

## Foreword

Harvard professor and champion of biodiversity Edward O. Wilson wrote in his two books *Naturalist* (1994) and *The Diversity of Life* (1992): “The rain forests were and are of crucial importance as reservoirs of diversity. They teem with the greatest variety of plants and animals of all the world’s ecosystems...Hot spots are habitats with many species found nowhere else and in the greatest danger of extinction from human activity.”

The rain forests of the Philippines are part of the 18 hot spots in the world according to biodiversity experts. In these humid rain forests, several thousands of native plants exist. These forests also provide microhabitats for thousands of species of animal life. Three zones can be recognized in these forests: the three-storied lowland rain forest or dipterocarp forest with a closed canopy that prevents sunlight from penetrating to the forest floor and with many epiphytic ferns and lianas; the submontane or mid-mountain forest at middle altitudes with two layers of trees and more numerous tree ferns, bird’s nest ferns, lianas, rattans, climbing bamboos, and screw pines; and the one-storied montane or mossy forest at higher altitudes, with trees forming thick growths of epiphytic bryophytes and other plant species, such as pitcher plants.

Aside from rain forests, Wilson recognizes other types of habitats as hot spots such as lakes, river systems, and coral reefs. In the Philippines, freshwater lakes (for example, Lake Lanao) and coral reefs should also be considered hot spots. There were 18 endemic freshwater fish species that evolved in Lake Lanao. Thus far, only three species have survived intense fishing by fishermen and predation by an introduced species of goby. Fish in Philippine marine waters number about 3,000+ species and many of them are found in coral reefs. There are about 500 species of corals in Philippine coral reefs, second only to Indonesia in the number of species. Coral reefs in shallow marine waters could be destroyed by high water temperatures due to climate change, which in turn could reduce fish biomass. One possible solution to mass die-offs of shallow reefs is to create marine protected areas in depths beyond 40–50 m where ocean currents are expected to be cool enough to maintain the integrity of these deep reefs and their fish populations.

The Philippine Red List of Threatened Wild Fauna for 2020 lists 102 species of amphibians, reptiles, birds, and mammals as “Critically Endangered” and “Endangered” species in the Philippines, about two times the number I reported in 1998, which was 52 (Foreword for the book *Vanishing Treasures of the Philippine Rain Forest* by L.R. Heaney and Jacinto C. Regalado, Jr., 1998). Since there are more than a thousand species of native land vertebrates in the Philippines, these two threatened categories are about 10% of the total terrestrial vertebrate species in the country.

It should be noted that the 2020 Philippine Red List does not include the number of species that have gone extinct in recent years. Of course, it is very difficult to determine this number as it requires frequent regular monitoring of the various groups of native vertebrates. However, our fieldwork since the 1950s would indicate possible local extinction of at least two species of birds as both species have not been seen or collected in recent years. One of them is the Negros fruit dove *Ptilinopus arcanus*. I was part of the field party in Mount Kanlaon, Negros in 1953 when a pair of this species was shot with a shotgun by a member of the research team. One of the birds fell dead from a tree, but the other was able to fly away; it was probably hit but not fatally, and must have died later. The second bird species that has disappeared in recent years is the little grebe *Tachybaptus ruficollis* in the Balinsasayao Twin Lakes Nature Park in Negros Oriental despite the protection of the forest in the Park.

Some conservation programs in the Philippines have been somewhat successful in saving a number of animal species from extinction through captive breeding and returning the captive-bred individuals to their specific habitats in various islands of the country. Examples are the Philippine eagle, the Philippine crocodile, Philippine giant clams, some Philippine endangered species of birds, at least one lizard species, and some direct-developing frogs. The Department

of Environment and Natural Resources (DENR) has maintained an island serving as a sanctuary for marine turtles, which has allowed some species to successfully recover their depleted populations throughout the country. It has also developed a technology of mass production of seedlings of dipterocarp trees for reforestation, as well as creating many protected forest areas as nature parks. Silliman University has initiated and pursued the Marine Protected Area Program for coral reef conservation since the early 1970s. The Marine Science Institute of the University of the Philippines, DENR, Bureau of Fisheries and Aquatic Resources, several local governments, and some non-government organizations have participated in this conservation effort. Silliman also has established a captive breeding program on threatened species, which include the Philippine crocodile, the Visayan spotted deer, the Visayan warty pig, and the Negros bleeding heart pigeon. This program intends to release captive-bred individuals to the wild, but this program needs help from the Philippine government and other conservation agencies.

The protected areas of DENR require strict protection of biodiversity. A problem sometimes arises because some parts of protected areas were used by local residents for farming certain plants (for example, abaca) before their proclamation as protected areas. Periodic harvesting of these plants disturbs the fauna of protected areas and prevents the area from developing into a forest. The Protected Area Management Board for each protected area should consider this problem seriously. Our tropical rain forests have been reduced from 17 million ha in 1934 to less than 2 million ha at present. As most of our terrestrial biodiversity species are found in rain forests, our country stands to lose some of them at the present time and in the future.

The 44 scientific papers in this special issue provide data on our biodiversity and are necessary for programs on the conservation of biodiversity. These papers deal mostly with forest fauna and flora and only a few papers on marine species. Still, a few papers report on the important role of watershed areas in conserving biodiversity. A few papers said that the species they studied should be conserved to prevent local extinctions of our fauna and flora. Our younger scientists should be encouraged to engage in and publish more researches on our biodiversity. It is important that the young scientists of our country are encouraged, as well as financially supported, to conduct more research on terrestrial and marine biodiversity for publication in scientific journals. Aside from publication, there is also a need to disseminate research results through the media.

It is good that after a thorough review, the editors of the Philippine Journal of Science accepted these 44 scientific papers on Philippine biodiversity for publication in this special issue. Their decision is truly commendable.

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