

MALAWI

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Bar-tailed Trogon *Apaloderma vittatum*. (ILLUSTRATION: PETE LEONARD)

GENERAL INTRODUCTION

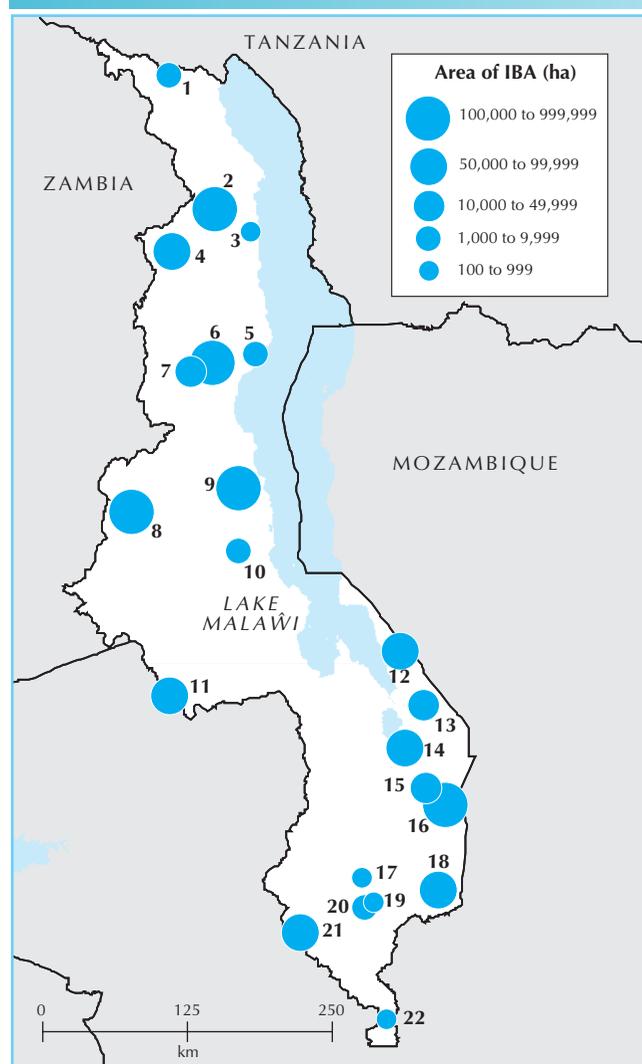
The Republic of Malawi is a landlocked country at the southern end of the Great Rift Valley and geographically dominated by Africa's third-largest lake, Lake Malawi (sometimes referred to as Lake Nyasa). It is bordered to the north and north-east by Tanzania, to the east, south and south-west by Mozambique and to the west by Zambia. The country is 860 km long and 90–200 km wide, with a land area of 94,276 km² (and total area of 118,480 km² with the Lake). The Rift depression is occupied by Lake Malawi (470 m a.s.l.), its narrow shore plains (470–600 m) and the valley of the Shire river, which drains the Lake southwards into the lower Zambezi in nearby Mozambique, reaching its lowest point on the border at 37 m. Malawi is one of Africa's smallest countries, yet its varied and complex topography exerts important influences on the country's climate, soil and vegetation. The country is positioned about half way along the chain of mountains extending from Ethiopia to South Africa. Most of the land north of 14°30'S is occupied by the Central African peneplain at 1,000–1,100 m, above which isolated hills and several high plateaux rise to 1,500–2,400 m—notably the Misuku Hills (peak at 2,050 m), Nyika Plateau (2,606 m), North Viphya Plateau (2,058 m), South Viphya Plateau (1,954 m) and Dedza Mountain (2,198 m). South of Lake Malawi the peneplain lies lower (500–600 m) and highland areas are much less extensive but more prominent with peaks rising in the Shire Highlands to 2,085 m (Zomba Mountain) and in the south-east to 3,002 m (Mulanje, the highest massif in south-central Africa).

Malawi has a tropical continental climate with maritime influences from the Mozambique Channel. Mean annual temperatures in plateau areas (from 1,000 to 1,800 m) vary from 15 to 21°C, with frosts occasional above 1,800 m in the dry season, whereas just prior to the rains daily maxima in the low-lying Shire Valley can exceed 42°C. Temperatures rise considerably from September until the onset of the rains in November. Thus, the year can be divided into three seasons: warm and wet (November–April), dry and cool (May–August) and dry and hot (September–October).

Mean annual rainfall varies considerably in different parts of the country, from c.700 mm to just over 3,000 mm.

Biogeographically, Malawi falls within the Zambezi Regional Centre of endemism, which is interrupted by isolated areas of the Afromontane biome. There is also an element of Eastern origin, with the most characteristic floristic representatives found in the lowland rainforest of the Malawi Hills in the extreme south of the country (an enclave of Zanzibar–Inhambane coastal forest) and a sprinkling of Eastern species elsewhere in the Shire Valley and further north, mostly on the shore of Lake Malawi.

At low and medium altitudes, the main vegetation consists of various types of Zambezi woodland and deciduous forest or thicket. From 500 to 1,500 m and locally higher, the dominant type of woodland is miombo (characterized by species of *Brachystegia*, often associated with *Julbernardia* and *Isoberlinia*). Vast areas of miombo have disappeared under cultivation; in most parts of the country little remains outside parks and Forest Reserves. Mopane woodland (with monodominant *Colophospermum mopane*) occurs in very small pockets in the north-west and south. Undifferentiated *Acacia–Combretum* woodland was once more widespread, but has largely been destroyed or seriously depleted. Dry deciduous forest and deciduous thicket (with *Pterocarpus antunesii*, *Newtonia hildebrandtii*, *Sterculia appendiculata*, etc.) were formerly widespread in the lower Shire Valley and on the Phalombe plain, where now only small patches remain. At low altitudes evergreen forest is confined mainly to banks of streams, and lowland rainforest has developed only locally in regions of high rainfall (as on the Nkhata Bay Lake shore, the foothills of the Shire Highlands and in the Malawi Hills). Between 1,100–1,600 m, rain-exposed mountains and hills often support patches of mid-altitude rainforest, and above 1,600 m the major mountain areas bear more extensive patches of Afromontane rainforest (also referred to as submontane rainforest, but see White 1983 and Dowsett-Lemaire 1989b). Mid-altitude forests are rather localized in the north, but are better-developed east of the Rift, with a particularly luxuriant form dominated by the flat-topped *Newtonia buchananii* on Mount

Map 1. Location and size of Important Bird Areas in Malaŵi.


Mulanje and Chikala Hill. Afromontane rainforests are, on the other hand, better developed in the north, with a tall canopy and several emergent species (e.g. *Aningeria adolfi-friedericii*, *Entandrophragma excelsum*, *Ficalhoa laurifolia* and *Ocotea usambarensis*, none of which occurs south of 13°S). There are small patches of short-canopy, undifferentiated montane forest on the highest mountains (mainly Nyika, Dedza, Mulanje); locally they are replaced by monodominant montane forest (with *Hagenia abyssinica* on the Nyika, and *Widdringtonia* cedars on Mulanje). By the early 1980s, the total area of Afromontane forest *sensu lato* was measured to cover c.220 km² and most of it was considered reasonably well protected; the area of mid-altitude forest, on the other hand, already reduced to c.72 km² at the time, is being reduced further, especially in southern Malaŵi. Grassland is most extensive on some of the high plateaux; at lower levels it is mainly associated with seasonally waterlogged soils in shallow depressions (dambos). Extensive swamps around Lake Chilwa and in the Lower Shire Valley ('Elephant Marsh') are largely intact except for some dry-season cultivation (locally) and the establishment of rice schemes on their margins.

Malaŵi is one of the world's least-developed nations with an economy based principally on agriculture. Ninety per cent of its estimated population of 11 million people live in rural areas, and with an annual growth-rate of 3.3%, it is one of the fastest-growing populations in Africa. Administratively, Malaŵi is divided into three main Regions—Northern, Central, Southern—with 24 smaller political units called Districts. The capital is Lilongwe. Population density varies from less than 25/km² in some northern areas to more than 500/km² in large urban centres in the south. Roughly 25% of land is currently designated 'arable', producing a wide range of crops from maize, millet and cassava to groundnuts, tobacco, cotton, tea and coffee. The natural vegetation cover of the country has been affected by man's influence and by fire for centuries. Shifting agriculture at a low population density is a relatively efficient form of land use, but settled rural populations put great pressure on forest resources that frequently leads to over-exploitation. Malaŵi's major environmental concerns are with deforestation, land degradation, overpopulation, chemical pollution from agricultural run-off, and sewage disposal.

For a country with such a high population density and the concomitant demands on land for subsistence agriculture, Malaŵi has set aside a considerable area for the protection of its natural

Table 1. Summary of Important Bird Areas in Malaŵi.

 22 IBAs covering 16,450 km²

IBA code	Site name	Administrative region	Criteria (see p. 11; for A2/A3 codes, see Tables 2/3)									
			A1	A2 092	A2 105	A3 A07	A3 A09	A3 A10	A4i	A4iii		
MW001	Misuku Hills Forest Reserves	Northern	✓		✓	✓						
MW002	Nyika National Park	Northern	✓		✓	✓		✓				
MW003	Uzumara Forest Reserve	Northern			✓	✓						
MW004	Vwaza Marsh Wildlife Reserve	Northern							✓			
MW005	Lake-shore Forest Reserves	Northern	✓					✓				
MW006	South Viphya Forest Reserve	Northern	✓		✓	✓	✓	✓				
MW007	Mtangatanga and Perekezi Forest Reserves	Northern							✓			
MW008	Kasungu National Park	Central	✓						✓			
MW009	Nkhotakota Wildlife Reserve	Central	✓						✓			
MW010	Ntchisi Mountain Forest Reserve	Central			✓	✓			✓			
MW011	Dzalanyama Forest Reserve	Central	✓						✓			
MW012	Namizimu Forest Reserve	Southern	✓		✓	✓	✓	✓				
MW013	Mangochi Mountain Forest Reserve	Southern	✓		✓	✓	✓	✓				
MW014	Liwonde National Park	Southern					✓	✓				
MW015	Liwonde Hills Forest Reserve	Southern	✓		✓	✓	✓	✓				
MW016	Lake Chilwa and flood-plain	Southern	✓							✓	✓	
MW017	Soche Mountain Forest Reserve	Southern	✓		✓	✓	✓					
MW018	Mount Mulanje Forest Reserve	Southern	✓		✓	✓	✓					
MW019	Thyolo tea estates	Southern	✓		✓		✓					
MW020	Thyolo Mountain Forest Reserve	Southern	✓		✓	✓	✓					
MW021	Lengwe National Park	Southern		✓			✓	✓				
MW022	Malaŵi Hills Forest Reserve	Southern					✓					
Total number of IBAs qualifying:			15	1	12	11	12	13		1	1	

Table 2. The occurrence of restricted-range species at Important Bird Areas in Malaŵi. Sites that meet the A2 criterion are highlighted in **bold**. Species of global conservation concern are highlighted in **bold blue**.

092 – South-east African coast Endemic Bird Area (two species in Malaŵi; one site meets the A2 criterion)																
IBA code:																021
<i>Apalis ruddi</i>																✓
<i>Serinus citrinipectus</i>																✓
Number of species recorded:																2
105 – Tanzania–Malaŵi mountains Endemic Bird Area (11 species in Malaŵi; 12 sites meet the A2 criterion)																
IBA code:	001	002	003	005	006	009	010	011	012	013	015	017	018	019	020	
<i>Phyllastrephus alfredi</i>		✓	✓		✓		✓									
<i>Laniarius fuelleborni</i>	✓	✓	✓		✓											
<i>Alethe choloensis</i>									✓	✓	✓	✓	✓		✓	
<i>Sheppardia sharpei</i>		✓	✓													
<i>Modulatrix stictigula</i>	✓															
<i>Cisticola nigriloris</i>	✓	✓	✓													
<i>Cisticola njombe</i>		✓														
<i>Apalis chariessa</i>											✓	✓	✓	✓	✓	
<i>Apalis chapini</i>	✓	✓	✓	V	✓	✓	✓	✓								
<i>Serinus whytii</i>		✓	✓		✓											
<i>Euplectes psammocromius</i>		✓														
Number of species recorded:	4	8	6		4	1	2	1	1	1	2	2	2	1	2	
V Species of irregular occurrence, or winter (montane) visitors to lowland sites.																

resources. National Parks, Wildlife Reserves and Forest Reserves incorporate 21% of Malaŵi's land area, one of the highest percentages on the continent, but the integrity of a number of protected areas is no longer respected. In terms of globally important natural resources Malaŵi is best known for its freshwater fish. Along with Lake Tanganyika, Lake Malaŵi contains a greater variety of indigenous fish than any other freshwater lake in the world, with high levels of endemism (probably more than 90% among 500 or so species, particularly cichlids).

ORNITHOLOGICAL IMPORTANCE

With its varied topography and range of habitats, this relatively small country has a rich avifauna of 648 species; 456 of these are resident and a further 94 are intra-African migrants of regular occurrence, most of which are known or suspected to breed. Palearctics include 77 regular species and 12 vagrants.

Seventeen species of global conservation concern have been recorded from Malaŵi. These include six from the Palearctic, four of which pass through and winter in small numbers: *Circus macrourus* (NT), *Falco naumanni* (VU), *Crex crex* (VU) and *Gallinago media* (NT); the two others are mere vagrants (*Glareola nordmanni*, NT) or are extremely local (five localities are known for *Acrocephalus griseldis*, NT). Similarly, there are only irregular records of the intra-African migrant *Phoenicopterus minor* (NT); *Ardeola idae* (NT) from Madagascar is probably annual. (*Balaeniceps rex*, NT has not been recorded with certitude, and could be no more than an extreme vagrant.) The other nine species are resident: *Falco fasciinucha* (VU) has been known to breed, and the remaining eight are considered below.

Eleven species of the Tanzania–Malaŵi mountains Endemic Bird Area (105) occur; while *Modulatrix stictigula* is found only in the extreme north (Misuku Hills, where locally common), several sites, including the Nyika and Viphya Plateaux, hold important populations of *Phyllastrephus alfredi*, *Laniarius fuelleborni*, *Sheppardia sharpei*, *Cisticola nigriloris*, *Apalis chapini* and *Serinus whytii*. *Euplectes psammocromius* and *Cisticola njombe* (NT) are confined respectively to the dambos and montane grasslands of the Nyika Plateau where they are common. *Alethe choloensis* (VU) is almost endemic to the highlands of south-east Malaŵi (as otherwise recorded from only two sites in adjacent Mozambique) and used to be common in all patches of mid-altitude and lower montane forest, but the dramatic increase of deforestation in that part of the country gives serious cause for concern. Finally, *Apalis chariessa* (VU) was previously common in south-east Malaŵi in some of the lowland and mid-altitude forests in the Shire Highlands, but, as for *Alethe choloensis*, widespread deforestation has

reduced its range considerably. In addition, the northernmost part of the South-east African coast EBA (092) extends into extreme southern Malaŵi, up the valley of the Shire river, and two of its species occur: *Apalis ruddi*, which probably has little future in Malaŵi, as what is left of its thicket habitat is at best marginal, and *Serinus citrinipectus*.

Of the 94 biome-restricted species recorded from Malaŵi, 47 belong to the Afrotropical Highlands biome (A07). There is a general north–south impoverishment of montane avifaunas, and many Afrotropical species reach the southern limits of their distribution at various localities along the chain of highlands. *Hirundo atrocaerulea* (VU) is a widespread breeding species in montane grassland (from the Misukus to Mulanje), with the most important population present on the extensive high plateau of the Nyika. For other birds of Afrotropical origin, the Nyika grasslands are also the breeding stronghold for two key species, *Grus carunculatus* (VU) and *Neotis denhami*, although numbers are small.

The Zambezian biome (A10) is the other major biome in the country, with 33 species found in miombo and other woodland. Of these, *Dendropicos stierlingi* (NT) and *Ploceus olivaceiceps* have a limited range in south-east Africa and their habitat is under threat in places. The woodpecker, in particular, is inexplicably local; in Malaŵi it is found commonly in a large tract of *Brachystegia* woodland in Dzalanyama Forest Reserve and recorded in only a few other localities further east, where its status needs further study. The weaver is still common in mossy, mid-altitude miombo, mainly on the plateau of central Malaŵi (from Dzalanyama to the Viphya Plateaux), but few patches of suitable woodland persist today outside Forest Reserves.

Finally, 14 species belong to the East African Coast biome (A09), all but three found exclusively in the southern third of the country. All but one of them reach their western limits of distribution in Malaŵi. Of these, *Sheppardia gunningi* (VU) (the endemic race *bensoni*) survives at high densities in the small Forest Reserves along the Nkhata Bay Lake shore and up the eastern escarpment of the Viphya Plateaux; the total Malaŵi population is probably still over 3,000 pairs. On the other hand, *Zoothera guttata* (EN) occurs as a small isolated population in the mountains of the south-east and, as for *Alethe choloensis* and *Apalis chariessa*, deforestation in the area has restricted their ranges considerably. The main population of *Batis fratrum* in Malaŵi, a species of limited range in south-east Africa, was in the lowland forest of the Malaŵi Hills where, despite the protected status of the forest, this bird is now threatened with local extinction through illegal deforestation.

Lake Malaŵi is too deep to provide significant habitat for wetland species, although a few littoral lagoons and marshlands are suitable stop-over points for small numbers of migrant

Table 3. The occurrence of biome-restricted species at Important Bird Areas in Malaŵi. Sites that meet the A3 criterion are highlighted in **bold**. Species of global conservation concern are highlighted in **bold blue**. Any other species with a restricted range are highlighted in blue.

A07 – Afrotropical Highlands biome (47 species in Malaŵi; 12 sites meet the A3 criterion)																		
IBA code:	001	002	003	005	006	007	009	010	011	012	013	014	015	017	018	019	020	022
<i>Buteo oreophilus</i>	✓	✓																
<i>Sarothrura affinis</i>	✓	✓			✓										✓			
<i>Streptopelia lugens</i>	✓	✓																
<i>Caprimulgus poliocephalus</i>	✓	✓	✓		✓													
<i>Schoutedenapus myoptilus</i>	✓	✓	✓												✓			✓
<i>Apaloderma vittatum</i>	✓	✓	✓		✓			✓			V			✓	✓	V		✓
<i>Pogoniulus leucomystax</i>	✓	✓	✓		✓		V	✓							V			
<i>Hirundo atrocaerulea</i>	✓	✓			✓			V							✓			
<i>Coracina caesia</i>																	✓	V
<i>Andropadus masukuensis</i>	✓																	
<i>Andropadus nigriceps</i>		✓	✓		✓										✓			
<i>Andropadus milanjensis</i>	✓	✓	✓		✓			✓			✓		✓	✓	✓			✓
<i>Phyllastrephus alfredi</i>		✓	✓		✓		V	✓										
<i>Laniarius fuelleborni</i>	✓	✓	✓		✓													
<i>Telophorus olivaceus</i>															✓			
<i>Zoothera gurneyi</i>	✓	✓	✓		✓			✓		✓	✓		✓	✓	✓	V		✓
<i>Alethe fuelleborni</i>	✓	✓	✓		✓													
<i>Alethe choloensis</i>										✓	✓		✓	✓	✓			✓
<i>Pogonocichla stellata</i>	✓	✓	✓	V	✓	✓	V	✓	✓	✓	✓	V	✓	✓	✓	V	✓	V
<i>Sheppardia sharpei</i>		✓	✓															
<i>Cossypha anomala</i>		✓	✓		✓										✓			
<i>Modulatrix stictigula</i>	✓																	
<i>Illadopsis pyrrhoptera</i>		✓	✓															
<i>Pseudoalcippe abyssinica</i>		✓	✓		✓					✓	✓							
<i>Cisticola nigriloris</i>	✓	✓	✓															
<i>Cisticola njombe</i>		✓																
<i>Apalis chapini</i>	✓	✓	✓	V	✓		✓	✓	✓									
<i>Bradypterus cinnamomeus</i>		✓	✓												✓			
<i>Chloropeta similis</i>		✓																
<i>Phylloscopus ruficapilla</i>	✓	✓	✓		V			✓			✓		✓		✓	V		✓
<i>Sylvia lugens</i>		✓																
<i>Dioptrornis fischeri</i>	✓	✓			✓													
<i>Trochocercus albonotatus</i>	✓	✓	✓		✓					✓	✓		✓	✓	✓	V		✓
<i>Nectarinia graueri</i>		✓																
<i>Nectarinia mediocris</i>	✓	✓	✓		✓										✓			
<i>Nectarinia kilimensis</i>	✓	✓	✓		✓													
<i>Nectarinia johnstoni</i>		✓																
<i>Serinus hypostictus</i>	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓		✓	✓	✓			✓
<i>Serinus whytii</i>		✓	✓		✓													
<i>Linurgus olivaceus</i>	✓	✓	✓															
<i>Cryptospiza reichenovii</i>	✓	✓	✓		✓			✓	✓					✓	✓			✓
<i>Estrilda melanotis</i>	✓	✓	✓		✓		✓	✓	✓	✓	✓		✓	✓	✓			✓
<i>Ploceus baglafecht</i>		✓																
<i>Ploceus bertrandi</i>	✓	✓	✓		✓					✓	✓			✓	✓			✓
<i>Euplectes psammocromius</i>		✓																
<i>Onychognathus walleri</i>	✓	✓	✓															
<i>Onychognathus tenuirostris</i>		✓			✓													
Number of species recorded:	28	42	29		25	2	3	11	5	8	10		8	10	19		13	
A09 – East African Coast biome (14 species in Malaŵi; 12 sites meet the A3 criterion)																		
IBA code:					005	006	011	012	013	014	015	017	018	019	020	021	022	
<i>Poicephalus cryptoxanthus</i>										✓							✓	
<i>Pogoniulus simplex</i>								✓	✓									
<i>Lybius melanopterus</i>										✓								
<i>Telophorus quadricolor</i>																		E
<i>Zoothera guttata</i>												✓	✓		✓			
<i>Sheppardia gunningi</i>					✓	✓												
<i>Apalis chariessa</i>											✓	✓	✓	✓	✓			
<i>Apalis ruddi</i>																		V
<i>Batis fratrum</i>																		E?
<i>Batis soror</i>								✓	✓	✓	✓	✓	✓					✓
<i>Nectarinia veroxii</i>																		✓
<i>Serinus citrinipectus</i>																		✓
<i>Pyrenestes minor</i>								✓	✓									
<i>Oriolus chlorocephalus</i>											✓	V		✓	✓			
Number of species recorded:					1	1	1	3	2	3	3	3	3	3	2	3	3	1

Table 3 ... continued. The occurrence of biome-restricted species at Important Bird Areas in Malaŵi. Sites that meet the A3 criterion are highlighted in **bold**. Species of global conservation concern are highlighted in **bold blue**. Any other species with a restricted range are highlighted in blue.

A10 – Zambezi biome (33 species in Malaŵi; 13 sites meet the A3 criterion)																	
IBA code:	002	004	005	006	007	008	009	010	011	012	013	014	015	018	019	021	022
<i>Falco dickinsoni</i>	✓	✓				✓			✓	✓		✓				✓	
<i>Agapornis lilianae</i>												✓					
<i>Centropus cupreicaudus</i>																	
<i>Merops boehmi</i>							✓				✓	✓	✓			✓	
<i>Coracias spatulata</i>		✓		V	✓	✓						✓	✓			✓	✓
<i>Tockus pallidirostris</i>	✓	✓				✓	✓	✓	✓	✓		✓	✓				
<i>Stactolaema whytii</i>	✓			✓	✓	✓	✓		✓	✓	✓		✓				
<i>Tricholaema frontata</i>	✓	✓			✓	✓	✓		✓								
<i>Lybius minor</i>	✓																
<i>Dendropicos stierlingi</i>									✓	✓	✓		✓				
<i>Lanius souzae</i>	✓	✓		✓		✓	✓		✓	✓							
<i>Monticola angolensis</i>	✓			✓	✓	✓	✓	✓	✓	✓	✓		✓	✓			
<i>Turdus libonyana</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Cercotrichas barbata</i>	✓	✓		✓	✓	✓	✓		✓								
<i>Myrmecocichla arnotti</i>	✓	✓				✓	✓	✓	✓			✓	✓				✓
<i>Pinarornis plumosus</i>									✓								
<i>Calamonastes undosus</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓			✓	
<i>Sylvietta ruficapilla</i>	✓	✓		✓	✓	✓	✓	✓	✓								✓
<i>Muscicapa boehmi</i>	✓	✓				✓	✓		✓								
<i>Parus ruiventris</i>	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓			
<i>Parus griseiventris</i>	✓	✓		✓	✓	✓	✓	✓	✓								
<i>Anthreptes anchietae</i>	✓			✓	✓	✓	✓		✓								
<i>Nectarinia talatala</i>								✓				✓					✓
<i>Nectarinia oustaleti</i>																	
<i>Nectarinia manoensis</i>	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓			
<i>Nectarinia shelleyi</i>						✓	✓		✓								
<i>Serinus mennelli</i>	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
<i>Vidua codringtoni</i>																	✓
<i>Vidua obtusa</i>	✓	✓				✓	✓	✓	✓	✓	✓	✓					✓
<i>Plocepasser rufoscapulatus</i>	✓	✓				✓											
<i>Ploceus olivaceiceps</i>				✓	✓	✓	✓	✓	✓	✓			✓				
<i>Lamprotornis mevesii</i>												✓					
<i>Neocichla gutturalis</i>		✓															
Number of species recorded:	20	17	2	13	14	22	20	13	22	13	9	11	13	4	1	9	2

Note. The symbol V is for species of irregular occurrence, or winter (montane) visitors to lowland sites; E is for recently extinct species.

shorebirds and some local species; the more important (partly seasonal) wetlands around Lake Chilwa and in the Shire Valley (Elephant Marsh) still hold large populations of waterbirds.

Although Palearctic species represent nearly 14% of the country's avifauna, none occurs in significantly high numbers. Occasionally, noticeable movements of migrants do occur, especially raptors such as *Aquila pomarina*, *A. nipalensis* and *Falco amurensis*.

CONSERVATION INFRASTRUCTURE AND PROTECTED-AREA SYSTEM

The Parks and Wildlife Act provides for control of all activities in National Parks and Wildlife Reserves, covering 1,066,900 ha or 11% of Malaŵi's land area. Responsibility for administering the Act lies with the Department of National Parks and Wildlife (DNPW) within the Ministry of Forestry and Natural Resources. The Act has been under revision recently, to take into account new approaches to the conservation and management of protected areas. Forest Reserves cover an additional 900,000 ha or 10% of the land and come under the jurisdiction of the Department of Forestry. The Wildlife Society of Malaŵi (formerly the National Flora and Fauna Preservation Society) is the longest established and most active of a small number of NGOs operating in the conservation arena. It serves in an important watchdog role over government's wildlife related activities and provides support to many of DNPW's initiatives. Due in part to financial constraints, protected areas in Malaŵi do not have the human resources necessary to enforce effective policing programmes. Poaching is rife in all areas,

particularly Forest Reserves, and human population pressure continues to threaten the integrity of many of them. The following are the main categories of protected area in Malaŵi.

- **National Park:** five sites. These are large areas of land designated to preserve examples of Malaŵi's natural heritage and to promote their use for recreational and scientific purposes. They generally protect important wildlife populations, major water-catchment areas and landscapes of high aesthetic value. All plants and animals are fully protected and special permits are required to collect and remove any specimens. Each site has clearly defined conservation objectives set out in specific management plans that are implemented by DNPW staff. Recent revisions to the Parks and Wildlife Act allow for more flexible use of a site's resources, particularly the controlled access to minor woodland products such as honey, thatching-grass and edible caterpillars by local communities. Where once DNPW had strict control over all activities in its National Parks, government is now encouraging the private sector to take a full participatory role in promoting and managing tourist facilities at each site.
- **Wildlife Reserve:** four sites. For practical purposes, there are no differences between National Parks and Wildlife Reserves.
- **Forest Reserve:** 64 sites. Forestry activities in Malaŵi have two main functions: (1) environmental conservation, which includes conserving the botanical value of an area, the protection of soil and water resources, and tourism, and (2) production of saw-timber, fuelwood, pulpwood and poles. Some reserves have timber plantations attached to, or included in, the forested area. The necessary infrastructure to manage the numerous reserves is not so well developed in the Department of Forestry as it is in

the Department of National Parks and Wildlife. Many sites cannot be patrolled effectively and often their juxtaposition to high-density urban areas means levels of illegal timber removal are very high. This situation is germane to the conservation of some key bird species in Malaŵi, which are found only in a few Forest Reserves. Some of the more important Forest Reserves in the south (Thyolo Mountain, parts of the Mulanje massif, Matandwe Forest Reserve in the Malaŵi Hills) have been severely encroached upon by illegal settlers.

INTERNATIONAL MEASURES RELEVANT TO THE CONSERVATION OF SITES

Malaŵi is a party to the Convention on Biodiversity, the Convention on International Trade in Endangered Species, the Convention to Combat Desertification, the Convention on Climate Change, the Ramsar Convention (one area has been designated as a Ramsar Site: Lake Chilwa) and the World Heritage Convention (under which Lake Malaŵi National Park has been declared a World Heritage Site). Malaŵi participates in UNESCO's Man and the Biosphere Programme and has designated Mount Mulanje as a Biosphere Reserve.

OVERVIEW OF THE INVENTORY

The inventory contains 22 Important Bird Areas (IBAs), covering a total area of about 16,450 km², equivalent to 17% of Malaŵi's land area (Map 1, Table 1). These sites represent all major habitats and include all species of global conservation concern (other than a couple of rare migrants), all species of restricted range and all but two biome-restricted species: *Centropus cupreicaudus* and *Nectarinia oustaleti*. Of these, both of the Zambezi biome, the sunbird occurs very marginally in the extreme north while the coucal is also very local, but might be sought in Kasungu National Park (site MW008). Of the rest of the breeding avifauna, only 12 species are not known to occur in an IBA; some are species of sand beaches or of localized distribution in dambos (e.g. *Turnix hottentota*, *Macronyx ameliae*).

Twenty of the 22 sites are legally protected: four as National Parks, two as Wildlife Reserves and 14 as Forest Reserves. However, one of the National Parks (Lengwe) suffers from encroachment and several of the Forest Reserves in the south are under extreme threat from illegal removal of timber and clearance for agriculture. One site (MW019) is on private land where the remaining forest

patches have received some protection; finally, only one site (MW016) is not protected in any way, other than having been declared a Ramsar Site.

Given the problems that Malaŵi faces with regard to population growth, food supplies and poverty it is very unlikely that sweeping policies regarding IBAs will be adopted. Several sites in the south, especially Mount Mulanje, Thyolo Mountain and the Malaŵi Hills (sites MW018, MW020 and MW022), need urgent attention. The forest at Lisau/Chiradzulu (part of the Shire highlands) is just as important as some selected sites for threatened species (*Alethe choloensis*, *Zoothera guttata*, *Apalis chariessa*), but was not proposed as an IBA because it is both relatively small and already seriously damaged by timber removal. In fact, the Forestry Department has destroyed the best mid-altitude forest at Lisau (where *Zoothera guttata* was discovered in 1983) to replace it with sickly-looking eucalypt plantations.

Detailed information on the vegetation, birds and other wildlife of all the evergreen forests of the country was obtained in the 1980s by the main compilers (see Dowsett-Lemaire 1983–1990; Ansell and Dowsett 1988); all parks, the most important Wildlife Reserves, and Forest Reserves containing Zambezi woodland were also visited at the time. In the southern third of the country, where the human population density is highest, much clearance of forest and woodland has taken place in the last 10–15 years, the extent of deforestation was investigated at a number of key sites in November 2000. Information on birds other than our own field sheets (FDL, RJD) comes from the ongoing Atlas Project.

COMMENTS ON THE INVENTORY

- The 1:250,000 maps of Malaŵi (Government Department of Surveys) are good, with all parks and reserves shown. More details can be found in the *National atlas of Malaŵi* (Anon. 1983).

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GLOSSARY

dambo seasonally waterlogged soil in shallow depression.

SITE ACCOUNTS

Misuku Hills Forest Reserves

Admin region Northern

Coordinates 09°40'S 33°30'E

Area c.3,100 ha Altitude 1,600–2,050 m

MW001

A1, A2 (105), A3 (A07)

Forest Reserves

Site description

The Misuku Hills are situated in the extreme north of the country near the Tanzanian border; they rise above a much dissected plateau to a peak of 2,050 m (Matipa). They consist of two Forest Reserves located along parallel ridges running north-west–south-east: Mugesse Forest Reserve (1,600–1,880 m) includes one block of montane rainforest of c. 720 ha and is separated from Wilindi–Matipa Forest Reserve (1,700–2,050 m) by a few km of lower-altitude cultivated land. Wilindi–Matipa supports some 2,400 ha of forest intersected on the ridge by small clearings of montane grassland. The forests of the Misuku Hills are the most floristically diverse in the country (with over 150 species of trees recorded); the main emergents are *Aningeria adolfi-friedericii* and *Entandrophragma excelsum*. Mugesse is particularly luxuriant and has a striking abundance of strangling figs *Ficus* spp.

Birds

See Box and Tables 2 and 3 for key species. Over 100 species have been recorded at the site. Several pairs of *Hirundo atrocaerulea* are

present at Wilindi in the summer months. Three forest species, *Modulatrix stictigula*, *Andropadus masukuensis* and *Batis mixta* occur nowhere else in Malaŵi as they reach their southern limits of distribution in the Misukus. The *Modulatrix* is absent from Mugesse, but is locally common in Wilindi–Matipa above 1,800 m, with up to one pair/ha. The local population of *Stactolaema olivacea* (particularly numerous in Mugesse) belongs to the race *rungeensis*, confined to this site and Rungwe Mountain in southern Tanzania.

Key species

A1 *Hirundo atrocaerulea*

A2 (105) Tanzania–Malaŵi mountains EBA: Four of the 11 species of this EBA that occur in Malaŵi have been recorded at this site; see Table 2.

A3 (A07) Afrotropical Highlands biome: 28 of the 47 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.

Other threatened/endemic wildlife

Vegetation: five montane forest trees (including *Cylicomorpha parvifolia* and *Mitragyna rubrostipulata*) and several epiphytic orchids occur nowhere else in Malaŵi, reaching the southern limits of their distribution in the Misukus. Mammals: the bat *Glauconycteris argentata*, the flying-squirrel *Anomalurus derbianus* and the rodent *Otomys anchietae* are known in Malaŵi from nowhere else. A species of limited montane distribution that is well-represented here is the

squirrel *Paraxerus lucifer* (also present on the Nyika, site MW002). Butterflies: three species (*Papilio fuelleborni*, *P. thurau* s.s. and *Deudorix (Virachola) montana*) reach their southern limits, and others known nowhere else in Malaŵi include *Acraea cerasa* and *Danaus formosa*. On present evidence, *Charaxes nyikensis* reaches its northern limit here.

■ Conservation issues

The forests are reasonably well protected. The Forestry Department allows a small amount of pit-sawing on licence and some damage is occasioned at edges by bush fires but, to a large extent, the forest boundary has been respected since it was redefined in the 1950s. Despite the high population density and the clearance of almost all land between the reserves, pressure on the forests has been kept more or less under control thanks to natural emigration and a policy of land conservation through terracing.

■ Further reading

Ansell and Dowsett (1988), Chapman and White (1970), Dowsett-Lemaire (1989a, b).

Nyika National Park

Admin region Northern

Coordinates 10°40'S 33°50'E A1, A2 (105), A3 (A07, A10)
Area 313,400 ha Altitude c.1,000–2,607 m National Park

MW002

■ Site description

The Nyika Plateau is the largest montane complex in the country, with some 180,000 ha above the 1,800 m contour (above which montane conditions prevail). The scenery is spectacular, with the upper plateau covered by c.100,000 ha of gently rolling *Loudetia–Andropogon* grassland. The peak (Nganda, 2,607 m) is a grassy hill. Numerous impeded drainage channels support dambos, with small patches of short-canopy *Hagenia–Myrica* montane forest on the slopes (at 2,250–2,450 m). These are usually below 1–2 ha in size and cover c.2–3% of the area of the central plateau. Only the wet eastern escarpment is extensively forested, with some 3,400 ha of *Ocotea–Ficalhoa* montane rainforest at 1,700–2,350 m. Tall *Aningeria–Olea* montane rainforest reappears on the gentle south-western slopes (1,950–2,250 m) where it is rather fragmented. Total forest cover in the park is c.6,000 ha. *Brachystegia* (miombo) woodland ascends to 2,050 m on the drier and warmer western scarp. It is the dominant type of vegetation in the northern extension of the park (established 1978)—an area of rugged terrain, broken hills and large faulted valleys. A small section of the western side of the plateau lies in the contiguous Zambian Nyika National Park (IBA ZM022). The Nyika is an important catchment area and contains the source of four large rivers which drain into Lake Malaŵi, including the North Rukuru, and one into the Luangwa river in Zambia (the Chire or Luwumbu).

■ Birds

See Box and Tables 2 and 3 for key species. Over 420 species have been recorded. The plateau grasslands contain the main breeding population of *Grus carunculatus* in the country (12 pairs in 1986) and the site is also the breeding stronghold for *Neotis denhami*. The breeding population of *Hirundo atrocaerulea* was estimated at 204–260 pairs for the central plateau above 2,200 m, so probably approaches 300 pairs in the whole park. *Circus macrourus* is a common winter visitor, while *Falco naumanni* and *Gallinago media* are annual visitors in small numbers, and *Crex crex* is recorded occasionally. Several species occur nowhere else in the country: *Francolinus levaillantii* (the isolated endemic race *crawshayi*), *Chloropeta similis*, *Cisticola njombe*, *Nectarinia johnstoni*, *Euplectes psammocromius* and *Ploceus baglafecht*, all at the southern limits of their distribution here. The endemic and very isolated race *whytei* of *Nectarinia graueri* breeds commonly in montane shrubland. The little-known swift *Schoutedenapus myoptilus* is locally common over the larger patches of forest.

Key species

A1	<i>Circus macrourus</i>	<i>Hirundo atrocaerulea</i>
	<i>Grus carunculatus</i>	<i>Cisticola njombe</i>
A2 (105)	Tanzania–Malaŵi mountains EBA: Eight of the 11 species of this EBA that occur in Malaŵi have been recorded at this site; see Table 2.	

A3 (A07) Afrotropical Highlands biome: 42 of the 47 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.

A3 (A10) Zambeian biome: 20 of the 33 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.

■ Other threatened/endemic wildlife

Vegetation: the park is noted for its orchid flora, with c.150 terrestrial and c.50 epiphytic species, four of which are endemic and two others near-endemic (shared with Misukus or South Viphya). Several montane-forest trees (including *Hagenia abyssinica*, *Euphorbia obovalifolia*) reach their southern limits of distribution on the Nyika. Amphibians: the tree frog *Hyperolius mertensi* (or *H. quinquevittatus mertensi*, according to taxonomic treatment) is endemic to the Nyika dambos, and the ‘Nyika Squeaker’ is an endemic race (*nyikae*) of *Arthroleptis xenodactyloides*. Mammals: the Nyika is the only known Malaŵi locality for the following: *Suncus lixus*, *S. varilla* (shrews); *Plerotes anchietae* (bat); *Otomys typus* and *O. denti* (rodents). Species for which the Nyika is especially important include *Panthera pardus*, *Tragelaphus oryx* (LR/cd), *Hippotragus equinus* (LR/cd) and *Redunca arundinum* (LR/cd). Butterflies: *Charaxes dowsetti*, *Axiocerces nyika*, *Lepidochrysops handmani*, *L. chaldeus* and *L. nyika* are (on present evidence) endemic to the Nyika. The forest butterfly fauna is the richest in Malaŵi—some 120 of the 200 species present in the country. Species known from nowhere else in Malaŵi include: *Papilio mackinnoni*, *Neptis nina*, *Argiolaus pamela*, *Triclema nigeriae*, *Uranotauma williamsi*, *Brusa saxicola*, *Metisella medea*, *M. perexcellens* and *Chondrolepis telisignata*. The plateau is the southern limit of the following additional species: *Gorgyra bibulus*, *Charaxes ansorgei* and *Bematistes scalivittata*. The Nyika appears to be the northern known limit of *Eretis djaelaelae*.

■ Conservation issues

The recognition of the plateau and its surrounding hills as a water catchment area for four rivers in northern Malaŵi resulted in the park being expanded in 1978. The extension area includes 200,000 ha of miombo woodland that was formerly inhabited by several communities. These communities were relocated resulting, even today, in much resentment among the disenfranchised population. In general, population densities in northern Malaŵi are much lower than elsewhere in the country (<25/km² as against >100/km² in the south), but political pressure is being exerted to release land in the Parks and Wildlife estate back to the people. The park has no buffer zone and community agriculture creates a ‘hard edge’ effect against the park boundary. Uncontrolled fires in the dry season sweep up onto the plateau from below causing serious damage to the small patches of forest scattered over the grasslands, and the lack of any fire-protection policy in recent years has exacerbated the situation.

■ Further reading

Ansell and Dowsett (1988), Benson and Benson (1977), Chapman and White (1970), Clarke (1983a), Dowsett-Lemaire (1983, 1985, 1989a, b), Dyer (1992), Holroyd and Quinn (n.d.), La Croix *et al.* (1991), Stewart (1967).

Uzumara Forest Reserve

Admin region Northern

Coordinates 10°52'S 34°08'E A2 (105), A3 (A07)
Area 540 ha Altitude 1,600–1,940 m Forest Reserve

MW003

■ Site description

Uzumara Mountain caps a peak (1,920 m) rising from the North Viphya mountains, a narrow dissected plateau running north–south between 1,500 and 1,700 m, whose eastern slopes drop steeply to Lake Malaŵi. It is separated from the Nyika Plateau to the north-west by the South Rukuru Valley. Most of the forest is in one block that extends on the north-east slopes down to 1,600 m or 1,700 m; the drier southern slopes support a few broad gullies of forest between open ridges of *Protea* grassland and montane shrubland. It is a fairly impressive example of tall *Ficalhoa–Ocotea* montane rainforest, with a locally impenetrable understorey of Acanthaceae shrubs. Several other peaks rise above the plateau (most notably Chimaliro at 2,050 m), each supporting a patch of montane rainforest, but Uzumara is the largest and most luxuriant. Much of the rest of the plateau, which was once covered mostly with miombo woodland and mid-

altitude forest, is now settled by farmers who have cleared extensive areas of vegetation.

■ Birds

See Box and Tables 2 and 3 for key species. Uzumara's avifauna is broadly similar to that of the eastern escarpment forest of Nyika National Park (site MW002), 15 km to the north-west. Some 101 species have been recorded. Several, especially *Sheppardia sharpei* and *Illadopsis pyrrhoptera*, occur at higher densities in Uzumara than in the colder forest of East Nyika. The *Sheppardia* reaches densities of 1 pair/ha on the north-eastern slopes and is at the southern limit of its distribution here, as is also *Linurgus olivaceus*. *Cisticola nigriloris*, a species of forest regrowth, reaches its southern limit of distribution at nearby Chimaliro Mountain.

Key species

A2 (I05) Tanzania–Malaŵi mountains EBA: Six of the 11 species of this EBA that occur in Malaŵi have been recorded at this site; see Table 2.

A3 (A07) Afrotropical Highlands biome: 29 of the 47 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.

■ Other threatened/endemic wildlife

Vegetation: an epiphytic orchid, otherwise known from southern Tanzania, *Tridactyle virginea*, occurs nowhere else in Malaŵi. A tree recorded from only a handful of montane localities in Africa, *Ternstroemia polypetala*, is not uncommon near streams. Two species of forest tree, a *Strychnos* and a *Memecylon*, represent new, unnamed species (for which fertile material is still needed). Mammals: the squirrel *Paraxerus palliatus* reaches its northern limit in the country. Butterflies: three species reach their southern limits in Uzumara (*Papilio bromius*, *P. jacksoni* and *Charaxes nyikensis*).

■ Conservation status

Uzumara was set up as a Forest Reserve in 1948. The approach to the forest is up a very steep slope, and the access road is really usable only during the dry season (May–October). Some timber was removed commercially in the recent past (evidence of saw-pits), but the forest is now little used. The danger facing Uzumara is the rapid expansion of agricultural activities on the steep grass- and brush-covered slopes around the forest, including the damage caused by fires at forest edges.

■ Further reading

Dowsett-Lemaire (1989a, b).

Vwaza Marsh Wildlife Reserve

Admin region Northern

Coordinates 11°00'S 33°30'E

Area 98,600 ha Altitude 1,100–1,661 m

MW004

A3 (A10)

Wildlife Reserve

■ Site description

The reserve lies on the Zambian border, to the south-west of the Nyika Plateau. It includes Vwaza Marsh in the north, an extensive wetland of reedbeds, patches of papyrus and seasonally flooded grassland, fed by the Hewe stream. The Luwewe stream drains from the Marsh south into the South Rukuru, an important perennial river that forms the southern boundary. The small Lake Kazuni, in the south-east, is fed by the South Rukuru and its level fluctuates seasonally. The alluvial plain lies at 1,100–1,200 m and rises in the east to a series of pediments and hills towards the foothills of the Nyika; the highest point is Mpana (1,661 m). The reserve encompasses a great variety of habitats, from lake and marsh vegetation, flood-plain grassland, dambos, thickets, riparian forest, and *Colophospermum mopane* (mopane) and *Brachystegia* (miombo) woodland. The site is one of the most northerly locations in Africa for mopane, which is found in the alluvial plain as well as in the hills, next to and sometimes mixed with miombo or species of undifferentiated woodland.

■ Birds

See Box and Table 3 for key species. Over 300 species have been recorded. The site is particularly important for the conservation of the starling *Neocichla gutturalis*, a Zambezi species of highly localized and relict distribution; in Vwaza it is common in both miombo and mopane woodland. A few *Grus carunculatus* occur in the flood-plain;

in the past it was known to breed in dambos along the southern Rukuru to the south of Vwaza, so the odd pair may breed in the reserve, but this requires confirmation. There are also records of *Falco naumanni*. Vwaza is at the north-eastern limit of distribution of *Francolinus swainsoni*, which occurs nowhere else in Malaŵi.

Key species

A3 (A10) Zambezi biome: 17 of the 33 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.

■ Other threatened/endemic wildlife

Mammals: a small population of *Kobus vardonii* (LR/cd) seems to have established itself in recent years (one of only two in Malaŵi). The population of *Hippotragus equinus* (LR/cd) is one of the few large ones in Malaŵi, and that of *Alcelaphus lichtensteini* (LR/cd) is the largest.

■ Conservation issues

The Game Reserve (now Wildlife Reserve) was proclaimed in 1977. Illegal hunting of large mammals is a problem, but it hardly affects bird populations.

■ Further reading

Carter (1987), McShane and McShane-Caluzi (1988).

Lake shore Forest Reserves

Admin region Northern

Coordinates 11°50'S 34°10'E

Area 1,500 ha Altitude 500–1,496 m

MW005

A1, A3 (A09)

Forest Reserves

■ Site description

This part of the shore of Lake Malaŵi, between 11°30' and 12°08'S, some 70 km from north to south, receives more than 2,000 mm of rain annually and was covered, until late in the nineteenth century, with dense lowland rainforest and transition woodland (i.e. miombo with some evergreen species). The region is heavily populated today, and much of the natural vegetation has been turned to cash-crops such as tea and rubber. Only a few small patches of forest have been preserved in reserves, and the site includes the four main ones. These are, from north to south, Kalwe Forest Reserve (80 ha) and Nkuwadzi Forest Reserve (600 ha) near Nkhata Bay, Mzuma Forest Reserve (c.600 ha) near Chintheche and Kuwilwe Hill Forest Reserve (c.200 ha) some 38 km south-west of Chintheche. The sizes given in parentheses are those of the patches of forest and semi-evergreen transition woodland; the Forest Reserves also include more open miombo woodland and trial plots of plantations not considered here. The altitude of the first three reserves named is mainly between 500 m and 650 m; Kuwilwe Hill, an outlier of the South Viphya Plateau, rises prominently to 1,496 m, with forest ascending to 1,200 m in gullies. Floristically, the forests are somewhat impoverished, but represent a unique association of Zambezi elements and others of Guineo–Congolian affinity. They are best-developed at Nkuwadzi and Mzuma, where the 40-m-tall canopy is dominated by *Brachystegia microphylla* and *B. spiciformis* (briefly deciduous). Evergreen forest along streams and in depressions is characterized by *Afrosalsalia cerasifera*, *Erythrophleum suaveolens* and *Sorindeia madagascariensis*. The evergreen understorey includes numerous lianas and the ground storey is often a dense and impenetrable thicket of woody creepers.

■ Birds

See Box and Table 3 for key species. Some 112 species have been recorded; the area has been selected particularly for its (still) important population of the isolated Malaŵi endemic race (*bensoni*) of *Sheppardia gunningi*, which reaches densities of 1–2 pairs/ha in optimal habitat, alongside other common robins (*Erythropygia quadrivirgata*, *Cossypha natalensis*). The population left in the four reserves may be around 1,500 pairs. It is one of a very few localities in the country where the cuckoo *Cercococcyx montanus* still occurs, and *Guttera pucherani*, another highly localized species in Malaŵi, is recorded from Mzuma and Nkuwadzi. Two species of the Afrotropical Highlands biome occur as winter (non-breeding) visitors, *Pogonocichla stellata* and *Apalis chapini*, the latter also of the Tanzania–Malaŵi mountains EBA (see Table 2 and 3). In addition, two species of the Zambezi biome also occur (see Table 3).

Key species

- A1 *Sheppardia gunningi*
 A3 (A09) East African Coast biome: One of the 14 species of this biome that occur in Malaŵi has been recorded at this site; see Table 3.

Other threatened/endemic wildlife

Butterflies: *Pentila carcassoni* and *Euphaedra murphyi* (if a good taxon) appear to be endemic to these forests. Other species known from nowhere else in Malaŵi include: *Graphium polistratus*, *Acraea perenna*, *Oboronia bueronica*, *Xanthodisca vibius*, *Acleros placidus*, *Andronymus helles*, *A. evander* and *A. fenestrella*. Thirteen species of butterfly reach southern limits: *Andronymus helles*, *A. evander*, *A. fenestrella*, *Acleros placidus*, *Xanthodisca vibius*, *Euphaedra paradoxa*, *Catuna sikorana*, *Bematistes epaea*, *Acraea perenna*, *Aphnaeus flavescens*, *Deudorix cameroni*, *Amauris tartarea* and *A. crawshayi*.

Conservation issues

Several small areas of forest in Nkuwadzi have been replaced by trial plots of *Khaya* and *Milicia* (*Chlorophora*) by the Forestry Department; Kuwilwe suffers from over-exploitation of timber. All four reserves are under increasing pressure for land and fuelwood and their boundaries are receding.

Further reading

Dowsett-Lemaire (1989a, 1990).

South Viphya Forest Reserve
MW006

Admin region Northern

 Coordinates 11°50'S, 33°50'E A1, A2 (105), A3 (A07, A09, A10)
 Area 114,780 ha Altitude 1,000–1,950 m Forest Reserve

Site description

The South Viphya Plateau is the second-largest montane complex in Malaŵi; it is some 90 km long from north to south and 15–20 km wide. It starts about 30 km south-west of the North Viphya Plateau, from which it is separated by a belt of lower-altitude woodland around Mzuzu. Montane conditions prevail above 1,550–1,600 m and the total area above the 1,600 m contour covers some 82,000 ha. There are several peaks between 1,900 and 2,000 m. The eastern escarpment is deeply dissected, almost inaccessible country, whose numerous streams drain into the Luweya river system and Lake Malaŵi; the Luweya valley, at 900–1,000 m, forms part of the eastern boundary of the reserve. The central high plateau supports an enormous plantation (48,000 ha) of exotic pines, mainly *Pinus patula*. The pines were planted exclusively over montane grassland, while the patches of evergreen forest were deliberately preserved. As for the high Nyika, there is no evidence that this cold plateau was ever permanently settled. Three main patches of montane rainforest occur: Nthungwa (11°40'S 33°49'E, 108 ha at 1,600–1,800 m), Chamambo (11°50'S 33°50'E, 260 ha at 1,600–1,800 m) and Kawandama (12°01'S 33°52'E, 75 ha at 1,750–1,850 m). *Ficalhoa laurifolia* and *Cryptocarya liebertiana* are the most important emergents. Numerous smaller patches are scattered on the plateau and down the eastern slopes, totalling probably over 4,500 ha of montane and mid-altitude forest. Outside forests and plantations, the main vegetation-type is rank montane grassland and shrubland, with also some transition miombo woodland down the eastern escarpment, and a few attractive dambos in drainage channels.

Birds

See Box and Tables 2 and 3 for key species. Some 287 species have been recorded, including *Falco naumanni*, which is probably regular in small numbers. There are also old breeding records of *Grus carunculatus*, but it seems to have been extirpated by the pine plantations. The Zambebian biome species include *Ploceus olivaceiceps*. The site holds practically the whole population of the endemic and very isolated race *doni* of *Francolinus squamatus*: the francolin is widespread and locally common between 1,000–1,800 m in forest, secondary scrub and occasionally penetrates pine plantations. The eastern scarp-forests below 1,400 m contain important numbers of *Sheppardia gunningi* (possibly over 1,000 pairs) and are under less pressure than the Lake shore forests (site MW005); between them, sites MW005 and MW006 hold over 80% of the endemic race *bensoni*.

Several montane species reach their southern limits of distribution on the Viphya, including *Onychognathus tenuirostris* and *Laniarius fuelleborni*. *Neotis denhami* is regularly recorded and still breeds on the plateau grassland, where *Hirundo atrocaerulea* nests in small numbers.

Key species

- A1 *Hirundo atrocaerulea* *Sheppardia gunningi*
 A2 (105) Tanzania–Malaŵi mountains EBA: Four of the 11 species of this EBA that occur in Malaŵi have been recorded at this site; see Table 2.
 A3 (A07) Afrotropical Highlands biome: 25 of the 47 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.
 A3 (A09) East African Coast biome: One of the 14 species of this biome that occur in Malaŵi has been recorded at this site; see Table 3.
 A3 (A10) Zambebian biome: 13 of the 33 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.

Other threatened/endemic wildlife

Vegetation: an undescribed species of *Memecylon* forest tree has been collected at Nthungwa (and at site MW003). Some 14 species of montane trees and woody shrubs reach their southern limits of distribution on the Viphya (including *Entandrophragma excelsum*, *Ficalhoa laurifolia* and *Ocotea usambarensis*). Mammals: this is the only Malaŵi locality for the rodent *Arvicanthis niloticus*. Butterflies: species otherwise confined in Malaŵi to the lake shore forests include *Catuna sikorana* and *Amauris crawshayi*. Four species reach their southern limits: *Junonia sinuata*, *Henotesia ubenica*, *Uranotauma cuneatum* and *Phlyaria heritsia*.

Conservation issues

An important area of montane grassland (48,000 ha) has disappeared under pine plantations since the 1970s. The evergreen forests have, overall, been well preserved; the eastern scarp is uninhabited and the main risk is from bush fires coming up from the lowlands. However, the Forestry Plantation project has not been well managed in recent years; in 1996, 13,000 ha of pine plantations were maliciously burnt. Whether this affected the evergreen forests is unknown.

Further reading

Benson and Benson (1977), Dowsett-Lemaire (1989a, b).

Mtangatanga and Perekezi Forest Reserves
MW007

Admin region Northern

 Coordinates 11°56'S 33°40'E A3 (A10)
 Area 23,200 ha Altitude 1,400–1,700 m Forest Reserves

Site description

These two Forest Reserves (at 11°50'S 33°43'E and 12°02'S 33°38'E respectively) are situated on the western edge of the South Viphya Plateau, on gently undulating terrain; Mtangatanga is to the north of Perekezi, 10 km distant. They preserve fine examples of high-altitude, mossy *Brachystegia* (miombo) woodland; *Brachystegia taxifolia* is dominant locally and forms a closed canopy, with some evergreen shrubs in the understorey. Epiphytic orchids and lichens are abundant. Under the closed canopy the ground is devoid of grass, but is mossy and it appears that large sections of this transition woodland never burn; small patches of evergreen forest have developed in sheltered gullies.

Birds

See Box and Table 3 for key species. Some 172 species have been recorded so far; the Zambebian biome species include *Ploceus olivaceiceps*. The overall range of *P. olivaceiceps* is centred in Malaŵi but, at the present rate of destruction of mid-altitude miombo, the species is unlikely to survive in the medium-term outside of some Forest and Wildlife Reserves. These two reserves are a good example of the prime habitat favoured by this species; more Zambebian birds may be expected to be found on further exploration. In addition, two species of the Afrotropical Highlands biome occur in small forest patches (see Table 3).

Key species

- A3 (A10) Zambebian biome: 14 of the 33 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.

■ Other threatened/endemic wildlife

Vegetation: there is a rich flora of epiphytic orchids; this type of high-altitude miombo is poorly documented in Malaŵi and floristic exploration should be encouraged.

■ Conservation issues

Both Forest Reserves are in good condition.

Kasungu National Park

Admin region Central

Coordinates 13°00'S, 33°10'E

Area 231,600 ha Altitude 1,000–1,330 m

MW008

A1, A3 (A10)

National Park

■ Site description

The park lies on the Central African Plateau (1,000–1,100 m) along the border with Zambia. The vegetation consists mainly of tall *Brachystegia–Julbernardia* (miombo) woodland, locally mixed with *Combretum* and *Terminalia*. The woodlands are dissected by a network of grassy dambos which drain towards the major rivers of the park (the Dwangwa and Lingadzi). A few bare inselbergs rise above the woodland in the west of the park. There is a small dam on the Lifupa tributary.

■ Birds

See Box and Table 3 for key species. Over 370 species have been recorded; the Zambezi biome species include *Ploceus olivaceiceps*. *Circus macrourus* is an uncommon winter visitor while *Falco naumanni* may be regular on passage. *Grus carunculatus* has been recorded breeding in the past and one pair at least seems still to be present.

Key species

A1 *Grus carunculatus*

A3 (A10) Zambezi biome: 22 of the 33 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.

■ Other threatened/endemic wildlife

Mammals: a small population of *Kobus vardoni* (LR/cd) had established itself in recent years, the only other in Malaŵi is in Vwaza Marsh (MW004). The populations of *Redunca arundinum* (LR/cd) and *Alcelaphus lichtensteini* (LR/cd) were the second-most important in Malaŵi, and that of *Ourebia ouribi* (LR/cd) the largest. Kasungu also contained the largest population of *Loxodonta africana* (EN) in the country and was the only regular site for *Acinonyx jubatus* (VU), but see below.

■ Conservation issues

Kasungu gained National Park status in 1970, after having been a Game Reserve since 1930. There are periodic attempts at eradicating the tsetse fly (*Glossina* spp.) from the area and, were this to be successful, the main threat to the park would be land claim for tobacco-farming and other crops. In recent years, game stocks have been drastically depleted by uncontrolled poaching, and the population of elephant *Loxodonta africana* is down to 33 at the last count (2000).

■ Further reading

Ansell and Dowsett (1988), Carter (1987).

Nkhotakota Wildlife Reserve

Admin region Central

Coordinates 12°50'S 34°02'E

Area 180,000 ha Altitude 500–1,638 m

MW009

A1, A3 (A10)

Wildlife Reserve

■ Site description

Situated to the east of Kasungu National Park, Nkhotakota covers a huge area of escarpment wilderness, from the uplifted lip of the Central African Plateau (with the highest point, Chipata Mountain, at 1,638 m) on the western side, down a series of jumbled slopes and ridges to the Lake shore plain (at 500–600 m). Numerous drainage lines join three major north-easterly flowing rivers: the Dwangwa (on the northern boundary), the Bua and the Kaombe. Woodland (mostly miombo) is the main vegetation-type and there is some fine riparian forest along

the major rivers. A small patch of mid-altitude rainforest (44 ha) occurs on Chipata Mountain.

■ Birds

See Box and Table 3 for key species. Some 280 species have been recorded, but further exploration is likely to increase this figure considerably. The Zambezi biome species include *Ploceus olivaceiceps*; only three Afrotropical Highlands species, one of which is also of the Tanzania–Malaŵi mountains EBA, occur on Chipata Mountain, while another three are seasonal visitors or vagrants (see Tables 2 and 3). The elusive *Falco fasciinucha* has been recorded twice from Chipata Mountain; its status is uncertain, but extensive suitable habitat exists and it may breed.

Key species

A1 *Falco fasciinucha*

A3 (A10) Zambezi biome: 20 of the 33 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.

■ Other threatened/endemic wildlife

Mammals: the reserve held important populations of *Panthera leo* (VU), *Tragelaphus oryx* (LR/cd), *Kobus ellipsiprymnus* (LR/cd), *Redunca arundinum* (LR/cd) and *Hippotragus niger* (LR/cd), but poaching levels have increased recently. The bat *Triaenops persicus* is known from nowhere else in Malaŵi.

■ Conservation issues

This Wildlife Reserve holds some of the most unspoiled wilderness in the country. There are plans to build a dam in the reserve on the Bua river, the ecological implications of which are not clear.

■ Further reading

Carter (1987), Dowsett-Lemaire (1989a, b).

Ntchisi Mountain Forest Reserve

Admin region Central

Coordinates 13°20'S 34°02'E

Area 9,712 ha Altitude 700–1,640 m

MW010

A2 (105), A3 (A07, A10)

Forest Reserve

■ Site description

Ntchisi Mountain is one of several peaks in the Dowa Hills rising above 1,600 m, but it is the only one still bearing forest in this densely cultivated and eroded region. A short way south of Nkhotakota Wildlife Reserve (MW009), it is 75 km north-north-east of the capital Lilongwe. The forest is in one block and contains c.220 ha of *Aningeria* montane rainforest at 1,450–1,640 m, with a smaller area (30 ha) of tall *Newtonia* mid-altitude rainforest extending down the south-eastern slopes; strangling figs *Ficus* spp. are abundant. Most of the rest of the reserve contains some fine miombo woodland on the north-eastern gradient, down to an altitude of c.700 m.

■ Birds

See Box and Tables 2 and 3 for key species. Over 180 species have been recorded; in addition *Hirundo atrocaerulea* has been recorded once, on passage. The miombo woodland is more difficult of access than the forest and further exploration should produce more Zambezi biome species (cf. nearby site MW008, which has 22). Ntchisi is at the southern limit of distribution of *Phyllastrephus alfredi*.

Key species

A2 (105) Tanzania–Malaŵi mountains EBA: Two of the 11 species of this EBA that occur in Malaŵi have been recorded at this site; see Table 2.

A3 (A07) Afrotropical Highlands biome: 11 of the 47 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.

A3 (A10) Zambezi biome: 13 of the 33 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.

■ Other threatened/endemic wildlife

Vegetation: a *Garcinia* tree, found commonly throughout the forest, is closely related to *G. semseii* (a rare tree from eastern Tanzania); flowering material needs collecting. It also occurs on Chipata Mountain (part of site MW009). Mammals: Ntchisi is the only Malaŵi locality for the bat *Rhinolophus swinnyi*. Butterflies: two species

reach their southern limit here: *Charaxes ameliae* and *Hypolycaena hatita*.

■ Conservation issues

The site is situated in an area of high population density; some natural vegetation has been cleared on the southern and south-western sides and replaced with exotic plantations to help alleviate pressure on the forest. The latter is still in good condition and the maintenance of fire-breaks has been largely successful in the past. The woodland to the north-east is relatively untouched.

■ Further reading

Dowsett-Lemaire (1989a, b).

Dzalanyama Forest Reserve

Admin region Central

Coordinates 14°25'S 33°30'E

Area 98,934 ha Altitude 1,300–1,650 m

MW011

A1, A3 (A10)

Forest Reserve

■ Site description

Dzalanyama Forest Reserve, 60 km south-west of Lilongwe, is almost entirely covered with *Brachystegia–Julbernardia* woodland. It forms part of the Dzalanyama Range, a series of rocky hills running north-west–south-east along the border with Mozambique, which marks the watershed between Lake Malaŵi and the Zambezi river system. The eastern side of the reserve is relatively flat, at about 1,300 m. The hills to the west rise above 1,500 m with several peaks over 1,600 m. A few small patches (c. 75 ha) of mid-altitude forest occur on the highest ridge near Kasito Rock. Dambos occur along many of the drainage lines, breaking the continuity of the woodland cover. A *Pinus–Eucalyptus* plantation has been established in the reserve and covers about 5% of the land area. On the Mozambique side, the woodland extends uninterrupted over a much larger area with little sign of human settlement evident.

■ Birds

See Box and Table 3 for key species. Over 290 species have been recorded. There are a few records of *Falco naumanni*. The Zambezi biome species include *Dendropicos stierlingi* and *Ploceus olivaceiceps*, both of which are widespread in the reserve. A dambo in Dzalanyama is the only site in Malaŵi where *Sarothrura lugens* has been recorded, and *Pinarornis plumosus* is known from few other localities in the country. In addition, one species of the Tanzania–Malaŵi mountains EBA, five of the Afrotropical Highlands biome and one of the East African Coast biome have been recorded at this site (see Tables 2 and 3).

Key species

A1 *Dendropicos stierlingi*

A3 (A10) Zambezi biome: 22 of the 33 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.

■ Other threatened/endemic wildlife

Butterflies: an isolated population of *Cymothoe coranus* occurs (the most westerly known).

■ Conservation issues

Lying close to Lilongwe, in an area where fuelwood is in ever decreasing supply, Dzalanyama is under pressure from burgeoning, illegal timber-extraction activities. Some legal wood-cutting is sanctioned for the few remaining small communities who tend cattle in the reserve. Cattle-ranching at Dzalanyama was once considered to have great potential, but this has not proved to be the case and is being phased out. Fires, both natural and man-made, are annual features of the reserve's ecology, but their impact on the vegetation, and hence on the woodland's avifauna, is not known. The importance of Dzalanyama as a catchment area for Lilongwe's water-supply is well-recognized and, together with its growing potential for ecotourism development (wilderness hiking and camping), the area will probably command high conservation priority for at least the short-term future.

■ Further reading

Dowsett-Lemaire (1989a, b).

Namizimu Forest Reserve

Admin region Southern

Coordinates 14°05'S 35°18'E A1, A2 (105), A3 (A07, A09, A10)

Area 86,994 ha Altitude 500–1,800 m

Forest Reserve

MW012

■ Site description

The Namizimu Hills are a little-known part of the country, sandwiched between the south-eastern end of Lake Malaŵi and the Mozambique border. The Mangochi–Namizimu escarpment (north-east of Mangochi town) marks the start of a large upland area east of the Rift Valley which extends into Mozambique and southern Tanzania. It encompasses a wide altitudinal range, rising steeply from the Lake shore plain (500 m) to Msondole peak (1,800 m), with some 10 hills reaching over 1,500 m. Lions still occur in this sparsely populated region (historically famous for its man-eaters). The main type of vegetation is *Brachystegia* (miombo) woodland, with also dense riparian forest, lake-shore thicket and small patches of montane rainforest (the main one, on Mapalamba Hill, measuring 32 ha).

■ Birds

See Box and Tables 2 and 3 for key species. The provisional list is well over 200 species. The site is important for *Dendropicos stierlingi*, a Near Threatened species with an inexplicably restricted distribution in south-eastern Africa. Further exploration of the Namizimu woodland is necessary to assess the status of the woodpecker. Numbers of *Alethe choloensis* are likely to be few since the amount of available habitat is very small, c. 40 ha. In Malaŵi *Pogoniulus simplex* is confined to this site and nearby Mangochi Mountain (MW013). *Ardeola idae* has been recorded as a vagrant.

Key species

A1 *Dendropicos stierlingi* *Alethe choloensis*

A2 (105) Tanzania–Malaŵi mountains EBA: One of the 11 species of this EBA that occur in Malaŵi has been recorded at this site; see Table 2.

A3 (A07) Afrotropical Highlands biome: Eight of the 47 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.

A3 (A09) East African Coast biome: Three of the 14 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.

A3 (A10) Zambezi biome: 13 of the 33 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.

■ Other threatened/endemic wildlife

Mammals: a small population of *Loxodonta africana* (EN) lives in the reserve. Butterflies: the unique *Cooksonia aliciae* is known only from here and *Lepidochrysops auratus* is apparently also endemic to the area. Two species reach southern limits: *Cymothoe theobene* and *Acraea zonata*.

■ Conservation issues

Woodland in the reserve has been cleared locally, particularly on the lower escarpment near the Lake shore; some small villages have developed on higher ground and an attempt has been made to move them out. There is, however, still an enormous area of pristine woodland and riparian forest spanning a wide altitudinal range.

■ Further reading

Dowsett-Lemaire (1989a, 1989b).

Mangochi Mountain Forest Reserve

Admin region Southern

Coordinates 14°30'S 35°29'E A1, A2 (105), A3 (A07, A09, A10)

Area 32,553 ha Altitude 500–1,742 m

Forest Reserve

MW013

■ Site description

Mangochi Mountain is a prominent landmark, rising to a peak of 1,742 m, only 23 km east of the low-lying Shire river. As with Namizimu (MW012), this Forest Reserve covers a wide altitudinal range, rising from the Lake shore plain (500 m) on the south-western side, near the eastern shore of Lake Malombe. The upper limit of miombo woodland is 1,400–1,450 m; above this, the area of forest and rocky grassland covers c. 1,400 ha, of which 230 ha is montane forest (at 1,550–1,700 m). On the rocky substrate the forest is rather

stunted and dry, with a canopy mainly below 20 m (*Albizia-Craibia-Chrysophyllum-Ficus*, etc.) and very few epiphytes. Elephants have opened up paths through the Acanthaceae thickets of the understorey.

■ Birds

See Box and Tables 2 and 3 for key species. About 150 species have been recorded, but more are expected to occur; the forest is well known, but the woodland on the western slopes has not been well documented. The site is proposed mainly for the presence of *Dendropicos stierlingi* in the woodland and *Alethe choloensis* in the forest. The status of the woodpecker (reported so far from the eastern side of the mountain) needs further study; the alethe occurs only at low densities (fewer than 1 pair/10 ha?) as the forest is rather dry. Mangochi is at the southern limit of distribution of *Pseudoalcippe abyssinica*.

Key species

A1	<i>Dendropicos stierlingi</i>	<i>Alethe choloensis</i>
A2 (105)	Tanzania–Malaŵi mountains EBA: One of the 11 species of this EBA that occur in Malaŵi has been recorded at this site; see Table 2.	
A3 (A07)	Afrotropical Highlands biome: 10 of the 47 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.	
A3 (A09)	East African Coast biome: Two of the 14 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.	
A3 (A10)	Zambezi biome: Nine of the 33 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.	

■ Other threatened/endemic wildlife

Mammals: the reserve is visited seasonally by a small population of *Loxodonta africana* (EN); its present status is uncertain. It is the only Malaŵi locality for the bat *Otomops martiensseni*.

■ Conservation issues

Population pressure around the reserve is high. The forest has remained relatively unscathed because of the buffer belt of woodland. Dry-season fires have occasionally caused some damage. The status of the woodland, especially on the more extensive western slopes, needs further study, but it appears remarkably intact on the eastern slopes, where it is protected by some estates.

■ Further reading

Dowsett and Hunter (1980), Dowsett-Lemaire (1989a, b).

Liwonde National Park

Admin region Southern

Coordinates 14°50'S 35°20'E

Area 54,800 ha Altitude 470–921 m

MW014

A3 (A09, A10)
National Park

■ Site description

The park is primarily a system of Rift Valley flood-plain habitats with associated woodlands on higher ground. It follows the upper Shire river (the western boundary) for 30 km, up to the south-eastern shore of Lake Malombe; a northern section (added in 1977) connects it with Mangochi Mountain Forest Reserve (site MW013). Away from the river, the terrain slopes gently eastwards and is interrupted by two groups of hills (highest peak 921 m). The vegetation of the park is a complex of seven main types, the most widespread being tall, monodominant *Colophospermum mopane* woodland. Riverine habitats include extensive reedbeds, *Hyphaene* palm-savanna, flood-plain grassland and semi-evergreen thickets of *Acacia-Albizia-Diospyros*. A savanna woodland of *Adansonia digitata*, *Acacia* spp., *Albizia harveyi* and small clumps of mopane, interspersed with termitaria, lies adjacent to the flood-plain. On the hills *Brachystegia-Julbernardia* (miombo) woodland dominates. Cutting east–west across the flood-plain are tributary drainage lines fringed with evergreen forest.

■ Birds

See Box and Table 3 for key species. The park has a list of over 380 species. *Circus macrorurus* may winter in small numbers. There are also a few records of *Falco naumanni*, which is possibly regular on passage, while *Gallinago media* has been recorded, but its status is unknown. Many aquatic bird species occur, including *Gorsachius leuconotus* and *Ardeola rufiventris*, but numbers overall are rather

small. Liwonde is the only locality in Malaŵi where *Agapornis lilianae* is recorded and is an important site for this lovebird with well over 1,000 individuals occurring in mopane and baobab woodland. It is also the only regular site in the country today for *Lybius melanopterus*.

Key species

A3 (A09)	East African Coast biome: Three of the 14 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.
A3 (A10)	Zambezi biome: 11 of the 33 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.

■ Other threatened/endemic wildlife

Vegetation: an epiphytic orchid is almost endemic (*Microcoelia ornithocephala*; also recorded on the small Sambani Hill to the south). Mammals: the park holds the most important Malaŵi populations of *Kobus ellipsiprymnus* (LR/cd) and *Hippotragus niger* (LR/cd). Reintroduction of *Diceros bicornis* (CR) and some other species is being undertaken, but the long-term security of the park is far from certain.

■ Conservation issues

At first a controlled hunting area, Liwonde National Park was gazetted in 1973 to protect nationally and, to a lesser extent, regionally important game populations, including elephant *Loxodonta africana*, Lichtenstein's hartebeest *Alcelaphus lichtensteini* and sable antelope *Hippotragus niger*. High population densities on the periphery of the park have created serious problems recently. With no effective buffer zone around the park, cultivation occurs right up to the boundary, creating a 'hard edge' effect. Herds of elephants therefore had access to crops and have caused considerable damage to adjacent maize farms. Occasional loss of human life has resulted from encounters between raiding elephant herds and farmers. In 1994 the South African Government funded a project to construct 72 km of electric fencing to keep elephants out of farmers' crops. This has worked to some degree, but the fencing wire has been used by some community members to make snares for poaching game in the park; the fence has also been removed to facilitate collection of firewood in the park. In addition, poaching with firearms within the park has seen the reduction of several species, including lions (said to have been exterminated by the late 1990s). Elephants are being harassed from all quarters and suffer from multiple snare-related wounds.

For some time DNPW has received requests from the private sector to allow trade in live birds and, although these requests have been turned down in the past, the point may soon be reached when no option other than to conduct a 'trial' trade will be left. This clearly has implications for *Agapornis lilianae* and the situation must be closely monitored. The species is fully protected under the Parks and Wildlife Act at present, but is on CITES Appendix II, which means that the government can authorize exploitation. This does not, of course, rule out illegal capture and trade.

■ Further reading

Carter (1987), Clarke (1983b), Stead (1979).

Liwonde Hills Forest Reserve

Admin region Southern

Coordinates 15°08'S 35°30'E

Area 29,473 ha Altitude 550–1,626 m

MW015

A1, A2 (105), A3 (A07, A09, A10)

Forest Reserve

■ Site description

The Liwonde Highlands consist of a chain of four round hills on a ridge 32 km long from west to east, rising from the Lake shore plain (to the north) and Lake Chilwa (to the east), with the Shire Highlands stretching to the south. Chikala Hill is the easternmost and highest of the four, with a rocky peak at 1,626 m. It bears one of the finest patches (285 ha, at 1,300–1,600 m) of mid-altitude rainforest in the country, with a 40-m-tall canopy dominated by *Newtonia buchananii* and *Strombosia scheffleri*. The forest is surrounded by miombo woodland, but large areas have been cleared on the eastern saddle where 800 people have established themselves illegally. There is still much well-preserved miombo on the three hills to the west of Chikala, although at lower levels 3,000 ha have disappeared under *Eucalyptus* plantations.

Birds

See Box and Tables 2 and 3 for key species. Over 160 species are known from the reserve. The forest on Chikala is important for its breeding population of *Alethe choloensis* and *Oriolus chlorocephalus* (both common, with c.15 pairs of the oriole and more of the alethe), with smaller numbers of *Apalis chariessa*. *Zoothera guttata* has not been recorded, but could occur as it is known from similar habitat and altitude elsewhere in southern Malaŵi. *Dendropicos stierlingi* has been recorded from Chinduzi Hill and *Ploceus olivaceiceps* from high-altitude woodland near hilltops.

Key species

A1	<i>Dendropicos stierlingi</i>	<i>Apalis chariessa</i>
	<i>Alethe choloensis</i>	
A2 (105)	Tanzania–Malaŵi mountains EBA: Two of the 11 species of this EBA that occur in Malaŵi have been recorded at this site; see Table 2.	
A3 (A07)	Afrotropical Highlands biome: Eight of the 47 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.	
A3 (A09)	East African Coast biome: Three of the 14 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.	
A3 (A10)	Zambezian biome: 13 of the 33 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.	

Other threatened/endemic wildlife

None known to BirdLife International.

Conservation issues

The forest on Chikala Hill is still in good condition, but increasing pressure on the surrounding woodland by illegal settlers could eventually affect it. The miombo woodland to the west of Chikala is almost intact, but *Eucalyptus* plantations (3,000 ha in the year 2000) are likely to expand.

Further reading

Dowsett-Lemaire (1989a, b).

Lake Chilwa and flood-plain

MW016

Admin region Southern

Coordinates 15°15'S 35°40'E

A1, A4i, A4iii

Area c.220,000 ha Altitude 620 m

Ramsar Site (Unprotected)

Site description

Lake Chilwa is a shallow lake (1.5–3 m, maximum 5 m) that drains an area of c.8,000 km² of hills and mountains; it is bordered on all sides by swamps and seasonally flooded grassland, especially extensive on the flat western and northern shores. The lake itself is c.700 km² in size (or more at maximum extent), but dries up occasionally after a series of dry years (as in 1968, 1973 and 1995). It is very rich in fish and supports a population of c.60,000 people. The swamp vegetation consists mainly of *Typha* (c.650 km²) and *Phragmites* reedbeds (150–300 km²), with extensive patches of *Scirpus* in the open lake, whereas flood-plain grassland covers c.400 km². Several large rice-growing areas have been developed in the swamp, and the edges are cultivated (under maize) in the dry season, covering an estimated 10% of the surface overall.

Birds

See Box for key species. There has been no systematic survey of the avifauna, but over 160 species of birds associated with the Chilwa wetlands have been identified so far. In periods of flood the area supports very high numbers of waterfowl, but the flat terrain, the enormous size of the swamp and the nature of the vegetation all make counting of even the larger waterbirds a nearly impossible task. Preliminary studies carried out in 1996 have shown that numbers of at least nine species of waterfowl exceed the 1% thresholds; for the four main species snared by trappers (*Dendrocygna bicolor*, *Gallinula angulata*, *Porphyrio alleni* and *Amaurornis flavirostris*) the latest survey of commercial hunting in 1998–1999 has revealed that over one million birds were taken in a few months. It is likely other species exceed thresholds, e.g. a combined total of 41,500 *Anas hottentota* and *A. erythrorhyncha* were snared and shot in 1998–1999, but the proportion of each is unknown. Of species of global conservation concern, *Falco naumanni* winters in some numbers (flocks of 25–30 at

any one spot are not unusual) and the Chilwa flood-plain is certainly the most important site for this species in Malaŵi. *Circus macrourus* and *Gallinago media* both winter annually in small numbers while *Phoenicopterus minor* is only an occasional visitor. In general, much more fieldwork is needed, especially in seasonally flooded grassland, in order to verify the very high figures of cranes and other species reported by trappers. A ringing scheme aimed particularly at the migratory duck species would be useful in determining the origin of these seasonal populations.

Key species

A1	<i>Circus macrourus</i>	<i>Gallinago media</i>
	<i>Falco naumanni</i>	
A4i	Non-breeding	Year
	<i>Egretta ardesiaca</i>	600+
	<i>Plegadis falcinellus</i>	5,000+
	<i>Platalea alba</i>	300+
	<i>Dendrocygna bicolor</i>	100,000+
	<i>Amaurornis flavirostra</i>	100,000+
	<i>Gallinula angulata</i>	600,000+
	<i>Porphyrio alleni</i>	200,000+
	<i>Porphyrio porphyrio</i>	2,500
	<i>Larus cirrocephalus</i>	2,500
	<i>Rynchops flavirostris</i>	280
A4iii	More than 20,000 waterbirds occur regularly at this site.	

Other threatened/endemic wildlife

None known today; large mammals have been exterminated.

Conservation issues

Lake Chilwa was designated a Ramsar Site on 1 November 1997. Snaring and shooting of birds have been practised for a long time, but commercial exploitation of waterfowl started on a large scale in 1996, following the drying up of the lake and collapse of the fishery in 1995. It was estimated then that over 356,000 waterfowl were trapped on the western shores. Despite the recovery of the fishery industry, commercial waterfowl trapping has remained at a very high level, and a more detailed survey in the rains of 1998–1999 showed that over 450 villagers were involved in the activity on a full- or part-time basis. It is estimated that over a million waterfowl were snared between December and April, and over 70,000 birds shot, all of this taking place in the main breeding season. Birds shot include several legally protected species such as pelicans, flamingoes, spoonbills, ibises and storks. Several large waterbirds have already been eliminated through hunting (e.g. both species of cranes and *Ephippiorhynchus senegalensis*) and others are clearly decreasing. A Danish-funded project is currently under way which aims at involving the local communities in managing their waterfowl resources, by setting up some areas as breeding refugia where snaring should be abandoned, and by restricting access for bird-shooters in various ways. This latter idea clearly appeals to the local villagers as most bird hunters come from outside and cause a lot of disturbance to 'their' birds. If some form of control is not set up in time and the present scale of trapping is allowed to continue, one can expect a population crash in several key species, both resident and migratory.

Further reading

Schulten and Harrison (1975), Wilson (1999), Wilson and van Zegeren (1998), van Zegeren and Wilson (1999).

Soche Mountain Forest Reserve

MW017

Admin region Southern

Coordinates 15°50'S 35°01'E

A1, A2 (105), A3 (A07, A09)

Area c.200 ha Altitude 1,250–1,533 m

Forest Reserve

Site description

Soche Mountain is situated right on the edge of the city of Blantyre and is one of several isolated peaks that form part of the Shire Highlands on the eastern side of the Rift Valley in southern Malaŵi. It rises to a height of 1,533 m and supported some 150 ha of mid-altitude rainforest in the early 1980s; the *Brachystegia* woodland on the lower slopes provided a buffer zone against human pressure, but the south-east slopes (both woodland and forest) have been laid bare. The 30-m-tall forest on the ridge is fairly luxuriant and still largely intact, with *Albizia*

schimperana, *Cassipourea malosana*, *Chrysophyllum gorungosanum*, *Drypetes gerrardii* and two strangling *Ficus* spp. as dominant trees.

■ Birds

See Box for key species. Some 75 species have been recorded; of the East African Coast biome species, *Batis soror* is known from the woodland while *Oriolus chlorocephalus* has been recorded in the past, probably as visitor. Soche is still important for the occurrence of *Zoothera guttata* (of the Malaŵi endemic race *belcheri*), *Alethe choloensis* and *Apalis chariessa*; the first has been recorded breeding (the only nest record in Malaŵi comes from Soche) and was still present in 2000, the other two are common.

Key species

A1	<i>Zoothera guttata</i> <i>Alethe choloensis</i>	<i>Apalis chariessa</i>
A2 (105)	Tanzania–Malaŵi mountains EBA: Two of the 11 species of this EBA that occur in Malaŵi have been recorded at this site; see Table 2.	
A3 (A07)	Afrotropical Highlands biome: 10 of the 47 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.	
A3 (A09)	East African Coast biome: Three of the 14 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.	

■ Other threatened/endemic wildlife

Vegetation: Soche is one of only two sites for the Malaŵi endemic shrub *Buxus nyasica*, which is common in the forest understorey (it has also been recorded very locally on Mchese, northern Mulanje). A tall *Cola* tree, collected sterile, probably represents a new species and fertile material needs collecting urgently.

■ Conservation issues

The patch of forest on nearby Ndirande Hill (on the northern edge of Blantyre) was entirely destroyed in the 1990s. The fact that some forest has remained on Soche so close to the city is probably due to its being used as a shrine, but the south-eastern slopes have been cleared, and a few trees taken elsewhere. Its proximity to Blantyre should make it an ideal site for wildlife education. Urgent action needs to be taken about this.

■ Further reading

Benson and Benson (1977), Dowsett-Lemaire (1989a, b).

Mount Mulanje Forest Reserve

MW018

Admin region Southern

Coordinates 15°55'S, 35°38'E

A1, A2 (105), A3 (A07, A09)

Area 55,200 ha

Forest Reserve,

Altitude 600–3,002 m

Biosphere Reserve

■ Site description

Mount Mulanje is the highest massif in the country, located in the extreme south-east near the Mozambique border. From the surrounding plains at 600–700 m it rises abruptly to a square block of high plateaux at 1,800–1,900 m, surmounted by bare rock peaks up to 3,002 m. The area above 1,800 m is just under 20,000 ha. On the west, north and eastern sides the foothills have a belt of *Brachystegia* or transition woodland; the rain-facing southern and south-eastern slopes used to support extensive forest, but the situation has been drastically modified by human encroachment. The high plateaux have mainly montane grassland and shrubland, with small patches of *Widdringtonia* cedar forest (above c.2,250 m these turn into shrubland). The *Widdringtonia* forest on the western plateau of Chambe was replaced in the 1950s with exotic pine plantations. Four main forest-types may be recognized: lowland rainforest from 600 to 950 m (*Newtonia-Khaya-Albizia* dominated), mid-altitude rainforest at 950–1,500 m (with flat-topped *Newtonia buchananii* clearly dominant, the finest example being in Ruo Gorge on the southern slopes), montane rainforest at 1,500–1,850(–1,900) m, and mainly *Widdringtonia* monodominant forest above that. By the early 1980s, total forest cover was still c.7,000 ha (c.200 ha lowland, 1,800 ha mid-altitude, 5,000 ha on upper slopes and plateaux). The site includes the northern extension of Mchese Mountain, where the forest is currently in much better condition than on Mulanje itself. Most of the land around the mountain reserve was cleared for tea cultivation at the beginning of the twentieth century.

■ Birds

See Box and Tables 2 and 3 for key species. Some 180 species have been recorded. The site used to be and probably is still the stronghold for *Alethe choloensis* which is common between 900 and 1,900 m (700 m in winter). The population was estimated at c.1,000 pairs in 1983, although it is likely to have decreased much since. *Zoothera guttata* was discovered in 1983 and occurs between (700–)1,200 and 1,700 m; *Apalis chariessa* also occurs, up to 1,350 m, but in low numbers in these rather wet types of mid-altitude and lowland forest. The race *flavicularis* of *Apalis thoracica* (endemic to this site and the Zomba area) is common in forest and shrubland from 1,000 to 2,400 m, with altitudinal movements down to 600–700 m in the winter months. *Hirundo atrocaerulea* breeds in small numbers on the high plateaux. The montane species *Pogoniulus leucomystax*, *Andropadus nigriceps* and *Bradypterus cinnamomeus* reach their southern limits of distribution on Mulanje. The race of *Cossypha anomala* (nominata) found here is very isolated and confined to this site and adjacent Namuli and Chipirone mountains in Mozambique. In addition, four species of the Zambezi biome occur (see Table 3).

Key species

A1	<i>Hirundo atrocaerulea</i> <i>Zoothera guttata</i>	<i>Alethe choloensis</i> <i>Apalis chariessa</i>
A2 (105)	Tanzania–Malaŵi mountains EBA: Two of the 11 species of this EBA that occur in Malaŵi have been recorded at this site; see Table 2.	
A3 (A07)	Afrotropical Highlands biome: 19 of the 47 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.	
A3 (A09)	East African Coast biome: Three of the 14 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.	

■ Other threatened/endemic wildlife

Vegetation: Mulanje is the most important centre of plant endemism in Malaŵi, although some species thought to be endemic may well be found on the lesser-known Namuli Mountain (MZ009) in adjacent Mozambique. A taxonomic review of *Widdringtonia* cedars has recently shown that two distinct species are present on the mountain: the tall tree (*whytei*) is endemic while the shrubby ‘variant’ (*W. nodiflora*, syn. *W. cupressoides*) is widespread elsewhere in southern Africa. Another two forest trees are apparently endemic: *Rawsonia burtt-davyi* and *Ficus modesta*. The fern flora is exceptionally diverse (with over 100 species recorded in the forests) and contains two probably new species (in the genera *Asplenium* and *Elaphoglossum*). More flowering material is needed before a new species of mistletoe (Loranthaceae) can be named. Three lithophytic *Streptocarpus* and the cycad *Encephalartos gratus* are also endemic as well as several other plants of non-forest vegetation (although the total number varies according to taxonomic treatment). Reptiles and amphibians: a chameleon *Chamaeleo mlanjensis*, two geckos *Lygodactylus rex* and *L. bousi* and two races of frogs are apparently endemic. Mammals: Mulanje is the only known Malaŵi locality for the rodent *Aethomys namaquensis*. Butterflies: Mulanje has the second-most important forest fauna in Malaŵi, some 111 species. The following are, on present evidence, endemic to Mulanje: *Charaxes margaretae*, *Cymothoe melanjae* and *Baliocchila nyasae*. No fewer than 19 species of butterfly reach their southern limits: *Papilio desmondi*, *P. pelodurus*, *P. phorcas*, *Charaxes aubyni*, *C. dilutus*, *Pseudacraea deludens*, *Neptis incongrua*, *Sallya morantii*, *Acraea baxteri*, *A. goetzei*, *Belenois rubrosignata*, *Mylothris similis*, *Neocoenya gregorii*, *Eagris sabadii*, *Alaena picata*, *Teriomima puella*, *Uranotauma crawshayi*, *U. falkensteini* and *Platylesches rasta*.

■ Conservation issues

The mountain has been in a Forest Reserve since 1927, but the ecosystems of Mulanje are all threatened to varying degrees. Deforestation through human encroachment has affected Mulanje more than any other site in the country in recent decades. The largest single block of rainforest in the country, at Chisongeli on the south-eastern slopes, previously extended from 900 m to 1,800 m in a continuum and still measured 4,000 ha in 1974. It was almost totally destroyed in the 1980s, as local tea-estate workers (deprived of land by the tea estates) and refugees from the civil war in Mozambique cleared the forest for subsistence agriculture. The World Bank funded the establishment of a plantation of *Eucalyptus* to try to stop the encroachment, but this merely accelerated the process as people lost their gardens and crossed the plantation to clear more forest beyond. Similarly, many other areas of low or mid-altitude forest on the southern slopes have been cleared. Of

somewhat less importance for birds, the cedar forests on the high plateaux are also being heavily exploited, as illegal felling of the endemic *Widdringtonia* is increasing to the point that the tree is in danger of extirpation. Other serious threats are uncontrolled fires (often lit by poachers inside the fire-breaks) and the spreading of exotic *Pinus patula* throughout the plateaux (pines are invading and locally replacing the natural vegetation as they regrow faster after fires). Another potential threat is the exploitation of bauxite deposits on Lichenya Plateau.

■ Further reading

Benson and Benson (1977), Chapman and White (1970), Dowsett-Lemaire (1988, 1989a, b), Dowsett-Lemaire and Dowsett (1988), Dowsett-Lemaire and White (1990), Pauw and Linder (1997), van Strien (1989).

Thyolo tea estates

Admin region Southern

Coordinates 16°01'S 35°06'E

Area 300–600 ha Altitude 900–1,100 m

MW019

A1, A2 (105), A3 (A09)

Privately protected

■ Site description

Most of the natural vegetation in Thyolo District disappeared with the establishment of extensive tea estates around the beginning of the twentieth century. It must have consisted largely of moist *Brachystegia* or transition woodland (miombo interspersed with evergreen species), with rainforest in stream depressions and on the summit of Thyolo Mountain. Forest existed in a continuum down to the lower levels (c.1,000 m) around the mountain. This is no longer the situation, but a dozen patches of lowland rainforest have been preserved privately amid the tea fields to the north-east and within 2–10 km of Thyolo Mountain. They lie in stream depressions, at c.1,050 m, with a tall canopy of mainly *Albizia gummifera* and *Khaya anthotheca* (syn. *K. nyasica*). The three most important patches visited in the 1980s were on the estates of Mwalantunzi (93 ha), Namingomba (80 ha) and Mikundi (40 ha).

■ Birds

See Box and Tables 2 and 3 for key species. Some 50 species have been recorded so far; these forest remnants are important for their relatively high densities of *Apalis chariessa* (6–7 pairs/100 ha) and *Oriolus chlorocephalus* (4–7 pairs/100 ha). In addition, one species of the Zambezian biome occurs (Table 3) while five Afrotropical Highlands biome species are winter visitors; see Table 3.

Key species

A1 *Apalis chariessa*

A2 (105) Tanzania–Malaŵi mountains EBA: One of the 11 species of this EBA that occur in Malaŵi has been recorded at this site; see Table 2.

A3 (A09) East African Coast biome: Two of the 14 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.

■ Other threatened/endemic wildlife

None known to BirdLife International.

■ Conservation issues

Most forest patches left on the tea estates have been more effectively protected than the adjacent Forest Reserve on Thyolo Mountain. Their present status, however, needs reassessment and contact must be established with the managers of the tea estates concerned, to stress the scientific importance of 'their' forests; the main reason for their retention so far has been for conserving water.

■ Further reading

Dowsett-Lemaire (1989a, 1990).

Thyolo Mountain Forest Reserve

Admin region Southern

Coordinates 16°04'S 35°02'E

Area c.1,000 ha Altitude 1,160–1,462 m

MW020

A1, A2 (105), A3 (A07, A09)

Forest Reserve

■ Site description

Thyolo Mountain is the southern outlier of the Shire Highlands, which drop sharply to the Shire river plain (c.50 m a.s.l.) on the western

side, from a peak at 1,462 m. Soche Mountain (MW017) is 25 km to the north, and the Mulanje massif (MW018) is 50 km to the east. Thyolo Mountain used to support a single block of mid-altitude rainforest c.6 km in length along the north–south aligned ridge. The Forest Reserve is bordered by Satemwa tea estate on the south-east (where the forest descends to 1,160 m) and heavily populated agricultural land on all other sides, where the edge of the forest is retreating gradually to 1,200–1,300 m. From 1955 to 1980, the total area of forest decreased from c.1,500 to 1,000 ha. Since 1995–1996, the remaining area has been seriously encroached upon for gardens. As with the lower parts of the Misuku Hills and Ntchisi, Thyolo is a fig-dominated forest (with mostly the large strangler *Ficus sansibarica*); *Celtis gomphophylla*, *Chrysophyllum gorongosanum*, *Drypetes gerrardii* and *Macaranga capensis* are other common canopy trees.

■ Birds

See Box and Tables 2 and 3 for key species. About 81 species have been recorded on the mountain. The forest used to hold important numbers of *Alethe choloensis* (with densities of c.2 pairs/10 ha), and was the second most important site in the country after Mulanje. *Oriolus chlorocephalus* and *Apalis chariessa* were both common on the lower slopes below 1,300 m. A few pairs of *Zoothera guttata* also occurred. The local, isolated population of *Stactolaema olivacea* (a fig specialist) belongs to the race *belcheri* (confined to Thyolo and Namuli in adjacent Mozambique). Inexplicably, Thyolo is also the only locality in the country for *Columba delegorguei* and *Coracina caesia*. The montane species *Apaloderma vittatum*, *Bradypterus lopezi*, *Serinus hypostictus*, *Ploceus bertrandi* (and of course *Alethe choloensis*) all reach their southern limits of distribution here or on nearby Chipirone Mountain (site MZ010) in neighbouring Mozambique.

Key species

A1 *Alethe choloensis* *Apalis chariessa*

Zoothera guttata

A2 (105) Tanzania–Malaŵi mountains EBA: Two of the 11 species of this EBA that occur in Malaŵi have been recorded at this site; see Table 2.

A3 (A07) Afrotropical Highlands biome: 13 of the 47 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.

A3 (A09) East African Coast biome: Three of the 14 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.

■ Other threatened/endemic wildlife

None known to BirdLife International.

■ Conservation issues

From repeated encroachment on both sides, a tongue of forest in the north-west had been cut off by 1980 and has probably disappeared; enormous inroads have since been made into the principal remaining block of forest with large areas completely cleared by the collection of firewood and the illegal establishment of gardens. From 1955 to 1980 c.40% of the total forest cover had already been lost and the situation has worsened since: by the year 2000, another 40% of the forest cover had been lost, with huge gardens established right up to the beacon. Much land cleared for gardens has already been abandoned and returned to bracken as the topsoil has disappeared. In the 1960s and 1970s, renewed efforts by the Forestry Department to stop the spread of gardens, realign the boundary and mark it with short-lived eucalypt plantations all met with failure. Some of the people clearing the forest are employees of the nearby tea estates. The only way to save what is left is to provide estate employees and others with land outside the reserve.

■ Further reading

Benson and Benson (1977), Dowsett-Lemaire (1989a, b), Dowsett-Lemaire and Dowsett (1988), Johnston-Stewart (1982).

Lengwe National Park

Admin region Southern

Coordinates 16°15'S 34°30'E

Area 88,700 ha Altitude 100–384 m

MW021

A2 (092), A3 (A09, A10)

National Park

■ Site description

Lengwe lies on the western side of the low-lying Shire plain, along the border with Mozambique. The terrain rises gently from the alluvial

plain at 100 m to low hills in the west. There are six main vegetation-types: dry deciduous forest (*Pterocarpus antunesii*, *Newtonia hildebrandtii*) and dry deciduous thicket (with *Pterocarpus* as the main emergent), characteristic of the alluvial plain; riverine semi-evergreen thickets with various dominants (*Lecaniodiscus fraxinifolius*, *Sterculia appendiculata*, or *Cola mossambicensis*) along seasonal watercourses; thicket-clump savanna on termite mounds (*Cleistochlamyx kirkii*); undifferentiated woodland (*Acacia nigrescens*, *Albizia harveyi*, *Dalbergia melanoxylon*) and other woodland communities in the Lupata uplands in the south-west, including *Combretum/Diospyros* and a small area of mopane (*Colophospermum mopane*) woodland; finally there are some seasonally flooded grassy dambos and pans in the lowest-lying sections of the park. The park is bordered to the east by large sugar-cane estates.

■ Birds

See Box and Tables 2 and 3 for key species. Some 330 species of birds are known from Lengwe. There are several records of *Ardeola idae* between July and November. Of the East African Coast biome species, *Telophorus quadricolor* became extinct in the 1980s as the thickets were opened up and the area suffered a series of dry years. Similarly, the thicket habitat appears very marginal for *Batis fratrum* (probably also extinct) and the dense thorn thickets favoured by *Apalis ruddi* are not well represented in the park. The *Apalis* belongs to an endemic race (*caniviridis*) and it is strongly suspected that the main population originated from an area of denser thicket (to the east of Lengwe) that was completely destroyed in the 1970s with the expansion of sugar-cane plantations. Other species with restricted distribution in the country include *Guttera pucherani*, *Neafrapus boehmi* and *Tockus leucomelas*. *Bias musicus* is no longer recorded outside Lengwe, but is rare or of irregular occurrence there. Although *Merops boehmi* is recorded elsewhere in southern Malaŵi, the main population centres of this bee-eater are to be found in Lengwe and Liwonde National Park (site MW014). In Malaŵi *Pterocles bicinctus* is confined to Mwabvi Wildlife Reserve to the south of Lengwe, but it is possible that the species occurs in the little-explored sandstone woodland in the western section of the park.

Key species

- A2 (092) South-east African coast EBA: The two species of this EBA that occur in Malaŵi, have been recorded at this site; see Table 2.
 A3 (A09) East African Coast biome: Three of the 14 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.
 A3 (A10) Zambezi biome: Nine of the 33 species of this biome that occur in Malaŵi have been recorded at this site; see Table 3.

■ Other threatened/endemic wildlife

Mammals: the site is noted for its large population of *Tragelaphus angasi* (LR/cd) which today reaches its northern limit of distribution in Lengwe. It is also the only National Park in Malaŵi in which *Neotragus moschatus* (LR/cd) occurs.

■ Conservation issues

Lengwe Game Reserve became a National Park in 1970, essentially to protect the main thicket habitat for nyala *Tragelaphus angasi*. Habitat management (including the provision of permanent water-holes) and protection from poaching had resulted in overpopulation of nyala by the early 1980s. Regular culling was required to prevent habitat degradation by over-browsing. Today poaching is rife, and official culling has stopped as numbers of nyala dropped to below 1,000 animals (a quarter of the numbers reached 20 years earlier). Also of concern is the recent (1997) encroachment by pastoralists and agriculturalists, now established in the western sector of the park.

■ Further reading

Carter (1987), Clarke (1983b), Hall-Martin (1975), Hall-Martin and Drummond (1980).

Malaŵi Hills Forest Reserve

MW022

Admin region Southern

Coordinates 16°55'S 35°12'E

Area c.400 ha Altitude 600–945 m

A3 (A09)

Forest Reserve

■ Site description

The patch of forest considered here is part of the Matandwe Forest Reserve, at the southern tip of the country. The hills rise abruptly 900 m above the level of the Lower Shire plain (the peak is at 945 m). Forest occupied the slopes facing north-east to south-east, and was most dense between 700 and 940 m. The soils are very shallow, with many boulders; a few ridges are covered with transition woodland or rock-loving communities (*Aloe*, *Obetia*, etc.). Along the main western ridge the edge of the forest was sharply defined and gave way suddenly to open woodland—much of it now planted with *Toona ciliata*. The forest was an example, unique in Malaŵi, of Zanzibar-Inhambane lowland rainforest community, the largest trees being *Newtonia buchananii*, *Burttavia nyasica* and *Khaya anthotheca* (syn. *K. nyasica*).

■ Birds

Nearly 100 species have been recorded; the site was important for its population of *Batis fratrum*, estimated at over 100 pairs in 1983. In Malaŵi the species was otherwise only recorded from the Thangadzi valley (where riparian forest has been destroyed) and Lengwe (site MW021) where it was much scarcer and is probably extinct today. In addition, two species of the Zambezi biome have been recorded (see Table 3).

Key species

- A3 (A09) East African Coast biome: One of the 14 species of this biome that occur in Malaŵi has been recorded at this site; see Table 3.

■ Other threatened/endemic wildlife

Vegetation: 10 'Eastern' woody plant species and two others occur nowhere else in the country; a species of *Tricalysia* and of *Wrightia* cannot presently be matched and fertile material is needed. Butterflies: amongst a forest fauna of some 35 species, *Salamis cacta*, *Acraea quirina* and *Pentila tropicalis* are found nowhere else in the country (they are Eastern elements). *A. quirina* reaches its southern limit here. Reptiles: a new species of dwarf chameleon (*Rampholeon chapmani*) was described recently (1992) and is not known from anywhere else. Some live specimens were transferred to a patch of forest on a private tea estate (Mikundi) in 1996 as the new species faced extinction in the Malaŵi Hills.

■ Conservation issues

In 1983 the lower edges of the forest (above Nsanje) suffered from inroads by fire, otherwise the main block was intact. In December 1999 the site was visited by J. Haugaard and L. D. C. Fishpool and found to be in a state of advanced degradation and whole-scale clearing for maize-fields. At the current rate of destruction, it is feared that the remaining forest could disappear within two years.

■ Further reading

Dowsett-Lemaire (1989a, 1990), Tilbury (1992).

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