



# THE FIELD NATURALIST

Quarterly Bulletin of the Trinidad and Tobago Field Naturalists' Club

January– June 2023

Issue No: 1&2/2023



## RE-GREENING THE AJOUPA POTTERY GARDEN

by Bunty O'Connor



Recent aerial photo of garden. Photo courtesy Chas Sheppard

### WHEN OPPORTUNITY KNOCKS

The young man turned up every day at the big yellow doors of the pottery workshop, where Chandool worked at the potter's wheel. He said that he was attracted by "the Ship of Wisdom, Technology, Science and Order" and his desire was to make pottery. In fact, his true calling was gardening. A magical connection existed

between himself and the soil and Ajoupa Pottery had captured his imagination.

The serendipitous arrival of Seukraj marked the beginning of the transformation of the land, from derelict and damaged to healthy and vibrant. The story of Ajoupa Garden is interwoven with many lives. Reclaiming abandoned land and re-establishing a natural balance requires lots of hands, strong backs and hours of dedicated work. Seukraj came to

*(continued on page 3)*

## Inside This Issue

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- 1 RE-GREENING THE AJOUA POTTERY GARDEN**  
-Bunty O'Connor
- 16 Bug Group Report**  
**LEAFCUTTER ANTS HARVESTING VEGETATION**  
**IN BUSH BUSH**  
-Christopher K. Starr
- 18 EXPLORING THE BLUE RIDGE PARKWAY**  
-Christopher K. Starr
- 23 MANAGEMENT NOTICES**

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Trinidad and Tobago Field Naturalists' Club

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**January – June 2023**

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## WELCOME NEW MEMBERS!



### The club warmly welcomes the following new members:

Sonia Joseph	Shasra Hosein	Alana Joseph	Devin Rampersad	Julianne Bennette
Abdel Qadir Mohammed	Joshua Jacob Davis	Roger Porther	Robert Bermudez	Godfrey Samuel
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### ESTATE LIFE IN DAYS GONE BY

us with the best credentials. He had learned his gardening skills at La Vega Garden Centre and he had a spiritual connection to the Hindu Earth Goddess. We don't know how he discovered us, but he rode his bicycle from La Vega through one of the abandoned estate roads across the Couva River to Chickland Village and this soon became his daily journey.

With his father absent much of the time, Seukraj and his siblings had a sketchy acquaintance with school. Like so many young people in this situation, he learned neither to read nor write. As he explained to Rory, my husband, a visit to a supermarket was a nightmare for him as he could never find what he was looking for. His alphabet was the design of leaves, architecture of tree trunks and branches, feel of bark, colour of foliage and flowers, structure and volume of seed pods. Secrets of growing things came naturally to him. And it turned out that besides his green thumb, he had a gift for building. Pavers, steps, walls and wood construction were his forte, built to last and designed with decorative flair. He studded his pavers with brightly coloured pieces of crockery from broken Ajoupa pottery. His steps were wide and generous and he built rustic walls with local Guaracara boulders. He had much knowledge of the natural world that we, with all our book learning have lost.

After those first weeks with his hopeful face frequently at our door, Rory finally gave in and tasked him to clear the east side of the workshop property and plant some mahogany trees. With this commitment, Seukraj became the key that would unlock the Ajoupa Garden. He had a vision and he worked harder than any other person I have ever met. "Plenty people going to come and visit this place" was his affirmation.

In 1987 when Rory and I took possession of Les Lilas Pottery, we were propelled by youthful optimism and energy. The estate had been cultivated for more than a hundred and fifty years by the Melizan family, with orchards of coffee, cocoa and grapefruit. All the things that made living possible in these far-flung outposts of Central Trinidad, in the days before electricity, piped water, the motor car, and internet, were grown or made on the estate. Workers and their families, as well as the people who managed these small estates had to eat, and almost everything to sustain life was cultivated beside the cocoa and immortelle trees: citrus, breadfruit, paw paw, yams of all kinds, dasheen, eddoes, cassava, sapodilla, mango, bananas of all varieties, spices and herbs. Chickens pecked under the trees and pigs were shared out on the days that they were butchered. Mules and donkeys pulled carts and carried loads.

Estate life was stumbling to an end in the early 1900s along with the first discovery of oil in the south of Trinidad. Witchbroom, a fungal disease that infected growing cocoa trees, caused cocoa pods to turn black and rot, decimating production. Cocoa had been introduced into Africa and was being sold at very competitive prices.

As the years went on, labour became more difficult to come by as workers left the estates attracted by better wages offered in the oil fields. Orchards were gradually abandoned. Heavy rains eroded the soil on the slopes between trees, bridges and roads fell into disrepair and tall grass with razor sharp leaves, and bamboo, quickly invaded land that was no longer cultivated. Bush fires became commonplace, trees burned and with no roots to hold the land, roads slipped away and became impassable.

## OUR GREEN BACKGROUND

In the 1970s, Charles Melizan launched two new business ventures. First was the commercial raising of chickens. Several large sheds were built not far from the house to accommodate them. Chemicals and pesticides were used to keep the chickens healthy and their surroundings sterile. He also brought in a consultant from the potteries in Stoke on Trent in the UK to help him set up a ceramic factory, with the intention of using local clay. However the Chickland clay proved less than ideal for making mugs and tableware. By 1982, the Melizan family had emigrated to Canada and the house, factory and chicken pens lay empty.

Rory and I acquired the ceramic factory and named it Ajoupa Pottery. In 1989 we moved to Chickland and in 1991, bought the house and surrounding land which formed a five acre block. We planned that the pottery would support us financially and we would bring back fertility to the property by planting trees and restoring soil.



**Aerial photo of property from 1980.** Photo courtesy Stephen Dallacosta

Rory grew up in La Brea, not far from the Pitch Lake, in the forests of rubber trees. His family ran a cocoa estate in Sangre Grande. The French Creole cocoa farmers loved the land and the forests and he was no exception. As a child, growing up in La Seiva, Maraval, I caught fish and raised frogs from spawn collected in the river. We were both young naturalists, allowed to roam far and wide without much supervision. I collected bird skeletons and beetles and kept them under my bed in boxes, while Rory shot birds and roasted them over a campfire.

As teenagers, like many of our generation, we were angered by the ongoing Vietnam war and the needless loss of life. The Cold War, with Russian nuclear missiles installed in Cuba to fire on the USA, was endlessly discussed at home. Nuclear annihilation seemed imminent. As a backlash, many young people in America turned to the idea of going “back to the land”. The idea of living a healthy life where they could be in control of the future, motivated many to set up communes and teach themselves to live off the land. Rory and I often talked about a life of self sufficiency in the countryside, without a clear idea of what this really entailed. It took the cataclysmic events of Trinidad’s recession in the 1980’s to eject us from city life and make us put down roots south of the Caroni River.

Our first efforts were focused on building our Ajoupa Pottery business. We didn’t have much spare time on our hands, with a family of three kids and a pottery to manage with a growing workforce. Clay would become our raw material both in the pottery and the garden.



**(Left): Early and bare landscape looking west from 1980 contrasted with a vibrant view looking west in 2023 on the right.** Photos courtesy Bunty O’Connor

Seukraj helped us start to tackle the overgrown jungle of tall grass that surrounded the house and outbuildings. Meanwhile, in an effort to learn more about forests, plants and their linkages to wildlife, I joined the Friends of the Botanic Gardens in 1995. As a 'Friend', I volunteered as an intern with the Ministry of Agriculture in Centeno during the infestation of the pink hibiscus mealybug. This invasive species affected over a hundred plants, many of them agricultural crops. Biological warfare was declared with the introduction of a small ladybird from Australia. My job as volunteer was to place pairs of ladybirds in jars in the laboratory where they produced offspring. These were released by the thousands to prey on the mealybug in the worst afflicted areas of Trinidad. After some time balance was restored, with the pink hibiscus mealybug and its Australian predator, both settling in as permanent residents for better or for worse and I learned that the use of pesticides is not the only way to deal with an invasion of insect pests.

We also visited a gravel quarry in Valencia with the 'Friends' to look at the progress of a research project where trees had been replanted. Gravel is obtained from the quarry by washing it out of the clay in which it is embedded, leaving the residue of mud to dry. The landscape of these quarries is as barren as the moon. Research showed that there were barely any nutrients in the abandoned clay and the ground became so hot during the day that seeds were unable to germinate. A small section of the quarry had been planted with a non-native tree species, *Acacia magnum*. This tree fixes its own nitrogen in its root structure and its seedlings can withstand the very high temperatures of the clay surface in the quarry. Where the young acacias were thriving, we noticed native tree species had started germinating in their shade, bats and birds presumably having delivered the seeds from the nearby forest. We learned that land damaged in this way is not easy to restore and that tropical forests do not automatically regenerate. We witnessed that the grasslands surrounding Ajoupa did not support new tree growth in spite of seeds that were dispersed continuously from our own garden and that small neighbouring patches of forest shrank year by year as fire ate away at them, only to be replaced by bamboo.

In 1997, the Forestry Division in Trinidad and Tobago started a programme to encourage

*"Nitrogen is needed in great amounts by growing plants. Nitrogen gas is "fixed" by lightening and carried down in raindrops. It is made by free living soil bacteria, in lichen and in nodules on the roots of native trees such as pois doux and immortelle as well as a host of other plants held in tree branches."*

reforestation in an effort to reverse the cycle of land degradation on private property due to fire, poor land management and unsustainable land use. In spite of our small acreage and with only a nod at commercial agroforestry ventures, we became part of the Community Forestry Project. Useful workshops were held where we learned how to plant and thin cedar plantations and create our own tree nurseries. We visited Arena forest where the substrate is nutrient-poor silica sand. This forest was clear felled in blocks early in the 1920s and then replanted with mixed timber species. Today it is an example of natural forest, where plants and animals have taken over to continue the work started by man.

In 2001, the Food and Agriculture Organisation hosted a seminar on Private Forestry Programmes in which they introduced the idea of planting Caribbean pine and cedar, *Cedrela odorata* on private estates. The cedar, which was grown from seed imported from outside of Trinidad, did not thrive; in fact, the trees died out rapidly, suffering from a mysterious "die-back", whereas native cedars of the same species continued to flourish. The plantations were stopped and it was concluded that even though a species may be the same genetically, it needs time to develop immunities to pathogens and adapt to a new location.

It wasn't possible to get a degree in Forestry in Trinidad at that time, so in 2000 I signed up for a course on dendrology at the Eastern Caribbean Institute of Agriculture and Forestry in Centeno, where I began my journey to familiarise myself with native tree species. We walked many forests in our hard hats, including the Caroni Swamp, and discovered that there are many different types of plant associations in Trinidad, depending on elevation, soil and rainfall. We learned to identify trees in the wild by their leaves, fruit and flowers, and our teachers pointed out plants and trees that provide forage and shelter for birds, insects and animals. Foresters often identify trees by the texture of bark and formation of root buttresses. It was

obvious that it would take a lifetime to learn to identify these trees.

To try to make up for our lack of familiarity with forests, Rory and I, with our guide Carl, often spent time hiking in the Northern Range, hanging hammocks between trees overnight, exploring and sketching the astonishing foliage and landscape. We treasured the time spent beneath monumental trees, absorbing the beauty and sounds of the tropical jungle. In Trinidad and Tobago we are fortunate to have forest reserves that are uninterrupted by roads and buildings, from mountain top all the way down to sea shore. Forests like ours are unique in the world.

In 2007 Rory and I took part in the first permaculture design course in Trinidad at



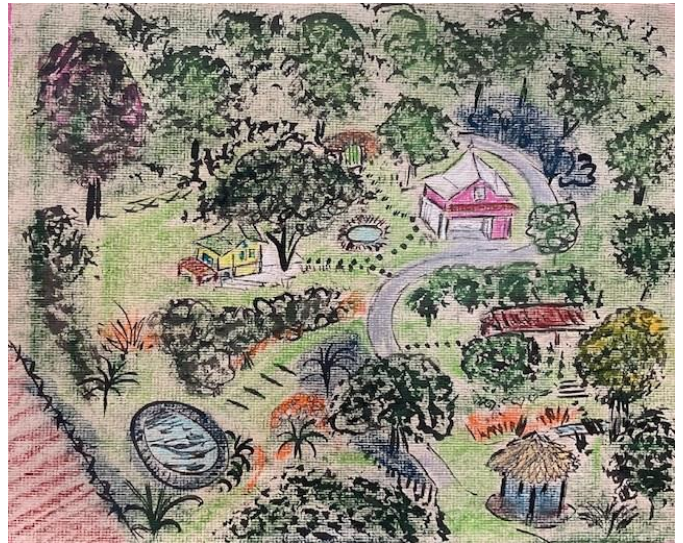
**Painting in the forest.** Photo courtesy Bunty O'Connor

*“Forests are essential to our existence on Earth, producing tons of oxygen, absorbing carbon dioxide, cooling the ground with their shade and transpiring water into the atmosphere through their leafy crowns. In old forests where soils are deep and spongy, water is conserved in the subsoil. Forests are the guardians of our watersheds, filtering and sharing water through streams and rivers.”*

Wasamaki. This course provided much practical information in planning the design of our garden.

Land is shaped and influenced by geological movements, rainfall, water runoff, tree shelter, wind direction, sun and shade, and plant and animal communities. Rather than stripping land of its green cover, excavating and bulldozing, permaculture shows us how to design communities and preserve natural systems in a sustainable way. Our goal was to understand the existing synergy of each part of our land.

#### GETTING TO WORK AND HEALING THE SOIL



**Plan of layout of future garden**

While our rather unstructured education was going on, we were busy with Seukraj laying out the garden, and deciding what to preserve and what to introduce. We had demolished the chicken pens and pulled down two of the three cocoa sheds, and reused most of the timber to build a small ajoupa cottage. The hardwood posts like balata and guatecare, became sleepers for steps to access the lower parts of the garden where we planted cedar. The old overseer of Les Lilas estate had observed that the northern facing flanks of the ridge that we occupied were poor lands for agriculture and very prone to slippage. However, cedar thrived in the sticky soil and held it from sliding downhill. We also planted hardwoods like balata and purple heart that had been felled for their useful timber in years gone by.

Much diversity had been lost over the years. The property had previously been sprayed with pesticides, like Aldrin, which persist for many years

in the soil. We never found a single earthworm when digging to plant in our first years. Drainage was very poor. Topsoil was non-existent, as leaf litter burned before it had time to compost. Ash was washed away downhill when heavy rains came. Grasslands and bamboo dominated the landscape. All the trees along the roadside, those that hadn't died by fire, had been cut down in the thrust to bring an electricity supply into Chickland village in the 1970's. With no tree roots to hold the soil, land and houses slipped downhill.

In the Ajoupa Garden soil means clay. To improve it, we brought in limestone dust and added truckloads of sugar cane waste matter, to break apart the clay particles. Rory and I were becoming acquainted with the microbial life of the soil and the vital role it plays. A huge number of species, including many pollinators, live and multiply in soil. We soon realised that it is better to let the soil lie undisturbed, than to plough it and expose the life force to sun and rain. We built up, layer by layer, plant cuttings, rotten wood, compost, ash, seaweed and even cardboard, to conserve moisture and life in the ground through the long dry seasons. We also kept free range chickens for eggs, leaving them to roost in the trees at night. Their droppings were a valuable source of fertiliser added to the goat, horse and cow manure we collected wherever it was offered.

Growing and planting trees came easily to us and we gave trees to our neighbours and friends. We planted trees in June at the beginning of the rainy

*"In tropical regions where soils are often very poor and nutrients are scarce, the biomass is held in the treetops. Felling forest only provides plant nutrition for one or two years and ploughing destroys the matrix of the soil and wastes what nature has accumulated over hundreds of years."*

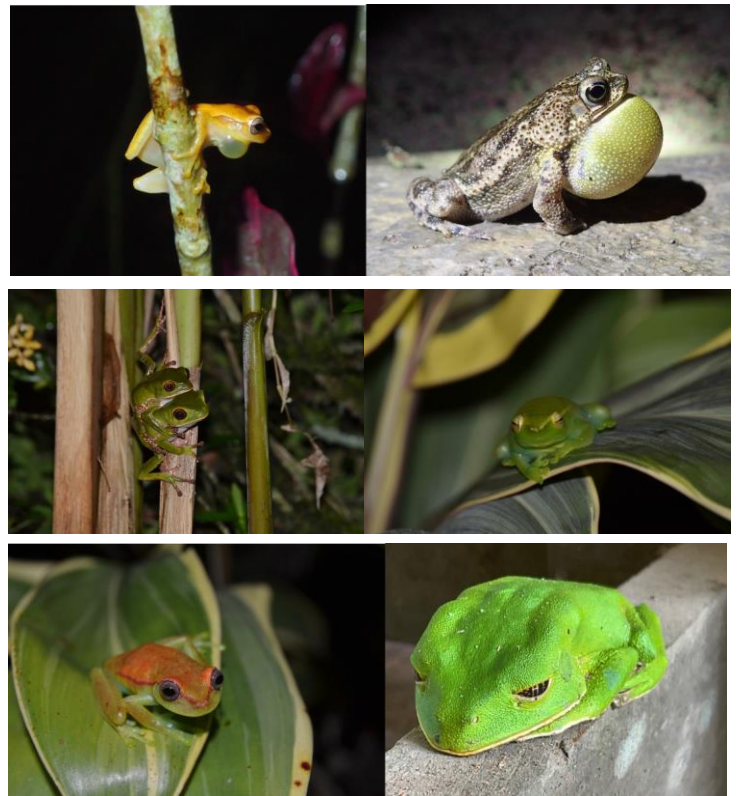
season. We learned by experience that young saplings need to be protected from the dangers of the weed whacker, tractors and grazing animals until they have grown stout bark on their trunk. PVC collars sliced down their length and put around the trunks were the best solution.

Seukraj made his own potting soil and started a nursery. He would arrive with cuttings from other gardens tied on to his bike in a huge roll, and made

an eclectic collection of flowering plants and herbs, many of them unknown to us. He planted stands of different types of heliconias which love to have their roots in clay. Their flowers attract hummingbirds and other nectar feeders to the garden. We cut them down once a year to make green manure to cover the soil and protect plant roots from the sun.

Drainage was a top priority, as rainfall flowed down from the ridge in all directions. To the north the land drained to the Chandernagore River, and to the south into a gully which meandered in a westerly direction. Seukraj had a clear understanding that water should flow slowly across the hillside, not down and we put in plants on the lower side of his drains to hold the soil. We discovered old sisal plants on the property, and learned from an elderly neighbour how to make string from the large coarse leaves.

Rainwater was collected from the roof of the house and stored in two large cylindrical concrete cisterns. Water was always scarce in the dry season, a situation that has never improved, and with bush fires a constant threat, it was important to have a good supply around the buildings. We discovered several "coppers" on the property. These are



**Some amphibians observed on the estate.**

*Photos by Amy Deacon.*

antique cast iron cauldrons formerly used in the sugar cane industry to boil sugar cane juice to produce molasses. In earlier days, they had held water for thirsty mules and cattle that were part of the mosaic of estate life. They provided habitat for insects, fish and amphibians. We situated them all over the garden so that they would be useful in case of fire, planted them with water lilies, and filled them with guppies to eat mosquito larvae.

Where the breeze blows in from the east coast, an acre of woodland had survived around a grove of old cashew trees on the top of the ridge, and we



**Painting of copper.** *Courtesy Bunty O'Connor*

decided to preserve this area as a gene pool. Trees like fiddlewood, hog plum, wild cashima, incense, coccoloba, clusia, bois tatu and genipa provided food and nectar for wildlife. Carat palms had been seeded by visiting parrots. Two enormous milkwoods bore fruit to feed fork-tailed flycatchers, before their epic flight south to Argentina and Chile. Toucans visited and corbeaux were forever testing their flight skills on the thermals that rose from the Caroni plains. Raptors roosted in the locusts while pygmy owls preferred the balata. We knew that as long as we protected it from fire, this forest would recover in time. We discovered the thorny manicou fig growing at ground level, as well as spiny climbing palms in the Desmoncus family. Besides cooling down temperatures in the house, this forest also served as a buffer from strong winds coming from the East. Seukraj created two trails through this forest for hikers.

Bromeliads were an important part of the treescape, indicating that the air was unpolluted. They provided food, water and shelter for birds,



**(Top to bottom) parakeet, plumbeous kite, fork tailed flycatcher and toucan.** *Photos by Rachel Lee Young.*



**Macaw feeding in immortelle tree.**  
*Photo by Faraaz Abdool*



frogs and other animals way up in the canopy. Caterpillars of the rare green-eyed owl butterfly eat the tough leaves of certain species. When the bromeliads fell to the ground as they often did, we propped them up on logs and they continued to flourish, creating a dramatic display. Cacti, orchids, lichen, vines of different kinds, arums and small succulents covered tree branches.

We found three types of manicoou or opossum frequenting this small forest, including the very endearing mouse opossum. Our family often raised



**Bromeliad.** Photo courtesy Bunty O'Connor

baby manicoous that had been orphaned by hunters and we learned to provide them with two calabashes, one for drinking water and one for use as a toilet. I imagined that the bromeliads were well fertilised by these toilet activities in the treetops.

Getting rid of tall razor grass was a major challenge. Rory brought in a small flock of black belly sheep to eat the grass, and before long our



**Minnie and Manny Manicoou.**  
Photo courtesy Bunty O'Connor

flock of five had turned into 15. The sheep did a great job, both at consuming the grass and providing minerals and calcium with their blood, bones and droppings. Their work done, we sold them on.

Fire was a major, ongoing challenge. In 1987, 2003 and 2010, some of the worst blazes on record swept through forests all over the island, damaging even managed forest reserves. In Chickland, fire is often set by farmers to clear land for agriculture. On many a windy afternoon we fought to put out these fires as they escaped and swept rapidly up the slopes on all sides of the property, racing through the grass and leaping up into stands of bamboo. We cut fire traces 10 metres wide, from as early as the first week in January and replanted trees many times, before we came to realise that we could never leave the garden unattended between March and June.

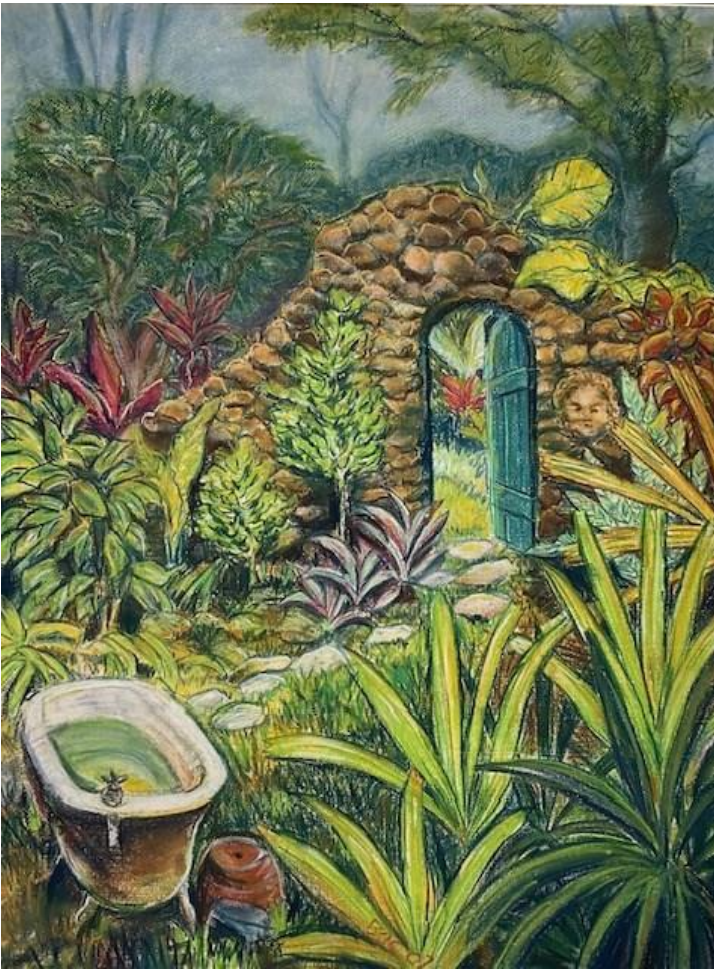
With a cutting donated by a friend from Martinique, Rory started cultivating vanilla orchids.



**Fire.** Photo courtesy Bunty O'Connor

There are four native species of vanilla in Trinidad. Brought to the Garden, they quickly ran up tree trunks and started to flower. Tiny pollinators come to the flowers which open for just one day and Rory helps the process by hand pollinating. Seukraj built an arched doorway which leads into this "Secret Garden."

We measured rainfall from 1998 to get an idea of the pattern of the dry and wet seasons. The annual average to the end of 2022 is 200 centimetres. Rainfall dictates what will and will not flourish and there were many desirable plants that could not withstand the long dry season, heavy clay soil and invasions of bachac ants. Native palms like



**Pastel painting of doorway.** Courtesy Bunty O'Connor

*Oenocarpus bataua* did not survive. This interesting palm was a favourite of the First People because it provided food and construction material. *Ryania*, which was heavily harvested for use as a biological insecticide, is now hard to find and we will try it in the garden soon. We have not been able to grow nutmeg or avocado. On the other hand we discovered that calabashes grow like weeds and they come in all different shapes and sizes. *Quassia amara* or bitter bark, much loved by hummingbirds, is popping up all over the garden.

Seukraj built a round shed using "monkey bone" and black poui posts which he harvested from the surrounding forest. The roof was thatched expertly with carat palm fronds by himself and his brothers. Over the years, many of the plants that Seukraj put in have not survived, but his concrete works, steps, paths, walls and drains have endured.

Our most recent project was to eradicate 15 bamboo stools on our eastern slope. Rory had been putting out fire in these bamboo clumps every year for 25 years. After a particularly fierce burn, we



**A ruby topaz hummingbird.** Photo by Rachel Lee Young

decided to eradicate it for good. We used cardboard packaging to cover the burned roots and keep them in the dark. In the first years, fire would return again and again to make a mockery of our efforts. After three years of eradication, with the help of friends and volunteers, we planted pineapples, sorrel, bananas and cassava, oranges, mango, immortelle, vervain, cedar, chataigne, bay, pois doux, and a cannonball tree to replace the bamboo monoculture. Vetiver grass holds the pathway at the top of the slope. The entire Northern Range is visible in a dramatic panorama from here and we built benches for visitors to take in the view.

Recently I came across an old journal dated 1995 which describes the whims of the fire season



**Eradicating bamboo and planting brick on the eastern slope.** Photo courtesy Bunty O'Connor



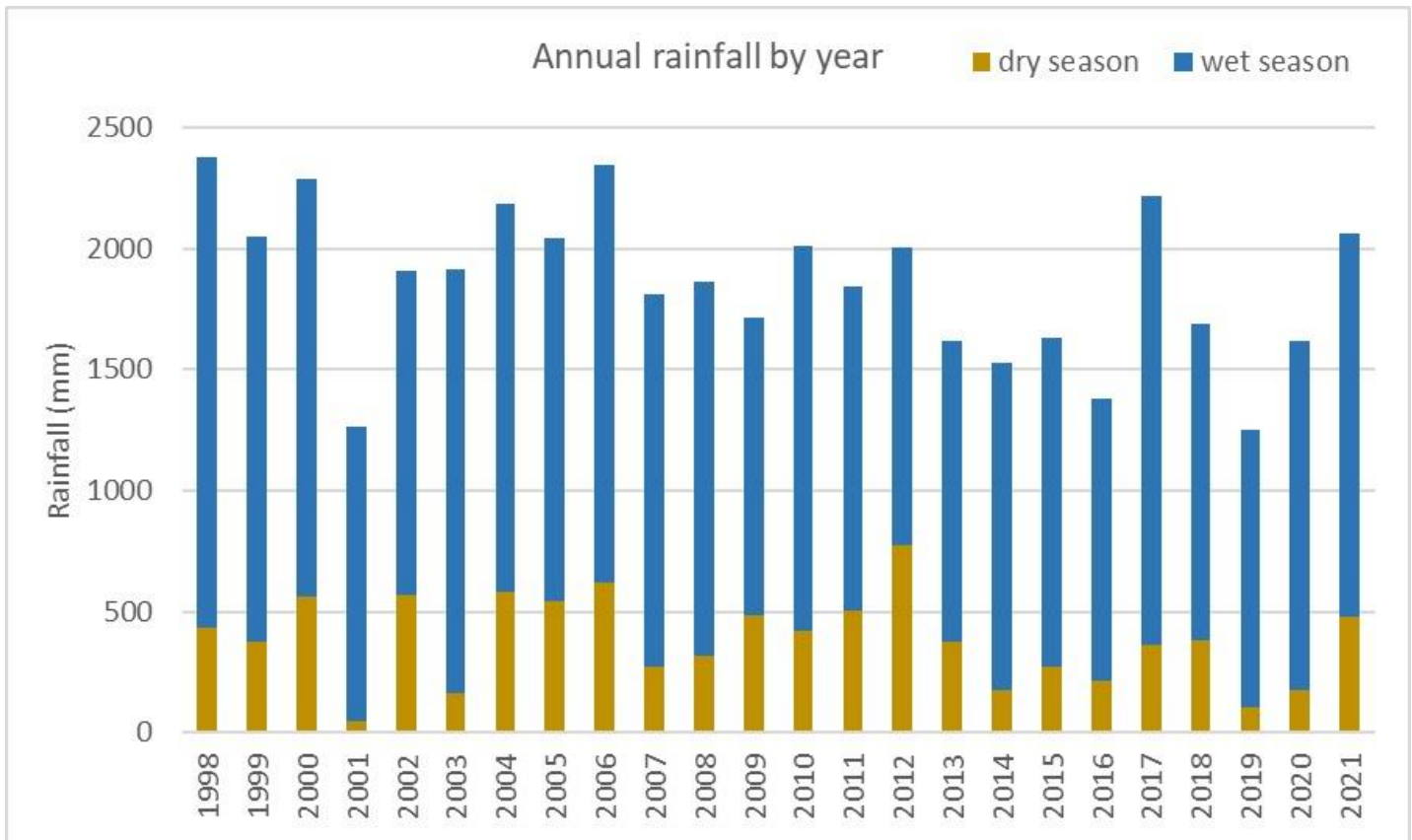
### Looking towards the Northern Range.

Photo courtesy Bunty O'Connor

*Bamboo is taking over old estate lands and hillsides all over Trinidad and Tobago. It is a giant, invasive grass with a thirsty habit. It burns fiercely in the dry season which makes it difficult for young trees to grow around it. It does not hold soil as well as trees but slips and slides down hill in heavy rains.*

and the inconsistency of the rains in central Trinidad. From April 22 to May 23 there was NO rainfall:

- March 12: A really fierce fire blackened the whole pasture today. Depressed.
- March 15: Poured with rain this afternoon, real heavy rain. Strange weather coming from the West.
- March 16: Full moon. Really heavy rain again all afternoon.
- March 17: Rain again for three hours what a joy to experience. The grass is already green and the
  - plants are holding up their leaves.
  - March 18: Pink pouis blooming.
  - March 23: Yellow pouis starting to bloom.
  - April 4: Pink pouis again. Cigales (Cicadas) begin to whine. Wild easter lilies, amaryllis bloom. Dry, dry. dry. Bush fires.
  - April 12: Big fire on cocoa shed side. Fire brigade came. Poor trees burned and burned. Loud chorus from cigales this evening. Calabash tree dropping all its leaves. Hummingbird with 2 eggs down at the pottery nesting in the electricity cable. There are masses again in the garden.
  - April 13: RAIN - about 3 hours in the afternoon. It drove into the house and made everything cold and humid. Half filled one tank.
  - April 14: Cigales are louder than ever. Green grass. Fiddlewood in flower - blue flowers like a mist. Rainstorm in Gulf.
  - April 15: Full moon.
  - April 16: Snake skin of a Tigre in pottery -



**Rainfall chart.** Courtesy Aidan Farrell

almost 6 foot long.

- April 22: Rain yesterday and today. The bauhinia and calabash are getting new leaves. Hummingbirds are everywhere - 2 babies hatched at the pottery. Yellow poui blooming for a second time. Flowers on white bauhinia.
- April 24: Cherries have brought out new leaves and pink flowers and are full of bees.
- April 26: Cedars getting their new leaves.
- May 23: It hasn't rained since. Incredibly hot even at night. News says driest May ever since record keeping began in 1946. Citrus looks terribly wilted. A small galap\* came out of a fire in the bamboo and ran down toward the gully.
- May 28: Lightening in south. Rain started.
- May 29: Looks like being permanent. This evening every ant in the insect kingdom has taken to the wing.

[\*Editor's note: galap]

#### GARDENING FOR JOY, INSPIRATION AND HEALING

*"In Wildness is the Preservation of the World"* - Henry David Thoreau

When you take possession of a few acres of land, you soon discover that you have to discard the plans for an ideal garden. You have to get to know your raw materials, rainfall, dry spells and drainage. You look around at what grows best and propagate these for ground cover. You notice a dead tree where a woodpecker is making a hole and make a mental note to find out how many bird species nest in dead trees. You leave rotten logs lying where they are, full of beetles reducing them to compost before they take to the wing. It dawns on you that every niche in the garden is inhabited by many tiny creatures. The weeds springing up are planted by birds and are visited by a host of crawling and winged animals. Richard Ffrench's book, 'A Guide to the Birds of Trinidad & Tobago', is a vital source of information on trees and weeds and their uses to birds for habitat and food. Birds need food year round if you want them to thrive in the garden, and they need nesting materials too, like cotton, moss

and palm fibres. Many migratory birds will pass through and stop over for a little while if there is food available.

You need many hours in the garden, growing as the plants grow, working in the rain, being stung by wasps and stuck by thorns to make you a part of the rhythm. Notice the ant nests on the citrus branches, hanging like stalactites and populated by a host of very irritable ants. These are the Aztecas, a type of ant that protects their territory mercilessly, preventing any other creatures from coming to live in their tree. This is the best kind of pesticide. Wasps are the farmer's friend. I have seen them build their nests next to plants infested with mites and in no time the plants are restored to health. Potter wasps build tiny clay pots in which they store insects of all kinds as a meal for their growing larvae. Spiders, dragonflies and a host of other insects are predators too. Guppies and dragon flies prey on the mosquito larvae in the coppers. The magic and beauty of the garden comes from balance not eradication.

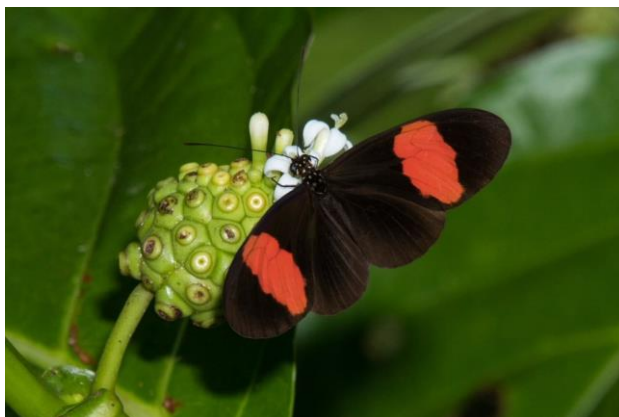


**Macajuel.** Photo courtesy Bunty O'Connor

Insects, bacteria, fungi and viruses form underground ecosystems, and live subterranean lives, including bachacs. These leaf cutting ants hollow out huge underground chambers complete with fungus gardens, nurseries and graveyards and clay is their favourite medium. Their labour in aerating the earth goes largely unappreciated by the two legged creatures who live aboveground. You have to welcome all when rewilding your land. Many species of native bees live hidden lives amongst the trees carrying out their work of pollination. They are susceptible to smoke from

fires, heavy rain, insecticide and competition from commercial honeybees. Trinidad has over 600 species of butterflies. Keeping pesticide out of the garden is the beginning of a living, breeding collection.

Clay swells in the rainy season, pushing up



**Butterflies at the garden.** Photo by Rachel Lee Young

foundations and shrinking in the dry season, forming deep cracks that can split a young sapling in half. You learn to cultivate different parts of the garden and allow others to collapse into chaos to give creatures like the nightjar an opportunity to find a nesting place on the ground and the gardener a respite from too much maintenance. The garden is a work forever in progress.

In a large garden there is space for burying beloved pets. There are tree branches for supporting a swing. Birdsong brings joy. Sweet aromas send us searching for their source, perhaps the blossom is high in the canopy. Citrus blossom has one of the loveliest perfumes and cocoa orchids remind us of childhood. The garden is a place for people to be at peace with themselves and their surroundings as they reconnect with nature.



**Tufted coquette.** *Photo by Rachel Lee Young*

### WHEN THE END IS THE BEGINNING

Ajoupa is a word that means “shelter.” Seukraj suffered from bipolar disorder. He often heard voices inside his head and his behaviour would spiral out of control. His terrifying seizures made him an outcast. His work was punctuated by these incidents when he could not cope, sometimes for weeks. The garden was his sanctuary.

Gardening has helped many people suffering from depression, post-traumatic stress syndrome, prison life and drug addiction to restore meaning to their lives. The simple act of digging, planting and watching vegetables and flowers grow, offers purpose and hope in the lives of these sufferers. Seukraj was no exception. Some days he would come to work “just to walk around the garden and enjoy”.

After some years he moved on, his work in the garden was done and we saw little of him. One day he came by to ask whether he could cut flowers to decorate a temple for the festival of Ganga Ma. He left with a van loaded with heliconia flowers and foliage. His unwavering vision had been our inspiration for so many years.

The Ajoupa garden has its roots in organisations like Asa Wright and the Pointe-a- Pierre Wildfowl Trust. Planning and bringing to fruition a project like this requires hands, time and money. Our garden was not self supporting for many years, its needs and wages were paid for by the pottery.

When we closed the pottery in 2010, the garden had to support itself. Visitors arrived for picnics, photo shoots, yoga retreats, to walk in the

cool under the tall trees and enjoy the peace and birdsong. Seukraj’s prediction was coming true.

A simple desire to repair a piece of land gave us daily insights into the world of nature, which goes along largely unobserved by most of the busy inhabitants of planet Earth. Healing the Earth is a passion shared by ourselves and many of our visitors. There is no shame in getting your hands dirty. Soil is marvellous stuff, full of magic. Imagine how many gardens neighbours could build in Trinidad in Tobago, in and around the concrete jungles that we have created. In healing the Earth we heal ourselves.


There is still so much we have to understand. Climate fluctuations over tens of thousands of years have altered sea levels, creating land bridges and allowing people, animals and plants to flow back and forth from mainland South America to Trinidad. Our address at Chickland has retained an intriguing clue to the recent history of our location: Upper Carapichaima. Broken into two words this reads “Carap” - for the Carap tree and “Chaima”

—a community of indigenous people who lived here and perhaps tended these trees to make their famous carap oil. Since 1989, when we planted our first tree at Ajoupa, much new research has been forthcoming on neo-tropical forest ecology and old growth forests.

Fires in Trinidad were barely mentioned in a FAO 2001 report on Ideas to Promote Forest Activities on Private Land. At that time, it was easy to accept that damaged forests would regenerate naturally. Since then, fire has become front-page news all over the world, with Trinidad no exception. Climate change promises longer dry seasons and unpredictable rainfall events for the future. We accept the fact that fires will get worse, unless there is a desire to educate rural communities. The future of tropical forests is worrying.

A garden doesn’t ever come to an end. After perhaps 15 years, our idea of what our garden should look like was accomplished. In the beginning, we had planned various “rooms” and tried to furnish them the way we wanted with plants we liked for their beauty, or admired for their usefulness to ourselves and the creatures and humans we wanted to welcome. Often plantings were successful but serendipity was a major player.

We learned to accept storms, plagues of insects both native and invasive, fires and drought.

Micro projects like ours have the potential for ongoing research into ways that plants and trees will adapt to the effects of climate change that we are already experiencing. At Ajoupa, we have learned that 35 years of care and protection have allowed wild species to return. It remains to be seen what will happen to the garden when we are gone. Will neighbours become guardians of communities, getting together to protect land from fire, toxic pesticides and landslides, helping the land to heal itself and, in so doing, help themselves to heal? I wonder. 

#### Acknowledgements:

I would like to thank the many people who helped us along the way. Our families, John Dunston and the people at Asa Wright, the Melizan family, Claire Henderson, Indra Furlong Kelly and the Friends of the Botanic Gardens, Tyrone Kalpee for his research on quarries, the Pointe-a-Pierre Wild Fowl Trust, George de Verteuil, Foresters Leo Lendore and Irwin Joseph, Carl and Kelly Fitzjames, Erle Rahaman Noronha at Wasamaki, Hugh Skinner and Peter Bane, Sandy Gibson, Feroze Omardeen, Bert Manhin and all the UWI people: Mike Rutherford, Amy Deacon, Aidan Farrell, Renoir Auguste, Linton Arneaud, Mark Hulme and Alex Sansom. Thank you Rachel Lee Young for photos of birds and butterflies and to Amy Deacon for the frogs! Many thanks also to the Trinidad and Tobago Field Naturalists' Club and all the artists who passed through the garden and left their unique imprint, especially our children Nancy, James and Ailis, Frederick "Dharmbodh" Westmaas, potters Chanarkar Persad and Deonarine and the gang at Ajoupa Pottery.

Books that we found helpful, especially in the days before the internet!

- A Neotropical Companion by John Kricher
- Butterflies of Trinidad and Tobago by Malcolm Barcant
- The Hidden Life of Trees by Peter Wohlleben
- The Well Gardened Mind, Rediscovering Nature in the Modern World by Sue Stuart Smith

- A Field Guide to the Amphibians and Reptiles of Trinidad and Tobago - Trinidad and Tobago Field Naturalists' Club
- A Guide to the Birds of Trinidad and Tobago by Richard French
- The Palm Book of Trinidad and Tobago by Paul L. Comeau, Yasmin S. Comeau and Winston Johnson
- Trees of Trinidad and Tobago by R.C. Marshall, printed in Trinidad in 1934

Native tree and plant species found on site or naturally introduced over the years:

- Balata (*Manilka bidentata*)
- Crappo (*Carapa guianensis*)
- Purple heart (*Peltogyne floribunda*)
- Obi (*Trichilia pallida*)
- Milkwood (*Sapium glandulosum*)
- Cedar (*Cedrela odorata*)
- Pois doux (*Inga* sp.)
- Hog plum (*Spondias mombin*)
- Black Fiddlewood (*Vitex divaricata*)
- Wild Cashima
- Locust (*Hymenaea courbaril*)
- Bois lay lay (*Cordia alliodora*)
- Carat palm (*Sabal mauritiformis*)
- Genipa (*Genipa americana*)
- Incense (*Protium guianense*)
- Manicou fig (*Bromelia plumerii*)
- Sapodilla (*Manilkara zapota*)
- Camwell (*Desmoncus*)
- Black poui (*Tabebuia chrysantha*)
- Mountain rose (*Brownea coccinea*)
- Cat's claw vine
- Black stick (*Pachystachys coccinea*)
- Cuchape (*Cocoloba latifolia*)
- Clusia
- Bois tattoo (*Rudgea freemani*)
- L'Epinet (*Zanthoxylum*)
- Balisier (*Heliconia bihai*)
- Mickey Mouse (*Ochna serrulata*)
- Stinging nettle (*Urena baccifera*)
- Bromeliads (*Aechmea* sp.)
- Wild coffee (*Diospyros inconstans*)
- Mountain Immortelle (*Erythrina poeppigiana*)
- False coffee (*Faramea occidentalis*)
- Wild tobacco (*Acnistus punctatus*)

Bug Group Report, May 23, 2023

# LEAFCUTTER ANTS HARVESTING VEGETATION IN BUSH BUSH



by Christopher K. Starr

In December 2021, the Bug Group carried out a study in the Arena Forest Reserve (10° 34'N 61° 15'W) in Central Trinidad around the question of which plants are utilized and which are not by the familiar leafcutter ant, or bachac, *Atta cephalotes* (see report in Issue 2021 no. 3). The motivation for this exercise was the observation that the abundant literature on foraging habits of this and other *Atta* species has much to say about which plant species are utilized but very little of which are left alone in the same habitat. During that field trip we were able to get sizeable datasets from nine understorey plant species, of which four showed signs of *Atta* damage to leaves of some individuals.

On May 13 2023, we extended this study with a comparable exercise in the Bush Bush Wildlife Sanctuary (10°23'N 61°02'W). Bush Bush is an elevated forested area of 1408 ha inland from the Nariva Swamp on the Atlantic coast of Trinidad (Aitken 1973). It resembles Arena in having a closed-canopy forest on sandy soil with a relatively open

understorey, but differs in being relatively flat and devoid of streams.

The group comprised Shane Ballah, Natalie Boodram, Jael Skeete and Christopher Starr. We left early from the UWI south gate in order to reach Bush Bush by mid-morning. The coastal road, which suffered serious damage due to massive flooding late last year, made for slow going in some stretches, but we reached our destination in good order.

Turning off the highway, we headed inland at Kernahan Village. A prominent feature of the canals at Kernahan is the profusion in many parts of the conspicuous lotus plant, *Nelumbo nucifera*. This Asian native has large lovely flowers and broad leaves, really very attractive. It is also an invasive that Shane reported having seen gradually spread along the canals, where it is out-competing the native water lily (*Nymphaea* sp.). We noticed some canals further inland where the water lily still prevails.

Entry permit in hand – although neither Shane nor Chris had ever been challenged by or even encountered any Forestry official on our several past visits to Bush Bush – we entered the forest and set to compiling data. Our aim was to record the presence or absence of leafcutter-ant damage from each of at least 50 individuals of several common understorey plants. We were able to do this for five species and recorded fewer data from each of three others. Of these, only one species showed signs of significant activity.

While the Bug Group approaches each field trip with a particular objective, we are by no means indifferent to chance encounters of interest inside Bush Bush. Among these:


1. The quiet forest understorey is a good place to see *Heliconius* butterflies and their mimics, and we saw several of them in the course of our stroll. These butterflies are characterized by long, narrow wings and slow flight.
2. Two or three individuals of the white-tailed page, *Urania leilus*, a moth with butterfly-like



Chris and Shane review their notes. All photos by Jael Skeete.



colourful wings and a diurnal habit. Like the very similar *U. fulgens*, every few years this moth undergoes a population outbreak in its mainland range and moves into other areas in large numbers. It seems improbable that the unusual sight of more than one individual in a day in Trinidad is a forerunner of such a population upsurge, but we will be on the lookout.

3. Several mound-like nests of *Termes* spp. Without destructively opening the nests for specimens, we could not determine the species. However, the two species found in Trinidad differ mainly by size. The curious thing is that in Arena, *Termes* nests are almost always on the trunks of large trees, usually at or near ground level, while in Bush Bush we found them only on the soil surface.
4. A striking reddish ant-mimicking spider. The many ant-mimicking spiders are mainly in the families Salticidae and Corinnidae (Ceccarelli & Cushing 2021). Some are generalized ant mimics, while others bear a close resemblance to a particular ant in their habitat. It is not obvious which ants serve as the model for this strikingly mimetic corinnid.
5. Chris was turning over a *Heliconia bihai* leaf when Jael pointed out that a colony of Jack Spaniard wasps was nesting there. It was *Polistes major*, one of our less common social wasps, not previously known from the Nariva area.
6. Shane drew our attention to *Desmoncus polyacanthos*, our only climbing palm, and its devices for clinging to other vegetation. It is known as the wait-a-while, a common name more often applied for the same reason to *Calamus australis*, a climbing palm native to Queensland, Australia. (See Naturalist-in review no. 56). 

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**Mound-like nests of *Termes* spp.**



**Ant-mimicking spider.**

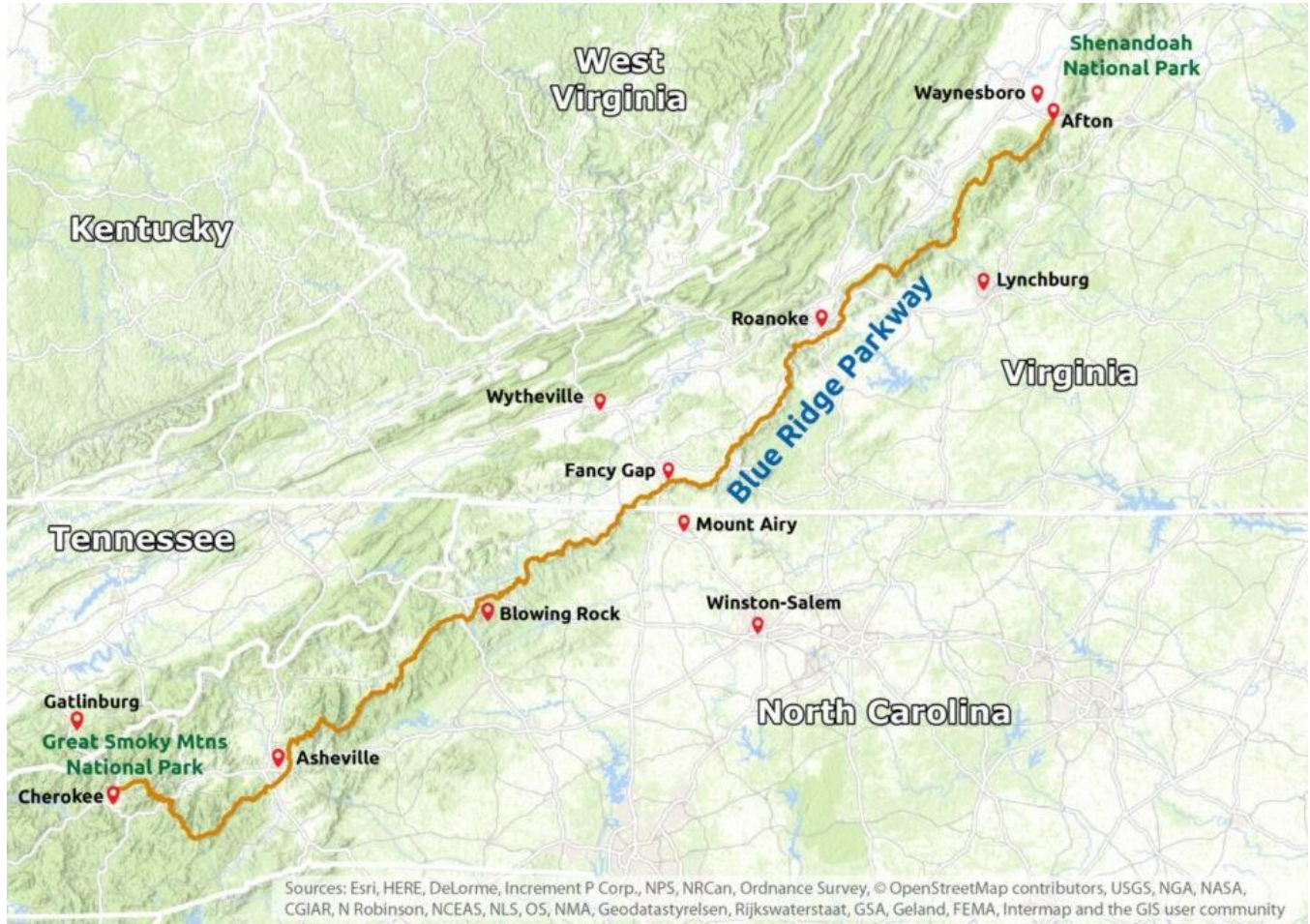
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## EXPLORING THE BLUE RIDGE PARKWAY

by Christopher K. Starr



Map of the Blue Ridge Parkway. Photo [www.blueridgeparkway.org](http://www.blueridgeparkway.org)

**Extending southwest-northeast over about 3300 km in eastern North America is a mountain range, the Appalachians.** It runs approximately parallel to the Atlantic coast, although at a distance, from northern Georgia to Newfoundland. Unlike the Rocky Mountains over toward the west coast, these are not the kind of high, rugged peaks beloved of rock climbers. Rather, they are old mountains that have been worn down through erosion over many millions of years, now with a maximum height just over 2000 m.

On the other hand, the Appalachians are a favourite of hikers (especially the 2200km Appalachian Trail), naturalists and the many who are simply drawn to spectacular scenery. I am especially

fond of the southern Appalachians and in particular the Blue Ridge, which extends up through most of the states of North Carolina and Virginia. This part of the range is invested with a characteristic haze that gives it its name. To our great benefit, the 755 km Blue Ridge Parkway runs along its length. This is over a range of 3 degrees of latitude, comparable to going from the southern end of Trinidad to the southern end of St Vincent.

It is not a route for those in a hurry, who are better served by Interstate-81 and other major highways. Rather, the Blue Ridge Parkway winds along ridges and through the gaps between summits, with a great many scenic overlooks where one can safely pull off to drink it in, and an abundance of



**New foliage on an oak tree (left) and distinctive flower of the tuliptree (right).**

*Photos by Christopher K. Starr*

larger stops with walking trails and camp grounds. It is ideal for a leisurely drive with many stops along the way. I can think of no better way to acquaint oneself with Appalachian nature.

Most of the way the view is of unbroken, healthy forest with only occasional farms. You see what I am saying. No gas stations, motels or fast-food joints, not one. In addition, there has been a downturn in farming and even more of logging in recent decades, so that many of the farms are abandoned and returning to wildness.

The Appalachians attract great numbers of visitors in the fall (autumn), when the leaves put on a grand display of colour. However, for most naturalists the best time is the late spring to early summer, when much more is happening. Accordingly, I took a decision to treat myself to a leisurely drive up the entire Blue Ridge Parkway at that very time of year. Starting at the Highlands Biological Station in North Carolina, not far from the start of the Parkway, I covered about the southern half around the end of May 2017. Then, together with my distant cousin, Allen Starbuck, I drove the northern half six years later, not in a rush, stopping to explore whenever we pleased. It was at the interface of late spring and early summer, a lovely time of year,

Over such a long south-north range the habitat and biota are of course not uniform. Furthermore, even relatively low mountains at a given latitude can show a marked south-north tendency as one goes

up in elevation. For this reason, the distinctive signs of summer first appear not just further south but also in hollows and lowlands, making their way progressively up. Then the process is reversed later in the year. This tendency is the theme of Edwin Way Teale's classic, 'North with the Spring', an account of a slow northward journey in eastern North America to keep pace with the advent of the spring.

Apart from the often spectacular scenery, the Appalachians are a biodiversity hotspot, recognized as a distinct floristic province. A preliminary study in the southern Appalachians identifies more than 1000 species of flowering plants, including more than 100 species of flowering trees, as well as 14 native conifers.

While most of the Blue Ridge biome is hardwood forest, higher areas tend to be colder, so that there are places where pines and other conifers prevail. At the very highest there are even features of cloud forest, especially as they tend to be wetter. Even so, most of the forest is of a small number of types, each with a very few dominant trees. The most common type is known as oak-chestnut. This is dominated by five species of oaks, but no longer by the once-prevalent American chestnut, which was reduced to a very low level by a fungus disease toward the end of the 19th century. In another forest type, cove hardwoods forest, the distinctive tulip tree is among the most abundant.



**Typical oak-chestnut forest floor.**

As at our Caribbean latitudes, mature hardwood forest tends to have little undergrowth, so that one can walk about relatively easily in the understory. However, I notice a marked difference in this respect between the oak-chestnut and cove hardwoods forests. Especially in tuliptree-dominant forest, there are greater canopy gaps, leading to more undergrowth.

It is of course a defining feature of temperate-zone hardwood forest that the trees are deciduous, losing their leaves with the approach of winter and producing new foliage in the spring. This can be quite rapid, bringing about conspicuous changes over just a few days. It starts in the predominant Blue Ridge trees in April and was still happening as I travelled north. The phenomenon of a tree being invested with a whole new foliage at once is not unknown at our latitudes (e.g. frangipani and sometimes mango), but it is quite another thing to see an entire mountainside clothed in light-green young leaves.

The Blue Ridge is also a grand place for wildflower fanciers. Most flowering plants there first bloom between March and July. I was too late for the lovely dogwood (*Cornus florida*), which flowers in March-April, and the dandelion (*Taraxacum officinale*) was past peak flowering and mostly



**Late-spring hillside. Note the many trees with light-green or pinkish new foliage.**

already in seed. However, there are plenty of others at that time of year. Of the several rhododendrons, the most conspicuous are the great laurel (*Rhododendron maximum*) at lower elevations, replaced at higher elevations by the purple laurel (*R. catawbiense*). They seemed to be at roadsides everywhere. Not so flagrantly showy, but just as lovely in their own way, are the mountain laurel (*Kalmia latifolia*) and Virginia spiderwort



**(Top left-right): Dandelion flowerhead gone to seed and purple laurel (Mary Vee); (Middle left-right): Mountain laurel and Virginia spiderwort; (Bottom): The fungus-like squawroot.**

(*Tradescantia sudaspera*).

One other flowering understorey plant calls for special mention. The fungus-like squawroot (*Conopholis americana*) is a parasite on tree roots, mainly of oaks. As you see, it has no leaves, as it does not photosynthesize.

As expected in relatively damp habitat, there are also plenty of fungi, lichens and mosses. As everywhere, the fungi are a key agent in the breakdown of the abundant leaf litter and other dead plant matter, while lichens cover not just tree trunks but rocks, where they aid in the erosion that has brought the Appalachians to their present state.

At our latitude we are accustomed to termites as the primary agents of dead-plant breakdown. However, these are mainly tropical creatures, and on the Blue Ridge they were very sparse in species and apparently in numbers. As an almost compulsive roller of logs and rocks—as I hope you are, although always take care to roll them back the way you found them—I found termites only once, at an elevation of about 400 m. It was probably the

widespread eastern subterranean termite (*Reticulitermes flavipes*).

Many birds breed in the Southern Appalachians, and many others can be seen during the spring northward migration at its peak in late April and May. Except somehow for the hawks, the fall migration back south in September tends to be less dramatic, as the males are no longer in courtship plumage and sing less. There is one unmistakable native bird that one is almost certain to encounter on a trip along the length of the Blue Ridge Parkway. The wild turkey is now much more abundant than in earlier times. This bird prefers mature forest, and with the downturn in agriculture and logging there is more habitat to support a breeding population.

Large mammals, such as the black bear, are much diminished or locally extinct in the Blue Ridge and elsewhere. As in much of rural North America, one can count on seeing white-tail deer, the only large mammal most visitors will encounter. Like the wild turkey, its numbers increased dramatically in the second half of the 20th century through legal



**Wild turkey and white-tailed deer. Photos courtesy Library of Congress and Oklahoma Historical Society respectively.**



**Spotted salamander.** Photo courtesy Amphibians and Reptiles of North Carolina.

protection and habitat changes. There are several widespread medium-sized mammals, including the groundhog (woodchuck), cottontail rabbit, raccoon, opossum and gray squirrel. One is unlikely to see the striped skunk, but one might have the good fortune to get a whiff of its recent presence.

But what of those animals that live the wet life? The Blue Ridge is rich in streams and has four rivers, but very few lakes or ponds. Accordingly, there are plenty of small fishes in the cold water, but almost no turtles or other animals that require standing water. In fact, it is a poor area for reptiles as a whole. But not for moisture-loving amphibians, and in particular salamanders. The Appalachians are the world's diversity centre for these peculiar tailed (vaguely lizard-like) amphibians that make up the order Urodela. Salamanders, of which about 760 species are known, are found throughout the North

Temperate Zone with only a slight penetration of the New World tropics. You needn't look for them in the West Indies, as there aren't any. Catlin (1984: Appendix) names 21 salamanders recorded from the Blue Ridge, and one government source puts this number at 31. These are best sought at night, especially when it is wet, but one can find them in the daytime too under logs and rocks. 🐸

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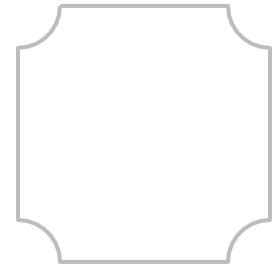
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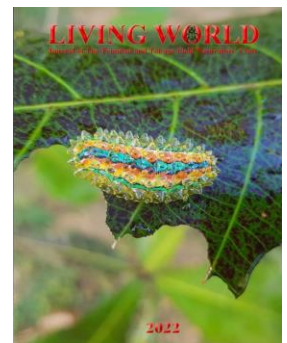
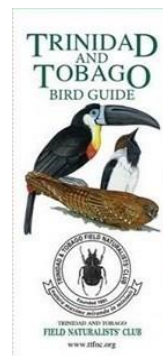
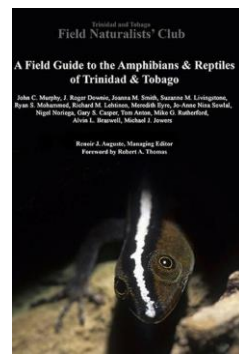
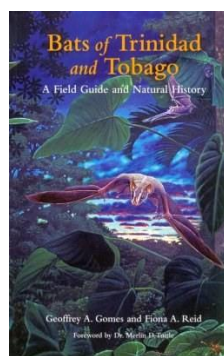
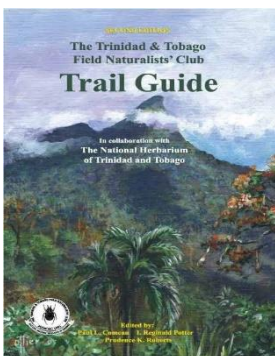
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## **PUBLICATIONS**

The following Club publications are available to members and non-members (*prices shown are those paid when purchasing directly from the Club*):



TTFNC Trail Guide (\$150); T&T Wildflower Guide (\$50); Bats of T&T (\$200); Field Guide to Amphibians & Reptiles (\$180); 2022 Living World Journal (\$60); TTFNC Bird Guide (\$50).

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