

# Biodiversity in the Konashen Community-Owned Conservation Area, Guyana



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## Introductory Letter from the Wai Wai

*We indeed find it a great pleasure to welcome you to our beautiful community, the home of the peaceful and friendly Wai Wai located in the deep south of Guyana.*

*Our Community-Owned Conservation Area (COCA) has much to offer in adventure, comfort, beauty and genuine hospitality of the Wai Wai people. Experience the scenic sites trekking through the pristine forests, swimming in the natural, refreshing waters of the mighty Essequibo, fishing, canoeing and bird watching. Here you will experience rare indigenous hospitality and breathtaking flora and fauna beyond your wildest imagination. We invite you to enjoy and experience an environment that cannot be compared to anywhere else in the world.*

*We are committed to preserving our natural environment and biodiversity by dedicating ourselves to sustainable tourism. There is genuine partnership between the government and our community as we open our COCA to visitors from all over the world.*

*We cherish and invite you to come. The community anxiously awaits you. Visit us.*

## On wara wii kesi awyaso tooto komo

*Amna niire cewton COCA me amna Wai Wai komo comota chewno komo. Pahaxa onwara exihra xakne amna tiroowon tan kayana po. Censom komo nasi amna yewton po merpora cemporen komo. Oni yepu komo, torowo, tanhamya cetarisom komo miyarma (comota marha). Comota rakatawno amna Kirwan iro maki amna yewton, titkenari, ocowo kenariokre, Kirwan tuuna keyehtopo, animtopo, ketaritopo kanawa yaw, torowo yentopo marha.*

*Eroke cmare mimokyaxe enso, tahwore awehtomeso, ona amna yewton pona, on yipu yapono exihra romaki nasi ha roowo po.*

*Eroke amna niire kirwanhe cemyapore miyaroronome ehtome. Amna yepamtho komo nenirme ehtome. Thuris komo mohtome marha. Yaro xa amna netakronomekne kayaritomo komo yakro COCA poko.*

*Tooto komo yanihtopo poko marha ahnoro roowo poko haknoamyamro. Amokuxe soro maki nasi amna, ona amna yewton pono. Eroke awenixeso ro miki nasi amna.*



# Why is Biodiversity Important to You?

The biodiversity—animals, plants, forests, streams and rivers—protected within the Konashen Community-Owned Conservation Area performs valuable **ecosystem services**.<sup>\*</sup> Protecting the plants and animals that live in the COCA is more important to your daily life than you may realize. The Konashen COCA ecosystem:

- Produces and cleans the air that we breathe.
- Keeps the soil in place so that it does not clog the waterways.
- Absorbs rainfall, filters, and slowly releases water into the rivers and streams for us and all of the animals to drink.
- Provides wood and other products for our homes, clothing, rope, and baskets, among other things.
- Provides food that we eat everyday such as nuts, fruits, fish, and meat.
- Is the source of both traditional and modern medicines.
- Provides a home to many animal and plant species.
- Determines the climate of the southern Guyana region including when the rain comes and how long the dry season will last.

## Ahce kacho xa tipine menatu comota chewno komo?

- On poyero miki kirwanhe`kesesitopo mimyasi comota.
- Onmarha kirwanhe nirasi, roowo etahkara nirasi tuna marha.
- Onwara marha nirasi comota nustumkes eepu ymo (Essequibo) kwaka tihtosom ahnororo komo wokrume.
- On poyero marha ixé taxé miimo ciitopo me exirke weewe mko yimichi, kahsom miyarma.
- Mik hak marha nimyasi knahri komo weewe yeperiri titko, kitmo kom marha miya rma.
- Comota chew nasi kehci komo kasaray me ciisom ha.
- Mikhak min me nasi comota. lito nasi anarmenpan weewe komo.
- Nihtinomexpesi tuuna mohtopo katpan marha.

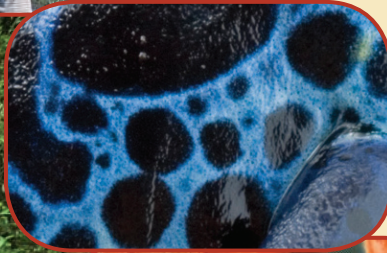
<sup>\*</sup> words in **bold** are defined in the glossary on the inside back cover

# What is biodiversity?

Biodiversity is the variety of plants, animals, and other organisms, the **habitats** in which they are found, and the ways that these living things interact with each other and with the environment.

The place where a **species** lives is known as its habitat. A habitat is a home that supplies all that an animal, plant, or other organism needs to survive: air, light, water, food, shelter, and space. Plants and animals with their habitats make up an **ecosystem**. Ecosystems are composed of living elements, the animals and plants, and non-living elements, such as soil, water, and air. Ecosystems can have variable sizes. For example, a pond is a small ecosystem while a forest is a large ecosystem. All of the earth's ecosystems are part of our planet's biodiversity.

Scientists estimate that there are between 30 and 100 million species of plants, animals, and microorganisms (tiny bacteria and other animals) on the planet, yet only about 1.8 million have been described so far.



# Biodiversity in the Konashen Community-Owned Conservation Area

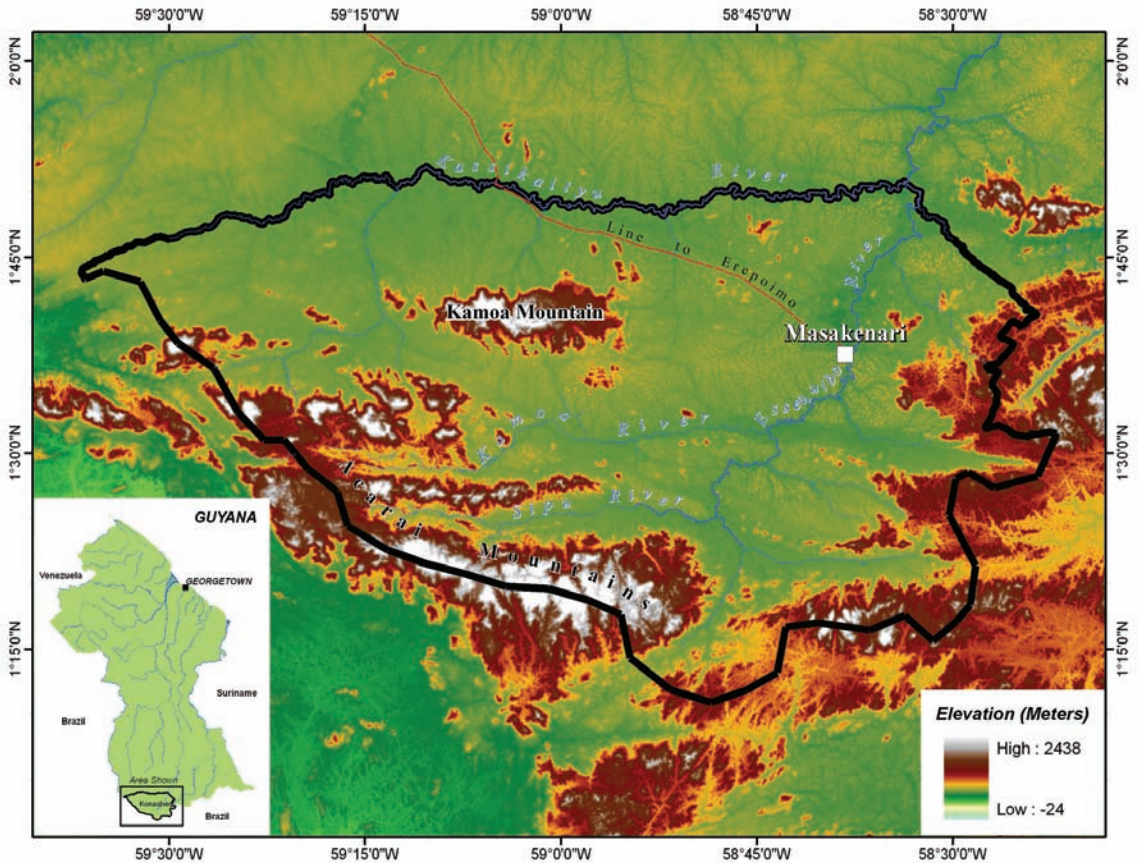
In February 2004, the Government of Guyana issued a title to more than 1 million acres of land in the Konashen Indigenous District, declaring this land as the Konashen Community-Owned Conservation Area (COCA) to be managed by the Wai Wai. This important event followed a request made by the Wai Wai community to the government of Guyana and Conservation International Guyana (CIG) for assistance in developing a sustainable plan for their lands in Konashen. The three parties signed a Memorandum of Cooperation which outlines a plan for sustainable use of the Konashen COCA's biological resources, identifies threats to the area's biodiversity, and helps develop projects to increase awareness of the COCA as well as generate the income necessary to maintain its protected status.

The Konashen Indigenous District of Southern Guyana houses the **headwaters** of the Essequibo River, Guyana's principal water source, and drains the Kassikaityu, Kamoia, Sipu and Chodikar rivers. Southern Guyana is host to some of the most **pristine** expanses of **evergreen** forests in the northern part of South America. Most of the forests found here are tall, evergreen hill-land and lower **montane** forests, with large expanses of flooded forest along major rivers. Thanks to the very low human population density of the area, most of these forests are still intact. The Smithsonian Institution has identified nearly 2,700 species of plants from this region, representing 239 distinct families, and there are certainly additional species still to be recorded.

Such incredible diversity of plants supports even more impressive diversity of animal life, recently documented by a biological survey organized by Conservation International. The clean, unpolluted waters of the Essequibo watershed support a remarkable diversity of fish and **aquatic** invertebrates, and are home to giant river otters, capybaras, and several species of caimans. On land, large mammals, such as jaguars, tapirs, bush dogs, giant anteaters, and saki monkeys are still common. Over 400 species of birds have been reported from the region, and the reptile and amphibian faunas are similarly rich. The Konashen COCA forests are also home to countless species of insects, arachnids, and other **invertebrates**, many of which are still undiscovered and unnamed.

The Konashen COCA is unique in containing very high biological richness that remains in nearly pristine condition. Such places are becoming exceedingly rare on our planet, and we must do everything possible to protect them from unsustainable exploitation and ultimate destruction. Some say that paradise found is paradise lost, but being witness to the biological wealth of the Konashen COCA, through ecotourism and raised awareness about the region, may be the key to the area's long-term survival.

# Map of the Konashen Community-Owned Conservation Area





# Categories of Plants and Animals

Scientists group living things into categories so that we can better understand their relationship to one another. The broadest categories are called Kingdoms and divide organisms into large groups, one being plants and another being animals. Each of these groups is divided into smaller and smaller groups, with the smallest group being called a species. For example, animals can be subdivided into **vertebrates** (animals with a backbone) and invertebrates (animals without a backbone). The vertebrates can then be subdivided into a number of groups including fishes, amphibians, reptiles, birds, and mammals. In the pages of this book you will see how these groups can then be divided into individual species.

## PLANT KINGDOM

There are more than 425,000 different types of plants in the world. Plants need water, air, and sunlight to live. Plants are divided into two main groups, flowering and non-flowering. Most of the plants around us are flowering plants. Flowering plants have roots, stems, leaves, flowers, and fruits. Plants that do not flower include algae, ferns, fungi, and mosses.



Plants provide animals with food, shelter, and much more. Katydid is a tasty insect targeted by many predators, such as birds and monkeys. In order to avoid becoming a meal, many katydids, such as this *Cycloptera speculata*, have evolved excellent, leaf-like camouflage. Can you find the katydid in this photo?



# ANIMAL KINGDOM

## Invertebrates

An invertebrate is an animal without a backbone or any other bones. Instead of bones, some have external skeletons or shells that provide support and protection. Some aquatic invertebrates, such as jellyfish, rely on water for support. Beetles, crayfish, spiders, ants, butterflies, and worms are all invertebrates. Invertebrates are the largest group of animals in the world — over one million different kinds have been documented.

## Vertebrates

### Fishes

Fishes live in water and use gills to breathe oxygen taken from the water. They have a swim bladder, which is a sac inside the body filled with gas. This sac helps fishes float in the water. Many fishes have scales, but some may have tough, bare, or slimy skin. Most fishes are **cold-blooded**.

### Amphibians

Amphibians include frogs, toads, newts, salamanders, and caecilians (burrowing worm-like creatures). Most have naked skin, no claws and are cold-blooded (their body temperature changes to the temperature of the surrounding air or water). Amphibians can pass water through their skin, which makes them able to obtain moisture not only from pools of water but from the soil too. However, this also makes them sensitive to pollution in the water, air, and soil. Because of this, they are good indicators of the overall health of the environment. When an area has a high number of amphibians that usually means that the area has clean air and water.





## Vertebrates, continued

### Reptiles

Reptiles include lizards, snakes, turtles, tortoises, and crocodiles. Their skin has scales and they are cold-blooded. They have claws on their toes, except for snakes and legless lizards. Some reptiles lay eggs with leathery shells while others give birth to live young. The hearts of most reptiles have three chambers but the hearts of alligators and crocodiles have four.

### Birds

Birds are the only group of animals that have feathers. They have forelimbs modified into wings, no teeth, and scales on their feet. Birds lay hard-shelled eggs and are **warm-blooded** (their body temperature stays the same regardless of the surrounding air or water temperature).

### Mammals

The main characteristic that makes mammals different from other vertebrates is that females can produce milk to feed their young. All mammals also have hair at some stage in their life and almost all give birth to live young.

# Plants

The main vegetation types in the Konashen COCA are tall evergreen highland forest and tall/medium evergreen lower montane forest. There are also small areas of tall evergreen flooded riparian forest and lowland shrub savanna. Species such as Manyokinaballi (*Geissospermum* spp.) and Kakaralli (*Eschweilera* spp.) are the most common of the 192 recorded species of plants. Additionally, it is thought that the area holds Guyana's largest stand of Brazil nuts/titko (*Bertholletia* spp.) which is a **keystone species**.



**Manicole palms** (*Euterpe oleracea*), also known as **Manaka**, are usually found in swamps along rivers. A major export crop of Guyana, this palm is valued by local communities for its edible heart. Mammals and birds also feed on the fruits.



Tall and majestic, **Brazil nut trees** (*Bertholletia* spp.), also known as **Titko**, provide food for both humans and a wide array of animals including macaws and ants. Some Brazil nut trees only grow in intact forest because they depend on native bees for pollination and continued reproduction. These trees depend on a single seed-disperser, the agouti, whose teeth are strong enough to open mature fruits. Several aquatic creatures, such as damselflies, a poison frog and a toad, can only breed in empty Brazil nut fruits that have filled with rain water.



**Kakaralli trees** (*Eschweilera* spp.), also known as **Awyuru**, are known for their various medicinal properties. While the bark is used as an antiseptic to treat burns and sores, and to treat dysentery, the seeds are used for treating infections and stomach aches. Kakaralli trees can grow very tall, some reaching over 30 meters.



# Insects and Other Invertebrates

Despite their small size, insects and other invertebrates are the most important animals in the Konashen forests. In fact, most other organisms, including humans, would not be able to exist if it were not for the ecosystem services provided by insects. On the most basic level, insects are in large part responsible for creating, fertilizing and aerating soil, which allows plants to grow. They remove and recycle organic matter, allowing nutrients trapped in dead leaves or manure to return to the soil and be reabsorbed by plants. But this is just the beginning. Without insects, most plants would never be able to reproduce as they rely on these animals both for pollination and seed dispersal. In fact, nearly every food item on our tables is dependent on this insect-plant relationship. Some foods, such as honey, coffee, and virtually all fruits and vegetables, are the result of the direct action of insects, while others, such as cereals or meats, are the indirect result of insect activities.

There are over a million species of insects known, but many more remain undiscovered. The forests of the Konashen COCA harbor probably tens of thousands of species of insects and other invertebrates, some still unknown to science. Almost all invertebrates are completely harmless to humans, and only very few species transmit diseases, such as malaria. Even most scorpions and spiders are harmless, and their sting is no more dangerous than the sting of a common bee. Along with insects, other invertebrates play vital roles in the complex ecosystem of the Konashen forests. Spiders and scorpions hunt flies and other insects, regulating their populations and preventing them from becoming too abundant. In addition to all of these services, invertebrates are also food for many larger organisms such as frogs, lizards, birds, and many mammals.



**Ants** are the most abundant animals in the forest, and their combined mass is equal to that of all mammals. Ants live in complex societies which can have thousands or even millions of workers. These workers take care of the single queen, who can live for many years and lay millions of eggs, and the developing larvae. Ants feed on many different things: some are **predators** and hunt other insects, some feed on seeds and flowers, while others are **omnivores** and will collect any organic material. In the process of feeding and nest-building, ants perform many helpful services in the forest: they remove dead animals, disperse seeds, and improve the condition of the soil.

**Leafcutter ants** (*Atta* spp.), also known as **Yawko**, are often seen carrying pieces of leaves on the forest floor to their underground nests. They do not eat the leaves, but use them to grow **fungi** in underground gardens. Later, they eat the fungi. Their behavior is very similar to farmers tending crops.





The **Goliath bird-eating spider** (*Theraphosa blondi*), also known as **Mawinaru**, is the largest spider in the world. Its leg span is nearly a foot, and its weight may exceed 120 g. Despite the name, these spiders feed primarily on insects, but are also known to catch lizards, frogs, or even adult mice. Their bite can be painful, but it is harmless to humans.



**Butterflies** in the Konashen COCA are not only beautiful, but also very important as members of the forest ecosystem. Adult butterflies **pollinate** plants, and many plants would not be able to produce fruits if they were not visited by butterflies. Caterpillars eat leaves of plants, but they themselves are also the main source of food for other animals, such as birds, lizards, or even monkeys. The beautiful, metallic-blue **Morpho butterflies**, also known as **maperuperuma**, are considered by some to be the most beautiful butterflies in the world. In Konashen they are common in the forest, especially along streams and rivers.

**Jewel beetles** (family Buprestidae), also known as **Kmaka**, are colorful insects that can be seen flying during the day in the forest. Their **larvae** develop in wood, and some species help **recycle** old tree logs and stumps. In some parts of the world, jewel beetles are used to make necklaces and other ornaments.





# Insects and Other Invertebrates, *continued*



**Dung beetles** (family Scarabeidae), also known as **Weeto iyamni**, provide a very important ecosystem service to the forests of the Konashen District. They are recyclers of dung produced by mammals and other large animals, and allow for the nutrients trapped in dung to return to the soil. Female dung beetles bury dung in underground chambers and lay their eggs there. The developing larvae feed on the dung, and emerge as adult beetles a few months later.

**Biting flies** (*Lutozmyia* sp.), also known as **Tiroko**, are insects that fly after dark, preying on the blood of other animals. They are similar to mosquitoes, but much smaller. Like mosquitoes they can transmit diseases. Leishmania is a disease that causes the development of painful wounds on the skin of a person bitten by these flies. It is therefore important to avoid being bitten by sleeping under a mosquito net, wearing a long-sleeved shirt after sunset, and/or using insect repellent.



**Freshwater crabs** (*Fredius* sp.), also known as **Xakawa**, are common in the streams and rivers of the Konashen District, and can also be found on land, where they hide under rocks and logs. These animals are **scavengers**, feeding on dead fish and other organic matter, but will also hunt smaller animals, such as water insects and worms. The crabs are themselves food for large fish and caimans.





Katydids, also known as **Cey cey**, such as this **Leaf katydid** (*Cycloptera speculata*), are very common in the forests of the Konashen District, but often very hard to find. They closely resemble the plants on which they feed, and during the day sit motionlessly among leaves. Most katydids become active only at night, when they start feeding and singing. All katydids produce sound by rubbing their wings together, but often the sound is too high-pitched for the human ear to hear it. Katydids are important members of forest communities as herbivores and recyclers of dead organic material, and also as the primary food source for many larger animals. Some monkeys and many birds feed primarily on katydids.

The **Peacock katydid** (*Pterochroza ocellata*) looks like a dead leaf, and is very difficult to see when it is sitting on vegetation. But if something scares it, this insect suddenly displays a pair of colorful hind wings with large, false eyes. This is enough to scare off a bird or other small predator, and gives the katydid time to escape.



# Fishes

Fishes are the most diverse and species-rich group of vertebrate animals. The waters of Guyana are home to over 700 species of fishes, most of which are known from the Essequibo River basin, although the Upper Essequibo, including the Konashen COCA, has been little studied. During the RAP survey, over 110 species of fishes were recorded in the COCA (including several species new to science), but this number most likely represents only a small portion of the actual fish diversity of this area. Fishes are exceedingly important members of aquatic communities, both as predators and herbivores, and as a source of food for other organisms, including reptiles, birds, and mammals. For the community living within the Konashen COCA, fishes are probably the most important source of animal protein. Their abundance and the ease with which they can be caught makes them a reliable and renewable staple, and at least 50 species are regularly harvested by the Wai Wai.



The **Bearded catfish** (*Pseudancistrus barbatus*) is a small fish (up to 20 cm long), common among rocks of river rapids within the Essequibo River basin. Populations of this fish have a hierarchical structure, where the status of males is determined by the length of their snout bristles. This species is fished in shallow waters using harpoons and bows.





**Haimara** (*Hoplias aimara*), also known as **Aymara**, are large, predaceous fish, which can reach 100 cm (over 3 feet) in length and weigh up to 40 kg. They feed mostly on other fish, but are known to attack any small animal that falls into the water. Haimara are active mostly at dusk and at night. This fish species is one of the species most frequently caught by the Wai Wai community. Haimara populations within the COCA appear to be healthy, but a noticeable decline in haimara abundance has already occurred near Masakenari village.



The **Armored catfish** (*Ancistrus lithurgicus*) is a small fish (13 cm long) with little value as a commercial species. It is a bottom feeder, but very little is known about its biology. This species is known only from the Essequibo River basin in Guyana.



**Lukanani** (*Cichla ocellaris*), also known as **Parana**, is a large cichlid fish. Cichlids are known for well developed parental care over eggs and newly hatched fry. Individuals of this species can grow to a length of over 70 cm (2.3 feet) and a weight of nearly 7 kg. Lukanani often form schools in quiet waters with medium depth and rocky substrates. This species has been introduced from its native northern South America to Central America, the United States, and Africa, where it sometimes becomes a pest.



# Amphibians

The amphibian fauna of the Konashen COCA includes frogs, toads, and legless, snake-like caecilians. Twenty-five species of amphibians were recorded during a recent biological survey of the area, however there are certainly more species present in the area. Amphibians play an important role in the forest habitats of Konashen, both as predators of insects and other small organisms, and as food for reptiles, birds, and mammals. In some parts of South America, the venom of highly **toxic** amphibian species is used for hunting arrows.

Because amphibians have no scales or hair to protect their skin, they are very sensitive to pollution in the water, air, and soil. This makes them good indicators of the overall health of the environment. When an area, such as the Konashen COCA, harbors large populations of many different amphibian species, this shows that the area has clean air and water. Throughout the world, numbers of amphibians are declining as a result of various factors including increased pollution, outbreaks of disease, and disappearing natural habitats. Scientists estimate that almost half of all amphibian species on earth are threatened with extinction! Conserving areas that provide habitat to many different species of amphibians, such as the Konashen COCA, is therefore even more important for the survival of these sensitive animals.



The **Blue poison arrow frog** (*Dendrobates azureus*), also known as **Kirpapa**, is a beautiful animal, with bright coloration. The skin of this frog species is highly toxic, and the frog advertises its noxious properties with its very noticeable colors. The frogs obtain their toxins from ants, on which they feed. If a frog is forced to feed on insects other than ants, it will lose its toxicity over time. The venom of some species of poison arrow frogs is used by Amerindians to hunt monkeys and other mammals.



The **monkey frog** (*Phyllomedusa tomopterna*), also known as **Kepetu**, is a slow-moving, brightly colored tree frog. The monkey frog has a toxic body and, like the poison arrow frog, the bold patterns on its legs and sides serve to warn other animals of this toxicity. These frogs produce a waxy substance, which they rub all over their bodies. This helps them retain water by making their skin less permeable.



The **Surinam toad** (*Pipa pipa*), also known as **Kuxpa**, is undoubtedly one of the most unusual amphibian species in the world. This animal is completely aquatic, and has lost the ability to jump on land. Its body is very flat and resembles a large, brown leaf submerged under water. The Surinam toad also has truly unusual breeding habits. During a highly ritualized mating, with significant help from her partner, the female deposits her eggs directly on her own back. The eggs sink into her skin, where the entire development of tiny tadpoles takes place. Young froglets emerge fully developed from their mother's back, ready to begin independent life.



# Reptiles

The reptile fauna of the Konashen COCA includes lizards, snakes, turtles, and caiman. Thirty-six reptile species were recorded during a recent biological survey of the COCA, but there are certainly more species present in the area. The highest numbers of reptiles were found in the Acarai Mountains and the flooded forests near the Kamoia and Sipu rivers. Reptile species are highly beneficial for the forest ecosystem and surrounding areas since they control rodent and insect populations. Populations of reptiles, such as turtles and caiman, that are part of the Wai Wai diet should be monitored to make sure that local reptile biodiversity is maintained.



**Harlequin racerunners** (*Plica plica*), also known as **Wakanama**, are common, **arboreal** lizards which can be seen basking on tree trunks during the day. Since their coloration resembles moss-covered bark, they may be difficult to spot when sitting motionlessly. These reptiles are extremely agile and can run with a great speed if frightened. They feed on insects and other small organisms.



**Schnieder's dwarf caiman** (*Paleosuchus trigonatus*), also known as **Watwa**, occurs in shallow forest streams, but adults often spend much of their time in burrows away from water, traveling overland between burrows and water to forage. Their diet includes more terrestrial animals, such as rodents, than in other species of caimans. This species is still common in Guyana, but hunting for food, tourism, and the pet trade has reduced its populations in some places.



**Yellow-footed tortoises** (*Geochelone denticulata*), also known as **Wayamu**, like to build their nests in the dense rain forest or in the tropical lowlands. Since they are too slow to capture fast animals, their diet consists of grasses, fallen fruit, **carion**, plants, bones, mushrooms, excrement, and slow-moving animals such as snails and worms. On average, a female will lay between 6–16 brittle-shelled eggs per year. Larger females produce a higher quantity of eggs and also lay larger eggs. The young are self-sufficient from birth. The Yellow-footed Tortoise reaches maturity in between 8–10 years and can live for approximately 50–60 years. This species is considered threatened because it is heavily hunted for food and is sold in the international pet trade.



**Emerald boas** (*Corallus caninus*), also known as **Aaro**, are large, arboreal snakes, often found coiled on branches along river banks. These snakes are not venomous, but can bite if cornered. They feed primarily on birds, which they kill by strangulation. Boas have poor vision, and detect their prey by using heat-sensitive pits along their upper lips. Despite their aggressive nature, Emerald boas are popular pets, and their populations have been reduced in certain places by over-collecting.

# Birds

Birds are vital members of the forest community. They are primary seed dispersers and many tree species would not be able to reproduce without the help of birds. Many birds are **insectivores**, and by consuming large quantities of plant-eating insects, birds keep insect populations from excessive growth which could damage forests. Large birds, such as hawks and eagles, are predators of vertebrates as well as removers of carrion. Birds are also themselves food for other organisms. The Konashen COCA provides habitat for a remarkable diversity of bird species and these species presently appear to be under little threat. Care should be taken to maintain these healthy populations, in particular by protecting birds such as parrots from collectors who sell them to global markets.



The **Harpy Eagle** (*Harpia harpyja*), also known as **Yaymo**, is the most powerful bird of prey in the world with claws strong enough to pull monkeys out of trees. This eagle has broad wings, a long tail, and a distinct black chest band on its white underbody. The eagle preys on monkeys, sloths, other mammals, large birds, and snakes. Harpy Eagles build large stick nests and usually lay only 1–2 eggs per year. This bird is rare because its habitat is in large uncut forests which are becoming increasingly difficult for eagles to find because of human activities, such as logging, which destroy intact forests. Konashen is one of the last places left in the world with large uncut forests where Harpy Eagles can live.

The **Cock of the Rock** (*Rupicola rupicola*), also known as **Peewu**, builds nests on rock faces of cliffs, large boulders, caves or steep gorges. The female Cock-of-the-Rock builds a nest and raises her young without assistance from the male. Cock-of-the-Rock males spend much of their time at communal courtship sites called leks. When the Cock-of-the-Rock eats fruit, it swallows many whole seeds. Some of these seeds later **germinate** when the Cock-of-the-Rock defecates or regurgitates them at considerable distances from the parent trees. In this way, the Cock-of-the-Rock plays an important role in dispersing seeds of many forest trees. When high densities of seeds are deposited in this way at Cock-of-the-Rock leks or nest sites, the abundance and diversity of plant species can be greatly influenced, making the plant communities at these sites different from those of the surrounding forest.







**Scarlet Macaws** (*Ara macao*), also known as **Kworo**, are large, colorful parrots found in humid lowland rain forests, open woodlands, river edges and savannas. They can grow to about 96 cm long, but over half of this length is the pointed tail typical of all macaws. While males and females of this species look alike, the eyes of young Scarlet Macaws are dark and the eyes of adults are yellow. Scarlet Macaws make loud, low-pitched, throaty squawks, squeaks, and screams and they eat mostly fruits and seeds, including large, hard seeds. Although this species has historically been found in a very wide latitudinal range, since its habitat has become more fragmented, colonies are now mostly confined to tiny populations scattered throughout Central and South America. However they still occur in large numbers in some parts of their territory. Because these birds have been collected in great numbers for the pet trade, Scarlet Macaws are now internationally protected and cannot be taken from the wild.

The **Black Curassow** (*Crax alector*), also known as **Pawxi**, is a very large bird with a crest of feathers on its head. It is glossy black with a purple sheen and has a white belly. These birds live in rain and cloud forests, often near rivers, singing on moonlit nights and sometimes during the day. They build large nests of loose sticks and like to travel alone or in pairs. Black Curassows perform complex displays that involve striking poses, clapping their wings, and singing loudly. Because of their large size, Black Curassows are hunted for food. Hunting can lead to a decrease in the population of these great birds if too many are killed too quickly.



# Mammals

The Konashen COCA provides a home to a range of mammal species including 21 species recently recorded in the area by scientists. Of these, a number of species are known to be globally threatened such as Brown-bearded saki monkey, Giant otter, Giant armadillo, Bush dog, and Brazilian tapir. While the Wai Wai hunt within the COCA, hunting pressure is carefully moderated by limiting the hunting season to two weeks of the year. Otherwise, these areas are pristine, undisturbed tropical rain forest and contain the full complement of the large mammal species characteristic of the Guayana Shield. Because hunting pressure is low and habitats are relatively undisturbed, the COCA remains an important sanctuary for a number of species that face numerous threats in other parts of their ranges.



The **White-faced saki** (*Pithecia pithecia*), also known as **Urwa**, is found in Brazil, French Guiana, Guyana, Suriname and Venezuela. These tree-living monkeys are fast moving and shy, mainly travelling in leaps. White-faced sakis live in small family groups consisting of parents and two or three offspring. They make bird-like chirping sounds and show aggression by shaking their bodies, taking an arching posture and uttering loud growls. They feed mostly on fruits, but also eats nuts, seeds, and insects. Sakis are vulnerable to the destruction of their habitat by humans and are also hunted for food and for the pet trade.

The **Common squirrel monkey** (*Saimiri sciureus*), also known as **Awarku**, is a small primate, widely distributed in forests of northern South America. It lives in large groups of sometimes up to 300 individuals, and frequently forages together with other species of monkeys, or with birds. Within their societies, females have the dominant role. Squirrel monkeys have a high metabolic rate and must constantly feed on insects and other invertebrates. They also eat fruits, seeds, and other plant parts. While foraging, they often descend to lower levels of the forest, but nights are always spent high in the canopy, far from predators prowling the forest floor.







Capuchins, also known as **Meku**, such as **Brown capuchin monkeys** (*Cebus apella*), are considered the most intelligent New World monkeys, and are known to use rudimentary tools, such as stones, to crush nuts. Young capuchins learn the use of tools by observing older individuals. They are also known to use crushed millipedes which, rubbed on their backs, acts as a natural mosquito repellent! Capuchins live in groups of 6 to 40 individuals, usually dominated by a single male who has primary rights to mate with the females of the group. They are relatively long-lived animals and some are known to have lived for 45 years in captivity, although in the wild their lifespan is probably 20–25 years.



The **Pale-throated three-toed sloth** (*Bradypus tridactylus*), also known as **Xohri**, is a slow-moving, **arboreal** mammal, found in forests across most of Central and South America. The sloth has almost no tail or external ears, and at the end of its long arms are three hook-like claws, which it uses to suspend itself from tree branches. Sloths feed on the leaves of a number of tree species, and rarely descend to the ground. Their sedentary lifestyle allows green algae to grow on their hair, giving some sloths a greenish appearance. Some moths and beetles use sloths' fur as their habitat. Despite their large size, sloths are virtually defenseless, and rely on their ability to remain concealed for protection.

# Mammals, *continued*



The **Jaguar** (*Panthera onca*), also known as **Kamara**, is the largest cat of the Americas and has small black spots with rough edges. Jaguars occasionally roar, day or night, with deep grunts. They eat a variety of animals such as peccaries, tapirs, cattle, and deer. Although most jaguars are scared of man and usually flee quickly, they are potentially dangerous. Jaguars swim well and their habitats range from rainforest to dry forest. Jaguars are rare in many places due to hunting and the fur trade.



The **Giant anteater** (*Myrmecophaga tridactyla*), also known as **Amaci**, is the world's largest species of anteater and is found in many habitats including grasslands, deciduous forests, and rainforests. An anteater has no teeth and crushes the insects it eats using hard growths found inside its mouth and in its muscular stomach. The giant anteater feeds mainly on ants and termites, consuming up to 30,000 insects in a single day. It catches them with its remarkably long tongue, which can measure up to 60 cm (2 feet). The tongue is very sticky and can extend and withdraw up to 150 times per minute, each time trapping dozens of insects.



**Tayras** (*Eira barbara*), also known as **Wennako**, are members of the weasel family who live in tropical forest in burrows in the ground, in hollow trees, or in nests made in tall grass. Most tayras have dark brown or black fur with a lighter patch on the chest, and the fur on their heads changes to brown or grey as tayras grow older. They are expert climbers who can leap from treetop to treetop, run fast and swim well. They eat mainly fruit, but also hunt for rodents and invertebrates, climbing trees to find eggs and honey. Wild tayra populations are slowly shrinking as a result of habitat destruction for agricultural purposes.



The **Giant river otter** (*Pteronura brasiliensis*), also known as **Wayawaya**, is dark brown (black when wet) and has feet with webbed toes. Giant river otters live in and out of water and usually stay in groups of between 5 and 9. They call to each other with loud, high-pitched hums and squeals and are territorial, fiercely defending their young, even from a jaguar! They are found in lowland forest rivers and lakes and are threatened because their waterside habitat is limited and accessible to humans. They are overhunted for the fur trade and are wrongly perceived to compete with humans for fish.



# Glossary

**Aquatic** – growing or living in or upon water

**Arboreal** – living in trees or adapted for living in trees

**Carrion** – the dead and decaying body of an animal

**Cold-blooded** – having a body temperature that changes, approximating that of the surrounding air, land, or water

**Ecosystem** – a community of plants, animals and habitats together with the interrelated physical and chemical environment

**Ecosystem services** – Services provided by ecosystems that benefit humans and are necessary for a healthy planet like oxygen production, water purification, pollination, soil formation and nutrient recycling.

**Evergreen** – having green leaves throughout the year

**Fungi** – a group of organisms that are not plants or animals. Fungi live off of decaying organic matter, living plants and even animals. Many play an important role in the natural cycle as decomposers and return nutrients to the soil.

**Germinate** – to sprout, or cause to sprout, from a seed

**Habitat** – the area where a plant or animal naturally grows or lives

**Headwaters** – small streams that are the source of a river, located at the most upstream part of a watershed

**Invertebrate** – an animal without a backbone or any other bones

**Keystone species** – a species that has a very large effect on its environment and helps to determine the types and numbers of various other species in a community

**Larvae** – the wingless and often wormlike young that hatch from the eggs of many insects

**Montane** – zone of moist, cool upland slopes with many large evergreen trees

**Omnivore** – an animal that feeds on a variety of food types, both plant and animal

**Permeable** – allowing substances, especially liquids, to pass through

**Pollinate** – to transfer pollen from one flower to another so that plants can make seeds

**Predator** – an animal that lives by capturing and feeding on other animals

**Pristine** – pure and unspoiled

**Recycle** – to transform a waste material into a useable product

**Scavenger** – an animal that eats decaying plants or animals

**Species** – a distinct kind of animal. Members of the same species can reproduce with each other.

**Toxic** – containing or being poisonous material

**Vertebrate** – an animal with a backbone

**Warm-blooded** – having a warm body temperature that remains relatively constant



## Conservation International

Conservation International (CI) is an international, nonprofit organization based in Arlington, Virginia, USA. CI believes that the Earth's natural heritage must be maintained if future generations are to thrive spiritually, culturally and economically. Our mission is to conserve the Earth's living heritage, our global biodiversity, and to demonstrate that human societies are able to live harmoniously with nature.



## Conservation International–Guyana

Conservation International has been active in Guyana since 1990 and operates under a Memorandum of Understanding (MOU) signed with the Government of Guyana. CI–Guyana's staff is comprised of 100% Guyanese, a group committed to assisting with the development of Guyana in an environmentally sustainable, culturally appropriate, and economically sensitive manner. The vision of CI–Guyana is to establish Biodiversity Corridors in Guyana, incorporating the anchors of a National Protected Area System, while developing trans-boundary corridors across the Guiana Shield. CI–Guyana has been working with the Government of Guyana and resident indigenous communities to develop long-term and sustainable management for the establishment of protected areas, helping to develop protected area legislation in Guyana and actively working with the Government to endow and establish a protected areas trust fund to finance the management of Guyana's protected areas in perpetuity.



## Rapid Assessment Program (RAP)

RAP was created by CI in 1990 to address the lack of biological information needed to make quick but sound conservation decisions. RAP sends teams of international and host-country expert scientists to conduct rapid assessments of the biological value of selected areas. RAP findings are analyzed together with social, economic and other ecosystem information to develop a comprehensive conservation strategy. RAP scientists have discovered hundreds of new plant and animal species and provided key biological data on threatened ecosystems around the world.