World Heritage Sites

Protected Areas and World Heritage

KILIMANJARO NATIONAL PARK
TANZANIA

At 5,963 meters Kilimanjaro is the highest point in Africa. This massive volcano stands in splendid isolation above the surrounding plains, with its (fast-melting) snowy peak looming over the savannah. The mountain is encircled by mountain forest. Numerous mammals, many of them endangered species, live in the Park.

COUNTRY
The United Republic of Tanzania

NAME
Kilimanjaro National Park

NATURAL WORLD HERITAGE SITE
1987: Inscribed on the World Heritage List under Natural Criterion vii.

IUCN MANAGEMENT CATEGORY
II National Park

BIOGEOGRAPHICAL PROVINCE
Somalian (3.14.07) / East African Highlands (3.21.12)

GEOGRAPHICAL LOCATION
The National Park and Forest Reserve on Mount Kilimanjaro lie very near the border between Tanzania and Kenya north of Moshi in the north centre of the country. The National Park comprises the whole of the mountain above 2700m, including some of the montane forest, and six access corridors through the forest belt below. The whole area lies between 2° 45' to 3° 25'S and 37° 00' to 37° 43'E.

DATES AND HISTORY OF ESTABLISHMENT
1910s: Mt Kilimanjaro and its forests declared a game reserve by the German colonial government;

1921: The area was gazetted as a Forest Reserve, confirmed by subsequent legislation;

1973: The mountain above the tree line (~2700m) reclassified as a National Park by Government Notice 50 and opened to public access in 1977.

LAND TENURE
Government, in Kilimanjaro province. Administered by the Tanzania National Parks Authority.

AREA
National Park: 75,353 ha, surrounded by a Forest Reserve of 107,828 ha.

ALTITUDE
1,830m (Marangu Gate) to 5,895m (Kibo,Uhuru Peak)

PHYSICAL FEATURES
Kilimanjaro is a giant stratovolcano and one of the largest volcanoes and largest isolated mountains in the world. It is the highest mountain in Africa, rising 4,877m above the surrounding savanna plains to 5,895m and its base covers an area of about 388,500 ha. It stands alone but is the largest of an east-

west belt of volcanoes across northern Tanzania. It has three main volcanic peaks of varying ages lying on an east-southeast axis, and a number of smaller parasitic cones. Kibo (5,895m), is the most recent summit, having last been active in the Pleistocene and still has minor fumaroles. It consists of two concentric craters of 1.9 x 2.7 km and 1.3 km in diameter with a 350m deep ash pit in the centre. The highest point on the mountain is the southern rim of the outer crater. The rugged erosion-shattered peak of Mawenzi (5,149m) lies to its east. The top of its western face is fairly steep with many crags, pinnacles and dyke swarms. Its eastern side falls in cliffs over 1000m high in a complex of gullies and rock faces, rising above two deep gorges, the Great Barranco and the Lesser Barranco. Between Kibo and Mawenzi there is a plateau of some 3,600 ha, called the Saddle, which forms the largest area of high altitude tundra in tropical Africa. To the west, the oldest peak Shira (3,962m) of which only the western and southern rims remain, is a relatively flat upland plateau of some 6,200 ha, the northern and eastern flanks having been covered by later material from Kibo. There are deep radial valleys especially on the mountain's western and southern slopes.

The mountain is a combination of both shield and volcanic types of eruption. Over time different flows have produced a variety of different rock types. The predominant rock types on Shira and Mawenzi are trachybasalts; the later lava flows on Kibo show a gradual change from trachyandesite to nephelinite. There are also a number of intrusions such as the massive radial and concentric dyke-swarms on Mawenzi and the Shira Ridge, and groups of nearly 250 parasitic cones formed chiefly from cinder and ash. There is evidence of past glaciation on all three peaks, with morainic debris found as low as 3,600m. However, since 1912 the mountain has lost 82% of its ice cap and since 1962, 55% of its remaining glaciers. Kibo still retains permanent ice and snow and Mawenzi also has patches of semi-permanent ice, but the mountain is forecast to lose its ice cap by 2015. The mountain remains a critical water catchment for both Kenya and Tanzania but as a result of the receding ice cap and deforestation, several rivers have dried up, affecting the forests and farmland below.

CLIMATE

There are two wet seasons, November to December and March to May, with the driest months between August to October. Rainfall decreases rapidly with increase in altitude; mean precipitation is 2300mm in the forest belt (at 1,830m), 1300mm at Mandara hut on the upper edge of the forest (2,740m), 525mm at Horombo hut in the moorland (3,718m), and less than 200mm at Kibo hut (4,630m), giving desert-like conditions. The prevailing winds, influenced by the trade winds, are from the southeast. North-facing slopes receive far less rainfall. January to March are the warmest months. Conditions above 4000m can be extreme and the diurnal temperature range there is considerable. Mist frequently envelops much of the massif but the former dense cloud cover is now rare. The ice cap and glaciers are in rapid retreat, but this local evidence of climate warming may also be due to the loss of humidity caused by long deforestation of the mountain's foothills (Thompson *et al*, 2003), by farm clearances and by fires set by honey-harvesters.

VEGETATION

The mountain has five main vegetation zones: savanna bushland at 700-1,000m (on south slopes) and 1,400-1,600m (on north slopes), densely populated sub-montane agro-forest on southern and south-eastern slopes, the montane forest belt, sub-alpine moorland and alpine bogs. Above this is alpine desert. The montane forest belt circles the mountain between 1,300m (±1,600m on the drier north slopes) to 2,800m. Forests above 2,700m are within the National Park. According to Lambrechts *et al*. (2001) there are 2,500 plant species on the mountain, 1,600 of them on the southern slopes and 900 within the forest belt. There are 130 species of trees with the greatest diversity being between 1,800 and 2,000 meters. There are also 170 species of shrubs, 140 species of epiphytes, 100 lianas and 140 pteridophytes.

The forest between 1,000 and 1,700m in the south and east has been extensively farmed with remnants of natural forest left only in deep gorges. In the drier west there are large estates and ranches where some natural habitat still survives; the north and northwestern slopes are dominated by plantations of exotic *Pinus* species. Dominant species of the submontane forest between 1,300-1,600m in the west and 1,600-2,000m in the north are *Croton megalocarpus* and *Calodendron capense*. Dominant in the lower to middle montane forest between 1,600-2,200m in the west and 2,000-2,400m in the north is *Cassipourea malosana.* On the southern and southeastern slopes from 1,600 to 2,100m the dominant lower montane forest species is the commercially valuable camphorwood *Ocotea usambarensis;* from 2,100 to 2,400m the dominant middle montane forest species are camphorwood *Ocotea usambarensis* with yellowwood *Podocarpus latifolius*, a large evergreen, with the tree fern *Cyathea manniana,* sometimes growing to 7m high. From 2,400 to 2,800m the dominant upper montane forest species are

Podocarpus latifolius with *Ocotea usambarensis.* The subalpine southern and southeastern slopes between 2,800-3,100m have forest of *Hagenia abyssinica* with *Podocarpus latifolius* and *Prunus Africana*; and on the north slopes *Juniperus procera - Podocarpus latifolius* forest with *Hagenia abyssinica.* Above 2,800m to the edge of the tundra at 3,500m is *Erica excelsa* forest.

There is no bamboo zone, nor a *Hagenia - Hypericum* zone. Above about 4,600m, very few plants are able to survive the severe conditions, although specimens of *Helichrysum newii* have been recorded as high as 5,760m (close to a fumarole), and mosses and lichens are found right up to the summit. The upland moor consists primarily of heath/scrub plants, with *Erica excelsa*, *Philippia trimera*, *Adenocarpus mannii*, *Protea kilimandscharica*, *Stoebe kilimandscharica*, *Myrica meyeri-johannis*, and *Myrsine africana*. Grasses are abundant in places, and *Cyperaceae* form the dominant ground cover in wet hollows. On flatter areas between the upland moor and the forest edge are areas of moorland or upland grassland composed of *Agrostis producta*, *Festuca convoluta*, *Koeleria gracilis*, *Deschampsia* sp., *Exotheca abyssinica*, *Andropogon amethystinus*, and *A. kilimandscharicus*, with scattered bushes of *Adenocarpus mannii*, *Kotschya recurvifolia* and *Myrica meyeri-johannis*. Various species of *Helichrysum* are found in the grasslands and in the upland moor. Two distinct forms of giant groundsel occur on the upper mountain: *Senecio johnstonii cottonii*, endemic to the mountain and only occurring above 3600m, and *S.johnstonii johnstonii* which occurs between 2,450m and 4,000m, showing two distinct forms. At all altitudes *Senecio* favours the damper and more sheltered locations, and in the alpine bogs is associated with another conspicuous plant, growing up to 10m tall, the endemic giant lobelia *Lobelia deckenii*. Below the tree line, the Park includes six corridors through the forest to the mountain foot.

FAUNA

The whole mountain including the montane forest belt, part of which extends into the National Park, is very rich in species: 140 mammals, (87 forest species), including 7 primates, 25 carnivores, 25 antelopes and 24 species of bat (Lamprecht *et al.,* 2002). Above the treeline at least seven of the larger mammal species have been recorded (Child, 1965), although it is likely that many of these also use the lower montane forest habitat. The most frequently encountered mammals above the treeline are eastern tree hyrax *Dendrohyrax validus* (VU), grey duiker *Sylvicapra grimmia* and eland *Tragalaphus oryx*, which occur in the moorland, with bushbuck *T. scriptus* and red forest duiker *Cephalophus natalensis* being found above the treeline in places, and central African savanna buffalo *Syncerus caffer aequinoctialis* which occasionally moves out of the forest into the moorland and grassland. An estimated 220 elephants *Loxodonta africana* (VU) are distributed between the Namwai and the Tarakia Rivers (Tanzania National Parks, 1993) and sometimes occur on the higher slopes. Insectivores occur and rodents are plentiful above the tree line, especially at times of population explosion, although golden moles *(Chrysochloridae)* are absent. Three species of primate are found in the montane forests, blue monkey *Cercopithecus mitis albogularis*, eastern black-and-white colobus monkey *Colobus guereza caudatus* and bushbaby *Galago* species; among mammals found there are leopards *Panthera pardus* as well as some of the species listed above. Abbot's duiker *Cephalophus spadix* (EN) is restricted to Kilimanjaro and some neighbouring mountains. Eastern black rhinoceros *Diceros bicornis* (CR) is now extinct in the area and Chanler's mountain reedbuck *Redunca fulvorufula chanleri* (VU) is probably extinct (Lamprecht *et al.,* 2002).

The Park lies within one of the world's Endemic Bird Areas. 179 highland species of birds have been recorded for the mountain, although species recorded in the upper zones are few in number. These include occasional lammergeier *Gypaetus barbatus,* moorland chat *Cercomela sordida*, Hunter's cisticola *Cisticola hunteri*, and scarlet-tufted sunbird *Nectarinia johnstoni*. White-necked raven *Corvus albicollis* is the most conspicuous bird species at higher altitude. The forest has several notable bird species including wattled ibis *Bostrychia carunculata* Kenrick's starling *Poeoptera kenricki* and Abbot's starling *Cinnyricinclus femoralis* (VU), which has a very restricted distribution. Pallid harrier *Circus macrourus* and lesser kestrel *Falco naumanni* (VU) have been seen on the west slopes. The Kilimanjaro swallowtail butterfly *Papilio sjoestedti*, is restricted to Kilimanjaro, Ngorongoro and Mount Meru, and the subspecies *P.s. atavus* is found only on Kilimanjaro.

CULTURAL HERITAGE

The local tribe is the Chagga, Bantu who arrived about 300 years ago as nomads and settled as farmers, terracing the fertile slopes. The name *Kilima Njaro* means 'shining mountain' in Swahili, and the Chagga know it as the Home of God. It was first reported in the west by a missionary in 1848, and first climbed by the german H.Meyer in 1889, with a Chagga guide.

LOCAL HUMAN POPULATION

The area surrounding the mountain is quite heavily populated principally by the Chagga, and the northern and western slopes of the Forest Reserve surrounding the National Park has 18 medium to large 'forest villages'. Although it is illegal, these people still use the forest for many household and medicinal products, for fuelwood, small scale farming, beekeeping, hunting, charcoal production and logging. Some 12% of the forest is plantation, some almost reaching to the moorland. The *shamba* system of tree plantations interplanted with crops comprises over half the planted area but over half of it is not replanted with trees at all (Lamprecht *et al.,*2002).

VISITORS AND VISITOR FACILITIES

The National Park has been developed with tourism in mind, and approximately 10,800 people visit the Park each year. The mountain can be climbed by non-climbers and the tour is greatly increasing in popularity. All visitors climbing the mountain must have a guide preferably from a licensed tour operator and take precautions against mountain sickness. Although there are six routes up the mountain, 91% of all hikers use the Marangu Trail. There are three huts for climbers on this trail: Mandara, Horombo and Kibo. Food, bedding and porters are provided by tour operators. There is a mountain rescue team at the Park headquarters and at each of the huts At Marangu there are a lodge, a hostel, a shop and equipment rental (National Park Service, pers.comm.,1995).

SCIENTIFIC RESEARCH AND FACILITIES

A variety of scientific studies has been conducted within the Park, although there are no special facilities. The local Chagga tribe was extensively studied in the 19th century by a german missionary, B.Guttmann (Jäschke,1980). There has been long-term geological, hydrological and vulcanological research by the Geology Department of the University of Tanzania and Sheffield University in the United Kingdom which is of particular interest. There is potential for further work, particularly in relation to glaciology and world climate. The College of African Wildlife Management at Mweka and its facilities, is relatively close.

CONSERVATION VALUE

With its snow-capped peak standing alone almost 5km above the surrounding plains Mt. Kilimanjaro is a superlative natural feature and a powerful symbol of the country. It is also an essential water catchment for the surrounding countryside and protects wildlife and a unique endemic flora. The Park lies within the Conservation International-designated Eastern Afromontane Conservation Hotspot, is a WWF Global 200 Eco-region, a WWF/IUCN Centre of Plant Diversity, and in one of the world's Endemic Bird Areas.

CONSERVATION MANAGEMENT

Although protection is total within the Park, and access is restricted, management is still not entirely adequate. A management plan, prepared in 1993, outlines the following objectives: to protect and maintain the Park's natural resources; to increase interpretation and visitor information; to encourage visitor use and development in a sustainable fashion; to improve park operations; and to strengthen the Park's relationship with local communities. A number of boundary adjustments and land protection strategies are described. Four of these strategies are: to include forest reserve lands within the National Park except for pine and cypress plantations and the half-mile strip below the forest, which is to be returned to village government control under sustained yield practices to provide useful local resources; to initiate an Integrated Regional Conservation Plan to lessen the local community's dependence on the mountain's forest resources; to gazette the portion of Lake Chala within Tanzania into the National Park; and reaffirm and encourage full implementation of Mounduli District Council bylaws to provide complete protection for the North Kilimanjaro Migration Corridor.

A zoning scheme defining limits of acceptable use, has been implemented for the National Park and Forest Reserve areas. Seven zones have been identified: intensive use hiking zone (2,700 ha), low use hiking zone (summit-bound) (7,723 ha) and low use hiking zone (non-summit bound) (3,750 ha), day use zone (598 ha), wilderness zone (150,657 ha), mountaineering zone (2,510 ha), cultural protection zone (259 ha), and administration zone (62 ha) (Tanzania National Parks,1993). Two projects initiated by the GEF-funded Community Management of Protected Areas Conservation Project (COMPACT) during 2002-4 were completed: to strengthen the capacity of the Mt Kilimanjaro Tour Guides Association and to train local NGOs in project management.

MANAGEMENT CONSTRAINTS

As in many other parks and reserves in Africa, resources are stretched, and manpower and equipment are not sufficient for full implementation of the management plan. Within the forest reserve exploitive activity has continued, although this was curtailed by Presidential Decree in 1984 and the issuing of timber licences has been stopped. Most difficulties are encountered in the management and protection of the montane forest, from illegal hunting, honey gathering, felling, fuel wood collection, grass burning and incursions by domestic livestock, particularly in the south-west. Both honey gathering and grass burning result in outbreaks of uncontrolled fires every year, particularly during the dry season and in the south-west and related to areas visited by tourists. It occurs even on the moorland edge and quite extensively within the *Erica* heathland. As with moorland in many parts of the world, fire is almost certainly one of the factors that has influenced the mountain biota for hundreds of years, and management (or non-management) of fire is likely to continue presenting problems. Tomlinson (1986) expressed concern that the frequency of fire on the Shira Plateau was increasing, and that this might pose a threat to the populations of giant groundsel. The gradual drying up of mountain rivers is also threatening the forest and farmland dependent on them (Lamprecht *et al. ,*2002).

There is still a major problem of illegal deforestation, especially of camphorwood trees below 2,500m. This has led to widespread landslides: 88 were recorded by Lamprechts *et al*., 2002. The forest buffer zone is being maintained in six corridors within the park, but elsewhere felling has continued, and there has been some replacement with commercial plantations or maize crops, although this was halted temporarily by the 1984 Presidential Decree (Tanzania National Parks, 1993). Downslope, the mountain's forests are diminishing in extent and quality due to land conversion, illegal logging, and fires, despite being an invaluable natural asset for Tanzania and for the local people in particular. Large tracts of indigenous forest have been converted into forest plantations, which now cover around 13,000 hectares, some 12% of Kilimanjaro Forest Reserve. On the western slopes, these plantations extend nearly to the moorland boundary, dividing the natural forest belt. However, only some 44% of the area allocated to forest plantations is actually planted with trees, the remaining area being open fields, often cultivated with annual crops. People have moved into these open areas, creating dense settlements within the Forest Reserve, some of which have expanded to the size of a town (Lambrechts, n.d.).

Problems have also resulted from the increasingly heavy use of the area by tourists. The amount of illegal use of the mountain's resources however, reflects the stress caused by the very small percentage of hunting and viewing fees which reaches surrounding villagers. Animals often destroy crops and endanger daily chores in the countryside, but the government pays no compensation. Their wildlife is therefore more of a burden to the people than a benefit. Conservation is not coordinated between government sectors, and rural communities are not entrained to help protect animals in community wildlife management schemes (Singleton, 2004).

STAFF

There is a total of 156 staff, headed by the Chief Park Warden, one Senior Park Warden and two Park Wardens (National Park Service, pers. comm., 1995).

BUDGET

Kilimanjaro was reported in 1984, to be the only park in Tanzania which approached self-sufficiency, paying for much of its administrative and management costs from the revenue accruing from tourism and this is still the case. The Park no longer receives subsidiaries from the government, although assistance is provided by other local and foreign organisations (National Park Service, pers. comm.,1995). Grants totalling US$68,160 from the GEF Small Grants Program and UNF in 2003 funded community based conservation initiatives, via the Critical Ecosystem Partnership Fund.

LOCAL ADDRESSES

The Director-General, Tanzania National Parks Authority, PO Box 3134, Arusha, Tanzania.
Chief Park Warden, PO Box 96, Marangu. Tanzania National Parks, PO Box 3134, Arusha, Tanzania.

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