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The Seychelles Paradise Flycatcher *Terpsiphone corvina* on La Digue: population size, habitat requirements and management options

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Summary

The conservation of the Seychelles Paradise Flycatcher on La Digue is reviewed and compared with an earlier investigation (1978). The status of the bird and its habitat on the western plateau, which holds nearly 80% of the world population, was investigated, as was the Special Reserve, notably the validity of the present boundary and the need for management initiatives. The population on the western plateau has changed little in 10 years, with one pair less but more individuals, and there has been a small (<5%) decline in preferred breeding habitat. The number of pairs using the reserve was unchanged from 1978. The carrying capacity is small (*c.*6 pairs). Only one significant trend was isolated in an investigation of 10 habitat variables, suggesting that more birds occurred where trees were larger. The reserve boundary should be redrawn to include a significant part of the main freshwater marsh: earlier study showed that highest densities were found in woodland close to wetland, and conservation of the marsh is vital. The reserve requires a non-interventionist woodland policy, creation of ponds to extend wetland, improved boundary marking, provision of interpretation facilities and development of educational use. Away from the reserve, statutory zonation of land on the plateau for woodland and sustainable timber production is needed as part of an overall land-use policy.

Introduction

The Seychelles Paradise Flycatcher *Terpsiphone corvina* is a threatened species (Gaymer *et al.* 1969, Collar and Stuart 1985) almost entirely confined to the 16 km^2 island of La Digue in the Republic of Seychelles (Figure 1 inset). A study of the bird over 12 months in 1977–1978 resulted in a series of management recommendations (Watson 1981) which led to the establishment of a Special Reserve (Martin 1981) in a cooperative venture between the Seychelles government and the Royal Society for Nature Conservation. The total population was then estimated at 70–75 individuals with 60–65 birds on La Digue (Watson 1981). The bulk of the population lived on the 160 ha coastal "plateau" on the west side of La Digue (Figure 1) where nesting territories were largely confined to the surviving stands of takamaka *Calophyllum inophyllum*–badamier *Terminalia catappa* woodland (see Sauer 1967, Procter 1984 for descriptions of coastal vegetation). Nesting density was highest in such woodland immediately adjacent to freshwater marsh which fringed the landward edge of the plateau.

Reports in January 1988 indicated that the western plateau had deteriorated as a result of tree-felling and marsh drainage. A short survey in February 1988 confirmed these concerns and reported tree-felling, new cultivation for veg-

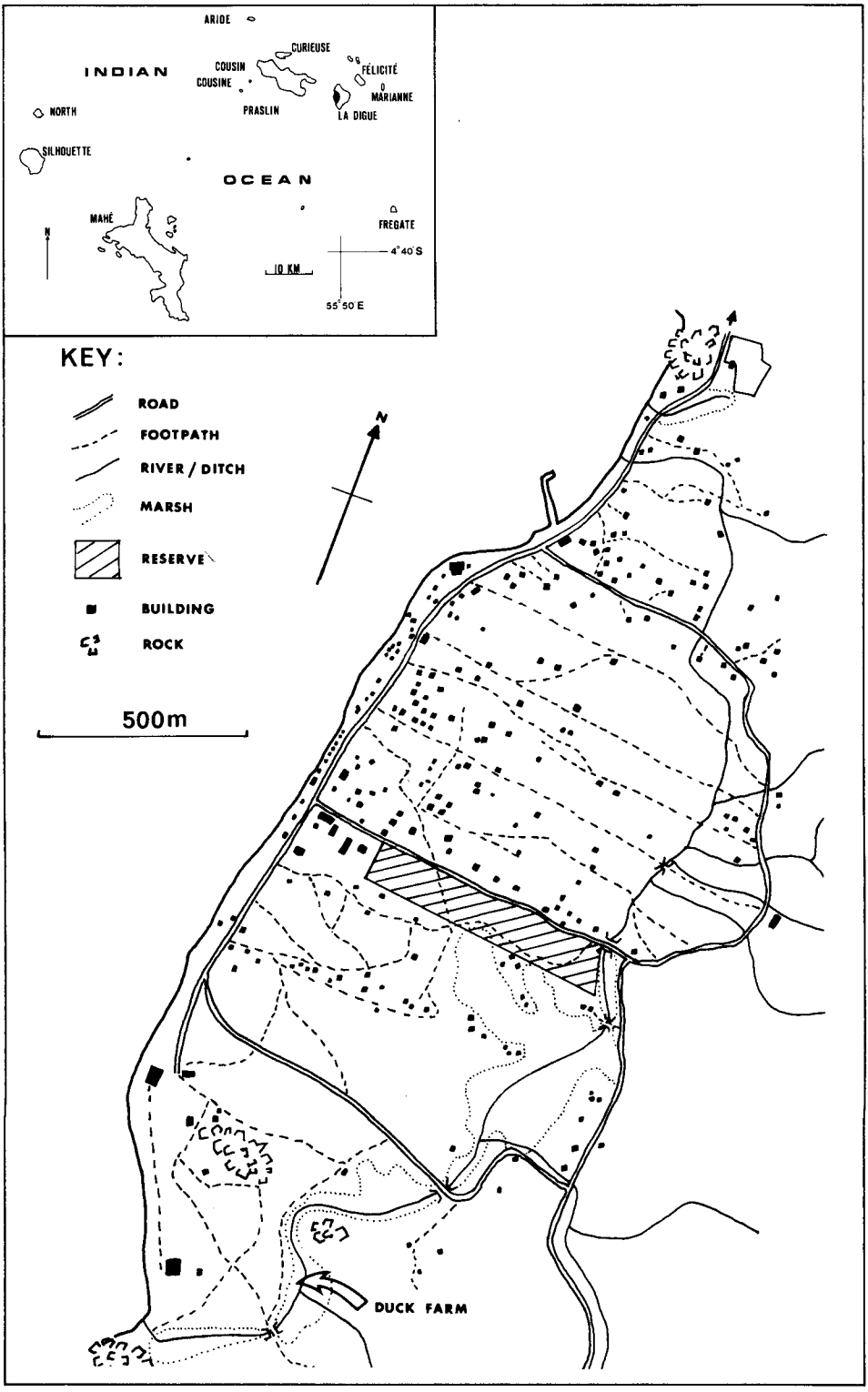

Figure 1. Map of the western plateau of La Digue showing roads, footpaths, buildings (approx.), river systems, marshland and the location of the Special Reserve. Inset shows the position of La Digue in relation to the main islands of the granitic Seychelles.

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etable production and housing development throughout the western plateau (Bullock *et al.* 1988). This prompted the International Council for Bird Preservation (ICBP) to instigate an emergency project, for which I carried out the fieldwork between 5 and 25 July 1988.

Objectives

The study had three main objectives: (1) to survey the status and distribution of the flycatcher and its habitat on La Digue, using methods which would allow direct comparison with studies carried out 10 years earlier (Watson 1981); (2) to make recommendations for the demarcation of a new Special Reserve which would sustain a viable population of the flycatcher; (3) to draft management prescriptions for the Special Reserve.

Methods

Population census

Methods used were similar to those described by Watson (1981). Nesting territories were identified by locating and plotting the positions of singing males, and by recognizing individual males from the unique patterns of growth and wear on their long tail-streamers. A series of 10 systematic early morning (05h45–06h15) song censuses covered the whole of the western plateau (Figure 2 shows the striking plumage dimorphism which characterizes this species). Areas where singing males were found were subsequently visited on at least four occasions and the resident males were observed with the aid of 8 × 40 binoculars. Details of tail-streamers were then drawn and checked on each subsequent visit. Two individually colour-ringed males were still present in the population, being survivors from five ringed in 1977, and these provided an independent check on the tail-streamer method. Each territorial male was observed for a minimum of two hours during the course of the study, though frequently much longer, and during this time the number of birds in female plumage, accompanying him without evidence of aggressive behaviour, was recorded. The caveat over non-aggression is important since males will frequently venture into the home ranges of neighbouring birds, although such behaviour will sooner or later result in an aggressive response from the resident male or female. Such behaviour takes the form of aerial chasing and displacement of the intruder from his perch. During the habitat survey (see below) any male flycatcher seen was closely observed and his tail-pattern recorded.

The short time available for the study precluded a systematic search of areas away from the western plateau, although brief visits were paid to Anse Source L'Argent, Grand Anse, Anse Gaulettes and Anse Sévère. An estimate of numbers of flycatchers off the western plateau was made from these visits and an earlier short survey (Bullock *et al.* 1988).

Habitat survey

The survey of *Calophyllum–Terminalia* woodland was done using a combination of field survey and interpretation of high resolution infra-red air photography

Figure 2. Female (left) and male (right) of the Seychelles Paradise Flycatcher. The male is almost entirely blue-black and the female has a blue-black head, off-white underside and chestnut back and tail. Notches and abrasion in the long central tail-streamers of males can facilitate individual recognition of birds over several weeks and can be a great help when censusing the population.

taken in 1986 and reproduced as a colour print at 1:3,000. All woodland was readily distinguishable on the latter, which formed the basis for the contemporary woodland distribution map. The field survey was done by a series of 26 linear transects running east–west between the shore and the freshwater system at the back of the coastal plateau. These were done at 100 m intervals and parallel to one another. During transects the approximate extent of *Calophyllum–Terminalia* woodland was mapped and the extent and location of recent felling recorded. It became apparent during the course of this survey that *Terminalia*

woodland adjacent to the freshwater marsh was unhealthy with most trees losing their leaves and probably dying. The extent of "dying" *Terminalia* woodland was therefore mapped. Information gathered on the field survey was superimposed on the 1986 photographic survey to give the extent of *Calophyllum–Terminalia* woodland in July 1988.

Flycatcher dispersion and habitat features in the Special Reserve

A series of observations were made inside the Special Reserve (Figure 1) to describe the dispersion of flycatchers and to attempt a quantitative assessment of the woodland. The purpose was to determine whether or not differential use of parts of the reserve could be explained by variation in the woodland habitat, and thereby provide an insight into woodland management which might benefit the species.

The Special Reserve was divided into thirty 50 × 50 m squares (numbered 1–30 in Figure 3) and the centre of each square identified with a temporary marker. Ten censuses were then carried out in which 10 minutes was spent in the vicinity of the central marker for each 50 × 50 m square. During each 10-minute period the total number of flycatchers detected was recorded and, for all males seen, individual identity was noted. The location and movement of males was further recorded in each of the four 25 × 25 m squares which made up the full square.

Quantitative measures of vegetation and several additional habitat features were also recorded in squares 1–24 (Figure 3) as follows (note that there was insufficient time to record habitat features in the other six squares).

(1) Canopy height. This was estimated using a long focal length (200 mm) telephoto lens attached to a camera mounted to a tripod at a fixed height above

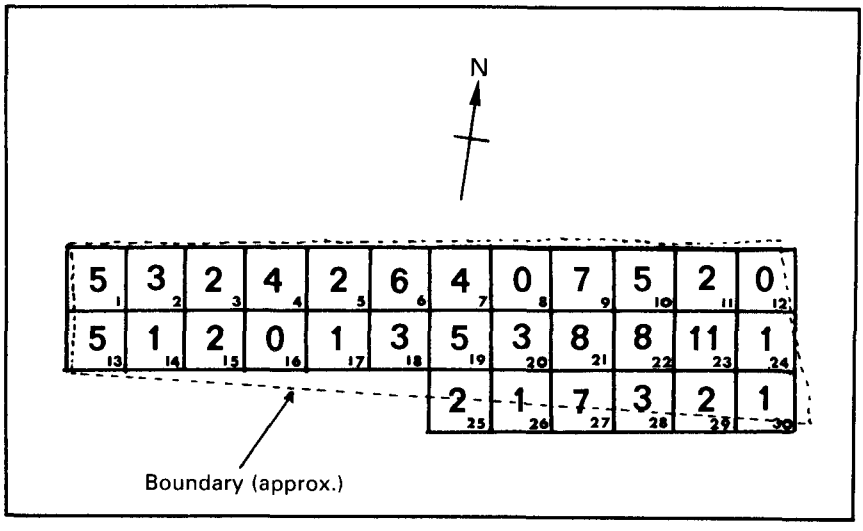

Figure 3. The Special Reserve subdivided into thirty 50 × 50 m squares and the numbers of flycatcher contacts (large figures) made during 10 × 10 minute censuses in each square, 1988.

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ground. The lens was focused on leaves at or close to the canopy above the central marker, the distance read off and the height of the camera above ground added.

(2) Stem density. A 10 × 10 m quadrat was paced out in the centre of each of the four 25 × 25 m squares which made up the full square and the number of stems within each was counted. Stems with a diameter at breast height (DBH) less than 10 cm were ignored. Stem density was converted to number/ha for analysis.

(3) Foliage cover < 1 m. A diagonal transect of approximately 40 m was centred on the temporary marker and at intervals of two paces along this the presence or absence of foliage cover less than 1 m high in a 50 × 50 cm quadrat was scored. Positive scores out of a possible maximum of 20 were then converted to percentages for analysis.

(4) Foliage cover 1–4 m. The same diagonal transect and method described under (3) was used to assess foliage cover in a column between 1–4 m above ground immediately over the ground quadrat. Scores were again converted to percentages.

(5) Foliage cover 4–8 m. The method was as for (4) above.

(6) Foliage cover > 8 m. The method was as for (4) above.

(7) Species composition. The 20 *Calophyllum* or *Terminalia* trees closest to the central marker were identified and the results converted to percentage *Calophyllum*. Stems with a DBH less than 10 cm were ignored as were the very small number of other tree species encountered.

(8) Average DBH. The circumference of the same 20 trees identified under (7) was measured at breast height and the measure converted to diameter breast height on the assumption that the circumference was approximately circular. Mean DBH of the 20 trees was used in the analysis.

(9) Length of footpath. The Special Reserve is crossed by several footpaths and the total length of footpath (m) in each 50 × 50 m square was paced out.

(10) Distance to standing water. The south-eastern boundary of the reserve runs close to the main freshwater marsh on La Digue. In addition there are several depressions throughout the reserve which hold freshwater for much of the year. The distance from the centre of each square to the nearest freshwater source was paced out.

The relationship between dispersion and habitat was tested by individual regression analysis of the dependent variable (bird contacts) on each of the independent variables (habitat features).

Results

Population census

The number of Seychelles Paradise Flycatchers recorded on the western plateau of La Digue in July 1988 is given in Table 1 alongside the census for the same month in 1978. The distribution of nesting territories is given for 1978 and 1988 in Figure 4a and 4b respectively. Census results also show numbers of full-

Table 1. Flycatchers located on the western plateau of La Digue in July 1978 and July 1988

Site	*1978*				*1988*			
	Ad.♂	Ad.♀	F.G.	Juv.	Ad.♂	Ad.♀	F.G.	Juv.
1	1	1		1	1	1		
2	1	1			1	1	1	
3	1	1			1	1	1	
4	1	1						
5	1	1		1	1	1	1	
6	1	1			1	1	1	
7	1	1		1	1	1		
8	1	1						
9	1	1			1	1		
10	1	1			1	1		
11	1	1			1	1	1	
12	1	1			1	1	1	
13	1	1	1		1	1	1	
14	1	1			1	1		
15	1	1			1	1		
16	1	1	1		1	1		1
17	1	1						
18	1	1			1	1		1
19	1	1						
20	1	1			1	1		
21	1	1						
22	1	1			1	1	1	
23	1	1			1	1		
24	1	1						
25	1	1			1	1	1	
26					1	1		
27					1	1		
28					1	1	1	
29					1	1		
30					1	1	1	

1978 summary: total pairs = 25; full grown young = 2; juveniles = 3; total birds = 55.

1988 summary: total pairs = 24; full grown young = 11; juveniles = 2; total birds = 61.

grown young (birds with plumage more or less identical to adult females) and juveniles (birds with characteristic chestnut down of nestlings and incomplete development of flight- and tail-feathers).

In 1988 24 nesting territories were occupied and the comparable figure for 1978 was 25. There were however more birds in total in 1988 (61) than in 1978 (55) and this was accounted for by significantly more territories holding full-grown young ($\chi^2 = 8.87$, df = 1, $p < 0.01$). In 1978 five territories, holding a minimum of 11 birds, were recorded off the western plateau on La Digue and in 1988 the combined observations of Bullock *et al.* (1988) in February and this study

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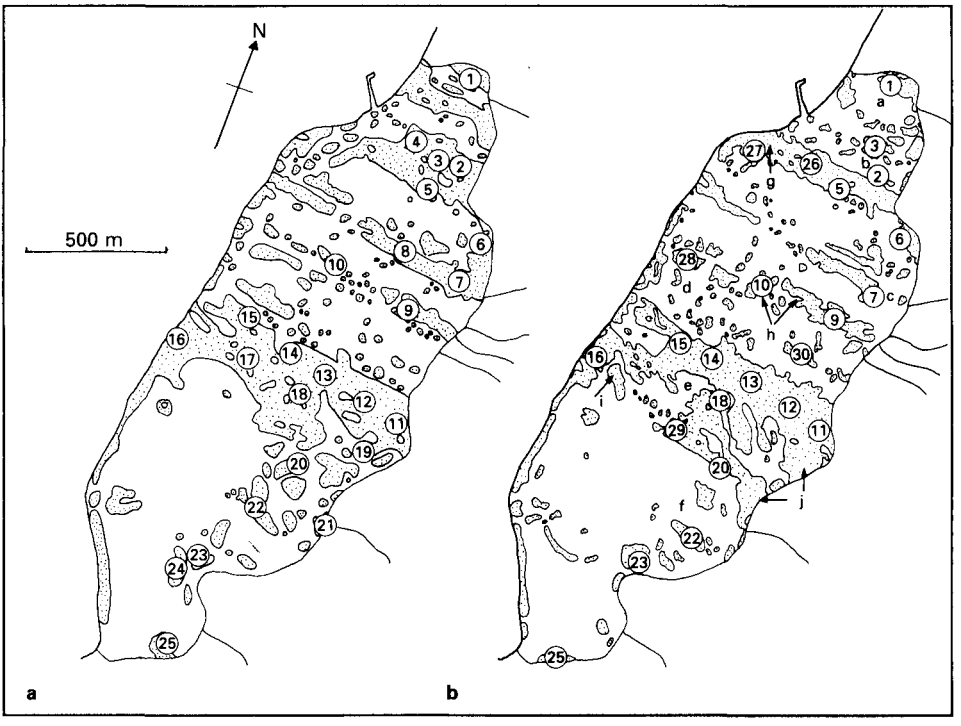

Figure 4a,b. Two maps of the western plateau of La Digue showing the distribution of *Calophyllum–Terminalia* woodland (stippled area) in (a) 1978 and (b) 1988. Numbers refer to the localities of flycatcher nesting territories in each year. Letters on the 1988 map indicate the main areas where the distribution of woodland has changed since 1978 (see text for details).

revealed a probable six territories containing at least 12 birds. These were at Anse Sévère (× 2), Anse Gaulettes, Grand Anse, Anse Songe and Tauzia. Watson (1981) reported on and reviewed sightings on islands other than La Digue and concluded that a minimum of five birds might be present, mostly on Praslin. Assuming a similar number in 1988, this gives a minimum estimate of 78 for the current world population compared with 71 in 1978.

Watson (1981) showed the flycatcher's dependence on *Calophyllum–Terminalia* woodland and this was reinforced during the present survey (Figure 4). In 1988 19 territories coincided with areas used in 1978. Six of the original 25 territories were no longer used although these were in effect replaced by five territories in new areas. Each of the latter, nos. 26–30 in Figure 4b, was centred on *Calophyllum–Terminalia* woodland. Possible reasons for these changes are discussed later.

Habitat survey

The distribution of *Calophyllum–Terminalia* woodland in 1978 (after Watson 1981) and in 1988 (from this survey) is shown in Figure 4a and 4b. In each case woodland is mapped only to the west of the drainage system near the rear of the

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plateau. The total area surveyed was 161.3 ha of which 52.9 ha (32.8%) was wooded in 1978 compared with 50.6 ha (31.3%) in 1988. This represents a decrease of 4.3% over 10 years. In addition to this small net decrease the survey detected a number of more subtle changes in the woodland.

Woodland distribution The comparatively small change in the total amount of woodland on the plateau disguises the fact there have been significant woodland losses in parts of the plateau whilst in other areas regeneration has occurred. The main areas of change are identified by letters on Figure 4b. South of the La Passe River (a) trees have been felled to accommodate new vegetable production and vanilla plantation. North of the La Passe road (b) areas have been cleared around existing houses with large trees presumably extracted for their timber. Similar timber extraction has occurred and was continuing in July 1988 at the east end of L'Allée Bernique (c). Fragmentation of woodland has occurred north-west of La Reserve road (d) apparently to make way for new housing, as has also happened south-west of La Reserve (e). Finally there have been significant losses at the north-eastern end of L'Union Estate (f), where vegetable production has intensified. Set against these there has been expansion of woodland south-east of the La Passe road (g), at several points along L'Allée Kersley (h), south-east of the church at La Réunion (i) and in places bordering the freshwater marsh south-east of La Reserve (j).

Woodland fragmentation In 1978 there were 140 discrete woodland blocks recorded in the survey and by 1988 this had risen to 154. In the earlier survey 99 blocks were < 0.1 ha in extent, 31 were 0.1–1.0 ha and 10 were > 1 ha. By 1988 comparative figures were 110, 37 and 7. Although not yet a statistically significant change, these figures are an indication that the woodland may be fragmenting into a larger number of smaller blocks.

Death of Terminalia Around the fringes of the freshwater marsh to the north-east and east of L'Union Estate *Terminalia catappa* trees are dying. This species is dominant in wet ground fringing the marsh, and trees extending over approximately 2 ha were dying in July 1988 (see also Bullock *et al.* 1988). Although structurally still intact, and therefore still included as woodland in Figure 4b, most trees were defoliated and unlikely to recover. These deaths have been attributed to a general raising of the water-table east of L'Union caused by the construction of a dam designed to retain water for a duck farm (Figure 1).

The Special Reserve

The number of flycatcher contacts made during the 10 censuses in the thirty 50 × 50 m squares is shown in Figure 3. The regression analysis of these data (squares 1–24 only) against habitat features revealed only one significant result, a positive relationship with tree diameter at breast height (DBH). The scattergram is shown in Figure 5 and the equation was $Y = -6.33 + 0.443X$. Analysis of variance gave $F = 8.33$, df 1/22 and $p < 0.05$. The relationships with all other features were extremely weak, although it is worth recording that the slope of

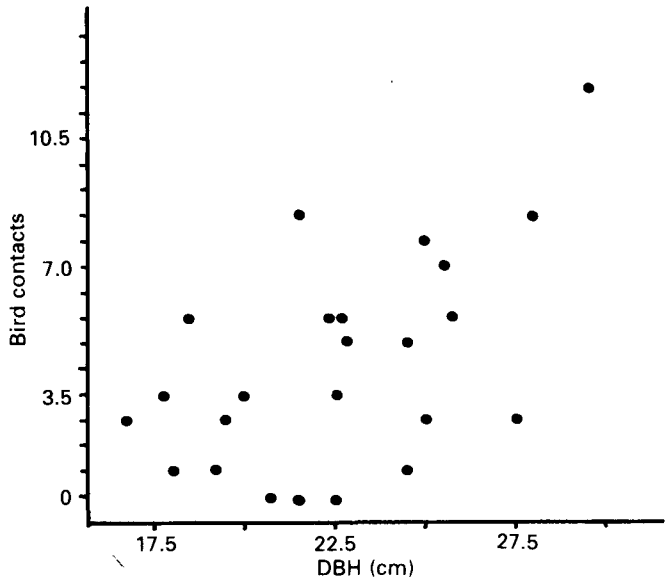

Figure 5. Scattergram showing the number of flycatcher contacts made in twenty-four 50 × 50 m squares and the average diameter at breast height (DBH) of trees sampled in these squares, 1988.

the regression was positive for both canopy height and all four foliage measures and negative for stem density.

During the survey seven different male flycatchers were detected in the reserve, and their dispersion based on sightings within 25 × 25 m squares is shown in Figure 6. Five males probably spent most of their time inside the reserve and two visited only occasionally. Results in Figures 3 and 6 suggest that there are no substantial parts of the reserve consistently unused.

Discussion

Status and distribution of the flycatcher and its habitat on La Digue

The flycatcher population was surveyed by me in 1977–1978 (Watson 1981), by the Oxford University Expedition in 1986 (Trevelyn *in litt.*) and by I. D. Bullock and colleagues in February 1988 (Bullock *et al.* 1988). Unfortunately the Oxford study is of little value since it has never been properly written up and what limited information is available is so approximate as not to be comparable with other surveys. The count in February 1988 is a very useful contribution since it first identified some of the distributional changes which had occurred since 1978. However, the absolute number of territories detected in February was probably an overestimate caused by some double counting (I. D. Bullock and J. Komdeur verbally). The following discussion therefore concentrates on the comparison shown in Table 1 and in Figure 4.

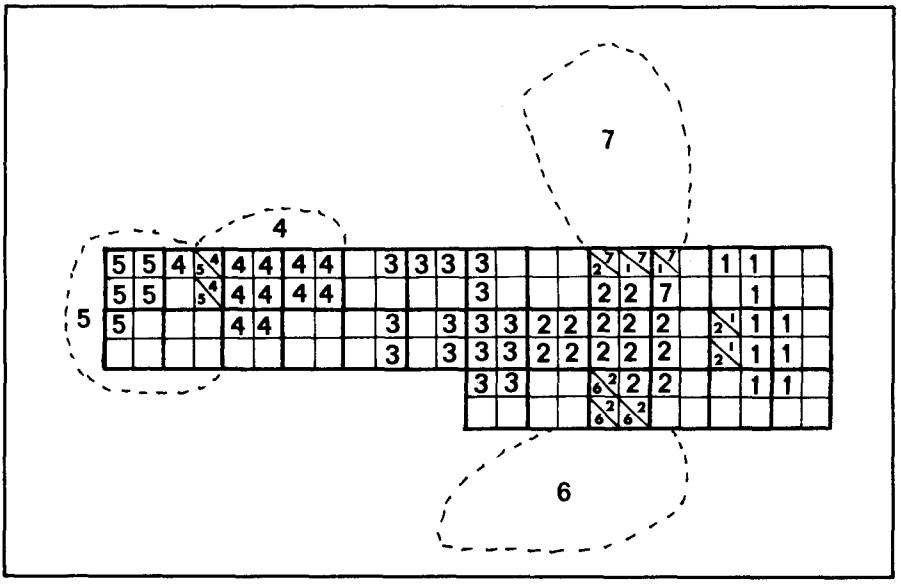

Figure 6. Records of seven different male flycatchers detected in 25 × 25 m squares during the 1988 censuses in the Special Reserve. Also shown are the approximate limits of sightings of birds which were known to move outside the reserve.

The number of occupied nesting territories did not change significantly between 1978 and 1988 although the total number of birds did with a marked increase in the number of full-grown young present on sites. The latter reflects either improved breeding performance in 1988, or improved survival of fledglings, or longer retention of dependent young on natal territories where they would be more readily detected than if they were ranging more widely across the island, or a combination of all these. Causes could be increased available food leading to improved breeding success or tolerance by adults for longer periods on the natal territory. Alternatively a reduction in the amount of the more marginal feeding habitat, which might normally accept young following independence from adults, could have resulted in young spending longer with their parents. The results from the habitat survey do not suggest any substantial change in the amount of woodland on the plateau, and the explanation based on increased food seems more likely. Observations on another insectivorous bird on La Digue, the Cave Swiftlet *Collocalia elaphra*, are consistent with this view. In July 1978 the number of nests in the only known colony on the island was 49 and this had remained more or less constant during the previous 10 months. However in July 1988 there were 85 nests, an increase of 73%. These birds are aerial insectivores which spend most of their time feeding over woodland and marshy areas on La Digue. A possible explanation for the above lies in the changes in the water-table caused by the construction of the dam at the duck farm around 1985. This will have extended the availability of surface water westwards from the main marsh along much of the rear of the plateau and will almost certainly have converted some of the temporary wet areas which once

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used to dry up in the south-east monsoon (May–October) to permanent water bodies, and thereby extended breeding habitat and the breeding period for insects with aquatic larval forms. These animals form a key part of the diet of the flycatcher although precise information on amounts is not available (Watson 1981).

Most distributional changes can be accounted for by changes in the *Calophyllum–Terminalia* woodland on the plateau. The losses at territories 4, 8, 17 and 24 are consistent with significant woodland clearance and new territories at 26, 27, 28, and 30 are all in areas where woodland has extended. The losses at 19 and 21 are associated with two of the worst areas of *Terminalia* die-back. Defoliation of these trees presumably reduces the potential food available for flycatchers, which spend much of their time "picking" insects from the underside of leaves. Finally territory 29 was apparently unoccupied in 1978 but occupied in 1988 although some of the ground covered by these birds fell within the range of territory 17, now abandoned.

Boundary of the Special Reserve

The second objective of this study was to review the current boundary of the Special Reserve and, if necessary, recommend changes. In 1978, what is now the reserve held the equivalent of six nesting territories (five largely within and two partly within the area). This was 24% of the plateau territories. In 1988 the number was the same (Figure 6).

The northern boundary follows the edge of La Reserve road and there is no logical extension to the north of this. To the west the reserve adjoins the school playground and there is little opportunity for extension here. To the east there is a case for a small extension amounting to less than 0.5 ha to include part of the freshwater marsh, although little additional woodland would be added. This leaves the southern boundary as the only option.

In 1978 an extension of the boundary 100 m to the south would have raised the number of territories to eight (32% of the plateau total). However, by 1988 two of the territories bordering and just outside the southern boundary had been abandoned and such an extension would now add only about half a territory. Consequently options for an extension contiguous with the existing area, and which might include several new nesting territories, do not exist. Nevertheless there is a strong case for enlargement of the reserve to the south to include a significant part of the freshwater marsh. Watson (1981) showed that woodland close to freshwater supported a higher density of flycatchers than woodland more distant from wetland, probably because the former supported more insect food. Although this relationship is now confused by the recent raising of water levels and the death of *Terminalia* at the edge of the marsh, it is likely that this is a temporary phenomenon which will be rectified if only because of its deleterious effect on vegetable production. A proposed new boundary for the Special Reserve is shown in Figure 7.

Management prescriptions for the Special Reserve

The preparation of a full management plan for the reserve, although one is undoubtedly needed, was beyond the scope of this short study. There were,

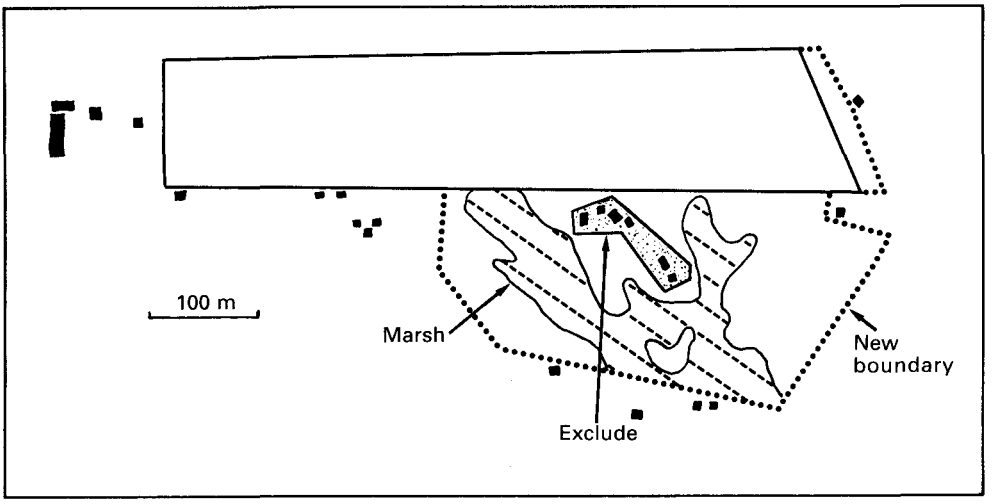

Figure 7. A proposed new boundary for the Special Reserve incorporating the most significant part of the freshwater marsh on the La Digue plateau.

however, a range of requirements identified during the study which need to be acted upon if the reserve is to be effective in its twin purposes of providing a nucleus of high-quality habitat for the flycatcher and of offering a facility for the viewing of the species by visitors to La Digue; the latter include both overseas tourists and Seychellois.

Woodland management Bullock *et al.* (1988) carried out some detailed observations on feeding behaviour in relation to habitat in the reserve. They were concerned that not all of the reserve was being effectively used and believed that management of the woodland might rectify this. The principal conclusion from their feeding study was that birds spent most time hunting in a vertical zone between 0.75 and 8 m above ground, and that there were parts of the reserve where foliage density in this band was too high to allow birds to feed effectively. The main problem with their analysis was that only one area with a high density of foliage at 0.75–8 m was investigated. This corresponded to the north-eastern-most 50 × 50 m square in Figure 6. Whilst this area does have a high density of saplings it is almost unique in this respect within the reserve, and it would be wrong to draw general conclusions on woodland management based on observations on this small patch. In fact the more extensive survey of dispersion and habitat features described in this report was no more effective at identifying management options. This need not be a problem since the survey showed that virtually the whole of the reserve was used and no large blocks were avoided. In structural terms the reserve is relatively uniform over much of its area and the even dispersion of flycatchers is thus not surprising. The one significant relationship showed that more birds occurred in areas with, on average, larger trees. Although nothing can be done immediately to enhance this feature, it could be appropriate to consider selective thinning of the woodland in areas where there is currently a high density of even-aged stems. Alternatively large trees will develop naturally over time and with the process of self-thinning.

Wetland management The importance of the wetland/woodland association for flycatchers was described in Watson (1981), reiterated in Bullock *et al.* (1988) and has been referred to again in this paper. Whilst the precise reasons remain unclear, it is certain that the existence of wetland in or near woodland can benefit flycatchers by permitting higher nesting densities, and may also enhance breeding performance. It is therefore imperative that the extensive marsh south-east of the present reserve boundary remains intact, and for this reason a substantial part of it should be incorporated within the reserve. In addition up to three artificial ponds, each approximately 20 m across, could be created in the western one-third of the reserve, since this area lacks standing water.

Monitoring Ecological monitoring should be used to check on the status of the flycatcher and its habitat and to assess the effectiveness of any management carried out. Monitoring should include records of all nesting attempts and an annual survey of the flycatcher population, which should be written up alongside a description of any recent management; habitat features within the Special Reserve should be sampled at five-year intervals.

Fencing The northern and eastern boundaries are presently defined by a barbed wire fence in a state of disrepair. This serves no useful function and causes resentment amongst the inhabitants of La Digue. The fence should be removed from the northern edge where the road is an easily identifiable boundary. The western and southern edges need to be accurately surveyed and marked with a series of large wooden posts (preferably *Casuarina* wood, not less than 20 cm in diameter, one metre above ground and half a metre cemented below ground) placed at 25 m intervals. These should not be wired. Assuming the eastern boundary is moved to the centre of the marsh as proposed this need not be marked, otherwise posts as described above should be used.

Provision of information Presently visitors to the reserve receive little information, although the warden is on hand to help locate the birds during "office hours" on weekdays. The reserve signs and the warden's hut at the reserve entrance are in poor condition. If the reserve is to survive in the long term it must succeed in attracting overseas visitors and provide a valued educational resource for the people of Seychelles. This could be achieved by providing an attractive interpretive facility at the reserve entrance. Such a facility would double as a potential source of income for the reserve and an improved working environment for the flycatcher warden.

Education Information about the reserve, preferably written in creole, should be made available to all primary schools in Seychelles, and school children should be encouraged to visit the reserve. A more detailed information pack should be provided for secondary school children and members of the National Youth Service (NYS). The latter should be used to carry out management in the reserve, including a concerted litter clearance campaign and assistance with pond construction and fence erection once the boundaries have been professionally surveyed. All such work should be done under the supervision of the warden and a senior park ranger. Secondary school children studying biology

should be encouraged to take part in the monitoring work, again with guidance from park rangers.

Management for the flycatcher off the Special Reserve on La Digue

The Special Reserve can only be one element in the management needed to ensure the long-term survival of paradise flycatchers in Seychelles. This is because the reserve can never support more than about 6–8 nesting territories, and it is very unlikely that this alone would be a viable population. The minimum objective for the species should be to maintain at least 20 nesting territories on the western plateau of La Digue; this should be possible without impinging unreasonably on alternative requirements for land use. Such an objective will not forever be achieved by chance, despite the fact that changes in land use over the past 10 years have not generally resulted in major net losses in woodland habitat. At least two of these changes, expansion of areas used for vegetable production and new housing development, are certain to intensify in the years ahead as human population pressures increase. Furthermore there will be a continuing demand for quality timber of the type produced on the plateau. In anticipation of these changes it is now essential that an overall land-use policy is devised with areas of the plateau zoned for woodland, agricultural production and housing.

Conclusions

(1) There has been little change in the flycatcher population on the La Digue plateau since 1978, with the loss of one pair but a small increase in the total number of birds.

(2) The extent of *Calophyllum–Terminalia* woodland has declined slightly (<5%), although there have been more significant changes in woodland distribution. The latter are reflected in changes in the distribution of flycatcher nesting territories.

(3) The number of pairs using the Special Reserve was the same as in 1978.

(4) The value of the reserve would be enhanced by the inclusion of a significant area of marsh within the boundary. A new boundary is proposed.

(5) Management prescriptions for the reserve should include non-interventionist woodland management; extension of the boundary to include an area of marsh; construction of ponds; systematic ecological monitoring; removal of barbed wire from the boundary; accurate survey and marking of the boundary with wooden posts every 25 m; provision of an interpretive facility; development of educational material and educational use of the reserve.

(6) A comprehensive land-use policy should be devised for the whole plateau, including statutory zonation of areas safeguarded for sustainable timber production, using trees native to the coastal plateau.

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