



Parrot on the Way to Extinction

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With numbers down to under ten birds and no evidence of successful breeding since 1975, the endemic echo parakeet in Mauritius seems doomed to extinction very soon. The main reasons are the destruction and degradation of the native forest on which these fruit-eating parrots depend and competition with introduced macaque monkeys and another parakeet, aided by cyclones that have defoliated and stripped trees of their fruit. All attempts at captive breeding have failed and numbers are now too low to consider translocation.

Mauritius is the second largest of the three Mascarene islands, with a human population of nearly a million in 720 square miles, making one of the highest population densities in the world. Inevitably cultivation for agriculture has destroyed or altered many natural habitats. Since the early 1970s, a stream of ornithologists have visited the island to study the rare endemic birds, especially the critically endangered Mauritius kestrel *Falco punctatus*, pink pigeon *Nesoenas mayeri* and echo parakeet *Psittacula echo*. In 1973 the kestrel, with a world population of only six birds, was considered the world's rarest bird. Today numbers are thought to be about 15, including a healthy proportion of young birds. Pink pigeons for the last few years have numbered about 20 birds in the wild, although recent cyclones have probably reduced them, and there is a captive population of over 40 birds, most of them captive-bred on Mauritius or at the Jersey Wildlife Preservation Trust.

The echo parakeet is the last endemic island species of *Psittacula* parakeet in the western Indian Ocean. Formerly *Psittacula* parakeets were widely distributed in this area. The hypothetical *P. eques* from Réunion is only known from a 15th-century account, and if it existed probably became extinct in the early years of colonisation. Rodriguez, the smallest of the Mascarene Islands, also had its own species, Newton's parakeet *P. exscul*, which became extinct

after 1875; this was a beautiful bluish-green and, like the echo parakeet, was probably closely related to the ring-necked *P. krameri*. The Seychelles also had their own species, *P. wardi*, which was probably closely related to the alexandrine parakeet *P. eupatria*: both had a red patch on the secondary coverts. This was extinct before 1906, probably through direct human persecution.

The echo parakeet, once classed as a subspecies of *P. krameri* but now accepted as a full species, is a larger, heavier bird than the ring-necked parakeet, with a shorter tail; it is also a darker, richer green. Unlike the ring-necked it is sexually dichromic in beak colour; the male has a red upper mandible and the female a dark almost black beak. Ecologically it differs in that it is a forest species, feeding almost exclusively on the fruits, flowers and leaves of native trees. It is also more graceful in flight. I have often watched these birds flying spectacularly above the Black River Gorges, swirling and diving in shallow swoops. In flight they often call with their characteristic *chaa-chaa chaa-chaa* vocalisation, which is higher pitched and not as coarse as the ring-necked parakeet's call.

Around 1886 the ring-necked parakeet was introduced into Mauritius, and both species can now be found in the same area of native forest, but there have been no recorded examples of hybrids. The ring-necked also appear to be ecologically isolated, although in the past there has been severe competition for nest sites.

Status

Echo parakeets were once widespread in the native forests, and the Newton brothers record seeing them in the forested east of Mauritius. Numbers have declined with the forest destruction, and today they are restricted to about 15-20 square miles of forest and scrublands in the south-west corner of the island. The population was not accurately censused until 1973 and 1974 when Stanley and Barbara Temple estimated between 32 and 58; local ornithologists put it at 'around 50'. In 1976 the estimate was about 45. In 1977 and 1978 no accurate census was made but several local naturalists thought numbers had declined drastically. In 1978 Fay Steele, who was studying the birds, believed they were low; the maximum number he saw was a flock of six.

I arrived on Mauritius in January 1979 and started my surveys of the endangered birds with the help of Yousoof Mungroo, the Mauritius Conservation Officer, and field helpers. We systematically searched the forested south-west corner of the island and gradually began to piece together the parakeets' movements. After several weeks it became clear that the population was probably below ten. We could only definitely account for six or seven individual birds – three or four males and three females.

In September we were optimistic that some of the parakeets would start nesting. Two pairs were seen prospecting for nest sites in suitable areas of the forest, but we have no evidence that they went beyond this stage. This was the fourth consecutive year that they had failed to produce any young. In 1978 a pair attempted to nest on the forested Macchabe Ridge, but failed when some non-breeding male parakeets tried to act as 'helpers', but only succeeded in displacing the male and causing the female to desert.

On December 22 and 23 1979, Mauritius was hit by Cyclone Claudette, which brought winds of up to 137mph and 289mm of rain in 24 hours. Trees

were defoliated and stripped of their fruit, and the fruit bats *Pteropus niger* were descending into gardens in search of fruit; several weak and emaciated bats were found or reported. The fruit-eating merle *Hypsipetes olivacea*, a bulbul, was also badly affected and there was a marked reduction in their numbers after the cyclone. I strongly suspect that the echo parakeets also suffered post-cyclone food shortages. Their movements became noticeably erratic and we could only account for four birds, three males and one female. Since then another four cyclones have passed close to Mauritius bringing high winds and torrential rain.

Feeding Biology

In 1876 Alfred and Edward Newton mentioned that the echo parakeet 'appears to feed exclusively on the seeds and fruits of indigenous trees, generally keeping to the upper branches'. All ornithologists have since confirmed these findings. Parakeets have been seen feeding on the fruits, flowers or leaves of most species of native trees, although certain species are clearly preferred and are more important than others. When a preferred species is fruiting the parakeets will fly several kilometres daily to feed on it, quietly climbing about on the outer branches and choosing the fruits carefully, often sampling and rejecting many. They are fastidious feeders and will masticate the food for several minutes before swallowing it.

Reasons for Decline

The decline of the echo parakeet and many of the other endemic birds is due to the destruction and modification of the forest on which they are almost totally dependent. Since man first colonised the island in 1638, most of the forests have been cleared, and today only about two per cent of the island is covered by native vegetation. Probably the greatest recent impact on the parakeet population has been the clearing in the early 1970s of about half the remaining *Sideroxylon-Helichrysum* scrub to make room for forestry plantations. These scrub lands on Plaine Champagne in the south-west of the island were an important foraging area for the parakeets.

In addition to the forest destruction, surviving areas of native vegetation are being degraded by exotic plants, especially privet *Ligustrum walkeri* and guava *Psidium cattleianum*, which, being more vigorous, replace the native plants. The result is little or no regeneration of the native forest. The trees on which the parakeets feed are becoming scarce, and the parakeets have to go further to find food. They also have to compete with the introduced and very numerous macaques *Macaca fascicularis*, estimated to number between 12,000 and 15,000; in the native forest Temple and Temple estimate their numbers at 3500-4500. I have repeatedly found large amounts of unripe fruit discarded on the ground after being torn off the branch, sampled and rejected by the macaques. The macaques are also supposed predators of the parakeets and the other endemic birds. Temple *et al* note: 'The introduced monkeys find it easy to locate the nests of the grosse cateau [echo parakeet] because it is such a noisy bird. They destroy many eggs and kill many young cateau each year.'⁹

The echo parakeets also have to compete for nest sites with the introduced house mynas *Acridotheres tristis*, and invariably lose. There may be other forms of competition between the echo and ring-necked parakeets contributing to the decline of the former. When congeneric species occur on islands there is a

tendency for their feeding characteristics to diverge. Grant also suggests that where congeneric species occur one may be eliminated due to interactions arising from mutual incompatability. The feeding habits of the two species seem to be divergent, the ring-necked feeding mainly on exotic plants and foraging mainly in open lowland scrub and cultivated land. Both are found in the Black River Gorges, but there is little contact between them, the echo usually keeping to the ridges and the upland plateau, and the ring-necked to the bottom of the Gorges and the lowland areas. This geographic separation supports the idea that there is some form of competitive exclusion.

Conservation

The many attempts since 1974 to halt the decline of the echo parakeet have all failed. *Psittacula* parakeets are usually straightforward to keep and breed in captivity, and in 1974 and 1975 a total of four young birds were taken for captive breeding.

Temple, who started the programme, wrote in 1976 that 'by 1980, the captive breeding programme should be capable of producing 20 or more young . . . per year for restocking and interisland transplants or for distribution to cooperating breeders'. Unfortunately the parakeets proved difficult to keep, and all died from various causes. There has been no further opportunity to take young birds from the wild, and attempts to capture adult birds have been fruitless. The wild parakeets refuse to visit feeding platforms baited with cultivated fruits and seeds and can detect mist nets suspended around their feeding trees.

Artificial nest boxes have been tried, made as monkey proof as is practical without excluding parakeets. The first two nest boxes were placed in the forest in 1974 by Temple; one was prospected but neither was used. In 1975 three were placed on the Macchabe Ridge, and in 1977 19 were placed in the forest. They were used by mynas, bees and black rats *Rattus rattus*, but none by parakeets. In 1979 another 17 boxes of a slightly different design were placed on the slopes of the Macchabe Ridge in some of the very large native trees, still without results. None of the 41 nest boxes has been used by parakeets and only one box was seen to be prospected. It seems unlikely that lack of nest sites is limiting the population.

Temple also proposed that the population would be helped by eliminating or controlling nest competition from mynas and ring-necked parakeets on the Macchabe Ridge, the parakeets' main nesting area. But no ring-necked parakeets have nested on the ridge since 1975, probably because the population was substantially reduced by Cyclone Gervaise in 1975.

Another suggestion is to translocate parakeets and some of the other endemic birds to the larger neighbouring island of Réunion, which has more of the less degraded forest than Mauritius and fewer bird species. The rationale behind this is ecologically sound, but it has still aroused some criticism. Anyway, it is now far too late to consider translocating parakeets; the population is almost certainly too low to risk such a procedure, even if the remaining birds could be caught.

In a last desperate effort to save this species we will try to capture a pair of the remaining birds for captive breeding, although the chances of eventual success must be regarded as slim. Like most Mauritian naturalists I believe that the echo parakeet will become extinct in the very near future.

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The Law that is not Enforced

The UK law to control imports and exports of endangered species (the Endangered Species Act of 1976) is not being enforced, and cannot be enforced, says Ian Prestt, Director of the RSPB, until there is proper control of the licensing procedure and expert identification of the species at the port of entry, neither of which has been happening. A case in January highlighted this. A Leicestershire bird dealer was sentenced to six months' imprisonment (the first such sentence in the UK) for infringing the Act by trading in protected species (which he had been doing for some time). But his case only came to light when the Canadian Mounted Police, investigating a Canadian dealer's activities, found incriminating letters from the British dealer and passed them to British Customs, which hitherto had accepted the dealer's word that no restricted species were involved.

Corrections

Michael Green points out two errors in his article on the Himalayan tahr in Nepal in *Oryx* November 1979, page 140: The reference number on line 10 page 141 should be 2 not 8, and the photograph is of a yearling tahr, probably a male because of its slight ruff, and not an adult female.

Due to a long delay in the post, Dr Luis S. Varona's corrected proof of his article in the last issue of *Oryx* (April) unfortunately arrived too late for an important correction to be included. In the last paragraph the figure for male *Crocodylus rhombifer* croppings should be 1000 (not 100).