
Breeding Butterflies to Save Butterflies

Tropical nuts? Eco-tourism? Sorry. Raising or collecting insects to sell is the only incentive some indigenous peoples have to save their tropical forests. Will you support them?

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You probably know that virgin tropical forests are declining at an alarming rate -- over half have been cleared in the last 40 years. And you may be aware that up to 2/3rds of all living species are tropical -- an immense wildlife storehouse that contains untold medicines and other products for our future. The case for saving tropical forests is clear. Many support this by buying "products of the rainforest," or helping conservation organisations working in tropical nations.

In the face of all this, collecting or buying tropical butterflies seems nothing less than a way to speed up their extinction. Right?

Wrong! Those who equate killing butterflies with destroying butterflies don't know much about butterflies, the tropics, or what strategies have gotten people in developing countries to save their forests. The fact is, buying tropical insects for your collection may be the best investment you ever made in tropical forest protection. This fact sheet tells you why.

Papua New Guinea (PNG): World Leader in Conserving Tropical Butterflies... by Utilising Them!

Papua New Guinea (PNG), a small nation located north of Australia, in another 20 years will likely be one of the last 4 places on earth to still have large tracts of virgin tropical forest (1). And it has some pretty

fantastic insects, including the world's largest (Queen Alexandra's Birdwing) and second largest (Goliath Birdwing) butterflies, the world's longest walking stick, largest katydid, hammer-headed flies, and a weevil that grows a garden of lichens and mosses on its back. Added to this are 3000+ species of orchids, 10% of the world's rhododendrons, and most of the world's birds-of-paradise and bower bird species. From an insect perspective, PNG is unique in other ways too. It is the only country whose constitution designates insects as one of its renewable natural resources (2). It's also the only country whose government set up an entity to develop this insect resource in a sustainable way -- the *Insect Farming & Trading Agency* (in Bulolo, Morobe Province). The agency started in 1978 (3) and now sells nearly \$400,000 worth of PNG insects yearly to collectors, naturalists, scientists and artists around the world. It buys these insects exclusively from Papua New Guinean villagers (4). Most of these are collected, but in the case of the common birdwing butterflies, the PNG government requires that they be bred.

How Can Killing Butterflies Save Tropical Rain Forests?

In developed countries, the "national park" strategy for conservation -- buying land and setting it aside for wildlife -- worked well. People violated the rules sometimes, but it was rarely too much for a few rangers and the law to handle.

With that kind of track record, it was natural that the "national park" strategy would be tried in the Third World(5), e.g., to protect Africa's big game wildlife. But over 30 years ago, conservationists noticed that the strategy wasn't working. Income earned from these national parks was largely going into government coffers. The surrounding people were benefiting little, if at all. Small wonder: they had little or no incentive to keep those parks intact. On the other hand, they *could* make money by poaching. And where human populations were increasing and survival was at stake, it was far more rewarding to cut firewood or make gardens inside those parks, than to leave them untouched. Think about it: Why would anyone who just barely eked out a living, elect to leave the wildlife alone, just because "it's nice to have around?" That naive assumption typically comes from people who have all their basic needs met, and forget that their fortunate lifestyle gives them a unique perspective.

The International Union for Conservation (IUCN) recognised that the "national park" strategy had failed for developing countries in its 1980 *World Conservation Strategy* (6). They recommended instead a strategy called 'conservation through development' (7). Basically, it entails finding out the needs of the local people, then offering incentives which provide rewards to help them better themselves, in return for work and behavior that helps wildlife. Culling and selling excess wildlife is a very effective incentive. This is simply because everyone likes a tight "cause and effect," and this incentive tightly links conservation with development opportunities (8): the peoples' livelihood is closely tied to the survival of that wildlife population. This explains why elephant populations were stable in southern African countries where sustainable harvests were carried out; in contrast, the "totally protected" national park populations further north were being decimated by poaching.

In PNG, villagers collect butterflies and other insects from their forests to sell. Or they plant caterpillar food plants and sell the adult butterflies that develop on those "extra" foodplants (a process known as "butterfly ranching"; touted as an almost perfect expression of the 'conservation through development' strategy --(9)). Many make hundreds of dollars a year in a country where there is only 15% formal employment. Villagers realise that the forest is the source of this income. That gives them greater incentive to leave the area alone, particularly when they're shown how those insects require the forest to survive. The money they earn is important. They need it to pay their children's school fees (sorry, education is never free). Also, just like you don't forego arguable luxuries, such as a private car, PNG villagers don't care to forego their morning tea, their cooking pots, and other simple items that cost money.

PNG villagers are clamoring for money. If they can't make it off of forest butterflies, they *will* find other ways. Cash crops require forest clearing; logging royalties require forest clearing. Are those better alternatives than collecting and selling butterflies?

Aren't the Villagers Collecting Too Many Butterflies?

They might if they could. But the fact is, insects are awfully hard to overcollect (10). The only insects that seem to be vulnerable to overcollecting are those whose populations (1) were naturally very small, e.g. relictual or small island populations, or (2) were already decimated by habitat destruction. In fact, two imminent biologists, Drs. Robert MacArthur and Vincent Dethier, once purposely tried to overcollect a localised eastern US butterfly, the Baltimore. They failed (11)! Essentially, their actions were little different than that of any predator (e.g., a bird, or an explosion of spiders) that had found the population. With each

caterpillar collected, the next one was harder to find. Those few caterpillars that escaped detection actually had a greater probability of developing into butterflies (according to the ecological theory of "density-dependent population regulation." Because the resulting butterflies were scarcer than usual, they weren't so likely to be found by naturally occurring predators -- so the butterflies were more likely to survive and reproduce. So the following year, the caterpillar population had bounced back to usual numbers. The population was not hurt -- yet this was a sedentary, localised population that should have been exceptionally vulnerable to overcollection!

The fact is, many biologists take population management concepts based on vertebrates (e.g., birds, deer), and apply them to insects. That is wrong. Nearly all insects have far greater reproductive capabilities than vertebrates; they can sustain far greater "harvest" rates. In short: it doesn't matter whether the 'harvester' is a bird, a praying mantid.. or a butterfly collector!

Aren't the Birdwing Butterflies Being Sold, Endangered?

Generally no! That politics sometimes masks fact is evident for the spectacular birdwings, the largest butterflies in the world, with numerous species distributed from southeast Asia to Australia.

In PNG, the only birdwing that is even *potentially* endangered right now is the world's largest butterfly, Queen Alexandra's Birdwing (*Ornithoptera alexandrae*). For years it was touted as a 'world conservation priority' by IUCN, and protected by PNG and international legislation. It's on the U.S. List of Endangered Species too. And what happened during all that attention and protection? Its habitat was steadily decimated by logging and oil plantation expansion (12). So much for the "old way" of saving wildlife. *Had* PNG villagers been given forest conservation incentives (raising and selling the butterfly being the easiest and cheapest to promote) and absolutely no protective legislation had existed, it is probable that more habitat would survive today. Remember: "*people can alter their behavior when they see that it will make things better....*"(6). All the endangered species legislation did nothing to improve the well-being of the Papua New Guineans.

When PNG's birdwings were first protected by the PNG government (13), little was known of their distribution. Subsequent surveys show that PNG's birdwings are often localised, but are widely distributed (14); new populations discovered all the time, most recently of the world's largest butterfly (15). Except for the world's largest butterfly, all other birdwings are on 'Appendix II' of CITES (Convention International Trade in Endangered Species of Fauna and Flora). Being on Appendix II does *not* mean the species is threatened or endangered. It only means that trade in the species is being monitored (16).

The PNG government has allowed the Insect Farming & Trading Agency to help one village grow and sell the Goliath Birdwing. A village-based butterfly ranching program for the Meridionalis Birdwing is in the works, and possibly one for the Paradise Birdwing. Now that outsiders have had their chance to save the world's largest birdwing through legislation, the PNG government hopes to be able to allow villagers to ranch and sell about 100 specimens per year to the Insect Farming & Trading Agency (17).

Does Buying Any New Guinean Insect Help Save Forest?

No. They have to be legally obtained insects. Only the Insect Farming & Trading Agency can issue permits to export Papua New Guinean insects *for commercial purposes*. This is so the Agency can both (1) control the market to keep prices for the villagers stable, and (2) returns maximum revenue back to the villagers. Occasionally Papua New Guineans sell directly to dealers, who *illegally* export the specimens. Ultimately, this hurts the long-term revenue for the villagers, because it saturates markets and lowers prices. Moreover, those dealers almost certainly make no effort to link insect collecting/raising with forest protection.

Every legally exported lot of PNG insects is accompanied by a PNG export permit (each insect is *not* given a separate permit). If the lot involves birdwing butterflies, they must *also* have a CITES stamp (which looks a lot like a postage stamp; again, the stamp is issued for the lot, *not* for each birdwing individual). Any dealer that buys direct from the Insect Farming & Trading Agency gets these; it's up to the buyer to get a photocopy of the permits, or otherwise certify that such permits are on file, if forest conservation is of concern.

Since birdwings have been on the CITES list since 1977, it is doubtful that any papered specimens bought from dealers (except perhaps for very rare species) were collected before listing (thus, exempting them from the CITES stamp requirement). Again, it's up to you, the buyer to decide whether you accept lame excuses that specimens were collected "before CITES," or instead adopt a buying strategy that maximises conservation prospects.

Can't Villagers Protect Their Forest & Make Money In Ways that Don't Require Killing Things?

Some conservation organizations are developing markets for nontimber forest products (e.g., nuts, fruits) so their revenue can be used as an incentive to protect tropical forest. Also, "ecotourism" is widely touted as another way to convince people to protect their tropical forests. Why not promote these more "palatable" initiatives, instead of teaching indigenous people how to kill animals?

First off, there is some deception concerning the "fruit and nuts" incentive. "Tropical juice blends" whose "forest products" include banana, papaya, and similar juices probably do *nothing* to protect virgin forest -- those fruits come from gardens *cleared* from tropical forests! Second, some tropical forest areas have few edible fruits and nuts to exploit. PNG's forests are an example (probably why Papua New Guineans turned from hunting and gathering, to agriculture, over 4,000 years ago); these island forests historically had few large animals that could have dispersed large fruits.

And ecotourism? It's overrated. Objective analyses by respected conservationists (8, 18, 19) indicate that it won't be able to save most tropical forests: "*only a small minority of protected areas attract significant numbers of visitors.... In particular, the potential for many tropical moist forest sites to attract large numbers of tourists is limited.*"(8)

The fact is, the world's dwindling tropical forests will be saved only through a creative array of strategies. Different forest peoples have different options. They traditionally lived off their forest by killing animals. So long as they do it sustainably, the results of those harvests can be channeled to protect forest.

Alternatively, outsiders from other nations can impose their cultural peccadilloes concerning wildlife use on these people -- a form of modern-day colonialism.

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