Meyburg, B.-U. & R. D. Chancellor eds. 1989
Raptors in the Modern World
WWGBP: Berlin, London & Paris

Successful Translocation of the Endemic Seychelles Kestrel *Falco araea* to Praslin

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ABSTRACT

Work on the endemic Seychelles Kestrel in the 1970s confirmed the continued existence of the species on Mahé and several small satellite islands as well as the larger island of Silhouette. Earlier this century kestrels became extinct on Praslin and several neighbouring islands. A three year study of dispersion and breeding biology on Mahé concluded that, with around 370 pairs, the population here was probably at carrying capacity. In 1977 an experiment was designed to establish whether surplus birds were present on Mahé and were being excluded from breeding by resident territorial birds. This involved the removal of 13 kestrels from nesting territories. At the same time there was evidence that conditions on Praslin had improved, notably through the recovery of woodland vegetation and by stringent control of the use of firearms, leading to the prospect of re-establishment of kestrels. The 13 birds were therefore released on Praslin. The removal experiment on Mahé confirmed the existence of surplus birds. Information on the fate of the released birds on Praslin is patchy but successful breeding definitely occurred in 1978 and by 1980 the population had increased to at least 10 pairs. In 1983 there was some evidence that birds reared on Praslin were themselves nesting. A full survey of kestrels on Praslin is planned for 1988.

INTRODUCTION

In 1977 thirteen Seychelles Kestrels *Falco araea* were trapped on Mahé (144.8 km^2), transported some 35 km north-east and released on the island of Praslin (40.4 km^2). This paper describes the background to the translocation and reports on the fortunes of the released birds since then. The translocation occurred towards the end of a three-year study into the population ecology of the kestrel on Mahé (Watson 1981; Collar & Stuart 1985).

PAST AND PRESENT DISTRIBUTION OF THE SEYCHELLES KESTREL

A century ago the kestrel occurred on Mahé, Praslin, Curieuse, Félicité, Marianne and the satellite islands off Mahé (Figure 1) (Hartlaub 1877; Newton 1867; North 1892; Oustalet 1878; Fisher 1981). It was probably also on La Digue, North Island and Sisters, all of which today hold habitat

similar to that occupied by kestrels in coastal areas of Mahé. During 1975-77 kestrels were found breeding on Mahé, Silhouette, St. Anne, Cerf and Longue, and birds were also seen and probably breed on North Island and Thérèse (Watson 1981). In the mid-1970s there were sporadic reports of single kestrels from Praslin and La Digue (Feare *et al.* 1974; A. Niol pers. comm.) but no evidence of breeding was detected and these were probably young birds dispersing from Mahé.

Intensive searches on Praslin in June/July 1976 revealed no birds and the species was suspected of being absent for some time (Watson 1981). The bird was reported extinct on La Digue by 1960 (Penny 1968) and there have been no contemporary records from Félicité, Marianne, Sisters or Curieuse.

THE POPULATION STUDY ON MAHE, 1975-77.

Details of the study of kestrels on Mahé are given elsewhere (Watson 1981; Collar & Stuart 1985) and the following can only be a brief summary. In a review of raptor population ecology Newton (1979) highlighted the shortage of information for tropical species. The Mahé study set out to describe and interpret dispersion and breeding biology in a tropical forest raptor living on an island. The detailed dispersion work was done in two study areas, one in north-west Mahé (1270 ha) and the other in south Mahé (825 ha). Observations were made on individually colour-ringed birds and on the pattern of dispersion of nesting territories. Kestrels were shown to live in exclusive home ranges (territories) which were actively defended and occupied all year round. Territory boundaries were mapped in the larger study area and mean territory size was 40.25 ± sd 3.99 ha. The whole of this area appeared to be occupied by territorial birds. Analysis of nearest neighbour distances between nest sites showed a significant departure from random in the direction of regular spacing.

Spacing analysis in the smaller study area gave a similar result and casual observations outside the two areas revealed breeding kestrels in all the major habitats on the island. The significant 'over-dispersion' of nest sites and the occupancy of exclusive, defended home ranges were consistent with the view that the population of Mahé was at carrying capacity (Newton 1976).

Data on breeding biology were obtained from around 75 nesting attempts recorded each year between 1975 and 1977. Kestrels were monogamous and an average of 12% of the breeding population were first year birds. In upland areas (above 200 m altitude) 68% of pairs nested in cliffs and 32% in holes in trees. In coastal areas (below 200 m) 44% used coconut palms, 27% cliffs, 17% trees and 12% buildings. Egg-laying occurred each year between August and October and 80% of clutches were laid between 1st September and 15th October. Kestrels laid clutches of either two or three eggs and hatching success was high, with nearly 90% of pairs hatching at least one chick. Most failures occurred during the nestling period and fledging success was significantly lower at coastal nest sites (below 200 m) than in upland areas. This difference was linked with the kinds of nest site used in the two altitudinal zones. Seventy-five per cent of pairs nesting in cliffs reared at least one chick compared with 67% in trees, 35% in buildings and only 18% in coconut palms. It was concluded that the higher incidence of nesting failure amongst coastal kestrels reflected the greater vulnerability of nest sites in coconut palms and buildings to non-native predators such as cats and rats. The breeding study provided a measure of productivity and hence potential recruitment for the kestrel population on Mahé. Observations on the rate of disappearance of marked birds gave an estimate of mortality rate amongst the breeding population. Despite the putative effects of introduced predators on breeding success in some areas, the overall estimate of recruitment exceeded that for mortality during the study period and this finding was again consistent with the view that kestrels on Mahé were at carrying capacity.

THE TRANSLOCATION

Reasons for the extinction of the kestrel on Praslin, the second largest island in the granitic Seychelles, are unclear. At least three factors may have been involved. During the 19th and first half of the 20th century Praslin suffered widespread deforestation and subsequent appalling fires. The eroded hillsides which are still prevalent in the north of the island today bear witness. This may have led to reductions in available food, particularly the arboreal gecko *Phelsuma*, which is a key

component in the diet on Mahé (Watson 1981). Deforestation may also have eliminated many potential nest sites in trees. In addition killing of kestrels by the human population may have been a contributing factor. This may have been more serious on Praslin than on Mahé if for no other reason than that habitation extends more widely over this flatter island, leaving fewer remote areas which probably offered valuable refuge historically to kestrels on Mahé. In 1977 it was apparent that perceived threats to the survival of the kestrel on Praslin had significantly reduced. By both accident and design woodland and scrub had successfully recolonised much of the southern part of the island. Counts of geckos in a range of habitats on Praslin (Crawford 1978) detected numbers broadly similar to those found in equivalent habitats on Mahé (Watson 1981). Then, following the *coup d'état* in Seychelles on 5th June 1977, the government banned private ownership of firearms, thereby removing the most effective weapon against kestrels.

The healthy population of kestrels on Mahé (an estimated 370 pairs in 1976 - Watson 1981), and the improved prospects for survival should kestrels once again return to Praslin, were powerful arguments in favour of a translocation experiment. In the event this was carried out in July/August 1977 and had two key objectives:-

1. Kestrels were to be removed from known breeding territories on Mahé to determine whether a non-breeding surplus existed on that island, and thereby whether the kestrel's territorial behaviour might be limiting breeding density on Mahé (Watson & Moss 1970).
2. These birds were to be released on Praslin to determine whether that island might again be capable of supporting a population of breeding kestrels.

Thirteen kestrels (2% of the Mahé population) were trapped using bal-chatris (Berger & Mueller 1959) baited with Madagascar fodies. They were held in cages for up to two nights on Mahé before being transported to Praslin by air and released immediately. The trapped birds comprised three mated pairs and seven singles of which four were females and three males. Three birds were one year old and the remaining ten were at least two years old. The removals were done in two groups and the seven birds in the first group were individually colour-ringed and conspicuously dyed on the underside before being released in mid-July. After it was established that none of these had returned to their former sites on Mahé one month after the release, another six birds were trapped, individually marked and released in late August. Each of the vacated sites on Mahé was checked at fortnightly intervals until 12 weeks after the removals. At the three sites where both members of the pair were removed, occupancy by all neighbouring pairs was subsequently checked.

MAHE - POST TRANSLOCATION

Of the thirteen vacancies created, three (23%) were filled within two weeks and 100% replacement occurred within ten weeks of the removals. Whilst only three of the removed birds were in first year plumage, eleven of the replacements were one year old birds (a highly significant difference; $X^2 = 16.00$, $df = 1$, $p < 0.001$). At the three locations where pairs of birds were removed occupancy was confirmed at all eleven neighbouring sites during September 1977. These observations refute any suggestion that replacement birds were simply neighbouring territory holders expanding their ranges. Finally, despite the high incidence of first year birds amongst replacements, at no less than four sites, including two where the pair had been removed, an active nest was located during the 1977 breeding season. These results provide convincing evidence of the existence on Mahé of a non-breeding surplus which was physiologically capable of breeding (Watson & Mosse 1970) and confirm that the population on Mahé was indeed at carrying capacity.

PRASLIN - POST TRANSLOCATION

The detailed study of kestrels on Mahé necessarily came to an end in late 1977 and it was not therefore possible to maintain a continuous check on the fate of the translocated birds. Up to the end of 1978 detailed records of kestrel sightings and behaviour on Praslin were kept by another researcher (M. Nicoll pers.comm.).

Subsequently I was able to visit Seychelles, and Praslin in particular, in October 1980, September 1981, September 1982 and November 1983. The fortunes of the released birds up to 1983 can be summarised as follows.

During October 1977, only two months after the transfer, one pair of kestrels almost certainly laid eggs in a nest in a coconut palm although the attempt was unsuccessful (M. Nicoll pers. comm.). At least five pairs of kestrels were known to hold nesting territories in September/October 1978 and two pairs bred successfully, rearing two young each (M. Nicoll pers. comm.). A survey covering some 70% of Praslin in five days during October 1980 revealed a minimum of ten pairs, at least five of which had active nests (J. Watson, unpublished data). This was the first occasion on which more birds were detected than had originally been released and evidently the population had very nearly doubled over the three years since 1977. Brief visits in 1981 and 1982 confirmed continued occupancy and nesting at two sites which were first used in 1978. My final visit in 1983 confirmed occupancy at the same two sites and provided one more valuable piece of information. At one of these sites both breeding adults were seen at close quarters, both were in full adult plumage and neither bird was colour-ringed. Although it is possible that they may have been released birds which had lost their rings, or even birds which had arrived unaided from Mahé, the most likely explanation is that they were first generation Praslin birds.

The last extensive survey of kestrels on Praslin was in 1980 and, whilst limited evidence suggests that the early momentum of the translocation continues to be maintained, it is clear that a further assessment of the population will be needed soon. It is proposed to conduct such a survey in October 1988.

ACKNOWLEDGEMENTS

I am indebted to Martin Nicoll for providing information on the kestrels on Praslin during 1978. The study on Mahé was funded by a Natural Environment Research Council Studentship through Aberdeen University and I am grateful to Professor George Dunnet for his generous support throughout this work.

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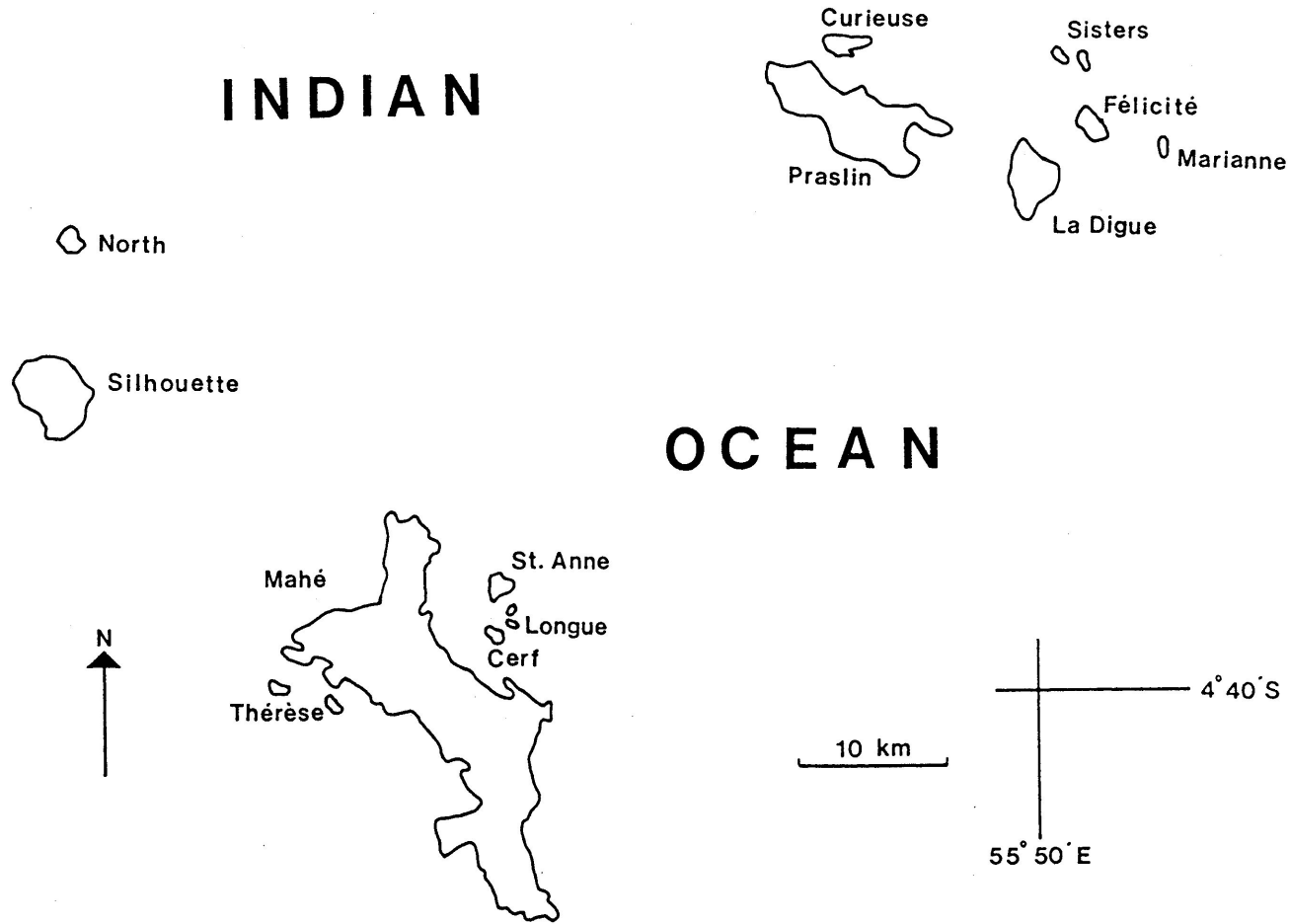

FIGURE 1: Map of the granitic Seychelles.