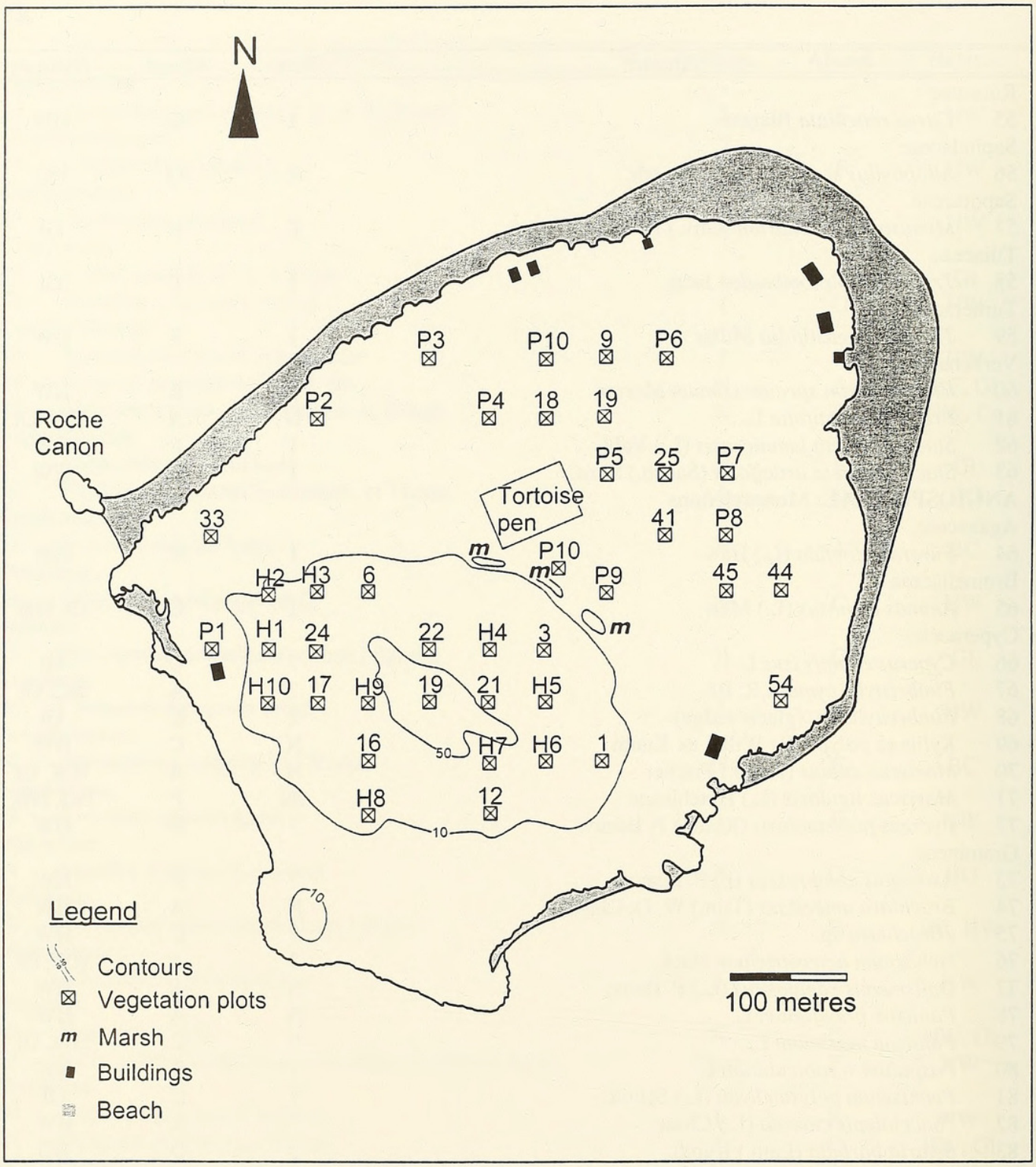

Figure 1. Cousin Island: physical, with locations of vegetation plots.

COUSIN

BY

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GEOLOGY, TOPOGRAPHY AND CLIMATE

Cousin is one of the smaller islands of the granitic Seychelles with an area of only about 29 ha. It lies about 2 km from Praslin, the second largest of the central Seychelles islands, and 2.1 km north east of the slightly smaller island of Cousine.

The island is dominated by its plateau (Table 1), a flat coastal plain made up of phosphatic sandstones. This rock was formed by the action of seabird guano on loose deposits, largely of marine origin, in the presence of *Pisonia* litter (Fosberg, 1984). The southern part of the island consists of a granite hill which reaches 58 m. The granite of the hill is similar in quality to that of Praslin Island (Braithwaite, 1984). Along Anse Frégate in the south, there is a conspicuous line of fossil beach-rock (Fosberg, 1970). A granite outcrop, Roche Cannon, of similar granite to the hill, is connected to the north west corner of the island by a natural causeway.

The plateau rocks support a thin layer of soil. Fosberg (1984) describes the plateau deposits as a beheaded Jemo soil, except around the marshes where deeper alluvial deposits have accumulated. These deeper soils were used for crop cultivation, and small numbers of fruit trees survive at the base of the hill.

Cousin's beaches surround the island and their sand is highly mobile, shifting between beaches on the east and west sides of the island with the two main seasons of the Seychelles (Frazier and Polunin, 1973). Standing fresh water on the island is limited in extent and seasonal. On the plateau at the northern base of the hill there are several freshwater pools. To the south of the hill is a regularly inundated area of land colonised by mangroves. There are several small seasonal streams.

The Seychelles islands experience a seasonal humid tropical climate (Walsh, 1984). Historical weather data for Cousin Island are limited and current data are unavailable. A summary of data on rainfall for the period 1970-75 is shown in Table 2.

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Table 1. Area of Cousin Island by altitude (calculated from maps published by Directorate of Overseas Survey (UK)/Seychelles Government).

Altitude range (m. asl.)	Area (ha)	Percentage total area
50 - 100	0.6	2.1
10 - 50	5.5	19.2
0 - 10	22.5	78.7

Table 2. Cousin Island. Mean monthly rainfall (mm), 1970-1975 (from Shah *et al.* 1999).

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	**Total**
232	141	143	110	56	30	41	100	112	205	139	310	**1619**

HISTORY

The island was briefly mentioned by Malavois (1787) who described it as wooded with difficult access (in Fauvel, 1909). In 1821, when the island was surveyed by the Mauritian Government surveyor, it was divided into three sections owned by freed slaves (Diamond, 1975). In the nineteenth and early twentieth centuries, the island had a succession of private owners. At this time mixed agriculture was probably practised and the natural resources of the predator-free island (turtles, seabirds and their eggs) exploited. Coconut plantations were begun on Cousin around 1910. Within 10 years, the natural vegetation of the plateau had been completely replaced by coconuts (den Boer and Geelhoed, 1990).

The island was managed for copra production until 1967 when it was purchased by the International Council for Bird Preservation (now BirdLife International) and subsequently managed as a nature reserve, largely to protect the Seychelles warbler *Acrocephalus sechellensis*, which was then known only from Cousin (Komdeur, 1988). Management from this time allowed the regeneration of semi-natural vegetation dominated by *Pisonia grandis* (Phillips, 1984). The island was designated a Nature Reserve by the Seychelles Government in 1968, and was designated a Special Reserve in 1969. The Special Reserve designation includes the sublittoral zone to 400 m beyond the high-water mark (Shah *et al.* 1999).

FLORA AND VEGETATION

Flora

Ninety-five plant species were recorded on Cousin Island, including three ferns and 92 angiosperms. Of the angiosperms, 47 (51.1%) species are regarded as introduced (Friedmann, 1994) and 32 (34.8%) native. Only one of these native species (*Pandanus balfourii*) is endemic to the Seychelles although the list also contains an endemic subspecies (*Ficus reflexa* ssp. *seychellensis*).

The flora of Cousin Island has a similar proportion of introduced species and a smaller number of endemics than the flora of Seychelles as a whole (of the total Seychelles flora, around 54% are introduced and 9% endemic: Procter, 1984). The small number of endemic taxa probably reflects the island's size; in general, smaller islands in the archipelago have fewer endemic species (Procter, 1984).

Of the introduced plants established on Cousin Island, a small number can be regarded as invasive weed species (Carlström, 1996a; Fleischmann, 1997). Of these, three are woody plants: casuarina *Casuarina equisetifolia* (frequent in beach crest vegetation; possibly native), papaya *Carica papaya* (abundant in plateau woodland) and agati *Adenanthera pavonina* (occasional in plateau woodland).

Other potentially invasive species are the herbs pineapple *Ananas comosus* and fatak grass *Panicum maximum*. Both species currently have a limited distribution on the island. The Rangoon creeper *Quisqualis indica* occurs at one point near the marsh. It has the potential to dominate large areas through vegetative propagation.

Several previous workers have produced plant species lists for Cousin Island, most notably Fosberg (1970, 1984). Fosberg recorded 132 species, many of which are still present on the island. Further surveys were carried out by Bathe and Bathe (1982) and Schumacher and Wüthrich (2000). In total, 54 species were identified in previous surveys but not in the current survey (Appendix 1). At least three of these previously recorded taxa are synonyms of other species on the list, and three may never have been present on the island. Many more (especially species of cultivation) are probably now extinct, or are occasionally cultivated. Some species were undoubtedly overlooked; a long-term survey of 1999 recorded 10 species not recorded by this survey (Schumacher and Wüthrich, 2000). If these, and species listed by previous authors which may survive (17 species: mainly herbs and grasses which may have been overlooked) are included, the total current plant species list for Cousin is 122.

Vegetation

The extents of major vegetation types on Cousin Island are shown in Table 3, and on Map 2. While most of the island was formerly coconut plantation, the plateau and part of the hill is now dominated by native woodland. The hill also has native scrub and large areas of bare rock.

In total, 40 vegetation plots were completed, 20 in June and 20 in December, covering 4,000 m^2 or 1.4% of the island's surface. Twenty vegetation plots were in plateau woodland covering 2,000 m^2 or 1.1% of this habitat type, and 20 were in hill woodland/scrub (excluding areas of bare rock), covering 2,000 m^2 or 4.7% of this habitat type. A summary of results is shown in Table 4.

Hill woodland plots had a relatively low density of trees with sparse shrub and herb layers. The most abundant tree was the native *Pisonia grandis* (Table 5). Introduced trees made up only a small proportion of the total tree layer (only one or two species, around three percent of stems). The shrub layer of hill plots was species-poor, with only eight species represented, seven of which were native. The most widespread species was *Euphorbia pyrifolia* (Table 6). Coconut *Cocos nucifera* was only present in one plot, although in that plot it constituted 38% cover in the herb layer. The herb layer of hill

plots had fewer species than plateau plots: only 18 species were recorded, four of them introduced. The only species occurring in more than 10 plots was the fern *Nephrolepis ?biserrata*, in 17 plots (with a mean coverage of 29.6% in these plots).

Plateau woodland plots had a high density of trees, relatively dense shrub layer, and sparse herb layer. The tree layer was more species-rich than that of hill woodland and included several species not present on the hill. *Pisonia grandis* was again dominant, but introduced species were more prominent due to the abundance of introduced papaya, absent on the hill. The shrub layer of plateau plots was more species-rich than that of hill plots with 15 species represented (three of them introduced). The most widespread species, and that forming the largest part of shrub cover in the plots where it occurred, was *Pisonia grandis*. *Cocos nucifera*, *Morinda citrifolia* and *Ochrosia oppositifolia* were also widespread in the plateau shrub layer. The herb layer of plateau plots was also species-rich with 20 species, seven or eight of which were introduced. Five species occurred in 10 or more plots: the most widespread and abundant were the liana *Canavalia cathartica* (in 15 plots, mean cover 14.8%) and the fern *Nephrolepis ?biserrata* (in 15 plots, mean cover 13.7%). *Morinda citrifolia* occurred in 12 plots (mean cover 1%), *Carica papaya* in 11 (mean cover 1%), and *Pisonia grandis* 10 (mean cover 4.7%).

Table 3. Extent of major vegetation types, Cousin Island.

	Vegetation type	Area (ha)
Hill	Woodland (*Pisonia grandis* dominant)	1.5
(> 10 m asl)	Woodland (figs, other native spp.)	0.4
	Scrub (native)	2.4
	Bare rock	1.1
Plateau	Woodland (*Pisonia grandis* dominant)	17.2
(< 10 m asl)	Woodland (other native spp.)	0.7
	Scrub (native)	0.1
	Coconuts	0.1
	Freshwater marsh	0.2
	Mangrove	0.8
	Beach crest vegetation (including *Casuarina*)	1.9
	Bare rock	1.5
	Grassland/garden	0.1

Table 4. Vegetation plot summary.

Habitat	Plots	Mean altitude (m asl)	Mean trees ha^{-1}	Mean shrub layer cover (%)	Mean herb layer cover (%)	Open leaf litter cover (%)	Bare rock (%)	Dead wood (pieces per plot)
Plateau woodland	20	<5	990	41.9	29.9	44.4	21.4	3.8
Hill woodland	20	21	390	15.9	29.6	22.1	47.1	1.3

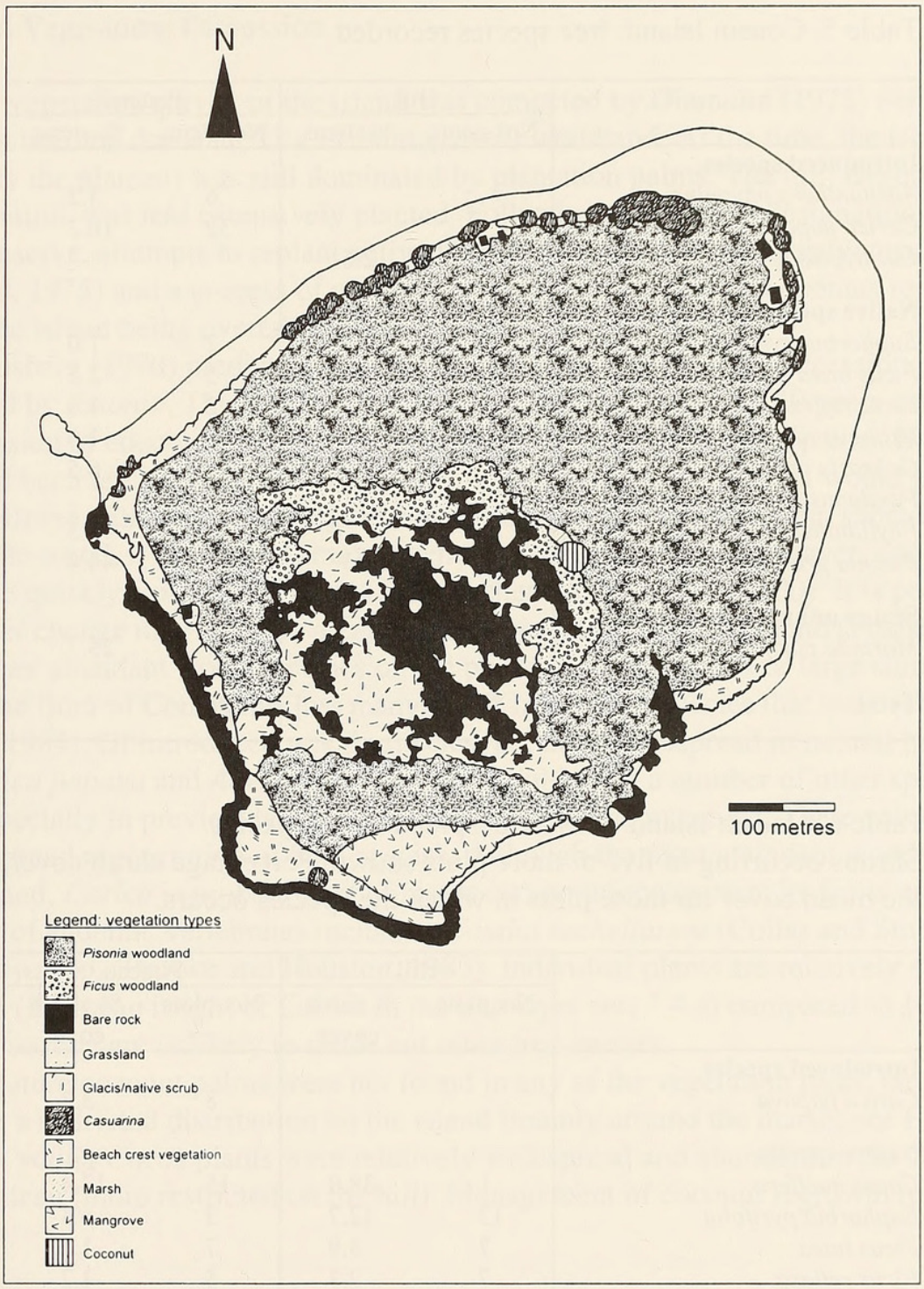

Figure 2. Cousin Island vegetation.

Table 5. Cousin Island: tree species recorded

	Hill		Plateau	
	No. stems	% stems	No. stems	% stems
Introduced species				
Adenanthera pavonina			6	3.2
Carica papaya			32	16.2
Eucalyptus sp.	2	2.6		
Native species				
Euphorbia pyrifolia	18	23.1	2	1.0
Ficus lutea	4	5.1	5	2.5
Ficus reflexa	9	11.5	2	1.0
Hibiscus tiliaceus			2	1.0
Ochrosia oppositifolia			13	6.5
Pandanus balfourii	11	14.1		
Phyllanthus pervilleanus			1	0.5
Pisonia grandis	33	42.3	88	44.4
Status unknown				
Morinda citrifolia	1	1.3	47	23.7
Total	**78**		**198**	

Table 6. Cousin Island: most widespread shrub species.
Shrubs occurring in five or more plots shown. Percentage shrub cover is the mean cover for those plots in which the species occurs.

	Hill		Plateau	
	No. plots	% shrub cover	No. plots	% shrub cover
Introduced species				
Carica papaya			8	3.3
Native species				
Cocos nucifera	1	38.0	15	13.4
Euphorbia pyrifolia	13	12.7	3	6.3
Ficus lutea	7	5.9	7	1.1
Ficus reflexa	7	2.3	5	1.2
Ochrosia oppositifolia			13	9.3
Phyllanthus pervilleanus			5	4.6
Pisonia grandis	5	8.0	19	14.9
Status unknown				
Morinda citrifolia	1	8.0	15	7.0
Total	**20**		**20**	

Flora And Vegetation: Discussion

A vegetation survey of the island was competed by Diamond (1975) before the island had become dominated by *Pisonia grandis* woodland. At the time, the island (especially the plateau) was still dominated by plantation palms. The hill, largely unsuited for cultivation, was less extensively planted. Following the island's designation as a Nature Reserve, attempts to replant native vegetation were deemed largely unsuccessful (Diamond, 1975) and a process of natural succession occurred with coconuts removed to prevent the island being overtaken by coconut scrub.

Fosberg (1970) predicted that the vegetation would undergo succession until dominated by *Pisonia*. This change has happened within a period of 30 years, assisted by the repression of coconut regrowth and the removal of mature fruiting palms. If mature palms had been left in place, and coconuts left to germinate, the plateau would probably now be a dense palmetum. Although *Pisonia* is a relatively fast-growing, short-lived tree with fragile wood, it can form climax vegetation through its ability to layer, and regenerate quickly from fallen stems (Schumacher and Wüthrich, 2000). It is possible that further change may result in areas of *Ochrosia*-dominated woodland (Fosberg, 1970); other abundant woody species on the plateau are small trees or large shrubs.

The flora of Cousin has lost many of the introduced species that were recorded by Fosberg (1984). Of introduced woody species, the most widespread in natural habitats were *Carica papaya* and *Adenanthera pavonina* (although a number of other species occur, especially in previously cultivated areas around the marshes). There was evidence for widespread regeneration of both species. Although the most abundant woody exotic on the island, *Carica* is probably not of major conservation concern: its fruits are eaten by a number of endemic vertebrates including *Foudia sechellarum* (Collar and Stuart, 1985) and *Mabuya* spp. (Brooke and Houston, 1983). Individual plants are relatively short-lived and small (the mean height of *Carica* in the tree layer was 7.4 m compared to 10.7 m for *Pisonia*), so they are unlikely to shade out other tree species.

Mature coconut palms were not found in any of the vegetation plots; large *Cocos* now have a restricted distribution on the island (mainly around the marsh; see Fig. 2). However, young *Cocos* plants were relatively widespread and abundant in the shrub layer on the plateau (more restricted on the hill). Management of coconut regrowth remains important.

INVERTEBRATES

Pitfall Trapping

Pitfall trap assemblages were relatively large, compared to those from other islands surveyed (Table 7). Assemblages (excluding ants) were larger in the north west monsoon period than in the dry season dominated by south east trade winds. The high value for hill plots in the SE season is due to extremely high ant numbers trapped in one plot. Ants dominated all pitfall assemblages forming between 57% of the total invertebrate individuals (NW, hill) and 98% of invertebrate individuals (SE, hill). Other

than ants, dominant invertebrate groups included Crustacea (including both Isopoda and Amphipoda), Blattodea, Dermaptera and Araneae (Fig. 3). In Hill plots, larger numbers of Crustacea were trapped. Only isopods were collected on the hill; amphipods were abundant but only trapped in plateau plots. Cockroaches (Blattodea) were also abundant in hill plots in both seasons.

Plateau woodland sites were dominated by ants which made up 78.6% of the total individuals in pitfall assemblages. The most abundant species was the native *Odontomachus troglodytes* (41.5% of individuals), followed by *?Cardiocondyla emeryi* (35.6% of individuals). The most abundant non-ant species (and the third most abundant species) was an amphipod crustacean which formed 5.0% of individuals. An earwig species (Dermaptera) made up 4.0% of individuals. A total of 73 morphospecies were collected in 20 plots.

In hill woodland/scrub, assemblages were similar but less species-rich. A total of 48 taxa were collected in 16 plots. Ants were again dominant, forming 90.0% of the total individuals. *Cardiocondyla emeryi* was the most abundant species (88.2% of individuals). An isopod crustacean was the second most abundant species (4.9% of individuals). Other species form much smaller proportions of the total assemblage: a cockroach species made up 2.3% of individuals, *Odontomachus troglodytes* 0.7%.

The crazy ant *Anoplolepis gracilipes* was collected twice. One individual was collected in a hill plot and one in a plateau plot.

Table 7. Pitfall assemblages from Cousin Island.
Only invertebrates of body length >2 mm included.
(Number in parentheses = number of invertebrates excluding ants).

	Habitat	Mean no. individuals per 5 traps	
		SE season	NW season
Cousin	Plateau woodland	58.0 (16.9)	122.9 (21.6)
	Hill woodland	410.2 (6.7)	62.7 (27.0)
Mean for all granitic islands		61.8 (9.4)	61.1 (16.0)

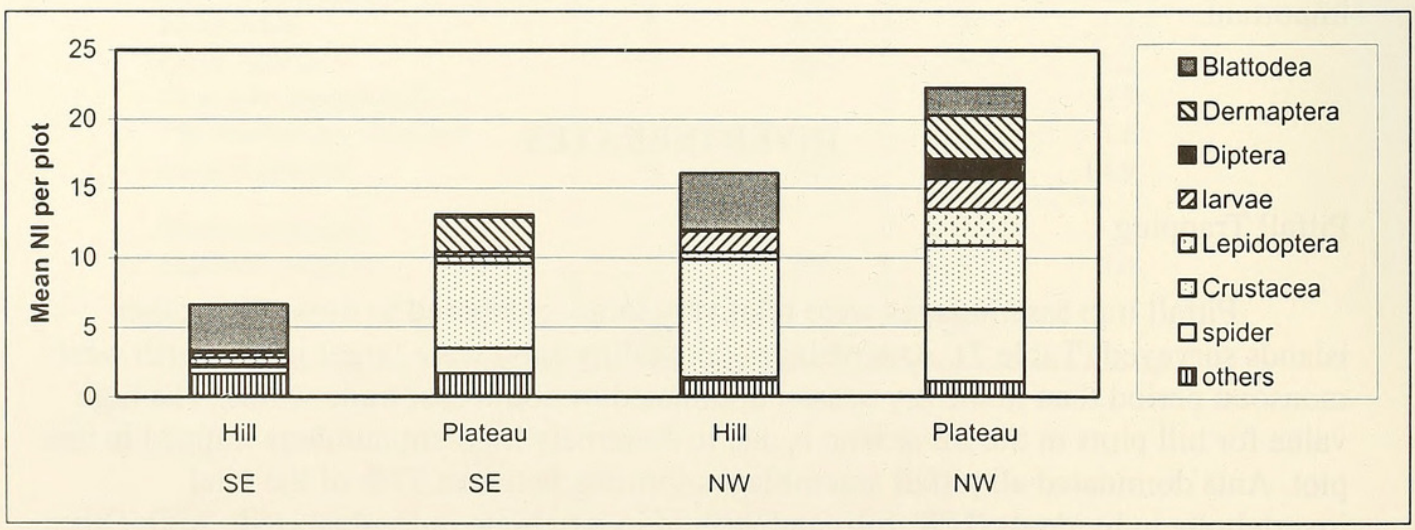

Figure 3. Composition of pitfall assemblages on Cousin Island, excluding ants.

Leaf-insect Counts

Leaf-insect counts were carried out for six tree and shrub species, five of these in both seasons (Table 8). For four of the species counted in both seasons, invertebrate densities were higher in June. For one species, invertebrate counts were higher in December, during the north west monsoon. As found on some other islands, the highest density of invertebrates was on the shrub *Morinda citrifolia*. *Pisonia grandis* also had high invertebrate densities (especially in June). Together, these two species dominate woodland vegetation on the plateau of Cousin.

Table 8. Density of invertebrates on foliage, Cousin Island
n = no. of leaves counted; NI = number of individual invertebrates.

Species	SE season (June)			NW season (December)		
	n	mean NI leaf^{-1}	mean NI m^{-2}	N	mean NI leaf^{-1}	mean NI m^{-2}
Native species						
Euphorbia pyrifolia	250	0.068	47.28	600	0.070	30.73
Ficus lutea	150	0.420	36.68	350	1.040	76.35
Ficus reflexa	0			400	0.193	57.88
Ochrosia oppositifolia	250	1.100	54.91	500	0.114	8.51
Pisonia grandis	400	3.133	150.93	1600	0.531	46.02
Status unknown						
Morinda citrifolia	250	4.332	322.56	550	0.342	33.27

Malaise Trapping

Malaise trapping was carried out in hill and plateau woodland habitats, during both seasons. Five Malaise traps (three in plateau plots, two in hill plots) were run in June, and four (two in each habitat) in December 1999 (Table 9). Assemblages were larger in the north west monsoon season (December), than in the south east season. However, there was no consistent difference in catch size between habitats. The major insect order in most seasons was the Diptera. In June, in hill plots, Hemiptera (especially Auchenorrhyncha) dominated assemblages. The majority of taxa collected have yet to be identified to species level.

Table 9. Malaise trap assemblages, Cousin.
NI = Number of Individuals.

	SE (June)		NW (December)	
	Hill	Plateau	Hill	Plateau
No. traps	2	3	2	2
Mean NI trap^{-1}	699.5	1038.0	2890.5	1875.0
Total NI Diptera	232	1262	4312	1137
Total NI Hemiptera	527	512	39	38
Total NI Hymenoptera	216	752	317	348
Total NI Lepidoptera	237	481	1013	288
Total NI Orthoptera	128	63	45	19
Total NI Other orders	59	44	55	45

Observation

A list of species observed or collected in the current survey, and by previous workers, is given in Table 10. Terrestrial invertebrates were collected on both assessment visits; aquatic invertebrates were only collected when there was water in the marsh, in December. At this time, the marsh had standing water with a combined area of about 1,000 m^2 and to a depth of up to 50cm. An aquatic light trap operated overnight collected two crustacean species in very large numbers.

Discussion: Invertebrates

Pitfall assemblages from Cousin Island were relatively large and assemblages on the plateau (excluding ants) were larger than those on the hill: plateau areas are more suitable for Seychelles magpie-robin than hill areas.

The presence of the crazy ant *Anoplolepis gracilipes* in pitfall assemblages, albeit in small numbers, is of concern. This pest species was introduced in Seychelles in the early 1960s (Haines *et al.*, 1994) and has since been spread to many islands including Marianne and Félicité. On Bird Island, especially high concentrations of ants have caused tree death (Hill, in prep.) and the eradication of native reptiles from large parts of the island (Feare, 1999a). Crazy ants were not recorded on Cousin in 1982 (Bathe, 1982b) but their presence has been reported on several occasions, and ants in the vicinity of buildings have been eradicated. It is possible that the species had been present on the island for some time but has not been able to reach the pest proportions found on other islands due to competitive exclusion by other ant species favoured in the semi-natural habitats of Cousin Island.

Leaf invertebrate counts were highest for the two tree species that currently dominate Cousin's woodland (especially plateau woodland). For most tree species (contrary to results for several islands) invertebrate densities were higher in the dry season (June) than in the north west monsoon season (December).

Few aquatic invertebrates were collected on Cousin, probably as a result of the seasonality of standing water on the island. No dragonflies were recorded, although six species have been recorded on the island, four breeding (Bathe, 1982c). Species lists have also been produced for Cousin bees (5 species: Bathe, 1982a) and ants (14 species: Bathe 1982b).

Table 10. Invertebrates, Cousin Island.
Previous records (in notes); 1 = Bathe and Bathe, 1982a; 2 = Mühlenberg 1977; 3 = Bathe and Bathe, 1982b; 4 = Bathe and Bathe, 1982c; 5 = Blackman 1965, in Blackman and Pinhey, 1967.

Order	Family	Species	Notes
Mollusca	Achatinidae	*Achatina* sp.†	Many empty shells
	Subulinidae	*Subulina octona* Bruguière, 1792	
		?Opeas sp.	
Arachnida:			
Amblypygi	Tarantulidae	*?Charinus seychellarum* Krapelin, 1898	
Araneae	Tetragnathidae	*Nephila inaurita* (Walckenaer, 1841)	
Scorpiones	Buthidae	*Isometrus maculatus* (de Geer, 1778)	
Crustacea:			
Decapoda	Coenobitidae	*Coenobita brevimanus* Dana, 1852	
	Grapsidae	*Grapsus tenuicrustatus* (Herbst, 1783)	
	Ocypodidae	*Ocypode ceratophthalmus* (Pallas, 1772)	
		Ocypode cordimana Desmarest, 1825	
Myriapoda:			
Chilopoda	Scolopendridae	*Scolopendra subspinipes* (Leach, 1918)	
Diplopoda	Spirostreptidae	*Seychelleptus seychellarum* (Desjardins, 1834)	
	Spirobolellidae	*?Benoitiulus flavicollis* Mauries, 1980	
	Trichopolydesmidae	*Cylindrodesmus hirsutus* (Pocock, 1888)	
	Trigoniulidae	*Spiromanes ?braueri* (Attems, 1900)	
		Spiromanes seychellarum Saussure & Zehntner, 1902	
Insecta:			
Coleoptera	Scarabaeidae	*Oryctes monoceros* (Olivier, 1789)	
Hymenoptera	Anthophoridae	*Ceratina nodosiventris* Cockerell 1912 *	Recorded 1982[1]
		Xylocopa caffra (Linnaeus, 1767)	
	Apidae	*Apis mellifera adansoni* Latreille, 1804	Recorded 1982[1] and 1999/2000
	Formicidae	*Anoplolepis gracilipes* (Smith, 1857)	
		Brachymyrmex cordemoyi Forel 1895 *	Recorded 1975[2]
		Camponotus grandidieri Forel, 1886 *	Recorded 1982[3]
		Camponotus hova Forel, 1891	
		Cardiocondyla emeryi Forel, 1881	
		Leptogenys maxillosa (Smith, 1858) *	Recorded 1982[3]
		Monomorium floricola (Jerdon, 1851) *	Recorded 1975[2]
		Odontomachus troglodytes Santschi, 1914	Recorded 1975[2], 1999-2000
		?Pachycondyla melanaria (Emery, 1894)	
		Paratrechina bourbonica (Forel, 1886) *	Recorded 1975[2]
		Paratrechina longicornis (Latreille, 1802)*	Recorded 1975[2]

Table 10 (cont.)

Order	Family	Species	Notes
		Pheidole megacephala (Fabricius 1793) *	Recorded 1982[3]
		Strumigenys rogeri Emery, 1890*	Recorded 1982[3]
		Tapinoma melanocephalum (Fabricius, 1793)*	Recorded 1975[2]
		Technomyrmex albipes (Smith, 1861)	Recorded 1975[2], 1982[3], 1999-2000
		Tetramorium ?bicarinatum (Nylander, 1846)	
		Tetramorium languinosa Mayr, 1870 *	Recorded 1982[3]
		Tetramorium simillimum (F. Smith, 1851)*	Recorded 1982[3]
	Halictidae	*Pachyhalictus mahensis* (Cameron) *	Recorded 1982[1]
	Megachilidae	*Megachile seychellensis* Cameron, 1907 *	Recorded 1982[1]
	Vespidae	*Polistes olivaceus* (de Geer, 1773)	
Lepidoptera	Hesperiidae	*Borbo* sp.	
	Lycaenidae	*Leptotes pirithous* Linnaeus, 1767	
Neuroptera	Myrmeleontidae	*Myrmeleon obscurus* Rambur, 1852	
Odonata	Coenagrionidae	*Ceriagrion glabrum* (Burmeister, 1839)*	Recorded 1980-81[4]
	Aeshnidae	*Hemianax ephippiger* (Burmeister, 1839)*	Recorded 1980-81[4]
	Libellulidae	*Diplocodes trivialis* (Rambur, 1842)*	Recorded 1980-81[4]
		Orthetrum stemmale wrightii (Selys, 1869)*	Recorded 1965[5], 1980-81[4]
		Tramea limbata (Selys, 1869)*	Recorded 1980-81[4]
		Zyxomma petiolatum (Rambur, 1842)*	Recorded 1965[5]

† extinct?

• species recorded by previous workers but not observed in current survey

VERTEBRATES

Reptiles and Amphibians

Six terrestrial reptiles were observed (Table 11), all native to Seychelles although one (Aldabra tortoise) was introduced in the granitic islands and was first recorded on Cousin in the 1960s (Bour, 1984). Four species of reptile previously recorded on Cousin were not observed in the current survey, the geckos *Urocotyledon inexpectata* and *Gehyra mutilata*, the Brahminy blind snake *Ramphotyphlops braminus* and the freshwater terrapin *Pelusios subniger*. Three of these (excluding *G. mutilata*) are rather cryptic, rarely observed species and were probably overlooked. *U. inexpectata* was recorded once, in 1979 (Shah *et al.*, 1999); its current status is unknown.. The introduced gecko *Gehyra mutilata* has been observed in houses (Shah *et al.*, 1999). It is common on larger islands such as Praslin and, if extinct, is likely to reinvade. The blind snake is a widespread introduced species found on many of the islands where agriculture formerly occurred, and probably survives on Cousin. The terrapin was introduced to the island from La Digue in *c.* 1940 (Bour, 1984). It is rarely observed by island staff but may survive.

Two of the native skinks of Cousin Island, Seychelles skink *Mabuya sechellensis* and Wright's skink *Mabuya wrightii*, reach extremely high population densities on

Cousin with a biomass of between 96 kg and 184 kg per hectare (Hunter, 1978: Brooke and Houston, 1983). Such high biomass is supported by the seabird colonies of the island. *M. wrightii* is restricted to islands with seabird colonies although the apparent association may be simply the result of its inability to survive on islands with introduced rats (Cheke, 1984). *M. sechellensis*, although endemic, is widespread in the granitic islands and the near coralline islands. The large gecko *Ailuronyx seychellensis* also survives on islands with rat populations, although it is most obvious on rat-free islands, where (as on Cousin) it is diurnal and often found in houses (Cheke, 1984).

In addition to the land reptiles, two marine turtle species breed on Cousin Island: green sea turtle *Chelonia mydas* (L.) and hawksbill *Eretmochelys imbricata* (L.). Breeding hawksbills were observed in December. October to January is the peak breeding season for hawksbill sea turtles on Cousin (Frazier, 1984).

One species of amphibian, an unidentified species of caecilian (possibly *Hypogeophis rostratus*) has been recorded on Cousin Island (Nussbaum, 1984b), but was not observed during the current survey.

Table 11. Reptiles observed on Cousin.
Status: E =endemic, I = introduced, N = native (in central Seychelles).

Family	Species		Status
Gekkonidae	*Ailuronyx seychellensis* (Dumeril & Bibron, 1836)	bronze-eyed gecko	E
	Phelsuma astriata Tornier, 1901	day gecko	E
Scincidae	*Mabuya sechellensis* (Dumeril & Bibron, 1836)	Seychelles skink	E
	Mabuya wrightii (Boulenger)	Wright's skink	E
	Pamelaescincus gardineri Boulenger, 1909	burrowing skink	E
Testudinidae	*Geochelone gigantea* (Schweigger, 1812)	Aldabra giant tortoise	I

Birds

In total, 15 land birds and waders were recorded (Table 12). Five of these were endemic species, three of which are regarded as endangered or vulnerable species in Seychelles (Watson, 1984). For much of the twentieth century, Cousin was the only island on which the Seychelles warbler *Acrocephalus sechellensis* occurred (Komdeur, 1988). In 1988-90 birds were translocated to Aride and Cousine and further populations established (Komdeur, 1994). The Seychelles magpie-robin *Copsychus sechellarum* was translocated to Cousin in 1994 and the Cousin population is now the second largest of three island populations (Parr *et al.*, 1999). The Seychelles fody *Foudia sechellarum* is currently restricted to three islands in the granitic archipelago, with an introduced population surviving on D'Árros. Cousin probably holds the major population of this species (Collar and Stuart, 1985).

Penny (1974) noted that the endemic Seychelles form of the "Madagascar" turtle dove, *Streptopelia picturata rostrata*, appeared to survive on the island but a survey in 1990 suggested that very few individuals display the characteristics of true *S. p. rostrata*. Most individuals belonged to an intermediate form showing characteristics of both *S. p.*

rostrata and the introduced Madagascar form *S. p. picturata* (den Boer and Geelhoed, 1990), suggesting that *S. p. rostrata* has become effectively extinct through cross-breeding.

Two additional resident land bird species are known on Cousin. The black-crowned night heron *Nycticorax nycticorax* was found to be breeding on the island in 2000 (Anon, 2000), following natural colonisation of the island. There are also occasional records of the introduced barn owl *Tyto alba* and it seems likely that there is at least one resident bird. On Cousin, where rats are unavailable, barn owls prey on birds, especially fairy terns *Gygis alba* (Penny, 1975). Other bird species are also taken, suggesting that the presence of the barn owl represents a threat to endemic land birds on the island. In addition to the land birds, Cousin Island supports breeding colonies of seven seabird species.

Ten seabird species were observed (Table 13), seven of which breed on the island. Diamond (1975) lists 52 bird species that had been recorded from Cousin Island, including migrants and vagrants not recorded in this survey. Since his list was written, two new resident breeding birds have been added to the fauna of Cousin: Seychelles magpie-robin and black-crowned night heron, and the Seychelles blue pigeon *Alectroenas pulcherrima*, which only occurred occasionally at the time of Diamond's list, is now resident.

Table 12. Land birds and waders observed on Cousin.
M = migrant species; E = Seychelles endemic species.

Species		Notes
Bubulcus ibis	cattle egret	One observed in mangrove, 14/6/99
Butorides striatus	green-backed heron	One observed near Roche Canon, 7/12/99
Gallinula chloropus	common moorhen	Common at main marsh, and in a variety of plateau and hill habitats
Dromus ardeola M	crab plover	One individual, December.
Arenaria interpres M	ruddy turnstone	Regularly observed on beaches and plateau woodland, in small groups, both June and December
Calidris alba M	sanderling	One group of 5-6 birds observed on beach, June
Streptopelia picturata ssp.	turtle dove	Regularly seen around houses and in woodland, June and December
Geopelia striata	barred ground dove	Occasional at houses, and on hill glacis, June and December
Alectroenas pulcherrima E	Seychelles blue pigeon	Nesting close to houses. Flock of 7-10 seen feeding on figs 20/6/99 (observed by Alan Burger)
Copsychus sechellarum E	Seychelles magpie robin	Regularly seen in woodland
Acrocephalus sechellensis E	Seychelles warbler	Very common in woodland
Nectarinia dussumieri E	Seychelles sunbird	Very common in woodland
Acridotheres tristis	common mynah	One observed in *Casuarina* close to research house, 14/6/99
Foudia madagascariensis	Madagascar fody	Rarely seen
Foudia sechellarum E	Seychelles fody	Very common in woodland and around houses, June and December

Table 13. Seabirds observed on Cousin Island.

Species		Notes
Puffinus pacificus	wedge-tailed shearwater	Breeding birds present (June)
Puffinus lherminieri	Audubon's shearwater	Breeding birds present (June & December)
Phaeton lepturus	white-tailed tropicbird	Breeding birds present (June & December)
Sterna anaethetus	bridled tern	Breeding birds present (June)
Anous stolidus	brown noddy	Breeding birds present (June)
Anous tenuirostris	lesser noddy	Breeding birds present (June)
Gygis alba	fairy tern	Breeding birds present (June & December)
Fregata minor	great frigatebird	Seen overflying island several times, in both June and December
Sterna dougalli	roseate tern	Seen from beach 23/6/99 (observed by Alan Burger)
Sterna fuscata	sooty tern	Seen from beach 23/6/99 (observed by Alan Burger)

Mammals

Two mammal species were observed in the course of the survey, the endemic fruit bat *Pteropus seychellensis* and the introduced black-naped hare *Lepus nigricollis*. During both assessments, Seychelles fruit bats were observed feeding on fruit on Cousin. Most or all appear to roost on Praslin; bats were observed flying over the sea from Praslin to Cousin on the evening of 21st June. Black-naped hares are the only terrestrial mammal on the island. They were seen every day of the survey, usually singly, throughout the island in woodland, scrub and grassy areas. The population of hares was estimated to be between 50 and 100 animals in 1974 (Diamond, 1975). In 1981, the population was estimated as 120–170 individuals (Kirk and Racey, 1992). The effect of the animals on the vegetation of Cousin has not been fully documented. In the 1980s, faecal pellets were dominated by plants that are now rather rare on the plateau (grasses and sedges). Hares may also distribute *Boerhavia* and *Achyranthes*, although the former species is also now rare on Cousin in comparison to many other islands. It is also possible that hares reduce the regeneration of *Casuarina* (Kirk and Racey, 1992).

Rats (*Rattus* spp.), although widespread on other islands of the granitic Seychelles (and introduced soon after human colonisation to many of the islands: Fauvel, 1909), have never been present on Cousin. The absence of rats and cats accounts for the survival here of the Seychelles warbler and large colonies of breeding seabirds.

CONSERVATION RECOMMENDATIONS

Conservation recommendations have been given in various management plans for the Nature Reserve, including the most recent (Shah *et al.*, 1999). Recommendations generally centre on the preservation of the island's existing wildlife values, rather than on habitat restoration, as a natural process of rehabilitation has occurred since the island was acquired as a nature reserve. In 30 years, *Pisonia* forest has replaced coconut plantations and the forest existing today, at least on the plateau, probably resembles the original vegetation of the island (Fosberg, 1970).

The major recommendations of management plans concern the need to prevent invasion of alien species currently absent from the island, especially mammals. Vegetation management measures in the most recent management plan are limited to the removal of fallen coconuts and the management of beach-crest vegetation by encouraging native species and removing casuarinas. Additional measures that could be proposed in the light of this report include:

1) Monitoring of crazy ant populations and (if feasible) eradication of this species.

Crazy ants are present, but apparently in very small numbers. It is important to monitor populations. The species tends to undergo "boom and bust" demography after introduction to a new area (Haines *et al.*, 1994) and it can have important conservation implications (Haines *et al.*, 1994; Feare, 1999).

2) Removal of mature coconut palms around marsh.

Although probably a native species in the granitic Seychelles (Sauer, 1967), the present abundance of coconuts is a function of planting in the nineteenth and twentieth centuries. On Cousin, coconuts can be regarded as a weed because the regrowth of young palms from fallen nuts produces dense vegetation unsuitable for foraging by Seychelles magpie-robin, which prefers open areas of leaf litter (McCulloch, 1994). Coconut palms are currently controlled by removal of seedling growth and fallen nuts. Both are still abundant near the main area of mature palms surviving on the plateau at the marsh. Here mature palms shade the marsh and prevent the growth of aquatic macrophytes. Removal of most (or all) of these palms would allow more light to reach the seasonal marsh and reduce the need for management of coconut seedling growth.

3) Control/eradication of other invasive introduced species.

Few introduced plant species appear invasive in Cousin's semi-natural habitats. *Adenanthera pavonina* was rather widespread in vegetation plots and produces many seedlings; it should be removed. The introduced ornamental vine Rangoon creeper *Quisqualis indica* only occurs in one place near the marsh but is potentially invasive through vegetative propagation and could also be removed. Bamboo *Bambusa vulgaris* also has the potential for vegetative spread. The species rarely flowers so is unlikely to spread by seed at least one clump could be left in place.

Because a number of endangered endemic birds already exist on the small island of Cousin, further translocations of endemic birds to the island are not recommended unless a greater understanding of habitat requirements and compatibility of species can be gained.

Appendix 1. Plant species recorded from Cousin Island (excluding seagrasses)

Plants recorded in the current survey (mainly sight records) are numbered. For plants only recorded by previous authors, not in current survey, date of most recent record is given (see below). Taxonomy of dicotyledons as given by Friedmann (1994). Of Monocotyledons, as in Robertson (1989). Families arranged in alphabetical order.

Status: E = Endemic; N = Native; I = Introduced.
Abundance: A = Abundant (>1000 individuals observed); C = Common (100 - 1000 individuals observed); F = Frequent (10 - 100 individuals observed); Occasional (3 - 10 individuals observed); R = Rare (1 or 2 individuals observed).
Habitats: Cu = Cultivation/settlement area; PG = Plateau grassland; PW = Plateau woodland; HW = Hill Woodland; Gl = Glacis; BC = Beach Crest; Ma = Marsh; Mg = Mangrove.
Historical records (in Notes): 1= Fosberg 1970; 2 = Bathe & Bathe 1982; 3 = Robertson 1989, 4 = Schumacher & Wüthrich 2000.

	Species	Status	Abund.	Habitats	Notes
PTERIDOPHYTA					
Adiantaceae					
1	*Acrostichum aureum* L.	N	R	Mg	
Davalliaceae					
2	*Nephrolepis ?biserrata* (Sw.) Schott	N	A	PW	
	Nephrolepis multiflora (Roxb.) Jarrett	N	-	-	Recorded 1970, 1982[1, 2]. = *N. biserrata?*
Polypodiaceae					
3	*Phymatosorus scolopendria* (Burm. f.)	N	F	HW, PW	
ANGIOSPERMAE: Dicotyledons					
Acanthaceae					
4	*Asystasia* sp B. (*sensu* Friedmann)	?I	A	PG, Gl	
	Asystasia gangetica (L.) T. Anders.	?I	-	-	Recorded 1970, 1982, 1999[1, 2, 4]. = *A.* sp. B?
	Justicia gendarussa	?I	-	-	Recorded 1970[1], not 1982[2]. Extinct on Cousin
Aizoaceae					
5	*Glinus oppositifolius* (L.) A. DC.	?N	F	PW, Cu	
Amaranthaceae					
6	*Achyranthes aspera* L.	I	A	PW	
7	*Amaranthus dubius* Mart. ex Thell.	I	C	PW, Cu	
8	*Lagrezia* cf. *madagascariensis* (Poir.) Moq.	N	?	BC	
Anacardiaceae					
	Mangifera indica L.	I	-	-	Recorded 1970, 1982[1, 2]. Extinct on Cousin
	Spondias cytherea Sonn.	I	-	-	Recorded 1970[1], not 1982[2]. Extinct on Cousin
Annonaceae					
	Annona muricata L.	I	-	-	Recorded 1970, 1982, 1999[1, 2, 4]
9	*Annona reticulata* L.	I	R	Cu	
10	*Annona squamosa* L.	I	O	Cu	

	Species	Status	Abund.	Habitats	Notes
Apocynaceae					
11	*Catharanthus roseus* (L.) G. Don.	I	C	HW, Cu	
12	*Ochrosia oppositifolia* (L.) K. Schum.	N	A	PW	
13	*Plumeria rubra* L.	I	R	Cu	
Avicenniaceae					
14	*Avicennia marina* (Forssk.) Vierh.	N	F	Mg	
Boraginaceae					
15	*Cordia subcordata* Lam.	N	F	BC	
16	*Heliotropium indicum* L.	I	O	Ma	
	Tournefortia argentea L. f.	N	-	-	Recorded 1970[1], 1982[2]. Extinct on Cousin
Caesalpiniaceae					
17	*Caesalpinia bonduc* (L.) Roxb.	N	R	PW	
18	*Senna occidentalis* (L.) Link	I	O	Ma, HW	
Capparidaceae					
19	*Cleome viscosa* L.	I	R	Gl	
Caricaceae					
20	*Carica papaya* L.	I	C	PW	
Casuarinaceae					
21	*Casuarina equisetifolia* J. R. & G. Foster	I	F	BC	
Combretaceae					
22	*Quisqualis indica* L.	I	R	Cu	
23	*Terminalia catappa* L.	?N	R	PW	
Compositae					
	Synedrella nodiflora (L.) Gaertn.	I	-	-	Recorded 1970[1], 1982[2]
24	*Vernonia cinerea* (L.) Less.	I	O	PW	
Convulvulaceae					
25	*Ipomoea macrantha* Jacq.	N	F	BC	
26	*Ipomoea pes-caprae* (L.) R. Br.	N	C	BC, Gl	
27	*Ipomoea venosa* (Desr.)	N	O	PW	
Crassulaceae					
28	*Kalanchoe pinnata* (Lam.) Pers.	I	O	PW	
Cucurbitaceae					
	Cucumis sp.	I	-	-	Recorded 1970[1], not 1982[2]. Extinct on Cousin
	Cucurbita moschata (Lam.) Poir.	I	-	-	Recorded 1970[1], not 1982[2]. Extinct on Cousin
	Momordica charantia L.	I	-	-	Recorded 1970[1], not 1982[2]. Extinct on Cousin
	Trichosanthes cucumerina L.	I	-	-	Recorded 1970[1], not 1982[2]. Extinct on Cousin
Euphorbiaceae					
29	*Acalypha indica* L.	I	C	PW	
	Euphorbia hirta L.	I	-	-	Recorded 1970, 1982[1, 2]
	Euphorbia prostrata L.	I	-	-	Recorded 1970[1]
30	*Euphorbia pyrifolia* Lam.	N	A	HW, Gl	
31	*Euphorbia thymifolia* L.	I	F	Gl	
	Euphorbia tirucalli	I	-	-	Recorded 1982[2], extinct on Cousin
	Manihot esculenta Crantz	I	-	-	Recorded 1970, 1982[1, 2], extinct on Cousin
	Pedilanthus tithymaloides (L.) Poit.	I	-	-	Recorded 1999[4]

	Species	Status	Abund.	Habitats	Notes
	Phyllanthus acidus (L.) Skeels	I	-	-	Recorded 1970, 1982[1, 2]. Extinct on Cousin
32	*Phyllanthus amarus* Schumach. et Thonn.	I	O	PW	
33	*Phyllanthus pervilleanus* (Baillon) Mull. Arg.	N	C	PW	
	Phyllanthus tenellus Roxb.	I	-	-	Recorded 1999[4]
34	*Ricinus communis* L.	I	F	PW	
Goodeniaceae					
35	*Scaevola sericea* Vahl.	N	C	BC	
Guttiferae					
36	*Calophyllum inophyllum* L.	N	R	PW, HW	
Labiatae					
37	*Plectranthus amboinicus* (Lour.) Spreng.	?I	O	PW, PG	
Lauraceae					
	Persea americana Mill.	I	-	-	Recorded 1970[1], 1982[2]. Extinct on Cousin?
Lecythidaceae					
38	*Barringtonia asiatica* (L.) Kurtz	N	O	BC	
Malvaceae					
39	*Abutilon indicum* (L.) Sweet	?I	R	PW, Cu	
40	*Gossypium hirsutum* L.	I	F	PW	
	Hibiscus surattensis L.	I	-	-	Recorded 1982[2]. Probably extinct on Cousin
41	*Hibiscus tiliaceus* L.	N	F	BC	
	Malachra capitata (L.) L.	?	-	-	Recorded 1970[1]. Not in Seychelles?
	Sida acuta Burm. f.	I	-	-	Recorded 1970[1]
42	*Sida cordifolia* L.	?N	F	Gl, HW	
	Sida stipulata Cav.	?I	-	-	Recorded 1989[3]
43	*Thespesia populnea* (L.) Soland. ex Correa	N	O	BC	
Mimosaceae					
44	*Adenanthera pavonina* L.	I	O	HW	
Moraceae					
	Artocarpus altilis(Parkins.) Fosb.	I	-	-	Recorded 1970[1], not 1982[2]. Extinct on Cousin
	Ficus benghalensis L.	I	-	-	Recorded 1999[4]. = *F. rubra?*
45	*Ficus lutea* Vahl.	N	C	HW, PW	
46	*Ficus reflexa* Thunb. *seychellensis* (Baker) Berg	E (ss)	R	HW	
47	*Ficus rubra* Vahl.	N	R	PW	
Moringaceae					
48	*Moringa oleifera* Lam.	I	R	Cu	
Myrtaceae					
49	*Eucalyptus camaldulensis* Dehnh.	I	O	HW	
	Syzygium samarangense (Bl.) Merr & Perr.	I	-	-	Recorded 1970[1], 1982[2]. Extinct on Cousin
Nyctaginaceae					
50	*Boerhavia repens* L.	?N	C	PG	
51	*Mirabilis jalapa* L.	I	O	Cu	
52	*Pisonia grandis* R. Br.	N	A	PW	

	Species	Status	Abund.	Habitats	Notes
Onagraceae					
53	*Ludwigia octovalvis* (Jacquin) Raven	?I	O	Ma	
Oxalidaceae					
54	*Averrhoa bilimbi* L.	I	R	Cu	
Papilionaceae					
55	*Canavalia cathartica* Thouars	N	A	PW	
56	*Gliricidia sepium* (Jacq.) Walp.	I	R	PW	
	Sesbania bispinosa (Jacq.) W. F. Wight	I	-	-	Recorded 1970[1], 1982[2]. = *S. cannabina?*
	Vigna unguiculata (L.) Walp.	I	-	-	Recorded 1970[1], not 1982[2]. Extinct on Cousin
57	*Sesbania cannabina* (Retz.) Poir.	I	O	Ma	
Passifloraceae					
58	*Passiflora foetida* L.	I	F	HW	
	Passiflora suberosa L.	I	-	-	Recorded 1970[1], 1982[2]
Piperaceae					
59	*Peperomia pellucida* (L.) H. B. K.	I	A	PW	
Polygonaceae					
	Polygonum senegalense Meisn.	?N	-	-	Recorded 1970[1], 1982[2].
Portulacaceae					
60	*Portulaca oleracea* L.	N	O	Gl	
Rhizophoraceae					
61	*Rhizophora mucronata* Lam.	N	R	Mg	
Rubiaceae					
62	*Coffea* sp.	I	O	Cu	
63	*Guettarda speciosa* L.	N	O	BC	
	Hedyotis corymbosa (L.) Lam.	?I	-	-	Recorded 1970[1]
64	*Morinda citrifolia* L.	?I	C	PW, HW	
Rutaceae					
	Clausena anisata (Willd) Hook f.	I			Recorded 1970[1], 1982[2]. = *Murraya koenigii?*
65	*Citrus* sp.	I	O	Cu	
66	*Murraya koenigii* (L.) Spreng..	I	O	PW	
Solanaceae					
67	*Capsicum frutescens* L.	I	O	Cu	
68	*Datura metel* L	I	F	PG	
	Nicotiana tabacum L.	I	-	-	Recorded 1982[2]. Probably extinct on Cousin
69	*Solanum americanum* Mill.	I	O	Ma	
70	*Solanum lycopersicum* L.	I	R	Cu	
	Solanum melongena L	I	-	-	Recorded 1970[1], not 1982, 1999[4]. Cultivated occasionally
Surianaceae					
71	*Suriana maritima* L.	N	O	BC	
Turneraceae					
72	*Turnera angustifolia* Miller	I	O	PW	
Umbelliferae					
	Centella asiatica (L.) Urb.	?I			Recorded 1970[1], not 1982[2].
Verbenaceae					
73	*Stachytarpheta jamaicensis* (L.) Vahl.	I	C	PW, PG	

	Species	Status	Abund.	Habitats	Notes
ANGIOSPERMAE: Monotyledons					
Agavaceae					
	Furcraea foetida (L.) Haw.	I	-	-	Recorded 1970[1], 1982[2]. Probably extinct on Cousin
Amaryllidaceae					
74	*Crinum asiaticum* L.	?I	O	PG	
75	*Hymenocallis littoralis* (Jacq) Salisb.	?I	F	PW	
76	*Scadoxus multiflorus* (Martyn.) Raf.	I	R	PW	
Araceae					
77	*Alocasia macrorrhiza* (L.) G. Don.	I	F	PW	
	Colocasia esculenta (L.) Schott	I	-	-	Recorded 1970[1], 1982[2]. Probably extinct on Cousin
Bromeliaceae					
78	*Ananas comosus* (L.) Merr.	I	F	Cu, Gl	
Cannaceae					
79	*Canna* hybrids	I	R	Cu	
Commelinaceae					
80	*Commelina diffusa* Burm f.	?	O	Gl	
Cyperaceae					
81	*Bulbostylis barbata* (Rottb.) C.B.Cl.	N	F	Gl	
	Cyperus alopecuroides Rottb.	?	-	-	Recorded 1970[1], not 1982[2]
82	*Fimbristylis complanata* (Retz.) Link	?	F	Gl	
83	*Fimbristylis cymosa* R. Br.	?	F	Gl	
84	*Fimbristylis* sp. (glacis sedge)	?	C	Gl	
	Kyllinga monocephala Rottb.	?	-	-	Recorded 1970[1], 1982[2]
85	*Kyllinga polyphylla* Willd. Ex Kunth	N	C	PW, Gl	
	Mariscus dubius (Rottb) Fischer	N	-	-	Recorded 1970[1], 1999[4]
86	*Mariscus ligularis* (L.) Urb.	?N	A	Gl	
87	*Pycreus polystachyos* (Rottb.) P. Beauv.	?	A	HW	
Dioscoriaceae					
	Dioscorea alata L.	I	-	-	Recorded 1970[1], not 1982[2]. Extinct on Cousin
Gramineae					
88	*Bambusa vulgaris* Schrad. Ex Wendl var. *aureo-variegata*	I	R	Mar	
	Brachiaria subquadripara (Trin.) Hitchc.	?	-	-	Recorded 1970[1], not 1982[2]
	Cenchrus echinatus L.	?	-	-	Recorded 1970[1], 1982[2]. Probably extinct on Cousin
	Dactyloctenium ctenoides (Steud.) Bosser or *D. aegypticum* (L.) Willd.	?	-	-	Recorded 1970[1], 1999[4]
	Digitaria horizontalis Willd.	?	-	-	Recorded 1970[1], 1999[4]
	Digitaria radicosa (Presl.) Miq.	?	-	-	Recorded 1970[1], not 1982[2]
	Digitaria setigera Roth.	?	-	-	Recorded 1970[1], not 1982[2]
	Eleusine indica (L.) Gaertn.	?	-	-	Recorded 1970[1], 1982[2]
	Enteropogon sechellensis (Baker) Dur & Schinz	N	-	-	Recorded 1970, 1982, 1999 [1, 2, 4]

	Species	Status	Abund.	Habitats	Notes
	Eragrostis tenella (L.) Beauv.	?	-	-	Recorded 1970[1], 1999[4]
	Eragrostis subaequiglumis Renvoize	?	-	-	Recorded 1970[1], not 1982[2]
89	*Panicum brevifolium* L.	N	A	PW, PG	
90	*Panicum maximum* L.	?	R	Mar	
91	*Sporobolus virginicus* (L.) Kunth.	N	A	BC	
92	*Stenotaphrum dimidiatum* (L.) Brogn.	N	A	PG	
	Stenotaphrum micranthum (Desv.) Hubb.	?	-	-	Recorded 1970, 1982, 1999 [1, 2, 4]
Lemnaceae					
	Lemna sp.	?	-	-	Recorded 1970[1]; occasional outbreaks in marsh
Musaceae					
93	*Musa ?sapientum* L.	I	F	Cu	
Palmae					
94	*Cocos nucifera* L.	N	F	PW, HW	
Pandanaceae					
95	*Pandanus balfourii* Mart.	E	C	Gl, HW	