

A SHORT NATURAL HISTORY OF BIKO ISLAND

The Island of Bioko, formerly known as Fernando Po, is located on the West African continental shelf. The 2017 sq km island is separated from the Cameroon coast by no more than 32 kilometers of shallow ocean. Bioko forms part of the nation of the Republic of Equatorial Guinea. The rest of the country consists of a mainland wedge of land called Rio Muni, which is tucked between the nations of Cameroon and Gabon, and two small islands, Annobon and Corisco. Equatorial Guinea was once a colony of Spain and Spanish remains its primary language. It became an independent nation in 1968.

Bioko is the last in a chain of four islands that reach 540 kilometers in a northeast direction towards the coast of Africa in the Gulf of Guinea. Annobon is the first; the middle two islands are Sao Tome and Principe. These two islands were once part of the Portuguese Empire and they united to form their own country in 1975. All of the islands are of a similar geological origin and their locations are the result of previously active volcanic hotspots along a fissure that stretches from St. Helena in the south Atlantic to Mounts Kupe and Mahenguba on the mainland nation of Cameroon. A similar phenomenon created the Hawaiian Island chain in the Central Pacific.

The best scientific evidence suggests that Bioko has been isolated from the mainland of Africa for anywhere from 10,000 to 20,000 years. Two massifs connected by a central highland region dominate the Island. The maximum elevation on Bioko is the extinct volcanic peak Pico Basile that reaches a height of 3,011 meters.

Although humans have settled the Island for at least 1,800 years, about three quarters of Bioko is still under some type of natural vegetation. The reason for such a high percentage of undeveloped land is its recent history. At independence the Island was ruled by the ruthless Macias Nguema who killed off or drove into exile an estimated one-third of the Island's population. As a result development stopped, coca and coffee plantations were abandoned and all guns on the Island were confiscated. After an eleven-year reign of terror Nguema was deposed in a coup and executed. An unexpected outcome of this inexcusable human tragedy was that Bioko's biodiversity largely escaped the development and hunting pressures that have devastated their counterparts on the coastal mainland of the Gulf of Guinea. When the first western scientists reentered Bioko in the mid 1980's, they found a large amount of pristine or secondary forest and thriving populations of wildlife.

Bioko has what could be considered an impoverished flora and fauna compared to the mainland forest of West Africa. It does, however, contain 1,200 species of plants. As for the vertebrates there are recorded 43 species of fresh and brackish water fish, 33 of amphibians, 52 of reptiles, 143 species of birds and 65 different mammals.

There are six major natural vegetation types found on the Island. Lowland rainforest is found from sea level to 800 meters. It is similar in composition to its mainland counterparts except for a lower diversity of species, due primarily to the absence of okoume trees (*Aucoumea spp*) and creeper palms. There is, however, a variety of endemic *Ficus* species. Montane forests range between 800 and 1,400 meters. There are numerous plant endemics found within this habitat with tree ferns (*Cyathea spp*) being a characteristic feature. Mossy forest is found between 1,500 and 2,500 meters. Endemism is rich in this forest type with most forms being severely stunted in height. Trees, for example, grow no higher than 10 meters here. Two types of vegetation are found at heights of over 2500 meters. These are shrub formations and sub alpine meadows. They are dominated by species of temperate affinity such as (*Hypericum lanceolatum* and *Agauria salicifolia*) and grasses (*Festuca scimpeana* and *Eragrostis mokensis*). The vegetation found in these two habitats is often covered in lichens and lobelias and orchids are common. The final forest type is mangrove forest, which is associated with the mouth of rivers on the Island. Of Bioko's 1,200 indigenous plants, only 3% are unique to the Island.

The fresh water fish fauna shows a difference between the north and west drainage areas of the Island and the eastern catchments. The fish of the rivers on the north and west side of Bioko show a close affinity to those of Mount Cameroon on the mainland. The only endemic species of fish found on the Island is located there. It is a type of tooth carp, (*Ashyosemion oeseri*). It is sympatric on Bioko with the (*Ashyosemion volcanum*), a resident of freshwater streams, brooks and rivers of the rainforest on volcanic soils. The *volcanum* is also found on Mount Cameroon. The fish species on the east side of the Island are salt tolerant species similar to those found in the islands to the south – Annobon, Sao tome and Principe. Such relationships can give clues to which river systems were once connected, and in what directions they flowed before the West African coastal plain became submerged by rising sea levels.

The 82 species of reptiles and amphibians found on Bioko show a similar low level of endemism. Only two, a skink (*Scelotes poensis*) and a caecilian (*Schistometopum garzonheydti*) are unique to the Island. The presence of a caecilian in an Island's fauna is of interest since these blind, limbless amphibians have such a scattered worldwide distribution. To add to that interest the genus *Schistometopum* (three other species are found on Sao Tome) resembles the South American genera *Dermophis* more than it does the mainland African forms. The largest snake, as well as the largest predator on Bioko, is the rock python. The island also has a healthy population of venomous serpents including the Gabon viper, forest cobra and green and black mamba. Nile monitors are still present and the dwarf crocodile was at one time, but is now most likely extinct.

The most important reptile species, from a conservation viewpoint, are sea turtles. Four species - the green, leatherback, hawksbill, and olive ridley - all nest on Bioko with the green being the most numerous, the leatherback being the second most common, the hawksbill is rare and the olive ridley nesting has just recently been discovered. The nests of all four species are limited to 20 kilometers of sand beaches, which is a small portion of the Island's normally rocky coast.

Of the birds found on the Island only two- the Fernando Po Speirops and the Fernando Po Batis - are unique. The Batis is more often seen at higher altitudes and the Speirops only recorded thus far on the upper reaches of Pico Basile. There is, however, a high degree of endemism at the subspecies level with 48 types being recognized. Most of these, like the endemic species, are found in the montane areas. The most striking birds include the West African goshawk, green fruit pigeon, bar-tailed trogon, Elliot's woodpecker, robin-chat, red-bellied paradise flycatcher and northern double-collared sunbird, all endemic subspecies. An unusual avian resident is the grey-necked rock fowl, which has a limited distribution on the south of the Island. Common lowland birds of note are the palm-nut vulture, grey parrot, blue turaco (also known as the blue plantain-eater), and, in the forest of the south, the black-wattled hornbill. The apparent absence of the crowned hawk-eagle from the Island's avifauna has implications for the primates as well as the tree hyrax of Bioko since this species is a major predator of these arboreal mammals on the mainland.

As for the Island's mammals, we will examine what is not found there first. There are no elephants, bush pigs, or leopards on Bioko and no evidence that they lived there in historic times. These species are characteristic of moderately or lightly hunted mainland West African forests. The absence of the forest elephant and bush pig may be due to over hunting by the first human settlers of the island who are believed to be a race of forest pygmies. Another hypothesis is called the "Island Biology Effect". This theory states that the population of plants and animals species are dependent on the size of their existing habitat range. When range size is small a species population becomes increasingly at risk of local extinction due to various random factors. These factors may include vegetation changes or catastrophic events, such as volcanoes, earthquakes or disease. The "Island Biology Effect" has significant implications for conservation. Many national parks in West Africa are smaller in size than Bioko Island and the large mammals, of such reserves, particularly forest elephants may be equally at risk of disappearing due to random events or human pressure.

The absence of the leopard is a bit of a mystery. There should be an ample enough prey population on the Island to provide enough food. Leopards were until recently found on the island of Zanzibar, located off the east coast of Africa, which is a bit smaller than Bioko and an island which has a much lower prey base. Red forest buffalo were once present but were probably eliminated from Bioko sometime during the early 20th century, most likely the result of over hunting by the indigenous residents of the island, the Bubi's. This species appears to be Bioko's first documented victim of the "Island Biology Effect".

The remaining mammals include 26 species of bats (the largest are hammer-headed, straw-colored and Angolan fruit bats), numerous rodents (including 5 species of squirrels – pygmy, red-cheeked rope, green, red-legged and African giant), some insectivores (one species, a white-toothed shrew *Crocidura eisentrauti*, is found only on Pico Basile), three species of genet/civets, the swamp (Congo clawless) otter, tree pangolin, West African tree hyrax and two species of antelope, the blue and Ogilby's duiker, and 10 species of primates. Of the carnivores present, - the otter, blotched genet, Palm civet and Central Africa linsang, only the linsang turns up in bush meat market surveys. In 2000 it was photographed in the wild for the first time on the Island. This may be an indication that the other three carnivores are very rare or likely extinct. It is suspected that the otter was hunted out for the fur trade in the 19th century and the genet and civet in the 20th century for the cultural reasons. The trade in carnivore parts for the fetish market in much of sub-Saharan Africa is rampant. Other species that turn up frequently in the Island's bush meat trade include - the tree hyrax, the pangolin, the bush-tailed porcupine, Emini's pouched giant rat, both species of duikers and seven species of diurnal primates. Both species of duiker are endemic subspecies. The Ogilby's duiker is a threatened species and Bioko is considered a stronghold for the animal but recent bush meat data shows a heavy harvest of this medium sized forest antelope and census counts of the animal are down. Ogilby's duiker may be in danger of disappearing from Bioko's fauna, much like the forest buffalo did nearly a hundred years ago.

It is the number of primate species found on Bioko, however, which makes the Island an important priority for conservation. Ten species are found here with at least eight considered unique or possibly unique subspecies. The primates consist of three types of galagos: the Allen's, dwarf and western needle-clawed. The dwarf galago is a confirmed endemic subspecies, while the Allen's is a probable one. There are four guenons: russet-eared, greater white-nosed, crowned and Preuss's, two types of colobus; the black and Pennant's red and the baboon-like drill. Among them the drill, Preuss's, russet-eared and red colobus are recognized as legitimate subspecies, while the greater white-nosed and black colobus need further investigation. In addition the drill, Pennant's red colobus and the Preuss's guenon are considered two of the most endangered species in Africa.

In spite of heavy hunting for the bush meat trade on the Island there are still viable populations of these monkeys. Several surveys done on Bioko in the 1980's turned up some of the highest density of primates ever recorded on the planet. Unfortunately recent census work on the southern end of the Island has shown a 40 to 60% decline in the number of primate groups encountered. If such areas, which are distant and difficult to access by hunters, are showing population declines it means that primates on the rest of Bioko must be under heavier and eventually unsustainable pressure.

The loss of Bioko's drill population would be particularly tragic. A separate species from the better known and more colorful mandrill, drills have always had a limited distribution on the mainland of Africa. Historically they have been found between the Cross River in Nigeria and the Sanaga River of Cameroon, a narrow wedge of territory 200 kms in length and 100 kms in width. The range of the drill has been the site of extensive development in these two nations. As a result the drill is endangered due to habitat destruction through logging and the oil industry, but the greatest threat is hunting for the bush meat trade. On Bioko, drill meat is sold for sale in urban markets and is consumed for mainly traditional cultural instead of essential nutritional reasons. It should be noted that as a result the primate meat is normally not eaten by the hunter or his family. By using dogs to track and tree the panicked animals, entire groups of drills, 20 to 40 individuals, can

be easily shot down en mass. Drill meat is a preferred food item. It is considered the best tasting of the monkeys and its large size (drills are as large as chacma baboons) make them attractive and profitable targets. Even protected areas are not effective since even the best parks in this region are poorly patrolled and in most reserves not at all.

Two protected areas have been demarcated on Bioko. They are the 35,000-hectare Pico Basile and the 60,000-hectare Southern Highlands Reserve. In theory these two reserves protect over 40% of the island and most of its biological diversity. But theory and reality, on Bioko, are two separate matters. The reserves have legal but no practical protection. They remain unmarked, unsupervised and unprotected, paper parks in which hunting for the bush meat market continues unchecked.

Bioko Island is at a crossroads. The unique and plentiful primates and sea turtles have survived to the beginning of the 21st century. Their counterparts just a short distance across the Gulf of Guinea have nearly disappeared. Due to unexpected events at the time of Equatorial Guinea's independence, the wildlife of the island has been given a second chance. The people of Bioko and the rest of Equatorial Guinea will ultimately determine whether they survive or perish. What we in the rest of the world can provide is the education to show them the natural gifts of their island home, aid to allow a poor nation to protect its natural heritage, and the advice to assist them in this endeavor.

Those wishing to travel or help with conservation on Bioko should contact the Bioko Biodiversity Fund.

Bioko Biodiversity Fund
Department of Bioscience and Biotechnology
Drexel University
3200 Chestnut Street
Philadelphia, Pa 19104 - USA

Those looking for further information on Bioko's natural history should check the following references:

Bioko Biodiversity Fund web site – www.bioko.org

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