Birds of Madagascar and Their Conservation

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Striding up a steep hillside with the loud whisper of a rushing stream in the background, I stepped into a mist-net lane I had cut a week before. As I entered the clearing, a medium-sized brown bird squawked and flew off from eye-level. Carefully searching the nearby vegetation, I became one of a lucky handful of foreigners to ever find a nest of the Brown Mesite *(Mesitornis unicolor),* a rare forest-dwelling relative of rails. The large egg, delicately colored in salmon with liver-colored spots, rested precariously in a frail, dove-like nest positioned at the end of a sloping sapling. This encounter with the Brown Mesite is just one of many ornithological marvels I witnessed during a typical day in Madagascar, a biologist's Mecca.

Madagascar is unique. This large island has been adrift in the Indian Ocean for millions of years, cut-off from Africa. A high percentage of the flora and fauna of Madagascar is endemic, having evolved in near-isolation from the rest of the world. Madagascar's ecosystems vary tremendously from rain forests in the northeast receiving several meters (yards) of rain per year, to the spiny bush in the southwest where only a few centimeters (about 1 inch) of rain may fall annually. Living in this wide array of habitats are a number of unique and peculiar birds. Many of these are rare, seldom seen by ornithologists and never kept by aviculturists.

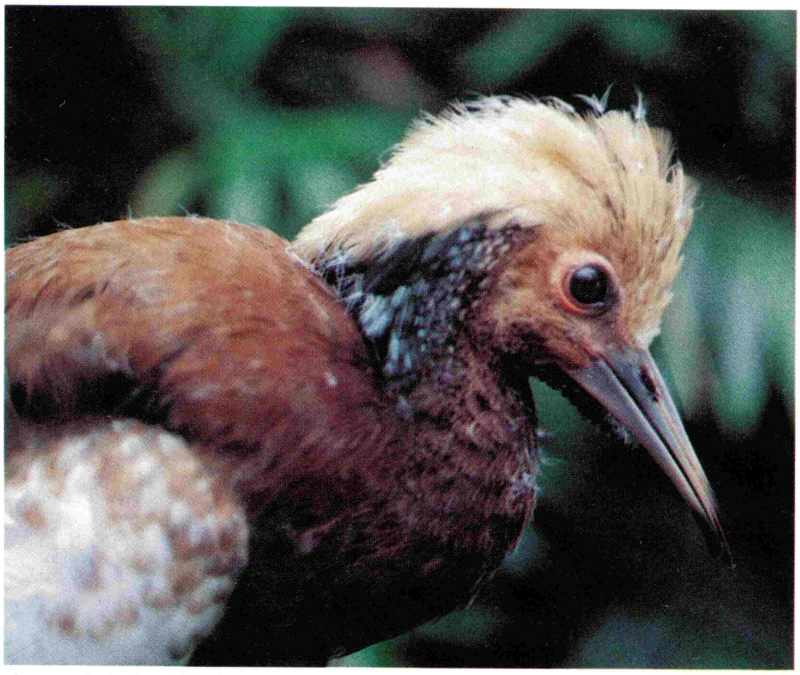
Despite their abilities of flight, two-thirds of Madagascar's 200 breeding species are found nowhere else (Dee, 1986). Five entire families of birds – Mesites, Ground-rollers, Cuckoo-roller, Asities, and Vangas - are confined to Madagascar and a few neighboring islands. These families are poorly known by even most ornithologists. According to the International Council for Bird Preservation (Collar and Stuart, 1985), 28 species of Malagasy birds are threatened and 14 species are considered as near-threatened. These species represent between one-fifth and one-third of the island's endemic bird species.

The primary threats to Madagascar's birds today, habitat loss and overhunting, have already eliminated many unique Malagasy creatures. Since people first arrived on Madagascar 1500 to 2000 years ago, much of the island has been deforested, leaving the red lateritic soil exposed and eroding, with little chance for forest regeneration. Gone are many Lemurs (some the size of Great Apes), a hippopotamus, a giant tortoise, and the entire family of Elephantbirds. The flightless Elephantbirds, known only from Madagascar, ranged in size from that of rheas to truly enormous brutes standing several meters (yards) tall and estimated to weight 450 kg (1000 pounds) (Amadon, 1947). Remains of the eggshells of these birds are still common in the south. Walking along a remote, white sand beach, I came across shell fragments of their 8 liter (2 gallon) eggs. Standing in the blazing sun, turning bits of eggshell over in my fingers, I wondered what these birds were like. What did they eat? How long did they incubate their eggs, the largest eggs ever known? How did their chicks break free from these vast vessels? I wondered if the egg of the Brown Mesite, like that I found in the rainforest, would someday be known only from a few specimens in some museum?

Malagasy Birds in Aviculture

While captive breeding sometimes offers hope to endangered bird species, few of the endemic Malagasy birds have been kept in captivity. To

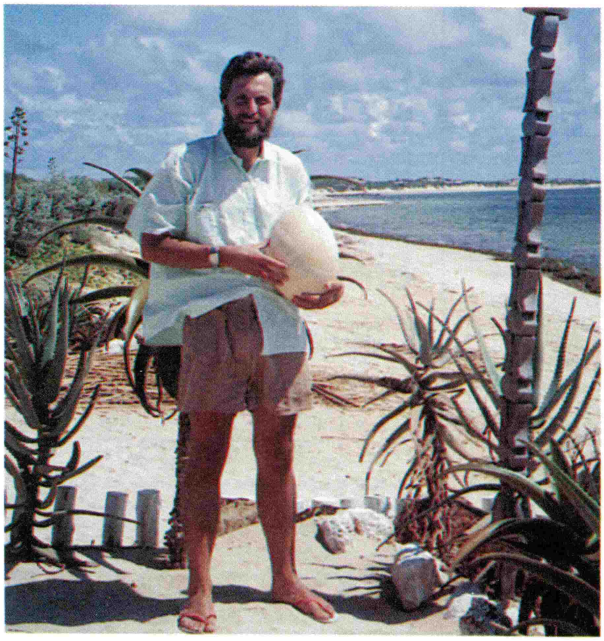
Photos by Michael S. Putnam



A recently fledged Madagascar Crested Ibis (Lophotibis cristata). As an adult, the facial skin of this forest-dweller will become bright red and devoid of feathers.

Burning of the deciduous forest to clear land for farming threatens the island's baobab trees (Adansonia spp.) as well as other plants and animals of western Madagascar.

A Vasa Parrot (Coracopsis vasa) perches gingerly on a spiky Didierea tree in southwestern Madagascar. This bird and its flock members were eating the meristematic tips from this plant.



The author with a reconstructed egg of an Elephantbird. Rarely whole eggs and often shell fragments can still be found in southern Madagascar. These eggs are the largest known from any animal.

A female Rufous Vanga (Schetba rufa) incubates three eggs. This bird and her mate produce vocally complex duets in addition to making clacking and popping sounds with their bills.

The Crested Drongo (Dicrurus forficatus) is a wide-ranging species that is found in each of Madagascar's different forests. It has adapted to living in some disturbed areas.

The Pitta-like Ground-roller (Atelonis pittoides) is one of four species of the endemic Ground-roller family that inhabit Madagascar's rain forests. A fifth species lives in the spiny subdesert of the southwest. All of these species lay their eggs at the end of tunnels they excavate in banks or the ground.

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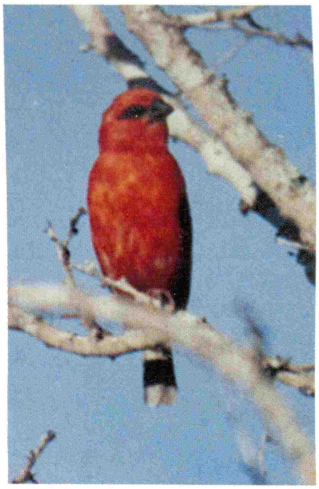
This male Sunbird-asity (Neodrepanis coruscans) is only very distantly related to the true sunbirds. The fleshy facial wattles greatly expand in the breeding season and nearly touch at the top of the head.

The Souimanga Sunbird (Nectarinia souimanga) occurs commonly throughout Madagascar, ranging from northeastern rain forest to the southwestern subdesert. This nectar-feeding bird pollinates many species of plants.



A male Madagascar Red Fody (Foudia madagascariensis). One of the island's more common birds, it ranges throughout most of the island including urban areas.

The author with a forest-dwelling Madagascar Pygmy Kingfisher (Ispidina madagascariensis) that was caught with a mist-net on the Masoala Peninsula.

A male Sakalava Weaver (Ploceus sakalava). The males build their nests in colonies and display from their nests during construction to attract a mate. This bird is widespread in the dry western parts of Madagascar.

the best of my knowledge, only the following birds are currently being kept in zoos or private collections outside the country: Meller's Duck *(Anas melleri),* Madagascar Partridge *(Magaroperdix madagascariensis),* Greater Vasa Parrot *(Coracopsis vasa),* Lesser Vasa Parrot *(Coracopsis nigra),* Gray-headed Lovebird *(Agapornis cana)* and the Madagascar Red Fody *(Foudia madagascariensis).* Readers of Roles and Cracroft's (1990) article on their efforts to breed the Greater Vasa Parrot will be interested to know that the eastern race *(C. v. vasa)* was bred in Switzerland in 1988 by Dr. Roumuald Burkard. The western race *(C. v. drouhardi)* was bred by Mr. Dieter Meyer of Germany in 1986 and again in 1988 (Robiller and Meier, 1989). In the past, the following endemic species were kept, and sometimes bred outside of Madagascar: Madagascar Teal *(Anas bernieri),* Madagascar Pochard *(Aythya innotata),* Madagascar Buttonquail *(Turnix nigricollis),* Madagascar Turtle Dove *(Streptopelia picurata),* and the Madagascar Mannikin *(Lonchura nana).*

Aviculture in Madagascar is almost non-existant. Unlike its impressive lemur collection, few birds are kept in the zoological garden at Parc Tsimbazaza in the capital, Antananarivo. Recently the waterfowl collection has been expanded, and the aviaries of other birds have been newly landscaped. A private hotel in the western port city of Mahajanga maintains a collection of birds which includes six species of herons, including two Madagascar Herons *(Ardea humbloti),* White-faced Whistling Ducks *(Dendrocygna viduata),* Fulvous Whistling Ducks *(D. bicolor),* a Black Kite *(Milvus migrans),* a female Madagascar Partridge, a Helmeted Guineafowl *(Numida meleagris),* Gray-headed Lovebirds, and Madagascar Red Fodies. Birds were occasionally for sale in the market in Antananarivo including a Squacco Heron *(Ardeola ralloides),* nestling Madagascar kestrels *(Falco newtoni),* Greater and Lesser Vasa Parrots, Gray-headed Lovebirds (the most commonly offered psittacine), Madagascar Red Fodies and Madagascar Mannikins. One vendor told me that Madagascar Green Pigeons *(Treron australis)* could be procured.

Unfortunately, of the 42 threatened and near-threatened species, few are good candidates for captive breeding programs. The two most likely species are the Madagascar Teal and the Madagascar Pochard. The latter species is dangerously close to extinction; a single male was recently uncovered by Lucienne Wilme after years of searching by her and other ornithologists (Wilme, 1991).

The status of these birds is uncertain since so little is known about many of them. This is due, in part, to the small number of ornithologists working in Madagascar from the 1930s through the early 1980s. For example, the Red-tailed Newtonia *(Newtonia fanovanae),* a small songbird, was known from a single specimen collected 60 years ago. In 1989, this bird was rediscovered by Steven Goodman and Thomas Schulenberg (1991) hundreds of kilometers from the original locality. The bird was found to be not uncommon and has since been found in a second rainforest area (Evans, 1991). Clearly, the status of many of Madagascar's birds needs to be better explored.

It is for this reason that the American Federation of Aviculture funded my efforts to census forest birds in Madagascar. My two field seasons extended from October 1989 to April 1990 and from September 1990 to February 1991. During this time my research assistant, Jennifer Graetz, and I worked at four study sites. The first was the newly created National Park at Ranomafana, a mid-altitude (1000 meter) rainforest in the southeast. The second was a lowland rainforest site (below 450 meters) on the Masoala Penisula in the northeast. Here we were joined by a Malagasy university student, Mr. Roche Mahatondra. Another study site was in the western deciduous forest at the Ampijoroa Forestry Station. The final study site was near Toliara, at the village of Ifaty, in the unprotected spiny subdesert of the Southwest. These sites were chosen to include the greatest diversity of Madagascar's forest bird species.

The primary objective of my research was to obtain density estimates (number of individuals per unit area) of as many forest species as possible. With these density estimates, conservationists can begin assessing whether there are large enough populations of each species within protected areas to insure their long-term survival. In preparation for the dawn census counts, I made numerous recordings of bird vocalizations. As we always heard more species than we saw, we relied heavily on knowing bird vocalizations during our censuses. More than 95 percent of the detections during the census counts were of vocalizations alone. Since Madagascar is so poorly known, I tried to collect additional information on its birds whenever possible. I began collecting data on the breeding biology and foraging behavior of some of the forest birds since knowing their reproductive rates and resource requirements is important to future conservation planning. I observed the nest of some rare species such as the Madagascar Crested Ibis *(Lophotibis cristata),* Pollen's Vanga *(Xenopirostris polleni)* and the Helmet Vanga *(Eurycerosprevostii).*

Although the census data are still being analyzed, I can relate some of the behavioral observations. I found that 11 of the 14 species of vangas, a group of shrike-like birds, use their feet to handle their prey. Unlike many other songbirds which clamp food between the perch and their feet, the vangas grasp their prey in a foot while resting the tarsus on the perch while consuming their meal. They are able to slightly raise the foot toward the bill to receive a food item but are not as dexterous as parrots in handling food with their feet. One of the islands's most unusual birds is Lafresnaye's Vanga *(Xenopirostris xenopirostris),* whose peculiar bill is something of a mystery. This bird's lower mandible is concavely curved while the upper mandible is hooked at the tip. This configuration results in a gap between the two mandibles of the closed bill. I discovered that Lafresnaye's Vanga inserts the curved lower mandible into holes in dead wood and, while using the hooked tip as a fulcrum, pries open insect galleries with a forward thrust of its head. This behavior is all the more remarkable since there are no woodpeckers found on Madagascar which would normally exploit this food resource. The roles of woodpeckers have been filled by several other birds as well, and a bizarre lemur, the Aye-aye (Daubentonia madagasacariensis).

One morning I happened onto a recently hatched downy chick of the rare Subdesert Mesite *(Monias benschi).* Cupping the chick in my hand, I was surprised to see three adults, one female and two males, frantically calling in defense of this chick. The female approached to within a meter

(yard) of me and with her wings raised, she paced hurriedly back and forth calling "nak-nak-nak." This encounter suggests that the species may be a cooperative breeder where more than one male and one female help in the raising of the chicks. Just as ornithologists are starting to uncover some of the fascinating stories these birds have to tell, however, we are faced with the prospect of losing them.

Bird Conservation in Madagascar

In addition to the early losses of species the island suffered, many species of plants and animals are suffering from the continuing loss of habitat. The major threat to the eastern rainforests is the cutting and burning of trees to clear land for subsistence agriculture. In the west, fires to clear more land for farming and to burn dead grass off rangeland destroy the remaining forest. Forests are also converted directly into charcoal for cooking. Little other fuel is available in the countryside or affordable in the cities. In addition, the conversion of marshes to rice paddies has threatened species such as the Slender-billed Flufftail *(Sarothura watersi)*, a rail (Wilme and Langrand, 1990). Hunting is largely for subsistence and its impact on the avifauna is not well documented. The critically endangered Madagascar Fish Eagle *(Haliaeetus vociferoides)* has, however, suffered from hunting as well as from degradation of the lakes and rivers it frequents (Langrand, 1987). Only 50 pairs of this eagle are thought to survive.

While the plight of many of Madagascar's unique birds is serious, several encouraging actions are taking place. Madagascar is the first African nation to negotiate a debt-for-nature swap. In these swaps, conservation groups buy-up, at a discount, a portion of the country's foreign debt from banks in developed countries. In exchange, the country then issues bonds in local currency to cover this debt and the earnings from these bonds go to support local conservation efforts. In Madagascar, these debt-for-nature swaps are being used to hire and train additional guards to better protect the already existing protected areas. The govenment has established several new national parks to protect rain forests. Also an increasing number of Malagasy, British, French and American ornithologists are conducting research on the island's birds. The publication of Olivier Langrand's "Guide to the Birds of Madagascar" (1990) should attract more people to the study of Malagasy birds. This guide should also attract additional birdwatchers and nature tours from around the world to the poor country of Madagascar. Such an influx of eco-tourism could help support Malagasy conservation efforts and demonstrate that native birds have economic value in the wild.

The future of the Brown Mesite and the rest of Madagascar's avifauna depends on protecting sufficient habitat throughout the island. Simply setting aside reserves for birds without addressing the causes of deforestation will not provide lasting results. Assistance must be provided to the people living in and near the forests so that they can live in a way that minimizes forest disturbance. The establishment of reserves must help the local inhabitants who obtain fuel, food and medicines from these for-

ests. Insuring the survival of the forests insures the availability of these products to the people as well as habitat for birds. In a poor country such as Madagascar, the government is unable to adequately address all of its social and conservation needs despite a commitment to its people and its natural heritage. Critical choices must be made soon as to which areas will be preserved and which will disappear. Research by Malagasy and foreign scientists and conservationists is beginning to address these conservation challenges. Much of the funding for this work will have to come from outside sources. Tropical ecosystems provide many important services and products, such as plants of known and potential value as crops or sources of medicinal drugs (Myers, 1983). We in the developed countries have already benefitted from Madagascar's biological bounty. Compounds from Madagascar's Rosy Periwinkle have provided modern medicine with two of the most effective drugs yet known against childhood leukemia and Hodgkin's disease (Rubin, 1983). It seems only fair that if we want to reap this harvest then we should help preserve it. Groups such as the American Federation of Aviculture play an important role by supporting conservation efforts in the financially poor, but biologically rich countries of the tropics.

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