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Finding Solutions

Native populations in many parts of the Pacific and Southeast Asia include bats in their diet, creating unique problems for conservation planners □

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by Ian Craven

Working in Irian Jaya (the western half of New Guinea) for the World Wildlife Fund (WWF) has presented me with many opportunities to learn about the bats of this largely unknown land. Habitats ranging from tropical coral seas to rain forest, alpine, and even mountain glaciers, along with the fact that New Guinea has been an island for eons, has resulted in high biological diversity and endemism. Classification of both plant and animal species here is still in its infancy and undoubtedly there remains much yet to be discovered. Irian Jaya is often referred to as the "last frontier," but as with all other frontiers, it too is being pushed back. With the advent of petroleum exploration, development and rapid change has arrived.

WWF is helping the Indonesian Conservation Directorate to plan and establish a system of protected areas. Much of my work centers around the Arfak Mountains, a small area near the east coast of the Birds Head Region, proposed as a nature reserve. Spending weeks at a time in the field, collecting data for the management plan, a number of interesting bats have been found in my mist nets. Among them has been the Round-eared tube-nosed bat (*Nyctimene cyclotis*) and a Small-toothed long-eared bat (*Nyctophilus microdon*), believed to be the only specimen collected since it was described in 1954 from the Hagen Mountains in Papua New Guinea.

The Hatam, a local tribal people of the northern Arfaks, call the tube-nosed bat the "evil bat," likely because of its rather bizarre appearance with yellow spots and large square teeth. In fact, the Hatam play an important part in the lives of both fruit and insectivorous bats: they eat them! Bats are an additional source of protein for these people who rely on slash and burn agriculture along with any animals they can catch by hunting. Bows and arrows are still used, but they are fairly ineffective. Now and then a deer is caught, maybe a bird or cuscus (an arboreal marsupial), but for the most part the main protein source is domesticated animals such as pigs and chickens.

My first contact with "harvesting" bats in Irian Jaya came in the fruit garden of a village in the southern Arfak Mountains. A quiet, still night soon turned into a frenzy of crashing foliage and shouts as villagers brandishing branches tried to knock fruit bats out of the air. At least two species tried to avoid the branches that night, the Blossom bat (*Syconycteris australis*) and Geoffrey's bat (*Rousettus amplexicaudatus*). Both commonly appear around village gardens in the lower altitudes of the mountains. During our three-night stay, the people tried on two nights to catch bats, but fortunately they lacked both flashlights and the timing necessary to down large numbers. They did manage to catch one, a Blossom bat, which after being roasted on the fire, tasted good (or so they told me).

Farther north, caves have formed where limestone has overlaid the igneous rocks of the Arfak massif. The cave systems are small and, unfortunately, do not provide the bats that roost there with much protection from local hunters. I believe that I have visited all of the large caves in the Arfak Mountains and each showed evidence of human disturbance. One had no bats, even though the locals told me that there were many "varying types" that lived there. The cave was only about 230 feet long with a roof so low that no bat could roost without being easily plucked off by a prospecting local. In fact, just before my arrival, the cave had been harvested. They do this by sealing the

entrance with foliage so that the bats inside cannot escape. Hunters then enter waving leafy branches to knock the bats to the floor. When I arrived, foliage was still blocking the entrance and bats had not been able to reenter the cave. What may be the final note for the bats of this particular roost is that now a garden is being built around its entrance. What was until recently prime rain forest is now being converted to a sweet potato patch.

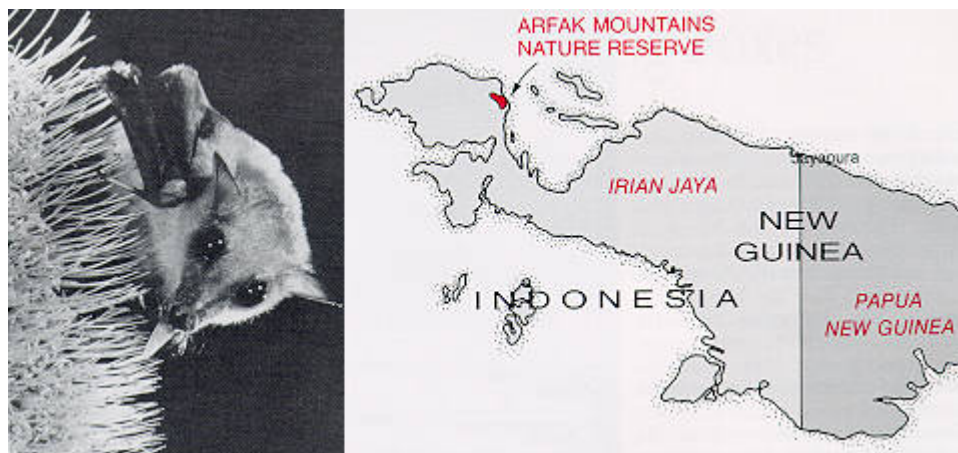
The largest cave in the area offers much more protection to the insectivorous bats which have been recorded roosting there. Three species of bent-winged bats (*Miniopterus pusillus*, *M. schreibersii* and *M. magnater*) and a large nursery of horseshoe bats (*Rhinolophus euryotis*) were found. Local people also harvest here, but claim to only take bats during the "flower season," [see "Flying Foxes and Economics" in this issue] when many species are rearing their young and are easier to catch.

The problem is how to manage diminishing bat populations so that the needs of both bats and people are satisfied. Keeping hunters out of the caves would not only be difficult, but unfair to a people who rely on bats as a food source. In the end, however, this may be the only solution. First, the large cave just described, along with nearly 10,000 acres of rain forest surrounding it, is to be part of the protected area. It will be managed so that no one may enter the cave, leaving the bats undisturbed. Other caves some miles away will have gates placed over their entrances, and access will be allowed at specific times of the year, but not during the "flower season," so bat populations will have a chance to recover.

The hope is that when the smaller caves are harvested, the bats will be able to recover their numbers by overflow from the larger groups living in the undisturbed cave. Local people also want access to certain caves to collect guano for their own relatively infertile gardens, as well as for sale to missionaries. The difficulties with some of these suggestions are recognized, and certainly much is unknown about bat population management in this part of the world. However, in places such as the Arfaks, where people have always been sustained by the rain forest, it is becoming clear that the conservation of species largely depends on our ability to manage them as a renewable resource. This approach makes conservation more readily acceptable not only to the local people, but to governments as well. Only time will tell how successful we have been.

(Bio)

Ian Craven is a member of BCI and has been a Conservation Officer with WWF in Irian Jaya for the past two years.



Blossom bats are some of the world's smallest flying foxes, but even they are a target for local hunters who need to supplement a generally protein-deficient diet. PHOTO BY MERLIN D. TUTTLE.

(MAP OF INDONESIA AND NEW GUINEA)

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