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2016

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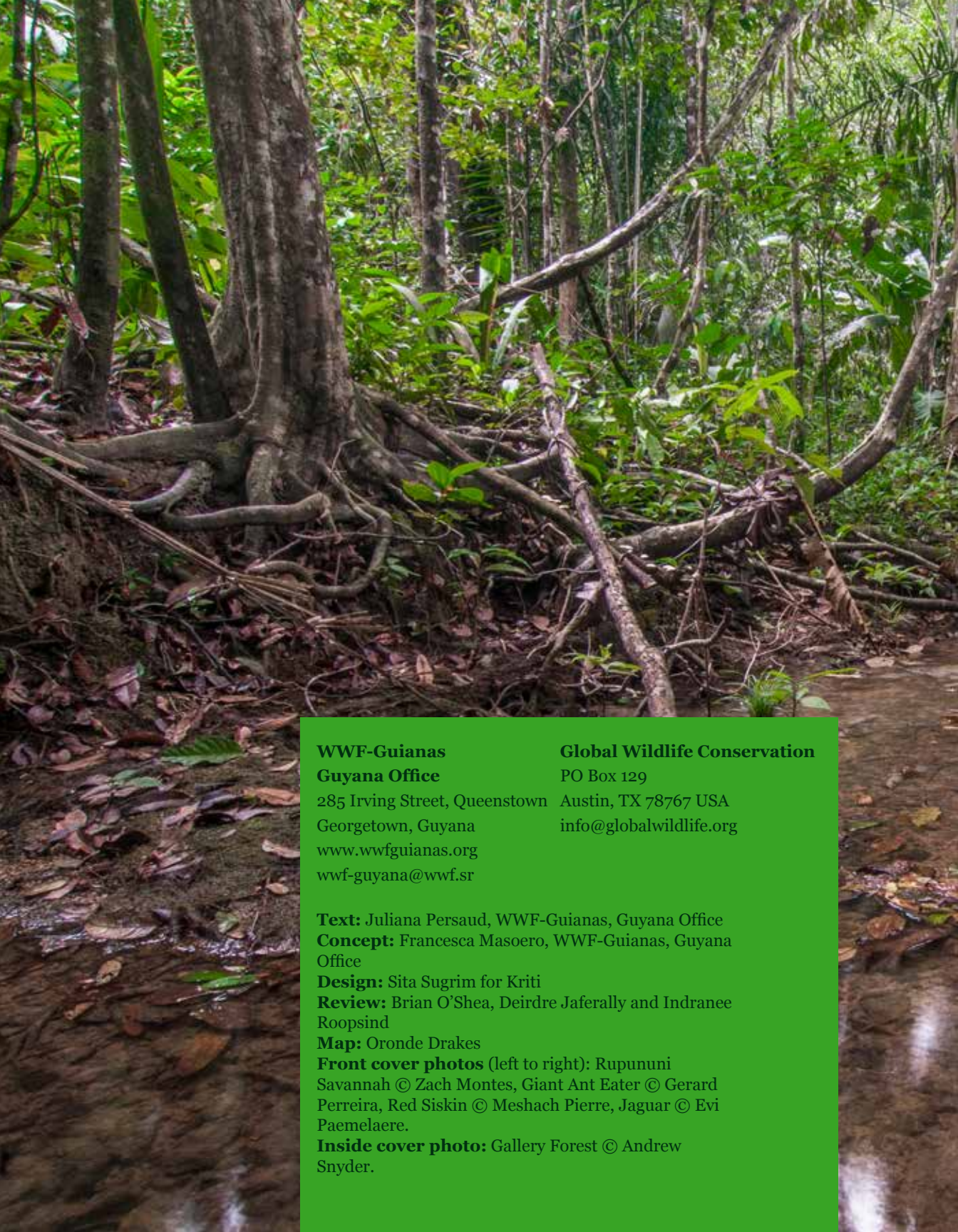
GLOBAL
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Biodiversity of the Southern Rupununi Savannah

World Wildlife Fund and Global Wildlife Conservation



2016



**WWF-Guianas
Guyana Office**

285 Irving Street, Queenstown
Georgetown, Guyana
www.wwfguianas.org
wwf-guyana@wwf.sr

Global Wildlife Conservation
PO Box 129

Austin, TX 78767 USA
info@globalwildlife.org

Text: Juliana Persaud, WWF-Guianas, Guyana Office
Concept: Francesca Masoero, WWF-Guianas, Guyana Office

Design: Sita Sugrim for Kriti

Review: Brian O'Shea, Deirdre Jaferally and Indranee Roopsind

Map: Oronde Drakes

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BIODIVERSITY OF THE SOUTHERN RUPUNUNI SAVANNAH.

Guyana-South America.

World Wildlife Fund and Global Wildlife Conservation
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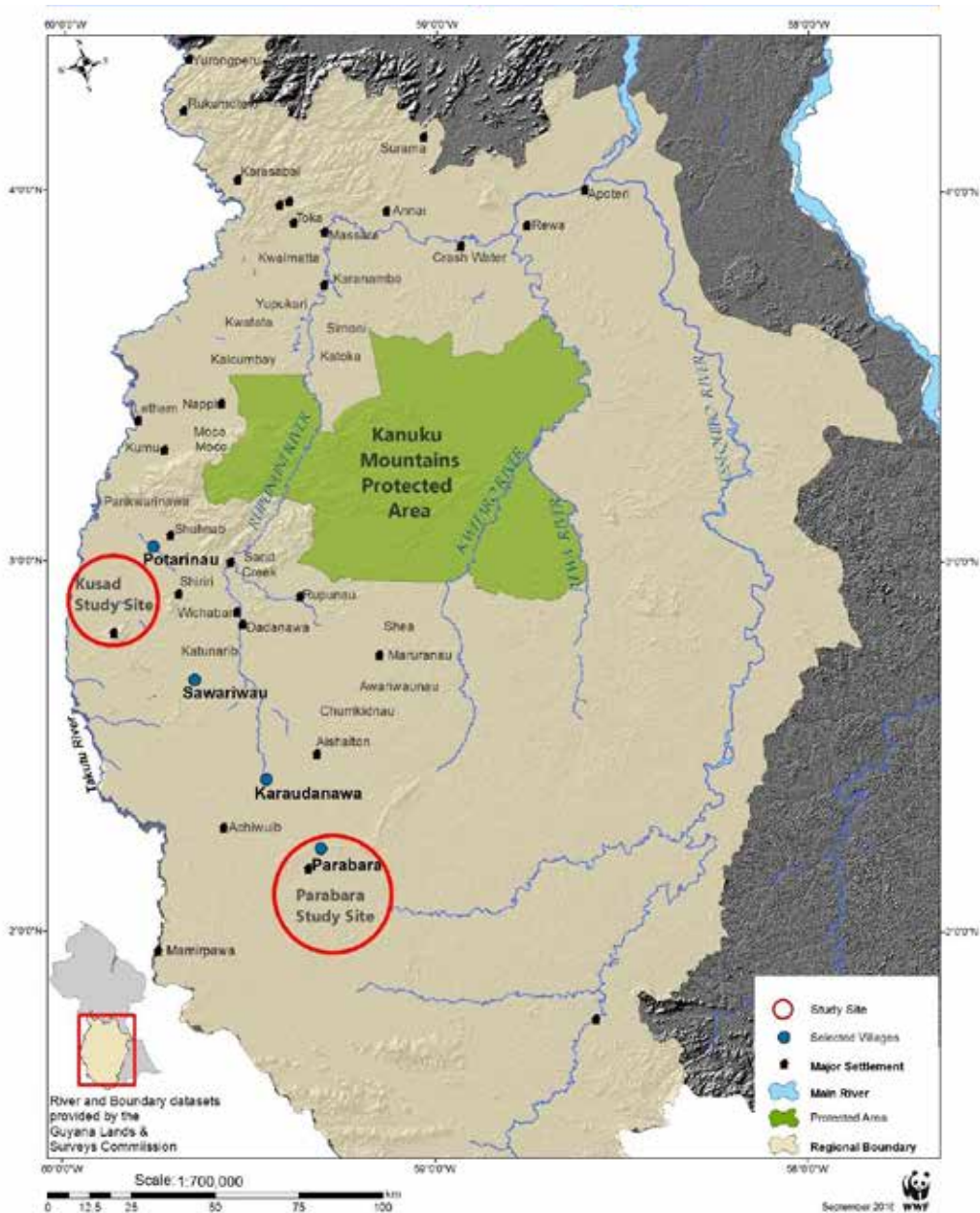


The Southern Rupununi Biodiversity Survey Team / © WWF - GWC.

Biodiversity Assessment Team (BAT) Survey.

This programme was created by WWF-Guianas in 2013 to contribute to sound land-use planning by filling biodiversity data gaps in critical areas in the Guianas. As far as possible, it also attempts to understand the local context of biodiversity use and the potential threats in order to recommend holistic conservation strategies. The programme brings together local knowledge experts and international scientists to assess priority areas. With each BAT Survey, species new to science or new country records are being discovered. This booklet acknowledges the findings of a BAT Survey carried out during October-November 2013 in the southern Rupununi savannah, at two locations: **Kusad Mountain** and **Parabara**. Four communities in the areas participated: **Potarinau, Sawariwau, Eropoimo (Parabara)** and **Karaudanawa**.

WWF Biodiversity Assessment Team Expedition Southern Rupununi - Guyana.



Location of Survey Sites in the Southern Rupununi Savannah region, Guyana.

The Rupununi savannah is divided into north and south by the Kanuku Mountains Protected Area.

What is Biodiversity?



Biodiversity or biological diversity means the many different types (or species) of plants, animals and other living things on our planet. When we think about what biodiversity means, we should also consider the places where they live, and ways that they interact with each other and their environment. The natural environment where an animal, plant or other organism lives is known as its habitat. Some examples are: ponds, wetlands and gallery forests. Living things obtain all that they need to survive from their habitat: food, water, sunlight, air, space, the right temperature, and even mates for reproduction. Many different habitats together with all the plants and animals that live in them, form an ecosystem. Ecosystems can be large, such as the whole Rupununi savannah, or small, such as a pool in the forest. Somewhere between 3 and 100 million species are thought to exist on the earth. However, scientists have only been able to describe around 1.7 million. Many species have important roles to play in keeping human populations healthy and ecosystems productive.

Why are Biodiversity Studies Important ?

Biodiversity is being lost at an alarming rate around the world and some of the main reasons are the spread of commercial agriculture into critical habitats, illegal and improper mining, water pollution, climate change and overharvesting of wildlife. Guyana has not experienced the scale of habitat disappearance and species loss as seen in other places. Our ecosystems have remained healthy, but the threats can be clearly seen and they are spreading quickly in some areas. Good conservation and management strategies, urgently needed to safeguard biodiversity, rely on field-based studies.

The southern part of Guyana, which includes the savannah, wetlands and forests of the Rupununi region, is still largely intact and is one of the most important places for biodiversity in Guyana and on the planet, making it incredibly valuable for conservation.



A biodiversity assessment survey was carried out during October-November 2013 in the southern Rupununi savannah, at two locations: **Kusad Mountain** and **Parabara**. Four communities in the areas participated: **Potarinau, Sawariwau, Eropoimo (Parabara)** and **Karaudanawa**. Local and international scientists, and community members came together during the expedition to study biodiversity in order to:

- know what types of plants and animals are present in an area;
- know if these plants and animals are plentiful or scarce and if their habitat are being threatened by human activities (e.g. overhunting and water pollution);
- determine where important biodiversity areas are located, so that harmful activities are not promoted in these areas;
- collect and share data with government and civil society so that action can be taken to protect biodiversity and livelihoods.

Biodiversity in the Southern Rupununi Savannah.

The savannahs of the southern Rupununi are part of an extensive, biodiversity-rich region situated in south-western Guyana: the Rupununi savannah. This area is separated from the North Rupununi by the forested Kanuku Mountains Protected Area.

The savannah ecosystem in the Rupununi, also called Guianan Savannah, is unique. It is the largest such ecosystem in Guyana and the wider Guianas.

The southern Rupununi savannah supports an incredible diversity of species, many of which are highly endangered or threatened. One of the main reasons why so many species thrive in these areas is because of the high diversity of habitat types. The savannah stores carbon, helps to keep forest and freshwater ecosystems healthy and creates large landscape connectivity, which contributes positively to species survival. Despite the importance of the Rupununi savannah, no portion of it has been given national-level protection.



Indigenous peoples have inhabited the Rupununi for thousands of years and play important roles in ensuring that the biodiversity of the area is well protected. Today, Wai-Wai and Wapishana peoples (and some Macushi) live in the south Rupununi

Although the biodiversity of the area is generally intact, it is important to strengthen conservation and management actions in the Rupununi savannah, since there are growing threats: gold mining, overharvesting of wildlife and commercial agriculture.

savannah, maintaining some traditional ways of life although there is a shift toward a cash-based economy. Families rely on fish and a limited variety of food crops, especially cassava, that are cultivated in shifting agriculture plots surrounding villages.

A conservation report compiled from this BAT Survey recommends the establishment of a protected area which ensures that the large-scale integrity of the Rupununi savannah is maintained (building on land and resource management plans developed by communities); regulating and limiting the expansion of gold mining activities; implementing plans for sustainable wildlife use; and further developing culture and nature-based tourism.



Habitats of the Southern Rupununi Savannah.





Gallery Forest.

These forests grow on the banks of rivers and streams flowing through the savannah. As the day heats up in the open savannah, gallery forests provide refuge for birds, mammals and reptiles. The soils here are more fertile and hold a more reliable supply of water, which supports biodiversity and lifestyles of local people. Gallery forests have been disappearing around the world due to harmful human activities which prevent seedlings from growing and interfere with water flowing naturally.



Rocky Outcrops.

This unusual feature is only found in the southern Rupununi. They rise out of the ground from underlying ancient rock and have uncommon, specialized vegetation. Forests are also associated with these outcrops, which include Kusad Mountain, pictured here.



Open Savannah.

In the dry season, wetland areas recede and the landscape becomes open savannah. This unique ecosystem delivers enormous benefits for people and biodiversity. Sandpaper trees (*Curatella americana*) provide nesting areas for the critically endangered Red Siskin (*Spinus cucullatus*). *Byrsonima verbascifolia*, known as *kenamanarare* (Macushi), and several other savannah plants are important medicinal plants. Soils in the open savannah are poor in nutrients and therefore not well suited for large-scale agriculture. Getting crops to produce sufficient food would require the application of massive amounts of fertilizers and other chemicals, which could lead to pollution of freshwater.



Wetlands.

The southern Rupununi savannah undergoes a remarkable transformation during the rainy season - permanent wetlands expand reaching their fullest and vast areas flood, becoming huge seasonal wetlands. These wetlands absorb, filter and store vast amounts of freshwater, recharging aquifers and keeping the surrounding forests and rivers healthy. It provides critical foraging or breeding grounds for many animals such as fishes, migratory birds from as far away as North America and southern South America, Jabirus (*Jabiru mycteria*), and Black caimans (*Melanosuchus niger*). Local communities depend on wetlands for food, housing materials and income.



Bush Islands.

These are patches of forest which grow on higher areas in the savannah. Bush islands bring connectivity to the savannah landscape which improves the survival of species - animals moving across the open savannah use them as a stop-over point because they are usually cool and full of food resources. They are also home for many birds that do not live the rainforests bordering the savannah. Without bush islands and open

savannah, the status of many birds would be threatened in the Rupununi. Indigenous communities living in the southern Rupununi consider bush islands as a 'store-house' for valuable resources like food animals, medicinal plants and firewood. Indigenous families also practice subsistence farming in the larger bush islands – so they can have a steady supply of food.

Benefits provided by biodiversity and habitats.

People rely on the wetlands, savannah, bush islands, forests, rivers, creeks, plants, fish, birds and other animals of the southern Rupununi savannah for many different purposes:

THEY PROVIDE FOOD: many kinds of fishes, mammals, birds, reptiles and plants are used for food. Bush islands are rich in biodiversity and act as a ‘store-house’ of food for indigenous people.

THEY PROVIDE SHELTER: leaves from palms which grow in wetland areas, timber from trees and bricks made of clay soil are used to build sturdy houses and other dwelling places.

THEY PROVIDE CLEAN WATER: the Rupununi wetlands absorb, filter and store enormous amounts of water during the rainy season. Wells are dug by communities to access underground water for drinking, cooking, and other household uses. Some rivers, creeks and ponds are also an important source of freshwater.

THEY PROVIDE MEDICINE: the stems, leaves, fruits, sap, roots and bark of many plants are used in traditional medicine. For example, oil extracted from the seeds of the Crabwood tree (also called crab oil) is used to repel insects, treat rashes and coughs. Many plants are also the source of modern medicine.

THEY SUPPORT ECO-TOURISM: birders, photographers, adventure-seekers and many others visit the southern Rupununi savannah each year, providing a source of income for cooks, craft makers, nature guides, those providing transportation, and even farmers.

THEY PROVIDE MATERIALS FOR EVERYDAY USE: firewood; raw materials to make baskets, sifters, furniture, jugs and other household items (for example, nibbi (*Heteropsis* spp), balata (*Manilkara bidentata*) and kufa); and timber for fence posts, houses and canoes.

THEY ARE HOME FOR PEOPLE AND SPECIES: Many indigenous communities live in the southern Rupununi savannah. It is also a home for thousands of plant and animal species, including endangered and threatened species.

THEY MAINTAIN THE GLOBAL CLIMATE: forests, wetlands and savannah keep large amounts of carbon stored and this helps to fight against global temperature rise. Clearing large areas of their trees, damaging wetlands, and overharvesting wildlife make the impact of climate change worse.

Species of the Southern Rupununi Savannah: PLANTS.

More than 1,000 species of plants - trees, grasses, sedges, woody herbs, climbers and vines - are found in the southern Rupununi savannah. One reason why so many different plants exist in the savannah is because there are a large number of habitat types – rocky outcrops (for example Kusad Mountain), bush islands, open savannah, forests along rivers and streams, and wetlands.

The south Rupununi savannah contributes greatly to the floristic diversity and species richness of northern South America, since many of its plants are uncommon.



Ite Palm (*Mauritia flexuosa*). Groves of ite palms are found lining the streams in the savannah and in areas which become flooded during the rainy season. These palms can grow as much as 35 meters and bear a shiny brown fruit which is used to prepare a tasty drink. The seeds are able to float in water, and this helps the plant to disperse.



Awara Palm (*Astrocaryum vulgare*).

Fruits of the awara palm are an important source of food for local communities and many animals including parrots and macaws. Its durable leaves are used as roofing material and can be made into hats, mats and other useful items. Seeds of ripened fruits are covered by an orange, oily pulp. The oil has medicinal purposes.



Sandpaper tree (*Curatella americana*). Also called “caimbe”, groves of these trees occurring at the forest-savannah interface in the southern Rupununi, for example, serve as the nesting areas for Red Siskin - a bird that has largely disappeared from its habitat in the wild and is now critically endangered. Siskins were discovered in the south Rupununi savannah in 2000.



Bulletwood or Balata tree (*Manilkara bidentata*).

Found in the forested areas of the savannah such as gallery forests, the bulletwood tree is a protected species in Guyana and special permission is required to cut these trees for commercial purposes.

BALATA CRAFTS.

The tree produces a milky latex called balata. In the 1970s, collecting balata was an important industry in the Rupununi. Balata was exported for use in the rubber industry, but was later replaced by cheaper, synthetic substitute.



***Bulbostylis* sp.** This plant, which is found in savannah grassland, has developed a clever way of coping with fires, some of which naturally occur in savannah areas. It has an enlarged caudex of leaf sheaths that flower only after fire.

Species of the Southern Rupununi Savannah: ANIMALS.

There is an incredibly high diversity of animals in the southern Rupununi savannah. This results from the mosaic of habitat types, the mixing of Amazonian and Guiana Shield fauna during events such as seasonal flooding and the relatively intact nature of the landscape.

The southern Rupununi savannah provides a good home for many animal species that are highly endangered globally.

INSECTS AND OTHER INVERTEBRATES.

Although they are small in size, invertebrates are one of the most important groups of animals in the southern Rupununi savannah. They play a major role in dispersing seeds, pollinating flowers, recycling organic matter and aerating the soil. Without these services, many plants and most animals, including humans, would not be able to exist. Nearly all fruits and vegetables, for example, grow because of the direct action of insects.



Nest of the arboreal Azteca (ziido) ant species.

Ants are expert builders and engineers – this nest, constructed high off the forest floor on the trunk of a tree, will last for many years. Vents circulate air and control the temperature inside the nest.

Ants.

Ants are one of the earth's most prominent group of land animals – there are over 12,000 species! They are found in lots of different habitats – high up in trees, below the ground, on the forest floor, and in open savannah. They live in complex societies made up of many thousand individuals. In each colony there is a division of duties: worker ants find food and repair the nest. Soldiers protect the colony from large predators using their strength and large jaws or mandibles. The queen heads the colony. She can live for many years, laying millions of eggs in her lifetime. In the process of feeding and building their nest, ants help to disperse seeds, improve the soil and get rid of dead animals.



Army ants (*Eciton burchellii*) are swarm raiding predators that live in large nomadic colonies.

Bullet ants (*Paraponera clavata*) reputedly have the world's most painful insect sting. This massive ant requires fairly large blocks of rainforest as habitat.



Gliding turtle ants (*Cephalotes atratus*) can glide to their home tree if they fall from the rainforest canopy.

Canopy ants (*Daceton armigerum*) hunt prey in trees with their fast trap-jaws.



Big-eyed ants (*Gigantiops destructor*) are easily recognized by their huge eyes (which provide excellent vision), yellow-tipped antennae and tendency to jump.



Katydids. Katydids are related to the cricket and grass hopper, and are known for their long thread like antennae and powerful hind legs which they use for jumping. This Peacock katydid looks like a dead leaf, a good camouflage which makes it hard for predators to find. Males rub their wings together to make music to attract females for mating, but often the sound is too high pitched for humans to hear.





Damselflies and dragonflies.

These insects are excellent aerial predators – their incredible vision allows them to spot prey from almost all directions. They control the mosquito population, and this may help to control diseases. They need healthy wetlands and freshwater habitats for the development of their young, which live in water. Dragonflies and damselflies are sensitive to changes in their environment and for this reason they act as bio-indicators, warning us of pollution in the environment that could affect our health.

Butterflies. Butterflies are critical to the survival of many plants, which rely on them for pollination. Butterflies feed on the sugary nectar of flowers and in the process transfer pollen grains from one flower to the next. This process of pollination allows plants to produce seeds which then germinate to bring forth the next generation of plants.



Aquatic Beetles. Aquatic beetles are found in a broad range of habitats including streams, lakes and waterfalls. Some are predators, while others feed mainly on algae or are scavengers. Aquatic beetles are used as indicators of water quality because they are sensitive to pollutants. 201 species, including 15 which are likely new to science were found during this survey.



Berosus brevibasis. This relatively rare species of scavenger beetle is known from ponds and marshes that occur in savannahs. It is a new country record for Guyana.

Spiders. Spiders, like this Orange tree spider, are part of healthy ecosystems, preying on a variety of invertebrates and other small animals which helps to maintain a natural population balance. Although spiders can seem harmful, many are not. Some produce venom which can be dangerous for humans but scientists are researching how these can be made into medicines and bio-insecticides.



MAMMALS.

In the south Rupununi savannah, 54 species of mammals were documented including a number of globally threatened ones such as the Giant anteater, Giant armadillo and the Brazilian tapir, and a new species of insect-eating bat. Hunting pressure has reduced the population densities of some mammals, particularly in areas that are readily accessible by people. Non-the-less, the south Rupununi savannah remains an important area for mammals that face numerous threats in other parts of their range.

Puma (*Puma concolor*). Also called the mountain-lion or cougar, this cat is mostly active around dawn and dusk. Agile and powerful, pumas hunt by stalking and ambushing their prey. They feed on a variety of animals including deer, labba and agouti. Like jaguars, pumas are affected by overhunting and habitat loss so it is necessary to put effective conservation actions in place to ensure they are protected.





Jaguar (*Panthera onca*). This magnificent animal is the largest cat in Guyana and all of South America. Its golden brown-yellow coat has dark spots or rosettes. They need a variety of habitat to survive and as such they are found in forest, seasonally flooded areas and savannahs – but near water sources. Due to overhunting and loss of habitat, Jaguar populations are declining globally. Strong conservation actions are needed to protect Jaguars.



Ocelot (*Leopardus pardalis*). The Ocelot bears a striking resemblance to its cousins, the Oncilla (*Leopardus tigrinus*) and Margay (*Leopardus wiedii*), except that it is much larger. Its fur is beautiful – spots run in chain-like lines and are pale in the middle with a black border. They reproduce slowly and the young take a long time to reach maturity – as much as 2 ½ years. Like all wild cats, this species is legally protected in Guyana.



Giant anteater (*Myrmecophaga tridactyla*). The Giant anteater is the largest member of the four species of living anteaters. Giant anteaters feed in the open savannah and rest in forested locations, making both types of habitat critical to their survival. They feed on ants and termites using their fore claws to dig them up and long, sticky tongue to collect them. Giant anteaters are mostly solitary animals, except for mothers and their offspring. Mothers carry their offspring on their back until they are weaned. Globally, habitat destruction and overhunting have caused a decline in the population of this savannah giant, and they are now vulnerable to extinction. The Rupununi savannahs is one of the remaining places where they can be found.



Red brocket deer (*Mazama americana*). Named for its foxy red coat, the red brocket is the largest of all brocket deer. This species needs large areas of habitat to sustain themselves and depend on the forest and savannah. Overhunting can be a problem for them as they reproduce slowly (the gestation period is about 218 days), only producing one offspring at a time.



Nine-banded Armadillo (*Dasypus novemcinctus*). Like its larger relative, the Giant armadillo (*Prionomys maximus*), this armadillo is found in the savannahs of the south Rupununi. Nine-banded armadillos have armour-like plates covering their body, weighs around 2 to 6 kilograms and generally feeds on insects. Their sensitive noses can detect prey through 8 inches of soil!

Bats. There are at least 35 species of bats in the southern Rupununi savannah. They disperse seeds and pollinate flowers – two important actions that help forest regenerate itself. Places like rocky outcrops at Kusad and rainforest with patches of savannah in the Parabara may provide important roosting sites and foraging habitats.



Orinoco sword-nosed bat (*Lonchorhina orinocensis*). This insect-eater was recorded in Guyana for the first time during this survey. Declining populations and threatened habitats have caused it to become vulnerable to extinction. This species is endemic to savannah areas.

***Molossus* sp. nov.** Another insect-eater, this undescribed species of free-tailed bat was found in Bototo Wau, near Parabara. It has also been found in eastern Ecuador, but there are currently no reports of this species from the intervening 2,000 km of Amazonian rainforest.



AMPHIBIANS.

The amphibian fauna of the southern Rupununi savannah includes frogs and toads. Twenty-seven species were found during our survey but there are certainly many more that are present in the area. Their life cycle depends on both water and land, making them excellent indicators of ecosystem health. Clean, unpolluted water is needed for the complete development of their larval stages and adults are sensitive to land use changes that degrade wetland and forest habitat used for breeding.



Myer's thin-toed frog (*Leptodactylus myersi*). This species was officially recorded for the first time in Guyana during this survey (photo on the left).

Emerald-eyed frog (*Hypsiboas crepitans*). This frog thrives in a variety of habitats, from tropical forests, to grasslands, to urban areas. They also occur across an incredibly vast range and exhibit variation in color, size, and call.



Guyana harlequin frog (*Lysapsus laevis*). This olive-green frog lives in the open flooded savannah area and is abundant in the southern Rupununi.

In the last two decades an alarming number of amphibian extinctions around the world have happened because of habitat destruction, disease and global climate change. Therefore, conserving areas which provide habitat for many species of amphibians such as the south Rupununi savannah is important for the survival of these sensitive animals.

REPTILES.

176 species of reptiles are found in Guyana, many of which are threatened globally because of human activities like overharvesting, large-scale land clearing and water pollution. In the southern Rupununi savannah, approximately 20 percent, or 30 species, were recorded. These included: red and yellow-footed tortoises; black, dwarf and spectacled caimans; boas, and lizards like the green iguana and gold tegu. Species that are commonly eaten should be monitored to make sure that local biodiversity is maintained.



Emerald tree boa (*Corallus caninus*). This exquisitely coloured boa, which can be more than 2 m in length, spends most of its time in trees and is usually encountered on branches overhanging bodies of water. This snake lacks venom, like all constrictors, and kills by tightening its body around its prey. Its diet consists mainly of small mammals, but it will also consume lizards, frogs and small birds.



Gold tegu (*Tupinambis teguixin*).

Locally known as the 'bush motorbike' or 'salipenter', this lizard can grow to be 2 to 3 ft. in length and can weigh up to 4 kg. Its body is glossy with gold stripes and has powerful limbs and a thick tail. They are voracious predators that feed on invertebrates, small mammals, birds, and reptiles, and occasionally fruit.

Black caiman (*Melanosuchus niger*). This impressive aquatic predator is the largest of all alligator species, reaching more than 4 m in length. Black caimans live in wetlands and slow moving rivers. They mainly eat fish and can be seen along river banks basking in the sunlight – this action helps them to regulate their body temperature since they are ‘cold-blooded’ animals. Once heavily hunted for their skins, black caiman populations are now recovering and the southern Rupununi provides good habitat for these animals to live and reproduce.



Red-footed tortoise (*Chelonoidis carbonaria*).

This tortoise has a dark-coloured carapace (back shell) with lighter patches in the middle of each scale which makes up the shell. Bright red scales on the legs make them easy to identify. It is closely related to the Yellow-footed tortoise, a species also found in the Rupununi savannah which has become vulnerable to extinction due to overhunting for their meat and eggs. The red-footed tortoise is similarly hunted by people and may even be overharvested in certain areas of the Rupununi, so it is important to implement good wildlife management practices to protect them.

FISHES.

The rivers, ponds, wetlands and other freshwater habitats of the Rupununi have high fish diversity. This short survey of the southern Rupununi savannahs yielded 168 species. Of these, 18 are likely new to science, 25 are endemic to Guyana and 19 are considered rare. Fishes living in the southern Rupununi range from the tiny aquarium species to mega-fish like the arapaima which grows to over 3 meters. Fishes are a traditional source of food for communities in the southern Rupununi, but some of the larger species are considered to be overfished.



Arapaima (*Arapaima sp.*). Arapaima are among the largest freshwater fishes in the world - weighing as much as 200 kg and measuring 10 ft. in length. They live only in the Essequibo and Amazon River basins. Seasonal flooding in the Rupununi and the Amazon has become part of the arapaima's reproductive cycle, making healthy wetlands and rivers vital for their continued survival. During low-water months, arapaimas construct bottom nests and females lay eggs. Eggs hatch and as water levels rise, the offspring have flooded conditions in which to flourish. In freshwater lakes, pools and rivers where they live, arapaima can be seen rising to the surface to breathe air! They come to the surface once every 10-20 minutes and breathe air in order to supply their large bodies with enough oxygen. Arapaima conservation in Guyana is of urgent importance since evidence indicates that the species of arapaima present in the Guyana is different – likely *Arapaima arapaima* and not *Arapaima gigas*. If confirmed, it would become another species endemic to Guyana that would require protection under the CITES agreement.



Geophagus "takutu" (Family: *Cichlidae*). This brightly coloured fish, collected from the Takutu River at Lukanani Falls, is possibly a new species. It is related to a larger group freshwater fishes called cichlids. Cichlids include the Lukanani and Tilapia, which are locally important food fishes, and many that are valuable as aquarium fishes.



Suckermouth armoured catfish (*Ancistrus* "net"). This fish is part of the Loricariidae family which has more than 600 different species found in freshwater habitats in South and Central America. Armoured catfishes are known for the bony plates on their body and sucker-like mouth which helps them to adhere to objects in the water, even in fast-flowing streams. Loricariids are nocturnal, live near the bottom of streams and other water bodies, and feed on algae, invertebrates and detritus (decaying organic materials).

BIRDS.

There are at least 487 species of birds in the southern Rupununi savannah and wider Rupununi region, or about 60% of all birds known from Guyana. The southern Rupununi provides a safe place for many species that are disappearing from other parts of their range due to habitat loss and overharvesting. At the same time, however, song-birds, parrots and others collected for the pet trade need protection in the Rupununi. Birds are a vital part of the southern Rupununi, helping to disperse seeds, control insect populations and remove carrion. They are also a source of food for local indigenous people.



Birds from as far as North America and southern South America migrate to the southern Rupununi savannah each year, many of them depending on the wetland areas for food and other resources.



Red Siskin (*Spinus cucullatus*). This critically endangered bird has disappeared from most of its range due to trapping for the cage bird trade. A population was discovered in the Rupununi in 2000, and has since been the subject of much research by the South Rupununi Conservation Society (SRCS). The Red Siskin has drawn many birdwatchers to the Rupununi over the past decade.



White-naped Xenopsaris (*Xenopsaris albinucha*). A target species for many visiting birdwatchers, it is found locally in the Rupununi, but does not occur anywhere else in the Guianas.



Bearded Tachuri (*Polystictus pectoralis*). These savannah birds have highly specialized habitat requirements. In the south Rupununi, the Tachuri is restricted to areas of seasonally wet savannah where fire is infrequent enough to allow growth of long grass and scattered shrubs.



Jabiru (*Jabiru mycteria*). This massive bird is an icon of the Rupununi savannah and can readily be found around shrinking pools of water in the dry season. It is the tallest flying bird in South and Central America – large males can stand as much as 5 feet tall. They eat invertebrates, amphibians, and a remarkable quantity of fish. Nests are built high in trees and are expanded each year – some reach a diameter of 1 meter and a depth of 1.8 meters! Individuals can live for 30 years or more.



White-faced and Black-bellied Whistling-Ducks (*Dendrocygna viduata* and *Dendrocygna autumnalis*). The seasonally flooded areas of the southern Rupununi savannah provide critical habitat for waterfowl, such as these two species of whistling ducks. Both species of ducks are quite noisy, live in large flocks, and require freshwater ponds, lakes and marshes in the Rupununi for their survival. Wild ducks are an important source of food for indigenous communities living in the savannah.



White-plumed Antbird (*Pithys albifrons*). This bird lives in small groups in the forest understory. It does not eat ants, but instead follows swarms of army ants, which flush other insects out of the leaf litter. Many other species of birds also follow army ants for this reason. White-plumed Antbirds can often be located by listening for their churring calls, indicating an ant swarm is nearby.

10 Actions recommended by communities to protect the Southern Rupununi Savannahs:

1. **Avoid overhunting of wildlife and fishes:** do not catch pregnant females, females with young, young ones or many animals at one time. Do not catch fish while they are spawning.
2. **Reduce bird trapping** demand coming from the pet trade is contributing to the scarcity of song birds (e.g. towa-towa, toucans, macaws and parrots)
3. **Stop using seines and poisons** to catch fish.
4. **Reduce logging** and cutting of its palms.
5. **Stop burning** the savannah and forest.
6. **Protect critical plants and animals** for future generations.
7. **Practice careful and vibrant management of the land;** include customary laws in management plans.
8. **Practice wise use of resources;** learn new methods of using resources.
9. **Establish wildlife and environmental clubs.**
10. **Have protected areas and conservation parks.**

ACTIVITIES.

Activity I: Drawing and Writing (stories and poetry) about Nature.

This activity will give you a chance to be creative and show others in an interesting way, how you see and think about the animals and plants around you.

What you will need:

1. Pencils or pens for writing and drawing; crayons for colouring.
2. Clean sheet of paper.
3. A quiet spot for thinking or drawing. You can sit out in a cool shady place, like under a tree, or in any place you think is comfortable.
4. Your friends. Get a few of your friends to draw and write with you. You will all be able to share your stories and drawings when you are done.

Here are some questions you can think about before writing:

1. Describe the plant or animal: What type of plant or animal is it? Where does it live? What kind of food does it eat? Does the plant bear fruits and flowers?
2. Why did you want to write or draw about it?
3. How is it important for you and your family or community or what is it used for?
4. What can you do to help protect it?

Activity II: Making a Nature Conservation Video.

What you will need:

1. A camera that can take videos or, use your phone if it can record a video.
2. Your friends. Get a few of your friends to help you or to be a part of the video.
3. An idea of what you would like the video to be about.

Here are some suggestions for making your video:

1. You can go outside and find plants, animals or other interesting things in nature that you would like to make a video of. Say something about why it is interesting or useful as you record the video.
2. You can talk to an elderly person in your community and ask them some questions about nature and conservation that you have written. OR, you can ask your classmates or friends these questions. What useful things did you find out during the interview?

Send us a copy of your videos, writing or drawing so we can share your work with others! See back page for contact details.
You can also follow and share your content with us on Facebook:
www.facebook.com/WWFGuianas.org
#TogetherPossible

ACTIVITIES.

Activity III: Doing a Mini-BAT Survey.

What you will need and need to know:

1. Notebook, pencils, small jars or containers, a camera (a camera on your phone will definitely work), a pair of binoculars (if you have one), a small fish net.
2. Understand how to spot the different categories of biodiversity: Plants, Invertebrates (like ants, dragonflies, spiders), Birds, Mammals, Amphibians, Reptiles and Fishes. If you are unsure, you can use this booklet to help you or ask a parent or teacher.
3. Consult with your teacher, or club leader or any other knowledgeable person about how to avoid accidents or risks during the survey. Remember to **MAKE SAFETY A PRIORITY**.

Steps of a Mini BAT Survey:

1. Go outside and find a natural area that looks suitable for you to do the mini BAT survey. This area will have some trees and maybe a body of water that will be part of your survey.
2. Draw a map of the area which clearly shows the boundaries. On your map, show where there are different kinds of vegetation – you can even use different colours to identify them on the map. Put in the water bodies and any other major things that are in the area like roads or trails. You don't have to be an artist to do this, a sketch will do.
3. At the top of a new page put in the following information at the top of a new page: Date, Weather, Time Started and Time Ended (when you finish the survey).
4. List out the following categories in your notebook: Plants, Invertebrates, Birds, Mammals, Amphibians, Reptiles and Fishes. Remember to look for each one of these and list out the animals and plants you see under these categories.
5. Begin your mini BAT survey. Some animals are hard to find because they are usually hidden under rocks or logs, in the holes of trees, and in leaf litter. So you can investigate these areas as well. You may want to go at different times during the day to find animals. Birds, for example, are more active in the early morning hours and before sunset – so these would be the best times to go looking for them. You may want to collect some things to show to others. Use your small jars to put them in. However, remember **NOT** to collect animals, plants that are poisonous or dangerous, or rare plants and flowers. Instead, use your camera to photograph what you see.
6. As you record the names of species you find, remember to jot down any special or unusual things you notice like the behaviour of the birds or whether the area has been damaged by human activity.
7. Consult with your teacher, or club leader or any knowledgeable person in your community to find out how these species are useful to us and record these.
8. Keep good records of your findings. This will help you to compare different sites to determine how different they are. It will also help you to better your skills at identifying organisms over time.

SCHOOL ACTIVITY IN PROGRESS: STUDENTS IDENTIFYING BIRDS IN THE SAVANNAH.



Asaph Wilson of the South Rupununi Conservation Society (SRCS) instructs students from Potarinau Primary School on the use of field guides to identify birds. Founded in 2003, the SRCS is a grassroots organization dedicated to the protection of the ecosystems, environment, and heritage of the southern Rupununi region. © Kim Spencer.

Notes.

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Glossary.

Antennae – a pair of long thin ‘feelers’ attached to the head of insects and some other animals.

Aquatic – growing or living in or upon the water; existing in water bodies.

Bio-indicator – Also called an “indicator species”, it is any species whose function, population, or status can reveal whether the environment is healthy or not.

Caudex – the thickened stem of some plants from which new leaves or flowering stems grow.

CITES – it means Convention on International Trade in Endangered Species of Wild Fauna and Flora. CITES is an international agreement between governments that aim to ensure that international trade of wild animals and plants does not threaten their survival.

Cold-blooded – become hotter and colder, depending on the temperature outside; reptiles, amphibians, and fish are cold blood.

Ecosystem - many different habitats together with all the plants and animals that live in them.

Endemic – only found in a particular country or area.

Extinction – when no living members of a species is alive in the wild.

Endangered – in danger of becoming extinct.

Gallery Forests - These forests grow on the banks of rivers and streams flowing through the savannah.

Habitat - the natural environment where an animal, plant or other organism lives.

Latex – the milky liquid found in certain plants or trees.

Nocturnal – active during the night.

Nomadic – having no fixed home and moves according to seasons from place to place to find food, shelter and water.

Pollinate – the transfer pollen grains from one flower to another so that plants can make seeds.

Predator – an animal that captures and feeds on other animals for food.

Roosting site – a place where birds and bats go to rest or sleep.

Scavenger – an animal that eats decaying plants or animals.

Solitary – being or living alone.

Vulnerable – likely to become extinct in the future if conservation actions are not taken.

Venom – poison produced by some spiders and snakes, or insects when they bite or sting.

Vegetation – all plants together, especially those found in a particular area or habitat.

Photo Credits.

What is biodiversity?

Frog © Andrew Snyder

Why are biodiversity studies important?

Local and international scientists work to understand biodiversity © Vitus Antone and Jackson Helms

Biodiversity in the Southern Rupununi Savannah.

Landscape of the southern Rupununi savannah © Andrew Snyder

Petroglyphs in the south Rupununi savannahs © Vitus Antone

Parching grated cassava to make farine © Donald Taphorn

Habitats of the Southern Rupununi Savannah.

Gallery Forest © Zach Montes

Rocky Outcrops © Andrew Snyder

Open Savannah © Andrew Snyder

Wetlands © Nelanie LaCruz

Bush Islands © Andrew Snyder

Species of the Southern Rupununi Savannah: PLANTS.

Ite Palm (*Mauritia flexuosa*) © Andrew Snyder

Awara Palm (*Astrocaryum vulgare*) © Vitus Antone

Sandpaper tree (*Curatella americana*) © Vitus Antone

Bullet-wood or Balata Tree (*Manilkara bidentata*), Balata turtles © Protected Areas Commission, Guyana

Bulbostylis sp. © Andrew Snyder

Species of the Southern Rupununi Savannah: ANIMALS.

Insects and other Invertebrates

Nest of the arboreal Azteca (*ziido*) ant species © Jackson Helms

Army ants (*Eciton burchellii*); Bullet ants (*Paraponera clavata*); Gliding turtle ants (*Cephalotes atratus*); Canopy ants (*Daceton armigerum*); Big-eyed ants (*Gigantiops destructor*) © Andrew Snyder

Katydid © Andrew Snyder

Damselflies and dragonflies © Andrew Snyder

Butterflies © Andrew Snyder

Aquatic Beetle © Andrew Short

Spiders © Andrew Snyder

Mammals

Puma (*Puma concolor*) © Nick Jewell

Jaguar (*Panthera onca*) © Evi Paemelaere

Ocelot (*Leopardus pardalis*) © WWF/GWC, Panthera

Giant Anteater (*Myrmecophaga tridactyla*) © Gerard Perreira

Red brocket deer (*Mazama americana*) © Evi Paemelaere (WWF/GWC)

Nine-banded Armadillo (*Dasypus novemcinctus*) © Vitus Antone

Orinoco sword-nosed bat (*Lonchorhina orinocensis*); Molossus sp. nov. © Royal Ontario Museum

Amphibians

Myer's thin-toed frog (*Leptodactylus myersi*) © Andrew Snyder

Emerald eyed frog (*Hypsiboas crepitans*) © Andrew Snyder

Guyana harlequin frog (*Lysapsus laevis*) © Andrew Snyder

Reptiles

Emerald Tree Boa (*Corallus caninus*) © Andrew Snyder

Gold Tengu (*Tupinambis teguixin*) © Andrew Snyder

Black Caiman (*Melanosuchus niger*) © Andrew Snyder

Red-footed tortoise (*Chelonoidis carbonaria*) © Andrew Snyder

Fishes

Arapaima (*Arapaima* sp.) © Lakeram Hayes

Geophagus "Takutu" © Donald Taphorn

Suckermouth armoured catfish (*Ancistrus "net"*) © Andrew Snyder

Birds

Birds © Melanie McTurk

Red Siskin (*Spinus cucullatus*) © Meshach Pierre

White-naped Xenopsaris (*Xenopsaris albinucha*) © Leon Moore

Bearded Tachuri (*Polystictus pectoralis*) © Leon Moore

Jabiru (*Jabiru mycteria*) © Leon Moore

White-faced and Black-bellied Whistling-Ducks © Chung Liu

White-plumed Antbird (*Pithys albifrons*) © Andrew Snyder



WWF-Guianas

WWF is one of the world's largest and most experienced independent conservation organizations. WWF has been active in the Guianas since the 1960s. WWF-Guianas' mission is to conserve distinct natural communities, ecological phenomena, and maintain viable populations of species of the Guianas in order to sustain important ecological processes and services that maintain biodiversity, while supporting the region's socio-economic development.



**GLOBAL
WILDLIFE
CONSERVATION**

Global Wildlife Conservation

Global Wildlife Conservation's mission is to protect endangered species and habitats through science-based field action. GWC brings together scientists, conservationists, policy makers, industry leaders and individuals to ensure a truly collaborative approach to species conservation and in meeting its goals of saving species, protecting wildlands and building capacity.

Contact Information

WWF-Guianas, Guyana Office
285 Irving Street, Queenstown, Georgetown.

Phone: +592.223.7802

Email: wwf-guyana@wwf.sr

www.wwfguianas.org

Facebook: www.facebook.com/WWFGuianas.org

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Why we are here

To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

panda.org/amazon

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