VOLUME 15, NO. 1 Spring 1997

Sorry, no PDF available

Livingstone's Flying Fox, I Presume?
Conservation efforts on the Comoros Islands have spurred public action to protect a once-obscure fruit bat . . .
Clark, Kathryn M.

Conservation efforts on the Comoros Islands have spurred public action to protect a once-obscure fruit bat . . .

By Kathryn M. Clark

In 1863, while busy being famous and intrepid, the British explorer Dr. David Livingstone shot what was to him a rather unremarkable large black bat on a remote island in the western Indian Ocean. In the midst of his visit to the Comoros Archipelago, Dr. Livingstone was far more interested in the economic aspects of these islands, which had been the destination of slave trading ships, the home of warring sultans, and a notorious haven for pirates. So unnoticed was this black bat that it lay in museum storage for a full three years before John Gray took the time to describe and name the new species after its discoverer, dubbing it Pteropus livingstonii--Livingstone□s flying fox. Even so, it was not until 25 years after the fatal shot that even a small amount of information emerged about the natural history of this mysterious animal; in 1888, the French explorer M. L. Humblot found the bat apparently confined to rain forests blanketing the steep interior slopes of two Comorian islands, Anjouan and Mohéli, but abundant nonetheless.

With the decline of the Arab sultanates, the end of the slave trade, and the opening of the Suez Canal, the Comoros lost their importance as a resupply point in the Mozambique Channel and began their descent into relative obscurity. Alongside them seemed to slip P. livingstonii; this once-abundant animal was, by 1908, described as rare. In 1981, barely a century after its discovery, no more than a few hundred were thought left, and none had ever been captured alive. Was this mysterious species, little-known and unremarkable, about to slide quietly and unnoticed into extinction?

During my first encounter with this creature, I must admit that □quiet□ and □unnoticed□ were about the last adjectives that sprang to mind, as I struggled in welding gloves with four other people to hold just one of these bats still. With jet black wings stretching nearly five feet, glossy black fur flecked with gold on the abdomen and shoulders, and startlingly bright red eyes, Livingstone□s flying fox could only be unremarkable to someone looking at a dried specimen and seriously lacking in imagination. Constantly twitching saucer-ears, otherworldly croakings and hootings, and a deep musky odor rounded out the sensory experience as I hurried to take measurements.

This first experience with Livingstone□s flying fox was at Jersey Wildlife Preservation Trust (JWPT), which breeds many endangered animals at its Channel Island zoo. I had agreed to help with the fourth and--we hoped--final attempt to bring back a sufficient number of the bats for a viable breeding colony. A preliminary expedition to the Comoros in 1988 had estimated that no more than 200 of this species remained in the wild. The International Union for the Conservation of Nature (IUCN) Chiroptera Specialist Group deemed the situation serious enough to give P. livingstonii a priority Grade 1, recommending that captive breeding commence as soon as possible, along with concerted research and environmental education. Soon after, in 1992, the British conservation organization Action Comores was formed out of concern for the preservation of this rare bat. With Action Comores□ help, JWPT brought ten males and two females into captivity. This was a more than respectable start, given the difficulty of catching animals whose preferred hangout is the tallest trees of rain-forested cliffs, but it was not enough for a viable captive colony. I was to aid JWPT and join Action Comores, organizing research and

education efforts for the 1995 field season.

Arriving in the Comoros in mid-May of 1995, I discovered that both groups previous work had prepared us well for what we found. Their weeks of climbing the volcanic peaks of Anjouan and Mohéli had already uncovered six P. livingstonii roosting sites. We visited these sites easily, despite their remote locations, thanks to Action Comores network of roost monitors and their Island Coordinators, Mohammed Moutui and Faissoili ben Mohadji. In addition, Action Comores previous educational efforts had raised awareness of these elusive bats enough that eager Comorian citizens brought three new roosts to our attention.

During daylight hours, we pinpointed these roosts by climbing strategic peaks and following lone bats with binoculars, as they soared on the rising thermals of Anjouan s slopes. This diurnal activity, though unusual among bats and not well understood, allowed us to find the small groups of emergent trees in the fragments of primary forest where the majority of Livingstone s flying foxes sleep their days away. With these discoveries, we were then able to organize a simultaneous count of all roosts on Anjouan, aided by many Comorian volunteers. This effort produced the first ever comprehensive population estimate: 377 on Anjouan and 60 on Mohéli, for a total of 437. Though more than double the previous estimate, this was still discouragingly low.

An intriguing potential factor in the bats decline may be what we often found accompanying Livingstone s flying foxes at these roosting sites: the Comoros lesser flying fox (*Pteropus seychellensis comorensis*). Common on all four islands of the archipelago, this smaller, golden-headed fruit bat does not seem as choosy about its roosting areas. It shares higher altitude forests with Livingstone s flying fox, but also inhabits secondary forests and agricultural areas down to sea level.

Both species fruit-eating habits appear similar to those of other flying fox species, many of which play key roles in the regeneration of rain forest habitats through pollination and seed dispersal. Certain foods, particularly figs and kapoks, seem to be favored by both types of bats, but we are not yet sure to what extent their competition for food may limit P. livingstonii numbers. The Livingstone s flying foxes certainly enjoy a physical advantage at the individual level; of 36 aggressive encounters observed in one Action Comores study, P. livingstonii individuals were victorious over P. s. comorensis 32 times.

To begin filling in answers to our questions about diet, we needed a site suitable for collection of fecal mate-rial from the two species. We were fortunate to find one in 1995. Simon Garrett, in real life a mild-mannered educational officer at Bristol Zoo, aided me in the unenviable task of living for a week on a 50-degree slope, collecting fecal samples--sometimes in the pouring rain. After hours of climbing and miles of rope, we managed to secure ourselves and our belongings to the mountainside, and our tarps directly beneath the unsuspecting bats. Mornings rewarded us with sheets of splats, which we collected while trying to explain our bizarre behavior to understandably curious local residents. These precious samples are currently being analyzed for seed, pollen, and leaf content by Emma Long, a fellow bat-lover and graduate student at the University of Aberdeen, and Gil Rodgers, an undergraduate at Princeton University.

The real task in 1995, however, was catching female P. livingstonii. Once again, prior expeditions made this job relatively straightforward. In 1992, they had discovered a grove of kapok trees ideally suited to mist-netting and had identified the annual six-week window when the kapoks were at their height of flowering. Dozens of both species of Pteropus, as well as a third fruit bat, the Comoros rousette (*Rousettus obliviosus*), are attracted to the fragrant nectar and pollen abundant at this time. Rob Saw, a JWPT tree climber, had previously devised a system of setting nets for bats above canopy level by lashing poles to treetops. He set these up again in 1995 with further refinements, in time for what we hoped would be peak flowering; we then settled in to wait for the moon to wane and the weather to behave. Given numbers caught in previous years, we were more than surprised by our enormous haul: 23 males, which were measured and released, and five females, which have joined their compatriots at JWPT. The JWPT colony now consists of ten males, seven females and--most encouragingly--eight captive-born offspring.

Despite the successful establishment of a Livingstone s flying fox captive breeding group, the future of these bats

is far from secure. The forest cover on Anjouan, the island with the highest Livingstone□s flying fox population, has decreased by 70 percent in the last 20 years. The Comoros have one of the world□s poorest and most rapidly growing human populations, which needs ever-increasing amounts of fuel wood and farmland to survive. If Comorians are compelled to continue cutting trees, at current rates they will consume the remaining forests entirely in 30 years. While the Comoros lesser flying fox seems to thrive in the secondary forest and agricultural groves that result from this deforestation, the Livingstone□s flying fox does not.

Continued political instability puts the Comoros in the spotlight now and again--most recently, in October 1995, when mercenaries attempted the 18th coup in 20 years of independence--but the instability also slows implementation of a concerted environmental policy. A vicious cycle of poverty, underdevelopment, and deforestation continues unabated.

The solution to this all-too-familiar round of problems is far less easy to pinpoint than its environmental effects: erosion, soil degradation, siltation of coral reefs, and loss of permanent rivers, as well as the disappearance of once-abundant forest species. With stabilizing forest cover gone, heavy tropical rains wash vast amounts of red topsoil into the sea, where it smothers coral and kills the fish that many Comorians rely on. With the sponge-like action of the root-tangled forest topsoil gone, these heavy rains run rapidly off slope surfaces rather than sinking in to be released gradually in river flows. The people of the Comoros are thus hit with a double blow: more violent flows when it rains, and drought when it doesn□t.

To change economic and political realities at this scale is well beyond the scope of small organizations like Action Comores. To change minds through environmental education, however, is not, thanks to funding from organizations like BCI. Slide packs and lesson plans have been created in French--a language used throughout the archipelago since colonial times--and distributed to most schools. These materials emphasize not only the consequences of deforestation, but also the role played by bats and other forest inhabitants in tree regeneration through pollination and seed dispersal. Stickers depicting bats and the slogan □Protect our forests, protect our fruit bats, protect our future□ now adorn taxis, houses, and other sites across the islands. Posters depicting Livingstone□s and Comoros lesser flying foxes with a similar conservation message can be seen on many shop doors; these images have been taken up and adapted creatively by Comorian citizens in many ways.

The most successful educational tool thus far, however, has been the Action Comores environmental video. Although made with a humble camcorder, it appears regularly on Comorian television. The combination of environmental teachings from the Koran, the use of a native Comorian language, and scenes familiar to viewers have made it a practically self-distributing environmental message in this Muslim country. Video stores holding copies have had to limit lendings to reduce wear on tapes, and they report that bootleg copies are regularly made.

Though the effects of our environmental education are more difficult to quantify than aggressive encounters between flying foxes, they are clearly significant. They have directly aided both scientific and conservation work, as recent roost discoveries and successful count attest. They have also aided the growth of the local organization □Ulanga,□ established in 1991 by the Peace Corps and Comorian citizens concerned with a variety of environmental issues. The impetus provided by Action Comores□ material has led to a great improvement in the motivation of members of the organization, and even to the creation of several new local Ulanga groups.

With ever-present political instability and the reluctance of development organizations to operate in the Comoros□ declining infrastructure, grassroots organizations of Comorians themselves may be the best hope for the future of Livingstone□s flying fox. While protective legislation is an important goal, it remains a distant prospect as long as the country□s politics are uncertain. Ulanga and the Action Comores□ network of Comorian nationals remain nascent organizations, filled with the will but often not the means to overcome the difficulties of transport, communication, and material supplies presented by life in one of the world□s most remote nations.

Will Action Comores□ flagship species, an obscure bat brought to the world□s attention by the business end of a missionary□s gun, go the same route as the dodo, another Indian-Ocean-island endemic? P. livingstonii does enjoy

some advantages over the extinct bird: it is not flightless, its habitat has not yet been entirely destroyed, and it has not proven nearly as easy to catch--nor does anyone on the Comoros seem to find it as tasty. Indeed, it is a testament to Comorians commitment to their black bat that I was the sole non-national Action Comores member during over two-thirds of the 1995 expedition. Thanks to them, a team of monitors now keeps regular tabs on Livingstones flying foxes at several roosting sites, and helps disseminate environmental information, even while the rest of us are back in our own countries. With luck, their work will prevent P. livingstonii s ultimate slide into oblivion and will allow environmental awareness and action to increase in the Comoros, just as the number of P. livingstonii do at the JWPT zoo.

(Author Bio)
Kathryn M. Clark conducted work in the Comoros while she was a graduate student
at Aberdeen University and the Institute of Zoology in the UK. Her work was partially funded by a grant from BCI. Clark has since begun pursuing a Ph.D. at Princeton University s Department of Ecology. Other 1995 expedition members included Bryan Carroll, Michael Clark, Simon Garrett, Susan Pinkus, and Robert Saw.

Editor s Note: Action Comores and Jersey Wildlife Preservation Trust favor using the common name fruit bat instead of flying fox, primarily for its greater accuracy and more positive connotations when translated into other languages. We have kept the term flying fox in this article per standard BCI style.

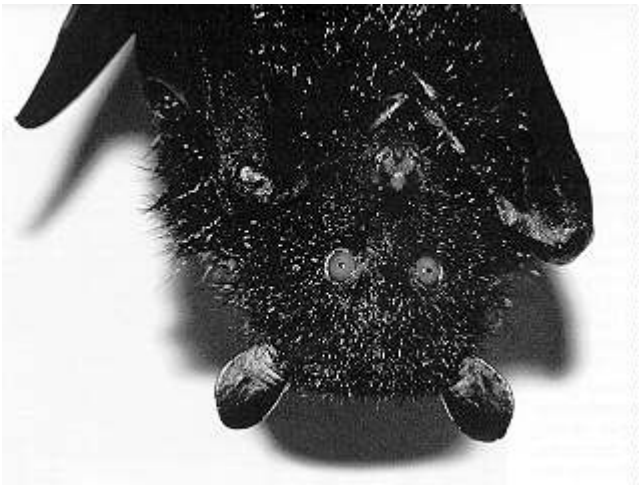
For further information, contact:

Action Comores, P. Reason & W. Trewhella, Directors, The Old Rectory, Stansfield, Sudbury, Suffolk CO10 8LT, UK; E-mail: plzwjt@pln1.life.nottingham.ac.uk; Web site: http://ibis.nott.ac.uk/Action-Comores

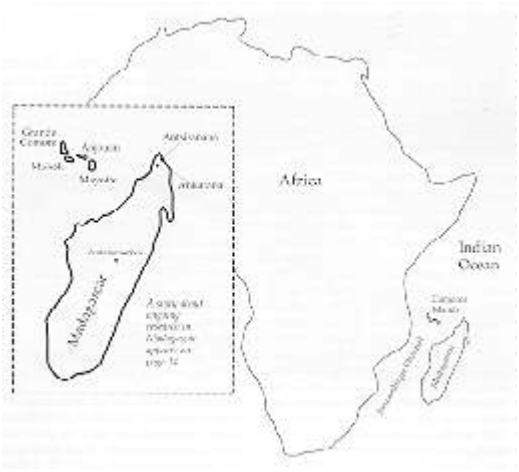
JWPT (Jersey Wildlife Preservation Trust), Jeremy Mallinson, Director, Les Augrés
Manor, Trinity, Jersey, Channel Islands, JE3 5BF, UK; Web site: http://www.itl.net/vc/ europe/jersey/ tourism/Zoo

The author would like to acknowledge the additional support of Air France, Bristol Zoo Gardens, British Airways Assisting Conservation, British Ecological Society, Fauna and Flora International, the Marshall Aid Commemoration Commission, People s Trust for Endangered Species, Rother Valley College, Wildlife Preservation Trust Canada, and the Zoological Society of London (London Zoo).

We are pleased to announce that Kathryn Clark is the first recipient of the BATS Editor s Award, which was established this year to recognize outstanding contributions to this magazine.



This Livingstone□s flying fox is one of more than two dozen individuals in the breeding colony at Jersey Wildlife Preservation Trust.
Photo courtesy of Phillip Coffey, Jersey Wildlife Preservation Trust



MAP of Madasgascar

After days of painstaking maneuvering on a steep slope, the author is pleased to get her tarp set up and later to discover that her work has paid off with a splatter of bat fecal samples.

An Action Comores worker holds a Comoros rousette, one of three species of fruit bats found in the Comoros Islands, commonly caught in nets set for Livingtone□s flying foxes.

Large amounts of fuel wood being sold in the marketplace make it clear why the rain forest habitat of Comorian bats is threatened.

This educational poster, produced jointly by Action Comores and Jersey Wildlife Preservation Trust, shows the two Comorian Pteropus species and describes in both French and Arabic how the bats aid in seed dispersal and pollination. The popular poster can be seen hanging in many local venues, such as the small store shown above.

Mohammed Moutui, Action Comores regional coordinator for the island of Anjouan, distributes educational stickers to the community.

All articles in this issue: