

Flora and Fauna of the Philippines, Biodiversity and Conservation

Located in the western most part of the Pacific Ocean the Philippines is one of the most biodiverse and ecologically rich areas in the world. With over 7100 individual islands covering almost 300,000 square kilometers the Philippines is the second largest archipelago on earth. The Philippines lies north of Indonesia and directly east of Vietnam. The country is one of the few nations that is, in its entirety, both a hotspot and a megadiversity country, placing it among the top priority hotspots for global conservation.

Many endemic species are confined to forest fragments that cover only 7 percent of the original extent of the hotspot. This includes over 6,000 plant species and many birds species such as the Cebu flowerpecker, the Philippine cockatoo, the Visayan wrinkled hornbill, and the enormous Philippine eagle. Endemic amphibian species are also unusually high in the Philippines and boasts unique species like the panther flying frog.

The Philippines is also one of the most endangered areas. Historically logged for timber products, today, the forests are also being cleared for farming needs and for developments to accommodate the nations growing population. Sadly almost 93% of the original forests have been cleared due to logging and agricultural needs. This places the Philippines in the sad position of being one the the most endangered areas while at the same time still remaining one of the most biodiverse areas on the planet. Conservation of this unique archipelago is a top priority for global conservations due to this unique combination of factors.

The archipelago is formed from a series of isolated fragments that have long and complex geological histories, some dating back 30-50 million years. With at least 17 active volcanoes, these islands are part of the "Ring of Fire" of the Pacific Basin. The archipelago stretches over 1,800 kilometers from north to south. Northern Luzon is only 240 km from Taiwan, and the islands off southwestern Palawan are only 40 kilometers from Malaysian Borneo. The island of Palawan, which is separated from Borneo by a channel some 145 meters deep, shares many animal species with both the Philippines and Borneo in the Sundaland Hotspot, and may species of plantlife are also shared with the Sunda Shelf.

The entire country has been designated a global hotspot and is one of the few nations which are in their entirety designated as such. a few quick facts about the Philippine hotspot are:

Hotspot Original Extent (km²) 297,179
Hotspot Vegetation Remaining (km²) 20,803
Endemic Plant Species 6,091
Endemic Threatened Birds 56
Endemic Threatened Mammals 47
Endemic Threatened Amphibians 48
Extinct Species 2
Human Population Density (people/km²) 273
Area Protected (km²) 32,404

Easily seen within these quick facts is the urgent need to help prtect and conserve the remaining resources, flora and fauna of the Philippines before it is too late. Because of the large number of remote islands and the once extensive rain forest the Philippines is home to an unusually high number of endemic species. The single island of Luzon has 31 endemic species of mammal alone. The Philippines also has one of the highest discovery rates for new speicies as well with 16 species of mammals being discovered here within the last 10 years

further illustrating the need for aggressive conservation.

At the very least, one-third of the more than 9,250 vascular plant species native to the Philippines are endemic. Plant endemism in the Philippines is mostly concentrated at the species level. Gingers, begonias, gesneriads, orchids, pandans, palms, and dipterocarps are particularly high in endemic species. For example, there are more than 150 species of palms in the hotspot, and around two-thirds of these are found nowhere else in the world. Of the 1,000 species of orchids found in the Philippines, 70 percent are restricted to the hotspot.

The broad lowland and hill rain forests of the Philippines, which are mostly gone today, were dominated by at least 45 species of dipterocarps. These massive trees were the primary canopy trees from sea level to 1,000 meters. Other important tree species here include giant figs, which provide food for fruit bats, parrots, and monkeys, and *Pterocarpus indicus*, like the dipterocarps, is valued for its timber.

There are over 530 bird species found in the Philippines and about 185, or 35%, of these being endemic and over 60 are threatened. Seven Endemic Bird Areas have been identified in the Philippines: Mindoro, Luzon, Negros and Panay, Cebu, Mindanao and the Eastern Visayas, the Sulu archipelago, and Palawan. Like other species, birds exhibit a strong pattern of regional endemism. Each area supports a selection of birds not found elsewhere in the Philippines. The Philippines also has a single endemic bird family, the Rhabdornithidae, represented by the Philippine creepers. In May 2004, a possibly new species of rail *Gallirallus* was observed on Calayan island in the Babuyan islands, northern Philippines. It is apparently most closely related to the Okinawa rail from the Ryukyu islands, Japan.

Perhaps the best-known bird species in the Philippines is the Philippine eagle which is the second-largest eagle in the world. The Philippine eagle breeds only in primary lowland rain forest. Habitat destruction has threatened and virtually eliminated the eagle everywhere except on the islands of Luzon, Mindanao and Samar, where the only large tracts of lowland rain forest remain. Today, the total population is estimated at less than 700 individuals. Captive breeding programs have been largely unsuccessful so habitat protection is the eagle's only hope for long term survival.

Among the Philippines other threatened endemic species are the Negros bleeding heart, Visayan wrinkled hornbill, Scarlet-collared flowerpecker, Cebu flowerpecker, and Philippine cockatoo.

At least 165 mammal species are found in the Philippines, and over 100 of these are endemic (61 percent), one of the highest levels of mammal endemism in any location on earth. Endemism is high at the generic level as well, with 23 of 83 species endemic to the Philippines. Rodent diversification in the Philippines is comparable with the radiation of honeycreepers in the Hawaiian Islands and finches in the Galapagos.

The largest and most impressive of the mammals in the Philippines is the tamaraw, a dwarf water buffalo that lives only on Mindoro Island. A century ago the population numbered 10,000 individuals while today only a few hundred animals exist in the wild. Other mammals endemic to the Philippines include: the Visayan and Philippine warty pigs; the Calamianes hog-deer and the Visayan spotted deer, which has been reduced to a population of a few hundred on the islands of Negros, Masbate and Panay; and the golden-capped fruit bat which is the world's largest bat with a wingspan up to 1.7 meters.

The Negros naked-backed fruit bat, which was thought to be extinct in the Philippines, has recently been rediscovered, on the islands of Cebu in 2000 and Negros in 2003.

Reptiles are represented by about 235 species, some 160 of which are endemic (68 percent). Six genera are endemic, including the snake genus *Myersophis*, which is represented by a single species, *Myersophis alpestris*, on Luzon. The Philippine flying lizards from the genus

Draco are well represented here, with about 10 species. These lizards have a flap of skin on either side of their body, which they use to glide from trees to the ground.

An endemic freshwater crocodile is considered the most threatened crocodylian in the world. In 1982, wild populations totaled only 500-1000 individuals and by 1995 a mere 100 crocodiles remained in natural habitats. The recent discovery of a population of this species in the Sierra Madre of Luzon brings new hope for its conservation, as does the implementation of projects aimed at raising awareness and protecting the crocodile's habitat. The Crocodile Rehabilitation, Observance and Conservation (CROC) Project of the Mabuwaya Foundation is active in carrying out such projects.

Other unique and threatened reptiles include Gray's monitor and the Philippine pond turtle. A newly discovered monitor lizard, *Varanus mabitang*, from Panay is only the second monitor species known in the world to specialize on a fruit diet.

There are nearly 90 amphibian species in the Philippines, almost 85 percent of which are endemic; these totals continue to increase, with the continuing discovery and description of new species. One interesting amphibian, the panther flying frog, has special adaptations for gliding, including extra flaps of skin and webbing between fingers and toes to generate additional lift during glides. The frog glides down from trees to breed in plants suspended above stagnant bodies of water. The frog genus *Platymantis* is particularly well represented with some 26 species, all of which are endemic and of these, 22 are considered threatened. The young of all *Platymantis* species undergo direct development, bypassing the tadpole stage. The Philippines is also home to the Philippine flat-headed frog, one of the world's most primitive frog species.

The Philippines has more than 280 freshwater species of fish, including nine endemic genera and more than 65 endemic species, many of which are confined to single lakes. An example is *Sardinella tawilis*, a freshwater sardine found only in Taal Lake. Sadly, Lake Lanao, in Mindanao, seems likely to have become the site of one of the Philippines worst extinction catastrophes, with nearly all of the lake's endemic fish species now almost certainly extinct, primarily due to the introduction of exotic species like *Tilapia*.

About 70 percent of the Philippines' nearly 21,000 recorded insect species are found only in the Philippines. About one-third of the 915 butterflies found here are endemic to the Philippines, and over 110 of the more than 130 species of tiger beetle are found nowhere else.

With a high human population the Philippine is threatened by human encroachment, deforestation, and pollution and efforts clearly need to be taken at a more aggressive level to protect this unique and beautiful area of our planet. Conservationists fear that, without immediate intervention, the Philippines is on the brink of an extinction crisis. Logging concessions have not been eliminated from lowland forests, which have already been reduced to a tiny fraction of their original cover, and illegal logging is widespread.

National parks and protected areas are crucial for the conservation of Philippine biodiversity. However, only a very small 11 percent of the total land area of the Philippines (approximately 32,000 km²) is protected. This figure drops to only six percent of the hotspot (18,000 km²) when only protected areas in IUCN categories I to IV are included. National park boundaries have not been well demarcated, there is little enforcement against illegal poaching, logging and deforestation. Two-thirds of parks have human settlements within park boundaries, and one-quarter of their lands have already been disturbed or converted to agriculture. Not all is bad news as at least five new protected areas were proclaimed in 2002. In October 2003, the Peñablanca Protected Landscape and Seascape was greatly expanded, from 4,136 hectares to 118,108 hectares. More recently, the Quirino Protected Landscape, which covers 206,875 hectares in northeastern Luzon, was established through a presidential proclamation.

In addition to creating effective protected areas, basic field research is desperately needed to support conservation activities. New endemic species are being discovered all of the time. A

range of other conservation activities are underway throughout the islands. For example, the Philippine Cockatoo Conservation Program on Palawan has made great progress in reducing the theft of this species' eggs. On Cebu, the recent rediscovery of several of the islands' presumed-extinct species (most famously the Cebu flowerpecker), has focused community conservation activities by the Cebu Biodiversity Conservation Foundation on protecting the island's last few hectares of forest. The Haribon Foundation and Critical Ecosystem Partnership Fund have organized a Threatened Species Program to support such initiatives through the provision of small grants.

In the long term, it is clear that landscape- and seascape-scale conservation will be necessary to allow the Philippines' extraordinary biodiversity to persist. To this end, Conservation International and the Critical Ecosystem Partnership Fund have been supporting conservation in biodiversity conservation corridors in the Sierra Madre, Palawan, and Eastern Mindanao regions. This work has included the establishment of the Philippine Eagle Alliance, to coordinate the work of the various conservation groups working within the range of this magnificent but seriously threatened flagship species for Philippine conservation.