for stability. They survive by collecting leaf litter and other debris falling into their centre. This is then broken down with the help of microorganisms to feed the plant. Bird Nest Ferns and other epiphytes create habitat for insects, nesting birds, insect larvae (living inside the pooled water) and even frogs in some cases! Caste your eyes around as you keep moving along the track and you'll see that epiphytes are a common sight in the rainforest.

In the world of air plants, bigger is not necessarily better. Epiphytes such as the visually stimulating Staghorn and the Bird Nest Ferns before you can grow so large (or so many can be growing on one space) that the limb of a host plant can physically break under their weight. Another danger of growing too large is that the centre of the epiphyte collects so much debris that the insides begin to rot; leaving the plant highly vulnerable to decomposing as well. This is particularly dangerous after excessive rainfall as the Bird Nest Fern is designed to hold onto every drop of water that falls within.

13. Tree Nodules

Visual Sighting: tree with large, obvious protrusions (marker on the left hand side)

Abnormal growths, or lumps, on tree branches and stems are usually galls. Some trees are more susceptible to certain types of galls than others- not all galls are caused by disease. Insect activity (especially by wasps) is a major source of galls on tree branches and foliage. Other than potentially harboring damaging insects, galls generally do not harm the tree. Fungal infections and bacterial diseases may be carried to the tree on the wind, injected into the tree by insects or from the ground. Bacterial crown galls generally appear at the base of the trunk near the top of the roots. They can also appear higher on the trunk through the branches and limbs. These galls are round and spongy at first, then turn hard inside with a cork-like exterior.

14. Fungi

Visual Sighting: fallen logs breaking down alongside track (marker on the left hand side)

Unlike green plants, fungi lack chlorophyll and therefore must obtain their nutrition from other sources. There are three main forms of fungi: parasitic, mutualistic and decomposers. Parasitic fungi are not common but will absorb their nutrients directly from the host plant. Mutualistic fungi simultaneously penetrates and engulfs the tiny rootlets of the surrounding trees and shrubs. Surprisingly, this doesn't hurt the plant; in fact both the fungus (mushroom) and the plant derive benefit from this symbiosis. For its part the tree obtains nitrogen, phosphorous and other precious nutrients directly from the fungi while the fungi absorb moisture, sugar and carbohydrates from the tree. Trees without fungi typically don't fare as well as those that have them laced around their roots. Mutualistic fungi are recognised as ecosystem engineers for the efficient way in which they

control nutrient recycling within the ecosystem. The final type of fungi- decomposer fungi- only lives in dead organic material. This includes leaves, grass, faeces and dead wood (amongst others). These species have an important role in the ecosystem where they break down and decompose dead plants and animals thereby returning important nutrients to the soil and the rainforest. This action benefits plants that get their sustenance from the soil's nutrients; but it is the aid it delivers to xylophagous invertebrates (herbivore critters with a diet that consists primarily of wood) that get decomposing fungi recognised as another ecosystem engineer. Decomposer fungi actively create habitat where the xylophagous invertebrates previously could not survive. All in all, fungi are pretty useful organisms within the rainforest habitat.

15. The Canopy

Visual Sighting: solid foliage canopy above (marker on the left hand side)

Rainforest plants are typically graded into several vertical layers – the overstory, canopy, understory, shrub layer and ground level. The overstory is the occasional tree that grows that much higher than the canopy. The rainforest canopy is the primary layer of 'roof' fashioned by the foliage. It is created by the trees whose combined branches and leaves form a dense and distinct layer. The understory is recognised as the space between the canopy and the forest floor. The understory is divided into two parts; the lower portion is characterised by shrubs and saplings. This is called the shrub layer. Finally there is the ground level which is the forest floor itself.

The canopy is a fascinating world of its own, accounting for an estimated 70% of all rainforest life. Evergreens dominate the biodiversity. The canopy is rich with vines, epiphytes (including beautiful orchids), moss and lichen. Predatory birds such as the island's raptors perch atop the tallest branches and peer for prey. Doves, kingfishers, butterflies, snakes and other creatures thread their way through its concentrated structures. They live alongside a variety of insects and arthropods in their own entirely self-sustaining ecosystem. Most never touch the forest floor but spend their entire lives in the canopy. Water can be found in hollows or epiphytes; although many animals received the majority of their moisture from the leaves or animals they consume.

Most rainforest trees tend to grow straight; they only branch out once they have obtained a significant height. Then they spread out to claim their fair share of the canopy (or in most cases, they'll try to take more than their fair share). Each tree grows so closely to its neighbour that their combined foliage can block sunlight from reaching the forest floor. Notice how much cooler it is in here?

16. Birds

Visual Sighting: various rainforest debris (marker on the right hand side)

Birds play an important role in the rainforest ecosystem. They seek shelter in the density of the canopy, consume nutrients through the fruits and insects, pollinate flowers, are preyed upon by large snakes (and other large animals like the Golden Orb Spider) and disperse seeds away from the parental plant for propagation. Their faecal deposits create the next generation of rainforest plants competing for survival. In return the rainforest ecosystem provides the birds with ample food and a warm home in the winter (avoiding the cold temperate zones). Up to 27% of the world's bird population live in rainforests at some stage of the year.

One of the most common birds spotted around Fitzroy Island is the Orange Footed Scrub Hen. A comical bird with their undignified gait and extremely noisy vocalisations, they feed primarily on insects and beetles but will consume some fruits and seeds at a pinch. They spend the majority of their day searching for food amongst the forest floor by using their powerful legs and claws to upend the earth. This act enables a rapid topsoil turnover which in turn provides the soil with vital oxygenation. Their faecal matter aids in fertilising the top soil. They are lazy parents; instead of building a nest and tending to the care of their fledglings, Orange Footed Scrub Hens opt for a far easier method. They compile giant mounds from the gathered rotting plant matter, soil, sand and any other organise compound they can get their feet around. They lay their eggs inside this mound and simply

strut away; entrusting the heat produced by the sun and decaying organics material to keep their eggs warm. Chicks have to dig their way to the open; from the moment they hatch they are entirely self-reliant as their parents have no interest in them. Talk about welcome to the world!

The Wompoo Fruit Dove is another common bird but you would be entirely forgiven for not knowing what it actually looks like (for the record it is a beautiful species with purple, green and grey markings). As a bird of the canopy, Wompoos rarely venture close enough to allow a sighting. More often than not you are aware of their presence because of their characteristic call- '*wollack-wa-hoo*' and '*wompoo*'. Though the birds will consume insects and other arthropods, their main function in rainforest ecology is as a seed disposer (basically, they're an ecological pez dispenser). In the bird world, it pays to be a big mouth as they are able to digest the large fruits and seeds that their smaller brethren just cannot get their beaks around! Wompoo Fruit Doves chose not to migrate through the winter, but stay in the region and change their diet to whatever is fruiting at the time. They will eat the fruit of vines, trees and palms in turn; devouring all and 'reposting' seeds.

Another of the great 'movers and shakers' of the rainforest ecosystem is the Pied Imperial Pigeon. This elegant black and white bird is a regular visitor to Fitzroy Island during their annual September-March migration from Papua New Guinea. They are an ecosystem engineer; credited with introducing Native Nutmeg to the region. One Pied Imperial Pigeon was tracked on its journey through Australia. It covered 65.5km in 78 days, flitting from one rainforest to another. These birds 'deposit' an estimated 190 seeds each day. This makes them a crucial rainforest element in terms of forest regeneration. If they were lost there would be a steady decline in rainforest biodiversity and significantly fewer saplings in the forest. In return, the birds not only eat a hearty amount of fruit but also gain a useful breeding ground in which to nest.

17. Ground Hunters

Visual Sighting: perfect ambush habitat by large buttress roots (marker on the left hand side)

The forest floor is home to a vast array of wildlife; many too small to even notice until you start to really look. This is where many of the rainforest fauna live in a constant game of cat-and-mouse. The food chain is prolific as each animal kills, and is killed, in its turn. There are numerous hunters that stalk the ground, hidden amongst the leafy debris. Here is a selection of some of the best (and worst!) of the Secret Garden's ground hunters.

Let's start with everyone's favourite animal- the tarantula. Yes, we have them on Fitzroy Island. Fortunately, sightings are few and far between. That is, unless you're me and you find a tarantula crouched at your feet while you're sitting at your desk. Not even kidding; that actually happened. But most people are lucky enough not to see them at all. That's because tarantulas live in burrows dug into the earth where they hide during the day. They creep out at night using slow, deliberate movements to creep up on would-be-victims before pouncing. They mostly eat invertebrates such as insects and beetles- in fact tarantulas have been identified as an important form of biological control over beetle populations – but they will target bigger game such as the larger skinks, geckos, frogs, giant millipedes, other spiders and even young bird hatchlings. As ground hunters tarantulas have no need for a web in order to catch prey. Instead they spin a few small silk strands around the entrance to their homes that act as a doorbell. These vibrate as unsuspecting creatures shuffle over them and alert the spider to the presence of potential dinner. Tarantulas snatch prey with their appendages, inject paralysing venom before dispatching their unfortunate victims with their hollow fangs. They secrete digestive enzymes that liquefy their victims' bodies; allowing the spider to slurp them up like a ghoulish thick shake. After a large meal, the tarantula may not need to eat for a month.

As you can imagine, tarantulas have very few natural enemies. This is largely because they have a very short temper and are, quite frankly, terrifying when their blood is up. They are like the spider version of the hulk and no one wants to mess with that. However the parasitic Pepsis Wasps are a formidable exception. These gladiators will go into combat seeking to paralyse the tarantula with a well-placed sting so that it can inject its eggs inside the spider's body. When the eggs hatch, the wasp larvae gorge themselves on the body of the still living spider. Another, less gruesome, threat to wild tarantula populations is collection for the pet industry.

Believe it or not some people are crazy enough to want to cuddle them. Good luck with that. It is estimated that 10 000 tarantulas are collected from the wild and sold as pets every year in Australia. As you can imagine, this has a negative impact on the vital wild populations. If Fitzroy Island lost its tarantulas the bug population would explode and the harmony of the Secret Garden's ecosystem would fall out of balance. So we like our tarantulas here; we just don't want to meet them face to face.

Another (less terrifying) spider is the huntsman. Fitzroy Island is known to be home to at least two species of huntsmen - the Giant Green Huntsman (which grows as big as your outstretched hand) and the Grey Huntsman. Not going to lie, the Giant Green Huntsman can be a little unnerving to meet in your living room. But it actually has a really gentle nature. Grey Huntsmen are a little more erratic; although fortunately for us the Grey Huntsmen of the tropical north are not as aggressive as the species found in southern Queensland (which actively charge at you gnashing their teeth). So all in all, huntsmen may be a little freaky to look at but they are gentle giants. Unlike the tarantula which uses silk around its home, a huntsman has no need for silk at all except for around their egg sacs. They hunt at night using a combination of vision and vibration to locate prey. Like the tarantula before them, huntsmen are incredibly effective natural bug control agents. They sit almost perfectly still and rely on camouflage; once the prey ventures too near the spider will pounce. However the will occasionally run after prey using their lightning-quick reflexes to mow them down like a miniaturised cheetah. They eat spiders, insects, beetles and occasionally small vertebrates (like reptiles or young melomys). They hunt at night and spend their day curled up behind loose bark, inside rock crevices, in split logs, under rocks or fallen wood and of course, underneath the leafy debris strewn around you. Their flattened frame allows the large spider to squeeze into small gaps and hide. Huntsmen must be wary of birds, larger reptiles, parasitic wasps, nematode worms (internal parasites) and egg parasites which include wasps and flies.

Another thoroughly charming rainforest occupant is the Giant Centipede, capable of growing up to 16cm. Are you wearing shoes with exposed toes? I bet you wish you weren't. Just a friendly reminder- stay on the track and don't venture off because even a few steps can bring you into contact with some members of the rainforest population you would rather not meet. And on that note- the Giant Centipede lives in sheltered places such as under logs, leaf litter, bark and rocks. This is because they lack the waxy outer-cuticle of insects and spiders and are therefore vulnerable to dehydration. During the day they seek out cool places to hide. They hunt at night, stalking their way through the foliage and searching for prey. Giant Centipedes are amongst the largest invertebrate predators found on land and as such, they play a crucial role in the ecosystem. They will eat insects, beetles, lizards, frogs, small melomys, bats and even birds. You may be happy to discover that centipedes and spiders are the rainforest version of the Bull Shark and the Salt Water Crocodile (on a slightly smaller scale of course). These two enemies both prey on, and fall prey to, each other every day. Some snakes and beetles will eat centipedes as well. Imagine trying to floss all those legs out of your mouth. But their main contribution as a rainforest ground hunter is in actively contributing the constant nutritional recirculation through the bodies of their meals. Once a prime target has been acquired, the centipede will quickly subdue its victim using its rear modified 'claws' (called forcipules) to curve over its head (hats off for flexibility!) and deliver the venom. Centipedes use their strong mouth parts to hold prey until the venom takes effect. Their venom is toxic to mammals, birds and insects, and it can make a person ill. Its potency is enough to overcome small prey; though it generally cannot overpower a large animal. That said, you'll be thrilled to discover that with most animals, the rule of thumb is: the weaker your physical form, the stronger your venom and vice versa. Using this theory, the centipede should have incredibly weak venom because their physical attributes pack a serious punch. But just to make them extra cuddly; centipedes don't follow the rules and actually have both. Happy thoughts indeed.

Have you met the rainforest scorpions? For once, this is an example where Australia actually has the best kind of dangerous animal- our scorpions aren't deadly! Stings are annoying and painful, but not deadly. How about that? Australia finally caught a break! We have Dwarf Forest Scorpions here on Fitzroy Island. They grow to a maximum of 3cm. However it is entirely possible that we have the larger Rainforest Scorpions too; they can grow to 8cm. As their names suggest, these arachnids live in forests. They use their large claws to anchor themselves into minute cracks and crevices in rocks, logs and tree bark. Dwarf Forest Scorpions live in colonies typically located up to 40m above the ground. They will eat anything as long as it is smaller than themselves –

beetles, insects, spiders, frogs and reptiles all line their stomach at one time or another. Scorpions are mostly nocturnal but they can be active during the day, especially during prolonged wet weather. Despite having bad eyesight, scorpions can readily distinguish light from dark. They appear to have excellent low light sensitivity which enables them to avoid harsh sunlight as well as navigate the darkened forest by moonlight. They sense their way around using sensory hairs and slit organs on the legs, pedipalps and body. These pick up vibrations and scents via a series of mechanoreceptors and chemoreceptors. Scorpions also have special organs on the underside of the body called pectines which pick up textures and scents along the ground. Usually the scorpions are content to keep to themselves but during the rainy season males start looking for a female and may unintentionally wander into a room. If this happens, just call Reception for help and remember; for once the Australian version is the good one!

Another nocturnal ground predator is the beautiful Slatey-Grey Snake. Capable of growing to lengths up to 1.5m, this is a strong and muscular snake. It's considered harmless to humans but this reptile is a ready biter if provoked so it's best to observe them from a distance. They'll also produce an 'interesting' (polite way of saying 'foul') odour from their anal glands when they feel threatened... a.k.a. they 'pop off'. Slatey-Grey's are able climbers but they generally choose to forage along the forest floor. They will eat eels, frogs, fellow reptiles, melomys, fish and eggs. All in all, our ground hunters are a formidable group. As hunters positioned at the high end of the food chain, they play an essential role in maintaining the balance of the ecosystem. Without them, the rainforest would cease to function and all that you see around you would be lost.

18. Cluster Fig

Visual Sighting: tree with unusual surface lumps set 3m back from the track (marker on the left hand side)

Cluster Figs are a visually striking tree, their knarled and 'cauliflowered' appearance is a result of their unusual fruit that spouts from the tree trunk rather than a limb. These fruit are home to the Fig Wasp. A pregnant female wasp will enter the fruit through a minute hole located near the crown. As she pushes deeper inside the fig she pollinates the flowers, then lays her eggs and dies; all within the fig cavity. Young males are the first to hatch. They chew their way through the flesh of the fruit to reach the outside world, but leave the larger females trapped inside. But they don't leave without leaving a thoughtful gift behind - they drop polite little sperm packages back inside the holes then scarper before the females can tell them what they think of their less-than-chivalrous behaviour. The females are not able to chew their way out of the fig without the male's assistance so after a period (when they are sure the girls are no longer bearing a grudge and have made use of the sperm packages) the males return and create a larger hole for the ladies to squeeze through (she is pregnant after all!) As the female pushes her way out of her nursery fig she inadvertently brushes against pollen, coating her with granules which will pollinate the next fig. Females then have less than 48 hours to locate another fig tree to begin the process again. This constant cycle ensures that both species – the wasps and the figs- will continuously exist as they are both providing essential assistance that is fundamental to the other's survival. Once the fig ripens, birds, bats and mammals consume the fruit (dead wasps and all), then disperse the seed to a new location.

19. The Understory

Visual Sighting: plants growing alongside track (marker on the left hand side)

As previously outlined (see stop #15), the understory is the dark, humid space that stretches between the forest floor and the canopy. As the canopy generally blocks the sunlight, plants growing in the understory are characterised by large leaves in order to increase their capability for photosynthesis. Most generally do not grow above 3m high with the exception of vines (which catch a ride) and the trees of the canopy themselves. Every tree that currently resides in the canopy began life as a young seedling here in the understory; but they are not considered to be a 'true' understory plant. They spend their years, sometimes for decades, as stunted juveniles awaiting a chance opening in the canopy above (from a tree dying) so that they can quickly grow into

the gap. In comparison, true understory plants will live their entire lives at this layer. They are shade tolerant plants; usually bushes, shrubs, herbs, small trees and large woody vines. The understory generally exists at a higher level of humidity than other rainforest layers. Very little solar radiation penetrates the canopy which means that the ground does not experience the rapid heating/cooling cycles experienced in rainforest layers. As such, the lower rainforest levels take longer to 'dry out' after rain; effectively increasing the atmospheric humidity. This phenomenon actively encourages the growth of epiphytes such as moss, ferns and orchids. It also increases the ability of fungi and other decomposers to flourish; once again providing the driving force for nutritional recycling. Without this all important process, the soil would be barren and the rainforest would simply not exist. It also means that the understory is a preferred habitat for many of the rainforest flora and fauna. The 'shrub layer' contains over 84% of rainforest orchids; a major contributor to creating habitat niches for the rainforest's various insects and beetles. This layer is dominated by invertebrates as they forage, hunt and break down nutrients into the top soil.

20. Hollows

Visual Sighting: beautiful fallen hollow tree with epiphyte (marker on the left hand side)

It takes 100- 150 years for a living tree to form a hollow; their sizes can range from a 2cm opening to a gape of >75cm. Depths can be anything between 10cm and 10m. In general, young trees do not form hollows because they are too resilient to the numerous contributing elements that create cavities. The older a tree, the more occasions it has experienced wind, heat, fire, lightning and rain. It is also more likely to have come under attack from various decomposer agents such as fungi, bacteria, termites and wood-chewing beetles such as the island's Carpenter Bees. The bark and outside of the tree may remain healthy while any injuries to the inner bark (as referenced in the earlier mention of tree scars, see #7) allows potential decomposers to penetrate the tree's armour. Once the initial hole is made, wildlife will use a combination of claws, jaws and beaks to clear space and open the recess further. 28% of Australian reptiles, 17% of birds and 42% of mammals utilise hollows for shelter and protection. These include bats, birds (such as the forest's Kingfishers), snakes, frogs, skinks and echidnas. Many invertebrates seek the shelter and protection of hollows as well. Elements such as the size, shape, depth, natural insulation levels and position on the tree can affect which animals will seek to make a home within the cavity. Hollows provide shelter from poor weather as well as a secure location to safely raise young. Not every hollow-using animal will live in a hollow permanently. Some use them on a temporary basis such as the island's Short Nose Echidnas.

Thanks in large to the efficiency of decomposers, this process is significantly sped up once a tree has died. During the decomposition process vital hollows are opened, providing necessary habitat in a fraction of the time it would take to form in a living tree.

21. Wait-A-While

Visual Sighting: well established palm surrounded by other Wait-A-Whiles in various stages of growth (marker on the left hand side)

The infamous Wait-a-While, *Calamus muelleri*, is so named because the large thorns can easily ensnare a person (or animal); forcing them to stop and spent time physically extraditing themselves from the plant. This is the same reason that you will sometimes hear it called 'Lawyer Vine'. These sharp prickles provide a highly effective form of defence against grazers as well as extremely useful climbing tools as the vine-like palm seeks to establish itself. Like its cousin the Hairy Mary, While-A-While was first collected on Fitzroy Island. Scottish born naturalist John McGillivray collected the first specimen when he explored the island in 1848. Wait-A-While and Hairy Mary are often confused with each other however the true Wait-A-While has larger fronds and its stem is thickly covered with delicate spines rather than hooked claws. The Hairy Mary also has a slight purple tinge on

new fronds, a feature that is absent in Wait-A-While. As with its hairy little cousin, the fruit of the Wait-A-While is consumed with gusto by rainforest birds such as the doves and pigeons.

22. The Dry Creek Bed

Visual Sighting: empty rocky creek bed, notable for the smooth boulders and very little debris (marker on the left hand side)

Fitzroy Island is characterised by a number of natural freshwater springs, the result of underground creeks that originally originate in the Tablelands. The water travels in an underground aquifer until it arrives at Fitzroy Island where it encounters an upwelling that drives it to the surface. The most famous example of this on Fitzroy Island is Kings Waterhole which wells up near the Resort and is the source of the islands' water supply. However a lesser example is the creek in the Secret Garden. For the majority of the year the creek remains underground- if you listen carefully you can hear it as the water does rise near the surface. After torrential rain the creek temporarily reopens, clearing forest debris from its path and surging precious aquatic nutrients along the forest floor. Long Finned Eels are amongst the inhabitants that live in the creek when the water flow allows.

23. Queensland Parks and Wildlife Rangers

Visual Sighting: the platform (marker on the right hand side)

During the 1950's an act was passed turning Fitzroy Island into a National Park. This protected all of the flora and fauna both on the island and in the surrounding waters. Queensland Parks and Wildlife Service vision statement is to:

'Maintain Fitzroy Island as a relatively undisturbed coastal landscape where visitors can enjoy a relaxed, quiet atmosphere and undertake a range of nature-based activities. The key focus on this island is to protect the natural, cultural and World Heritage values of the island as well as maintaining the island's high scenic appeal through appropriate visitor management.'

Other aims include managing pest plants and animals and allowing access to the National Park via the designated walking tracks. Rangers are regularly on the island and continuously strive to improve conditions for visitors whilst maintaining ecologically sound work practices - this includes partaking in annual controlled burns of various sections of the island. For more information visit www.nprsr.qld.gov.au

Conclusion

The Secret Garden is a special environment. The complexities of the interspecies relationships within are the driving force for the entire rainforest ecosystem. Every plant, animal and even microorganisms such as bacteria play a role in supporting the life cycle of another being. Without the creepy crawlies participating in the numerous ecological processes across the forest; this rainforest would not stand here today. Likewise, Fitzroy Island would not exist in its current splendour without its numerous and ecologically important wildlife. They may not be the warmest, cuddliest of creatures but each plays its role to perfection here. This is the main reason why the Government strictly regulates chemical use on the island; some everyday household items (such as bleach and some forms of pest control) will have adverse effects on the environment by potentially upsetting the population balance of individual animals. So the next time you see a critter that you are not too fond of- just pop it back into the forest and remember: without it; this rainforest would not exist at all.