

## OUR WILDLIFE RESOURCES AND CONSERVATION

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Philippine Biology boasts of a considerable number of wildlife species with a high degree of endemism. More than half of the 196 species of its indigenous mammals and about one-fourth of the 380 resident birds are endemic.

Of the several large islands that characterize the Philippines, Palawan (to include the Calamian Group off its north and Balabac and Bugsuk Islands to the South), being on the Sunda Shelf, has the richest and most distinct fauna (I. R. Grimwood, 1978). Its endemic species include the Palawan tree shrew (*Tupaia palawanensis*), Palawan porcupine (*Thecurus pumilus*), Palawan stink badger or skunk (*Suillotaxus marchei*), two squirrels of the genus *Callosciurus* and a flying squirrel of the genus *Hylopetes*. Other interesting examples of its mammals are the scaly anteaters or Pangolin (*Paramanis culionensis*), clawless otter, (*Amblonyx cinerea*), Binturong (*Arctictis whitei*), mouse-deer (*Tragulus nigricans*, found in Balabac only) and the Calamianes wild pig (*Sus calamianensis*). And of its numerous birds perhaps the endemic Palawan peacock pheasant (*Polyplectron emphanum*) is the most prominent, if not the most beautiful (the male that is!).

Second in the richness and diversity of its fauna is the Mindanao Island. Its endemic mammals include the Philippine gymnure (*Podogymnura truei*), flying lemur (*Cynocephalus volans*), Philippine tree shrew (*Urogale everetti*), Philippine tarsier (*Tarsius philippinensis*), two squirrels (*Callosciurus mindanensis* and *C. davensis*), two pygmy squirrels (*Nannosciurus luncefordi* and *N. surrutilus*), a flying squirrel (*Petinomys* or *Hylopetes mindanensis*) and two subspecies of the sambar deer (*Cervus* [Rusa] *nigellus apoensis* and *C. n. nigellus*). Among the birds the Philippine eagle, also known as Monkey-eating (*Pithecophaga*

*jefferyi*) is the most notable, although like the tarsier and the flying lemur it has extended its range to the islands of Samar and Leyte in the Visayas.

Other distinctive endemic mammals of the Philippines are the tamaraw (*Bubalos* or *Anoa mindorensis*) found only in Mindoro, particularly in Mt. Iglit, and now is reduced to some 200 individuals, the slow loris (*Nycticebus menagensis*) found only in Sanga-sanga Island of Tawi-Tawi and the leopard cat (*Felis minuta*) in Negros Island and Panay Island of the Visayas.

Actually, when we talk of wildlife we speak not only of birds and mammals but also of reptiles, amphibians and fishes. A famous scientist, Dr. Rabor, even went to the extent of including aside from the large forms of plants the unicellular animal and plant organisms. In the present paper, however, discussion is purposely limited only to the birds, mammals, reptiles, amphibians and their conservation.

At a glance, then, we have such a prodigious array of wildlife resources. Perhaps its impact on our socio-economic development could easily be surmised without much discourse.

### Birds

In the Philippines we have about 500 species of birds 350 (380, DuPont 1971) of which are resident and 150 are migratory (Alcala, 1976). Of this number, seven species have so far been included in the Red Data Book of the International Union for the Conservation of Nature (IUCN) as rare or endangered, to wit:

1. Philippine Eagle (*Pithecophaga jefferyi*)
2. Palawan Peacock Pheasant (*Polyplectron emphanum*)
3. Mindoro Imperial Pigeon (*Ducula mindorensis*)
4. Giant Scoops Owl (*Otus* or *Mimizuku gurneyi*)
5. Koch's Pitta (*Pitta kochi*)
6. Cebu's Black Shama (*Copsychus niger cebuensis*)
7. Ashy Ground Thrush (*Zoothera cinerea*)

It is a common knowledge that birds have their own virtues and inequities. For their inequities people tend to advocate their extermination basing on the damage birds cause to food crops, orchards, fruit and

forest resources. However, we shall find after examining some facts that the virtues of birds could easily outweigh their mischiefs.

Since time immemorial, birds partly suffice the basic dietary needs of man so much so that they have been extensively hunted for such purposes, which oftentimes extend beyond the natural limits where the species (especially the large ones) could still gainfully regain its normal population.

Try to imagine a world without birds. What will happen to our plants, the producers upon which most animals and even man himself depend for their source of food? Who can conduct a persistent and diligent check on the highly damaging insects which if let alone could lay waste all existing plant life? No better agent could outdo what the birds can. There is, indeed, much truth in this! Salim Ali (1977) has revealed that the variety, fecundity and voracity of insects are colossal. Over 30,000 species have so far been described from the Indian Subcontinent. Many of the insects are destructive pest of vegetation including our food crops (this is very evident in the Philippines being largely an agricultural country), economic timbers and forest produce. The fecundity of insects is phenomenal. For example, one pair of the American colorado beetle (*Leptinotarsa decemlineata*) would, without check, increase to 60 million in a single season. As for voracity, many caterpillars eat twice their own weight in leaves per day; certain flesh-feeding larvae will consume 200 times their original weight in the course of 24 hours (*Tigerpaper*, IV, 3).

Locust is another pest which had its time in the early fifties in the province of Cotabato when its swarm ravaged a wide area of cultivated crops in a matter of just a few hours. As we well know, the locust lays its eggs in capsules underground, each capsule containing about 100 eggs. As revealed by Salim Ali (1977), several of these capsules are laid by each individual. "On a farm in South Africa, measuring about 18,000 hectares, enough capsules were dug up to have produced 1,250 million locusts! It is obvious that with such astounding rates of reproduction and feeding potential it would not take long for all vegetation to disappear unless the hungry hordes were kept under constant and rigid control. This the birds do. A large proportion of the food of many birds is insects and their eggs. The insects are taken in all stages of their

life cycle, above and below the ground, as well as in the air and in the water. An idea of the prodigious appetite of birds, and thus the impact of the insectivorous species upon their prey, can be gleaned from the fact that many birds in the first few days of their lives consume more than their own weight of food in 24 hours. The rate of metabolism in birds is higher than in mammals and the high energy demands for swift aerial locomotion render feeding a continuous process." (Ali, 1977).

Still other astounding pests which are among the most damaging to agriculture, as have been the problem in Cotabato in 1954-55 (Rabor, 1955), are the rats and mice. Like insects, rats and mice are also prolific breeders. "It has been computed that a single pair of rats could increase at the end of the year to 880 rats. This figure is of course hypothetical and perhaps would never be attained in nature. But it is sufficient to point to their extreme reproduction potential and thus to the capacity for mischief of this ubiquitous group of vermin. Mice are even more prolific." (Ali, 1977). The owls and the hawks are the most important and constant natural checks on rodent population.

In the final analysis then, with respect to their economic status, birds are actually more beneficial than harmful.

Sad to note, however, hunting accounted for 42% of bird extinction (Alcala, 1976), while a large part of the blame goes to logging with an astounding rate of denudation and outright destruction of the birds' habitats.

### Mammals

Out of about 196 (180, Alcasid 1970) species of Philippine mammals, there are four species so far listed in the Red Data Book of the IUCN (*Tigerpaper*, IV, 2). These are the:

1. Mindanao Gymnure (*Podogymnura truei*)
2. Dugong (*Dugong dugon*)
3. Tamarau (*Bubalus* or *Anoa mindorensis*)
4. Calamian Deer (*Axis calamianensis*)

Aside from the above protected species, there may be more species of mammals which need immediate protection like the following: mouse-deer (*Tragulus nigricans*), wild pig (*Sus celebensis*), Philippine

tarsier (*Tarsius philippinensis*), Tree shrew (*Urogale everetti*), Philippine sambar deer (*Cervus [Rusa] francianus*), and the Philippine macaque (*Macaca philippinensis*).

Wildlife resources, especially mammals, played an important role in the food economy not only of our ancestors (Archaeologist Fox 1970, reported to have found bones of birds, bats, deer and pigs in Tabon cave, one of the caves inhabited by ancient men in Palawan), but also of present-day Filipinos, especially the mountain people. The wild pig and the deer have been the favorite game animals of the hunters, both natives and urban people, so much so that they are now fast becoming depleted (except perhaps in Sulu Islands and Lanao provinces where a majority of the people do not eat pork).

Mammals are not only important as food but they also offer an abundance of hide (the most important raw material for our foot-wears), and guano or organic fertilizers, i.e., scats of different species of cave-bats like Geoffrey's rousette (*Rousettus amplexicaudatus*), nectar-eating bat (*Eonycteris spalaea*) and insect-eating bats (*Microchiroptera spp.*).

Some mammals can also be good sources for musk oil (perfume) e.g., the Palm civet (*Paradoxurus philippinensis*) and Civet Cat (*Viverra zangalunga*).

Just like the birds, mammals are a very effective natural check for pestiferous insects. Sanguila (1962) studies 31 specimens of the Malay brown bat (*Scotophilus temminckii*). Stomach analysis revealed its food to be insects belonging to six orders, mostly beetles. Out of the 87 species of bats in the Philippines, there are about 59 species of Microchiroptera or 68% (Alcasid, undated paper) of the bat population and these are primarily insect-feeders. The tarsier (*Tarsius philippinensis*) is primarily an insect-eater, too (Alcala, 1976).

The importance of mammals are not juxtaposed with food or agricultural economy alone but also with scientific research. Our Philippine monkey (*Macaca philippinensis*) have been exported to the U.S.A. in planeloads for use as experimental animals in the laboratory for the production of vaccines. Mammals kept in zoos or as pets offer researchers captive-breeding studies and the like. Alcala (1976) noted how

Philippine scientists utilize animals for research in the various areas of public health behaviour, physiology, zoology, to mention only a few disciplines. The study of Macasaet, et al. (1970) on arboviral infections in man and other vertebrates in Negros Oriental showed that most lowland rats, bats, and birds contained anti-bodies against arbo-B viruses but did not generally react to arbovirus group A (Chikungunya Virus).

Frugivorous and herbivorous mammals of tropical rainforest play an important role in forest ecology and evolution by serving as agents of seed dispersal and of pollination (Alcala, 1976). A few examples are the civets (*Viverra Zangalunga*), palm-civets (*Paradoxurus philippinensis*), Philippine monkey (*Macaca philippinensis*), which swallow chunks of fruit including seeds which oftentimes are not digested. Such seeds are dispersed by these animals through their movements in the forests.

### Reptiles

There are about 171 or more species of reptiles in the Philippines broken down as follows:

Lizards	±	92	spp.
Snakes	±	74	spp.
Turtles	±	3	spp.
Crocodiles	±	2	spp.

From the above number, three species are listed in the Red Data Book of the IUCN which are considered rare or endangered. They are the:

1. Estuarine crocodile (*Crocodylus porosus*)
2. Sailfin Water Lizard (*Hydrosaurus pustulosus*)
3. Hawksbill Turtle (*Eretmochelys imbricatus*)

Reptiles are important not only as food but also for commercial purposes, scientific researches, especially in the field of medicine, and as natural check for insect population.

There are a lot of natives and even metropolitan people who relish the epicurean taste of the meat of the *sawa* or *bitin* snakes (*Python reticulatus*) and the *Sigwalo* or *walo-walo* (*Laticauda spp.*), turtles (*Cyclemys amboinensis*) and crocodiles (*Crocodylus porosus*). Alcala

(1976) pointed out that the most common predator of *C. amboinensis* is man. In fact, some restaurants include turtle soup in their menu, and one prominent restaurant in Makati, Metro Manila has an array of aquaria displayed, with live sea snakes wriggling, where any customer could take his pick.

So great has been the demand for the skins of reptiles for use as leather that the exportation of these animals has been so proportionated as to create a drastic change in the ecological balance of some countries, thus prompting export ban. An example is in Calcutta, where the export of venomous or non-venomous species of snakes (dead or alive) has been banned.

The estuarine crocodile (*Crocodylus porosus*) has been the object of trade for its skin as leather and its meat as food. The Association for Conservation of Wildlife in Thailand (*Tigerpaper*, II, 4) has reported that *C. porosus* is being threatened to extinction. For the purpose of meeting the commercial demands and upholding conservation at the same time, the *C. porosus* has been raised in captivity. The unprocessed skin of a three-year old *C. porosus* costs US \$85; its fresh meat US \$3 per kilo and dried meat US \$4 per kilo. The meat is sold like hotcakes not only because of its flavor but also because of its being an effective cure for asthma. An average 3-year old *C. porosus* weighs 14 kilograms. Approximately 5-7 kg. is marketable. Thus with the skin plus the meat, the value of an average crocodile is about US \$100 or P750.00. (*Tigerpaper*, II, 4).

Snakes like the Philippine Cobra (*Naja naja samarensis*) are used in the Alabang Laboratories of the Philippine Bureau of Health as source of venom in the manufacture of antivenoms.

A large number of lizards belonging to the Family Gekkonidae like *Hemidactylus frenatus*, *Peropus mutilatus* and *Cosymbotus platyurus* are welcome guests, being almost indispensable adjuncts in the house management of Filipinos. They are skillful hunters of cockroaches, mosquitoes, moths and ants. (Dickerson, 1928).

### **Amphibians**

The Philippines is rich in species of Amphibia. No less than sixty-

six have been enumerated by Taylor (1921) in his monograph and twenty-two species more have been discovered and described since then (Dickerson, 1928).

The amphibians of the Philippines are represented by only two orders: 1. *Apoda*- which is composed of only one family, the *Caeciliidae*, restricted to Palawan, Borneo and the Sulu Archipelago. 2. *Salientia* or *Anura*- with only four families (*Ranidae*, *Brevicipitidae*, *Bufonidae* & *Pelobatidae*) and 15 genera. (Dickerson, 1928.)

Perhaps, the most important uses of amphibians in the lives of Filipinos are as 1) Food—represented by edible species notably *Rana magna*, *Rana cancrivora* and *Rana limnocharis*; 2) as natural check for insect population—most of the Philippine species of amphibians belong to the order *Salientia* (Dickerson, 1928) which families and genera are represented by frogs and toads. As we all know, frogs and toads feed on insects like mosquitoes; and 3) experimental animals in the laboratory courses of basic biology and zoology.

No amphibians species have yet been considered endangered nor included in the Red Data Book of the IUCN. Probably, it may be due to some reasons like 1) its peculiar habits, e.g., a species of *Ichthyophis* (a caecilian) place their eggs in underground holes near water; the *Ichthyophis glutinosus* (Linnaeus) coils about its eggs, evidently for the purpose of protecting them from their enemies; *Polypedates leucomystax* (Gravenhorst), banana frog, lays its eggs in a mass of froth or foam deposited along the edges of small pools of water, on reeds or plants growing in the water, or on an overhanging bough of a tree at some distance above the water; *P. pardalis* (Gunther), often lays its eggs in water collected in the axils of the leaves of abaca (*Musa*) or *Alocasia* (Dickerson, 1928); 2) being quite prolific breeders and 3) elusive preys being mostly nocturnal and hibernators during dry season.

### Conservation

Conservation simply means “well-planned management of natural resources.” A considerable number of people still has that negative feeling against conservation for to them it means “DON’T DO THIS, DON’T DO THAT.” This should not be the case. There is nothing wrong with utilization or exploitation of our natural resources; after all

it is for man's welfare and survival. In fact, natural resources are so well interwoven with the life and culture of the people that when we look at the country's economy we have to view it through its natural resources. Wildlife and forests are renewable resources, thus it is very clear that the future of mankind must therefore be based on them.

What actually is wrong is when the exploitation becomes so unrestrained and the utilization so unregulated as to conspire to bring many animal species to the brink of extinction. As Prof. Rabor (1975) pointed out, the basic question one must bear in mind in the preparation of any plan of development and exploitation of any specific natural resource is: "Does the plan for the Development and Exploitation of a specific natural resource fall within the structural and functional fabric or framework of the ecosystem in that particular locality where the natural resource is found?" The rationale behind this is that normally natural ecosystems have the ability to maintain balance in themselves in response to any external disturbance if such a disturbance is still within reasonable limits. In other words, the balance or equilibrium in any specific ecosystem is dynamic and self-stabilizing.

In the Philippines, the significance of wildlife conservation is enhanced by the high degree of endemism as discussed earlier in this paper. Actually, we have enough conservation laws and established national parks, game refuges and birds sanctuaries in the Philippines. The problem perhaps lies on the following factors: 1) lack of proper considerations of the full ecological requirements of the species. 2) Proper implementation of the legal provisions, i.e., for the protection of our wildlife we have about 62 national parks, game refuges and bird sanctuaries established as early as 1933 (34 in Luzon, 10 in Visayas, 14 in Mindanao, 1 in Sulu and 3 in Palawan) but the question is, has there been enough personnel watching over these parks? 3) How to effectively disseminate the gospel of conservation to the general public? It seems that only those who are natural scientists are interested in wildlife conservation. In the poor country of Papua-New Guinea, H. A. Haantjens (1977) observed that since conservation ranks low among human wants, its need is most strongly felt by those members of the society whose more basic requirements are already amply satisfied. The

least support, then, come from the poor and industry workers who have more pressing problems to worry about and who may conceive of conservation as some sort of threat to their livelihood. Alcala (1976) has suggested some approaches to conservation like 1) Stomach Approach—the role of animals in food economy to the people should be clearly explained and demonstrated; and this has a rather logical assumption that people tend to take good care of resources which they derive an immediate benefit; 2) Food Chain Approach—to consider food chain leading to man and the cycling of nutrient within a habitat or ecosystem; this is quite effective in the sense that people know the basic food requirements of organisms; 3) Fear Approach—this employs fear as a motivating factor i.e., we let people realize the disastrous effects of calamities like flood, drought and hunger.

It may be worthwhile to mention some institutions directly or indirectly involved in Wildlife Conservation with varying concerns or specializations. Some are deeply concerned with Conservation Education, research support for conservation and others hold conferences and take population of natural history as hobby. These institutions are:

1. Ministry of Education and Culture
  2. Ministry of Natural Resources
  3. Ministry of Agriculture
  4. National Research Council of the Philippines
  5. National Science Development Board
  6. National Power Corporation
  7. IUCN
  8. UPLB-PCARR
  9. UNESCO
  10. National Museum
  11. World Wildlife Fund
  12. Pacific Science Congresses
  13. Silliman University
  14. MSU-Natural Science Museum
  15. Philippine Wildlife Conservation Association
- etc.

## Recommendations

Some suggested solutions which may actually be the only hope for survival of some of the species are:

1. Captive breeding programme, whereby the numbers of rare species can be rebuilt to optimum levels and re-introduced into their natural habitats.
2. Domestication of wild animals—"Experiments in the domestication of eland in Africa have been successful enough to encourage the belief that other wild bovines might in time be added to mankind's domestic stock. The banteng, a wild ox, has already been domesticated in Indonesia. Man's new species of meat-producing domestic animals are all members of the order Artiodactyla which has 192 species in all." (Food and Environment, FAO 1976, *Tigerpaper*, IV, 2).
3. Since the Philippines is largely composed of small islands, separate conservation areas are needed to spread over a wide range of islands meeting all ecological requirements of the specific animals to be protected.
4. Aside from establishing reserves covering a wide range of ecosystems, special species-conservation reserves will be necessary if they are to be saved. (I. R. Grimwood, 1978).

The prospects of our wildlife resources and conservation may still be bright ahead if only man should realize that these rich resources have been created for him. He alone has the inalienable prerogative to exploit them. However sad their plight today may be, only he can take the blame. Naturally only he can protect and save them if only to save himself.

Let's expect for a total disaster when a particular species of mammals called *Homo sapiens* joins the list of the IUCN Red Data Book!

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