

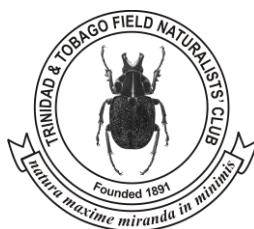


# NARIVA SWAMP BioBlitz 2014

## Final Report



UNIVERSITY OF THE WEST INDIES  
ZOOLOGY MUSEUM



First Citizens

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## **Executive Summary**

The third Trinidad & Tobago Bioblitz was conducted 18–19 October 2014 in the Nariva Swamp, Trinidad & Tobago. More than 100 volunteers helped observe, collect, and identify a diverse range of organisms: plants, fungi, birds, mammals, reptiles, amphibians, terrestrial invertebrates and aquatic organisms. A variety of surveying methods was used, including direct observation, trapping, netting and sampling. More than 100 members of the public came to watch the volunteers work, visit information stands staffed by members of various organisations, and take part in guided walks. A total of 742 species of organisms were reported after 24 hours of surveying; this total was corrected to 737 after further analysis of specimens and results.

**Keywords:** Bioblitz, biodiversity, Nariva Swamp, Trinidad, wildlife survey

## Introduction

A bioblitz (short for Biodiversity Blitz) is an event in which a group of biological experts gather together to record as many different species of organisms as possible during a set period at a chosen site. The period is normally 24 hours but can range from a few hours to several days. The first event held under the title of a bioblitz took place in Kenilworth Park and the Aquatic Gardens National Park, Washington, DC, U.S.A., in May 1996 (Droege, 1996), although events with similar goals and methods had been held before.

Since then, bioblitz events have been held all over the world, including in Australia, New Zealand, Canada, the U.K., Spain, Portugal, Ireland, Germany, Italy, Switzerland and Taiwan (Wikipedia: Bioblitz, 2013). The event described herein was the third to be held in the Republic of Trinidad and Tobago after the inaugural bioblitz in the Tucker Valley in 2012 and the second bioblitz held in Arima Valley in 2013.

Although a bioblitz gives a snapshot of the wildlife in an area, it is not designed to yield an exhaustive inventory (Lundmark, 2003). This is because of the limited time during which the sampling takes place and also because it is conducted over a single weekend, meaning that seasonal variation cannot be accounted for; however, the sampling does provide a baseline against which results of future surveys and bioblitzes can be compared and measured.

The Nariva Swamp, on the east coast of Trinidad, was chosen for the site of the 2014 Trinidad & Tobago bioblitz because it represented a different range of habitats than those represented in previous events. The main plant communities in the Nariva Swamp are swamp forest (mangal, swamp wood and palm swamp forest), evergreen seasonal forest, semi-evergreen seasonal forest, littoral woodland and marsh (*Cyperus* marsh, *Phragmites* marsh and floating marsh) (Bacon, 1979). The survey area included the final stretch and mouth of the Nariva River and several kilometres of the Manzanilla Beach.

A great deal of research has been conducted in the Nariva Swamp over the years, with the Bush Bush Wildlife Sanctuary in particular being the focal point for the study of disease vectors by the Trinidad Virus Research Laboratory. Peter Bacon and a team from the University of the West Indies conducted a rigorous survey of the swamp from August 1977 to July 1979 covering the geographical, physical and biological characteristics of the area (Bacon, 1979).

Mike G. Rutherford, Curator of the University of the West Indies Zoology Museum (UWIZM), organized the event, with help from members of the Trinidad & Tobago Field Naturalists' Club (TTFNC) and the Department of Life Sciences, University of the West Indies (UWI), St. Augustine, Trinidad. First Citizens Bank very generously sponsored the event through the TTFNC.

The base camp was at the Nariva Swamp Field Station in Kernahan. This facility is run by the Forestry Division and is set up as an education centre as well as a tree nursery. The building provided the Bioblitz team with catering and toilet facilities and space to camp as well as a place to set up microscopes and other equipment for identifying specimens. The grounds around the building were used to set up displays for the general public.

The weather during the 24-hour period was variable. Saturday was overcast after noon, and there was a brief rain shower around 15:00, but this soon cleared, and the rest of the day and that night were dry. Sunday was dry and sunny with little cloud cover all day.

## **Methods**

Before the event began, volunteers were divided into several groups that varied in number of members and surveying methods to be used. At noon on Saturday the groups headed into the swamp to start surveying. Some continued late into the night (until approximately 1am) and then started again at daybreak on Sunday before finishing up before noon.

### **Plants**

The Plant Group split into two sub-groups. The first sub-group, led by Doreen Jodhan and Winston Johnson, headed off into Bush Bush Sanctuary and surveyed along the main forest trails. The second sub-group, led by Mike Oatham, surveyed along the road that led to the Bush Bush Sanctuary. For both sub-groups, if specimens could be identified on sight, collection was unnecessary. However, if positive identification of a particular plant could not be made on sight, a specimen was collected, labelled and bagged for subsequent identification.

After surveying for approximately three hours, both groups returned to the base camp, where the plant experts commenced the task of identifying unknown specimens. Later that evening, a few members of the plant group returned to the field and conducted a survey of beach vegetation in the Cocal area. Most identifications of unknown plants were made at the base camp later that night. On the following morning, one sub-group of the Plant Group remained at the base camp to complete plant identifications while another drove through Kernahan and recorded vegetation in the area. In cases where positive identification could not be made on sight, photographs were taken; these were later used for identification of the unknown specimens.

### **Birds**

The main Bird Group, coordinated by Feroze Omardeen, consisted of members of the TTFNC, staff of the AWNC, and independent bird enthusiasts. Observations were made with the aid of optical equipment such as binoculars, spotting scopes, and cameras (point-and-shoot and DSLRs). Birds that were heard but not seen were still recorded as being present. Generally, at least two observers had to see or hear a bird for it to be counted unless a suitable picture was taken to clinch the identification.

A second group focused on bird banding. The team set up mist nets and caught birds that they identified, banded, measured and eventually released back into the wild. The team consisted of Carl Fitzjames, Darshan Narang, Kareena Anderson, Vishnu Debie, Richard Smith and Robyn Bath. Assistance was provided by numerous volunteers.

The mist nets used for this survey were each 12 m long by 2.7 m tall with a mesh size of 27mm. Each net contained five trammels (folds in the net into which the birds fall when they strike the nets). The birds were extracted from the nets by experienced handlers and were then placed into cotton bags until they were processed. On October 18, six 12 m nets were set up in Bush Bush along existing trails for four hours, from 13:30 to 17:30. On October 19, six 12 m nets were set up in the orchard behind the Forestry Division's office in Kernahan from 06:00 to 10:00.

### **Mammals**

Mammals were surveyed by use of three main methods: 1) a focused Bat Group set up nets along trails, 2) another group set up camera traps, 3) and all groups recorded chance sightings of mammals at all locations.

The Bat Group sampled by capturing bats in ground and triple high mist nets. At 16:30 on Saturday, the group set off on the Bush Bush Sanctuary trail. They split up into two groups, the first of which

deployed four 12 m ground mist nets, while the other deployed two 12 m ground mist nets and the three 9 m mist nets on the triple high. All nets were set at about 18:00, and were left up until about 22:00

Nine camera traps were set up for the Bioblitz. All of the cameras had infrared flash and were set to take three to five photos per triggering. Three cameras were put in place on 10 October, two of which were around the outside of the Forestry Division compound in Kernahan and one of which was in a forested area just off the Manzanilla Mayaro Road west of the bridge over the Nariva River. On 16 October, six other cameras were placed along trails in Bush Bush Sanctuary, positioned approximately 200 metres apart. All cameras were collected on 19 October.

Mammals photographed or observed by other participants were reported to the Mammal Group.

### **Reptiles and Amphibians**

The herpetologists consisted of two sub-groups. The first was led by John Murphy of the Field Museum, Chicago, IL, U.S.A. with some fellow Americans and members of the TTFNC Herpetology Group. The second was led by Saiyaad Ali with members of the Serpentarium (a Trinidad organisation whose mission is *to enhance awareness and appreciation of all reptilian and amphibian species found in Trinidad and Tobago*). The main search areas were around the field station, along the road to Bush Bush and within the Bush Bush Reserve itself. Searches were conducted during both day and night.

Both groups used several methods for finding specimens, including actively searching the vegetation along trails during the day and with the aid of torchlight at night; turning over objects such as logs, rocks, palm fronds, and examining tree trunks and leaf litter; driving along the roads looking for roadkill; and searching the margins of ponds and ditches containing water. The groups located frogs during both day and night and often identified them by their calls. Some specimens were collected for closer examination and for display at the base camp.

### **Aquatic**

Two sub-groups surveyed the aquatic habitats around Nariva Swamp: a Freshwater Group organized by Amy Deacon and Ryan Mohammed, and a Marine Group organized by Mark Charran. Due to the proximity of the habitats to each other at some sites, there was some crossover in surveying techniques and areas surveyed.

A variety of sampling methods were used, including the following: a two-person hand seine net for catching large fish and decapods; a dip net in small pools and along the edges of streams and ditches for catching smaller species of fish and freshwater prawns; fish pots for catching smaller fish; and visual searches for adult insects on vegetation and for reptiles and amphibians on river banks.

The Freshwater Group started sampling at the boat line site, using a seine and dip net to capture fish and crustaceans in the shallow river. At 15.30 on Saturday, nine people, guided by Kayman Sagar, surveyed by kayak along the boat line to Bush Bush Sanctuary.

Ryan Mohammed led the remaining Freshwater Group volunteers in sampling the many ditches and streams around Kernahan. They set up two types of fish traps in these ditches, deploying them in the late afternoon on Saturday and recovering them on Sunday morning.

The Marine Group, including many members of the Trinidad & Tobago Eco Divers Club, started by dragging a 30 m seine net across the mouth of the Nariva River at the tip of the Bell Piece peninsula near the convergence of the Nariva River with the Atlantic Ocean. They followed this with line fishing, fish trapping, and beach combing. It had been decided before the event that neither the sea

nor river conditions were favourable for scuba or snorkelling, in terms of both safety and visibility.

Guy Marley and others set up additional fyke nets near the mouth of the Nariva River, left them overnight, and checked them on Sunday morning.

On Sunday the pond behind the field station was surveyed using dip nets and by collecting sediment samples, which were then sifted for invertebrates.

Dragonflies and damselflies were abundant at the pond and at all sites throughout the survey area. Butterfly nets proved effective at catching a few specimens for identification; females tended to be much more cryptically coloured than males.

In addition to the weekend's sampling, water samples had been taken from the ditches in Kernahan during a reconnaissance visit two weeks before the event. Samples were examined for diatoms and other phytoplankton under a microscope at 600X magnification. This activity had been conducted in advance of the Bioblitz because the lengthy time required to process specimens meant that the task could not have been completed within the 24 hours of the Bioblitz.

Specimens were identified on site wherever possible, by use of expert knowledge, identification guides, and a portable digital microscope. Specimens that could not be identified on site were transported to the base camp in vials or other containers for examination with more powerful microscopes and where there was access to a wider range of literature and expertise.

### **Terrestrial Invertebrates**

The wide variety of terrestrial invertebrates to be found in the Nariva Swamp resulted in several independent groups conducting their own surveys.

#### Lepidoptera

Surveying was conducted in three main ways – observation of species while walking, using fruit bait traps set out for 24 hours and using light traps at night. On Saturday, walking surveys started at the field station and then the group headed on foot into Bush Bush Sanctuary, walking the trail from the southern entrance to the hut at the end of the boat line. In Bush Bush, fruit bait traps were set up in the forest as far as 10 m off the main trail and were collected the following day.

On Saturday evening, two light traps were set up just inside Bush Bush along the main trail, one with a mercury vapour bulb and one with a combination of regular and UV compact fluorescent bulbs. The group watched these traps for several hours before returning to the base camp and identifying the species that had gathered under the lights of the field station.

The book *Butterflies of Trinidad and Tobago* by Malcolm Barcant, was the main reference used for identification. Moths were identified with the help of online resources and by sending photos to Matthew J. W. Cock of CAB International in the U.K.

#### Mosquitos

A team led by Raymond Martinez searched for mosquito larvae and adults around the base camp, Kernahan and in Bush Bush Sanctuary. They collected specimens using three main methods: 1) using hand nets to catch mosquitos after they had landed on human bait, 2) suspending CDC light traps with no bait from trees in several locations throughout Bush Bush, and 3) collecting larvae from water sources including rain barrels and bromeliads (*Gravisea aquilega*). Specimens were identified by use of a 40X dissecting microscope at the base camp.

#### Molluscs



Mike G. Rutherford surveyed terrestrial molluscs around the base camp in Kernahan and in Bush Bush. Members of the Aquatic Group collected specimens from along the seashore and in ponds and ditches. Both live molluscs and empty shells were collected by hand. This involved turning over rocks and logs and sifting leaf litter, examining vegetation, and searching drainage ditches, ponds, and streams for freshwater specimens. Soil samples were collected from Bush Bush and examined for micro snails (<5mm diameter) under a stereo microscope. Terrestrial specimens were identified by use of the report by Robinson, Fields and Zimmerman (2004).

### Scorpions

Rakesh Bhukal led a group searching for scorpions. They left the field station at around 20:00 and surveyed along the trail from the base camp and into Bush Bush Sanctuary. Ultraviolet (UV) lights were used to scan for scorpions, which fluoresce bright yellow under the lights. Leaf litter and rotting logs along the trail were turned over and illuminated. Trees and other vegetation along the trail were also searched. More than 80 scorpions were collected and taken back to the base camp, where they were subsequently identified by use of a 40X dissecting microscope and a number of scorpion identification guides (Kjellesvig-Waering, 1966; Lourenço & Huber, 1999; Prendini, 2001).

### Social Insects

Christopher K. Starr looked for Hymenoptera (ants, bees, wasps, and allies) and Isoptera (termites) in Bush Bush Sanctuary, around the base camp and in Kernahan. Surveying was conducted by visually searching for nests and individuals. This sampling effort was supplemented by photos and by specimens collected by other participants in the bioblitz.

### Spiders

Jo-Anne Sewlal looked for spiders and other arachnids. Specimens were collected along the trail to the Bush Bush Sanctuary and along the main trail in the Sanctuary. Collecting was also carried out along the roadside in Kernahan. Specimens collected in the Sanctuary were identified in the field and released in compliance with an agreement with the Forestry Division that no collecting could be done in the Sanctuary. Two sampling methods were used: sweep-netting and visual searching. The first method involved brushing the understory vegetation with a heavy canvas net, which served to dislodge any species, whether diurnal or nocturnal, that were on or were retreating in the vegetation. Visual searching involved walking and collecting specimens that could be seen with the naked eye. Collecting was supplemented by observations and photos taken by members of other specialist groups.

### Other Invertebrates

During the bioblitz, participants encountered a variety of invertebrates at locations throughout Nariva Swamp. These organisms were either photographed or collected in plastic vials for later identification by the relevant expert(s) at the base camp. These specimens included many different insects, arachnids, echinoderms, crustaceans, myriapods, and worms.

### **Fungi**

Jeffrey Wong Sang led this group, whose main survey method was to photograph any specimens encountered during a walk through Bush Bush Sanctuary. These photographs were then collated and identified to morphospecies during the bioblitz with further identification carried out after the event.

## Public Participation

From 7:00 to 13:00 on Sunday, experts and participants showed members of the public what they had discovered. Mike Rutherford, with help from Karl Phillip, led about 30 people on a walking tour of Bush Bush Sanctuary; Amy Deacon and members of the Aquatic Group conducted a pond -dipping activity at the Forestry Station; Carl Fitzjames and Darshan Narang demonstrated bird mist netting at the field station; the Herpetology Group, assisted by the Serpentarium, displayed vivaria containing live snakes, lizards and frogs that had been collected on Saturday. The ground floor of the field station was set up with displays by the Forestry Division, while outside on the driveway were displays by the TTFNC, the UWIZM and the Trinidad & Tobago Marine Mammal Stranding Network.

*For more information about the locations of the sites mentioned above, see Appendix 1.*

## Results and Discussion

### Plants

By 12:00 on Sunday a total of 224 species had been recorded by the Plant Group. Of these species, 154 had been found in disturbed areas along the sides of agricultural traces in Kernahan and on the trace to Bush Bush Sanctuary, 62 species had been found in natural ecosystems in Bush Bush and along the boat line, and 8 species had been found on the seacoast. The geographical challenges of the bioblitz this year meant that surveying in the most species-diverse localities in Bush Bush was not as comprehensive as it could have been; the long walk to reach Bush Bush was one such challenge. Although one sub-group had intended to cross the floating mats of grass that led to a stand of Royal Palm (*Roystonea oleracea*) trees in a particular area of the Nariva Swamp, this endeavour could not be accomplished primarily because of time constraints.

As was the case during our previous bioblitzes other constraints included a lack of expert identifiers for specimens gathered in the field and brought back to the base camp for identification. Plant identification is a long and laborious task which cannot be completed within the 24 hours of the Bioblitz without a much greater team of experienced plant identification personnel. Even sorting to morpho-species takes a long time, especially with inexperienced people who need to learn the difference between such basic identification characteristics as a compound leaf and a simple leaf. Because not much time was spent in natural ecosystems, few species of interest were observed apart from the Moriche Palm (*Mauritia flexuosa*).

After the event, the lists were scrutinized and some duplicates were found, making the final Plant Group total 219 species from 74 families. This total included one species of Pteridophyte and 218 species of Spermatophyta. Three desmids were also found in some of the water samples; these microscopic green algae are found in fresh water throughout the world but are often overlooked in surveys of this sort because of their small size and difficulty in identification.

Bacon (1979), in a two-year survey of the Nariva Swamp, reported 324 species from 84 families, so our finding 67% of that total within 24 hours was a very good result. However, many species noted in the Bioblitz were not noted by Bacon and vice versa; this difference could result from climate change, changes in local agricultural practices or extent of areas in agricultural use, use or non-use of pesticides, etc., and thus warrants further investigation.

### Birds

A total of 119 species of birds from 46 families were seen or heard during the Bioblitz. This compares to 482 different species from 72 families for the whole of Trinidad & Tobago (Trinidad & Tobago Bird

Status & Distribution Committee – Official List as of August 2016), meaning that during the Bioblitz 25% of the species and 63% of the families known from Trinidad were recorded in and around Nariva Swamp. Bacon (1979) listed 176 species from 47 families for Nariva Swamp. Recording a quarter of the bird species known from Trinidad & Tobago in 24 hours was an impressive result, helped by the proximity of several different habitats: seaside, freshwater marsh, scrubland and forest. Most of the species seen had been recorded previously from the area but two unexpected birds were noted. A dusky-capped flycatcher (*Myiarchus tuberculifer*) was identified based on its call, this species was thought to be restricted to the Northern Range but has recently been sighted in more lowland habitats. The second bird was even more surprising, a blue-tailed emerald (*Chlorostilbon mellisugus*) was also identified by call by the bird-banding team; this species is usually confined to the arid forest in north-west Trinidad. The record was included in the total but as the bird was not photographed the status of this species in Nariva Swamp is still open to further investigation.

The mist netting team captured five birds of three species in Bush Bush Sanctuary and 36 birds of 17 species in the orchard behind the field station. Measurements and data were taken for every bird, and the majority of those captures were fitted with bands.

The final tally of 123 species reported at the end of the event was adjusted to 119 after duplicate records were noted; this was in part a result of some people using shortened common names when handing in their reports. To make the initial count more reliable during future events, pre-printed lists should be used so people just have to tick off species; the main Birding Group did this during the event, but records from other groups were not tallied in the same way.

## **Mammals**

### Bats

The mist netting in Bush Bush Sanctuary resulted in the capture of 48 bats of 17 different species. The most common was Seba's short-tailed bat (*Carollia perspicillata*), with 16 individuals captured. Nine bats were from the fruit-eating genus *Artibeus*, seven from the insectivorous genus *Pteronotus* and the rest were mostly individuals of a variety of species. Of note was the stripe-headed round-eared bat (*Tonatia saurophila*), which is a gleaning animalivore that prefers mature forest habitat.

Another group observed a greater white-lined bat (*Saccopteryx bilineata*) roosting on a tree, which brought the total number of bat species seen to 18.

Previous studies have reported all of these species from Bush Bush (Bacon, 1979; Hargreaves, 2013).

### Trail Cameras

Three different species of animals were recorded. Red-rumped agouti (*Dasyprocta leporina*) were recorded by four cameras, at two sites in Bush Bush and at two sites in Kernahan. All of the 15 separate incidents were recorded between sunrise and sunset, i.e. all showing diurnal activity. One interesting photo appeared to show a family group of agoutis with two adults and one juvenile foraging together. One common opossum (*Didelphis marsupialis*) was recorded in Kernahan just after midnight, and two tegus (*Tupinambis teguixin*) were recorded in Kernahan during the day.

It was unfortunate that there was not a wider diversity of species recorded by the trail cameras, but this most likely resulted from the short time period over which the cameras were active. In addition, the presence of so many people in Bush Bush Sanctuary overnight on the 18 October would have scared away many species as well.

### Other Sightings

Mammals were spotted by several survey teams. Several sightings were made of red-tailed squirrels and red howler monkeys and tracks and signs of red brocket deer and tree porcupines were seen inside Bush Bush Sanctuary. Several small rodents were seen at the base camp and in Kernahan and in Bush Bush.

Previous studies have reported all of these species from Bush Bush and the surrounding area (Bacon, 1979)

It was disappointing that no manatees (*Trichechus manatus*) were reported during the event, as they are one of the iconic animals of Nariva Swamp. The Manatee Conservation Trust, a local NGO, had been invited to join the Bioblitz but because they had declined the invitation, the Bioblitz teams did not have access to those parts of the swamp where manatees are most easily viewable.

### **Reptiles and Amphibians**

The amphibians provided a lot of excitement this year, with reports of several new species for the area and the country. The grass frog (*Scarthyla vigilans*) was seen in some numbers around the base camp in Kernahan; this species is a recent colonist of Trinidad and has been spreading from the south west over the last 10 years or so. Another new record for the Nariva Swamp area was the Trinidad thin-toed frog (*Leptodactylus nesiotus*), which was previously known only from the southwest peninsula of Trinidad (Murphy, 1997).

The most exciting discovery was a new species record for Trinidad, with a single individual of the long-snouted thin-toed frog (*Leptodactylus longirostris*) being found in Bush Bush Sanctuary. The specimen was not collected because the permit from Forestry Division prohibited the removal of any vertebrates from the reserve, so the record is based on photographs only. Overall, 19 species of frogs were recorded, which is just over half of the species known from Trinidad and a very good result for 24 hours of surveying.

Reptiles also provided a lot of interest to the teams and to the public. Twelve species of snakes were observed, including an exceptionally large (0.8 m) water mapepire (*Helicops angulatus*), a species usually about 0.5 m long; the centipede-eating black-headed snake (*Tantilla melanocephala*), a hard-to-find but probably common species; and an exceptionally nice green colour morph of the usually black mangrove snake (*Erythrolamprus cobellus*).

Fourteen species of lizards were seen, including a minute, hard-to-find Mole's day gecko (*Sphaerodactylus molei*) that appeared in the kitchen of the base camp. Not surprisingly, the spectacled caiman (*Caiman crocodilus*) was seen at night in the swamp; this widespread caiman seems comfortable in almost any body of slow-moving water in the country.

### **Aquatic**

The total number of fish recorded was 29 species from 18 families. Bacon's report listed 33 species from 20 families, but only 12 of those species appeared in the Bioblitz list. Part of the reason for this difference is that, during the Bioblitz more attention was paid to the mouth of the Nariva River than to other areas, so many of the species recorded were marine fish, whereas Bacon's list included more freshwater and brackish species. The use of the fyke net near the river mouth provided some interesting results, with hundreds of catfish (mainly *Cathorops spixii* and *Pseudauchenipterus nodosus*) found in the net on Sunday morning. This collection took five team members several hours to sort through; unfortunately, one member received an injury to his hand from the spine of one catfish. None of the fish recorded was unexpected or unusual for the area.

The total number of crustaceans was 14 species from 12 families. This compares to 31 species from 9 families in recorded in 1979 (Bacon), with nine species in common between the lists. A notable absence was the blue crab (*Cardisoma guanhumi*); this species is heavily targeted in the area for human consumption, and it is worthy of note and a cause for concern that none were encountered during the event.

The molluscs recorded were all typical of the area, with four freshwater species, including the black conch (*Pomacea urceus*), being found in the ditches, ponds and streams. Seven species of bivalve were found along the beach and in the mangrove area, and four marine/brackish gastropods were found as well, bringing the total to 15 species from 12 families, all having been recorded previously in the area.

Finally, Amy Deacon compiled a list of 15 different species from the water samples: 11 diatoms, 3 desmids and 1 rotifer.

### **Terrestrial Invertebrates**

#### Lepidoptera

In all, 45 species of butterflies and 62 species of moths from 20 families were recorded for a total of 107 species of Lepidoptera. Common and expected species included the open-country and marsh-edge species such as *Ascia monuste*, *Dynamine postverta* and *Hamadryas feronia*.

Overall, fewer species were recorded than expected. This might have resulted from the dry weather before the survey. Also of note was the lack of any sightings of *Anartia amathea*, one of the most common butterflies in Trinidad.

#### Social Insects

Strictly speaking, not all of the insects recorded by this group were social, many of the species being solitary wasps. A total of 21 species of Hymenoptera and 4 species of Isoptera were found in Bush Bush and Kernahan. Many of these species were found in high numbers, particularly the termites and the *Apoica* sp. (wasps), which appeared in the thousands at the base camp overnight.

#### Mosquitos

Bush Bush Sanctuary has long been a place of study for "vector" species of mosquitoes. Research by the Trinidad Regional Virus Laboratory reported more than 100 species of biting flies in Nariva Swamp (Bacon et al. 1979). During the Bioblitz, 20 species were found, all having been recorded previously from the swamp.

#### Molluscs

The terrestrial molluscs found during the Bioblitz were dominated by micro-snails (species where the shell of the adult has a diameter or length of less than 5mm), with five tiny species found in soil samples from Bush Bush. Several other cosmopolitan species were found as well for a total of nine species of land snails. One species of slug (*Sarasinula plebeia*), a well known crop pest, was found in very high numbers, especially in the watermelon fields between the base camp and Bush Bush.

#### Spiders

A total of 36 species of spiders and opiliones from 20 families were found mainly in Bush Bush Sanctuary but also at the base camp and along the road to Bush Bush. Nine of the orb-weaving species encountered had been recorded previously from Bush Bush (Sewlal, 2010).

## Scorpions

Approximately 80 scorpions were collected during the survey. Amongst these were five different species from two families. The vast majority were of one species, *Tityus trinitatis*. This is a medically important species that is responsible for many deaths in the region. All of the species recorded during the Bioblitz had been reported previously from Bush Bush Sanctuary (Bacon, 1979).

## Other Invertebrates

During the Bioblitz many other insects besides those mentioned previously were photographed or collected. These were identified where possible during the event or taken to the UWI Zoology Museum for further identification.

Four species of millipedes from four families were observed, two of the flat-backed type and two snake millipedes. One species of centipede was found under a rotten wooden board in Kernahan. Undoubtedly, many more species are present in Nariva Swamp, but as no one was focusing on this group, not many centipedes or millipedes were collected.

## **Fungi**

The fungi group found and photographed many different species in Bush Bush, but because of the lack of taxonomic expertise, most of them could be identified only to the morpho-species level during the Bioblitz. A rough estimate of 15 species was made for the day's surveying. The final result was five specimens identified to species and the rest to the morpho-species level.

## Conclusion

This Bioblitz once again saw an improvement in collecting techniques used by the teams in comparison with events in 2012 and 2013. The base camp area also worked out very well as far as space for displays, catering and accommodation and space for analysis were concerned.

Once again there was a lack of expertise in certain invertebrate groups, which meant that the species totals were comparatively low for many insect orders, in particular the Coleoptera, Orthoptera and Diptera.

The 2014 Bioblitz was well received by the participants and by the members of the public who attended the event. The walking tour of Bush Bush was enjoyed by all despite the voracious mosquitos and the long walk in and back.

However, possibly as a result of the remote location of the base camp, visitor numbers were lower than expected.

The total number of organisms recorded, announced at the end of the Bioblitz event itself, was 215 vertebrates (123 birds, 28 mammals, 23 reptiles, 16 amphibians, 25 fish), 266 invertebrates (20 molluscs, 40 arachnids, 2 myriapods, 185 insects, 3 worms, 1 echinoderm, 15 crustaceans), 15 fungi, 15 diatoms and 231 plants, for a total of 742 species. After the event, several groups had more time to analyse their results as well as to identify specimens and photographs, which resulted in some changes to their totals. The final counts are as follow: 119 birds, 29 mammals, 27 reptiles, 19 amphibians, 29 fish, 175 insects, 25 molluscs, 41 arachnids, 14 crustaceans, 5 myriapods, 3 annelids, 1 echinoderm, 1 rotifer, 1 platyhelminth, 15 fungi, 11 diatoms, 219 plants and 3 desmids, for a final total of 737 species recorded.

The Nariva Swamp faces many challenges, such as coastal erosion, squatting and overharvesting of natural resources, but despite these, the area is home to a wonderful array of wildlife. The participants in this Bioblitz were fortunate to encounter a great many of these species.

## **Acknowledgements**

### **Bird Group**

Coordinators: Feroze Omardeen (general birding), Darshan Narang (mist netting)

Faraaz Abdool, Zakariya Ali, Kimberly Chu Foon, Sherazade Curfew Ali, Kareena Anderson, Vicki Blanchard, Paul Christopher, Vishnu Debie, Denise Etienne, Stephanie Omardeen, Zara Omardeen, Sanjiv Parasram, Vishnal Rangersammy

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### **Plant Group**

Adanna Alexander, Linton Arneaud, Nigel Austin, Mia Avril, Nandani Bridglal, Edmund Charles, Chernell Crooks, Sarah Evelyn, Dan Jaggernauth, Doreen Jodhan, Winston Johnson, La Daana Kanhai, Jarah Oatham, Kahani Oatham, Mike Oatham, Elizabeth Seebaran, Veynu Siewrattan, Delezia Singh

### **Fungus Group**

Jeffrey Wong Sang, Roma Wong Sang

### **Other Bioblitzers**

Arianne Ali, Sabrina Ali, Gregory Bally, Maurice Frank, Anand Hamuman, Gideon Hosein, Sherri Lodhar, Kinman Loi, Jobe Millington, Khaliqia Mohammed, Rashad Mohammed, Christian Persad, Kristina Sankar, Yufer Wu

**Thanks to the following:**

- The members of the TTFNC committee and the various TTFNC groups for their help in organising and running the Bioblitz
- The Forestry Division for allowing the Bioblitz to use the Kernahan Field Station and for permits
- All of the group leaders for their efforts in gathering teams and reporting their results
- The staff and students of the UWI Department of Life Sciences and other UWI departments that participated
- Amy Deacon for supervising the pond dipping and colour-in a drawing of a macaw activity
- Mark Charran for the Fisheries Division's freshwater fish display at the base camp
- Eileen Rutherford for managing the catering and keeping us all fed
- Zoe Rutherford for writing up the final tally
- All of the journalists who reported on the event
- Coca Cola Ltd. for a donation of drinks
- Abstrakt Ltd. for printing of banners

And a final big thanks to First Citizens for generously sponsoring the event.



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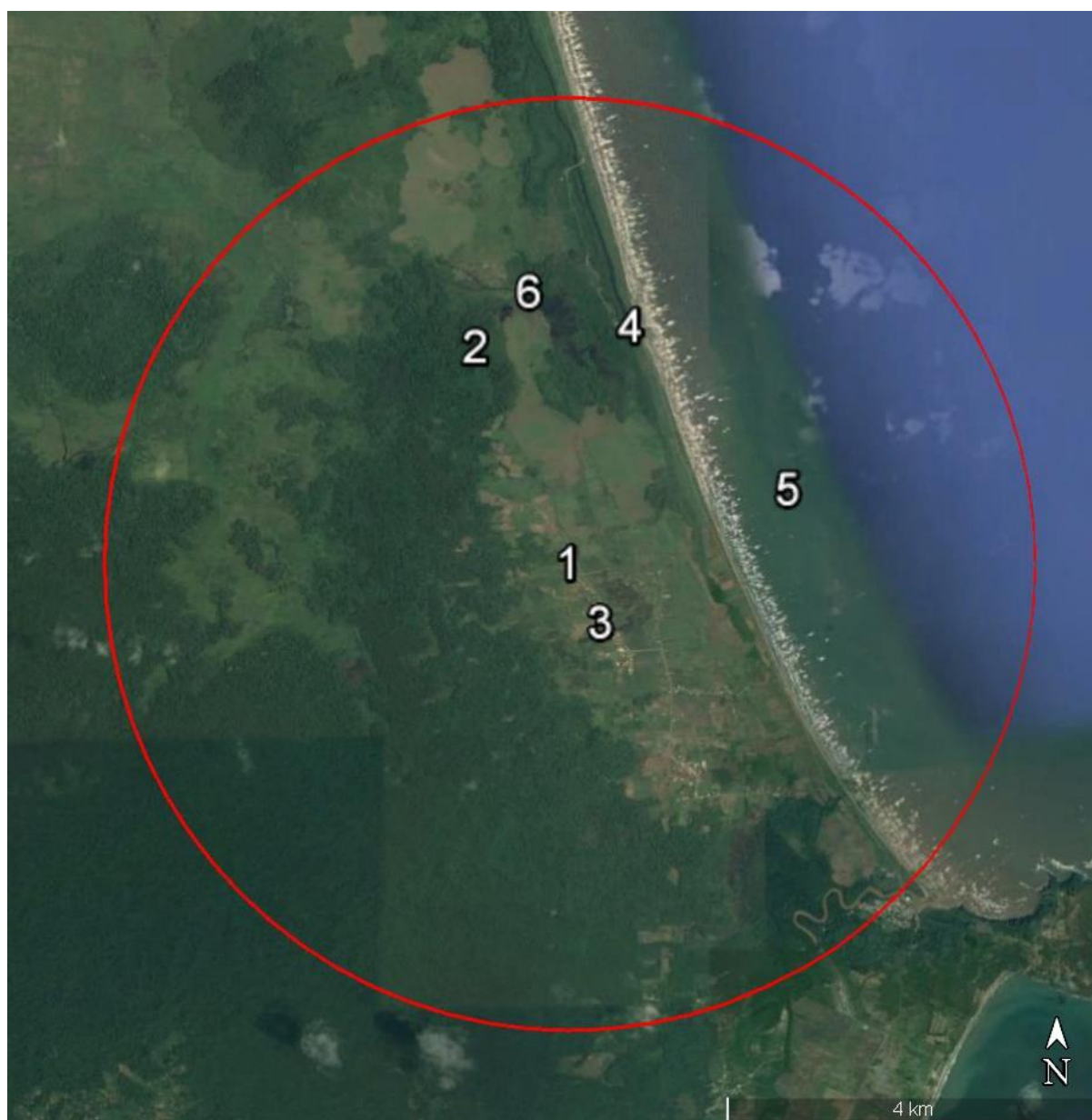
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## Appendix 1 - Locations of the main sampling sites



Site	Number	Decimal Latitude and Longitude	Altitude (in metres, from Google Earth)
Base camp – Forestry Station	1	10° 22.162'N 61° 1.604'W	4
Bush Bush Sanctuary	2	10° 23.413'N 61° 2.158'W	20
Kernahan	3	10° 21.818'N 61° 1.417'W	7
Nariva River	4	10° 23.534'N 61° 1.243'W	0
Cocos Bay	5	10° 22.5'N 61° 0.3'W	0
Boat line	6	10° 23.731'N 61° 1.839'W	4

Red circle is the 5km-radius extent of the sampling area for the Bioblitz.

## Appendix 2 - Species Lists

### Birds – 119 species from 46 families

Common name	Scientific Name	Family	Location
White-tailed Hawk	<i>Buteo albicaudatus</i>	Accipitridae	Nariva Swamp
Grey-lined Hawk	<i>Buteo nitidus</i>	Accipitridae	Kernahan
Common Black Hawk	<i>Buteogallus anthracinus</i>	Accipitridae	Nariva Swamp
Savannah Hawk	<i>Buteogallus meridionalis</i>	Accipitridae	Nariva Swamp
Long-winged Harrier	<i>Circus buffoni</i>	Accipitridae	Nariva Swamp
Double-toothed Kite	<i>Harpagus bidentatus</i>	Accipitridae	Nariva Swamp
American Pygmy Kingfisher	<i>Chloroceryle aenea</i>	Alcedinidae	Nariva Swamp
Green Kingfisher	<i>Chloroceryle americana</i>	Alcedinidae	Nariva Swamp
Belted Kingfisher	<i>Megaceryle alcyon</i>	Alcedinidae	Nariva Swamp
Ringed Kingfisher	<i>Megaceryle torquata</i>	Alcedinidae	Nariva Swamp
Blue-winged Teal	<i>Anas discors</i>	Anatidae	Nariva Swamp
Black-bellied Whistling-Duck	<i>Dendrocygna autumnalis</i>	Anatidae	Kernahan
Short-tailed Swift	<i>Chaetura brachyura</i>	Apodidae	Nariva Swamp
Fork-tailed Palm-Swift	<i>Tachornis squamata</i>	Apodidae	Nariva Swamp
Limpkin	<i>Aramus guarauna</i>	Aramidae	Nariva Swamp
Great Egret	<i>Ardea alba</i>	Ardeidae	Nariva Swamp
Pinnated Bittern	<i>Botaurus pinnatus</i>	Ardeidae	Nariva Swamp
Cattle Egret	<i>Bubulcus ibis</i>	Ardeidae	Nariva Swamp
Striated Heron	<i>Butorides striata</i>	Ardeidae	Kernahan
Little Blue Heron	<i>Egretta caerulea</i>	Ardeidae	Kernahan
Snowy Egret	<i>Egretta thula</i>	Ardeidae	Nariva Swamp
Yellow-crowned Night-Heron	<i>Nyctanassa violacea</i>	Ardeidae	Nariva Swamp
Common Pauraque	<i>Nyctidromus albicollis</i>	Caprimulgidae	Nariva Swamp
Turkey Vulture	<i>Cathartes aura</i>	Cathartidae	Nariva Swamp
Black Vulture	<i>Coragyps atratus</i>	Cathartidae	Kernahan
Collared Plover	<i>Charadrius collaris</i>	Charadriidae	Nariva Swamp
Semipalmated Plover	<i>Charadrius semipalmatus</i>	Charadriidae	Nariva Swamp
Black-bellied Plover	<i>Pluvialis squatarola</i>	Charadriidae	Nariva Swamp
Southern Lapwing	<i>Vanellus chilensis</i>	Charadriidae	Kernahan
Jabiru	<i>Jabiru mycteria</i>	Ciconiidae	Nariva Swamp
Bananaquit	<i>Coereba flaveola</i>	Coerebidae	Nariva Swamp
Rock Pigeon	<i>Columba livia</i>	Columbidae	Nariva Swamp
Plain-breasted Ground-Dove	<i>Columbina minuta</i>	Columbidae	Nariva Swamp
Ruddy Ground-Dove	<i>Columbina talpacoti</i>	Columbidae	Kernahan
Smooth-billed Ani	<i>Crotophaga ani</i>	Cuculidae	Kernahan
Squirrel Cuckoo	<i>Piaya cayana</i>	Cuculidae	Nariva Swamp
Striped Cuckoo	<i>Tapera naevia</i>	Cuculidae	Nariva Swamp
Cocoa Woodcreeper	<i>Xiphorhynchus susurrans</i>	Dendrocolaptidae	Nariva Swamp
Sooty Grassquit	<i>Tiaris fuliginosa</i>	Emberizidae	Nariva Swamp
Blue-black Grassquit	<i>Volatinia jacarina</i>	Emberizidae	Nariva Swamp

Crested Caracara	<i>Caracara cheriway</i>	Falconidae	Kernahan
Aplomado Falcon	<i>Falco femoralis</i>	Falconidae	Nariva Swamp
Yellow-headed Caracara	<i>Milvago chimachima</i>	Falconidae	Kernahan
Magnificent Frigatebird	<i>Fregata magnificens</i>	Fregatidae	Kernahan
Violaceous Euphonia	<i>Euphonia violacea</i>	Fringillidae	Nariva Swamp
Yellow-chinned Spinetail	<i>Certhiaxis cinnamomea</i>	Furnariidae	Kernahan
Pale-breasted Spinetail	<i>Synallaxis albescens</i>	Furnariidae	Nariva Swamp
Streaked Xenops	<i>Xenops rutilans</i>	Furnariidae	Nariva Swamp
Grey-breasted Martin	<i>Progne chalybea</i>	Hirundinidae	Nariva Swamp
Yellow-hooded Blackbird	<i>Agelaius icterocephalus</i>	Icteridae	Nariva Swamp
Moriche Oriole	<i>Icterus chrysiocephalus</i>	Icteridae	Nariva Swamp
Yellow Oriole	<i>Icterus nigrogularis</i>	Icteridae	Nariva Swamp
Shiny Cowbird	<i>Molothrus bonariensis</i>	Icteridae	Nariva Swamp
Giant Cowbird	<i>Molothrus oryzivorus</i>	Icteridae	Nariva Swamp
Crested Oropendola	<i>Psarocolius decumanus</i>	Icteridae	Nariva Swamp
Carib Grackle	<i>Quiscalus lugubris</i>	Icteridae	Nariva Swamp
Red-breasted Blackbird	<i>Sturnella militaris</i>	Icteridae	Nariva Swamp
Wattled Jacana	<i>Jacana jacana</i>	Jacanidae	Kernahan
Black Skimmer	<i>Rynchops niger</i>	Laridae	Kernahan
Tropical Mockingbird	<i>Mimus gilvus</i>	Mimidae	Kernahan
Common Potoo	<i>Nyctibius griseus</i>	Nyctibiidae	Nariva Swamp
Osprey	<i>Pandion haliaetus</i>	Pandionidae	Nariva Swamp
Masked Yellowthroat	<i>Geothlypis aequinoctialis</i>	Parulidae	Nariva Swamp
Northern Waterthrush	<i>Parkesia noveboracensis</i>	Parulidae	Nariva Swamp
Prothonotary Warbler	<i>Protonotaria citrea</i>	Parulidae	Nariva Swamp
Yellow Warbler	<i>Setophaga petechia</i>	Parulidae	Nariva Swamp
Brown Pelican	<i>Pelecanus occidentalis</i>	Pelecanidae	Nariva Swamp
Lineated Woodpecker	<i>Dryocopus lineatus</i>	Picidae	Nariva Swamp
Golden-headed Manakin	<i>Pipra erythrocephala</i>	Pipridae	Nariva Swamp
Long-billed Gnatwren	<i>Ramphocaenus melanurus</i>	Poliophtilidae	Nariva Swamp
Orange-winged Parrot	<i>Amazona amazonica</i>	Psittacidae	Nariva Swamp
Yellow-crowned Parrot	<i>Amazona ochrocephala</i>	Psittacidae	Nariva Swamp
Blue-and-yellow Macaw	<i>Ara ararauna</i>	Psittacidae	Nariva Swamp
Red-bellied Macaw	<i>Orthopsittaca manilata</i>	Psittacidae	Nariva Swamp
Grey-necked Wood-Rail	<i>Aramides cajanea</i>	Rallidae	Nariva Swamp
Azure Gallinule	<i>Porphyrio flavirostris</i>	Rallidae	Nariva Swamp
Purple Gallinule	<i>Porphyrio martinica</i>	Rallidae	Nariva Swamp
Channel-billed Toucan	<i>Ramphastos vitellinus</i>	Ramphastidae	Nariva Swamp
Spotted Sandpiper	<i>Actitis macularia</i>	Scolopacidae	Nariva Swamp
Pectoral Sandpiper	<i>Calidris melanotos</i>	Scolopacidae	Nariva Swamp
Lesser Yellowlegs	<i>Tringa flavipes</i>	Scolopacidae	Nariva Swamp
Willet	<i>Tringa semipalmata</i>	Scolopacidae	Nariva Swamp
Solitary Sandpiper	<i>Tringa solitaria</i>	Scolopacidae	Nariva Swamp
Tropical Screech-Owl	<i>Megascops choliba</i>	Strigidae	road to Bush Bush

Plain Antvireo	<i>Dysithamnus mentalis</i>	Thamnophilidae	Nariva Swamp
Black-crested Antshrike	<i>Sakesphorus canadensis</i>	Thamnophilidae	Nariva Swamp
Silvered Antbird	<i>Sclateria naevia</i>	Thamnophilidae	Nariva Swamp
Barred Antshrike	<i>Thamnophilus doliatus</i>	Thamnophilidae	Nariva Swamp
Blue Dacnis	<i>Dacnis cayana</i>	Thraupidae	Nariva Swamp
Silver-beaked Tanager	<i>Ramphocelus carbo</i>	Thraupidae	Nariva Swamp
Turquoise Tanager	<i>Tangara mexicana</i>	Thraupidae	Nariva Swamp
Blue-grey Tanager	<i>Thraupis episcopus</i>	Thraupidae	Nariva Swamp
Palm Tanager	<i>Thraupis palmarum</i>	Thraupidae	Nariva Swamp
Glossy Ibis	<i>Plegadis falcinellus</i>	Threskiornithidae	Nariva Swamp
Black-tailed Tityra	<i>Tityra cayana</i>	Tityridae	Nariva Swamp
White-chested Emerald	<i>Agyrtria brevirostris</i>	Trochilidae	Nariva Swamp
Copper-rumped Hummingbird	<i>Amazilia tobaci</i>	Trochilidae	Kernahan
Blue-tailed Emerald*	<i>Chlorostilbon mellisugus</i>	Trochilidae	Nariva Swamp
Blue-chinned Sapphire	<i>Chlorostilbon notatus</i>	Trochilidae	Nariva Swamp
Rufous-breasted Hermit	<i>Glaucis hirsutus</i>	Trochilidae	Nariva Swamp
Green Hermit	<i>Phaethornis guy</i>	Trochilidae	Nariva Swamp
Little Hermit	<i>Phaethornis longuemareus</i>	Trochilidae	Nariva Swamp
White-tailed Goldenthrout	<i>Polytmus guainumbi</i>	Trochilidae	Kernahan
Rufous-breasted Wren	<i>Thryothorus rutilus</i>	Troglodytidae	Nariva Swamp
House Wren	<i>Troglodytes aedon</i>	Troglodytidae	Nariva Swamp
White-headed Marsh-Tyrant	<i>Arundinicola leucocephala</i>	Tyrannidae	Kernahan
Southern Beardless-Tyrannulet	<i>Camptostoma obsoletum</i>	Tyrannidae	Nariva Swamp
Yellow-bellied Elaenia	<i>Elaenia flavogaster</i>	Tyrannidae	Kernahan
Pied Water-Tyrant	<i>Fluvicola pica</i>	Tyrannidae	Kernahan
Dusky-capped Flycatcher*	<i>Myiarchus tuberculifer</i>	Tyrannidae	Nariva Swamp
Brown-crested Flycatcher	<i>Myiarchus tyrannulus</i>	Tyrannidae	Nariva Swamp
Forest Elaenia	<i>Myiopagis gaimardii</i>	Tyrannidae	Nariva Swamp
Great Kiskadee	<i>Pitangus sulphuratus</i>	Tyrannidae	Kernahan
Yellow-breasted Flycatcher	<i>Tolmomyias flaviventris</i>	Tyrannidae	Nariva Swamp
Sulphury Flycatcher	<i>Tyrannopsis sulphurea</i>	Tyrannidae	Nariva Swamp
Tropical Kingbird	<i>Tyrannus melancholicus</i>	Tyrannidae	Nariva Swamp
Barn Owl	<i>Tyto alba</i>	Tytonidae	Kernahan
Rufous-browed Peppershrike	<i>Cyclarhis gujanensis</i>	Vireonidae	Nariva Swamp
Golden-fronted Greenlet	<i>Pachysylvia aurantiifrons</i>	Vireonidae	Nariva Swamp

\*species identified by call only

## Mammals – 29 species from 14 families

Common Name	Scientific Name	Family	Location
Red Howler Monkey	<i>Alouatta macconnelli</i>	Atelidae	Bush Bush
White-fronted Capuchin	<i>Cebus albifrons</i>	Cebidae	Bush Bush
Red Brocket Deer	<i>Mazama americana</i>	Cervidae	Bush Bush
Large-headed Rice Rat	<i>Hylaeamys megacephalus</i>	Cricetidae	Bush Bush
Nine-banded Armadillo	<i>Dasypus novemcinctus</i>	Dasypodidae	Bush Bush

Red-rumped Agouti	<i>Dasyprocta leporina</i>	Dasyproctidae	Bush Bush
Common Opossum	<i>Didelphis marsupialis</i>	Didelphidae	Bush Bush
Proboscis Bat	<i>Rhynchonycteris naso</i>	Emballonuridae	Bush Bush
Greater White-lined Bat	<i>Saccopteryx bilineata</i>	Emballonuridae	Bush Bush
Brazilian Porcupine	<i>Coendou prehensilis</i>	Erethizontidae	Bush Bush
Trinidad Spiny Pocket Mouse	<i>Heteromys anomalus</i>	Heteromyidae	Bush Bush
Davy's Naked-backed Bat	<i>Pteronotus davyi</i>	Mormoopidae	Bush Bush
Parnell's Moustached Bat	<i>Pteronotus parnelli</i>	Mormoopidae	Bush Bush
Lesser Moustached Bat	<i>Pteronotus personatus</i>	Mormoopidae	Bush Bush
Gervais's Fruit-eating Bat	<i>Artibeus cinereus</i>	Phyllostomidae	Bush Bush
Jamaican Fruit Bat	<i>Artibeus jamaicensis</i>	Phyllostomidae	Bush Bush
Great Fruit-eating Bat	<i>Artibeus lituratus</i>	Phyllostomidae	Bush Bush
Seba's Short-tailed Fruit Bat	<i>Carollia perspicillata</i>	Phyllostomidae	Bush Bush
Pallas's Long-tongued Bat	<i>Glossophaga soricina</i>	Phyllostomidae	Bush Bush
Little Big-eared Bat	<i>Micronycteris megalotis</i>	Phyllostomidae	Bush Bush
Striped Hairy-nosed Bat	<i>Mimon crenulatum</i>	Phyllostomidae	Bush Bush
Pale-faced Bat	<i>Phylloderma stenops</i>	Phyllostomidae	Bush Bush
Greater Spear-nosed Bat	<i>Phyllostomus hastatus</i>	Phyllostomidae	Bush Bush
Trinidadian Yellow-shouldered Bat	<i>Sturnira tildae</i>	Phyllostomidae	Bush Bush
Stripe-headed Round-eared Bat	<i>Tonatia saurophila</i>	Phyllostomidae	Bush Bush
Common Tent-making Bat	<i>Uroderma bilobatum</i>	Phyllostomidae	Bush Bush
Great Stripe-faced Bat	<i>Vampyroides caraccioli</i>	Phyllostomidae	Bush Bush
Mouse		Rodentia	Kernahan
Red-tailed Squirrel	<i>Sciurus granatensis</i>	Sciuridae	Bush Bush

## Reptiles - 27 species from 13 families

Common Name	Scientific Name	Family	Location
Spectacled Caiman	<i>Caiman crocodilus</i>	Alligatoridae	Bush Bush
Machete Savane	<i>Chironius carinatus</i>	Colubridae	Bush Bush
Brown Vine Snake	<i>Oxybelis aeneus</i>	Colubridae	Bush Bush
Cribo	<i>Spilotes pullatus</i>	Colubridae	Bush Bush
Black-headed Snake	<i>Tantilla melanocephala</i>	Colubridae	Bush Bush
Leaf Anole	<i>Anolis planiceps</i>	Dactyloidae	Bush Bush
Mangrove Snake	<i>Erythrolamprus cobellus</i>	Dipsadidae	Bush Bush
Shaw's Black-backed Snake	<i>Erythrolamprus melanotus</i>	Dipsadidae	Bush Bush
Water Mapepire	<i>Helicops angulatus</i>	Dipsadidae	Bush Bush
Blunt-headed Tree Snake	<i>Imantodes cenchoa</i>	Dipsadidae	Bush Bush
Cat-eyed Snake	<i>Leptodeira annulata ashmeadi</i>	Dipsadidae	Bush Bush
Slug-eating Snake	<i>Sibon nebulata</i>	Dipsadidae	Bush Bush
Flat Snake	<i>Siphlophis compressus</i>	Dipsadidae	Bush Bush
House Gecko	<i>Hemidactylus mabouia</i>	Gekkonidae	Kernahan
Turnip-tailed Gecko	<i>Thecadactylus rapicauda</i>	Gekkonidae	Kernahan
Trinidad Ground Puppy	<i>Bachia trinitatis</i>	Gymnophthalmidae	Bush Bush

Multi-colored Tree Lizard	<i>Polychrus marmoratus</i>	Hoplocercidae	Bush Bush
Green Iguana	<i>Iguana iguana</i>	Iguanidae	Bush Bush
Greater Windward Skink	<i>Copeglossum aruae</i>	Scincidae	Bush Bush
Spot-nosed Gecko	<i>Gonatodes humeralis</i>	Sphaerodactylidae	Bush Bush
Streak Lizard	<i>Gonatodes vittatus</i>	Sphaerodactylidae	Bush Bush
Mole's Day Gecko	<i>Sphaerodactylus molei</i>	Sphaerodactylidae	Kernahan
Giant Ameiva	<i>Ameiva atrigularis</i>	Teiidae	Bush Bush
Beach Runner	<i>Cnemidophorus lemniscatus</i>	Teiidae	Bush Bush
Tegu	<i>Tupinambis teguixin</i>	Teiidae	Kernahan
Caribbean Treerunner	<i>Plica caribena</i>	Tropiduridae	Bush Bush
Maepire Balsain	<i>Bothrops cf. atrox</i>	Viperidae	Bush Bush

## Amphibians – 19 species from 7 families

Common Name	Scientific Name	Family	Location
Marine Toad	<i>Rhinella marina</i>	Bufonidae	Kernahan
Urich's Litter Frog	<i>Pristimantis urichi</i>	Strabomantidae	Bush Bush
Dwarf Marsupial Frog	<i>Flectonotus fitzgeraldi</i>	Hemiphractidae	Bush Bush
Minute Treefrog	<i>Dendropsophus goughi</i>	Hylidae	Bush Bush
Small headed Treefrog	<i>Dendropsophus microcephala</i>	Hylidae	Bush Bush
Neotropical Treefrog	<i>Boana crepitans</i>	Hylidae	Bush Bush
Spotted Treefrog	<i>Boana punctatus</i>	Hylidae	Bush Bush
Leaf-nesting Frog	<i>Phyllomedusa trinitatus</i>	Hylidae	Bush Bush
Paradox Frog	<i>Pseudis paradoxa</i>	Hylidae	Bush Bush
Grass Frog	<i>Scarthyla vigilans</i>	Hylidae	Kernahan
Red-snouted Treefrog	<i>Scinax ruber</i>	Hylidae	Bush Bush
Slope-headed Treefrog	<i>Sphaenorhynchus lacteus</i>	Hylidae	Bush Bush
Tungara Frog	<i>Engystomops pustulosus</i>	Leiuperidae	Kernahan
Whistling Frog	<i>Leptodactylus fuscus</i>	Leptodactylidae	Kernahan
Napo Tropical Bullfrog	<i>Leptodactylus hylaedactylus</i>	Leptodactylidae	Bush Bush
Long-snouted Thin-toed frog	<i>Leptodactylus longirostris</i>	Leptodactylidae	Bush Bush
Trinidad Thin-toed Frog	<i>Leptodactylus nesiotus</i>	Leptodactylidae	Bush Bush
Smooth-skinned Ditch Frog	<i>Leptodactylus validus</i>	Leptodactylidae	Kernahan
Flashy Narrow-mouth Frog	<i>Elachistoclesis surinamensis</i>	Microhylidae	Bush Bush

## Fish - 29 species from 18 families

Common Name	Scientific Name	Family	Location
Four-eyed Fish	<i>Anableps anableps</i>	Anablepidae	Nariva River
Catfish	<i>Arius</i> sp. 1	Ariidae	Nariva River
Catfish	<i>Arius</i> sp. 2	Ariidae	Nariva River
Catfish	<i>Cathorops spixii</i>	Ariidae	Nariva River
Catfish	<i>Sciades herzbergii</i>	Ariidae	Nariva Swamp
Catfish	<i>Pseudauchenipterus nodosus</i>	Auchenipteridae	Nariva River



Cascadura	<i>Hoplosternum littorale</i>	Callichthyidae	Kernahan
Cavali	<i>Caranx hippos</i>	Carangidae	Nariva River
Pompano	<i>Trachinotus goodei</i>	Carangidae	Nariva River
Snook	<i>Centropomus ensiferus</i>	Centropomidae	Nariva River
Snook	<i>Centropomus parallelus</i>	Centropomidae	Nariva River
Snook	<i>Centropomus undecimalis</i>	Centropomidae	Nariva Swamp
Two-spot Sardine	<i>Astyanax bimaculatus</i>	Characidae	Kernahan
Featherfin Sardine	<i>Hemigrammus unilineatus</i>	Characidae	Kernahan
Hunchback Sardine	<i>Roeboides dayi</i>	Characidae	Kernahan
Guabine	<i>Hoplias malabaricus</i>	Erythrinidae	Kernahan
Flagfin Mojarra	<i>Eucinostomus melanopterus</i>	Gerreidae	Nariva Swamp
Goby	Sp. 1	Gobiidae	Nariva Swamp
Teta	<i>Hypostomus robinii</i>	Loricariidae	Nariva River
Tarpon	<i>Megalops atlanticus</i>	Megalopidae	Kernahan
Mullet	<i>Mugil</i> sp.1	Mugilidae	Nariva River
Mullet	<i>Mugil</i> sp.2	Mugilidae	Nariva River
Flatfish	Sp. 1	Pleuronectiformes	Nariva Swamp
Swamp Guppy	<i>Micropoecilia picta</i>	Poeciliidae	Nariva Swamp
Guppy	<i>Poecilia reticulata</i>	Poeciliidae	Kernahan
Guyana Leafish	<i>Polycentrus schomburgkii</i>	Polycentridae	Nariva Swamp
Zangee	<i>Synbranchus marmoratus</i>	Synbranchidae	Kernahan
Banded Pufferfish	<i>Colomesus psittacus</i>	Tetraodontidae	Nariva River
Checkered Pufferfish	<i>Sphoeroides testudineus</i>	Tetraodontidae	Nariva River

## Molluscs - 25 species from 20 families

Common Name	Scientific Name	Family	Location
Black Conch	<i>Pomacea urceus</i>	Ampullaridae	Nariva Swamp
Apple Snail	<i>Pomacea glauca</i>	Ampullaridae	Nariva Swamp
Giant Ram's horn	<i>Marisa cornuarietis</i>	Ampullaridae	Nariva Swamp
Incongruous Ark Clam	<i>Anadara brasiliiana</i>	Arcidae	Cocos Bay
Chip Chip	<i>Donax striatus</i>	Donacidae	Cocos Bay
River Mussel	<i>Mytilopsis domingensis</i>	Dreissenacea	Nariva River
Coffee Snail	<i>Melampus coffeus</i>	Ellobiidae	Nariva River
none (land snail)	<i>Karolus consobrinus</i>	Ferussaciidae	Bush Bush
none (land snail)	<i>Striatura umbratilis</i>	Gastrodontidae	Bush Bush
none (land snail)	<i>Helicina dysoni</i>	Helicinidae	Bush Bush
Mangrove Snail	<i>Littorina angulifera</i>	Littorinidae	Nariva River
Caribbean Winged Surf Clam	<i>Mactronella alata</i>	Mactridae	Cocos Bay
Caribbean Crown Conch	<i>Melongena melongena</i>	Melongenidae	Cocos Bay
Apple Murex	<i>Phyllonotus pomum</i>	Muricidae	Cocos Bay
Mangrove Oyster	<i>Crassostrea rhizophorae</i>	Ostreidae	Nariva River
none (land snail)	<i>Bothriopupa</i> sp.	Pupillidae	Bush Bush
none (land snail)	<i>Allopeas micra</i>	Achatinidae	Bush Bush

none (land snail)	<i>Obeliscus plicatellum</i>	Achatinidae	Bush Bush
none (land snail)	<i>Subulina octona</i>	Achatinidae	Kernahan
none (land snail)	<i>Succinea</i> sp.	Succineidae	Bush Bush
none (land snail)	<i>Scolodonta implicans</i>	Scolodontidae	Bush Bush
Red-rimmed Melania	<i>Melanoides tuberculatus</i>	Thiaridae	Nariva Swamp
Elegant Venus	<i>Hysteroconcha dione</i>	Veneridae	Cocos Bay
Venus Clam	<i>Tivela mactroides</i>	Veneridae	Cocos Bay
Leatherleaf Slug	<i>Sarasinula plebeia</i>	Veronicellidae	Kernahan

## Lepidoptera – 106 species from 20 families

Common Name	Scientific Name	Family	Location
Cattleheart	<i>Parides</i> sp. prob. <i>anchises</i>	Papilionidae	Nariva Swamp
Ruby-spotted Swallowtail	<i>Heraclides anchisiades</i>	Papilionidae	Nariva Swamp
King Swallowtail	<i>Heraclides</i> sp. prob. <i>thoas</i>	Papilionidae	Nariva Swamp
Apricot Sulphur	<i>Phoebis argante</i>	Pieridae	Nariva Swamp
Cloudless Sulphur	<i>Phoebis sennae</i>	Pieridae	Nariva Swamp
Leuce Yellow	<i>Pyrisitia leuce</i>	Pieridae	Nariva Swamp
Pale Yellow	<i>Pyrisitia venusta</i>	Pieridae	Nariva Swamp
Ghost Yellow	<i>Eurema albula</i>	Pieridae	Nariva Swamp
Great Southern White	<i>Ascia monuste</i>	Pieridae	Nariva Swamp
Tropical Milkweed Butterfly	<i>Lycorea halia</i>	Nymphalidae	Nariva Swamp
Soldier	<i>Danaus eresimus</i>	Nymphalidae	Nariva Swamp
Orange-spotted Tiger Clearwing	<i>Mechanitis polymnia</i>	Nymphalidae	Nariva Swamp
Helenor Morpho	<i>Morpho helenor</i>	Nymphalidae	Nariva Swamp
Owl Butterfly	<i>Caligo</i> sp.	Nymphalidae	Nariva Swamp
none (butterfly)	<i>Pierella hyalinus</i>	Nymphalidae	Nariva Swamp
Penelope's Ringlet	<i>Cissia penelope</i>	Nymphalidae	Nariva Swamp
Hermes Satyr	<i>Hermeuptychia hermes</i>	Nymphalidae	Nariva Swamp
Blue-grey Satyr	<i>Magneuptychia libye</i>	Nymphalidae	Nariva Swamp
Two-banded Satyr	<i>Pareuptychia ocirrhoe</i>	Nymphalidae	Nariva Swamp
Laches Satyr	<i>Taygetis laches</i>	Nymphalidae	Nariva Swamp
Variable Cracker	<i>Hamadryas feronia</i>	Nymphalidae	Nariva Swamp
Mylitta Greenwing	<i>Dynamine postverta</i>	Nymphalidae	Nariva Swamp
White Peacock	<i>Anartia jatrophae</i>	Nymphalidae	Nariva Swamp
West Indian Buckeye	<i>Junonia zonalis</i>	Nymphalidae	Nariva Swamp
Julia	<i>Dryas iulia</i>	Nymphalidae	Nariva Swamp
Red Postman	<i>Heliconius erato</i>	Nymphalidae	Nariva Swamp
Common Postman	<i>Heliconius melpomene</i>	Nymphalidae	Nariva Swamp
Ricini Longwing	<i>Heliconius ricini</i>	Nymphalidae	Nariva Swamp
Wallace's Longwing	<i>Heliconius wallacei</i>	Nymphalidae	Nariva Swamp
Helicopis Cupid	<i>Helicopis cupido</i>	Riodinidae	Nariva Swamp
Emylius Metalmark	<i>Calospila emylius</i>	Riodinidae	Nariva Swamp

none (butterfly)	<i>Nymphidium lisimon</i>	Riodinidae	Nariva Swamp
Ceraunus Blue	<i>Hemiargus ceraunus</i>	Lycaenidae	Nariva Swamp
Cassius Blue	<i>Leptotes cassius</i>	Lycaenidae	Nariva Swamp
none (butterfly)	<i>Arawacus aetolus</i>	Lycaenidae	Nariva Swamp
Smudged Hairstreak	<i>Rekoa</i> sp. prob. <i>stagira</i>	Lycaenidae	Nariva Swamp
Red-spotted Hairstreak	<i>Strymon (Tmolus?) echion</i>	Lycaenidae	Nariva Swamp
Silver-banded Hairstreak	<i>Chlorostrymon simaethis</i>	Lycaenidae	Nariva Swamp
Origo Groundstreak	<i>Calycopis</i> prob. <i>origo</i>	Lycaenidae	Nariva Swamp
none (butterfly)	unidentified sp. 1	Hesperiidae	Nariva Swamp
none (butterfly)	unidentified sp. 2	Hesperiidae	Nariva Swamp
none (butterfly)	unidentified sp. 3	Hesperiidae	Nariva Swamp
none (butterfly)	unidentified sp. 4	Hesperiidae	Nariva Swamp
none (butterfly)	unidentified sp. 5	Hesperiidae	Nariva Swamp
none (butterfly)	unidentified sp. 6	Hesperiidae	Nariva Swamp
none (moth)	Unidentified	Crambidae	Nariva Swamp
none (moth)	<i>Phostria varialis</i>	Crambidae	Nariva Swamp
none (moth)	<i>Glyphodes rubrocinctalis</i>	Crambidae	Nariva Swamp
none (moth)	<i>Spilomena perspicata</i>	Crambidae	Nariva Swamp
none (moth)	Prob. <i>Diaphania hyalinata</i>	Crambidae	Nariva Swamp
none (moth)	Unidentified	Crambidae	Nariva Swamp
none (moth)	<i>Syngamia florella</i>	Crambidae	Nariva Swamp
none (moth)	<i>Apogeshna stenialis</i>	Crambidae	Nariva Swamp
none (moth)	<i>Diaphania nitidalis</i>	Crambidae	Nariva Swamp
none (moth)	<i>Blepharomastix colubralis</i>	Crambidae	Nariva Swamp
none (moth)	<i>Marasmia</i> sp.	Crambidae	Nariva Swamp
none (moth)	<i>Dolichomia nigrapuncta</i>	Pyalidae	Nariva Swamp
none (moth)	<i>Herpetogramma</i> sp.	Crambidae	Nariva Swamp
none (moth)	<i>Diatraea</i> sp. prob. <i>lineolata</i>	Crambidae	Nariva Swamp
none (moth)	<i>Diatraea</i> sp.	Crambidae	Nariva Swamp
none (moth)	<i>Samea disertalis</i>	Crambidae	Nariva Swamp
none (moth)	Possibly <i>Macalla</i> sp.	Pyalidae	Nariva Swamp
none (moth)	Possibly <i>Neodavisia</i> sp.	Pyalidae	Nariva Swamp
none (moth)	<i>Carcha violalis</i>	Pyalidae	Nariva Swamp
none (moth)	<i>Galasa</i> sp. 1	Pyalidae	Nariva Swamp
none (moth)	<i>Galasa</i> sp. 2	Pyalidae	Nariva Swamp
none (moth)	<i>Automeris jucunda</i>	Saturniidae	Nariva Swamp
none (moth)	<i>Gamelia abas</i>	Saturniidae	Nariva Swamp
none (moth)	<i>Hylesia metabus</i>	Saturniidae	Nariva Swamp
none (moth)	<i>Hylesia murex</i>	Saturniidae	Nariva Swamp
none (moth)	<i>Pseudodirphia eumedide</i>	Saturniidae	Nariva Swamp
none (moth)	<i>Semura</i> sp.	Limacodidae	Nariva Swamp
none (moth)	<i>Coenipeta</i> sp. prob. <i>capensis</i>	Erebidae	Nariva Swamp
none (moth)	<i>Herminodes concatenalis</i>	Erebidae	Nariva Swamp
none (moth)	<i>Phlyctaina irrigualis</i>	Erebidae	Nariva Swamp

none (moth)	<i>Metria bidens</i>	Erebidae	Nariva Swamp
none (moth)	<i>Lesmone porcia</i>	Erebidae	Nariva Swamp
none (moth)	<i>Lephana excisata</i>	Erebidae	Nariva Swamp
none (moth)	<i>Gorgone fellearis</i>	Erebidae	Nariva Swamp
none (moth)	<i>Antiblemma melanoides</i>	Erebidae	Nariva Swamp
none (moth)	<i>Baniana inaequalis</i>	Erebidae	Nariva Swamp
none (moth)	<i>Metalectra agriodes</i>	Erebidae	Nariva Swamp
none (moth)	<i>Euclystis insana</i>	Erebidae	Nariva Swamp
none (moth)	<i>Balbura dorsisigna</i>	Erebidae	Nariva Swamp
none (moth)	<i>Deinopa</i> sp. prob. <i>biligula</i>	Erebidae	Nariva Swamp
none (moth)	<i>Letis scops</i>	Erebidae	Nariva Swamp
none (moth)	<i>Agaraea minuta</i>	Erebidae	Nariva Swamp
none (moth)	<i>Calonotus tiburtus</i>	Erebidae	Nariva Swamp
none (moth)	unidentified sp. 1	Erebidae	Nariva Swamp
none (moth)	unidentified sp. 2	Erebidae	Nariva Swamp
none (moth)	unidentified sp. 3	Erebidae	Nariva Swamp
none (moth)	<i>Acrolophus</i> sp.	Tineidae	Nariva Swamp
none (moth)	<i>Thysanopyga</i> sp. prob. <i>abdominaria</i>	Geometridae	Nariva Swamp
none (moth)	<i>Eusarca concomitaria</i>	Geometridae	Nariva Swamp
none (moth)	<i>Psamatodes nicetaria</i>	Geometridae	Nariva Swamp
none (moth)	<i>Dolichoneura nigrinotata</i>	Geometridae	Nariva Swamp
none (moth)	<i>Synchlora expulsata expulsata</i>	Geometridae	Nariva Swamp
none (moth)	<i>Idaea triangulata</i>	Geometridae	Nariva Swamp
none (moth)	<i>Idaea</i> sp. prob. <i>caudata</i>	Geometridae	Nariva Swamp
none (moth)	<i>Chloropteryx opalaria</i>	Geometridae	Nariva Swamp
none (moth)	<i>Eumorpha fasciatus fasciatus</i>	Sphingidae	Nariva Swamp
none (moth)	<i>Phastia basalis</i>	Notodontidae	Nariva Swamp
none (moth)	<i>Hemeroblemma leontia</i>	Noctuidae	Nariva Swamp
none (moth)	<i>Himmacia</i> sp.	Oecophoridae	Nariva Swamp
none (moth)	<i>Olceclostera irrorata</i>	Apatelodidae	Nariva Swamp
none (moth)	Unidentified	Plusiinae?	Nariva Swamp

## Hymenoptera – 21 species from 6 families

Common Name	Scientific Name	Family	Location
Digger Bee	<i>Centris</i> sp.	Apidae	Nariva Swamp
Social Wasp	<i>Polybia occidentalis</i>	Eumenidae	Kernahan
Social Wasp	<i>Polybia rejecta</i>	Eumenidae	Bush Bush
Social Wasp	<i>Angiopolybia pallens</i>	Formicidae	Bush Bush
Bachac	<i>Atta cephalotes</i>	Formicidae	Bush Bush
Carpenter Ant	<i>Camponotus</i> sp.?	Formicidae	Nariva Swamp
Ant	<i>Ectatomma ruidum</i>	Formicidae	Bush Bush
Ant	<i>Megalomyrmex</i> sp.	Formicidae	Nariva Swamp

Army ant	<i>Neivamyrmex</i> sp.	Formicidae	Bush Bush
Trap-jaw ant	<i>Odontomachus</i> sp.	Formicidae	Bush Bush
Trap-jaw ant	<i>Odontomachus</i> sp. prob. <i>bauri</i>	Formicidae	Bush Bush
Ant	<i>Pachycondyla</i> sp. 1	Formicidae	Bush Bush
Ant	<i>Pachycondyla</i> sp. 2	Formicidae	Bush Bush
Tarantula Hawk Wasp	<i>Pepsis</i> sp.	Pompilidae	Bush Bush
Solitary Wasp	<i>Sceliphron</i> sp. prob. <i>fistularium</i>	Sphecidae	Kernahan
Social Wasp	<i>Agelaia multipicta</i>	Vespidae	Bush Bush
Social Wasp	<i>Apocia pallens</i>	Vespidae	Kernahan
Social Wasp	<i>Apocia pallida</i>	Vespidae	Kernahan
Social Wasp	<i>Mischocyttarus rotundicollis</i>	Vespidae	Kernahan
Jack Spaniard	<i>Polistes lanio</i>	Vespidae	Kernahan
Solitary Wasp	<i>Zeta canaliculatus</i>	Vespidae	Kernahan

### Mosquitos – 20 species from 1 family

Common Name	Scientific Name	Family	Location
none (mosquito)	<i>Aedes hastatus</i>	Culicidae	Bush Bush
none (mosquito)	<i>Aedes scapularis</i>	Culicidae	Bush Bush
none (mosquito)	<i>Aedes sematus</i>	Culicidae	Bush Bush
none (mosquito)	<i>Anopheles</i> sp.	Culicidae	Bush Bush
none (mosquito)	<i>Coquilletiola venezuelensis</i>	Culicidae	Bush Bush
none (mosquito)	<i>Culex aiken?</i>	Culicidae	Bush Bush
none (mosquito)	<i>Culex amazonensis</i>	Culicidae	Bush Bush
none (mosquito)	<i>Culex caudelli?</i>	Culicidae	Bush Bush
none (mosquito)	<i>Culex crybola</i>	Culicidae	Bush Bush
none (mosquito)	<i>Culex nigripalpus</i>	Culicidae	Bush Bush
none (mosquito)	<i>Culex portesi</i>	Culicidae	Bush Bush
none (mosquito)	<i>Culex vomerifer</i>	Culicidae	Bush Bush
none (mosquito)	<i>Mansonia pseudotitillans</i>	Culicidae	Kernahan
none (mosquito)	<i>Mansonia titillans</i>	Culicidae	Bush Bush
none (mosquito)	<i>Microculex</i> sp.	Culicidae	Bush Bush
none (mosquito)	<i>Phoniomya ferox</i>	Culicidae	Bush Bush
none (mosquito)	<i>Phoniomya</i> sp.	Culicidae	Bush Bush
none (mosquito)	<i>Psorophora ferox</i>	Culicidae	Bush Bush
none (mosquito)	<i>Psorophora lineata</i>	Culicidae	Bush Bush
none (mosquito)	<i>Uranotaenia lowii</i>	Culicidae	Base camp

### Other Insects – 28 species from 20 families

Common Name	Scientific Name	Family	Location
Spur-throat Toothpick Grasshopper	<i>Leptysma filicormis</i>	Acrididae	Nariva Swamp

Giant water bug	<i>Belastoma sp.</i>	Belostomatidae	Base camp
Ground beetle	<i>Pheropsophus aequinoctialis</i>	Carabidae	Nariva Swamp
none (lacewing)	Sp. 1	Cephidae	Nariva Swamp
Cicada	Sp. 1	Cicadidae	Bush Bush
Spotted ladybird beetle	<i>Coleomegilla maculata</i>	Coccinellidae	Nariva Swamp
none (damselfly)	<i>Ischnura capreola</i>	Coenagrionidae	Kernahan
Leaf-footed bug	<i>Pachylis sp.</i>	Coreidae	Nariva Swamp
Burrower bug	<i>Cyrtomenus mirabilis</i>	Cydnidae	Nariva Swamp
Tawny Mole Cricket	<i>Neoscapteriscus sp.</i>	Gryllotalpidae	Nariva Swamp
Firefly	<i>Photinus sp.</i>	Lampyridae	Kernahan
none (dragonfly)	<i>Brachymesia herbida</i>	Libellulidae	Bush Bush
Flame-tailed Pondhawk	<i>Erythemis peruviana</i>	Libellulidae	Kernahan
none (dragonfly)	<i>Erythrodiplax fervida</i>	Libellulidae	Nariva Swamp
Band-winged Dragonlet	<i>Erythrodiplax umbrata</i>	Libellulidae	Kernahan
none (mantid)	<i>Liturgusa trinidadensis</i>	Liturgusidae	Bush Bush
Large milkweed bug	<i>Oncopeltus varicolor</i>	Lygaeidae	Bush Bush
none (mantid)	<i>Brunneria subaptera</i>	Mantidae	Bush Bush
none (mantid)	<i>Parastagmatoptera unipunctata</i>	Mantidae	Nariva Swamp
none (mantid)	<i>Stagmomantis carolina</i>	Mantidae	Boatline
Water scorpion	<i>Curicta curicta</i>	Nepidae	Base camp
Stick insect	<i>Creoxylus spinosus</i>	Pseudophasmatidae	Bush Bush
Scarab beetle	<i>Dyscinetus geminatus</i>	Scarabidae	Nariva Swamp
none (termite)	<i>Microcerotermes arboreus</i>	Termitidae	Bush Bush
none (termite)	<i>Nasutitermes corniger</i>	Termitidae	Bush Bush
none (termite)	<i>Nasutitermes ephratae</i>	Termitidae	Bush Bush
none (termite)	<i>Termes hispaniolae</i>	Termitidae	Bush Bush
Pygmy mole cricket	Sp. 1	Tridactylidae	Nariva Swamp

## Crustaceans – 14 species from 12 families

Common Name	Scientific Name	Family	Location
none (terrestrial isopod)	<i>Armadillidium sp.?</i>	Armadillidae	Nariva Swamp
none (water flea)	<i>Daphnia sp.</i>	Daphniidae	Kernahan
Mangrove Root Crab	<i>Goniopsis cruentata</i>	Grapsidae	Nariva Swamp
none (isopod)	<i>Ligia sp.?</i>	Ligiidae	Nariva Swamp
Ghost crab	<i>Ocypode quadrata</i>	Ocypodidae	Cocos Bay
Mudflat Fiddler Crab	<i>Uca rapax</i>	Ocypodidae	boatline
Fiddler Crab	<i>Uca sp.</i>	Ocypodidae	Nariva Swamp
none (freshwater prawn)	<i>Macrobrachium jelskii</i>	Palaemonidae	boatline
none (terrestrial isopod)	<i>Porcellio sp.?</i>	Porcellionidae	Nariva Swamp
Swimming Crab	<i>Callinectes sp.</i>	Portunidae	boatline
Mangrove Tree Crab	<i>Aratus pisonii</i>	Sesarmidae	boatline
Mangrove Boring Isopod	<i>Sphaeroma terebrans</i>	Sphaeromatidae	Nariva Swamp

Sandhopper	<i>Talorchestia sulensoni</i>	Talitridae	Nariva Swamp
Marsh crab	<i>Poppiana dentatus</i>	Trichodactylidae	Kernahan

## Echinoderms – 1 species from 1 family

Common Name	Scientific Name	Family	Location
Six-hole sand dollar	<i>Leodia sexiesperforata</i>	Mellitidae	Manzanilla Beach

## Arachnids – 41 species from 22 families

Common Name	Scientific Name	Family	Location
none (spider)	Sp. 1	Agelenidae	Nariva Swamp
none (orb-weaver spider)	<i>Araneid</i> sp. 1	Araneidae	Nariva Swamp
none (orb-weaver spider)	<i>Araneid</i> sp. 2	Araneidae	Nariva Swamp
none (orb-weaver spider)	<i>Argiope argentata</i>	Araneidae	Nariva Swamp
Trashline Orbweaver	<i>Cyclosa caroli</i>	Araneidae	Nariva Swamp
none (orb-weaver spider)	<i>Mangora melanocephala</i>	Araneidae	Nariva Swamp
none (orb-weaver spider)	<i>Metazygia</i> sp.	Araneidae	Nariva Swamp
none (orb-weaver spider)	<i>Metepeira</i> sp.	Araneidae	Nariva Swamp
Arrowhead orb weaver	<i>Micrathena schreibersi</i>	Araneidae	Nariva Swamp
Arrowhead orb weaver	<i>Micrathena triangularispinosa</i>	Araneidae	Nariva Swamp
none (scorpion)	<i>Ananteris cussinii</i>	Buthidae	Bush Bush
none (scorpion)	<i>Tityus discrepans</i>	Buthidae	Bush Bush
none (scorpion)	<i>Tityus melanostichus</i>	Buthidae	Bush Bush
none (scorpion)	<i>Tityus trinitatis</i>	Buthidae	Bush Bush
none (scorpion)	<i>Broteochactas nitidus</i>	Chactidae	Bush Bush
none (sac spider)	Sp. 1	Corinnidae	Nariva Swamp
none (opilione)	<i>Santinezia serratotibialis</i>	Cranaidae	Bush Bush
Wandering spider	Sp. 1	Ctenidae	Nariva Swamp
Net-casting spider	<i>Dienopus</i> sp.	Dienopidae	Bush Bush
sub-social tarantula	<i>Ischnothele caudata</i>	Dipluridae	Nariva Swamp
none (wolf spider)	Sp. 1	Lycosidae	Nariva Swamp
none (prowling spider)	Sp. 1	Miturgidae	Nariva Swamp
Golden Orb Weaver	<i>Nephila clavipes</i>	Nephilidae	Nariva Swamp
Lynx spider	<i>cf. Oxyopes salticus</i>	Oxyopidae	Nariva Swamp
none (spider)	<i>Mesabolivar aurantiacus</i>	Pholcidae	Nariva Swamp
Fishing spider	<i>Dolomedes</i> sp.	Pisauridae	Nariva Swamp
Fishing spider	Sp. 1	Pisauridae	Nariva Swamp
Grey wall jumper	<i>Menemerus bivittatus</i>	Salticidae	Nariva Swamp
none (jumping spider)	Sp. 1	Salticidae	Nariva Swamp
none (jumping spider)	Sp. 2	Salticidae	Nariva Swamp
none (jumping spider)	Sp. 3	Salticidae	Nariva Swamp
none (jumping spider)	Sp. 4	Salticidae	Nariva Swamp

none (opilione)	<i>Prionostemma cf insulare</i>	Sclerosomatidae	Bush Bush
Huntsman spider	<i>Olios</i> sp.	Sparassidae	Nariva Swamp
none (orb-weaver spider)	<i>Azilia vachoni</i>	Tetragnathidae	Nariva Swamp
none (orb-weaver spider)	<i>Leucauge argyra</i>	Tetragnathidae	Nariva Swamp
none (orb-weaver spider)	Sp. 1	Tetragnathidae	Nariva Swamp
none (orb-weaver spider)	<i>Tetragnatha</i> sp.	Tetragnathidae	Nariva Swamp
Pink-toed Tarantula	<i>Avicularia avicularia</i>	Theraphosidae	Nariva Swamp
Crab spider	<i>Misumenops</i> sp.	Thomisidae	Nariva Swamp
none (orb-weaver spider)	Sp. 1	Uloboridae	Nariva Swamp

### Myriapods (Centipedes, Milipedes) – 5 species from 5 families

Common Name	Scientific Name	Family	Location
none (centipede)	<i>Cryptops</i> sp.	Cryptopidae	Kernahan
none (flat-backed millipede)	<i>Amphelictogon bidens</i>	Chelodesmidae	Nariva Swamp
none (flat-backed millipede)	<i>Dilophops bullatus</i>	Polydesmidae	Nariva Swamp
none (millipede)	<i>Pseudospirobolellus avernus</i>	Pseudospirobolellidae	Nariva Swamp
none (millipede)	<i>Siphonocybe harti</i>	Siphonophoridae	Nariva Swamp

### Platyhelminthes – 1 species from 1 family

Common Name	Scientific Name	Family	Place
none (flatworm)	<i>Dolichoplana</i> sp.	Geoplanidae	Nariva Swamp

### Annelids – 3 species from 2 families

Common Name	Scientific Name	Family/Class	Location
none (polychaete)	Sp. 1	Polychaeta	Cocos Bay
none (feather duster worm)	Sp. 1	Sabellidae	Cocos Bay
none (feather duster worm)	Sp. 2	Sabellidae	Cocos Bay

### Diatoms – 11 species from 4 families/classes

Common Name	Scientific Name	Family/Class	Place
none (diatom)	<i>Synedra</i> sp.	Fragilariaceae	Nariva Swamp
none (diatom)	<i>Amphora</i> sp.	Catenulaceae	Nariva Swamp
none (diatom)	<i>Gyrosigma</i> sp.	Naviculaceae	Nariva Swamp
none (diatom)	Sp. 1 (rhombic)	Bacillariophyceae	Nariva Swamp
none (diatom)	Sp. 2 (crescentic)	Bacillariophyceae	Nariva Swamp
none (diatom)	Sp. 3 (elliptic)	Bacillariophyceae	Nariva Swamp
none (diatom)	Sp. 4 (narrow elliptic with capitate ends)	Bacillariophyceae	Nariva Swamp



none (diatom)	Sp. 5 (lanceolate)	Bacillariophyceae	Nariva Swamp
none (diatom)	Sp. 6 (rhombic with rostrate ends)	Bacillariophyceae	Nariva Swamp
none (diatom)	Sp. 7 (lanceolate with capitate ends)	Bacillariophyceae	Nariva Swamp
none (diatom)	Sp. 8 (fusiform lanceolate)	Bacillariophyceae	Nariva Swamp

### Rotifers – 1 species from 1 family

Common Name	Scientific Name	Family	Location
none (roifer)	Sp. 1	unknown	Nariva Swamp

### Fungus – 15 species from at least 4 families

Common Name	Scientific Name	Family	Location
pod parachute	<i>Caripia montagnei</i>	Marasmiaceae	Bush Bush
none (fungus)	<i>Marasmius rotuloides</i>	Marasmiaceae	Bush Bush
veiled lady fungus	<i>Phallus indusiatus</i>	Phallaceae	Bush Bush
Turkey tail mushroom	<i>Trametes versicolor</i>	Polyporaceae	Bush Bush
cup fungus	<i>Cookeina sulcipes</i>	Sarcoscyphaceae	Bush Bush
none (fungus)	Morphospecies A	Unknown	Bush Bush
none (fungus)	Morphospecies B	Unknown	Bush Bush
none (fungus)	Morphospecies C	Unknown	Bush Bush
none (fungus)	Morphospecies D	Unknown	Bush Bush
none (fungus)	Morphospecies E	Unknown	Bush Bush
none (fungus)	Morphospecies F	Unknown	Bush Bush
none (fungus)	Morphospecies G	Unknown	Bush Bush
none (fungus)	Morphospecies H	Unknown	Bush Bush
none (fungus)	Morphospecies I	Unknown	Bush Bush
none (fungus)	Morphospecies J	Unknown	Bush Bush

### Plants – 219 species from 74 families

Common Name	Scientific Name	Family	Location
Black mangrove	<i>Avicennia germinans</i>	Acanthaceae	Boatline
Fever root	<i>Ruellia tuberosa</i>	Acanthaceae	Kernahan
Shoreline seapurslane	<i>Sesuvium portulacastrum</i>	Aizoaceae	Cocos Bay
Thread Alternanthera	<i>Alternanthera ficoidea</i>	Amaranthaceae	road to Bush Bush
Calicoplant	<i>Alternanthera tenella</i>	Amaranthaceae	Cocos Bay
Pigweeds	<i>Amaranthus sp.</i>	Amaranthaceae	road to Bush Bush
Cocks Comb	<i>Celosia argentea</i>	Amaranthaceae	Kernahan
Swamp lily	<i>Crinum erubescens</i>	Amaryllidaceae	Boatline
Mango	<i>Mangifera indica</i>	Anacardiaceae	road to Bush Bush
Pomme cythere	<i>Spondias dulcis</i>	Anacardiaceae	road to Bush Bush

Hog plum	<i>Spondias mombin</i>	Anacardiaceae	road to Bush Bush
Custard Apple	<i>Annona muricata</i>	Annonaceae	road to Bush Bush
False ashoka	<i>Polyalthia longifolia</i>	Annonaceae	Kernahan
Wild sweet sop	<i>Rollinia mucosa</i>	Annonaceae	Bush Bush
Allamanda	<i>Allamander cathartica</i>	Apocynaceae	Kernahan
Kapok tree	<i>Calotropis procera</i>	Apocynaceae	Kernahan
Rosy periwinkle	<i>Catharanthus roseus</i>	Apocynaceae	Kernahan
Rubbervine	<i>Cryptostegia grandiflora</i>	Apocynaceae	Kernahan
Oleander	<i>Nerium oleander</i>	Apocynaceae	Kernahan
Frangipani	<i>Plumeria cockleata</i>	Apocynaceae	Kernahan
Frangipani	<i>Plumeria rubra</i>	Apocynaceae	Kernahan
none (tree)	<i>Tabernaemontana divaricata</i>	Apocynaceae	Kernahan
Anthurium	<i>Anthurium jenmanii</i>	Araceae	Boatline
Swiss Cheese Vine	<i>Monstera adonsonii</i>	Araceae	road to Bush Bush
Moco-moco	<i>Montrichardia arborescens</i>	Araceae	Boatline
Philodendron	<i>Philodendron acutatum</i>	Araceae	road to Bush Bush
Philodendron	<i>Philodendron lingulatum</i>	Araceae	Bush Bush
Philodendron	<i>Philodendron phylloides</i>	Araceae	road to Bush Bush
Philodendron	<i>Philodendron scandens</i>	Araceae	Bush Bush
Arrowleaf elephant ear	<i>Xanthosoma sagittifolium</i>	Araceae	road to Bush Bush
Matchwood	<i>Schefflera morototoni</i>	Araliaceae	Bush Bush
Cocorite	<i>Attalea maripa</i>	Arecaceae	road to Bush Bush
Roseau	<i>Bactris major</i>	Arecaceae	road to Bush Bush
none (palm)	<i>Bactris simplicifrons</i>	Arecaceae	Bush Bush
Liana palm	<i>Desmoncus polyacanthos</i>	Arecaceae	Bush Bush
none (palm)	<i>Euterpe oleracea</i>	Arecaceae	Bush Bush
Moriche palm	<i>Mauritia flexuosa</i>	Arecaceae	road to Bush Bush
Royal Palm	<i>Roystonea oleracea</i>	Arecaceae	road to Bush Bush
Siam weed	<i>Chromolaena odorata</i>	Asteraceae	road to Bush Bush
False daisy	<i>Eclipta prostrata</i>	Asteraceae	road to Bush Bush
Tropic daisy	<i>Egletes prostrata</i>	Asteraceae	Cocos Bay
Emilia	<i>Emilia fosbergii</i>	Asteraceae	road to Bush Bush
Tropical burnweed	<i>Erechites valerianifolia</i>	Asteraceae	road to Bush Bush
none (herb)	<i>Vernonia cinerea</i>	Asteraceae	road to Bush Bush
none (shrub)	<i>Wulffia baccata</i>	Asteraceae	road to Bush Bush
Trinidad Pink Trumpet Vine	<i>Phryganocydia corymbosa</i>	Bignoniaceae	Bush Bush
none (vine)	<i>sp. 1</i>	Bignoniaceae	Bush Bush
none (vine)	<i>sp. 2</i>	Bignoniaceae	Bush Bush
Pink Poui	<i>Tabebuia rosea</i>	Bignoniaceae	road to Bush Bush
Annato	<i>Bixa orellana</i>	Bixaceae	Kernahan
Black Sage	<i>Cordia curassavica</i>	Boraginaceae	road to Bush Bush
Indian heliotrope	<i>Heliotropium indicum</i>	Boraginaceae	road to Bush Bush
none (bromeliad)	<i>Aechmea aquilega</i>	Bromeliaceae	Boatline
Protium	<i>Protium guianense</i>	Burseraceae	Bush Bush

Achira	<i>Canna indica</i>	Cannaceae	Kernahan
Paw paw	<i>Carica papaya</i>	Caricaceae	road to Bush Bush
White mangrove	<i>Laguncularia racemosa</i>	Combretaceae	Boatline
White Olivier	<i>Terminalia amazonia</i>	Combretaceae	Bush Bush
Water grass	<i>Commelina erecta</i>	Commelinaceae	road to Bush Bush
none (vine)	<i>Rourea surinamensis</i>	Connaraceae	Bush Bush
Water spinach	<i>Ipomoea aquatica</i>	Convolvulaceae	Bush Bush
Bayhops	<i>Ipomoea pes-caprae</i>	Convolvulaceae	Cocos Bay
none	<i>Ipomoea rubens</i>	Convolvulaceae	road to Bush Bush
Hogvine	<i>Merremia umbellata</i>	Convolvulaceae	road to Bush Bush
none	<i>Iseia luxurans</i>	Convolvulaceae	road to Bush Bush
Costus	<i>Costus scaber</i>	Costaceae	Bush Bush
Watermelon	<i>Citrullus lanatus</i>	Cucurbitaceae	road to Bush Bush
Cucumber	<i>Cucumis sativus</i>	Cucurbitaceae	road to Bush Bush
Wild Carilee	<i>Momordica charantia</i>	Cucurbitaceae	road to Bush Bush
none (tree)	<i>Thuja sp.</i>	Cupressaceae	Kernahan
Dwarf papyrus sedge	<i>Cyperus haspan</i>	Cyperaceae	Cocos Bay
Sedge	<i>Cyperus ligularis</i>	Cyperaceae	road to Bush Bush
Purple nutsedge	<i>Cyperus rotundus</i>	Cyperaceae	road to Bush Bush
Suriname sedge	<i>Cyperus surinamensis</i>	Cyperaceae	road to Bush Bush
Scallion grass	<i>Eleocharis mutata/interstincta</i>	Cyperaceae	Boatline
Fimbry	<i>Fimbristylis sp.</i>	Cyperaceae	road to Bush Bush
none	<i>Doliocarpus dentatus</i>	Dilleniaceae	Bush Bush
Diospyros	<i>Diospyros cayennensis</i>	Ebenaceae	Bush Bush
Euphorbia	<i>Acalypha sp.</i>	Euphorbiaceae	road to Bush Bush
False croton	<i>Caperonia palustris</i>	Euphorbiaceae	road to Bush Bush
Croton	<i>Croton sp.</i>	Euphorbiaceae	road to Bush Bush
Croton	<i>Croton variegatum</i>	Euphorbiaceae	Kernahan
Pumpkin	<i>Cucurbita moschata</i>	Euphorbiaceae	Kernahan
none	<i>Euphorbia sp.</i>	Euphorbiaceae	road to Bush Bush
Cobnut	<i>Omphalea triandra</i>	Euphorbiaceae	Bush Bush
Milkwood	<i>Sapium glandulosum</i>	Euphorbiaceae	road to Bush Bush
Puni	<i>Abarema jupunba</i>	Fabaceae	Bush Bush
Alyce Clover	<i>Alysicarpus vaginalis</i>	Fabaceae	road to Bush Bush
Barbados Pride	<i>Caesalpinia pulcherrima</i>	Fabaceae	Kernahan
Pigeon Pea	<i>Cajanus cajan</i>	Fabaceae	Kernahan
Beach bean	<i>Canavalia rosea</i>	Fabaceae	Cocos Bay
Blue pea	<i>Clitoria ternatea</i>	Fabaceae	Kernahan
Rattlepod	<i>Crotalaria retusa</i>	Fabaceae	road to Bush Bush
Creeping beggarweed	<i>Desmodium canum</i>	Fabaceae	Cocos Bay
Threeflower ticktrefoil	<i>Desmodium triflorum</i>	Fabaceae	road to Bush Bush
none	<i>Dioclea guianensis</i>	Fabaceae	road to Bush Bush
Bois immortelle	<i>Erythrina fusca</i>	Fabaceae	road to Bush Bush
Hairy indigo	<i>Indigofera hirsuta</i>	Fabaceae	road to Bush Bush

none	<i>Inga fastuosa</i>	Fabaceae	Bush Bush
none	<i>Inga ingoides</i>	Fabaceae	road to Bush Bush
Graceful mimosa	<i>Mimosa casta</i>	Fabaceae	road to Bush Bush
Giant sensitive tree	<i>Mimosa pigra</i>	Fabaceae	road to Bush Bush
Ti-marie	<i>Mimosa pudica</i>	Fabaceae	road to Bush Bush
Velvet bean	<i>Mucuna pruriens</i>	Fabaceae	road to Bush Bush
Fine Leaf	<i>Pentaclethra macroloba</i>	Fabaceae	Bush Bush
Dragonsblood tree	<i>Pterocarpus officinalis</i>	Fabaceae	Boatline
Kudzu vine	<i>Pueraria lobata</i>	Fabaceae	road to Bush Bush
Senna	<i>Senna bacillaris</i>	Fabaceae	road to Bush Bush
Silky sesban	<i>Sesbania sericea</i>	Fabaceae	road to Bush Bush
none (tree)	<i>Swartzia pinnata</i>	Fabaceae	Bush Bush
Tamarind	<i>Tamarindus indica</i>	Fabaceae	road to Bush Bush
Cowpea	<i>Vigna lasiocarpa</i>	Fabaceae	road to Bush Bush
none (climber)	<i>Vigna sp.</i>	Fabaceae	road to Bush Bush
Calopo	<i>Calopogonium mucunoides</i>	Faboideae	road to Bush Bush
none	<i>Sp. 1</i>	Gentianaceae	road to Bush Bush
none (herb)	<i>Xiphidium caeruleum</i>	Haemodoraceae	Bush Bush
Balisier	<i>Heliconia bihai</i>	Heliconiaceae	Bush Bush
Heliconia	<i>Heliconia hirsuta</i>	Heliconiaceae	Bush Bush
Heliconia	<i>Heliconia psittacorum</i>	Heliconiaceae	road to Bush Bush
Jack in a box	<i>Hernandia sonora</i>	Hernandiaceae	Bush Bush
none (tree)	<i>Vismia cayennensis</i>	Hypericaceae	road to Bush Bush
Lions ear	<i>Leonotis nepetifolia</i>	Lamiaceae	road to Bush Bush
none	<i>Marsypianthes chamaedrys</i>	Lamiaceae	road to Bush Bush
Holy basil	<i>Ocimum sanctum</i>	Lamiaceae	Kernahan
none (tree)	<i>Aniba citrifolia</i>	Lauraceae	Bush Bush
Avocado	<i>Persea americana</i>	Lauraceae	Kernahan
Cannonball tree	<i>Couroupita guianensis</i>	Lecythidaceae	road to Bush Bush
Watercare	<i>Eschweilera subglandulosa</i>	Lecythidaceae	Bush Bush
Serette	<i>Byrsonima spicata</i>	Malpighiaceae	road to Bush Bush
West Indian elm	<i>Guazuma ulmifolia</i>	Malvaceae	road to Bush Bush
Hawaiian pink hibiscus	<i>Hibiscus furcellatus</i>	Malvaceae	road to Bush Bush
Chinese hibiscus	<i>Hibiscus rosa-sinensis</i>	Malvaceae	Kernahan
Roselle	<i>Hibiscus sabdariffa</i>	Malvaceae	road to Bush Bush
Coral hibiscus	<i>Hibiscus schizopetalus</i>	Malvaceae	Kernahan
none (tree)	<i>Melochia manducata</i>	Malvaceae	road to Bush Bush
none (shrub)	<i>Sida acuta</i>	Malvaceae	road to Bush Bush
none (tree)	<i>Sterculia pruriens</i>	Malvaceae	Bush Bush
none	<i>Ischnosiphon arouma</i>	Marantaceae	Bush Bush
none	<i>Maranta gibba</i>	Marantaceae	Bush Bush
Monotagma	<i>Monotagma spicatum</i>	Marantaceae	Bush Bush
Arrowroot	<i>Thalia geniculata</i>	Marantaceae	road to Bush Bush
Toilet Paper Bush	<i>Clidemia hirta</i>	Melastomataceae	Bush Bush

Miconia	<i>Miconia sp.</i>	Melastomataceae	Bush Bush
Andiroba	<i>Carapa guianensis</i>	Meliaceae	Bush Bush
Alligatorwood	<i>Guarea glabra</i>	Meliaceae	Bush Bush
Breadfruit	<i>Artocarpus altilis</i>	Moraceae	road to Bush Bush
Breadnut	<i>Brosimum alicastrum</i>	Moraceae	Bush Bush
Weeping fig	<i>Ficus benjamina</i>	Moraceae	Kernahan
West Indian laurel fig	<i>Ficus guianensis</i>	Moraceae	road to Bush Bush
Strangler fig	<i>Ficus nymphaeifolia</i>	Moraceae	road to Bush Bush
Fig	<i>Ficus trigonata</i>	Moraceae	road to Bush Bush
Banana	<i>Musa sp. 1</i>	Musaceae	road to Bush Bush
Plantain	<i>Musa sp. 2</i>	Musaceae	road to Bush Bush
Wild Nutmeg	<i>Viola surinamensis</i>	Myristicaceae	road to Bush Bush
Wild Guava	<i>Myrcia arimensis</i>	Myrtaceae	Bush Bush
none	<i>Sp. 1</i>	Myrtaceae	Bush Bush
Jambul	<i>Syzygium cumini</i>	Myrtaceae	road to Bush Bush
Pomerac	<i>Syzygium malaccense</i>	Myrtaceae	road to Bush Bush
Fern	<i>Nephrolepis biserrata</i>	Nephrolepidaceae	Bush Bush
Bougainvillea	<i>Bougainvillea spectabilis</i>	Nyctaginaceae	Kernahan
White water lily	<i>Nymphaea amphla</i>	Nymphaeaceae	road to Bush Bush
none	<i>Ludwigia erecta</i>	Onagraceae	road to Bush Bush
Mexican primrose-willow	<i>Ludwigia octovalvis</i>	Onagraceae	Bush Bush
Sour Cherry	<i>Phyllanthus acidus</i>	Phyllanthaceae	Kernahan
none (shrub)	<i>Phyllanthus amarus</i>	Phyllanthaceae	road to Bush Bush
none (shrub)	<i>Phyllanthus sp.</i>	Phyllanthaceae	road to Bush Bush
Piper	<i>Piper aequale</i>	Piperaceae	Bush Bush
Goatweed	<i>Scoparia dulcis</i>	Plantaginaceae	road to Bush Bush
Buffalo grass	<i>Brachiaria mutica</i>	Poaceae	road to Bush Bush
Para grass	<i>Brachiaria mutica</i>	Poaceae	road to Bush Bush
Lemon grass	<i>Cymbopogon citratus</i>	Poaceae	Kernahan
Bermuda grass	<i>Cynodon dactylon</i>	Poaceae	road to Bush Bush
none (grass)	<i>Echinochloa colonum</i>	Poaceae	road to Bush Bush
Goose grass	<i>Eleusine indica</i>	Poaceae	road to Bush Bush
Marsh grass	<i>Hymenachne amplexicaulis</i>	Poaceae	road to Bush Bush
Bed grass	<i>Ichnanthus pallens</i>	Poaceae	Bush Bush
none (tree)	<i>Panicum maximum</i>	Poaceae	road to Bush Bush
none (tree)	<i>Panicum pilosum</i>	Poaceae	Bush Bush
none (grass)	<i>Paspalum fasciculatum</i>	Poaceae	road to Bush Bush
none (grass)	<i>Paspalum vaginatum</i>	Poaceae	Cocos Bay
none (grass)	<i>Paspalum virgatum</i>	Poaceae	road to Bush Bush
Common reed	<i>Phragmites australis</i>	Poaceae	road to Bush Bush
Sugar Cane	<i>Saccharum officinarum</i>	Poaceae	road to Bush Bush
Coccoloba	<i>Coccoloba ascendens</i>	Polygonaceae	Bush Bush
Coccoloba	<i>Coccoloba latifolia</i>	Polygonaceae	road to Bush Bush
Coccoloba	<i>Coccoloba venosa</i>	Polygonaceae	Bush Bush
Tapertip smartweed	<i>Polygonum acuminatum</i>	Polygonaceae	road to Bush Bush

Water hyacinth	<i>Eichornea crassipes</i>	Pontederiaceae	Kernahan
Moss rose	<i>Portulaca grandiflora</i>	Portulacaceae	Kernahan
Purslane	<i>Portulaca oleracea</i>	Portulacaceae	road to Bush Bush
Indian plum	<i>Ziziphus mauritiana</i>	Rhamnaceae	Kernahan
Red mangrove	<i>Rhizophora mangle</i>	Rhizophoraceae	Boatline
none (tree)	<i>Amaioua corymbosa</i>	Rubiaceae	Bush Bush
False coffee	<i>Faramea occidentalis</i>	Rubiaceae	Bush Bush
Marmalade box tree	<i>Genipa americana</i>	Rubiaceae	road to Bush Bush
Wild Isertia	<i>Isertia parviflora</i>	Rubiaceae	Bush Bush
Needle flower	<i>Ixora sp.</i>	Rubiaceae	Kernahan
Noni	<i>Morinda citrifolia</i>	Rubiaceae	Kernahan
Psychotria	<i>Psychotria bahiensis</i>	Rubiaceae	Bush Bush
Bois tatoo	<i>Rudgea freemani</i>	Rubiaceae	Bush Bush
Spermacoce	<i>Spermacoce laevis</i>	Rubiaceae	road to Bush Bush
Lime	<i>Citrus aurantifolia</i>	Rutaceae	road to Bush Bush
Guyanese wild coffee	<i>Casearia guianensis</i>	Salicaceae	Bush Bush
Water velvet	<i>Azolla caroliniana</i>	Salvinaceae	road to Bush Bush
Balata	<i>Manilkara bidentata</i>	Sapotaceae	road to Bush Bush
none (climber)	<i>Smilax cumanensis</i>	Smilacaceae	Bush Bush
Angel's Trumpet	<i>Brugmansia sp.</i>	Solanaceae	Kernahan
Pepper	<i>Capsicum annuum</i>	Solanaceae	road to Bush Bush
Bitter greens	<i>Cestrum latifolium</i>	Solanaceae	road to Bush Bush
Gouma	<i>Solanum americanus</i>	Solanaceae	road to Bush Bush
Dogstooth	<i>Solanum stramonifolium</i>	Solanaceae	road to Bush Bush
none (graminoid)	<i>Sorghum halepense</i>	Solanaceae	road to Bush Bush
Bois Canot	<i>Cecropia peltata</i>	Urticaceae	road to Bush Bush
Spiny fiddlewood	<i>Citharexylum spinosum</i>	Verbenaceae	road to Bush Bush
Wild sage	<i>Lantana camara</i>	Verbenaceae	road to Bush Bush
Vervain	<i>Stachytarpheta</i>	Verbenaceae	road to Bush Bush
Teak	<i>Tectona grandis</i>	Verbenaceae	Kernahan
Millionaire vine	<i>Cissus verticillata</i>	Vitaceae	road to Bush Bush
Mardi gras	<i>Renealmia alpinia</i>	Zingiberaceae	road to Bush Bush

### Charophyta - 3 species from 1+ families

Common Name	Scientific Name	Family	Location
none (desmid)	Sp. 1	unknown	Nariva Swamp
none (desmid)	Sp. 2	unknown	Nariva Swamp
none (desmid)	Sp. 3	unknown	Nariva Swamp