Annotated checklist of the mammals of Rwanda

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Summary: This updated list presents the mammals of Rwanda. The text provides a concise overview of the changes that have occurred in Rwanda's landscapes and national parks since A. Monfort first published a list in 1992. The text also justifies the taxonomic choices made in terms of species and subspecies. The presence of species in national parks and their conservation status in Rwanda are also mentioned. Despite the decline in natural habitats, the current list comprises 229 species, 50 more than Monfort's list. This increase can be attributed to the evolution of the species concept, as well as to studies conducted over the recent decades on groups that had previously received little attention. Conversely, 35 taxa previously mentioned for Rwanda can not be accepted on the Rwanda list. This list also shows that 82 percent of medium-sized and large mammals only survive in protected areas, underlining the paramount importance of national parks. Recent research indicates the potential for further species discovery in the country.

Key words. Mammals, Rwanda, checklist, Volcanoes National Park, Gishwati Forest, Gishwati-Mukura National Park, Nyungwe Forest, Nyungwe National Park, Akagera National Park, Cyamudongo Forest, Mukura Forest, species concept, national parks.

Résumé. Une liste mise à jour est présentée des mammifères du Rwanda. Elle décrit de manière très succinte les changements intervenus dans les paysages du Rwanda et les parcs nationaux depuis la publication de la première liste en 1992 par A. Monfort. Elle justifie également les choix taxonomiques sur le plan des espèces et l'usage des sous-espèces. Elle mentionne la présence des espèces dans les parcs nationaux et leur statut de conservation au Rwanda. Malgré le recul des milieux naturels, la liste actuelle comprend 229 espèces, soit 50 de plus que la liste de Monfort. Cette augmentation provient en partie de l'évolution du concept de l'espèce et en partie aussi des études réalisées au cours des dernières décennies au sujet des groupes qui avaient été peu étudiés auparavant. En revanche, 35 taxons mentionnés précédemment ne peuvent être retenus sur la liste du Rwanda. Cette liste montre par ailleurs que 82 pourcents des mammifères de moyenne et de grande taille ne survivent que dans les aires protégées ce qui souligne l'importance des parcs nationaux. Des travaux récents suggèrent que d'autres espèces restent encore à découvrir dans le pays.

Mots clés. Mammifères, Rwanda, check-list, Parc national des Volcans, Forêt de Gishwati, Parc national de Gishwati-Mukura, Forêt de Nyungwe, Parc national de Nyungwe, Parc national de l'Akagera, Forêt de Cyamudongo, Forêt de Mukura, concept de l'espèce, parcs nationaux.

Introduction

The first list of mammals in Rwanda, Burundi and the Belgian Congo was published in Dutch by Henri Schouteden in 1947, followed by a summarised French version (Schouteden, 1947; 1948). An annotated and revised checklist was published 44 years later by Alain Monfort (Monfort, 1992). Since then, Rwanda has experienced considerable upheaval, culminating in the 1994 genocide against the Tutsi. Over the past 30 years, Rwanda's environmental landscape has also changed dramatically. The human population has almost doubled from around 7 million to 14 million (NISR, 2025), accompanied by rapid agricultural expansion and urban development. Consequently, the natural environment has been profoundly affected, even in some protected areas (Figure 1). At the same time, mammalian taxonomy has evolved considerably, driven by advances in molecular genetics and changes in our understanding of the species concept. The publication of well-illustrated reference works for scientists and the general public, such as the 'Handbook of the Mammals of the World' and the 'Illustrated Checklist of the Mammals of the World', alongside the widespread use of smartphones and computers, has greatly improved access to existing knowledge. Not only has information become far more accessible, but the volume of data collected each year has also increased substantially (Burgin *et al.*, 2020). Hence, by 2025, Monfort's list had become largely obsolete. Given this lack of information, an attempt was made in 2022 to produce an updated checklist (Cockar, 2022). This list was based on the review of books and papers, especially the six volumes of Mammals of Africa (Kingdon *et al.*, 2013). However, national lists should not be based on world lists and general works. They need to be based on the available information at national level and should feed the world lists. When the opposite is happening, because national lists do not exist, the continental and global databases like the IUCN Red List of Threatened Species and the ASM Mammal Diversity Database, contain many inaccuracies and gaps.

The publication of this checklist was not only necessary because Monfort's list, published in 1992, was obsolete. The 1990-1994 war and the Genocide against the Tutsi caused a profound break in Rwanda's history, and knowledge about the environment and biodiversity became deeply affected by the Shifting Baseline Syndrome (SBS). Many recent publications overlook or lack access to research conducted prior to 1990, thereby demonstrating a tendency

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to 'rediscover' Rwanda's biodiversity. This phenomenon is likely reinforced by limited exchange between American and European scientific communities working in Africa and the difficulty that African researchers encounter in accessing older publications. In the current context of biodiversity collapse, SBS is particularly regrettable because it masks the true scale of this collapse. It shows that there is a collapse, but it hides what has already collapsed. For this reason, we have compiled this list by revisiting the earliest available data to highlight the changes that have occurred over the past 50 years. We hope it will serve as a valuable resource for scientists, managers, nature enthusiasts, and visitors to Rwanda's national parks.

Brief chronology of mammal studies in Rwanda

From the beginning of the 20th century onwards, new species of mammals have been described from Rwanda, including the mountain gorilla *Gorilla beringei*, which was first described by Matschie in 1903 as *G. gorilla beringei*. This work was followed by partial inventories, including those by Lönnberg (1912), Gyldenstolpe (1928) and Osgood (1936). The first inventory of the southern part of Albert National Park, which became Volcanoes National Park in 1960, was published by Schouteden in 1934. This was followed by Freshkop's studies of Albert National Park and Kagera National Park in 1943 and 1944 respectively. Finally, Schouteden published the first synthesis of the mammals of the Congo and Rwanda-Urundi in 1947 and 1948. The most complete publication is that dating from 1947, but it is written in Dutch and is therefore often overlooked or misunderstood. In the 1950s, a study on *Grammomys surdaster* (Fain, 1953) and a note on the introduction of the black rhinoceros, *Diceros bicornis*, into Akagera National Park (Haezaert, 1959) were published.

De Leyn's research on the African wild dog, *Lycaon pictus*, was published posthumously in the early 1960s (De Leyn, 1962). Several other significant studies were released during this period, including a census of rodent species in Akagera National Park (Misonne, 1965), a survey of the park's bats (Verschuren, 1965a) and an assessment of mammals and their associated ticks in the Rugege Forest (now known as Nyungwe Forest) (Elbl *et al.*, 1966). Notable publications also included studies on the bats of Congo, Rwanda, and Burundi (Hayman *et al.*, 1966); a study of the Muridae of the Lake Kivu region (Rahm, 1967), and an initial report on the ecology of large mammals in Akagera National Park (Verschuren, 1965b).

The description of a new subspecies of duiker, *Cephalophus weynsi lestradei*, in Rwanda was published in the 1970s (Groves & Grubb, 1974), as was a study of the Kivu region's Soricidae (Dieterlen & H. de Balzac, 1979). Various other studies were published, including those on the eco-ethology of the ungulates in Akagera National Park (Monfort-Braham, 1972; Monfort, 1972, 1974, 1975, 1978, 1979, 1980; Monfort & Monfort, 1974), and on the transfer of elephants from Bugesera to Akagera National Park (Monfort & Monfort, 1977, 1979a, 1979b).

Several significant studies on Rwandan mammals were published in the 1980s. These included research on the mammals of the Nyungwe Forest (Storz, 1982), a study of bat species (Baeten *et al.*, 1984) and a checklist of the country's shrews (Soricidae) (Hutterer *et al.*, 1987). A report also documented new records of *Lophuromys rahmi* and *Delanymys brooksi* (Van der Straeten & Verheyen, 1983), while Hutterer & Verheyen (1985) described a new species of the genus *Sylvisorex* from Rwanda and Zaire. Other publications included a note on the introduction of giraffes to Akagera National Park (Verschuren, 1985) and an analysis of the evolution of habitats for large fauna within the park (Verschuren, 1988). In 1985, Nicole Monfort published a booklet about the mammals of Rwanda in *Kinyarwanda* for schoolchildren. Verschuren produced an annotated list of mammals found in the national parks of Congo, Rwanda and Burundi (Verschuren, 1987).

The 1990s saw the publication of several key studies on Rwandan mammals. In 1990, Kate Offutt published a short guide for visitors to Nyungwe Forest containing notable observations on mammals. In 1991, a final report was released on the WWF Belgium project in Akagera National Park (1986–1990). This included faunal lists (Dejace & Vande weghe, 1991; Vande weghe & Dejace, 1991). Unfortunately, the war in Rwanda had broken out by this time, so the report had to be kept as short as possible. Consequently, much information was lost. Notes on the mammals of the Nyungwe Forest (Dowsett & Dowsett-Lemaire, 1990), *Lutra maculicollis* in Rwanda (Lejeune & Frank, 1990) and the small mammals of the Nyungwe Forest (Geider & Kock, 1991) were published. In 1992, Alain Monfort compiled the first annotated list of Rwanda's mammals. Other studies addressed topics related to conservation. For example, the risk of extinction of the roan antelope *Hippotragus equinus* in Akagera National Park was assessed (Beudels *et al.*, 1992); the size of the sitatunga *Tragelaphus spekii* population in the Middle Akagera swamps was estimated (Beudels *et al.*, 1997); and changes in ungulate social behaviour in response to population dynamics were described (Vande weghe, 1998).

In the 2000s, studies focused on the biodiversity of the Nyungwe Forest (Plumptre *et al.*, 2002), the Albertine Rift (Plumptre *et al.*, 2003; 2007) and the Volcanoes region (Owiunji *et al.*, 2005). Research was also published on the dramatic degradation of the Rugezi marshes, including information on mammalian species (Hategekimana, 2005). In 2008, Nerissa Chao compiled a catalogue of the mammals in Nyungwe National Park.

During the 2010s, were published a study of the post-war recovery of ungulate populations in Akagera National Park (Apio & Wronski, 2011; Apio *et al.*, 2015), the first observation in Rwanda of the giant genet, *Genetta victoriae,* (Dinets, 2011), a study of small mammals in Volcanoes National Park (Tuyisingize *et al.,* 2013), a study of duikers in Nyungwe National Park, including the 'rediscovery' of *Cephalophus weynsi lestradei* (Moore *et al*., 2018), the first observation of the Central African Oyan, *Poiana richardsoni* (Moore & Niyigaba, 2018), a study of the Golden Cat, *Caracal aurata*, in Volcanoes National Park (Moore *et al*., 2019). A review of all bat data from the Democratic Republic of the Congo (DRC), Rwanda and Burundi was also published (Van Cakenberghe *et al*., 2017). Several species new to Rwanda were discovered; several new observations of bats were published from the Musanze region (Patterson *et al*., 2018); and a behavioural study of *Colobus angolensis ruwenzorii* in Nyungwe National Park was also published (Miller *et al*., 2019). A bibliographic review of mammalian research respective to the Akagera ecosystem was published (Sun *et al*., 2018). In 2019, a paper on pangolins in global camera trap data mentions the first published record for the giant pangolin in Akagera National Park (Khwaja *et al.*, 2019).

The 2020s saw the first recorded observation of *Micropotamogale ruwenzorii* in Rwanda (Grant *et al.*, 2020), a study on duiker population densities in Nyungwe and Volcanoes National Parks (O'Brien *et al*., 2020), and the 'rediscovery' of Hill's leaf-nosed bat *Rhinolophus hilli*, a species endemic to the Nyungwe Forest. Additionally, researchers identified several bat species that are either extremely rare or newly recorded in Rwanda (Flanders *et al.*, 2022). Further studies examined ground-dwelling mammals in Gishwati-Mukura National Park (Sun *et al*., 2022) and assessed the conservation status of the golden monkey *Cercopithecus kandti* (Tuyisingize *et al.*, 2023). Further research on the social and dietary habits of *Colobus angolensis ruwenzorii* was also published (Miller *et al*., 2020). In 2025, Methode Majyambere and his colleagues published an annotated checklist of terrestrial small mammals of Nyungwe National Park based on recent reassessments (2009–2023). In Nyungwe and Akagera National Parks, several studies on the distribution and ecology of mammals were launched; in particular, they clarified the presence in Rwanda of the 'servaline' form of the Serval *Leptailurus serval* (Bantlin & Evers, 2023).

The evolution of Rwanda's landscapes

Rwanda covers an area of about 26 000 km² and lies just below the equator between 1°05'S and 2°50'S on the eastern rim of the Albertine Rift. Schematically, the country is divided into two parts that were until recently very different. Western and north-western Rwanda consists mainly of the highlands of the Congo-Nile divide, culminating at 2 950 m asl. on Mount Bigugu in Nyungwe NP, the volcanoes (Virunga) range, culminating in Mount Karisimbi at 4 507 m, and the northern highlands rising to almost 2 400 m (Figure 1). These highlands receive an average rainfall of 1 400 to over 2 200 mm (probably 3 000 mm in the wettest parts of the Nyungwe Forest). They were almost entirely covered with montane forests and their associated moorlands, peat swamps and bamboo thickets until about the 17th century (Vande weghe & Vande weghe, in prep). Above 3 000 m on the volcanoes developped Afro-Alpine vegetation with high altitude ericaceous thickets and *Lobelia-Dendrosenecio* moors.

To the west, between the Congo-Nile divide and Lake Kivu, which extends to an elevation of around 1,456 metres, there was a narrow strip of submontane forests and acacia savanna islands (especially between Karongi and Rubavu). The steep slopes of the Rusizi valley were covered in *Combretum* savannas, while *Balanites aegyptiaca* savannas covered the Rusizi plain at an altitude of around 1 000 m.

Outside of national parks and other protected areas, the natural vegetation has been completely altered. Overall, natural habitats now cover only around 11% of their original area. Montane forests remain dominant in all national parks. Afro-alpine habitats are found only in Volcanoes National Park. Submontane forests survive only in the Cyamudongo Forest and to a limited extent in the westernmost Nyungwe Forest. The largest remaining peatlands are those of the Kamiranzovu River in the Nyungwe Forest and those of the Rugezi Ramsar site.

To the east of the Congo-Nile divide, the Rwandan plateau is deeply dissected by the drainage system of the Akagera River, which forms the upper basin of the White Nile. The average altitude of this plateau decreases towards the east, where there are three large depressions with a gently undulating relief at altitudes between 1 300 and 1 500 m. The Umutara extends to the north-east. The Middle Akagera basin lies to the east along the Rwanda-Tanzania border. The Mayaga and Bugesera lowlands are separated by the Akanyaru River and cover the south and centre of the country. The highlands of the Mubari region peak at about 1 815 m at Mount Mutumba in Akagera NP.

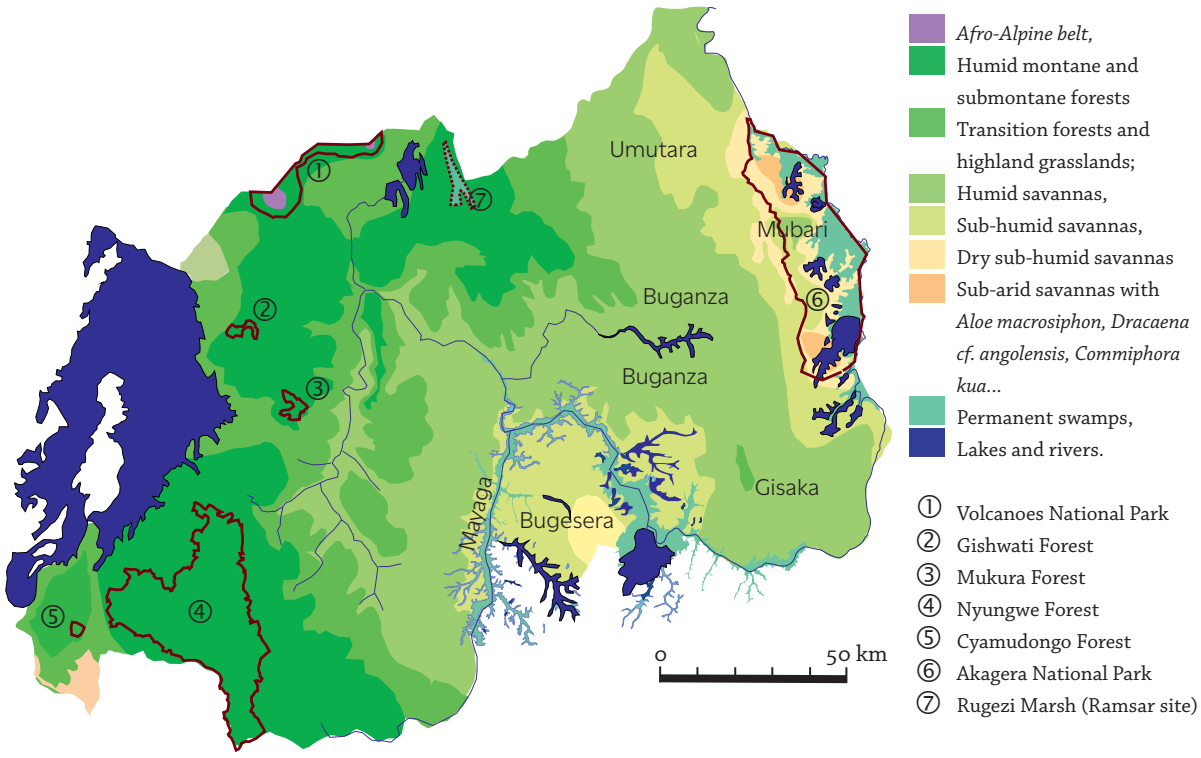

Fig. 1. Rwanda's natural vegetation as it would most probably have looked around 2 000 years ago, before the agro-pastoralists and agriculturists began to clear woodlands and riparian forests. This map is mainly based on personal observations made by J.P. Vande weghe between 1970 and 1985, complemented by data from Roche (1996, 1998) and Fischer (1987). It shows that the west and north-west of the country was covered with forest formations that were part of the Albertine Rift region. The centre and east were part of the interlacustrine savannas located between the Albertine Rift in the west and Lake Victoria in the east. The eastern savannas of Rwanda comprised two lowland regions: Umutara-Mubari in the north-east and Mayaga-Bugesera in the south-central area. The Buganza-Gisaka plateaus separated the two regions. The eastern edge of the Congo-Nile Ridge forests was undoubtedly altered by fires sweeping through the savannas from east to west.

The entire lowland region to the west of the Congo-Nile Ridge receives 650–1 200 mm of rainfall per year and was originally covered in savannas. The plateaus in central Rwanda, as well as those separating the Umutara, Mubari and Bugesera-Mayaga lowlands, were covered in sub-humid *Acacia-Combretum* savannas. The lowlands were covered in drier savannas, while the lower parts of the Akagera National Park region were covered in subarid savannas with species such as *Euphorbia dawei, Commiphora kua, Boscia angustifolia, Senegalia brevispecia, Senegalia senegalia* and *Ximenia caffra*. This eastern savanna belt was interspersed with many bush clumps or anthill thickets, and blocks of relict dry forests, while riparian forests grew alongside the Akagera River and its tributaries. An isolated patch of *Pterygota*-lower montane forest existed near Kibungo (now Ngoma) in the Gisaka region.

The most humid parts of the eastern savanna belt were progressively cleared beginning around 2 000 years ago (Roche, 1991, 1996; Van Grunderbeek *et al.*, 1982). However, the drier lowlands were only inhabited by specialised pastoralism, which opened up the landscape (especially in Umutara), but preserved the savanna ecosystem. Until 1950, large parts of the Mayaga-Bugesera, Umutara and Mubari lowlands, were still largely intact while the Buganza and Gisaka plateaus had been transformed in open grasslands. However, the human population increased enormously from about 2.2 million in 1950 to over 14 million in 2025 (NISR, 2025), putting enormous pressure on natural habitats. Most of the savannas outside protected areas were completely converted to man-made habitats. The clearing of all natural woody vegetation was accelerated by the growing demand for charcoal to supply the rapidly expanding urban populations. Today, the last savannas outside protected areas have disappeared, except in Umutara, where some degraded remnants remain on stony hills that are unsuitable for agriculture, and in southern Bugesera, where the Rwanda Institute for Conservation Agriculture (RICA) manages about 1 500 ha. The forests along the banks of the Akagera River have been completely cleared, leaving only the 169-hectare Ibanda-Makera Forest. Most wetlands have been or are being drained for agricultural use, either to grow food or industrial crops such as sugar cane and rice. The only large wetlands to escape transformation are the 50,000 hectares of lakes and marshes within Akagera National Park and marginally the swamps along the Akagera River bordering Burundi. Overall, natural vegetation covers only around 8.5% of its original area, and outside of protected areas almost all woody vegetation consists of exotic species.

In addition to habitat destruction and conversion, pesticide use has increased enormously in recent decades. This has had a devastating effect on insect populations — a phenomenon whose full scale still requires proper research. By extension, this is more than likely having an equally strong impact on all insectivores such as birds and small mammals. Small bats have been hit particularly hard and have greatly diminished in urban areas.

The protected areas

Rwanda currently has four national parks, totalling about 232 000 ha, the Rugezi-Burera-Ruhondo Ramsar site of 6 736 ha (REMA/UNEP/UNDP, 2011) and a few small protected relict forests, savannas or wetlands. Unfortunately, very little is known about the mammal fauna of the Ramsar site and the small protected areas. Yet these sites play most probably an important role in the biodiversity conservation. For example, the rare Derby's anomalure, *Anomalurus derbianus,* was photographed in the 150-hectare Busaga Forest (see page 22. However, because of lack of information, we cannot include these sites in this study.

Volcanoes National Park
Established in 1927, it comprised the southern sector of Congo's Albert National Park, covering 30,000 hectares. Following Congo's independence in 1960, it became the Volcanoes National Park, but successive disgazettements reduced its size to 15 000 hectares, clearing all its mixed mid-montane forests below 2 600 metres. Its size has remained unchanged since the 1980s, apart from a few minor boundary changes during the 1990–1994 war. The government has also recently developed a programme to extend the park by 700 hectares in order to improve protection of the narrow corridor between its western and eastern parts (REMA, 2023). This national park therefore essentially comprises old *Hagenia* upper mountain forests, *Cornus* (*Afrocrania*) forests, montane bamboo *Yuhina alpina* thickets, *Vernonia* thickets, *Hypericum* thickets, high altitude moist grasslands, high altitude Ericaceous thickets and high altitude *Dendrosenecio-Lobelia wollastoni* moors.

Akagera National Park
This park was established in 1934. Initially, it comprised a 174 000-hectare integral reserve and a 76 000-hectare annex zone. In 1956, the 80 000-hectare Mutara Hunting Reserve was added. The protected savanna ecosystem then covered almost 330 000 ha. However, in 1975, 50,000 ha of the hunting reserve were degazetted, and the remaining 30 000 ha were cleared of all human populations. The total savanna ecosystem then covered 280 000 ha. In 1994, the hunting reserve was downgraded, and in 1998 the park was reduced to 112 000 ha. Consequently, the savanna ecosystem shrank to approximately 60 000 ha, representing just 22% of its area in the early 1970s. The park's wetlands, covering 50 000 ha, remained unaffected by these changes. Apart from the loss of area, it should be noted that the remaining areas consist of the driest part of the former ecosystem. Consequently, most of the dry-season grazing lands of the park's dominant herbivorous ungulates (topis, zebras, impalas and elands) have been lost. However, significant changes have been observed in the park over the last 30 years, particularly in the region south of Lakes Hago and Kivumba. There has been a slight increase in rainfall (approximately 10%) and the 'short dry season' in January and February has either shortened or nearly disappeared, leading to the landscape becoming greener. Perhaps the subarid savannas have now become subhumid.

These changes can be attributed to anthropogenic influences and increased rainfall. The former has exerted a significantly greater influence than the rainfall change. From 1994 to 2005, a period of approximately ten years, the park was inhabited by a large number of pastoralists with their herds and big dogs, and the bushfires were banned. The *Loudetia* savannas on the hilltops, ridges, and steep slopes appear to have remained largely unaltered. However, the *Themeda-Hyparrhenia* wooded grasslands of the foothills have been subjected to overgrazing in numerous locations, thereby promoting significant bush encroachment. Consequently, the relatively open woodlands in the southern part of the park have been invaded by dense thickets of *Senegalia brevispica*. In certain areas, the herds have been observed to compact the soil (Mund & Christ, 2002), though this does not appear to have had any lasting consequences.

Significant alterations have also been observed in the areas bordering the lakes and marshes. The prolonged periods of high water levels in the Middle Akagera basin has led to the inundation of a fringe of dryland. Many large trees (*Ficus vallis-choudae*), the embryonic riparian forests that had developed in places, particularly along the shores of Lake Ihema, and most of the acacia fringes (*Senegalia polyacantha*) have been drowned and have

[3]) In 1933, the Gishwati Forest covered probably close to 28,000 ha, but when it was set aside, the corridor linking it to the volcano forest, most of which consisted of mixed bamboo thickets, and some other marginal areas that were already too much degraded, were not included in the reserve. The total forest cover of the forest reserve was therefore only 22,000 ha.

disappeared. Conversely, a new belt of dense thickets, foreshadowing more elaborate forest formations, has developed and now forms an almost continuous fringe along the southern lakes. Along Lake Ihema, this fringe of dense thickets joins in places the thorn thickets of the foothills. This could lead to the transformation of the entire southern region of the park into dry forest within the next decades. Only the *Loudetia* grasslands of the stony hilltops are likely to escape this evolution.

Nyungwe National Park
The 125 000 ha Nyungwe Forest became a forest reserve in 1933 but between 1962 and 1964 it lost about 15.000 ha due to illegal clearings on its edges. In the 1970s it lost a further 8 000–9 000 ha along its north-western edge. During the 1990–1994 war it was only marginally impacted. However, the gold panners, who were predominantly active in the Nyungwe River basin since 1935, had significantly degraded some valley-bottom forests and strongly depleted the ground-dwelling mammals. The primates had remained untouched, but buffalo, elephant, giant forest hog and leopard had been locally brought to extinction.

In 2005 the goldpanners were expelled. In 2006, the forest was declared a national park, encompassing not only the 101 000 ha of the Nyungwe Forest, but also the 11 ha Gisakura Forest and the circa 400 ha Cyamudongo Forest. Despite its proximity to the main forest block, this smaller forest is home to numerous plant and insect species that are not present in the main forest block. In 2022, Nyungwe NP became a World Heritage site. Representing the largest block of intact montane forests in the Albertine Rift, it stretches from an altitude of 1 480 m to 2 950 m, encompassing large peat bogs, fern moors, several pioneer and secundary forest types at different stages of their succession, montane bamboo thickets, ericaceous thickets, *Hagenia* and *Macaranga kilimanscharica* pioneer forests, open-canopy *Entandrophragma* forests, and old grown closed-canopy *Parinari-Newtonia* forests. Consequently, it contains an impressive 1 485 species of vascular plants (Fischer *et al.*, 2024), which is substantial in proportion to its surface area.

Gishwati-Mukura National Park
When it became a forest reserve in 1933, the Gishwati Forest covered 22 000 hectares and an altitudinal gradient of 1 200 m (1 750–2 950 m). It was connected to the Volcanoes forests via an 8-kilometre-wide corridor. However, in the 1980s it was reduced to 4 000 hectares by a large-scale agro-sylvo-pastoral project (Weber & Vedder, 2001; Vande weghe & Vande weghe, in prep.). During and just after the war, the forest shrank further to 600 ha. Similarly, the 2 500-hectare Mukura Forest was reduced to 1 500 hectares during and just after the war. In 2010, the remaining parts of the Gishwati and Mukura forests became the Gishwati-Mukura National Park. Stretching between 2 050 and 2 600 metres above sea level, the park consists mainly of mixed mid-montane forest and *Makaranga kilimanscharica* pioneer forest. This pioneer forest apparently succeeded mixed bamboo-*Podocarpus* formations. Maps from the 1930s show that bamboo thickets covered most of the higher parts of the Gishwati Forest at that time. This explains the ancient presence of species that depended on bamboo.

The taxonomic changes

In the last 30 years, the development of molecular genetics, mathematics and computers technology has led to profound upheavals in the classification of living organisms. The species concept also has significantly evolved (Burgin *et al.*, 2020). Because the biological species concept (BSC) has many inherent problems, biologists have proposed various alternative concepts (ecological, evolutionary, phylogenetic, etc.). These concepts differ on the means and methods to be used to define a species, but they all agree that a species is a lineage of populations that evolves independently of other lineages. Although many biologists cling to the BSC, increasingly the Phylogenetic Species Concept (PSC) is gaining ground (Taylor *et al.*, 2019). In the context of the current collapse of biodiversity that humans have triggered, this development was essential and urgent because it provides a much more acurate view of the real biological diversity and biodiversity losses (Groves & Grubb, 2011).

The consequence was an increase in the number of accepted species. This worried some biologists and conservation practitioners (e.g. Garnett & Christidis, 2007, 2017; Zachos *et al.*, 2013, 2019), and in the name of 'taxonomic stability' and conservation, these authors proposed amongst others the creation of standardised global species lists based on political, economic and conservation concerns, as well as a legal committee to restrict the freedom of action of taxonomists. These proposals obviously provoked strong reactions in the scientific community (e.g. Raposo *et al.*, 2017). It is true, however, that the number of accepted species has increased over the last few decades. As for example, the total number of mammal species, including recently extinct species, was 5 416 in 2005, 6 495 in 2018 and has risen to 6 801 in 2025, an average increase of 44 species per year (MDD, 2025). However, it should be borne in mind that this current 'inflation' is merely a reaction to the wave of excessive lumping in the mid-20th century that followed the widespread adoption of Mayr's Biological Species Concept (BSC) (Mayr, 1942).

Mayr's ideas were developed specifically to reduce the number of species and thus facilitate the work of museum curators. Nevertheless, they were of enormous importance in the development and acceptance of the modern metapopulation lineage concept of species. Unfortunately, the required reproductive isolation of species has proved to be unrealistic and therefore inapplicable in practice (de Queiroz, 2005). Hybridisation in nature has turned out to be much more common than we originally thought and is even a mechanism of speciation (Grant & Grant, 1994, 2014; Riesenberg *et al*., 2003; Arnold, 1997).

The 'species problem' is evident throughout the African mammal fauna, but particularly among African ungulates. Many of the species currently recognised have a wide distribution across the Sudano-Zambezian savanna biome. In reality, however, most of these species comprise a juxtaposition of populations that differ from one another to varying degrees and often have very low levels of genetic exchange with neighbouring populations. These populations were originally often described as species. In the name of the BSC, they subsequently became subspecies. Then, in their 'Ungulate Taxonomy' (2011), Groves and Grubb separated them again. There are many examples of this. For instance, eight species were previously described in the genus *Ourebia*, of which Groves and Grubb recognised four, whereas the Mammal Diversity Database recognises only one. Wilson and Reeder (2005) recognised four species in the genus *Damaliscus*. Groves and Grubb (2011), recognised 11 species, divided into three groups, but the Mammal Diversity Database (MDD), in 2025, recognises only two. Clearly, there is a serious problem with the delimitation of species here.

To address this issue and prevent a rise in species numbers, the concept of the Evolutionarily Significant Unit (ESU) was introduced (Ryder, 1986). This concept aligns closely with the phylogenetic species concept (Casacci *et al*., 2014). It also aligns more closely with the diversity observed in the field. So why not just use the term 'species' instead of creating additional categories? This is particularly relevant given that the vast majority of legislation only recognises 'species'.

Unfortunately, some IUCN specialist groups cling to the BSC. This tendency to reduce the number of species is rather surprising. While we are trying to save the biological diversity at all levels, this 'anti-inflationist' attitude is reducing this diversity and thus masking or attenuating its collapse. This has been proven for Malagasy small mammals (Taylor, 2019) and is evident in the case of the giraffe. By admitting the existence of only one species of giraffe, the IUCN comes to the conclusion that the species is 'Vulnerable'. Assuming the existence of four species (Fenessy *et al.,* 2016), we have to admit that one is doing rather well but that the other three are currently 'Endangered'. So whether we call them 'species', 'subspecies' or 'Evolutionary Significant Units', these four giraffe populations must be managed independently. A similar situation exists with the genus *Damaliscus* and even with the genus *Syncerus*.

Recent genetic studies suggest that the process of speciation, especially in the highly mobile African antelopes, has a very complex history (e.g. Wang *et al*., 2022). Indeed, according to some conventional ideas, hybridisation between species almost never leads to introgression (e.g. Mayr, 1963, 1992). However, recent studies have shown that after speciation, there is a long period during which hybridisation can still lead to introgression, as reproductive isolation only appears progressively. In some cases, only part of the genome is reproductively isolated, which means that genetic isolation can be difficult to apply to an entire genome (Mallet, 2005). In other words, speciation is a fluid phenomenon that can extend over a very long period of time, making it difficult to define precisely populations that are 'following their own evolutionary path'.

Due to this complexity, there is a strong argument for conceptualising these populations as distinct species. When two or more divergent populations are grouped under a single species name, a considerable amount of information about these populations is lost, primarily because the 'subspecies' level is rarely considered. As a result, re-establishing the distinction between these populations becomes a very difficult task. To illustrate this point, consider the four species of marsh rats, *Dasymys*, described as *D. alleni, D. cabrali, D. rwandae* and *D. sua*, but subsequently lumped under the single species name *D. incomtus*. However, in his assessment of this species for the IUCN Red List, Taylor (2016b) acknowledged that *D. incomtus* 'may represent a complex of several species' and that 'further studies are needed to clarify the taxonomic status of the populations currently assigned to this species'. It is clear that the implementation of these studies is hampered by the fact that all populations have been lumped under one name. Which observation belongs to what species? A similar problem exists with many other species. Although we know that they represent two or more different species, we face the challenge of accurately describing their distribution, behaviour and ecology because of the aggregation of all the data under a single taxonomic label. Moreover, this lumping approach is not really scientific. In mathematics, we assume that two factors are different until we prove that they are equal. So why take the opposite approach in taxonomy?

Finally, there is one more practical reason to choose the PSC. As more and more species are threatened, it becomes essential to transfer individuals from one protected area to another in order to reduce inbreeding and increase

the chances of survival of isolated populations. However, these individuals cannot simply be taken randomly. Artificially mixing genetically different populations may result in genes linked to adaptations for particular habitats, foods or diseases disappearing. In mammals with a very wide distribution, populations that have evolved independently are adapted to particular environments. Sometimes these populations are morphologically distinct and can be recognised as species. In other cases, these populations are morphologically almost identical and can only be differentiated genetically. These are known as cryptic species. When considering the transfer of individuals between protected areas, these differences must be taken into account, whether visible or not, to avoid creating an anthropogenic mixed population that could be less resistant to existing environmental factors. Such transfers could therefore increase the extinction risk (Jansen van Vuuren *et al*., 2017).

As for subspecies, they are, in principle, geographic divisions of a species. However, the PSC does not recognise any infraspecific entity by definition. According to Groves and Grubb (2011), who first applied the PSC consistently to a major group of species (the ungulates), subspecies can be categorised as 'Good', 'Bad' or 'Ugly'. 'Good' subspecies are 100% diagnosable and are, in fact, species that fell victim to the wave of lumping that swept through the mid-20th century. The 'Bad' and 'Ugly' subspecies have no real taxonomic status, but can sometimes be used in practice. Groves and Grubb use them in certain cases themselves, especially for conservation purposes.

In conclusion, we have chosen to adhere to the American Society of Mammologists (ASM MDD) nomenclature and classification as closely as possible. However, for species or genera that have been the subject of specific studies, we adhere to the classification that best reflects biodiversity at the level of species and populations. For the Bovidae in particular, we follow the Ungulate Taxonomy of Groves and Grubb (2011), unless a more recent study arrives at a different conclusion.

This attitude disturbs some taxonomists, politicians and conservationists, but we believe that taxonomy and conservation are two fields that must evolve independently. Taxonomy today is not perfect, and some charismatic species groups are better studied than others. As a result, taxonomy will evolve over time. Nevertheless, decisions in taxonomy should not depend on the effect they will or could have on conservation. It is up to conservationists and politicians to take responsibility by defining their strategies and priorities based on the data provided by taxonomy. In other words, it is not up to taxonomy to define species according to conservation strategies. We understand that a conservation programme may spend more money on lions than on marsh rats. But that does not mean we should cross that rat population off our list.

The Rwanda list

In the current list of the mammals of Rwanda (Table 1), we follow the nomenclature of the Mammal Diversity Database of the American Society of Mammologists (ASM MDD) which underwent a last updating in June 2025. This list was also the basis for the Illustrated Checklist of the Mammals of The World (Burgin *et al*., 2020). For ungulates, we follow the classification proposed in the Ungulate Taxonomy (Groves & Grubb, 2011). No one is obliged to accept this taxonomy, but it is a good idea to take it into account in the management of national parks, especially as more and more translocations of animals are planned or implemented. Furthermore, if we adopt the 'lumping' approach to taxonomy, it will be impossible to imagine that many species of ungulate actually comprise several distinct species. As a result, two or three million years of ungulate history would be erased. These species, which are mainly associated with savannas, have indeed had a complex history due to the climatic oscillations of the Pleistocene.

As for the distribution of the species in Rwanda, we only consider the four national parks. For the Busaga Forest, Buhanga Eco-Park, Mashoza Parike, Ibanda Makera Forest and Nyandungu Eco-Park we have almost no information on mammals. Regarding the Rugezi-Burera-Ruhondo Ramsar site, a recent study has been conducted but the final report is not yet available. All what we know for sure is that it has lost the situatunga, *Tragelaphus spekii* — its only large mammal (Hategekimana & Twarabamenye, 2015). This lack of information is regrettable, on the one hand because it makes it impossible to assess the conservation value of these sites, and on the other because it accentuates artificially the importance of national parks.

Finally, it should be noted that the Mammal Diversity Database (MDD) accepts more species than the IUCN Red List of Endangered Species. This difference has two reasons. Firstly, the experts who draw up the IUCN species assessments do not necessarily accept the same principles as those who update the MDD. Secondly, the MDD is updated much more frequently than the IUCN list (Burgin *et al*., 2020). For most mammals the IUCN assessments date from 2016 to 2020, whereas the last MDD update is from 2025.

Fig. 2. The L'Hoest's Monkey, *Allochrocebus lhoesti*, is nearly endemic to the Albertine Rift. Its semi-prehensile tail is often held above its back in a characteristic question-mark shape. (Photo taken by Gael R. Vande weghe on 16 November 2023 in Nyungwe Forest, Nyungwe National Park).

Fig. 3. The Silver Monkey, *Cercopithecus mitis doggetti*, is the commonest monkey in the forests of western Rwanda but it also inhabits the extensive papyrus beds in the Middle Akagera swamps. (Photo taken by Gael R. Vande weghe on 4 October 2010 in Nyungwe National Park).

Fig. 4. The Golden Monkey, *Cercopithecus kandti.* (Photo taken by Gael R. Vande weghe on 6 November 2022 on the edge of Volcanoes National Park. Hence the conifer, *Cupressus lusitanicus*).

Fig. 5. Dent's Monkey, *Cercopithecus denti.* (Photo taken by Drew Bantlin on 10 May 2023 in Nyungwe Forest, Nyungwe National Park).

Fig. 6–8. The Owl-faced Monkey, *Cercopithecus hamlyni*. (Photos taken by the Nyungwe Management Company in the Nyungwe Forest, Nyungwe National Park).

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Fig. 9. A fraction of a large group of Angola Colobus, *Colobus angolensis ruwenzorii*, licking minerals at a recent roadcut in the Nyungwe-Shava valley in the heart of the Nyungwe Forest. Forming herds of 200–500 individuals seems to be a speciality of the *ruwenzorii* subspecies. (Photo taken by Gael R. Vande weghe on 30 June 2024 in Nyungwe Forest, Nyungwe National Park).

Table 1. The list of mammals in Rwanda.

Column 1: English name/orders, families, species (subspecies).
Column 2 (Habitat): F= forest, N= non-forests, FN= forest and non-forests.
Column 3 (Biogeography): AR= Albertine Rift endemic species; ar= Albertine Rift endemic subspecies.
Column 4 (IUCN status): CR= critically endangered; EN= endangered; VU= vulnerable; NT= near threatened, lc= least concern; ne: not evaluated.
Column 5 (Status in Rwanda): CD= conservation dependent; CDe= high risk of extinction; Ex= extinct; Int= introduced.
Columns 6-11 (National Parks): Int= introduced; ex= extinct; ▲= present on site; ∆= present in immediate periphery or inside the former park limits ; ?= no recent information.
Column 12: outside national parks.
Column 13: main references.

Orders, families, species	Habitat	Biogeography	IUCN Status	Status in Rwanda	Volcanoes NP	Gishwati Forest	Mukura Forest	Nyungwe Forest	Cyamudongo Forest	Akagera NP	Outside prot. areas	Main references
AFROSORICIDA												
MACROCELIDIDAE, elephant shrews												
Short-snouted Sengi, *Elephantulus sp.* [1]	N	–	lc	?	–	–	–	–	–	∆	?	Verschuren, 1988; Monfort, 1992.
Four-toed Sengi, *Petrodromus tetradactylus* [2]	N	–	lc	CD	–	–	–	–	–	▲	–	Vande weghe & Dejace, 1991; MDD, 2025.
CHRYSOCHLORIDAE, golden moles												
Stuhlmann's Golden Mole, *Chrysochloris stuhlmanni* [3]	?	(ar)	lc	CD	▲	–	–	▲	–	–	▲	Monfort, 1991; Chao, 2008; Majyambere *et al.*, 2025; not in MDD, 2025.
TENRECIDAE, otter shrews												
Ruwenzori Otter Shrew, *Micropotamogale ruwenzorii* [4]	AqF	AR	lc	CD	–	–	–	▲	–	–	–	Moore & Niyigaba, 2018; Majyambere *et al.*, 2025; MDD, 2025.
TUBULIDENTATA												
ORYCTEROPODIDAE, Aardvark												
Aardvark, *Orycteropus afer* [5]	N	–	lc	CD	–	–	–	–	–	▲	ex	Freshkop, 1944; Vande weghe & Dejace, 1991; Monfort, 1992; MDD, 2025.
PROBOSCIDEA												
ELEPHANTIDAE, elephants												
African Savanna Elephant, *Loxodonta africanus* [6]	FN	–	EN	CD	▲	ex	–	ex	–	▲	ex	Freshkop, 1943; Verschuren, 1988; Vande weghe & Dejace, 1991; Monfort, 1992; MDD, 2025.
HYRACOIDEA												
PROCAVIIDAE, hyraxes												
Southern Tree Hyrax, *Dendrohyrax arboreus* [7]	F	–	lc	CD	▲	▲	▲	–	–	(ex)	–	Freshkop, 1943; Vande weghe & Dejace, 1991; Monfort, 1991; Tuyisingize, 2013 (as *Heterohyrax helgei*); MDD, 2025.
Western Tree Hyrax, *Dendrohyrax dorsalis* [8]	F	–	lc	CD	–	–	–	▲	▲	–	–	Dowsett & Dowsett-Lemaire, 1990; Offutt, 1990 (as *D. arboreus dorsalis*); Monfort, 1992; Plumptre et al., 2002; Chao, 2008; MDD, 2025.
Bush Hyrax, *Heterohyrax brucei* [9]	N	–	lc	CD	–	–	–	–	–	▲	▲	Verschuren, 1987; Monfort, 1992; not in MDD, 2024.
PRIMATES												
CERCOPITHECIDAE, monkeys & colobus												
L'Hoest's Monkey, *Allochrocebus lhoesti*	F	–	VU	CD	–	▲	ex?	▲	–	–	–	Monfort, 1992 (as *Cercopithecus lhoesti*); Chao, 2008; MDD, 2025
Red-tailed Monkey, *Cercopithecus ascanius* [10]	F	–	lc	CD	–	–	–	▲	–	–	–	Offutt, 1990; Monfort, 1992; Chao, 2008; MDD, 2025.
Dent's Monkey, *Cercopithecus denti*	F	–	lc	CD	–	–	–	▲	–	–	–	Offutt, 1990 (as *C. mona denti*); Monfort, 1992 (as *C. wolfi*); Chao, 2008 (as *C. mona*); MDD, 2025.
Owl-faced Monkey, *Cercopithecus hamlyni* [11]	F	–	VU	CDe	–	ex?	–	▲	–	–	–	Schouteden, 1947; Dowsett & Dowsett-Lemaire, 1990; Monfort, 1992; Chao, 2008; MDD, 2025.
Silver Monkey, *Cercopithecus mitis doggetti*	FN	–	lc	CD	int	–	(▲)	▲	▲	▲	▲	Dowsett & Dowsett-Lemaire, 1990; Vande weghe & Dejace, 1991; Monfort, 1992 (as *C. m. stuhlmanni* and *C. m. doggetti*); Chao, 2008; MDD, 2025.
Golden Monkey, *Cercopithecus kandti* [12]	F	AR	EN	CD	▲	▲	–	▲?	–	–	–	Schouteden, 1947; Offut, 1990; Monfort, 1992.
Vervet Monkey, *Chlorocebus pygerythrus*	FN	–	lc	–	–	–	–	▲	?	▲	▲	Vande weghe & Dejace, 1991; Monfort, 1992, and Chao, 2008 (as *C. aethiops*); MDD, 2025.
Johnston's Mangabey, *Lophocebus johnstoni*	F	–	VU	CD	–	–	–	▲	–	–	–	Monfort, 1990 (as *Cercocebus albigena*); MDD, 2025

Orders, families, species	Habitat	Biogeography	IUCN Status	Status in Rwanda	Volcanoes NP	Gishwati Forest	Mukura Forest	Nyungwe Forest	Cyamudongo Forest	Akagera NP	Outside prot. areas	Main references
Olive Baboon, *Papio anubis*	FN	–	lc	CD	–	–	–	▲	▲	▲	▲	Vande weghe & Dejace, 1991; Monfort, 1992; Chao, 2008; MDD, 2025.
Angola Colobus, *Colobus angolensis ruwenzorii* [13]	F	ar	VU	CD	–	–	–	▲	–	–	–	Dowsett & Dowsett-Lemaire, 1990; Monfort, 1992; Chao, 2008; MDD, 2025.
Guereza Colobus, *Colobus guereza occidentalis* [14]	F	–	lc	ex	ex	(ex)	–	–	–	–	–	Schouteden, 1947; MDD, 2025.
HOMINIDAE, gorillas & chimpanzees												
Eastern Gorilla, *Gorilla beringei beringei*	FN	ar	CR	CD	▲	–	–	–	–	–	–	Freshkop, 1943; Monfort, 1992; MDD, 2025.
Common Chimpanze, *Pan troglodytes schweinfurthii*	F	–	EN	CD	–	▲	–	▲	▲	–	–	Storz, 1983; Dowsett & Dowsett-Lemaire, 1990; Monfort, 1992; Barakabuye *et al.*, 2007; Chao, 2008; MDD, 2025.
GALAGIDAE, galagos & bushbabies												
Spectacled Galago, *Galago matschei*	F	–	lc	CD	ex	?	?	▲	▲		–	Dowsett & Dowsett-Lemaire, 1990; Monfort, 1992; Chao, 2008 (as *Galago inustus*); MDD, 2025.
Senegal Bushbaby, *Galago senegalensis*	N	–	lc	CD	–	–	–	–	–	▲	?	Vande weghe & Dejace, 1991; Monfort, 1992; MDD, 2025.
Thomas Galago, *Galagoides thomasi* [15]	F	–	lc	CD	–	–	–	▲	–	–	–	Dowsett & Dowsett-Lemaire, 1990; de Jong & Butyinski, 2018; Svenson & Bearder, 2019; MDD, 2025; Niyigaba (pers. comm.).
Brown Greater Galago, Otolemus crassicaudatus [16]	F	–	lc	CD	–	–	–	–	–	▲	-	Vande weghe & Dejace, 1990 and Monfort, 1992 (as *Galago crassicaudatus*); MDD, 2025.
LORISIDAE, pottos												
Eastern Potto, *Perodicticus ibeanus*	F	–	lc	CD	–	–	–	▲	?	–	–	Dowsett & Dowsett-Lemaire, 1990; Monfort, 1992 (as *P. potto*); Chao, 2008; de Jong & Butynski, 2018; de Jong *et al.*, 2019; MDD, 2025.
LAGOMORPHA												
LEPORIDAE, hares & rabbits												
African Savanna Hare, *Lepus microtis* [17]	N	–	lc	CD	–	–	–	–	–	▲	?	Freshkop, 1944 (as *L. capensis crawshayi)*; Vande weghe & Dejace, 1991 (as *L. capensis)*; Monfort, 1992 (as *L. crawshayi*); MDD, 2025.
RODENTIA												
HYSTRICIDAE, porcupines												
African Brush-tailed Porcupine, *Atherurus africanus*	F	–	lc	CD	▲	–	–	▲	?	–	–	Storz, 1983; Monfort, 1992; Chao, 2008; Majyambere *et al.*, 2025; MDD, 2025.
Cape Porcupine, *Hystrix africaeaustralis*	N	–	lc	CDe	▲	–	–	–	–	▲	–	Freshkop, 1943, 1944, Vande weghe & Dejace, 1991; Tuyisingize *et al.* 2013 (as *Hystrix stegmani*); Monfort, 1992.; MDD, 2025.
THRYONOMYIDAE, cane-rats												
Lesser Cane-Rat, *Thryonomys gregorianus*	N	–	lc	–	?	–	–	▲	–	–	▲	Elbl *et al.*, 1966; Monfort, 1992; Chao, 2008; not in MDD, 2025.
Greater Cane-Rat, *Thryonomys swinderianus* [18]	N							N			N	Majyambere *et al.*, 2025;
GLIRIDAE, dormice												
Savanna Dormouse, *Graphiurus microtis* [19]	FN	–	lc	?	–	–	–	–	–	▲	?	Geider & Kock, 1991; MDD, 2025.
Forest Dormouse, *Graphiurus murinus* [20]	F	–	lc	CD	▲	–	–	▲	–	?	?	Freshkop, 1944 (as *Claviglis vulcanicus*); Vande weghe & Dejace, 1991; Tuyisingize *et al.*, 2013; Majyambere *et al.*, 2025; MDD, 2025.
SCIURIDAE, squirrels												
Carruthers's Mountain Squirrel, *Funisciurus carruthersi*	F	AR	lc	CD	▲	▲	?	▲	–	–	–	Schouteden, 1947; Monfort, 1992; Choa, 2002; Tuyisingize *et al.*, 2013; Ping, 2021; Majyambere *et al.*, 2025; MDD, 2025.
Fire-footed Rope Squirrel, *Funisciurus pyrropus*	F	–	lc	CD	▲	–	–	▲	–	–	–	Elbl *et al.*, 1966; Dowsett *et al.*, 1990; Monfort, 1992; Plumptre *et al.*, 2002; Chao, 2008; Majyambere *et al.*, 2025; MDD, 2025.
Red-legged Sun Squirrel, *Heliosciurus rufobrachium* [21]	F	–	lc	CD	–	–	–	▲	–	–	–	Vande weghe, G. (pers. obs.) ; MDD, 2025.

Orders, families, species	Habitat	Biogeography	IUCN Status	Status in Rwanda	Volcanoes NP	Gishwati Forest	Mukura Forest	Nyungwe Forest	Cyamudongo Forest	Akagera NP	Outside prot. areas	Main references
Ruwenzori Sun Squirrel, *Heliosciurus ruwenzorii*	F	AR	lc	CD	▲	▲	?	▲	–	–	–	Elbl *et al.*, 1966; Dowsett & Dowsett-Lemaire, 1990; Monfort, 1992: Plumptre, 2002; Chao, 2008; Tuyisingize *et al.*, 2013 (as *Aethosciurus ruwenzorii vulcanius*); Majyambere *et al*., 2025; MDD, 2025.
Boehm's Squirrel, *Paraxerus boehmi*	F	–	lc	CD	▲	▲	–	▲	–	–	–	Schouteden, 1947; Monfort, 1992; Plumptre *et al.*, 2002; Chao, 2008; Tuyisingize *et al.*, 2013 (as *Tamiscus vulcanorum*); Majyambere *et al*., 2025; MDD, 2025.
African Giant Squirrel, *Protoxerus stangeri*	F	–	lc	CD	▲	–	–	▲	–	–	–	Curry-Lindahl, 1956; Dowsett *et al.*, 1990; Offut, 1990; Plumptre *et al.*, 2002; Chao, 2008; Cassola, 2016g; Majyambere *et al*., 2025; MDD, 2025.
ANOMALURIDAE, anomalures												
Lord Derby's Anomalure, *Anomalurus derbianus* [22]	F	–	lc	CD	–	–	–	▲	–	–	–	Monfort, 1992; Chao, 2008; J.P. Vande weghe (pers. comm.); Majyambere *et al*., 2025; MDD (2025).
MURIDAE, rats & mice												
Link Rat, *Deomys ferrugineus*	F	–	lc	CD	▲	–	–	▲	–	–	–	Elbl *et al.*, 1966; Monfort, 1992; Plumptre, 2002; Chao, 2008;Majyambere *et al*., 2025; MDD, 2025.
Ansorge's Brush-furred Rat, *Lophuromys ansorgei* [23, 24]	N	–	lc	?	–	–	–	–	–	△	–	Elbl *et al.* (1966); Vande weghe & Dejace, 1991 (as *L. sikapusi*); Monfort 1992; MDD, 2025.
Grey Brush-furred Rat, *Lophuromys cinereus* [25]	F	AR	DD	CD				▲	▲			Majyambere *et al*., 2025;
Albertine Rift Brush-furred Rat, *Lophuromys laticeps* [26]	FN	AR	lc	?	▲	–	–	▲	–	△	▲	Schouteden, 1947 and Vande weghe & Dejace, 1991 (as *L. flavopunctatus*); Monfort, 1992; Chao, 2008; Tuyisingize *et al.*, 2013 (as *L. aquilus laticeps*); Majyambere *et al*., 2025; MDD, 2025.
Buff-bellied Brush-furred Rat, *Lophuromys luteogaster* [27]	F	–	lc	CD	–	–	–	▲	–	–	–	Elbl *et al.*, 1966; Monfort, 1992; Chao, 2008; GBIF (Grant *et al.*, 2020).
Western Rift Brush-furred Rat, *L. medicaudatus* [28]	F	AR	VU	CD	–	–	–	▲	–	–	–	Plumptre *et al.*, 2002; Kennerly, 2016a; Majyambere *et al*., 2025; MDD, 2025.
Rahm's Brush-furred Rat, *Lophuromys rahmi* [29]	F	AR	nt	CD	–	–	–	▲	–	–	–	Elbl *et al.*, 1966. Monfort, 1992; Chao, 2008; Kennerly, 2016b; Majyambere *et al*., 2025; MDD, 2025.
Woosnam's Brush-furred Rat, *Lophuromys woosnami* [30]	F	AR	lc	CD	▲	–	–	▲	▲	–	▲	Elbl *et al.*, 1966; Monfort, 1992; Chao, 2008; Tuyisingize *et al.*, 2013; Majyambere *et al*., 2025; MDD, 2025.
Boehm's Gerbil, *Gerbilliscus boehmi*	N	–	lc	?	–	–	–	–	–	△	–	Misonne, 1965 (as *Tatera boehmi*); Monfort, 1992; GBIF, 2024; MDD, 2025.
Giffard's Gerbil, *Gerbilliscus giffardi* [31]	N	–	ne	?	–	–	–	–	–	△	–	MDD, 2025.
Savanna Gerbil, *Gerbilliscus validus*	N	–	lc	?	–	–	–	–	–	▲	–	Monfort, 1992 (as *Tatera valida*); MDD, 2025.
Kaiser's Veld Rat, *Aethomys kaiseri* [32]	N	–	lc	CD	–	–	–	–	–	▲	–	Misonne, 1965 (as *A. nyikae*); Monfort, 1992; MDD, 2025.
African Grass Rat, *Arvicanthis niloticus*	N	–	lc	–	▲	–	–	–	–	▲	▲	Freshkop, 1944 (as A. abyssinicus nubilans); Monfort, 1992; Tuyisingize *et al.*, 2013 (as *A. abyssinicus rubescens*); MDD, 2025.
Middle Shaggy Rat, *Dasymys medius* [33]	FN	–	lc	?	▲	–	–	?	–	–	?	Freshkop, 1944 (as *D. bentleyae medius)*; Tuyisingize *et al.*, 2013 (as *D. incomtus medius*); MDD, 2025;
Rwandan Marsh Rat, *Dasymys rwandae* [34]	Aq	Rw	?	CD	▲	▲	–	▲	–	–	–	Verheyen *et al.*, 2003; Tuyisingize *et al.,* 2013 (as *D.* cf. *rwandae*); Majyambere *et al*., 2025 (as D. cf. sp.); MDD, 2025.
Albertine Rift Thicket Rat, *Grammomys dryas* [35]	F	AR	lc	CD	▲	–	–	–	–	–	–	Monfort, 1992 (as *G. dolichurus*); Bryja *et al.*, 2016; Ferguson & Kennerley, 2019; MDD 2025
Woodland Thicket Rat, *Grammomys surdaster* [36]	FN	–	ne	CD	?	–	–	▲	–	▲	–	Bryja *et al.*, 2016; Tuyisingize *et al.*, 2013 (as *G. cf. dolichurus*); MDD, 2025.
Peters's Striped Mouse, *Hybomys univittatus*	F	–	lc	CD	▲	–	–	▲	–	–	–	Plumptre *et al.*, 2002; Chao, 2008; MDD, 2025.
Buffoon Striped Grass Mouse, *Lemniscomys macculus* [37]	FN	–	lc	–	–	–	–	–	–	▲	▲	Van Der Straeten *et al.*, 2016; MDD, 2025.
Zebra Mouse, *Lemniscomyscus striatus*	N	–	lc	–	▲	▲		▲	▲	▲	▲	Misonne, 1965; Vande weghe & Dejace, 1991; Monfort, 1992; Plumptre, 2002; Chao, 2008; Tuyisingize *et al.*, 2013 (as *L. striatus* cf. *massaicus*); Majyambere *et al*., 2025; MDD, 2025.

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Dybowski's Mill Rat, *Mylomys dybowski*	F	–	lc	CD	▲	–	–	–	–	▲	–	Misonne, 1965; Vande weghe & Dejace, 1991; Monfort, 1992; MDD, 2025.
Rusty-nosed Rat, *Oenomys hypoxanthus*	N	–	lc	?	▲	–	–	▲	n	▲	▲	Misonne, 1965; Vande weghe & Dejace, 1991; Monfort, 1992; Chao, 2008; Tuyizingize *et al.*, 2013., Majyambere *et al.*, 2025; MDD, 2025.
East African Swamp Rat, *Pelomys fallax*	N	–	lc	?	▲	–	–	–	–	▲	–	Fain, 1953; Vande weghe & Dejace, 1991; Monfort, 1992; MDD, 2025.
Hopkin's Groove-toothed Swamp Rat, *Pelomys hopkinsi*	Aq	–	lc	?	–	–	–	▲	–	△	▲	Hayman, 1955; Misonne, 1965; Verschuren, 1988; Vande weghe & Dejace, 1991; Monfort, 1992; MDD, 2025.
Kemp's Thicket Rat, *Thamnomys kempii*	F	AR	VU	CD	▲	–	–	▲	–	△	▲	Elbl *et al.*, 1966 (as *T. venustus*); Monfort, 1992; Plumptre, 2002; Chao, 2008; Tuyisingize *et al.*, 2013; Majyambere *et al.*, 2025; MDD, 2025.
Thomas's Thicket Rat, *Thamnomys venustus* [38]	F	AR	lc	CD				n				Majyambere *et al.*, 2025.
Big-eared Swamp Rat, *Malacomys longipes* [39]	FAq	–	lc	CD	▲	–	–	▲	▲	–	–	Elbl *et al.*, 1966; Monfort, 1992; Plumptre *et al.*, 2002; Chao, 2008; MDD, *2024.*
Toad Mouse, *Mus bufo* [40]	F	–	lc	CD	▲	–	–	▲	n	–	–	Elbl *et al.*, 1966; Monfort, 1992; Plumptre *et al.,* 2002; Chao, 2008; Tuyisingize *et al.*, 2013; Bryja *et al.*, 2014; Majyambere *et al.*, 2025; MDD, 2025.
Sub-Saharan Pygmy Mouse, *Mus minutoides*	FN	–	lc	?	▲	–	–	▲	–	▲	▲	Misonne, 1965; Vande weghe & Dejace, 1991 (as *Leggada minutoides*); Monfort, 1992; Plumptre *et al.*, 2002; Tuyisingize *et al.*, 2013 (as *Mus gratus gratus*); Bryja *et al.*, 2014; Majyambere *et al.*, 2025; MDD, 2025.
West African Pygmy Mouse, *Mus musculoides* [41]	FN	n	lc	n	n						n	Majyambere *et al.*, 2025;
Thomas's Pygmy Mouse, *Mus sorella* [42]	N	–	lc	–	–	–	–	–	–	△	–	Misonne, 1965; Vande weghe & Dejace, 1991 (as *Leggada sorella*); Cassola, 2016b.
Grey-bellied Pygmy Mouse, *Mus triton*	FN	–	lc	?	▲	–	–	▲	–	–	–	Elbl *et al.*, 1965; Vande weghe & Dejace, 1991 (as *Leggada triton*); Monfort, 1992; Plumptre *et al.*, 2002; Chao, 2008; Tuyisingize *et al.,* 2013 (as *M. triton birungensis*); MDD, 2025.
Dent's Vlei Rat, *Otomys denti*	N	–	lc	CD	▲	–	–	▲	–	–	–	Elbl *et al.*, 1966; Monfort, 1992; Chao, 2008; Tuyisingize *et al.*, 2013 (as *O. denti kempi*), Majyambere *et al.*, 2025; MDD, 2025.
East African Vlei Rat, *Otomys tropicalis* [43]	N	–	lc	?	▲	–	–	▲	–	△	▲	Fain, 1957 (as *O. irroratus*); Vande weghe & Dejace, 1991; Monfort, 1992; Chao, 2008; Tuyisingize *et al.*, 2013 (as *O. tropicalis vulcanis*), Majyambere *et al.*, 2025; MDD, 2025.
African Wading Rat, *Colomys goslingi*	FN	–	lc	?	▲	–	–	▲	–	–	–	Elbl *et al.*, 1966; Monfort, 1992; Majyambere *et al.*, 2025; MDD, 2025.
Beaded Wood Mouse, *Hylomyscus aeta*	F	–	lc	?	▲	–	–	▲	–	–	–	Plumptre *et al.*, 2002; Tuyisingize *et al.*, 2013 (as *H. aeta weileri*); Schlitter, 2019; Majyambere *et al.*, 2025; MDD, 2025.
Stella Wood Mouse, *Hylomyscus stella*	F	–	lc	CD	▲	–	–	▲	–	△	–	Vande weghe & Dejace, 1991 (as *H. alleni*); Plumptre, 2002; Chao, 2008; Majyambere *et al.*, 2025; MDD, 2025;
Montane Wood Mouse, *Hylomyscus vulcanorum* [44]	F	–	lc	CD	▲	–	–	▲	–	–	–	Elbl *et al.*, 1966; Plumptre et al., 2002; Chao, 2008 (as *H. denniae*); Tuyisingize *et al.*, 2013; Demos *et al.*, 2014, 2015, 2019; Majyambere *et al.*, 2025; MDD, 2025.
Guinea Multimammate Ms., *Mastomys erythroleucus*	FN	–	lc	?	▲	–	–	?	–	–	–	Granjon, 2016a; MDD, 2025.
Natal Multimammate Mouse, *Mastomys natalensis*	FN	–	lc	?	▲	–	–	–	–	▲	▲	Misonne, 1965 (as *Praomys natalensis*); Monfort, 1992; Granjon, 2016b, Majyambere *et al.*, 2025; MDD, 2025.
De Graaff's Soft-furred Mouse, *Praomys degraaffi*	F	AR	lc	CD	▲	–	–	▲	–	–	–	Denys *et al.*, 2001; Plumptre *et al.*, 2002; Chao, 2008; Tuyisingize *et al.*, 2013; Majyambere *et al.*, 2025; MDD, 2025.
Jackson's Soft-furred Mouse, *Praomys jacksoni*	F	–	lc	CD	▲	–	–	▲	n	△	▲	Misonne, 1965; Vande weghe & Dejace, 1991; Monfort, 1992; Denys *et al.*, 2001; Plumptre *et al.*, 2002; Chao, 2008; Tuyisingize *et al.*, 2013; Majyambere *et al.*, 2025; MDD, 2025.

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Dwarf Serengeti Mouse, *Serengetimys pernanus* [45]	N	–	dd	?	–	–	–	–	–	∆	–	Misonne, 1965; Vande weghe & Dejace, 1991 and Monfort, 1992 (as *Mastomys pernanus*); MDD, 2025.
Hildegarde's Broad-headed Ms., *Zelotomys hildegardae*	N	–	lc	?	–	–	–	–	–	∆	–	Misonne, 1965; Vande weghe & Dejace, 1991; Monfort, 1992; MDD, 2025.
Roof Rat, *Rattus rattus*	N	–	lc	Int	▲	–	–	▲	–	∆	▲	Freshkop, 1944; Vande weghe & Dejace, 1991; Monfort, 1992; Chao, 2008; Majyambere *et al*., 2025; MDD, 2025.
NESOMYIDAE, giant rats & climbing mice												
Kivu Giant Rat, *Cricetomys ansorgei* [46, 47]	FN	–	lc	CD	–	–	–	–	–	▲	▲	Olayemi *et al*., 2012.
Emin's Giant Rat, *Cricetomys eminii* [48]	F	–	lc	CD	▲	▲	?	▲	–	–	▲	Monfort, 1992; Ping, 2021; Majyambere *et al*., 2025; MDD, 2025.
Delany's Swamp Mouse, *Delanymys brooksi*	N	–	VU	CD	▲	–	–	▲	–	–	–	Vanderstraeten & Verheyen, 1983; Dowsett & Dowsett-Lemaire, 1990; Monfort, 1992: Plumptre *et al*., 2002; Chao, 2008; Tuyisingize *et al*., 2013; Majyambere *et al*., 2025; MDD, 2025.
Montane Afr. Climbing Mouse, *Dendromus insignis* [49, 50]	N	–	lc	?	▲	?	–	–	–	–	–	Tuyizingize *et al*., 2013; MDD, 2025.
Chestnut Climbing Mouse, *Dendromus mystacalis* [51]	N	–	lc	?	–	–	–	–	–	▲	–	Misonne, 1965; Monfort, 1992; MDD, 2025.
Kivu Climbing Mouse, *Dendromus nyassae* [52]	N	–	lc	?	▲	–	–	▲	–	▲	▲	Misonne, 1965 and Vande weghe & Dejace, 1991, Chao, 2008 (as *D. mesomelas*); Majyambere *et al*., 2025; MDD, 2025.
Grey African Climbing Mouse, *Poemys melanotis* [53]	N	–	lc	?	▲	–	–	▲	–	–	–	Child & Monadjem, 2016 (as *Dendromus melanotis*).
Tiny African Fat Mouse, *Steatomys* cf. *parvus* [54]	N	–	lc	CD	–	–	–	▲	–	▲	–	Misonne, 1965, and Vande weghe & Dejace, 1991; (as *Steatomys* cf. *pratensis*); Monfort, 1992; not mentioned by MDD, 2024.
SPALACIDAE, mole-rats												
East African Mole-Rat, *Tachyoryctes splendens* [55]	N	–	lc	?	–	–	–	▲	–	∆	▲	Schouteden, 1947; Vande weghe & Dejace, 1991 (as *Tachyoryctes* sp.); Chao, 2002; Tuyisingize *et al*., 2013 (as *T. ruandae*); Majyambere *et al*., 2025; MDD, 2025.
EULYPOTYPHLA												
SORICIDAE, shrews												
Long-tailed White-toothed Shrew, *Crocidura dolichura* [55]	FN			?				n				Majyambere *et al*., 2025; MDD, 2025.
Hildegarde's Shrew, *Crocidura hildegardeae*	F	–	lc	?	–	–	–	n	–	∆	▲	Hutterer *et al*., 1987; Monfort, 1992; Majyambere *et al*., 2025; MDD, 2025.
Kivu Long-haired Shrew, *Crocidura lanosa* [57]	FN	AR	VU	CD	–	–	–	▲	–	–	–	H. de Balzac, 1968; Dieterlen & H. de Balzac, 1979; Hutterer *et al*., 1987; Monfort, 1992; Chao, 2008; Majyambere *et al*., 2025; MDD, 2025.
Moonshine Shrew, *Crocidura luna* [58]	FN	–	lc	?	–	–	–	–	–	–	?	Wilson & Reeder, 2005; Cassola, 2016e; MDD, 2025.
Gracile Naked-tail Shrew, *Crocidura maurisca*	AqF	–	lc	?	▲	–	–	▲	–	–	?	Plumptre *et al*., 2002; Wilson & Reeder, 2005; Chao, 2008; Cassola, 2016f; Majyambere *et al*., 2025; MDD, 2025.
Savanna Dwarf Shrew, *Crocidura nanilla* [59]	N	–	lc	?	–	–	–	–	–	?	▲	Hutterer *et al*., 1987, Monfort, 1992.
African Black Shrew, *Crocidura nigrofusca* [60]	F	–	lc	?	–	–	–	?	–	∆	▲	Dieterlen & H. de Balzac (as *C. turba*); Elbl *et al*., 1969 (as *C. hildegardae*); 1979; Monfort, 1992; Choa, 2008; Majyambere *et al*., 2025; MDD, 2025.
Niobe's white-toothed Shrew, *Crocidura niobe* [61]	F	AR	lc	CD	▲	–	–	nn	–	–	–	Kerbis Peterhans & Austin, 1996; Majyambere *et al*., 2025; MDD, 2025.
African Giant Shrew, *Crocidura olivieri* [62]	FN	–	lc	?	▲	–	–	▲	–	∆	▲	Freshkop, 1944; Monfort, 1992; Chao, 2008 (as *C. occidentalis*); Tuyisingize *et al*., 2013; Majyambere *et al*., 2025; MDD, 2025.
Roosevelt's Shrew, *Crocidura roosevelti*	N	–	lc	?	–	–	–	–	–	∆	–	H. de Balzac & Verschuren, 1968; Monfort, 1992; MDD, 2025.
Uganda Shrew, *Crocidura tarella*	FN	AR	EN	CD	▲	–	–	–	–	–	–	Tuyisingize *et al*., 2013; MDD, 2025.
Turbo White-toothed Shrew, *Crocidura turba*	F	–	lc	?	–	–	–	–	–	–	–	Hutterer, 2016; MDD, 2025.
Greater Large-headed Shrew, *Paracrocidura maxima*	AqF	–	lc	CD	▲	–	–	▲	–	–	–	Hutterer, 1986b; Monfort, 1992; Chao, 2008; Majyambere *et al*., 2025; MDD, 2025.

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Ruwenzori Shrew, *Ruwenzorisorex suncoides*	AqF	AR	VU	CD	–	–	–	▲	–	–	–	Elbl *et al.*, 1966 (as *Sylvisorex suncoides*); Hutterer, 1986: Monfort, 1992; Choa, 2008; Majyambere *et al.*, 2025; MDD, 2025.
Armoured Shrew, *Scutisorex somerini*	F	–	lc	CD	–	–	–	▲	–	–	–	Pirlot, 1964; Elbl *et al.*, 1966; Rahm, 1965; Dieterlen & H. de Balzac, 1979; Monfort, 1992; Chao, 2008; Majyambere *et al.*, 2025; MDD, 2025.
Hutu-Tutsi Shrew, *Suncus hututsi* [63]	F	AR	lc					▲				Majyambere *et al.*, 2025;
Climbing Shrew, *Suncus megalurus*	FN	–	lc	?	▲	–	–	▲	–	–	▲	Hutterer *et al.*, 1987 (as *Sylvisorex megalura*); Monfort, 1992; Majyambere *et al.*, 2025; MDD, 2025.
Asian House Shrew, *Suncus murinus* [64]	N	–	lc	Int	–	–	–	–	–	–	(▲)	Hutterer *et al.*, 1987.
Grant's Forest Shrew, *Sylvisorex granti*	FN	–	lc	CD	–	–	–	▲	–	–	–	Hutterer *et al.*, 1987; Monfort, 1992; Chao, 2008; Majyambere *et al.*, 2025; MDD, 2025.
Johnston's Forest Shrew, *Sylvisorex johnstoni* [65]	F	–	lc	?	–	–	–	▲	–	–	–	Cassola, 2017; Grant *et al.* , 2020; Majyambere *et al.*, 2025; MDD, 2025.
Moon Forest Shrew, *Sylvisorex lunaris*	F	AR	nt	CD	▲	–	–	▲	–	–	–	Elbl *et al.*, 1966; Monfort, 1992; Chao, 2008; Majyambere *et al.*, 2025; MDD, 2025.
Volcano Shrew, *Sylvisorex vulcanorum*	F	AR	lc	CD	▲	–	–	▲	–	–	–	Hutterer & Verheyen, 1985; Monfort, 1992; Chao, 2008; Majyambere *et al.*, 2025; MDD, 2025.
Babault's Mouse Shrew, *Myosorex babaulti*	AqF	AR	lc	CD	▲	–	–	▲	–	–	–	Kerbis Peterhans & Austin, 1996; GBIF; Majyambere *et al.*, 2025; MDD, 2025.
CHIROPTERA												
PTEROPODIDAE, fruit bats												
African Straw-coloured Fruit Bat, *Eidolon helvum*	FN	–	nt	?	–	–	–	▲	–	▲	▲	Dowsett & Dowsett-Lemaire, 1990; MDD, 2025.
Dobson's fruit bat, *Epomophorus dobsonii*	N	–	lc	?	▲	–	–	–	–	–	▲	Bergmans, 1979 (as *Epomops dobsonii*); Van Cakenberghe *et al.*, 2017; MDD, 2025.
Ethiopian Epauletted Fruit Bat, *Epomophorus labiatus*	N	–	lc	?	▲	–	–	▲	–	▲	▲	Schouteden, 1947 (as *E. minor*); Verschuren, 1965 and Vande weghe & Dejace, 1991 (as *E. anurus*); Van Cakenberghe *et al.*, 2017; Flanders *et al.* 2022; MDD, 2025.
Minor Epauletted Fruit Bat, *Epomophorus minor*	FN	–	lc	?	–	–	–	–	–	–	▲	Taylor, 2016a; Van Cakenberghe *et al.*, 2017; MDD, 2025.
Peter's Epauletted fruit Bat, *Epomophorus pusillus* [66]	N	–	lc	?	–	–	–	–	–	–	▲	Monfort, 1992 and Bakwo Fils & Kaleme, 2016 (as *Micropteropus pusillus*); MDD, 2025.
Wahlberg's Epauletted Fruit Bat, *Epomophorus wahlbergi*	N	–	lc	?	▲	–	–	▲	–	–	▲	Hayman *et al.*, 1966 (as *E. crypturus*); Van Cakenberghe *et al.*, 2017; MDD, 2025.
Angolan Soft-Furred Fruit Bat, *Myonycteris angolensis*	FN	–	lc	?	▲	–	–	▲	–	–	▲	Hayman *et al.*, 1966 and Monfort, 1992, and Chao, 2008 (as *Lissonycteris angolensis*); Van Cakenberghe *et al.*, 2017; Flanders *et al.*, 2022; MDD, 2025.
Egyptian Rousette, *Rousettus aegyptiacus*	FN	–	lc	?	▲	–	–	▲	–	–	▲	Monfort, 1992; Chao, 2008; Van Cakenberghe *et al.*, 2017; Flanders *et al.*, 2022; MDD, 2025.
Long-haired Rousette, *Stenonycteris lanosus*	F	–	lc	?	▲	?	?	▲	–	–	▲	Baeten *et al.*, 1984; Monfort, 1992 and Chao, 2008 (as *Rousettus lanosus*); Chao, 2008; Van Cakenberghe *et al.*, 2017; Flanders *et al.*, 2022; MDD, 2025.
EMBALLONURIDAE, tomb bats												
Mauritian Tomb Bat, *Taphozous mauritianus*	N	–	lc	–	▲	–	–	–	–	▲	▲	Freshkop, 1944; Vande weghe & Dejace, 1991; Monfort, 1992; Van Cakenberghe *et al.*, 2017; MDD, 2025 (as possible).
NYCTERIDAE, slit-faced bats												
Bates's Slit-faced Bat, *Nycteris arge*	FN	–	lc	?	–	–	–	–	–	–	▲	Monadjem *et al.*, 2017c; Chao, 2008; MDD, 2025.
Large Slit-faced Bat, *Nycteris grandis* [67]	F	–	lc	–	–	–	–	–	–	–	▲	Kityo *et al.*, 2009; not in MDD
Hairy Slit-faced Bat, *Nycteris hispida*	N	–	lc	–	–	–	–	–	–	▲	▲	Hayman *et al.*, 1966; Monfort, 1992; Van Cakenberghe *et al.*, 2017; MDD, 2025.
Large-eared Slit-faced Bat, *Nycteris macrotis*	FN	–	lc	?	–	–	–	–	–	△	▲	Hayman *et al.*, 1966; Monfort, 1992; Van Cakenberghe *et al.*, 2017; MDD, 2025.

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Dwarf Slit-faced Bat, *Nycteris nana*	FN	–	lc	?	–	–	–	△	–	–	▲	Chao, 2008; Van Cakenberghe *et al.*, 2017; MDD, 2025.
Egyptian Slit-faced Bat, *Nycteris thebaica*	FN	–	lc	?	▲	–	–	–	–	▲	▲	Verschuren, 1965; Vande weghe & Dejace, 1991; Monfort, 1992; MDD, 2025.
MEGADERMATIDAE, yellow-winged bat												
Yellow-winged Bat, *Lavia frons*	N	–	lc	CD	–	–	–	–	–	▲	▲	Freshkop, 1944; Vande weghe & Dejace, 1991; Van Cakenberghe *et al.*, 2017; MDD, 2025.
RHINOLOPHIDAE, horseshoe bats												
Geoffroy's Horseshoe Bat, *Rhinolophus acrotis*	F	–	lc	CD	▲	▲	–	▲	–	–	▲	Hayman *et al.*, 1966; Van Cakenberghe *et al.*, 2017, and Flanders *et al.*, 2022 (as *R. clivosus*); MDD, 2025.
Eloquent Horseshoe Bat, *Rhinolophus eloquens*	FN	–	lc	?	▲	–	–	–	–	▲	▲	Vande weghe & Dejace, 1991; Van Cakenberghe *et al.*, 2017; MDD, 2025.
Rüppell's Horseshoe Bat, *Rhinolophus fumigatus*	FN		lc		▲					▲	▲	Schouteden, 1947; Vande weghe & Dejace, 1991; Van Cakenberghe *et al.*, 2017; MDD, 2025.
Hildebrandt's Horseshoe Bat, *Rhinolophus hildebrandti*	N	–	lc	?	▲	–	–	–	–	▲	▲	Vande weghe & Dejace, 1991; Van Cakenberghe *et al.*, 2017; MDD, 2025.
Hill's Horseshoe Bat, *Rhinolophus hilli* [68]	F	Rw	CR	CD	–	–	–	▲	–	–	–	Aellen, 1973; Dowsett & Dowsett-Lemaire, 1990, and Chao, 2008 (as *R. maclaudi*); Van Cakenberghe *et al.*, 2017; Flanders *et al.*, 2022; MDD, 2025.
Peters's Horseshoe Bat, *Rhinolophus landeri* [69]	N	–	lc	?	▲	–	–	▲	–	▲	▲	Vande weghe & Dejace, 1991, Van Cakenberghe *et al.*, 2017, Flanders *et al.*, 2022.
Ruwenzori Horseshoe Bat, *Rhinolophus ruwenzorii*	FN	AR	EN	?	▲	–	–	–	–	–	▲	Van Cakenberghe *et al.*, 2017; MDD, 2025.
HIPPOSIDERIDAE, leaf-nosed bats												
Cyclops Leaf-nosed Bat, *Doryrhina cyclops* [70]	F	–	lc	CD	?	–	–	?	–	–	▲	Hayman *et al.*, 1966, Monfort, 1992, Monadjem et al., 2017b (as *Hipposideros cyclops*); MDD, 2025.
Noack's Leaf-nosed Bat, *Hipposideros ruber*	FN	–	lc	?	▲	▲	–	–	–	△	▲	Baeten *et al.*, 1984; Van Cakenberghe *et al.*, 2017; Flanders *et al.*, 2022; MDD, 2025.
Sundevall's Leaf-nosed Bat, *Hipposideros caffer*	N	–	lc	?	▲	–	–	▲	–	△	▲	Verschuren, 1965; Vande weghe & Dejace, 1991; Van Cakenberghe *et al.*, 2017; Flanders *et al.*, 2022; MDD, 2024.
Striped Leaf-nosed Bat, *Macronycteris vittatus* [71]	N	–	lc		–	–	–	–	–	–	▲	Schouteden (1947) and Monfort (1992) (as *Hipposideros commersoni marungensis*).
MOLOSSIDAE, free-tailed bats												
Ansorge's Free-tailed Bat, *Mops ansorgei*	N	–	lc	?	▲	–	–	–	–	△	▲	Freshkop, 1944 (as *Nyctinomus ansorgei*); Baeten *et al.*, 1984 (as *Tadarida ansorgei*); Van Cakenberghe *et al.*, 2017 (as *Chaerephon ansorgei*); MDD, 2025.
Gland-tailed Free-tailed Bat, *Mops bemmeleni*	FN	-	lc	?	-	-	-	-	-	-	▲	Monadjem *et al.*, 2017d (as *Chaerephon bemmeleni*); MDD, 2025.
Short-winged Free-tailed Bat, *Mops brachypterus* [72]	F	–	lc	?	–	–	–	–	–	–	▲	Van Cakenberghe *et al.*, 2017; not in MDD, 2024.
Long-crested Free-tailed Bat, *Mops chapini* [73]	N	–	lc	?	–	–	–	–	–	–	▲	Van Cakenberghe *et al.*, 2017 and Monadjem et al. 2017a (as *Chaerephon chapini*); not in MDD, 2024.
Little Free-tailed Bat, *Mops pumilus*	FN	–	lc	?	▲	–	–	▲	–	▲	▲	Verschuren, 1965; Vande weghe & Dejace, 1991 (as *Tadarida limbata*); Monfort, 1992 (as *Tadarida pumila*); Van Cakenberghe *et al.*, 2017 (as *Chaerephon pumilus*); not in MDD, 2024.
Angolan Free-tailed Bat, *Mops condylurus*	N	–	lc	?	▲	–	–	–	–	▲	▲	Freshkop, 1944, Vande weghe & Dejace, 1991 and Monfort, 1992 (as *Tadarida condylura*); Van Cakenberghe *et al.*, 2017; MDD, 2025.
Mongalla Free-tailed Bat, *Mops demonstrator*	N	–	lc	?	–	–	–	–	–	–	▲	Van Cakenberghe *et al.*, 2017; not in MDD, 2024.
Midas Free-tailed Bat, *Mops midas* [74]	AqN	–	lc	?	–	–	–	–	–	–	?	Baeten *et al.*, 1984 and Monfort, 1992 (as *Tadarida midas*); Monadjem *et al.*, 2017h; MDD, 2025.
White-bellied Free-tailed Bat, *Mops niveiventer*	FN	–	lc	?	△	–	–	–	–	–	▲	Hayman *et al.*, 1966 and Monfort, 1992 (as *Tadarida niveiventer*); Van Cakenberghe *et al.*, 2017; MDD, 2025.
Railer Free-tailed Bat, *Mops thersites*	F	–	lc	CD	–	–	–	–	–	▲	▲	Baeten *et al.*, 1984, Monfort, 1992 (as *Tadarida thersites*) Van Cakenberghe *et al.*, 2017; MDD, 2025.
Harrison's Giant Mastiff Bat, *Otomops harrisoni* [75]	NIc	–	VU	?	△	–	–	–	–	–	▲	Patterson *et al.*, 2018; MDD, 2025.

Orders, families, species	Habitat	Biogeography	IUCN Status	Status in Rwanda	Volcanoes NP	Gishwati Forest	Mukura Forest	Nyungwe Forest	Cyamudongo Forest	Akagera NP	Outside prot. areas	Main references
Large-eared Giant Mastiff Bat, *Otomops martiensseni*	FN	–	nt	?	▲	–	–	–	–	▲	▲	Schouteden, 1957; Vande weghe & Dejace, 1991; Monfort, 1992; Van Cakenberghe *et al.*, 2017; Patterson *et al.*, 2018; MDD, 2025.
Malagasy Free-tailed Bat, *Tadarida fulminans*	N	–	lc	?	–	–	–	–	–	–	▲	Hayman *et al.*, 1966: Monfort, 1992; Van Cakenberghe *et al.*, 2017; MDD, 2025.
MINIOPTERIDAE, long-fingered bats												
Greater Long-fingered Bat, *Miniopterus inflatus*	FN	–	lc	?	▲	–	–	–	–	–	▲	Baeten *et al.*, 1984; Monfort, 1992; Chao, 2008; Van Cakenberghe *et al.*, 2017; MDD, 2025.
Natal Long-fingered Bat, *Miniopterus natalensis*	FN	–	lc	?	▲	–	–	–	–	–	▲	MDD, 2025 (see *M.* cf. *fraterculus*).
VESPERTILIONIDAE, pipistrelles & serotines												
Banana Pipistrelle, *Afronycteris nanus* [76]	FN	–	lc	?	▲	–	–	▲	▲	▲	▲	Verschuren, 1965, Vande weghe & Dejace, 1991 and Monfort, 1992 (as *Pipistrellus nanus*); Van Cakenberghe *et al.*, 2017 (as *Neoromicia nana*); MDD, 2025.
Damara Woolly Bat, *Kerivoula argentata* [77]	N	–	lc	?	?	–	–	▲	–	–	–	Flanders *et al.*, 2022; Monfort, 1992; not in MDD, 2024.
Coppery Wolly Bat, *Kerivoula* cf. *cuprosa* [78]	–	–	–	–	–	–	–	▲	–	–	–	Chao, 2008; Kityo *et al.*, 2009.
Rufous Myotis, *Myotis bocagii*	N	–	lc	?	–	–	–	–	–	▲	▲	Verschuren, 1965; Van Cakenberghe *et al.*, 2017; MDD, 2025.
Temminck's Myotis, *Myotis tricolor*	?	–	lc	?	△	–	–	?	–	–	▲	Van Cakenberghe *et al.*, 2017; MDD, 2025.
Welwitsch's Mouse-eared Bat, *Myotis welwitschii*	N	–	lc	?	–	–	–	?	–	–	▲	Van Cakenberghe *et al.*, 2017; MDD, 2025.
Common Butterfly Bat, *Glauconycteris argentata*	FN	–	lc	?	–	–	–	?	–	–	▲	Anciaux, 1972; Van Cakenberghe *et al.*, 2017; MDD, 2025.
Dusky Pipistrelle, *Pipistrellus hesperidus*	N	–	lc	?	△	–	–	▲	–	–	▲	Baeten *et al.*, 1984; Monfort, 1992, and Chao, 2008 (as *Pipistrellus kuhlii*); Van Cakenberghe *et al.*, 2017; MDD, 2025.
Yellow-bellied House Bat, *Scotophilus dinganii*	N	–	lc	?	–	–	–	–	–	△	▲	Schouteden, 1947; Monfort, 1992; MDD, 2025.
Cape Serotine, *Laephotis capensis* [79]	FN	–	lc	?	–	–	–	▲	–	–	?	Chao, 2008 (as *Pipistrellus capensis*); MDD, 2025
Somali Serotine, *Neoromicia somalica*	N	–	lc	?	–	–	–	?	–	–	▲	Baeten *et al.*, 1984 (as *Eptesicus somalicus*); Monfort, 1992: Van Cakenberghe *et al.*, 2017 (as *Neoromicia somalica*); MDD, 2025.
Zulu Serotine, *Neoromicia zuluensis*	N	–	lc	?	–	–	–	–	–	△	▲	Van Cakenberghe *et al.*, 2017; MDD, 2024.
Large-headed Serotine, *Nycticeinops macrocephalus* [80]	F	AR	ne	CD	–	–	–	▲	–	–	–	Chao, 2008 (as *Pipistrellus eisentrauti*); Van Cakenberghe *et al.*, 2017 (as *Hypsugo* cf. *eisentrauti*); Hutterer & Kerbis Peterhans, 2019 (as *Parahypsugo macrocephalus*); Monadjem *et al.*, 2020 (as *Nycticeinops macrocephalus*); MDD, 2025 (as *Afropipistrellus macrocephalus*).
Rendall's Serotine, *Pseudoromicia rendalli* [81]	N	–	lc	–	–	–	–	–	–	–	▲	Monadjem *et al.*, 2017; MDD (2025).
White-winged Serotine, *Pseudoromicia tenuipinnis* [82]	FN	–	lc	?	△	–	–	–	–	△	▲	Hayman *et al.*, 1966; Monfort, 1992; (as *Eptesicus tenuipinnis*); Van Cakenberghe *et al.*, 2017 (as *Neoromicia tenuipinnis*); MDD, 2025.
Ruppell's Pipistrelle, *Vansonia* cf. *rueppellii* [83]	N	–	lc	?	△	–	–	–	–	–	▲	Van Cakenberghe *et al.*, 2017 (as *Pipistrellus rueppellii*); Monadjem *et al.*, 2020 (as *Vansonia* cf. *rueppellii*); not in MDD, 2024.
PHOLIDOTA												
MANIDAE, pangolins												
Giant Pangolin, *Smutsia gigantea* [84, 85]	N	–	EN	CD	–	–	–	–	–	▲	–	Freshkop, 1944; Schouteden, 1947; Monfort, 1992; Khwaja *et al.*, 2019; MDD, 2025.
Ground Pangolin, *Smutsia temminckii* [86]	N	–	VU	CD	–	–	–	–	–	▲	–	Freshkop, 1944; Monfort, 1992; MDD, 2025.
CARNIVORA												
MUSTELLIDAE, otters, weasels, badger												
African Clawless Otter, *Lutra capensis* [87]	Aq	–	nt	CD	–	–	–	–	–	▲	–	Vande weghe & Dejace, 1991; Vande weghe & Dejace, 1991; and Monfort, 1992 (as *Aonyx capensis*); MDD, 2025.
Congo Clawless Otter, *Lutra congica* [88]	Aq	–	nt	CD	▲	–	–	▲	–	–	–	Storz, 1983, Monfort, 1992, and Chao, 2008 (as *Aonyx congicus*); MDD, 2025.

Orders, families, species	Habitat	Biogeography	IUCN Status	Status in Rwanda	Volcanoes NP	Gishwati Forest	Mukura Forest	Nyungwe Forest	Cyamudongo Forest	Akagera NP	Outside prot. areas	Main references
Spot-necked Otter, *Hydrictis maculicollis* [89]	Aq	–	nt	–	–	–	–	–	–	▲	▲	Lejeune, 1989; Vande weghe & Dejace, 1991; Monfort, 1992; MDD, 2025.
Zorilla, *Ictonyx striatus* [90]	N	–	lc	–		–		–	–	–	▲	Monfort, 1992; obs, pers.; MDD, 2025.
Honey Badger, *Mellivora capensis* [91]	FN	–	lc	CD	▲	▲	–	?	–	▲	▲	Vande weghe & Dejace, 1991; Monfort, 1992; MDD, 2025.
Striped Weasel, *Poecilogale albinucha* [92]	FN	–	lc	–	▲	–	–	▲	–	–	▲	Dowsett & Dowsett-Lemaire, 1990; Vande weghe & Dejace, 1991; Monfort, 1992; MDD, 2025.
CANIDAE, wild dog & jackals												
Side-striped Jackal, *Lupulella adustus* [93]	N	–	lc	–	▲	▲	?	▲	?	▲	▲	Freshkop, 1944; Vande weghe & Dejace, 1991; Monfort, 1992 (as *Canis adustus*); Vhao, 2008; MDD, 2025
African Wild Dog, *Lycaon pictus* [94]	N	–	EN	ex	–	–	–	–	–	ex	ex	Freshkop, 1944; De Leyn, ….?…; Vande weghe & Dejace, 1991; Monfort, 1992; not in MDD, 2024.
FELIDAE, cats, leopard & Lion												
African Wildcat, *Felis lybica* [95]	N	–	lc	–	▲	?	?	▲	?	▲	▲	Freshkop, 1944, Vande weghe & Dejace, 1991; (as *F. lybica*); Monfort, 1992 (as *F. sylvestris*); Chao, 2008 (as *F. sylvestris*); MDD, 2024.
Serval, *Leptailurus serval* [96]	FN	–	lc	CD	▲	▲	–	▲	?	▲	▲	Freshkop, 1944 (as *Leptailurus serval)*; Vande weghe & Dejace, 1991, Monfort, 1992, and Chao, 2008 (as *Felis serval*); Bantlin & Evers, 2023; MDD, 2025.
Golden Cat, *Caracal aurata* [97]	F	–	VU	CD	▲	?	–	ex	–	▲	–	Elbl *et al.*, 1966; Storz, 1983; Dowsett & Dowsett-Lemaire, 1990; Vande weghe & Dejace, 1991; and Monfort, 1992, and Chao, 2008 (as *Felis aurata*); Moore *et al.* (2019); MDD, 2025.
Lion, *Panthera leo* [98]	N	–	VU	CD	ex	–	–	–	–	▲	ex	Freshkop, 1944; Vande weghe & Dejace, 1991; Monfort, 1992 (as *Felis leo*); Mdd, 2025.
Leopard, *Panthera pardus* [99]	FN	–	VU	CD	ex	ex	ex	ex	ex	▲	ex	Freshkop, 1944; Vande weghe & Dejace, 1991; Monfort, 1992 (as *Felis pardus)*; MDD, 2025.
NANDINIIDAE, Palm Civet												
African Palm Civet, *Nandinia binotata*	F	–	lc	CD	▲	▲	–	▲	▲	–	–	Monfort, 1992; Chao, 2024; MDD, 2025.
HERPESTIDAE, mongoose												
Marsh Mongoose, *Atilax paludinosus*	FN	–	lc	–	▲			▲		▲	▲	Freshkop, 1944; Dowsett & Dowsett-Lemaire, 1990; Vande weghe & Dejace, 1991; Monfort, 1992; Chao, 2008; MDD, 2025.
Red Mongoose, *Galerella sanguinea*	FN	–	lc	–	▲			▲	▲	▲	▲	Vande weghe & Dejace, 1991, Monfort, 1992, and Chao, 2008 (as *Herpestes sanguineus*); MDD, 2025.
Dwarf Mongoose, *Helogale parvula*	N	–	lc	CD	–	–	–	–	–	▲	–	Vande weghe & Dejace, 1991; Monfort, 1992.
Egyptian Mongoose, *Herpestes ichneumon*	N	–	lc	–	▲			▲	▲	▲	▲	Dowsett & Dowsett-Lemaire, 1990; Vande weghe & Dejace, 1991, Monfort, 1992; Chao, 2008; MDD, 2025.
White-tailed Mongoose, *Ichneumia albicauda*	N	–	lc	CD	–	–	–	–	–	▲	–	Freshkop, 1944; Vande weghe & Dejace, 1991; Monfort, 1992; MDD, 2025.
Banded Mongoose, *Mungos mungo*	N	–	lc	CD	–	–	–	–	–	▲	–	Freshkop, 1944; Vande weghe & Dejace, 1991; Monfort, 1992; MDD, 2025.
HYAENIDAE, hyenas												
Spotted Hyena, *Crocuta crocuta* [100]	N	–	lc	CD	??	–	–	ex	–	▲	▲	Freshkop, 1944; Vande weghe & Dejace, 1991; Monfort, 1992; MDD, 2025.
VIVERRIDAE, Civet & genets												
African Civet, *Civettictis civetta* [101]	N	–	lc	CDe	▲	▲	–	▲	▲	▲	▲	Freshkop, 1944; Vande weghe & Dejace, 1991; Monfort, 1992 (as *Viverra civetta*); MDD, 2025.
Large-spotted Genet, *Genetta fieldiana* [102]	N	–	lc	_	▲	▲	?	▲	▲	▲	▲	Vande weghe & Dejace, 1991, and Monfort, 1992 (as *G. tigrina*): MDD, 2025.
Small-spotted Genet, *Genetta servalina* [103]	F	–	lc	CD	–	–	–	▲	–	–	–	Monfort, 1992; MDD, 2025.
Giant Genet, *Genetta victoriae* [104]	F	–	lc	CD	–	–	–	▲	–	–	–	Dinets, 2011; MDD, 2025.
Central African Oyan, *Poiana richarsoni* [105]	F	–	lc	CD	–	–	–	▲	–	–	–	Moore & Niyigaba (2018)

Orders, families, species	Habitat	Biogeography	IUCN Status	Status in Rwanda	Volcanoes NP	Gishwati Forest	Mukura Forest	Nyungwe Forest	Cyamudongo Forest	Akagera NP	Outside prot. areas	Main references
PERISSODACTYLA												
RHINOCEROTIDAE, rhinoceroses												
White Rhinoceros, *Ceratotherium simum simum* [106]	N	–	nt	Int	–	–	–	–	–	Int	–	
Black Rhinoceros, *Diceros bicornis* [107]	N	–	CR	Int	–	–	–	–	–	Int	–	Vande weghe & Dejace, 1991; Monfort, 1992; MDD, 2025.
EQUIDAE, zebras												
Common Zebra, *Equus quagga* [108]	N	–	nt	CD	–	–	–	–	–	▲	▲	Freshkop, 1944 (as *E. quagga boehmi*); Vande weghe & Dejace, 1991, and Monfort, 1992 (as *E. burchelli*); MDD, 2025.
CETARTIODACTYLA												
BOVIDAE, buffalo & antelopes												
Common Impala, *Aepyceros melampus* [109]	N	–	lc	CD	–	–	–	–	–	▲	▲	Freshkop, 1944; Vande weghe & Dejace, 1991; Monfort, 1992, MDD, 2025.
Topi, *Damaliscus ugandae* [110]	N	–	lc	CDe	–	–	–	–	–	▲	–	Freshkop, 1944 (as *D. lunatus tiang*); Monfort, 1992 and MDD, 2025 (as *D. lunatus*).
Klipspringer, *Oreotragus oreotragus* [111]	N	–	lc	CD	–	–	–	–	–	▲	ex	Freshkop, 1944; Vande weghe & Dejace, 1991; Monfort, 1992 (as *Oreotragus oreotragus)* MDD, 2025.
Oribi, *Ourebia montana* [112]	N	–	lc	CD	–	–	–	–	–	▲	–	Freshkop, 1944; Vande weghe & Dejace, 1991, Monfort, 1991; MDD, 2025 (as *O. ourebi*).
Kivu Duiker, *Cephalophorus kivuensis* [113]	F	–	ne	CD	▲	ex	ex	▲	–	–	–	Freshkop, 1944 (as *C. natalensis nigrifrons*); Monfort, 1992 (as *Cephalophus nigrofrons*); Plumptre *et al.*, 2002; Chao, 2008 (as *C. nigrifrons*); MDD, 2025.
Weyns's Duiker, *Cephalophorus lestradei* [114]	F	AR	ne	CD	–	?	–	▲	–	–	–	Monfort, 1992; Chao, 2008; Moore *et al.*, 2018; MDD, 2025 (as *C. weynsi*);
Yellow-backed Duiker, *Cephalophus silvicultor*	F	–	nt	CD	–	ex	ex	▲	–	–	–	Dowsett & Dowsett-Lemaire, 1990; Monfort, 1992; Chao, 2008; MDD, 2025.
Bush Duiker, *Sylvicapra grimmia* [115]	N	–	lc	CDe	–	–	–	–	–	▲	?	Freshkop, 1944, Vande weghe & Dejace, 1991; Monfort, 1992; MDD, 2025.
Roan Antelope, *Hippotragus equinus* [116]	N	–	lc	CDe	–	–	–	–	–	▲	–	Freshkop, 1944; Vande weghe & Dejace, 1991; Monfort, 1992; MDD, 2025.
Waterbuck, *Kobus defassa* [117]	N	–	lc	CD	–	–	–	–	–	▲	–	Freshkop, 1944 (as *K. defassa ugandae*); Vande weghe & Dejace, 1991; Monfort, 1992 and MDD, 2025 (as *K. ellipsiprymnus*).
Bohor Reedbuck, *Redunca bohor* [118]	N	–	ne	CDe	–	–	–	–	–	▲	–	Freshkop, 1944; Vande weghe & Dejace, 1991; Monfort, 1992 and MDD, 2025 (as *R. redunca*).
Cape Buffalo, *Syncerus caffer*	N	–	nt	CD	–	–	–	–	–	▲	–	Freshkop, 1944 (as *Bubalus caffer*); Vande weghe & Dejace, 1991; Monfort, 1992; MDD, 2025.
Virunga Buffalo, *Syncerus mathewsi* [119]	FN	AR	ne	CD	▲	ex		ex?	–	–	–	Wilson & Mittermeier, 2011.
Bushbuck, *Tragelaphus sylvaticus* [120]	N	–	lc	CD	–	–	–	▲	–	▲	▲	Freshkop, 1944, Vande weghe & Dejace, 1991, and Monfort, 1992 (as *T. scriptus*); MDD, 2025.
Sitatunga, *Tragelaphus spekii* [121]	Aq	–	lc	CDe	–	–	–	–	–	▲	▲	Freshkop, 1944 (as *Limnotragus spekii*); Dejace & Vande weghe, 1991; Monfort, 1992; MDD, 2025.
Cape Eland, *Taurotragus orix* [122]	N	–	lc	CDe	–	–	–	–	–	▲	–	Freshkop, 1944; Monfort, 1992, MDD, 2025.
GIRAFFIDAE, giraffes												
Masai Giraffe, *Giraffa tippelskirchi* [123]	N	–	VU	Int	–	–	–	–	–	Int	–	Vande weghe & Dejace, 1991; Monfort, 1992 (as *G. camelopardalis*).
SUIDAE, warthog, hogs & bushpigs												
Common Warthog, *Phacochoerus africanus*	N	–	lc	CD	–	–	–	–	–	▲	–	Freshkop, 1944, Vande weghe & Dejace, 1991, and Monfort, 1992 (as *P. aethiopicus*); MDD, 2025.
Giant Forest Hog, *Hylochoerus meinertzhageni* [124]	FN	–	lc	Ex	ex	–	–	ex	–	ex	–	Freshkop, 1943; Dowsett & Dowsett-Lemaire, 1990; Vande weghe & Dejace, 1991; Monfort, 1992; Chao, 2008; MDD, 2025.
Bush Pig, *Potamochoerus larvatus*	FN	–	lc	CD	?	?	?	▲	?	▲	–	Freshkop, 1944 (as *P. porcus*); Dowsett & Dowsett-Lemaire, 1990; Vande weghe & Dejace, 1991; Monfort, 1992; Chao, 2008; MDD, 2025.
HIPPOPOTAMIDAE, hippopotamus												
Common Hippopotamus, *Hippopotamus amphibius* [125]	Aq	–	VU	CD	–	–	–	–	–	▲	▲	Freshkop, 1944; Dejace & Vande weghe, 1991; Monfort, 1992; MDD, 2025.

Fig. 10. Boehm's squirrel, *Paraxerus boehmi*, is one of the most common species of squirrel in Nyungwe Forest. It is often seen in loose groups of 10–15 individuals in the tree canopy. Unlike Alexander's Dwarf Squirrel, *Paraxerus alexandri*, which inhabit the lowand forests, it has a clear, well-defined, pale line on each side of its back, bordered on both sides by sharp black lines. (Photo taken by Gael R. Vande weghe on 4 October 2010 in Nyungwe Forest, Nyungwe National Park).

Fig. 11. Rwenzori Sun Squirrel, *Heliosciurus ruwenzorii* in the Nyungwe Forest. This species can be confused with *H. rufobrachyum*. Both species are quite variable, but *H. ruwenzorii* has a white ventral line extending from the throat to the genital region; in *H. rufobrachyum*, the belly is uniformly pale brown, whitish-brown or reddish, and grizzled. (Photo taken by Gael R. Vande weghe on 4 July 2021 in Nyungwe National Park).

Fig. 12 The Fire-footed Rope Squirrel, *Funisciurus pyrropus*, in Rwanda has a distinct pale stripe on its sides, but the rufous colouring on its legs is much less extended than in populations of western Central Africa. This species often feeds on the ground. (Photo taken by Drew Bantlin on 4 April 2024 in Nyungwe National Park).

Fig. 13 The Fire-footed Rope Squirrel with the red colouration on the legs clearly visible. (Photo taken by Drew Bantlin on 4 April 2024 in Nyungwe National Park).

Fig. 14. Lord Derby's Anomalure, *Anomalurus derbianus,* in Nyungwe Forest. (Photo taken by Drew Bantlin on 17 May 2022 in Nyungwe National Park).

Fig. 15. The Spectacled Galago, *Galago matschei.* (Photo taken by Drew Bantlin on 17 May 2022 in the Nyungwe Forest, Nyungwe National Park).

Comments

Afrosoricida

Macroscelididae

[1]) **Sengi, *Elephantulus*** sp. Verschuren (1988) mentions a species of this genus based on photographs taken by Hediger in 1948 on top of Mount Gabiro (1790 m). He is very confident about the genus, but does not propose a species, probably because it was difficult to see on black and white photographs. Based on this discovery, Monfort (1992) suggests that an *Elephantulus* species inhabits the short *Loudetia* grasslands on stony summits and ridges in Akagera National Park. The most likely species is the Short-Snouted Sengi, *E. brachyrhynchus*, which is widespread around Lake Victoria in Kenya, Tanzania and eastern Uganda. In Rwanda, no one has ever looked after this species and there are no observations apart from Hediger's photographs. However, it should be noted that very few biologists has visited the summit of Mount Gabiro. The habitat of *Elephantulus* is also very different from that of *Petrodromus tetradactylus* (see page 18). As a mainly diurnal species that is about half the size of *Petrodromus*, it should be easy to recognise in the field. However, it is the size of a mouse, hides under woody cover and runs very fast from one hiding place to another. Unfortunately, Mount Gabiro is no longer in Akagera National Park and being part of a military domain it is inaccessible today.

[2]) **Four-toed Sengi**, ***Petrodromus tetradactylus***. The nominate subspecies of this elephant-shrew is widespread in Akagera National Park. In the 1970s, it was only seen around Nyamwashama Plain and Lake Ihema, northwards to Lake Kizi and Lake Hago. Today it reaches Lake Rwanyakizinga and the Mubari peninsula in the north. This strict nocturnal species inhabits foothill and lakeside woodlands, wooded grasslands and anthill thickets at altitudes of 1 300-1 450m. Despite it being a quite common species, we have never seen it on hill tops or high ridges.

Chrysochloridae

[3]) **Stuhlmann's Golden Mole**, ***Chrysochloris stuhlmanni***. This species was already mentioned for the Nyungwe Forest by Monfort (1992) where its presence was confirmed by Chao (2008) based on a specimen found near Uwinka after a heavy rain. More recently the species has been collected at Mount Bigugu and Gisakura (Majyambere *et al.*, 2025). It most probably belongs to the subspecies *stuhlmanni*, endemic to the Albertine Rift. The occurrence in Nyungwe National Park represents a significant extension of its known distribution towards the south. Indeed, the species was known in Rwanda from only the volcanoes (Monfort, 1992) and the Rukiga highlands (Bronner, 2015), both localities being situated in the north of the country.

Potamogalidae

[4]) **Ruwenzori Otter Shrew**, ***Micropotamogale ruwenzorii***. A specimen has been trapped in a small river of the Nyungwe Forest in 2009. It is preserved at the Field Museum of Natural History in Chicago (Stephenson, 2016; Grant, 2024; Majyambere *et al.*, 2025).

Tubulidentata

Orycteropodidae

[5]) **Aardvark**, ***Orycteropus afer***. According to information gathered in 1938 by Freshkop (1944), this species existed throughout the eastern savanna belt. In the 1970s it was still present around Kigali and throughout Bugesera, but it was hunted intensively because its meat was highly prized. In any case, the species does not survive in agricultural regions.

Proboscidea

Elephantidae

[6]) **African Savanna Elephant**, ***Loxodonta africana***. This species is still present in Volcanoes National Park, where the current population is estimated to number a few dozen individuals. The species was also present, albeit sporadically, in the Akagera National Park region. In September 1947, an individual was killed by Nyambo hunters near Karugaju in the Lakes Region (Verschuren, 1965), and there was an isolated sighting in 1955 (Verschuren, 1988). In 1957, an attempt to drive a group of elephants from Bugesera to Akagera National Park failed (Monfort & Monfort, 1977), but in 1960 and 1961, a small group was seen in the park again for several months. They were said to come from Tanzania. From 1968 onwards, the idea of moving the Bugesera elephants to Akagera National Park was raised again and several reports in favour of this solution were submitted, but the operation would require a considerable budget and, without external aid, could not be implemented (Monfort & Monfort, 1977). Finally in 1975, 24 elephants were re-introduced (Monfort & Monfort, 1977). These animals came from two different places in Bugesera, where the remaining population of around 110 elephants had to be killed

due to frequent fatal conflicts with pioneer farmers. The southern group in Bugesera was also in conflict with the Karama research station, whereas the northern group used to visit the marshes between the Kanombe region and Icyanya (now the Masaka region), as well as the Kabuga area. Currently, the population in Akagera National Park is around 140 individuals (Afican Parks, pers. comm.). In Nyungwe Forest, the population numbered between 100 and 200 individuals in the 1960s. However, these animals were killed for their ivory in the late 1960s and early 1970s. Five individuals took refuge in the swamp forests of the Kamiranzovu basin, and the last of these was killed by a poacher in 1999 (Plumptre *et al*., 2002). These Nyungwe elephants lived mainly in large peat bogs surrounded by ericaceous moors (e.g. Mubuga), pioneer *Hagenia* and ridge forests, in herds of up to 40 adults. While the elephants in Volcanoes National Park show some evidence of hybridisation with the forest elephant *Loxodonta cyclotis* (Kuhner *et al*., 2025), those in the Nyungwe-Kibira population were true savanna elephants, even though they lived in forests. Before 1948, they lived in the dry savannas of the Rusizi Plain in Burundi during the wet season, moving to the Kibira and Nyungwe Forests during the dry season. This transhumance ended in 1948, when the Belgian colonial government sent professional hunters to cull these elephants to make way for a large-scale agricultural project on the Rusizi Plain. Those that escaped remained in the Kibira-Nyungwe Forests throughout the year (F. Verhulst, pers. comm.).

Hyracoidea

Procaviidae

7) **Southern Tree Hyrax**, ***Dendrohyrax arboreus***. This species is well known from Volcanoes National Park (Monfort, 1992; Milner & Harris, 1999). However, contrary to what Monfort mentions, it was also present in Akagera National Park before 1994, especially in the riparian forests of the Akagera River near Kagitumba. We often heard it there at night, which is why we mentioned it before (Vande weghe & Dejace, 1991). It was also mistakenly mentioned for Nyungwe Forest by Storz (1983). At present, since the boundaries of Akagera National Park were changed, the Akagera riparian forests are no longer part of the park and have been almost completely cleared. It is therefore unlikely that any hyrax survives in this region. In any case, the species does not exist within the boundaries of the current Akagera National Park. So it only exists in Volcanoes National Park and most probably in Gishwati-Mukura National Park, but this should be confirmed.

8) **Western Tree Hyrax**, ***Dendrohyrax dorsalis***. This species has long been confused with the Eastern Tree Hyrax. It was first mentionned from the Nyungwe Forest by Dowsett and Dowsett-Lemaire (1990) on the basis of its nocturnal vocalisations which differ significantly from those of *D. arboreus* in Volcanoes National Park. It was subsequently also mentionned by Offutt (1990) as *D. arboreus dorsalis*, Plumptre *et al.* (2002) and Chao (2008). It is also found in the Cyamudongo Forest.

9) **Bush Hyrax**, ***Heterohyrax brucei***. Freshkop (1944) and Verschuren (1987) identified the diurnal hyrax living on cliffs and rocks in Akagera National Park as Bush Hyrax *Heterohyrax brucei*. This species has been reported from Mount Gabiro, granite outcrops (kopjes) in the Umutara region and cliffs in the southern part of the park. Several photographs are kept in the archives of the Royal Belgian Institute of Natural Sciences (RBINS). Recently, an undated colour photograph of two specimens taken near Nyagatare (now far outside the park) was published on the Internet by Torsten Wronski, and the identification as Bush Hyrax was confirmed by Thomas Butynski (in litt.). In the 1970s and 1980s we observed a large colony of several dozen hyraxes established on an large rocky cliff with extensive adjacent outcrops south of the Gashiranyota Forest in the extreme south of Akagera National Park. This site is now outside the park boundaries and the colony is most likely gone. However, we remember the vocalisations of these animals (rather long, high-pitched alarm calls) wich were those of the Bush Hyrax, not Rock Hyrax. Today, there is still a diurnal hyrax in the south of Akagera National Park (Kiyonza, Muyumbu) and we have seen several individuals crossing a track on the edge of the Nyamwashama Plain or in the Karenge area during day-time or even on the Rurama peninsula, far from any outcropping rock. H. Hinkel has seen the species on the Rurama peninsula. Curiously, the Bush Hyrax is not mentioned for Rwanda by the IUCN Red List (Butyinski *et al*, 2015) and the MDD (2025).

Primates

Cercopithecidae (Figs. 2-5)

10) **Red-tailed Monkey**, ***Cercopithecus ascanius***. This species was discovered in Rwanda in 1974 just outside the Nyungwe Forest in a remnant patch of large forest trees (Storz, 1983). After the felling of these trees the species was no longer seen. It was re-discovered in the early 2000s by several biologists and game rangers. Finally it was found that this monkey inhabits almost all forests below 1,800 m along the western edge of the Nyungwe Forest between Gisakura and Bweyeye. It lives in small groups and is fairly shy.

[11]) **Owl-faced Monkey**, ***Cercopithecus hamlyni***. Schouteden (1947) first reported the species (Fig. 6–8) from an area between Ruhengeri and Rwankeri, close to the extensive bamboo forests of the volcanoes. He also found that Mrs Pinson held in Kigali a captive specimen, originating from northern Rwanda. At that time, an almost continuous belt of mountain bamboo, *Yuhina alpina,* thickets covered the lower slopes of the volcanoes and the higher parts of Gishwati Forest. Therefore, it is reasonable to assume that *C. hamlyni* lived in north-western Rwanda until at least the 1940s, where it became extirpated in the 1950s or early 1960s (Hart & Butyinski, 2008; Hart & Maisels, 2020). The species was rediscovered in 1989 by Kate Offutt in the Nyungwe Forest (Monfort, 1992), and Dowsett & Dowsett-Lemaire (1990) reported two sightings of this species in the northern part of the forest block. In 2008 and 2009, the WCS team organised a census in the tall bamboo thickets of the Nshiri area in southern Nyungwe Forest (Easton *et al.*, 2011). Contrary to what Easton *et al.* (2011) claim, this primate was not strictly linked to the 32 km² area of tall bamboo in the Nshiri region. It has also been observed further north, south of Rwasenkoko, and in the north-west of the forest massif (Dowsett & Dowsett-Lemaire, 1990). In the Nyungwe Forest, this monkey is most often found in mountain bamboo thickets. However, since at least the mid-20th century, mountain bamboo in Rwanda has been in decline as bamboo thickets have flowered. In the Gishwati Forest, bamboo thickets were already heavily fragmented prior to 1970, and in the Nyungwe Forest, they have been in continuous decline since the 1980s. The largest bamboo stands in the centre of the forest had disappeared by 2011. The only stable bamboo thickets are those on the volcanoes, as they regrow after flowering; those in the Gishwati and Nyungwe forests, however, disappear after flowering. Consequently, it is feared that the owl-faced monkey will disappear as bamboo continues to regress, having already disappeared from the northwest of the country. This ground-dwelling monkey is threatened not only by poaching (Hart *et al.*, 2013), but also by the continuous regression of its preferred habitat.

[12]) **Golden Monkey**, ***Cercopithecus kandti***. This monkey is common in Volcanoes National Park and Gishwati Forest (Fig. 4). Contrary to Butynski & de Jong (2020) and Tuyizingize *et al.* (2022), it is or was also found in Nyungwe Forest as mentioned by Lawes *et al.* (2013). Schouteden (1947) mentions two specimens collected from the 'Rugege Forest' (now Nyungwe Forest) and 'Astrida Forest near Nyanza'. This was another name for the Nyungwe Forest in colonial time. Before the Second World War the Rugege Forest was indeed reached from Astrida (now Huye). In the late 1980s, Amy Vedder found a small group of eight or nine individuals in the extensive bamboo thickets of the south-central part of the Nyungwe Forest, about two hours walking south of Uwasenkoko (pers. comm.). She was very excited about this unexpected discovery and planned to follow this group to study their ecological requirements and behaviour. Unfortunately she had to leave Rwanda. A small brochure for visitors to Nyungwe Forest mentions these Golden Monkeys in the extensive bamboo thickets of the reserve (Offutt, 1990). According to Vedder, only one individual showed perhaps some signs of hybridisation with the Silver Monkey *C. mitis doggetti*. Today, these bamboo stands have flowered and about 90-95% of the stems have died, giving way to open eagle fern moors and pioneer *Hagenia-Macaranga* thickets. These Golden Monkeys evidently had to move and nobody saw them since 1994. Perhaps they no longer exist in Nyungwe. Perhaps we have not been looking in the right place, but they must be difficult to find due to the poor accessibility of the central areas of the Nyungwe Forest. More research is clearly needed. In any case, there is no doubt that the Golden Monkey has existed and may still exist in Nyungwe Forest. Its presence in a forest dominated by the Silver Monkey (Fig. 3) is highly unexpected. Given that the Nyungwe Forest has been separated from the Gishwati Forest since the second half of the 18th century (Kagame, 1972), these two monkeys must have coexisted for at least two centuries without the small Golden Monkey population being assimilated by the abundant Silver Monkeys. Clearly, there has been a very effective ecological or behavioural barrier preventing this assimilation. This seems to be a strong argument for considering *Cercopithecus kandti* as a separate species from *C. mitis* (Fig. 3), like already done by Groves (2001) and Wilson & Reader (2005). In any way this monkey is clearly a 'Significant Evolutionary Unit'.

We can assume that the Golden Monkey inhabited the vast belt of bamboo thickets that stretched across the Congo-Nile ridge from the volcanoes in the north to the Nyungwe Forest in the south until the 18th century. This almost continuous belt was first fragmented by the separation of the Nyungwe massif from the Gishwati massif in the late 18th century (Kagame, 1972), later by the separation of the Gishwati and Mukura Forests, and in the late 1960s by the separation of the Gishwati Forest from the Volcanoes National Park (pers. obs.). On a map dating from 1937, the bamboo thickets still form a continuous belt covering the lower slopes of the volcanoes and the upper parts of the Gishwati Forest. In addition, this bamboo belt has been heavily fragmented by bamboo flowering and its replacement by other types of vegetation. By the 1970s, the bamboo in the Gishwati Forest had already been largely replaced by very open *Neoboutonia* stands, but the Golden Monkeys had already adapted to the canopy of dense mixed forests.

[13]) **Angola Colobus**, ***Colobus angolensis ruwenzorii***. This colobus monkey has a fairly wide distribution, but the subspecies *ruwenzorii* is endemic to the Albertine Rift (Fig. 9). It is characterised by the fact that it occurs in groups of 200-300 individuals (Miller *et al.*, 2019, 2020).

[14]) **Guereza Colobus**, ***Colobus guereza***. This colobus was reported by Schouteden (1947) as *C. abyssinicus uellensis* from Ruhengeri and Nyundo close to the Volcanoes National Park. It still lives in the Rutshuru area of Virunga National Park in the Democratic Republic of Congo (DRC) and Bwindi Impenetrable Forest National Park in Uganda. Therefore it seems obvious that this colobus monkey once existed in the Virunga-Gishwati montane forest block in Rwanda. As its skin was highly prized (Freshkop, 1943), this species must have become locally extinct before the middle of the 20th century. We will never know its exact status and distribution in Rwanda.

Galagidae

[15]) **Thomas Galago**, ***Galagoides thomasi***. The presence of this species in Nyungwe National Park was confirmed by Protée Niyigaba (pers. comm.).

[16]) **Thick-tailed Greater Galago, *Otolemur crassicaudatus***. Some tourist folders mention this species for the Nyungwe Forest. It definitely does not occur in western Rwanda, as already stated by Dowsett & Dowsett-Lemaire (1990), and is restricted to the riparian forests, dry forests and large thickets of Akagera National Park. It is often seen at Rusizi Tented Lodge. Most specimens are dark, blackish brown, but a pale silvery grey specimen was seen, killed by a Bateleur Eagle *Terathopius ecaudatus* in the early 1970s in the north of the park.

Lagomorpha

Leporidae

[17]) **African Savanna Hare**, ***Lepus microtis***. This is the common hare in Rwanda, formerly mentioned as *Lepus crawshayi* (Freshkop, 1944; Misonne, 1965; Monfort 1985; Verschuren, 1987; Vande weghe & Dejace, 1991; Monfort, 1992). Named *Lepus microtis* by Wilson & Reeder (2002) and the MDD (2025). It used to be common throughout the eastern savanna belt, but currently it does not survive outside Akagera National Park.

Rodentia

Thryonomidae

[18]) **Greater Cane Rat**, ***Thryonomys swinderianus***. This species is mentioned by Schouteden (1947) for 'Ruanda-Urundi' based on a specimen from Rumonge, a locality in Burundi, not in Rwanda. However, this species of rat was known in the Nyirabanda valley below Uwinka in the 1960s, and according to park rangers, it may still exist in at least two places on the edge of the Nyungwe Forest (Majyambere *et al.*, 2025).

Gliridae

[19]) **Savanna Dormouse**, ***Graphiurus microtis***. This species was reported from Akagera National Park by Geider & Kock (1991). It had previously been mentioned by Misonne (1965b) and Verschuren (1987) as *G. murinus*. Monfort (1992) does not mention it. *Graphiurus murinus* and *G. microtis* have often been confused or even lumped, and some populations have been misidentified (GBIF, 2023). According to Wilson & Reeder (2005) it is even likely that *G. microtis* actually covers two species.

[20]) **Forest African Dormouse**, ***Graphiurus murinus***. From 2009 to 2023, this species was trapped at Gisakura, Kitabi, and Uwinka in Nyungwe National Park; the identification was confirmed by DNA barcoding (Majyambere *et al.*, 2025)

Sciuridae (Figs. 6-8)

[21]) **Red-legged Sun Squirrel**, ***Heliosciurus rufobrachium***. This species was seen several times in the Nyungwe Forest by J.P. Vande weghe in the 1970s and early 1980s, and there are several records with photographs published in iNaturalist. This species is mentionned for Rwanda by the IUCN Red List and the MDD (2025), while it was not mentioned in any previous checklist.

Anomaluridae

[22]) **Lord Derby's Anomalure**, ***Anomalurus derbianus***. Several observers had seen an anomalure in the Nyungwe Forest but had been unable to identify it with certainty (Chin Sun in Monfort, 1992; Dowsett & Dowsett-Lemaire, 1990; Monfort, 1992). We had also observed an anomalure on three occasions, once at very close range in the Bururi area at about 1,900 m, below Uwinka. After observing *Anomalurus derbianus* on several occasions in Gabon, we became certain that it was indeed this species. In July 2014, a Lord Derby's anomalure was photographed in the Busaga Forest by James Hogg & Kenny Babylon. More recently a specimen was photographed in the Nyungwe Forest by D. Bantlin (Fig. 14) and a specimen was found dead on the road crossing the Nyungwe Forest by G.R. Vande weghe.

Muridae

[23]) ***Lophuromys***. According to the MDD (2025), this genus comprises 34 accepted species, eight of which are found in Ethiopia and 26 of which are found in tropical Africa. The distribution of the latter group was poorly understood until recently, when the work of Onditi *et al.* (2021) clarified it. It therefore appears that five species exist in Rwanda, but two previously listed species are not present.

[24]) **Ansorge's Brush-furred Rat**, ***Lophuromys ansorgei***. This species was mentioned as *L. sikapusi* from Akagera National Park, but most probably from outside the current park limits. It has a widespread distribution in Central and East Africa, while *L. sikapusi* is a West African species.

[25]) **Grey Brush-furred Rat, *Lophuromys cinereus***. This Albertine Rift endemic was known only from the DR Congo (Kahuzi Biega National Park) but is was found in Cyamudongo Forest (three specimens) and the Gisakura area in Nyungwe Forest (one specime) in 2022-2023. The identification was confirmed by Barcoding (Majyambere *et al.*, 2025).

[26]) **Albertine Rift Brush-furred Rat, *Lophuromys laticeps***. It was mentionned as *L. flavopunctatus* (Schouteden 1947). The latter is now limited to the Ethiopian highlands and is represented in the Albertine Rift area by *L. laticeps*, which is known from the DR Congo, Uganda, Rwanda and Burundi (MDD, 2025). However, *L. laticeps* is not mentioned by the IUCN Red List, being lumped into *L. flavopunctatus s.l.* (Cassola, 2016c).

[27]) **Buff-bellied Brush-furred Rat, *Lophuromys luteogaster***. It was mentionned by Elbl *et al.* (1966) and Monfort (1992). According to recent studies, the species should be limited to an area situated between the Lualaba (Upper Congo River) and the Albertine Rift in DR Congo (Cassola, 2016c; Onditi *et al.*, 2021). There is, however, a record from the Nyungwe Forest mentioned by GBIF: a specimen collected on 30 July 2009 at 2 120 m along the Nyabishwati River in the Nyungwe Forest by J.C. Kerbis Peterhans and preserved at the Field Museum of Natural History (Grant *et al.*, 2020).

[28]) **Medium-tailed Brush-furred Rat**, ***Lophuromys medicaudatus***. This rat is endemic to the Albertine Rift and is found mainly in the highlands around Lake Kivu in the DR Congo, Uganda and Rwanda (Kennerley, 2016a; MDD, 2025). It inhabits montane rainforests and wetlands, avoiding modified habitats. Its presence in the Nyungwe Forest was confirmed in 2022-2023 when a total of seven specimens were collected at Bigugu, Uwinka and Gisakura (Majyambere et al., 2025).

[29]) **Rahm's Brush-furred Rat**, ***Lophuromys rahmi***. This rat is also an Albertine Rift endemic mainly centred on the highlands around Lake Kivu at elevations between 1 900 and 2 500 m in the DR Congo (Kahuzi Biega National Park), Rwanda (Nyungwe National Park), Uganda (Bwindi Impenetrable National Park) and Burundi (Bururi Forest) (Kerbis Peterhans, 2010; Kennerley, 2016b; MDD, 2025). Its presence in the Nyungwe Forest was condirmed in 2022-2023 when several specimens were trapped at Nyabishwati, Kitabi, and Uwinka (Majyambere et al., 2025).

[30]) **Woosnam's Brush-furred Rat**, ***Lophuromys woosnami***. This is an Albertine Rift endemic known from the DR Congo, Uganda, Rwanda and Burundi. It inhabits mountain forests at elevations of 1 600 to 3 880 m from the Ruwenzori range in the north to the Itombwe Forest (DR Congo) and the Bururi Forest (Burundi) in the south (Cassola, 2016d; Burgin *et al.*, 2024). Its presence in the Nyungwe Forest was confirmed in 2022-2023 (Majyambere et al., 2025).

[31]) **Giffard's Gerbil**, ***Gerbilliscus giffardi*.** This species, formerly lumped into *Gerbilliscus kempi*, is mentioned for Rwanda by Granjon *et al.* (2012) and the MDD (2025). still not recognised by the IUCN Red List.

[32]) **Kaiser's Rock Rat**, ***Aethomys kaiseri***. This species is mentioned as *Aethomys nyikae* by Misonne (1965) for Akagera National Park. The confusion was due to the fact that Delany (1975) considered *A. kaiseri* to be synonymous with *A. nyikae*. However, the two species are clearly distinct and sympatric in Zambia (Wilson & Reeder, 2005).

[33]) **Middle Shaggy Rat, *Dasymys medius***. The genus *Dasymys* was previously represented by a single species, *Dasymys incomtus*, which apparently covered a species complex. A craniometric and genetic study has allowed this group to be disentangled (Verheyen *et al.*, 2003). While the IUCN Red List still recognise only six species, the MDD in 2025 mentions 14 species, two of which occur in Rwanda: *D. rwandae* and *D. medius* (MDD, 2025). The latter was described from the Ruwenzori Mountains by O. Thomas in 1906, but only recognised in 2005. It is thought to occur in the highlands of the Albertine Rift and the East African Rift at altitudes of up to 2 600 m, from South Sudan in the north to Tanzania, Burundi and the Democratic Republic of Congo in the south.

[34]) **Rwandan Marsh Rat**, ***Dasymys rwandae***. This species was described in 2003 (Verheyen *et al.*, 2003), and seems to be endemic to the Birunga volcanoes and the highlands of western Rwanda. It is accepted by Wilson & Reeder (2005) and by the MDD (2025). However, being part of the *Dasymys incomtus* species complex, Taylor (2016) in his evaluation for the IUCN Red List, includes *Dasymys alleni, D. cabrali, D. rwandae* and *D. sua* in *D. incomtus* pending further studies to clarify the taxonomic status of these five taxa. So he concludes that the species is not threatened, 'Least Concern', whereas *D. rwandae* should at least be considered as "Vulnerable". We prefer to keep *D. rwandae*, because otherwise it will be forgotten. A study published in South Africa in 2005 accept 11 species in the genus *Dasymys* but ignore *D. rwandae,* most probably because it was described in 2003 and no specimen was obtained for the study (Mullin, 2005). *D. incomtus s.s.* is known only from Gabon (MDD, 2025).

[35]) **Albertine Rift Thicket Rats**, ***Grammomys dryas***. Geider & Kock (1991) and Monfort (1992) cited *G. dolichurus* for Akagera, Nyungwe and Volcanoes National Parks. This species actually represents a group of species. Hence the IUCN Red List mentions two species for Rwanda: *G. dryas*, for the Volcanoes National Park (Fergusson & Kennerley, 2019), and *G. kuru*, for the whole country (Cassola, 2016a). These assessments, however, do not take into account the molecular genetic study by Bryja *et al.* (2016) and Mikola *et al.* (2021). The first shows that the genus *Grammomys* actually comprises five well-differentiated lineages, within which several species can be recognised. The latter places *G. kuru* in *Thamnomys*. The MDD thus recognises seven species, two of which exist in Rwanda (MDD, 2025). These are *G. surdaster* and *G. dryas*, known from Ruwenzori to Mount Kahuzi. In the light of current knowledge and the paucity of reliable data from Rwanda, we can accept two species for the country: *G. dryas*, limited to the volcanoes, and *G. surdaster* for the rest of the country. However, we do not know whether the two species coexist in the volcanoes. Clearly more data are required. As for *G. dolichurus s.s.* it is restricted to South Africa, Eswatini, and perhaps Lesotho, Mozambique and Zimbabwe (MDD, 2025).

[36]) **Woodland Thicket Rat, *Grammomys surdaster.*** This species is split from *Grammomys dolichurus* by Bryja *et al*. (2024). It is known from the Nyungwe and Akagera National Parks.

[37]) **Buffoon Striped Grass Mouse**, ***Lemniscomys macculus***. This species is known from Ethiopia, Kenya, Uganda and eastern DRC. The IUCN Red List mentions it as 'quite possibly' for Rwanda (Van der Straeten *et al.*, 2016), but the MDD accepts it for Rwanda. Apart from the specimens identified as *L. griselda* by Misonne (1965) there are, however, no other specimens collected. It would still be interesting to re-examine the specimens collected by Misonne in Akagera National Park or to implement new studies. Akagera National Park is much drier than the rest of Rwanda.

[38]) **Thomas's Thicket Rat, *Thamnomys venustus***. This species is mentioned for Rwanda by the MDD (2025) and by the IUCN Red List pending verification (Kennerley, 2016c). It was mentioned for Nyungwe Forest and the Volcanoes National Park by Elbl *et al.* (1966) but these collections apparently all refer to *Thamnomys kempi*. This therefore needed clarification. *T. venustus* was mentioned for the Nyungwe Forest by Dowsett & Dowsett-Lemaire (1990). This statement was based on the collection of *T. kempi major* in the 1960s by Elbl *et al.* (1966). Finaly, an immature specimen was captured in 2021 near the Kamiranzovu Swamp and its identification was confirmed by Barcoding (Majyambere *et al.*, 2025).

[39]) **Long-footed Swamp Rat, *Malacomys longipes***. The presence of this species was confirmed in the Cyamudongo and Nyungwe Forest in 2009, 2012, and from 2021 to 2023; it was not found in swamps but rather along forest streams. All records were made below 2 000 m except one at about 2 400 at Uwinka (Majyambere *et al.*, 2005).

[40]) **Toad Mouse**, ***Mus bufo***. This species was considered an Albertine Rift endemic, but a molecular genetic study of the African representatives of the genus *Mus*, has indicated that its distribution is much wider and includes northern DR Congo and Central African Republic (Bryja *et al.*, 2014).

[41]) **West African Pygmy Mouse**, ***Mus musculoides***. This species, found in Central and West Africa, is known to range from Senegal to South Sudan and Ethiopia (Bryja *et al.*, 2014). It is often confused with *Mus minutoides* and was probably incorrectly recorded in Rwanda by Plumptre *et al.* (2002). However, three specimens collected at Kitabi, just outside Nyungwe National Park in 2021-2022, were identified as *Mus* cf. *gratus* through DNA barcoding. As this species is a synonym of *Mus musculoides*, this West African species must be included on the list for Rwanda (Majyambere *et al.*, 2025). This indicates a significant overlap in the distribution of *M. minutoides* and *M. musculoides*.

[42]) **Thomas's Pygmy Mouse**, ***Mus sorella***. This species has been mentioned for Akagera National Park by Vande weghe & Dejace (1991) and Monfort (1992) based on 2 specimens collected in February 1960 by Misonne (1966).

Misonne was not sure of the identification and felt that it could be *Mus tenellus*, but this species inhabits the Ethiopian highlands and the Eastern Rift in Kenya and Tanzania.

[43]) **Tropical Vlei Rat**, ***Otomys tropicalis***. This species was mentionned for Rwanda by Fain (1957) and subsequently by Vande weghe & Dejace (1991) and Monfort (1992) as *Otomys irroratus*, but this name applies currently to a South African species (MDD, 2024).

[44]) **Albertine Rift Wood Mouse**, ***Hylomyscus vulcanorum***. This species was first mentionned for Rwanda by Elbl *et al.* (1966) as *Praomys denniae*. It was subsequently transferred to the genus *Hylomyscus* as *H. denniae*. However, the latter is part of a group of three species: *H. endorobae* in Kenya, *H. denniae* in the Ruwenzori range in Uganda and the DR Congo and *H. vulcanorum* in eastern Rwanda, Burundi and eastern DR Congo (Demos *et al.*, 2014, 2015).

[45]) **Dwarf Serengeti Mouse**, ***Serengetimys pernanus***. It was mentionned by Misonne (1965) and Monfort (1992) for Akagera National Park as *Mastomys pernanus*, but transferred to genus *Serengetimys* following the molecular genetic study of Nicolas *et al.* (2021). There is therefore no reason to doubt about the presence of this species on the Rwanda list (MDD, 2025).

Nesomyidae

[46]) **Genus *Cricetomys***. In the past, the genus *Cricetomys* included two species: *C. gambianus* in all savannas of sub-Saharan Africa and *C. eminii* in the forests of West and Central Africa. A phylogenetic study based on a combination of mitochondrial DNA and cranial measurements, has shown that the genus *Cricetomys* encompasses in fact six species: *C. gambianus*, *C. eminii*, *C. ansorgei* and 3 undescribed species in the forests of West Central Africa (Olayemi *et al.*, 2012).

[47]) **Kivu Giant Rat**, ***Cricetomys ansorgei***. Two specimens collected in Bugesera and south-eastern Rwanda belong according to their mtDNA to *C. ansorgei* (Olayemi *et al.*, 2012). This species has a widespread distribution in the savannas of eastern and southern Africa.

[48]) **Emin's Giant Rat**, ***Cricetomys eminii***. Two giant rats collected in the highlands of western Rwanda were identified as *C. eminii* according to their mtDNA (Olayemi *et al.*, 2012). This species is widely distributed in the forests along the right bank of the Congo River. Its presence in the Nyungwe Forest was confirmed by Barcoding in 2022-2023 (Majyambere *et al.*, 2025).

[49]) **Genus *Dendromus***. According to a recent molecular genetic study (Voelcker *et al.*, 2021), the genus *Dendromus* now encompasses 13 species, three of which are known from Rwanda. One species found in Nyungwe Forest could not be identified (Vander Straeten & Verheyen, 1983).

[50]) **Montane African Climbing Mouse**, ***Dendromus insignis***. This species is known from the Volcanoes National Park (Tuyisingize *et al.*, 2013), and several records are mentioned for the Nyungwe Forest and the area of the Gishwati Forest in western Rwanda (GBIF).

[51]) **Chestnut Climbing Mouse**, ***Dendromus mystacalis***. This species has a widespread distribution in sub-Saharan Africa. In Rwanda it has been recorded in the south-east of the country (GBIF) and it has been collected by Misonne in Akagera National Park.

[52]) **Kivu Climbing Mouse**, ***Dendromus nyassae***. This species was formerly considered a subspecies of *D. mesomelas*, which is now restricted to southern Africa. *D. nyassae* has been collected in Akagera National Park (Misonne, 1965) and in Nyungwe National Park (Chao, 2008; Majyambere et al., 2025).

[53]) **Grey African Clibing Mouse**, ***Poemys melanotis***. This species was formerly included in *Dendromus* as *D. melanotis* (Child & Monadjem, 2016), but the genus *Poemys* was ressurected by Voelcker *et al.* (2021). The MDD (2025) does not mention this species for Rwanda, but the IUCN Red List mentions *D. melanotis* for western Rwanda, based on 25 specimens collected in 1981 and 1982 in the Volcanoes National Park and Nyungwe National Park by Verheyen (GBIF). This species has a very wide but fragmented distribution from Uganda, Kenya and Tanzania southward to Mozambique, Angola and South Africa.

[54]) **Tiny Fat Mouse**, ***Steatomys*** cf. ***parvus***. Misonne (1966) collected a species of this genus in Akagera National Park which he identified as *S.* cf. *pratensis*. However, *Steatomys pratensis* has a fragmented distribution in the Sudano-Guinean transition zone, southern Tanzania and northern Mozambique and from Angola to South Africa. No observations of this species have been made within 500 km of Rwanda. The only species of this genus

that may occur in eastern Rwanda is therefore *S. parvus* (Child & Monadjem, 2015), and it seems most likely that the species collected by Misonne was *S. parvus*. However, a confirmation or a re-examination of the specimen collected by Misonne would be welcome.

Spalacidae

[55]) **East African Mole-Rat**, ***Tachyoryctes splendens***. This species has been mentioned for Rwanda under the name *Tachyoryctes ruandae,* described in 1925 by Lönnberg & Gyldenstolpe. It had also been mentioned by Elbl *et al.* (1966) and more recently by Wilson & Reeder (2005) under the name *T. ruandae* and by Rahm (1967) as *T. splendens*. A recent molecular genetic study has shown that all mole-rats found outside of the Ethiopian highlands in Uganda, Kenya, Tanzania, Burundi and Rwanda, belong to a single recent species, the East African Mole Rat, *T. splendens* (Šumbera *et al.*, 2018).

Eulipothyphla

Soricidae

[56]) **Long-tailed White-toothed Shrew, *Crocidura dolichura***. This small shrew was collected in 2009 at Mount Bigugu and Bweyeye in Nyungwe National Park (Majyambere et al., 2025).

[57]) **Long-haired White-toothed Shrew, *Crocidura lanosa***. Two individuals of this species were collected near the Nyabishwati River, not far from Uwinka, in 2009 (Majyambere et al., 2025). Several specimen had previously been collected at Uwinka (Hutterer et al., 1987).

[58]) **Moonshine Shrew, *Crocidura luna***. This species is mentioned for Rwanda by Wilson & Reeder (2005), Cassola (2016e) and the MDD (2025), but we would like to know details about their records.

[59]) **Savanna Dwarf Shrew**, ***Crocidura nanilla***. Hutterer *et al.* (1987) mention *C. nanilla* from a garden in Butare (now Huye) and cite a specimen collected near Bukavu (DRC), close to the Rwanda border. Curiously, the species is not mentioned for Rwanda either by Wilson & Reeder (2005), the IUCN Red List or MDD (2024).

[60]) **African Black Shrew**, ***Crocidura nigrofusca***. Dieterlen & H. de Balzac mention *Crocidura* cf. *nigrofusca* for Akagera National Park and the Nyungwe Forest. There are, however, no other records of this species for Rwanda, and the IUCN Red List (Cassola, 2016) and the MDD (2024) mention the occurrence in Rwanda as uncertain. Further studies would be welcome.

[61]) **Niobe's Shrew**, ***Crocidura niobe***. The species was found in Volcanoes National Park (Kerbis Peterhans & Austin, 1996) but more recent surveys of the area failed to detect it (Tuyisingize *et al.* 2013). In 2009 it was found in Nyungwe National Park at Mount Bigugu (Majyambere *et al.*, 2025). This species seems to inhabit high altitude montane forests.

[62]) **African Giant Shrew**, ***Crocidura olivieri***. This very large shrew was mentionned by Freshkop (1944) as *Crocidura occidentalis* but this taxon has been considered as the subspecies *occidentalis* of *C. oliveri* (Wilson & Reeder, 2005). Tuyisingi *et al.* (2013) also mention this species from the Volcanoes National Park. as *C. oliveri kivu*. Its presence in Nyungwe Forest was confirmed by Majyambere *et al.* (2025).

[63]) **Hutu-Tutsi Dwarf Shrew, *Suncus hututsi*.** This species was described by Kerbis Peterhans and Hutterer in 2009 from specimens collected in Kibira National Park in Burundi. Its presence in Rwanda was predictable. It was confirmed when three specimens were collected in Bweyeye (Majyambere *et al.*, 2025).

[64]) **Asian House Shrew**, ***Suncus murinus***. A skull of this Asiatic species is preserved in the Berlin Museum. It was collected by Kandt at "Kivu See" around 1900. As a commensal species this specimen probably came via a trade route from the Indian Ocean coast of East Africa (Hutterer *et al.,* 1987). This remains the only record of this species in Africa.

[65]) **Johnston's Forest Shrew**, ***Sylvisorex johnstoni***. GBIF mentions two records for the Nyunge Forest from 23 and 24 July 2009 at about 1,730 m asl near Bweyeye and preserved at the FMNH (Grant *et al.*, 2020; Majyambere *et al.*, 2025).

Chiroptera

Pteropodidae

[66]) **Peter's Epauletted Fruit Bat**, ***Epomophorus pusillus***. Monfort (1992), the IUCN Red List and the MDD (2024) mention this species for Rwanda as *Micropteropus pusillus*, but Van Cakenberghe *et al.* (2017) have not found any

record of this species for the country, only one for nearby Burundi.

Nycteridae

[67]) **Large Slit-faced Bat**, ***Nycteris grandis***. One specimen was collected in 1985 in Gashora near Lake Kirimbi (Bugesera) (Kityo *et al.*, 2009).

Rhinolophidae

[68]) **Hill's Horseshoe Bat**, ***Rhinolophus hilli***. This species was discovered in Nyungwe Forest in 1964 and described by Hayman *et al.* (1966) (Fig. 16). It was known from only two specimens. According to Dowsett & Dowsett-Lemaire (1990), it was *Rhinolophus maclaudi*, a species known from only Upper Guinea and described from Conakry (Shapiro *et al.*, 2019). However, *Rhinolophus hilli* was rediscovered in the Nyungwe forest during the 2010s and a molecular genetic study was able to confirm the validity of the species, which remains endemic to the Nyungwe National Park and therefore to Rwanda (Flanders *et al.*, 2022). According to Webala *et al.* (2021) 'the species population and number of mature individuals is inferred to be declining as there is a continuing loss in the extent and quality of its habitat'. We disagree with this statement. The western part of the Nyungwe Forest, where the species is found, has remained virtually unchanged since at least 50 years, and there has certainly been no loss in habitat quality —at least inside the national park— and the species seems to remain in or close to the forest.

Fig. 16 Hill's Horseshoe Bat, *Rhinolophus hilli*. (Photo taken by Drew Bantlin in Nyungwe Forest, Nyungwe National Park).

[69]) **Peters's Horseshoe Bat**, ***Rhinolophus landeri***. Examining historical and recent collections of small *Rhinolophus* bats, Taylor *et al.* (2018) revealed cryptic taxonomic diversity within southern African populations that had previously been classified as *R. landeri*. The study concluded that *R. landeri s.s.* is found in western, central, northern and north-eastern Africa, whereas populations in southern and eastern Africa belong to *R. lobatus*. However, due to insufficient sampling, the ranges of these two species and the location of the boundary between them remain uncertain. *R. landeri* appears to be primarily a forest species, whereas *R. lobatus* is more prevalent in savanna habitats. As Rwanda is located around the presumed boundary between the two species, it is impossible to determine to which species the collected specimens belong without re-examination. The specimens collected in Nyungwe and Volcanoes National Parks could be *R. landeri s.s.*, whereas those collected in Akagera National Park could be *R. lobatus*, but this needs to be confirmed. The MDD (2025) mentions *R. lobatus* for Rwanda, but not *R. landeri*. However, this decision is based on assumptions, not facts.

Hipposideridae

[70]) **Cyclops Leaf-nosed Bat**, ***Doryrhina cyclops***. This species is mentioned for Rwanda by Hayman *et al.* (1966), the IUCN Red List (Monadjem *et al.*, 2017) and the MDD (2024). Van Cakenberghe *et al.* (2017) mention only one record for Burundi close to the Rwanda border and one for the Virunga NP in DRC. The presence of this species in Rwanda seems most likely. According to Patterson *et al.* (2020), a specimen from Burundi belongs to *D. camerunensis*. This species known from Cameroon, DRC, Uganda and Kenya (MDD, 2024) could therefore also be present in Rwanda.

[71]) **Striped leaf-nosed Bat**, ***Macronycteris vittatus***. A specimen is mentioned by Schouteden (1947) as *Hipposideros commersoni marungensis*. At that time *H. commersoni* was considered to occur across the African continent. Today, this species is transferred to the genus *Macronycteris* (Foley *et al*., 2017), but its nominal population, *commersoni*, refers to Malagasy populations only. The two former subspecies, *gigas* and *vittatus* (or its synonym *marungensis)*, have been elevated to species rank as *Macronycteris gigas* and *M. vittatus*, because their ranges partially overlap and they differ in size and genetics (Patterson *et al*., 2020). Curriously, neither the IUCN Red List nor the MDD (2024) mention a species of the genus *Macronycteris* for Rwanda. The maps produced by Van Cakenberghe *et al*., (2017) clearly indicate the presence of *M. vittatus* in Rwanda but don't correspond with their text.

Molossidae

[72]) **Short-winged Free-tailed Bat, *Mops brachypterus***. Four specimens (unknown date, unknown locality) are in BMNH (Van Cakenberghe *et al.*, 2017.). However, the species is not mentioned for Rwanda in IUCN Red List and MDD (2025).

[73]) **Long-crested Free-tailed Bat, *Mops chapini***. One specimen (RBINH, 22466) were collected on 1 January1956 in Masha, a locality a little south of Musanze (Van Cakenberghe *et al.*, 2017.). The species is mentioned for Rwanda in the IUCN Red List but not in the MDD (2025).

[74]) **Midas Free-tailed Bat**, ***Mops midas***. This species was recorded for Rwanda by Baeten *et al*., (1984) as *Tadarida midas*. As such it was also mentioned by Monfort (1992) and as *Mops midas* by the IUCN Red List (Monadjem *et al.*, 2017h) and by the MDD (2025). However, as a widespread species of lowland savannas, this species should not be common in Rwanda. Van Cakenberghe *et al.* (2017) do not mention any record for the country.

[75]) **Harrison's Giant Mastiff Bat**, ***Otomops harrisoni***. This species, newly described by Ralph *et al.* (2015), has recently been recorded in a volcanic cave near Musanze (Patterson *et al.*, 2018).

Vespertilionidae

[76]) **Banana Pipistrelle**, ***Afronycteris nanus***. This species had been mentioned by Verschuren (1965) as *Pipistrellus nanus*, by Dowsett & Dowsett-Lemaire (1990) as *P. africanus* and by Van Cakenberghe *et al.* (2017) as *Neoromicia nana*. It was placed in the new genus *Afronycteris* by Monadjem *et al.* (2020) during a revision of the pipistrelle-like bats (Vespertilionidae).

[77]) **Damara Wooly Bat**, ***Kerivoula argentata***. According to the IUCN Red List (Monadjem *et al.*, 2017f) Rwanda is just outside the distribution area of this species. Nevertheless, it was recorded recently in the Nyungwe National Park (Flanders *et al.,* 2022).

[78]) **Coppery Woolly Bat**, ***Kerivoula*** cf. ***cuprosa***. This species was already mentioned for the Nyungwe Forest without any detail (Chao, 2008). Two specimens were collected at Kamiranzovu and Uwinka in Nyungwe National Park, in November 2004 (Kityo *et al.*, 2009). A question mark remains because these two specimens could perhaps belong to *K. smithii*, a large *Kerivoula* species known from only a handful specimens. Until the definition of this taxon is re-stated the identification has to remain provisonal.

[79]) **Cape Serotine**, ***Laephotis capensis***. This species is widely distributed through most of sub-Saharan Africa. It is mentioned for the Nyungwe Forest as *Pipistrellus capensis*, but without any details by Chao (2008). It is also mentioned for Rwanda by the MDD (2024). More details would be welcome.

[80]) **Large-headed Serotine**, ***Nycticeinops macrocephalus***. Van Cakenberghe *et al* (2017) mention an adult male specimen from the Nyungwe Forest in March 1990 and identified as *Hypsugo* cf. *eisentrauti*. *Hypsugo eisentrauti* is, however, endemic to Cameroon. This specimen was therefore re-studied by Hutterer & Kerbis Peterhans in 2019 and identified as *Parahypsugo macrocephalus*. During a revision of the Verspertilionidae family, it was renamed *Nycticeinops macrocephalus* by Monadjem *et al* (2020), the genus *Nycticeinops* being a sister branch of *Hypsugo*.

[81]) **Rendall's Serotine**, ***Pseudoromicia rendalli***. This widely distributed species is mentioned for Rwanda by the IUCN Red List (Monadjem *et al.*, 2017) and the MDD (2025), based on two records from eastern Bugesera (iNaturalist).

[82]) **White-winged Serotine**, ***Pseudoromicia tenuipinnis***. This species was listed by Hayman *et al.* (1966) as *Eptesicus tenuipinnis* and by Van Cakenberghe *et al.* (2017) as *Neoromicia tenuipinnis*. It was placed in the newly created genus *Pseudoromicia* by Monadjem *et al.* (2020).

[83]) **Ruppell's Pipistrelle**, ***Vansonia*** cf**. *rueppellii***. Van Cakenberghe *et al.* (2017) doesn't mention *Pipistrellus rueppellii* for Rwanda. However, his modelled distribution map shows that this species is widespread throughout tropical Africa, and even in the Mediterranean regions from Tunisia to Egypt. It could therefore be present in Rwanda. In their revision of the family Vespertilionidae, Monadjem *et al.* (2020) included two specimens from Rwanda in their molecular genetic analysis. It appears that they cluster with two specimens from Kenya fairly close to specimens of *Vansonia rueppellii* from Egypt and Senegal. They were therefore considered to be *Vansonia* cf. *rueppellii*. Further studies will be needed to decide whether the specimens from East Africa (Rwanda and Kenya) represent an undescribed species or whether they belong to a more polymorph *Vansonia rueppellii*.

Pholidota

Manidae

[84]) According to Hassanin *et al.* (2015), the African Manidae all belong to the genera *Phataginus* (the tree pangolins) and *Smutsia* (the ground pangolins), while the genus *Manis* is restricted to the Asian species.

[85]) **Giant Pangolin**, ***Smutsia gigantea***. This species was first mentioned by Freshkop (1944) from a specimen collected in the area of Kibungo (now Ngoma) but nobody had ever seen it again. Recently several observation were made in Akagera National Park with camera traps. D. Bantlin observed a specimen walking along the main road from the gate to the reception in 2017, and visitors to the park filmed a specimen walking close to their vehicle in November 2022.

[86]) **Ground Pangolin**, ***Smutsia temminckii***. This species is uncommon in Akagera National Park. However, being strictly nocturnal, it is probably less rare than the few observations suggest.

Carnivora

Mustelidae

[87]) **African Swamp Otter**, ***Lutra capensis***. A recent molecular genetic study based on whole-genome analysis of the Lutrinae subfamily of the Mustelidae found that the genera *Aonyx* and *Lutra* should be synonymised under *Lutra* (de Ferran *et al.*, 2022). *Lutra capensis* has been recorded in the east of Rwanda (Lejeune & Franck, 1990).

[88]) **Congo Swamp Otter**, ***Lutra congica***. According to Wilson & Reeder (2005) *Aonyx congica* should be regarded as a subspecies of *A. capensis*, but many authors consider the two taxa as distinct at species level, based on their sympatric occurrence in Uganda and Rwanda (e.g. Jacques, 2009). A recent molecular genetic study based on whole-genome analysis has confirmed that the Congo Swamp Otter and the more widespread African Swamp Otter are reciprocally monophyletic, having diverged about 440,000 years ago, and should be considered separate species (de Feran *et al.*, 2022). The Congo Swamp Otter is known from western Rwanda, and was even photographed in Nyungwe National Park (Chao, 2008).

[89]) **Spot-necked Otter**, ***Hydrictis maculicollis***. This species is especially common in Lake Muhazi (Lejeune & Frank,1990).

[90]) **Zorilla**, ***Ictonyx striatus***. This species was recorded from Gisenyi, Ruhengeri and Kigali by Schouteden (1947). It is mentioned without any detail by Monfort (1992), but a specimen was recently killed at night on a road.

[91]) **Honey Badger**, ***Mellivora capensis***. In Akagera National Park, many badgers seen at night crossing a track were black and white. In the area of Musanze several road kills were reported in the last decades; it were almost all whole blackish animals.

[92]) **Striped Weasel**, ***Poecilogale albinucha***. This species is extremely discreet and strictly nocturnal. It was mentioned by Schouteden (1947) from Ruhengeri, Gisenyi and Kigali. Around 1970 it was observed near Rwinkwavu (just outside Akagera National Park) but the species was never detected by camera traps inside the park. Records in the Nyungwe Forest and Mukungwa Valley concern animals killed at night on a road (Dowsett & Dowsett-Lemaire, 1990). A recent record near Gakenke on the road Kigali-Musanze was also a road-kill.

Canidae

[93]) **Side-striped Jackal**, ***Lupulella adusta***. This species was mentioned as *Canis adustus* (Freshkop, 1944; Vande weghe & Dejace, 1991; Monfort, 1992), but phylogenetic analysis consistently support the placement of side-striped jackal and black-backed jackal as a monophyletic lineage outside the clade that includes *Lycaon*, *Cuon*, and

all other *Canis* species. Studies based on palaeontological data as well as a dataset of morphological characters and genetics support this placement. Despite morphometric overlap between all jackal-like species, the IUCN SSC Canid Specialist Group recommends that the side-striped jackal and the black-backed jackal should be placed in a distinct genus, *Lupulella*, with specific names *Lupulella adusta* and *Lupulella mesomelas*, respectively (Alvares *et al.*, 2019). In the 1970s and 1980s, the side-striped jackal still existed throughout Rwanda and was regularly seen crossing roads at night. Today, it has become rare outside protected areas, except perhaps in the Gisakura region and the Musanze region, where several specimens were killed by farmers during an administrative hunt in 2024.

[94]) **African Wild Dog**, ***Lycaon pictus***. This species was common in Akagera National Park before 1962 (De Leyn, 1962). At that time it was even considered a pest, and despite the strong conservation rules many individuals were culled by the park authorities. At that time, lone individuals or small groups even appeared outside the Akagera National Park around Rwamagana or in the Bugesera. During the 1960s, its population started to decrease and the species became extinct locally in the early 1980s as mentioned by Verschuren (1988), Vande weghe (1990) and Monfort (1992).

Felidae

[95]) **Afro-Asiatic Wildcat**, ***Felis lybica***. This species was mentioned by Schouteden (1947) from a locality north-east of Lake Rweru (Gisaka). It was referred to as *F. sylvestris* by Monfort (1992). Recent studies have shown, however, that *F. silvestris* is restricted to Europe, while *F. lybica* is found throughout Africa, the eastern Mediterranean and western Asia as far east as western China and Mongolia (Kitchener *et al.*, 2017). In Rwanda, this species is very elusive and appears to be less rare than expected. It was observed at night in Akagera National Park in the early 1970s and in November 2023 at Nyankora, close to Akagera national Park. Recent Camera trap surveys on the outskirts of Nyungwe and Volcanoes National Parks have revealed that it thrives in human-made environments. There is most probably some hybridisation with domestic cats, but this has not yet been documented and domestic cats are not numerous in Rwanda outside urban areas.

[96]) **Serval**, ***Leptailurus serval***. The serval (Fig. 17–19) was found in most of Rwanda until the late 1970s, but it was heavily hunted for its skin which was openly sold on the street in Kigali and Gisenyi. Today, it only survives at low density in the national parks, and has been recorded far inside closed-canopy forest in Nyungwe National Park (Evers *et al.*, 2025). There are some records outside of national parks but this requires further investigation.

[97]) **Golden Cat**, ***Caracal aurata***. This species was mentioned from the Bugoie region and Rwankeri by Schouteden (1947). It was reported from the Nyungwe Forest by Elbl *et al.* (1966) and Storz (1983). A skin of this species from near Gabiro in Akagera National Park was collected by R. Verhulst in the 1940s. In 1971, a specimen was seen at early morning in the riparian forest along the Akagera river near Kagitumba (Vande weghe & Dejace, 1991). This animal had been attracted by the distress calls of a sunbird caught in a mist net (J.P. Vande weghe, pers. obs.). Recently, the presence of this species in Volcanoes National Park was confirmed (Moore *et al*., 2019) the Golden Cat has been captured by a camera trap in the Gashiranyota Forest in the south of Akagera National Park (D. Bantlin, pers. obs.). However, no trace of this species has been found in the Nyungwe Forest for 20 years, and no camera traps have been able to detect its presence. It must therefore be considered locally extinct in this forest (Moore *et al*., 2019), most probably as a result of snare trapping by gold miners.

[98]) **Lion,** ***Panthera leo***. According to information collected in 1938, lions existed throughout eastern Rwanda, especially Bugesera, the Kigali region and in the territories of Ruhengeri and Gisenyi (Freshkop, 1944). During the Second World War, a lion was shot in Butare (now Huye). In the 1950s, the species was present in the volcanoes sector of Albert NP including current Volcanoes National Park (IPNCB archives). It was eradicted in Bugesera when the Karama research station was built, but it appeared regularly in eastern Buganza where it was feeding on domestic animals. It was still present in Icyanya (current Masaka region) until the late 1950s. Towards the end of the 1980s, the lion population of Akagera National Park numbered 200-250 individuals (Monfort, 1992). However, during the 1990-1994 war and especially in the early post-war years, the species was eradicated from eastern Rwanda by poisoning cattle carcasses. In 2015, lions were re-introduced from South Africa. They were not East African lions, but they belonged at least to the same *melanochaita* subspecies.

[99]) **Leopard**, ***Panthera pardus***. According to Freshkop (1944), leopards were present throughout Rwanda by 1938. In the early 1970s, the species was still present around Kigali (e.g. in the Mount Jari and Icyanya regions), as well as in Bugesera and Gisaka regions. However, contrary to Monfort (1992), we agree with Storz (1984) that the species had disappeared from the Nyungwe and Gishwati forests, as well as Volcanoes National Park, by 1970. Between 1972 and 1985, J.P. Vande weghe spent over 180 days hiking through the Nyungwe Forest, yet he never found a leopard footprint on a muddy trail. Scientists from the Nyungwe Forest Programme and the Moermond team were also unable to find any evidence of this large carnivore in the forest. Large carnivores such as leopards

Fig.17. A Serval, *Leptailurus serval,* on a trail in Nyungwe Forest (camera trap photo taken by the Nyungwe Management Company on 9 March 2022 in Nyungwe National Park). Many Servals recorded in the Nyungwe Forest belong to the servaline morph, whereas most Servals found in Akagera National Park belong to the 'normal' morph (Fig. 19).

Fig. 18. A Serval of the 'servaline' morph in Akagera National Park. (Camera trap photo taken by the Akagera Management Company on 6 June 2020).

Fig. 19. A Serval in Akagera National Park. (Photo by Drew Bantling on 4 July 2021 in Akagera National Park).

can only survive and reproduce in the presence of a significant population of medium-sized or large mammals (Henschel, 2008). This was no longer the case in the forests of the Congo-Nile Ridge in Rwanda short after gold panning began in 1935. At that time, in most of Rwanda, the last surviving leopards were feeding on domestic animals, especially dogs and goats (Freshkop, 1944). Even in Akagera National Park, the population did not number 'several hundred', as claimed by Monfort. Studies in the vast forests of Gabon have revealed that the population density of this species is typically much lower than previously thought, even in pristine forests (Henschel, 2008).

Hyaenidae

[100]) **Spotted Hyena**, ***Crocuta crocuta***. According to information gathered in 1938 by Frechkop (1944), this species still existed throughout Rwanda in the 1930s. In the 1960s it was still present around Kigali and Gitarama. In the 1970s it still existed around the Volcanoes National Park and the Nyungwe Forest. Currently it only survives in numbers in Akagera National Park, but a few hyenas are still living outside the park's fence in cultivated areas. Inside the park its population had strongly increased during the period that there were no lions. In Kirara plain hyenas sometimes form groups of over 30 individuals.

Viverridae

[101]) **African Civet**, ***Civettictis civetta***. This species was fairly common before 1994. It was often seen during night drives throughout Akagera National Park, and it also existed outside the park, especially in the Umutara and Gisaka regions, in the Ruhengeri and Kibuye regions and in the border areas of the Nyungwe Forest. Skins were often sold in Kigali or Gisenyi (now Rubavu). A specimen was killed recently near Nyagatare. However, this species is nowadays extremingly rare outside the protected areas. Even in Akagera National Park it is now very rare. The reasons for the alarming situation of this species are unclear. The presence of a huge number of cattle and herders with large dogs inside the park for nearly 10 years could be an explanation. Civets are terrestrial animals that are most likely very vulnerable to large dogs, unlike genets, which are much more arboreal.

[102]) **Large-spotted Genet, *Genetta fieldiana***. This species was until recently known as *G. maculata*. The name *maculata* was rejected by the ICZN, however, and the name *fieldiana* was the next available name (ICZN, 2007). This species is fairly common in Akagera National Park, and is not significantly less common today than in the 1980s. It still exists on the outskirts of Kigali, and probably in many other places.

[103]) **Small-spotted Genet**, ***Genetta servalina***. This species is known from Nyungwe Forest, but should also be present in Cyamudongo Forest and Gishwati Forest. According to the revision of the genus *Genetta* (Gaubert *et al.*, 2005), this species is most likely Schouteden's Genet *Genetta 'schoutedeni'* (Crawford-Cabral, 1970), which has a widespread distribution in Central and East Africa.

[104]) **Giant Genet**, ***Genetta victoriae***. This species was seen and photographed on 10 July 2005 at night in the Nyungwe Forest at about 1,800 m asl (Dinets, 2011).

[105]) **Central African Oyan**, ***Poiana richardsoni***. This arboreal species was recorded by camera-traps between June and September 2017 on several locations in the Nyungwe Forest between 1 790 and 2 700 m (Moore & Niyigaba, 2018).

Perrissodactyla

Rhinocerotidae

[106]) **White Rhinoceros**, ***Ceratotherium simum***. According to Groves *et al.* (2010), the northern and southern white rhinos were distinct species, separated by around 1 million years (quite similar to the separation between the two gorillas or the chimpanzee and the bonobos). This conclusion was significant, but was never accepted. Had it been accepted, however, more efficient efforts to save the critically endangered northern species might have succeeded (Groves & Grubb, 2011). In 2021 and 2025, white rhinos from South Africa were introduced into Akagera National Park as part of a programme to save this species.

[107]) **Black Rhinoceros**, ***Diceros bicornis***. In 1956, six black rhinos originating from Karagwe in Tanzania, and therefore belonging to the subspecies *minor*, were introduced into Akagera National Park. One male died quickly but was replaced in 1957. The population flourished and by the early 1970s numbered several dozen individuals. We will never know exactly how many. Poaching began in the late 1970s and especially in the 1980s. After the war, in the mid-1990s, three or four individuals survived in the west of the park, and a last black rhino was photographed by tourists in 2007 near the Kirara plain. In 2017, black rhinos were reintroduced. They came from South Africa but belonged to the Kenyan subspecies *michaeli*.

Equidae

[108]) **Plains Zebra**, ***Equus quagga***. This species is widely distributed across eastern and southern Africa, with numerous forms having been described. Rwandan zebras belong to the subspecies *boehmi*, which is found from Ethiopia and Somalia to Tanzania, Uganda and Rwanda (Fig. 10). However, a molecular genetic study has shown that, although zebra populations are highly diverse, they cannot be separated into homogeneous groups (Lorenzen *et al.*, 2008). A few zebras survive outside Akagera National Park in the Gabiro military camp and the Umutara area, where they are tolerated.

Cetartiodactyla

Bovidae

[109]) **Common Impala**, ***Aepyceros melampus***. This species existed throughout eastern Rwanda from the Muvumba valley in western Umutara to the Rusumo area and the Bugesera region. Today it is almost restricted to Akagera National Park, but a few survive outside the park in the Umutara region.

[110]) **Topi**, ***Damaliscus ugandae*.** The genus *Damaliscus* is widespread in the Sudano-Zambezian and Sudano-Sahelian savanna biome. Numerous 'subspecies' have been described, but with the exception of the South African bontebok *D. pygargus*, some authors group them all into a single species, *Damaliscus lunatus*. This is the classification proposed by Duncan (2013) and followed by the MDD (2025), while Groves & Grubb (2011) recognise 11. *D. ugandae* is known only from Uganda, Rwanda and the Lake Edward plain in the DRC (Figs. 22 and 23). Its popuations in DRC and Rwanda are declining, and its conservation status is worrying.

Damalisks currently have a wide but fragmented distribution. Each 'subpopulation' is centred on a particular floodplain system where the males establish leks. However, seasonally, they move to other open savannas where the calves are born. Due to their strict ecological requirements, it is likely that there is little or almost no gene flow between some neighbouring populations. This could explain the morphological differences observed between the various populations. A molecular genetic study revealed significant variation in mitochondrial DNA sequences, reflecting a strong population structure with complete lineage sorting. The study suggests that this antelope, which at times was widespread across Africa, became extinct except in a few refugia. In response to eco-climatic oscillations, each relict population may have undergone alternating expansion and contraction of lineages (Arctander *et al.*, 1999). However, only two taxa (*jimela* and *lunatus*) were tested. Therefore, to draw conclusions regarding the genus *Damaliscus*, many more populations should be tested. In the meantime, we prefer to treat the different populations as distinct, following the classification of Groves & Grubb (2011).

A comprehensive genetic study of the genus *Damaliscus* would be all the more welcome given that its overal situation is rather worrying. The IUCN SSC Antelope Specialist Group (2016) classifies *D. lunatus* in the 'Least Concern' category, but it recognises that the topi 'was one of the most numerous large antelope species in Africa, but has been eliminated from much of its former range. Various populations have become very rare and the species has disappeared from Mali, Mauritania, Mozambique, Senegal, The Gambia, Burundi, Nigeria, western Chad, Katanga province in DRC, Mozambique, and Swaziland (where it has been re-introduced recently)'. Moreover, it is declining even in some large, well protected areas, as for example in the Kruger NP in South Africa (Dunham *et al.*, 2005). This 'species' does not only suffer from being hunted for its meat, like most antelope species. It is also driven from its preferred floodplain grasslands by the ever increasing domestic livestock. As for *D. ugandae,* this species is endemic to the Interlacustrine Savannas. In Rwanda, its population was estimated at about 2 000 in 1947 and 2 044 (1 588-2 500) in 1969. It increased to 9 800 (8 300-11 300) in 1990 (Vande weghe & Dejace, 1991; Vande weghe, 1998a), but was strongly reduced after 1994: 770 in 1998, 531 in 2002 and 1 518 (317-4 367) in 2014 (Apio & Wronski, 2011; Apio *et al.*, 2015). Around 2010, it was definitely recovering (Apio *et al.*, 2015), but has declined again since then. The exact reason for this recent decline is unclear. It is most likely due to the suppression of its migration and the excessive pressure from hyenas and lions.

[111]) **Klipspringer**, ***Oreotragus oreotragus***. This species has a wide distribution in sub-Saharan Africa, but as it inhabits rock outcrops and cliffs or at least very stony hills, its population is extremely fragmented. As a result, there is great variation in size, colouration and sexual dimorphism. Groves & Grubb (2011) therefore recognise temporarily 11 species and two undescribed forms. One of these is the 'Ankole' form to which the Rwandan klipspringers belong (Fig. 20) and which could perhaps be lumped with the Kenyan Golden Klipspringer *Oreotragus aureus*. In any case, the Rwandan population is currently reduced to the high ridges in Akagera National Park (from Muhororo to Kiyonza), whereas in the 1960s and 1970s it extended from the Umutara kopjes to the Nyarubuye cliffs in Gisaka.

[112]) **Oribi**, ***Ourebia montana*.** The genus *Ourebia* is widely distributed, but it is also highly fragmented into many isolated populations, with very little gene flow between neighbouring populations. While most authors recognise

Fig. 20. Some individuals of the common zebra, *Equus quagga,* in the Rwandan population have an abnormality in the black-and-white pattern of their saddles. This abnormality was already present around 1970 and does not appear to be increasing significantly in frequency. (Photo taken by J. P. Vande weghe on 10 March 2012 on Mount Mutumba in Akagera National Park).

Fig. 21. A female Klipspringer, *Oreotragus oreotragus*, with a large juvenile. According to Groves & Grubb (2011), the Rwandan population of Klipspringer may belong to the 'Ankole' form, which could perhaps be grouped with the Kenyan Golden Klipspringer, *Oreotragus aureus*. However, the colour pattern of the two animals in the picture resembles that of the East African subspecies, *shillingsi*. A genetic study would be interesting. In his inventory of the mammals of Akagera National Park, Freshkop (1944) mentions the species but without identifying the subspecies. (Photo taken by Gael R. Vande weghe, on 19 May 2021 in Rwingwe, Akagera National Park).

Fig. 22. Two Topis, *Damaliscus ugandae,* in the Kirara Plain. The Rwandan population is isolated from the Tanzanian population living in Burigi-Chato National Park by the Middle Akagera River and its extensive lake and swamp system. The only population with which the Rwandan population could have had genetic exchanges in the last 10,000 years is the population from the Lake Mburo National Park area in Uganda. Genetic comparisons between these populations would be interesting. (Photo taken by Gael R. Vande weghe, on 8 November 2025, Kirara Plain, Akagera National Park).

Fig. 23. A female Topi with her calf, which is a few weeks old. (Photo taken by Gael R. Vande weghe, on 29 September 2010 on the Kandaro Ridge in Akagera National Park).

Fig. 24. Three Oribis, *Ourebia montana*, on the Mutumba Plateau: a male on the left, an adult female on the right, and an immature animal in the middle. The male's and female's tail is black. (Photo taken by Jean P. Vande weghe on 10 March 2012 in Akagera National Park).

Fig. 25. A female Oribi, *Ourebia montana*, on the Mutumba Plateau. As with most East African oribis, its tail is black. (Photo taken by Jean P. Vande weghe on 10 March 2012 in Akagera National Park).

only one species, Groves and Grubb (2011) recognise four. The Rwandan oribis apparently belong to *O. montana*, which is found from northern Nigeria to Ethiopia and Uganda (Figs. 24 and 25). They belong more precisely to the 'Ankole' population, which was described in 1926 as '*O. pitmani*' and sometimes has a black tail, similar to the Kenyan species *O. hastata*. This species was once widespread in eastern Rwanda, but is now only found in Akagera National Park.

[113]) **Kivu Duiker**, ***Cephalophorus kivuensis***. This species is mentioned by Freshkop (1944) as *Cephalophus natalensis nigrifrons* for Akagera National Park (Kadjumbura) but the description of his observation is not very convincing. It is mentioned for Nyungwe National Park by Dowsett & Dowsett-Lemaire (1990), Plumptre *et al.,* 2002, and Chao (2008) as *Cephalophus nigrifrons*. It is also mentioned with the same name for Volcanoes National Park (Monfort, 1992). In fact it is the commonest duiker in the forests of western Rwanda. However, this species has recently been split from *Cephalophus nigrifrons* and moved from *Cephalophus* to *Cephalophorus* (See comments on *Sylvicapra grimmia*). As for *Cephalophorus kivuensis*, described in 1919 by Lönberg as *Cephalophus nigrifrons kivuensis*, it was elevated to the rank of species by Bärmann *et al.* (2022); it is known from eastern DR Congo, Uganda, Rwanda, Burundi and Kenya (MDD, 2025).

[114]) **Lestrade's Duiker**, ***Cephalophorus lestradei***. This species is often considered to be a subspecies of Weyns's duiker *Cephalophus weynsi* (IUCN SSC Antelope Specialist Group, 2016; MDD, 2024). As a result, very little information is available on this species. It was first collected in 'Astrida Forest' (now Nyungwe Forest) by Lestrade, but was misidentified as Abbott's duiker *Cephalophus spadix* (Schouteden, 1947). It was described as *C. weynsi lestradei* by Groves & Grubb (1974) and elevated to species status by Groves & Grubb (2011). This decision was followed by Wilson & Mittermeier (2011). This is justified by the fact that species in the tribe Cephalophini have been separated for 5-7 My (Hassanin *et al.*, 2012; Groves, 2014). Furthermore, *C. lestradei* is restricted to Nyungwe National Park in Rwanda and Bwindi Impenetrable NP in Uganda (Moore *et al*., 2018). It may also be present in Kibira NP in Burundi and north-western Tanzania (Gombe and Mahale Mountains) but we found no objective data for these locations. Its populations are diagnosable and clearly isolated from *C. weynsi* populations on the eastern mountain ranges of the central Albertine Rift. Its conservation status was of concern, but the species was rediscovered using camera traps in Nyungwe Forest and Bwindi Impenetrable NP between 2012 and 2017 (Moore *et al.*, 2018). It was placed in the genus *Cephalophorus* by Groves (2014), as suggested by the work of Hassanin *et al*. (2012), in order to maintain the monophyly of the genus *Cephalophus*. The speciation of *C. lestradei* from *C. weynsi* seems to have followed a mechanism similar to that which isolated *C. kivuensis* from *C. nigrifrons* or perhaps even *Syncerus mathewsi*. These three species have roughly the same distribution.

[115]) **Grimm's Duiker**, ***Sylvicapra grimmia***. Molecular genetic studies have shown that *Sylvicapra* is deeply nested in the phylogenetic tree of the genus *Cephalophus s.l.* (Johnston & Anthony, 2012; Bibi, 2013). It is even part of the *Cephalophus silvicultor* clade together with *Cephalophus dorsalis, C. jentinki* and *C. spadix*. To save the monophyly of *Cephalophus,* Grimm's Duiker could be placed in *Cephalophus*. However, this arrangement would erase seven million years of evolutionary history of the Cephalophini, a bovid tribe endemic to Africa. Accordingly, the genus *Cephalophus s.l.* has to be split into several genera (Groves, 2014) due to the deep temporal separations between the different species groups (Hassanin *et al*., 2012; Bibi, 2013). Therefore, it was most reasonable to split the genus *Cephalophus s.l.* into *Cephalophorus* (*brookei, callipygus, kivuensis, lestradei, leucogaster, harveyi, natalensis, niger, nigrifrons, ogilbyi, rubidus, rufilatus, weynsi*), *Cephalophula* (*zebra*), *Leucocephalophus* (*adersi*) and *Cephalophus* (*dorsalis, jentinki, silvicultor, spadix*). As a result, Grimm's Duiker remains in the genus *Sylvicapra*. This species was widely distributed throughout Rwanda's eastern savanna belt, and until the 1980s it was found in man-made habitats. Today it is very rare outside protected areas and even in Akagera National Park is now very uncommon, perhaps as a result of the impressive carnivore population.

[116]) **Roan Antelope**, ***Hippotragus equinus***. In the first half of the 20th century, this species had a rather wide distribution in eastern Rwanda, ranging from the Umutara region and the Rwamagana area to the Rusumo area. In the 1980s, the population of Akagera National Park was estimated to be between 150 and 160 individuals, divided into 14 territorial groups. Ten of these groups had their territory entirely outside the park's current boundaries. Three groups inhabited areas within the current park boundaries, and one group straddled the border. The future of the species in Rwanda was uncertain, so a study was performed to assess the risks of extinction of this population (Beudels *et al.*, 1992). However, most of the roan population used to live in areas with a higher level of humidity than the current Akagera National Park. In other words, this species is currently living in an eco-climatic zone that is suboptimal. It is therefore unsurprising that there are now only a few dozen roan antelopes and that their population is in continuous decline.

[117]) **Defassa Waterbuck *Kobus defassa***. This taxon is often considered to be a subspecies of the Waterbuck *Kobus ellipsiprymnus*. The IUCN Red List and the MDD accept only one species of waterbuck with two subspecies: *Kobus e. ellipsiprymnus* and *K. e. defassa*. However, the genetic differences between the two 'subspecies' are significant, despite their superficial similarity, admixture between the two 'subspecies' seems to be a recent event, and the introgression between the 'subspecies' is limited (Lorenzen *et al.*, 2006). This could be the result of chromosomal differences that prevent gene flow between *ellypsiprymnus* and *defassa*. A more recent study (Wang *et al*., 2022) came to the conclusion that 'the waterbuck cannot be simply regarded as two discrete evolutionary or management units corresponding to the two subspecies'. The same study concluded that 'if genetic admixture or even hybridisation is a widespread natural process in the biogeographical history of the African antelopes, these processes need to be better understood before we can make informed decisions about what the most relevant conservation units are'. Clearly, we must consider *K. defassa* and *K. elipsiprymnus* to be distinct species, at least as a precautionary measure, until someone can prove otherwise. The Rwandan waterbuck population is now restricted to Akagera National Park. Like several other antelopes it recovered well after the war, but since the 2010s it is decreasing again.

[118]) **Bohor Reedbuck**, ***Redunca bohor***. This species is part of the *Redunca redunca* species complex. It is known from Ethiopia, Kenya and Uganda (Groves & Grubb, 2011). In Rwanda, this species used to occur in the Bugesera, Icyanya, Buganza, Umutara and Mubari regions. In the 1980s, it was particularly abundant in Umutara, where groups of 12-18 individuals were regularly observed. It is currently restricted to Akagera National Park where a few isolated specimens survive, mainly around the Kirara and Muhana plains. Until around 2010–2012, the species was recovering, but since the reintroduction of lions, it has been in steady decline and is probably close to local extinction.

[119]) **Virunga Buffalo**, ***Syncerus mathewsi***. This buffalo was described by Lydekker in 1904, but has traditionally been considered an intermediate between the large black Cape Buffalo *Syncerus caffer* and the small red Dwarf Buffalo *S. nanus* (Wilson & Reeder, 2005; MDD, 2024). However, current evidence suggests that it is a homogeneous taxon distinct from all other African buffaloes (Groves & Grubb, 2011). It is known from extreme south-western Uganda, western Rwanda and easternmost DR Congo, where it is currently restricted to the forested mountains of the Virungas and the western side of Lake Edward. The buffalo population of the Gishwati Forest that still existed in the late 1980s (Weber & Vedder, 2001) most likely belonged to this species, as the Gishwati Forest formed a continuum with the forest of the volcanoes until the 1960s. The buffalo population of the Nyungwe and Kibira forests most probably also belonged to this species. They were small, black buffalo with narrow, backwards oriented horns. According to the hoof tracks we observed in 1972 in a small forest river, they were rather small animals. Unfortunately we will never know for sure as it became extinct in the mid- or late 1970s. The small population in Volcanoes National Park, estimated at less than 100 individuals, may be the last viable population of this species. It is very different from the buffalo in Akagera National Park and fortunately much less aggressive, otherwise there would have been many accidents with tourists on gorilla trekking. It is important to be aware of the existence of this species in the event of buffalo being reintroduced into the Nyungwe Forest, as they should originate from the volcanoes.

[120]) **Cape Bushbuck**, ***Tragelaphus sylvaticus***. This species was described in 1780 by Sparrman but usually considered a subspecies of the Common Bushbuck *T. scriptus*. It was proven to be distinct by molecular genetic studies (Moodley *et al.*, 2009; Hassanin *et al.*, 2018). It has a wide distribution from East Africa to the Cape. A few survive outside Akagera National Park in the Gabiro military camp and the Umutara region.

[121]) **Sitatunga**, ***Tragelaphus spekii***. This species was widely distributed in all wetlands of eastern Rwanda. For example, it was quite common in the Nyabugogo valley until about 1970. It was most abundant, however, in the Middle Akagera wetlands in Akagera National Park. Its population there was estimated at about 10.000 (Dejace & Vande weghe, 1991; Beudels *et al*., 1997). This was probably the largest population in East Africa at the time, but it was nearly brought to extinction by Nyambo poachers from Tanzania. The species survives in small numbers in the Upper Akagera swamps (there is even a recent record in Nyandungu Ecopark located inside Kigali) and in the Gabiro military camp.

[122]) **Common Eland, *Taurotragus oryx***. The population of this species was estimated at 700 individuals in 1947 and 735 (670-800) in 1969. In 1990, it had declined to about 325 (300-350) (Vande weghe & Dejace, 1991; Vande weghe, 1998). After the war, this population was estimated at 114 in 2002 (Apio & Wronski, 2011) and about 120 in 2014 (Apio *et al*., 2015). Currently, only around 50 individuals remain. In Akagera National Park, this species appears well adapted to its habitat; however, it may suffer from inbreeding or unsustainable predator pressure on calves.

Giraffidae

[123]) **Masai Giraffe**, ***Giraffa tippelskirchi***. Six individuals (two males, four females) were introduced in 1985 to

Akagera National Park. One male died in a poachers trap, but all other giraffes became well established in the park. Currently their population is estimated at over one hundred. This population is not insignificant, given that the Masai giraffe has suffered a 50% decline in East Africa over the last few decades (Muller *et al*., 2016). The main problem with this introduction in the long term could be inbreeding.

Suidae

[124]) **Giant Forest Hog**, ***Hylochoerus meinertzhageni***. This species was widespread in Rwanda until the 1950s. It was reported in the volcanoes (Schouteden, 1947). According to F. Verhulst, who organised mining prospections in the Nyungwe and Kibira forests in the late 1950s, the species was 'common' (F. Verhulst, pers. comm.). In Akagera National Park, Chief-Warden P. Baert observed groups of five and seven animals in August 1956 near Lake Hago (Verschuren, 1965b). The last records date back to 1974 in Akagera National Park (Vande weghe & Dejace, 1991); 1979 in Volcanoes National Park (Weber & Vedder, 2001); July-August 1985 in the Mpanga Ranch where a skull was found (H. Hinkel & E. Fischer, pers. comm.); and 1996 in the Nyungwe Forest, when a skull was found near Rwasenkoko (H. Hinkel, pers. comm.).

Hippopotamidae

[125]) **Common Hippopotamus**, ***Hippopotamus amphibius***. In the 1970s, this species was widespread throughout the Akagera basin. Today, close to 100 survive in the swamps just outside Akagera National Park. A few individuals also survived in the Nyabarongo valley, which is located on the outskirts of Kigali. The population inside Akagera National Park has been slowly increasing since the eviction of the fishermen in September 2013. Fishing was permitted again in 2020 during the Covid-19 pandemic, but only under strict environmental regulations.

Species not accepted

Procaviidae

Rock Hyrax, *Procavia capensis*. According to Butynski *et al.* (2015) and the MDD (2024), the diurnal hyrax living on rock outcrops in Akagera National Park should be the Rock Hyrax *Procavia capensis*. According to Butynski (in litt.), this statement is based on the distribution map of the species published in Mammals of Africa, Vol. I (Hoeck & Bloomer, 2013), but no observations have been found. We therefore prefer not to list this species in Rwanda. Its presence is not impossible, however, as the Rock Hyrax often lives in association with the Bush Hyrax (Hoeck & Bloomer, 2013).

Cercopithecidae

Foa's Red Colobus, *Piliocolobus foai*. Recently Tom Butynski and Yvonne de Jong found three skins of this colobus in the collections of the British Museum, originating from 'Gisenyi' in 1928 (Butinsky, pers. comm.). At that time, this species, which is currently highly endangered, was found in the montane and submontane forests of the Albertine Rift, from the Kahuzi-Biega area in the north to Mount Kabobo in the south. It is highly likely that these three skins were brought to Rwanda by Congolese people who came to sell masks, ivory and skins to Westerners in the Goma-Gisenyi area. The exact origin of these specimens will remain unknown.

Uganda Red Colobus, *Piliocolobus tephrosceles*. An isolated specimen of this colobus monkey was seen by Gael R. Vande weghe in June 2021 in Rusumo. The animal was in the remnants of riparian forest on the Tanzanian bank of the Akagera River. In the 1970s and 1980s, Belgians who had hunted 'big game' in this area in the 1950s and 1960s told us that they had repeatedly seen 'red' colobus in the riparian forests (e.g. H. Verhulst, F. Verhulst). They never told us whether they had seen them on the Tanzanian or the Rwandan side of the river. This observation is not unexpected, as the Ugandan Red Colobus was common (pers. obs.) and is still present in Ruvubu NP in Burundi (The Wilderness Project, 2024), 80 km upstream from Rusumo. There, in the mid-1990s, groups of up to 80 individuals were observed in the dense riparian forests (pers. obs.). The presence of this species in Rwanda, at least before the clearing of the forests in the Rusumo region, was therefore highly possible as mentioned by the MDD (2025). However, in the absence of any confirmed observations from the Rwandan side of the river, we cannot include this species in the Rwandan list.

Galagidae

Southern Lesser Galago, *Galago moholi*. The MDD mentions this species in Rwanda, but we have no evidence of its presence in the country. It is also absent from Burundi and Tanzania (Bearder *et al*., 2021), and its northern distribution limit appears to be around 400–500 km south of Rwanda.

Demidoff Galago, ***Galagoides demidoff*.** Dowsett & Dowsett-Lemaire (1990) report a possible sighting of this species by J. Kalina, but also report that despite spending many nights in the forest they never heard this species, although it is noisy. We do not know on what basis MDD mentions this species for Rwanda.

Leporidae

Cape Hare, *Lepus capensis*. According to Monfort (1992) this hare exists in Rwanda, but we couldn't find any concrete records. However, Freshkop (1943) mentions *Lepus capensis crawshayi* in his list of mammals from the Albert NP in Congo, including the present Volcanoes National Park. This is very misleading as *L. crawshayi* is a synonym of *L. microtis*. Nevertheless, the GBIF database mentions a record of *L. capensis* for Kisoro in south-western Uganda, a few kilometres from the Rwandan border. The presence of *L. capensis* in Rwanda therefore seems possible, but in the absence of concrete evidence, we cannot list this species for Rwanda. The IUCN Red Data List and the MDD (2024) do not mention it for Rwanda either.

Bunyoro Rabbit, ***Poelagus marjorita*.** Schouteden (1947, 1948) mentions two specimens from Nyagatare (Umutara) as *Lepus (Poelagus) marjorita ruandensis* nov. sp. At the RMCA there are also specimens identified as *P. marjorita* from Kibungu and Rwinkwavu (Happold & Wendelen, 2006), but these were all examined by Petter (1959) who identified them as belonging to the genus *Lepus*. *P. marjorita* therefore does not exist in Rwanda and Monfort (1992) was right not to include it in his checklist.

Hystricidae

Crested Porcupine, ***Hystrix cristata***. This species is mentioned for Rwanda in the IUCN Red Data List (Amori & De Smet, 2016) and in the MDD (2025), but we don't know of any records. All *Hystrix* specimens that could be identified were *H. africaeaustralis*. Furthermore, according to the GBIF database, the distribution of this species in East Africa seems to be restricted to Kenya, north-eastern Tanzania and the Lake Albert area in northern Uganda. Therefore, in the absence of concrete evidence, we do not list this species for Rwanda.

Sciuridae

Alexander's Squirrel, ***Paraxerus alexandri*.** This lowland forest squirrel has been mentioned without any evidence by Cockar (2022) based on Plumptre *et al.* (2002), Chao (2008) and Kingdon *et al.* (2013). This was based on a misidentification of Boehms's Squirrel, *Paraxerus boehmi* (Fig. 6).

Striped Ground Squirrel, *Xerus erythropus*. This species is erroneously mentionned for Akagera National Park by Cockar (2022) based on Kingdon *et al.* (2013).

Muridae

Kemps's Gerbil, ***Gerbilliscus kempii***. This gerbil is mentioned in the IUCN Red List for Rwanda (Granjon, 2019), but according to the MDD (2024) its distribution is restricted to West Africa. The specimens attributed to *G. kempii* in Rwanda now belong to *G. giffardi* (Granjon *et al.*, 2012).

Moon Mountains Striped Mouse, ***Hybomys lunaris***. This species is only known to occur in the Democratic Republic of Congo and Uganda (MDD, 2025). DNA examinations of *Hybomys* specimens trapped in the Nyungwe Forest in 2022 and 2023 and apparently not belonging to *H. univittatus*, showed 94.71–95.02% similarity with *Hybomys lunaris* for the Cytb gene. This result was not considered conclusive for the acceptance of this species on the Rwanda list (Majyambere *et al.*, 2025) but it seems that in the Nyungwe Forest there is an unnamed species of genus *Hybomys*. Further studies are needed.

Griselda Grass Mouse, ***Lemniscomys griselda***. This species was mentioned for Rwanda by Misonne (1965), Vande weghe & Dejace (1991) and Monfort (1992). In its current definition, however, it is restricted to Angola and the neighbouring regions of the DR Congo and Zambia (MDD, 2025). The specimens collected in Rwanda most probably refer to *L. macculus*. This is probably why the MDD (2025) mentions *L. macculus* for Rwanda.

Eastern Rainforest Thicket Rat, ***Thamnomys kuru***. This species is mentionned for Rwanda as *Grammomys kuru* by the IUCN Red List (Cassola, 2016a) and as *Thamnomys kuru* by the MDD (2025). Bryja *et al.* (2016) only mention one record for the Rwandan area, which is from the lower Akagera River near Lake Victoria (i.e. not in Rwanda). We found no other records. Therefore, we prefer not to include this species in our list for Rwanda.

Nesomyidae

Kivu Giant Rat, ***Cricetomys kivuensis***. This species was described by Lonnberg in 1917 from the forests of the Albertine Rift, and is listed for Rwanda by the MDD (2025). Most authors synonymised it with *C. eminii*, and craniometric data do not support the existence of *C. kivuensis* as a separate species (Olayemi *et al.*, 2012). Majyambere *et al.* (2025) suggest that the species might be present in Nyungwe National Park but they provide no arguments to confirm this. Further research is therefore needed, but so far the few specimens from western Rwanda have all proved to be *C. eminii*.

Savanna Giant Rat, ***Cricetomys gambianus.*** This species is restricted to the Sudanese savannas from Senegal to western Ethiopia, far from the savannas of eastern Rwanda (Olayemi *et al.*, 2012). The references to this species in Rwanda actually referred to *C. eminii* and *C. ansorgei*.

Erinaceidae
Four-toed Hedgehog, *Atelerix albiventris*. This species is mentionned by Cockar for Akagera National Park and as possible for Rwanda by MDD (2025), but we don't know about any record for the country.

Soricidae
Bicoloured Musk Shrew, ***Crocidura*** cf. ***fuscomurina***. *C. fuscomurin*a has a very wide distribution in tropical Africa and its presence in Rwanda is possible. However, according to Hutterer (1983) the taxonomy of this group of very small shrews is difficult, and the identification of the specimen collected near Kibungo (now Ngoma) was tentative and must remain tentative. The species is not mentioned for Rwanda by the MDD (2025) and in most countries of East Africa its presence remains doubtful. So further research is needed.

Jackson's White-toothed Shrew, ***Crocidura jacksoni***. This species is mentioned for Rwanda by the MDD (2025), but not by Wilson & Reeder (2005) or by the IUCN Red List (Oguge *et al.*, 2015). Its distribution is centred in the Lake Victoria basin, and it is found in lowland and montane forests or mixed forest-savanna areas. It also appears to be relatively tolerant of disturbance. It could therefore be found in Rwanda, but pending further research we cannot accept this species on the Rwanda List.

Montane Mouse-shrew, ***Myosorex blarina***. This species is mentioned as most probable for the Volcanoes National Park by Monfort (1992), but it is actually retricted to the Ruwenzori mountains in Uganda and DR Congo (Kerbis Peterhans & Demos, 2021). Its occurrence in Rwanda is therefore unlikely.

Pteropodidae
Hammer-headed Fruit Bat, ***Hypsignathus monstrosus***. This species is mentioned for the Nyungwe Forest without any details (Chao, 2008), and there are no records. Its presence in Rwanda is very unlikely.

Eastern Woermann's Fruit Bat, ***Megaloglossus woermanni.*** This species is mentioned for the Nyungwe Forest without any details (Chao, 2008). Its presence in Rwanda is unlikely.

Little collared Fruit Bat, ***Myonycteris torquatus***. This bat is mentioned for Rwanda by the IUCN Red List (Bakwo Fils & Kaleme, 2016) and MDD (2025). Van Cakenberghe *et al.* (2017) found no records for the country, but several specimens were collected around Bukavu and in the Rutshuru area in DRC, close to the Rwanda border (GBIF). The occurrence of this species in Rwanda seems likely, but according to the IUCN Red List it is a lowland species with 800 m as upper elevation limit, while Rwanda is entirely above 1000 m. We therefore don't accept this species on the Rwanda List until a formal record.

Bergman's Fruit Bat, ***Scotonycteris bergmansi***. This species was first described in 2015 (Hassanin *et al.*, 2015). Prior to this, it was classified as *Scotycteris zenkeri*. The MDD (2025) mentions it as a possibility for Rwanda. However, this bat mainly inhabits lowland areas, and even *S. zenkeri* has never been recorded in Rwanda. Therefore, pending new data, we do not accept this species on the Rwanda list.

Emballonuridae
African Sheath-tailed Bat, ***Coleura afra***. This bat is mentioned as possibly occurring in Rwanda by Monadjem *et al.* (2017) and the MDD (2025). This species is indeed widespread in tropical Africa, from Guinea to Kenya and Angola. However, its distribution is highly fragmented and no records are known from Rwanda.

Miniopteridae
Lesser Long-fingered Bat, ***Miniopterus*** cf. ***fraterculus***. This species was mentioned for Rwanda by Baeten *et al.* (1984) as *Miniopterus schreibersi*, currently a Palaearctic species. Van Cakenberghe *et al.* (2017) mention several records of *M. fraterculus* for the volcanoes region in Rwanda and DRC, the Kibira NP area and other locations in Burundi, and the areas of eastern DR Congo near the Rwandan and Ugandan borders. However, in their assessment of the species for the IUCN Red List, Monadjem *et al.* (2017e) suggest that these identifications should be confirmed. A multilocus phylogeny of the Afrotropical species of the genus *Miniopterus* (the only genus in the family Miniopteridae) has revealed a cryptic radiation with several unnamed 'species' (Demos *et al.*, 2019). This study also suggests that several species may escape identification in less collected areas. The MDD subsequently recognises 11 Afrotropical species in the genus *Miniopterus*, and *M. fraterculus* appears to be a strictly southern African species (South Africa, Eswatini and perhaps Mozambique). The only two species found

hiterto in Rwanda are *M. inflatus* and *M. natalensis*. The former has a wide distribution from Guinea and Liberia to Kenya, Namibia and Mozambique. The latter is found in central, eastern and southern Africa.

Rhinolophidae

Peters's Horseshoe Bat, ***Rhinolophus lobatus***. A study has revealed that *R. landeri s.l.* comprises two species: *R. landeri s.s.* in western, central, northern and north-eastern Africa, *R. lobatus* in southern and eastern Africa (Taylor *et al.,* 2018). Without a re-examination we cannot decide to which species belong the specimens collected in Rwanda. According to the MDD (2025), they would belong to R. lobatus. However, pending confirmation, we cannot accept this species on the Rwanda list. This is particularly the case given that Rwanda lies on the border between the two species, and the Rwandan specimens were collected in the forested areas of the western part of the country.

Vespertilionidae

Lesser Woolly Bat, ***Kerivoula lanosa***. This species is mentioned for Rwanda by the IUCN Red List (Monadjem *et al.,* 2017g) and given as probable by the MDD (2024). However, Van Cakenberghe *et al* (2017) found no collections for the country. This bat has indeed a widepread distribution in sub-Saharan Africa, but pending concrete evidence, we do not accept this species on the Rwanda list.

Variegated Butterfly Bat, ***Glauconycteris variegata***. This Bat has a very wide distribution in Sub-Saharan Africa, mainly in the savanna belt, and is mentioned for Rwanda (Monadjem et al., 2017; MDD, 2025). However, Van Cakenberghe *et al* (2017) found no record for the country. Pending a concrete record, we don't accept this species currently on the Rwanda list.

Manidae

Tree Pangolin, *Phataginus tricuspis*. This lowland forest species was first mentioned by N. Monfort (1985) in a short popular booklet written in Kinyarwanda for schoolchildren. This reference was cited by A. Monfort (1992) and repeated by N. Chao (2008), but the basis for this statement is unknown. According to the Batwa people living near the Cyamudongo Forest, the Tree Pangolin existed in this forest but seems to have disappeared during the 1960s (H. Hinkel, pers. comm.). In the absence of more precise observations, we can conclude that the species may have existed in Rwanda; however, we cannot include it on the Rwanda list. This species is indeed nowhere mentioned from montane forests (Kingdon & Hoffmann, 2013).

Bovidae

Harvey's Red Duiker, ***Cephalophorus harveyi***. According to Freshkop (1944), Schouteden (1947), Verschuren (1987, 1988) and Monfort (1992), '*Cephalophus natalensis*' existed in Akagera National Park. Most observations were made along the lakes of the Middle Akagera basin, but they were always brief and most authors did not provide a description of the animals they observed. Monfort saw a 'red duiker' in dense dry thickets and shrubs in the north of Akagera National Park around 1971 or 1972, but he never mentioned this observation because he was not sure if it was '*C. natalensis*' or '*C. nigrifrons*' (Monfort, pers.com.). The latter, as *Cephalophorus kivuensis*, was and is still common in humid mountain forests in western Rwanda. Only a detailed description by curator Haezaert was convincing. In 1958, he observed such a red duiker on the Byisitire plain, now outside the park (Veschuren, 1987, 1988). This duiker has since been split into two species: the Natal red duiker *C. natalensis* and the Harvey's duiker *C. harveyi*. The former is widely distributed from south-eastern Tanzania to north-eastern KwaZulu-Natal in South Africa (IUCN SSC Antelope Specialist Group, 2016b), while the latter is found from southern Somalia to northern Malawi, with isolated 'relict' populations in central Kenya, Ethiopia, and Zambia (IUCN SSC Antelope Specialist Group, 2016a). Recently, both species were placed in the genus *Cephalophorus* (Groves, 2014). Therefore, the Akagera National Park records were most likely *Cephalophorus harveyi*. Unfortunately, Haezaert's 1958 description, included in a monthly report to the National Parks Institute, has been lost. Without this document, we cannot include the species on the Rwanda list, especially since the Rwandan population would have been nearly 1 000 km outside the species' known distribution.

Felidae

Cheetah, **Acinonyx jubatus**. Despite the lack of any concrete evidence, rumours have circulated that the cheetah is, or has been, present in Rwanda. Some faunal lists have even mentioned the possible occurrence of this species in Akagera National Park (Verschuren, 1987). During the 1970s and early 1980s, several European hunters who had lived or hunted in Rwanda for many years claimed 'to know someone who had killed a cheetah in the 1920s or 1930s'. F. Verhulst claimed that the species had a name in Kinyarwanda: '*uratarangwe*'. However, this name is said to refer to a mythical animal 'much bigger than a leopard'. According to some witnesses, this mythical animal was found throughout eastern Rwanda, while others claimed that it lived only in Gisaka. Several visitors to Akagera National Park claimed to have seen a cheetah (always in Umutara), and some even took photos of it. Each time, however, it turned out to be a large Serval. In the 1980s, the last Rwandan and Hima traditional pastoralists in the

Umutara region had never seen or heard of anything resembling a cheetah. At the time, we therefore concluded that this species had never existed in Rwanda, at least not in recent historical times. It is important to bear this in mind because the idea of 'reintroducing' the species to Akagera National Park has recently been raised.

Table 2. Changes in the known mammalian fauna of Rwanda between 1992 and 2024.

Ordre	Monfort, 1992	Current list	Changement
Hyracoidae	3	3	0
Proboscidea	1	1	0
Tubulidentata	1	1	0
Afrosoricida	2	4	+2
Lagomorpha	2	1	-1
Rodentia	52 (1)	67	+15 (+29%)
Primates	15	18	+3 (+20%)
Eulipotyphla	14 (2)	23	+9 (+64%)
Cetartiodactyla	19 (2)	21	+2 (+10%)
Perissodactyla	2	3	+1
Chiroptera	42	59	+16 (+38%)
Pholidota	3	2	-1 (-33%)
Carnivora	23 (1)	26	+3 (+13%)
Total	179 (6)	229	+50 (+28%)

Discussion

The evolution of Rwanda's mammal checklist

From 1992 to 2025 (33 years) Rwanda's list has increased from 179 to 223 species, despite the fact that two species had to be removed from Monfort's list (Table 2). This increase of 49 species or 24% in the most densely populated country in Africa, where natural environments now represent only 8% of the national territory, is at least unexpected. It is therefore important to understand what this increase is based on.

(1) The White Rhinoceros, which had never existed in Rwanda in historial times, was introduced from South Africa as part of an international programme initiated by African Parks to save the species.

(2) Some specimens in old collections had been ignored or misidentified. This was amongst others the case for several bat species that were found by Van Cakenberghe *et al.* (2017) during a revision of the Chiroptera of the DRC, Rwanda and Burundi. We also found that *Colobus guereza* had existed in Rwanda when we re-examined Schouteden's texts published in Dutch in 1947.

(3) Revising many rodent genera (*Dasymys, Grammomys, Dendromus, Hylomyscus, Praomys* and *Lophuromys*), the families Soricidae and many bat genera revealed several cryptic or previously unrecognised species. Following these studies, some species had also to be renamed.

(4) Remarkably, 16 species (8.9% of the current fauna) were newly discovered after 1992: *Micropotamogale ruwenzorii, Heliosciurus rufobrachyum, Protoxerus stangeri, Poiana richardsoni, Genetta victoriae, Praomys degraaffi, Nycteris grandis, Kerivoula argentea,* and *Kerivoula* cf. *cuprosa* were discovered in the Nyungwe National Park; *Otomops harrisoni* was found in volcanic caves near Musanze; *Crocidura tarella, Crocidura niobe, Myosorex babaulti*, and *Dendromus insignis,* were captured in Volcanoes National Park; *Crocidura maurisca* in Volcanoes National Park and Nyungwe National Park; *Crocidura luna* outside a protected area.

The composition of the national list

A summary of the composition of the Rwandan mammal fauna is given in Table 2. It shows that rodents and bats alone account for 53% of the fauna.

Table 3. Number of species endemic to the Albertine Rift (AR), subspecies endemic to the Albertine Rift (ar) and species endemic to Rwanda (RW).

Ordre	AR	ar	Rw
Afrosoricida	1	(1)	-
Rodentia	10	-	1
Primates	1	2	-
Eulipotyphla	8	-	-
Cetartiodactyla	2	-	-
Chiroptera	2	-	1
Total	24	2	2

Table 4. The number of Critically Endangered (Cr), Endangered (En), and Vulnerable (Vu) species in the list of mammals of Rwanda according to IUCN Red List.

		Representation of the main threat categories						Conservation dependence	
Order	Ext.	Cr	En	Vu	Tot End	Total	%	CD	CD%
Afrosoricida		-	-	-	-	4	-	4	100
Tubulidentata		-	-	-	-	1	-	1	100
Proboscidea		-	1	-	1	1	100	1	100
Hyracoidea		-	-	-	-	3	-	3	100
Primates	1	1	2	4	8	18	44	15	88
Lagomorpha		-	-	-	-	1	-	1	100
Rodentia		-	-	3	3	67	4.8	?	?
Eulipotyphla		-	1	2	3	23	14	?	?
Chiroptera		1	1	1	3	59	5	?	?
Pholidota		-	2	-	2	2	100	3	100
Carnivora	1	-	-	3	4	26	27	17	62
Perrissodactyla		1	-	-	1	3	33	3	100
Cetartiodactyla	1	-	-	2	3	21	14	21	100
Total	3	3	7	16	28	229	12.5	69/86	80

Table 5. Number of Albertine Rift endemic species (AR) or subspecies (ar) and Rwanda endemic species (RW) in Rwanda's national parks; total endemic taxa (TET).

	Volcanoes NP	Nyungwe NP	Akagera NP	Outside PAs	Total
AR	15	18	1	4	38
ar	1	1	-	-	2
RW	1	2	-	?	2
TET	17 (40%)	21 (50%)	1 (2.3%)	4 (9.5%)	42

Extinct species

Three species have become locally extinct: *Colobus guerezae, Lycaon pictus* and *Hylochoerus meinertzhageni*.

Introduced species

Among the 230 species listed, five have been introduced. The Black Rhinoceros was introduced in colonial time on the erroneous assumption that the species once existed in eastern Rwanda (Verschuren, 1988). The giraffes were officially a gift from President Arap Moi of Kenya to the president of Rwanda, but the species was mainly introduced following a presidential decision to increase the park's tourist appeal. The White Rhinoceros was introduced as part of a vast conservation programme for the species. The Roof Rat is an invasive species. The Asian House Shrew was most probably introduced accidently with goods imported via the Indian Ocean.

Albertine Rift endemic species
In all, 22 species are endemic to the Albertine Rift (Table 5). These species are mainly rodents and shrews, but there are also two subspecies endemic to the Albertine Rift among Primates and most probably among Afrosoricida.

Rwanda endemic species
Two species are endemic to Rwanda, among Chiroptera (*Rhinolophus hilli*) and Rodentia (*Dasymys rwandae*).

The threatened species
According to IUCN criteria, a total of 26 taxa (11.4%) are threatened. Most orders are affected, but in absolute numbers the most threatened are the Primates, with seven taxa under threat, the Carnivores, also with seven taxa under threat, and the Chiroptera, with six taxa under threat. In relative numbers, the most threatened are Proboscidea, Pholidota and Perissodactyla, with 100% of species threatened. The three 'Critically Endangered' species are *t*he Mountain Gorilla, Hill's Horseshoe Bat, and the Black Rhinoceros.

The locally threatened species
Nine species are locally endangered (CDe). For three species (*Cercopithecus hamlyni, Damaliscus ugandae, Hippotragus equinus*), this threat is based, at least in large part, on the fact that their preferred habitat is no longer available in the national parks, either because they have been excluded from Akagera National Park in its current configuration (Topi, Roan) or because their habitat, montane bamboo thickets, has changed naturally (Owl-faced Monkey). For two species, the Bush Duiker and the Reedbuck, there may be a habitat problem, but pressure from large carnivores (Lion, Leopard and Spotted Hyaena) seems to be the main reason for their potential disappearance. For two species (Roan Antelope and Common Eland) inbreeding could play a significant role. For one species (Sitatunga), intensive and difficult-to-control poaching appears to be the main cause of the threat. Finally for two species (Cape Porcupine and African Civet), the reasons for their alarming situation are unclear. The presence of a huge number of cattle and herders with large dogs inside the Akagera National Park for nearly 10 years could be an explanation. Porcupines and civets are terrestrial animals that are most likely very vulnerable to large dogs, unlike genets for example, which are much more arboreal.

Knowledge gaps

The Rwanda's national parks do not all have been studied to the same extent. Volcanoes National Park is fairly well known thanks to several studies (e.g. Schouteden, 1934; Freshkop, 1943; Plumptre *et al.*, 2003, 2007; Tuyisingize *et al*., 2013).

In Akagera National Park, the large mammals are well known (Freshkop, 1944; Monfort, 1972; Monfort & Ruwet, 1973; Monfort, N., 1985), and there have been a few studies on rodents (Misonne, 1965), bats (Veschuren, 1965) and shrews (Hutterer *et al.*, 1987). However, most of these small mammal studies were carried out in the Gabiro and Umutara regions (Freshkop, 1944; Misonne, 1965; Verschuren, 1968), while only a few observations were made along Lake Mihindi and in the Rurama area near Lake Ihema. Given that the area of the current park is significantly drier than the Gabiro and Mutara regions, the ancient studies are perhaps not representative for the current park, and new observations may reveal unexpected species.

As for Nyungwe National Park, the western part of the Nyungwe Forest has been explored out of the Uwinka Station and is better known than the eastern part, at least above 1 750 m (Elbl *et al*., 1966; Dowsett & Dowsett-Lemaire, 1990; Geider & Cock, 1991; Chao, 2008; Flanders *et al*., 2022). The lowest parts between 1 480 and 1 750 m have never been studied. As for the eastern parts of the Nyungwe Forest, except for the Rwasenkoko and Kitabi areas, are poorly known, and the Kabulantwa valley in the forest's extreme south is entirely unexplored. Similarly, the Cyamudongo Forest is almost entirely unknown, except for its chimpanzee population. Moreover, the results of the large collection of small mammals carried out by Walter Verheyen's team in the 1980s have been only partially published. Nevertheless, the small mammals (Rodentia, Eulipotyphla) are fairly well known thanks to the work of M. Majyambere and his colleagues (Majyambere *et al.*, 2025).

In Gishwati-Mukura National Park, only large and medium-sized mammals, such as primates and bovids, are known about. Much of this information has been obtained using camera traps. Unfortunately, this method is unsuitable for rodents, shrews, and bats.

Finally, we don't know very much about which small mammals are currently surviving outside the parks. Several older studies have focused on Rwanda as a whole (Schouteden, 1947, 1948; Hayman *et al.* 1966; Rahm, 1967; Baeten *et al.* 1984; Hutterer *et al.* 1987), but we have very few recent information while the landscapes have

undergo fundamental changes. The intensification of agriculture and widespread use of pesticides have most probably killed many species, but we have no objective informations about these destructions.

Overall, we can conclude that a great deal is known about the mammals of Rwanda and its national parks. However, some knowledge gaps persist in at least three of the four national parks. Furthermore, it would be interesting to determine which species survive outside the parks and the conditions in which they do so. This information is crucial for evaluating the extinction risk of many species.

Table 6. Number of threatend species in Rwanda's national parks: Critically Endangered (CR), Endangered (EN), Vulnerable (VU); total number of threatened taxa (TTT).

	Volcanoes NP	Nyungwe NP	Akagera NP	Outside NPs	Total
CR	1	1	1	-	3
EN	4	3	2	1	7
VU	3	10	6	3	16
TTT	8 (31%)	14 (54%)	9 (35%)	4 (15%)	26

Comparaison with the Mammal Diversity Database (2025)

(1) Two species are mentioned in the MDD but are actually unknown in Rwanda: *Thamnomys kuru* and *T. venustus*. We explain why (see Comments).

(2) Three species mentioned in the MDD are not certainly present in Rwanda and can not be listed: *Galagoides demidoff, Cricetomys kivuensis,* and *Crocidura jacksoni*.

(3) Five species are mentioned as possibly existing in Rwanda by MDD, but their presence was confirmed: *Serengetimys pernanus, Mops midas, Caracal auratus, Taphozous mauritianus,* and *Panthera leo*.

(4) Twenty species are not mentioned for Rwanda in MDD but their presence was confirmed: *Chrysochloris stuhlmanni, Thryonomys gregorianus, Protoxerus stangeri, Lophuromys luteogaster, Malacomys longipes, Cricetomys ansorgei, Poeomys melanotis, Crocidura nanilla, Suncus murinus* (an accidental introduction), *Macronycteris vittata, Rhinolophus landeri, Mops demonstrator, M. pumilus, Kerivoula argentata, Vansonia rueppelii, Neoromicia zuluensis, Felis lybica, Helogale parvula, Poiana richardsoni* and *Giraffa tippelskirschii*.
(5) One species is not mentioned for Rwanda in the MDD, but it became locally extinct at the end of the 20th century: *Lycaon pictus*.

(6) *Elephantulus* is not mentioned for Rwanda by the MDD because only the genus not the species had been mentioned by Verschuren (1988) and Monfort (1992).

The role of the national parks

In the context of debates on resource management, the effectiveness of conservation policies or conflicts between nature conservation and economic development, the effectiveness of national parks has sometimes been questioned — especially in social media and outside of conservation circles. Also, we have focused this faunal checklist on the presence of species in the country's four national parks because outside these protected areas, natural environments in Rwanda have almost disappeared. A large proportion of Rwanda's mammalian fauna therefore survives only in national parks (Table 2). For medium-sized and large mammal species (Aardvark, African Savanna Elephant, Common Zebra, rhinoceroses, bovids and large carnivores), this dependence on national parks reaches 100%. Among the primates, the Vervet Monkey (a savanna species) manage in a few places to survive in human-made environments. It survives even in Kigali in an urban environment. As far as rodents and shrews are concerned, we know that some species disappear in man-made environments, particularly forest species, but we lack information on the species that survive. All we can assume is that some species still exist because they allow some small carnivores to survive (African Wildcat, mongooses, Side-striped Jackal). As for bats, we know that many species used to live in man-made environments, but in recent decades they have greatly diminished, more than likely due to the collapse of insects. We can therefore ask ourselves what is happening with the bats in the national parks, especially those in the savannas, some of which are migratory. A study would

be welcome. In the meantime, we can conclude that, overall, out of 95 medium-sized and large species, 78 (82%) are strictly dependent on national parks (Table 1).

Of the 26 taxa endemic or subendemic to the Albertine Rift or endemic to Rwanda, only four exist outside national parks (Table 5). In other words, 85% survive only in national parks. As expected, the Volcanoes and Nyungwe National Parks are home to the majority of these species. The two species endemic to Rwanda are both found in Nyungwe National Park and one is found in Volcanoes NP. In fact, Hill's Horseshoe Bat has never been recorded outside the Nyungwe National Park.

With regard to the 28 endangered species (Table 6), only four survive outside national parks, meaning that 85% survive only in national parks. Nyungwe National Park is the most important with 54% of the total number of threatened species, but Akagera National Park is also home to 35% of the total number of threatened species. These are mainly large and very large species, such as the Savanna Elephant, Lion, Leopard, the Masai Giraffe, the Black Rhinoceros, and the Common Hippopotamus.

Bibliography

Alvares, F., W. Bogdanowicz, L.A.D. Campbell, R. Godinho, J. Hatlauf, Y.V. Jhala, A.C. Kitchener, K.-P. Koepfli, M. Krofel, H. Senn, C. Sillero-Zubiri, S. Viranta & G. Werhahn, 2019. Old World *Canis* spp. with taxonomic ambiguity: Workshop conclusions and recommendations. CIBIO, Vairão, Portugal, May 2019.: http://www.canids.org/Old_world_canis_taxonomy_workshop.pdf.

Amori, G. & K. De Smet, 2016. *Hystrix cristata*. *The IUCN Red List of Threatened Species 2016*: e.T10746A22232484. DOI:10.2305/IUCN.UK.2016-2.RLTS.T10746A22232484.en.

Anonymous, 2024. *Ruvubu and Ruvironza Rivers; Burundi. River Report*. The Wilderness Project, Bujumbura.

Apio, A. & T. Wronski, 2011. A rough population estimate of large ungulates in the Akagera National Park, Rwanda. *Gnusletter,* 29: 18–20.

Apio, A., M. Plath & T. Wronski, 2015. Recovery of ungulate populations in post-civil war Akagera National Park, Rwanda. *Journ. East Afr. Nat. Hist*., 104: 127–141.

Arctander, P., C. Johansen, & M.-A. Coutellex-Vreto, 1999. Phylogeography of Three Closely Related African Bovids (Tribe Alcelaphini). *Mol. Biol. Evol.*, 16(12): 1724–1739.

Arnold, M.L., 1997. *Natural Hybridization and Evolution*. Oxford: Oxford University Press.

Baeten B., V. Van Cakenberghe & F. De Vree, 1984. An annotated inventory of a collection of bats from Rwanda (Chiroptera). *Rev. zool. afr.,* 98(1): 183–196.

Bantlin, D.A. & E.E. Evers, 2023. First record of the servaline morph in a serval (Leptailurus serval Schreber, 1776) in Akagera National Park, Rwanda. *Mammalia*, 2023. DOI:10.1515/mammalia-2022-0106

Bärmann, E.V., V.G. Fonseca, K. Langen & P. Kaleme, 2022. New insights into the taxonomy of duiker antelopes (Artiodactyla: Bovidae) from the eastern Democratic Republic of the Congo, with the formal description of a new genus. *Mammalian Biology*, 1–17.

Beolchini, F. & M. Corti, 2004. The taxonomy of the genus *Tachyoryctes*: A geometric morphometric approach. Italian *Journal of Zoology*, 71(1): 35–43.

Bergmans, W., 1979. First records of *Epomops dobsonii* (Bocage, 1889) from Tanzania and Rwanda, with a note on its size range (Mammalia, Megachiroptera). *Zeitschrift Für Säugetierkunde*, 44(4): 239–240.

Beudels-Jamar, R.C., P. Devillers & J. Harwood, 1997. Estimating the size of the population of sitatunga (*Tragelaphus spekei*) in the "Parc National de l'Akagera", Rwanda. AGAR Publishers.

Beudels, R.C., S.M. Durant & J. Harwood, 1992. Assessing the risks of extinction for local populations of roan antelope *Hippotragus equinus*. *Biol. Cons*., 61: 107–116.

Bibi, F., 2013. A multi-calibrated mitochondrial phylogeny of extant Bovidae (Artiodactyla, Ruminantia) and the importance of the fossil record to systematics. *BMC Evol. Biol*., 13: 166. DOI: 10.1186/1471-2148-13-166.

Bizuru, E., S. Nshutiyayesu, C. Nsabagasani, D. Tuyisingize & E. Uwayezu, 2015. Study to establish a national list of threatened terrestrial ecosystems and species in need of protection in Rwanda. Final report. Rwanda Environment Management Authority (REMA), Biodiversity Conservation, Environmental Management and Rural Development (BIOCEM-RD) Ltd.

Bronner, G. 2015. *Chrysochloris stuhlmanni*. *The IUCN Red List of Threatened Species 2015*: e.T40601A21288271. DOI:10.2305/IUCN.UK.2015-2.RLTS.T40601A21288271.en

Bryja, J., R. Šumbera, J.C. Kerbis Peterhans, T. Aghova, A. Bryjova, O. Mikula, V. Nicolas, C. Denys & E. Verheyen, 2017. Evolutionary history of the thicket rats (genus *Grammomys*) mirrors the evolution of African forests since late Miocene. *Journ. Biogeogr*., 44: 182–194. DOI:10.1111/jbi.12890.

Bryja. J., O. Mikula, R. Šumbera, Y. Meheretu, T. Aghová, L.A. Lavrenchenko, V. Mazoch, N. Oguge, J.S. Mbau, K. Welegerima, N. Amundala9, M. Colyn, H. Leirs & E. Verheyen, 2014. Pan-African phylogeny of *Mus* (subgenus *Nannomys*) reveals one of the most successful mammal radiations in Africa. *BMC Evol. Biol*., 14, 256 (20 pp). DOI: 10.1186/s12862-014-0256-2.

Bryja, J., J.C. Kerbis Peterhans, L.A. Lavrenchenko, V. Nicolas, C. Denys, A. Bryjová, R. Šumbera & O. Mikula, 2024. Integrative taxonomic revision of the African thicket rats (Murinae: *Grammomys*): how genomics decreases the number of currently recognized species. *Zool. Journ. Linn. Soc*., 203(2):1-20. DOI: 10.1093/zoolinnean/zlae057

Burgin, C. J., Zijlstra, J. S., Becker, M. A., Handika, H., Alston, J. M., Widness, J., Liphardt, S., Huckaby, D. G., & Upham, N. S., 2025. How many mammal species are there now? Updates and trends in taxonomic, nomenclatural, and geographic knowledge. *bioRxiv* 2025.02.27.640393; DOI:org/10.1101/2025.02.27.640393.

Burgin, C.J., J. Widness & N.S. Upham, 2020. Introduction. Pp 23-40 *In*: C.J. Burgin, D.E. Wilson, R.A. Mittermeier, A.B. Rylands, T.E. Lacher Jr. & W. Sechrest, 2020. *Illustrated Checklist of the Mammals of the World*. Lynx Nature Books.

Butynski, T., Hoeck, H., Koren, L. & de Jong, Y.A. 2015. *Procavia capensis*. *The IUCN Red List of Threatened Species 2015*: e.T41766A21285876. DOI: 10.2305/IUCN.UK.2015- 2.RLTS.T41766A21285876.en.

Butynski, T.M. & Y.A. de Jong, 2019. *Cercopithecus mitis* ssp. *doggetti*. *The IUCN Red List of Threatened Species, 2019*: e.T136861A92570828. https://www.iucnredlist.org/species/136861/92570828.

Casacci, L.P., F. Barbero & E. Balletto, 2013. The "Evolutionarily Significant Unit" concept and its applicability in biological conservation. *Italian Journal of Zoology*, 81(2), 182–193. DOI: 10.1080/11250003.2013.870240.

Cassola, F., 2016a. *Grammomys kuru*. *The IUCN Red List of Threatened Species 2016*: e.T9460A115092901. DOI:10.2305/IUCN.UK.2016-3.RLTS.T9460A22437988.en.

Cassola, F., 2016b. *Mus sorella*. *The IUCN Red List of Threatened Species 2016*: e.T13983A22406595. DOI:10.2305/IUCN.UK.2016-2.RLTS.T13983A22406595.en.

Cassola, F., 2016c. *Lophuromys flavopunctatus*. *The IUCN Red List of Threatened Species 2016*: e.T47990318A22407469. DOI:10.2305/IUCN.UK.2016-3.RLTS.T47990318A22407469.en.

Cassola, F., 2016d. *Lophuromys woosnami*. *The IUCN Red List of Threatened Species 2016*: e.T12357A22407309. DOI:0.2305/IUCN.UK.2016-2.RLTS.T12357A22407309.en. (accessed on 18 January 2025).

Cassola, F., 2016e. *Crocidura luna* (errata version published in 2017). *The IUCN Red List of Threatened Species 2016*: e.T41331A115178646. DOI:org/10.2305/IUCN.UK.2016-3.RLTS.T41331A22305942.en. (accessed on 18 January 2025).

Cassola, F., 2016f. *Crocidura maurisca* (errata version published in 2017). *The IUCN Red List of Threatened Species 2016*: e.T41335A115179220. DOI:10.2305/IUCN.UK.2016-3.RLTS.T41335A22306327.en.

Cassola, F., 2016g. *Protoxerus stangeri* (errata version published in 2017). *The IUCN Red List of Threatened Species 2016*: e.T18386A115143054. DOI:10.2305/IUCN.UK.2016-3.RLTS.T18386A22252711.en.

Cassola, F. 2017. *Sylvisorex johnstoni*. *The IUCN Red List of Threatened Species 2017*: e.T41444A22291821. DOI:10.2305/IUCN.UK.2017-2.RLTS.T41444A22291821.en.

Chao, N., 2008. *Bird & mammal lists: Nyungwe National Park*. Wildlife Conservation Society. Rwanda Environment Management Authority. Kigali.

Child, M.F. & A. Monadjem, 2016. *Dendromus melanotis*. *The IUCN Red List of Threatened Species* 2016: e.T6443A22235350. DOI: 10.2305/IUCN.UK.2016-3.RLTS.T6443A22235350.en.

Cockar, Z.S., 2022. A checklist of the mammals of Rwanda. *Journ. East Afr. Nat. Hist.,* 111(1): 1–17.

De Ferran, V., H. Vieira Figueiró, F. de Jesus Trindade, O. Smith, M.-H.S. Sinding, C.S. Trinca, G. Zenato Lazzari, G. Veron, J.A. Vianna, F. Barbanera, *et al.*, 2020. Phylogenomics of the world's otters. *Current Biology*, 32(16): 3650-3658.e4. DOI: 10.1016/j.cub.2022.06.036.

Dejace, P. & J.P. Vande weghe, 1991. *Rapport scientifique du projet 3747 du Fonds Mondial pour la Nature (WWF Belgium au Parc National de l'Akagera et au Domaine de Chasse du Mutara, Rwanda. Volume II. Les marais du bassin moyen de l'Akagera*. agcd, unpublished report of Projet Tourisme et Parcs Nationaux, Bruxelles.

De Leyn, G., 1962. *Contribution à la connaissance des Lycaons du Parc National de la Kagera*. Inst. Parcs Nat. Congo et Rwanda. 30 pp.

de Jong, Y.A. T.M. Butynski, A. Perkin, M. Svensson & E. Pimley (2019). *Perodicticus ibeanus*. *The IUCN Red List of Threatened Species 2019*: e.T136875A91996195. DOI:10.2305/IUCN.UK.2019-3.RLTS.T136875A91996195.en.

Delany, M.J., 1975. *The Rodents of Uganda*. Trustees of the Brit. Mus. (Nat. Hist.): London, 165 pp.

Demos, T.C., J.C. Kerbis Peterhans, B. Agwanda & M.J. Hickerson, 2014. Uncovering cryptic diversity and refugial persistence among small mammal lineages across the Eastern Afromontane biodiversity hotspot. *Mol. Phylogenet. Evol.,* 71: 41–54.

Demos, T.C, J.c. Kerbis Peterhans, T.a. Joseph, J.d. Robinson, B. Agwanda & M.j. Hickerson, 2015. Comparative population genomics of African montane forest mammals support population persistence across a climatic gradient and Quaternary climatic cycles. *PLoS ONE*, 10(9): e0131800.

Demos, T., T. Dando & R. Kennerley. 2019. *Hylomyscus vulcanorum*. *The IUCN Red List of Threatened Species 2019*: e.T111679876A111679880. DOI:10.2305/IUCN.UK.2019-1.RLTS.T111679876A111679880.en.

Dieterlen, F. & Heim de Balzac, 1979. Zur Oekologie und Taxonomie des Spitzmause (Soricidae) des Kivu-Gebietes. *Saugetierkdl. Mitt.*, 27: 241–287.

Dinets, V., 2011. First sighting of the Giant Genet *Genetta victoriae* in Rwanda. *Small Carnivore Conserv.*, 44: 25–26.

Dowsett, R.J. & F. Dowsett-Lemaire, 1990. Les mammifères de la Forêt de Nyungwe (Rwanda): état des connaissances. Pp. 111–121 *In*: R.J. Dowsett, (ed.), Survey of the Fauna and Flora of Nyungwe Forest, Rwanda. Liège, Belgium. *Tauraco Research Report,* 3.

Easton, J., N. Chao, F. Mulindahabi, N. Ntare, L. Rugyerinyange & I. Ndikubwimana, 2011. Status and conservation of the only population of the Vulnerable owl-faced monkey Cercopithecus hamlyni in Rwanda. *Oryx*, 45(3): 435–438.

Elbl, A., U.H. Rahm & G. Mathys, 1966. Les mammifères et leurs tiques dans la forêt de Rugege. *Acta Tropica*, 23: 223–263.

Evers, E.E.M., P. Ndahayo, F. Mulindahabi, J.P. Ntibabarira & D.A. Bantlin, 2025. Presence of Servals (*Leptailurus serval*) in a Mature, Closed-Canopy Tropical Moist Montane Rainforest. Ecosystem Challenges Conventional Range Maps. *Afr. Journ. Ecol*., 63, e0072. DOI:org/10.1111/aje.70072.

Fain, A., 1953. Observation sur la biologie de *Grammomys surdaster* au Rwanda-Urundi en relation avec son parasitisme sur *Cordylobia rwandae*. *Rev. Path. Gen. Physiol. Cl*., 676: 379–382.

Fain, A., 1957. Note sur l'acariose des voies respiratoires chez l'homme et les animaux. *Ann. Soc. Belg. Méd. Trop*., 37:469–481.

Fennessy, J., T. Bidon, F. Reuss, V. Kumar, P. Elkan, M. Nilsson, M. Vamberger, U. Fritz & A. Janke (2016). Multi-locus analyses reveal four giraffe species instead of one. *Current Biology* 26: 1–7.

Ferguson, A. & R. Kennerley, 2019. *Grammomys dryas*. *The IUCN Red List of Threatened Species 2019*: e.T9455A22437574. DOI:org/10.2305/IUCN.UK.2019-1.RLTS.T9455A22437574.en.

Flanders, J., W.F. Frick, J. Nziza, O. Nsengimana, P. Kaleme, M.C. Dusabe, I. Ndikubwimana, I. Twizeyimana, S. Kibiwot, P. Ntihemuka, *et al*., 2022. Rediscovery of the critically endangered Hill's horseshoe bat (*Rhinolophus hilli*) and other new records of bat species in Rwanda. *Biodiv. Data Journ*., 10: e83546. DOI: 10.3897/BDJ.10.e83546

Freshkop, S., 1943. Mammifères. *Explor. Parc Nat. Albert, Mission Freshkop (1937-1938)*, 1, 3–180.

Freshkop, S., 1944. Mammifères. *Explor. Parc Nat. Kagera, Mission Freshkop 1938*, 1: 1–57.

Garnett, S.T. & L. Christidis, 2007. Implications of changing species definitions for conservation purposes. *Bird Conservation International*, 17: 187–195.

Garnett, S.T. & L. Christidis, 2017. Taxonomy anarchy hampers conservation. *Nature*, 546: 25–27.

Gaubert, P., P.J. Taylor & G. Veron, 2007. Integrative taxonomy and phylogenetic systematics of the genets (Carnivora, Viverridae, Genetta): a new classification of the most speciose carnivoran genus in Africa. *Proc. 5th Intern. Symp. Trop. Biol.: African Biodiversity: Molecules, Organisms, Ecosystems*. 371–383. DOI: 10.1007/0-387-24320-8_37.

GBIF Secretariat, 2023. *Graphiurus microtis* (Noack, 1887). *GBIF Backbone Taxonomy*. DOI: 10.15468/39omei accessed via GBIF.org on 2025-02-10.

GBIF. GBIF.org (2025), GBIF Home Page. Available from: https://www.gbif.org.

Geider, M. & D. Kock, 1991. Kleinsäuger im Nebelwaldgebiet des Forêt de Nyungwe, Rwanda. *Natur & Museum*, 121: 210–216.

Gerrie, R. & Kennerley, R. 2019. *Myosorex babaulti*. *The IUCN Red List of Threatened Species* 2019: e.T41380A22287111. DOI:org/10.2305/IUCN.UK.2019-1.RLTS.T41380A22287111.en

Gibson, D., 1992. The Nyungwe forest: saving its biodiversity. *Zoonooz,* 65(1): 6–11.

Granjon, L., P. Colangelo, C. Tatard, M. Colyn, G. Dobigny, G. & V. Nicolas, 2012. Intrageneric relationships within *Gerbilliscus* (Rodentia, Muridae, Gerbillinae), with characterization of an additional West African species. *Zootaxa*, 3325(1): 1–25.

Granjon, L. 2019. *Gerbilliscus kempi*. *The IUCN Red List of Threatened Species 2019*: e.T21515A22426529. DOI:10.2305/IUCN.UK.2019-1.RLTS.T21515A22426529.en

Grant S., K. Webbink, J. Jones & A. Ferguson, 2020. *Field Museum of Natural History (Zoology) Mammal Collection*. Version 9.18. Field Museum. Occurrence dataset. DOI:10.15468/n4zgxw. https://www.gbif.org/occurrence/1805725640 [accessed 12 February 2025].

Groves, C. & P. Grubb, 1974. A new duiker from Rwanda. *Rev. Zool. Bot. Afr*., 88: 189–196

Groves, C. & P. Grubb, 2011. *Ungulate Taxonomy*. The John Hopkins University Press, Baltimore, 310 pp.

Groves, C. P., 2001. *Primate Taxonomy*. Smithsonian Institution Press: Washington DC, 350 pp.

Groves, C., 2014. Current taxonomy and diversity of crown ruminants above the species level. *Ziteliana*, B 32(5): 14.

Grubb, P., T.M. Butynski, J.F. Oates, S.K. Bearder, T.R. Disotell, C.P. Groves & T.T. Struhsaker, 2003. Assessment of the diversity of African primates. *Internat. Journ. Primatol.*. 512 24(6):1301–1357. DOI:10.1023/B:IJOP.0000005994.86792.b9.

Gyldenstolpe, N., 1928. Zoological results of the Swedish Expedition to Central Africa 1921, Vertebrata, 5. Mammals from the Birunga Volcanoes, north of Lake Kivu. *Arkiv for Zoologie*, 20(4), 70–75.

Hart, J. & F. Maisels, 2020. *Cercopithecus hamlyni* (amended version of 2019 assessment). *The IUCN Red List of Threatened Species* 2020: e.T4219A166615690. DOI:10.2305/IUCN.UK.2020-1.RLTS.T4219A166615690.en. Accessed on 15 August 2025.

Hart, J.A. & T.M. Butynski, 2008. *Cercopithecus hamlyni*. *The IUCN Red List of Threatened Species* v. 2010.4. Http://www.iucnredlist.org.

Hart, J.A., T.M. Butynski, E.E. Sarmiento & Y.A. de Jong, 2013. *Cercopithecus hamlyni* Owl-faced Monkey (Hamlyn's Monkey). Pp. 339–344 *in*: T.M. Butynski, J. Kingdon & J. Kalina (eds.). *The Mammals of Africa*. Volume II: Primates. Bloomsbury Publishing: London.

Hassanin, A., M.L. Houck, D. Tshikung, B. Kadjo, H. Davis & A. Ropiquet, 2018. Multi-locus phylogeny of the tribe Tragelaphini (Mammalia, Bovidae) and species delimitation in bushbuck: Evidence for chromosomal speciation mediated by interspecific hybridization. *Mol. Phylogen. Evol.,* 129: 96–105. DOI:10.1016/j.ympev.2018.08.006.

Hassanin, A., J.-P. Hugot & B. Jansen van Vuuren, 2015. Comparison of mitochondrial genome sequences of pangolins

(Mammalia, Pholidota). *C.R. Biologies*, 338: 260–265.
Hategekimana, S., 2005. *La dégradation actuelle du Marais de Rugezi: une catastrophe écologique*. Mém. de Lic., Univ. Nat. Rwanda.
Hayman, R.W., X. Misonne & W.N. Verheyen, 1966. The bats of the Congo and of Rwanda and Burundi. *Ann. Mus. roy. Afr. centr*., 154: 1–105.
Hazaert, J., 1959. The Black Rhino is brought back in Rwanda. *Oryx*, 5: 96–99.
Henschel, P., 2008. *The conservation biology of the leopard Panthera pardus in Gabon: Status, threats and strategies for conservation*. Dissertation, Falculty Göttingen.
Hoeck, H.N. & P. Bloomer, 2013. *Procavia capensis* Rock Hyrax (Klipdassie). Pp. 166–171 *in*: J. Kingdon, D. Happold, M. Hofmann, T. Butynski, M. Happold & J. Kalina (eds.). *Mammals of Africa*, Volume I. London: Bloomsbury Publishing.
Hutterer, R., E. Van der Straeten & W.N. Verheyen, 1987. A checklist of the shrews of Rwanda and biogeographical condiderations on African Soricidae. *Bonn. zool. Beitrage*, 38: 155–172.
Hutterer, R. & W. Verheyen, 1985. A new species of shrew, genus *Sylvisorex*, from Rwanda and Zaire (Insectivora: Soricidae). *Z. Säugetierkunde*, 50 : 266–271.
Hutterer, R. & J. Kerbis Peterhans, 2019. A further new species of vesper bat from Central Africa (Chiroptera: Vespertilionidae). Lynx, n. s. (Praha), 50: xx–xx (2019). ISSN 0024-7774 (print), 1804-6460 (online)
Hutterer, R. 2016. *Crocidura turba. The IUCN Red List of Threatened Species 2016*: e.T41363A22308481. DOI:org/10.2305/

International Commission on Zoological Nomenclature, 2007. Opinion 2183 (Case 3204). *Viverra maculata* Gray, 1830 (currently *Genetta maculata*; Mammalia, Carnivora): specific name not conserved. *Bull. Zool. Nomencl.*, 64(3):205–206.
IPNCB (Institut des Parcs Nationaux du Congo belge), Archives 1934–1962. http//apncb.be.
IUCN.UK.2016-2.RLTS.T41363A22308481.en.
IUCN, 2021. *The IUCN Red List of Threatened Species*. Version 2021-3. https://www.iucnredlist.org.

Jacques, H., G. Veron, F. Alary & S. Aulagnier, 2009. The Congo clawless otter *Aonyx congicus* (Mustelidae: Lutrinae): A review of its systematics, distribution and conservation status. *African Zoology*, 44: 159–170.
Jansen van Vuuren, B., I. Rushworth & C. Montgelard, 2017. Phylogeography of oribi antelope in South Africa: evolutionary versus anthropogenic panmixia. *African Zoology*, 52(4): 189–197. DOI:10.1080/15627020.2017.1386077.
Jansen van Vuuren, B. & T.J. Robinson, 2001. Retrieval of Four Adaptive Lineages in Duiker Antelope: Evidence from Mitochondrial DNA Sequences and Fluorescence *in Situ* Hybridization. *Mol. Phylogen. Evol*., 20(3): 409–425. DOI:10.1006/mpev.2001.0962.
Jarvis, J.U.M., 2013. *Tachyoryctes splendens* African Root-rat. Pp. 151-152 *in*: M. Happold & D.C.D. Happold (eds). *Mammals of Africa*: Volume IV. Bloomsbury Publishing: London.
Johnston, A.R. & N.M. Anthony, 2012. A multi-locus species phylogeny of African forest duikers in the subfamily Cephalophinae: evidence for a recent radiation in the Pleistocene. *BMC Evol. Biol*. 12. DOI: 10.1186/1471-2148-12-120.

Kennerley, R., 2016a. *Lophuromys medicaudatus*. *The IUCN Red List of Threatened Species 2016*: e.T12350A22408558. DOI:10.2305/IUCN.UK.2016-3.RLTS.T12350A22408558.en.
Kennerley, R., 2016b. *Lophuromys rahmi. The IUCN Red List of Threatened Species 2016*: e.T12352A22408380. DOI:10.2305/IUCN.UK.2016-3.RLTS.T12352A22408380.en.
Kennerley, R., 2016c. *Thamnomys venustus. The IUCN Red List of Threatened Species 2016*: e.T21702A22412227. DOI:10.2305/IUCN.UK.2016-3.RLTS.T21702A22412227.en.
Kerbis Peterhans, J. & T. Demos, 2021. *Myosorex blarina*. *The IUCN Red List of Threatened Species* 2021: e.T14111A22286334. DOI:10.2305/IUCN.UK.2021-2.RLTS.T14111A22286334.en.
Kerbis Peterhans, J.C. & R. Hutterer, 2009. The description of a new species of *Suncus* (Soricidae, Mammalia) from central Africa. Pp. 141–150 in: E. Thorn & J.C. Kerbis Peterhans (eds.), Small Mammals of Uganda. *Bonner Zoologische Monographien,* 164 pp.
Kerbis Peterhans, J. & N. Ntare, 2009. *Major findings: small mammal survey at Nyungwe National Park, Rwanda, July-August 2009*. Unpublished report. 7 pp.
Kingdon, J., D. Happold, M. Hoffmann, T. Butynski, M. Happold & J. Kalina (Eds.), 2013. Mammals of Africa (6 Volumes). Bloomsbury Publishing: London & New York. (3 500 pp.)
Kingdon, J. & M. Hoffmann, 2013. *Phataginus tricuspis* Tree Pangolin (African White-bellied Pangolin). Pp 391–395 in: J. Kingdon & M. Hoffmann (eds.). Mammals of Africa, Vol. V. Carnivores, Pangolins, Equids and Rhinoceroses. Bloombury: London.
Kitchener, A.C., C. Breitenmoser-Würsten, E. Eizirik, A. Gentry, L. Werdelin, A. Wilting, N. Yamaguchi, A.V. Abramov, P. Christiansen, C. Driscoll, *et al.,* 2017. *A revised taxonomy of the Felidae.* The final report of the Cat Classification Task Force of the IUCN/SSC Cat Specialist Group. *Cat News Special Issue*, 11 (80 pp.)
Kityo, R.M., J.C. Kerbis Peterhans, M.H. Huhndorf & R. Hutterer, 2009. New additions and noteworthy records to the bat (Mammalia: Chiroptera) fauna of Uganda, Rwanda, and the Democratic Republic of Congo. Pp 127–140 in E. Thorn & J.C. Kerbis Peterhans (eds.). *Small Mammals of Uganda*. Bonner Zoologische Monographien. (164 pp).
Kuhner, M.K., K.S. Gobush, Z.A. Kaliszewska, R. Horwitz & S.K. Wasser, 2025. Distribution of African savanna elephants

(*Loxodonta africana*), African forest elephants (*L. cyclotis*), and their hybrids across Africa based on genetic evidence. *Glob. Ecol. Conserv*., 59 (2025), e03530.

Lawes, M.J., M. Cords & C. Lehn, 2013. *Cercopithecus mitis* Gentle Monkey. Pp 354–362 *in*: Butynski, T., J. Kingdon & J. Kalina. *Mammals of Africa. Vol. II. Primates*. Bloomsbury Publishing: London & New York.

Lecompte, E., K. Aplin, C. Denys, F. Catzeflis, M. Chades & P. Chevret, 2008. Phylogeny and biogeography of African Murinae based on mitochondrial and nuclear gene sequences, with a new tribal classification of the subfamily. *BMC Evolut. Biol.,* 2008, 8:199. DOI:10.1186/1471-2148-8-199.

Lejeune, A. & V. Frank, 1990. Distribution of *Lutra maculicollis* in Rwanda: ecological constraints. *IUCN Otter Specialist Group Bulletin,* 5: 8–16.

Lonnberg, E., 1912. Mammals collected by the Swedish Zoological Expeditions to British East Africa 1911. *Kungliga Svenska Vetenskapsakademiens Handlingar*, 48(5), 1–188.

Lorenzen, E.D., P. Arctander & H.R. Siegismund, 2008. High variation and very low differentiation in wide ranging plains zebra (*Equus quagga*): insights from mtDNA and microsatellites. *Mol. Ecol*., 17: 2812–2824. DOI: 10.1111/j.1365-294X.2008.03781.x.

Lorenzen, E., C. Masembe, P. Arctander, & H. Siegismund, 2010. A long-standing Pleistocene refugium in southern Africa and a mosaic of refugia in East Africa: Insights from mtDNA and the common eland antelope. *Journ. Biogeogr.*:,37:571-581. DOI:10.1111/j.1365-2699.2009.02207.x.

Majyambere, M., P. Ndahayo, A. Nsabimana & A. Nsabimana. 2025. An annotated checklist of terrestrial small mammals of Nyungwe National Park in Rwanda based on recent reassessments (2009–2023). *Tropical Zoology,* 38(3-4): 67–88. DOI:10.4081/tz.2025.222.

Mallet, J., M. Beltrán, W. Neukirchen & M. Linares, 2007. Natural hybridization in heliconiine butterflies: the species boundary as a continuum. *BMC Evol. Biol.*, 7: 28. DOI:10.1186/1471-2148-7-28

Mammal Diversity Database (MDD), 2025. *Mammal Diversity Database* (Version 2.). Zenodo. DOI:10.5281/zenodo.15007505.

Mikula, O., V. Nicolas, R. Šumbera, A. Konečný, C. Denys *et al.*, 2021. Nuclear phylogenomics, but not mitogenomics, resolves the most successful Late Miocene radiation of African mammals (Rodentia: Muridae: Arvicanthini). *Mol. Phylogen. Evol*., 157: 107069.

Miller, A., S. Uddin, D.S. Judge, B.A. Kaplin, D. Ndayishimiye, et al., 2019. Spatiotemporal association patterns in a supergroup of Rwenzori black-and-white colobus (*Colobus angolensis ruwenzorii*) are consistent with a multilevel society. *Am. J. Primatol.*, 2020;e23127. DOI: 10.1002/ajp.23127.

Miller, A., D. Judge, G. Uwingeneye, D. Ndayishimiye & C.C. Grueter, 2020. Diet and use of fallback foods by Rwenzori black-and-white colobus (*Colobus angolensis ruwenzorii*) in Rwanda: Implications for supergroup formation. *Intern. Journ. Primatol.*, 41: 434–457.

Misonne, X., 1965. Les Rongeurs du Parc National de la Kagera. *Inst. Parcs Nat. Congo et Rwanda* : 74–116.

Monadjem, A., F. Cotterill, A.M. Hutson, S. Mickleburgh. & W. Bergmans, 2017a. *Chaerephon chapini. The IUCN Red List of Threatened Species 2017*: e.T4310A22019424. DOI:10.2305/IUCN.UK.2017-2.RLTS.T4310A22019424.en.

Monadjem, A., J. Juste, W. Bergmans, S. Mickleburgh, A.M. Hutson & J. Fahr, 2017b. *Hipposideros cyclops. The IUCN Red List of Threatened Species 2017*: e.T10126A22095945. DOI:10.2305/IUCN.UK.2017-2.RLTS.T10126A22095945.en.

Monadjem, A., Fahr, J., Hutson, A.M., Mickleburgh, S. & Bergmans, W. 2017c. *Nycteris arge. The IUCN Red List of Threatened Species 2017:* e.T14926A22016999. DOI:org/10.2305/IUCN.UK.2017-2.RLTS.T14926A22016999.en

Monadjem, A., Fahr, J., Bergmans, W., Mickleburgh, S., Hutson, A.M. & Cotterill, F.P.D., 2017d. *Chaerephon bemmeleni. The IUCN Red List of Threatened Species 2017*: e.T4307A22020379. DOI:10.2305/IUCN.UK.2017-2.RLTS.T4307A22020379.en.

Monadjem, A., Ranivo, J., Hutson, A.M., Schlitter, D. & Racey, P.A. 2017e. *Miniopterus fraterculus. The IUCN Red List of Threatened Species 2017:* e.T13563A22104581. DOI:10.2305/IUCN.UK.2017-2.RLTS.T13563A22104581.en

Monadjem, A., P.J. Taylor, D. Jacobs & F. Cotterill, 2017f. *Kerivoula argentata. The IUCN Red List of Threatened Species 2017*: e.T10969A21970780. DOI:10.2305/IUCN.UK.2017-2.RLTS.T10969A21970780.en.

Monadjem, A., P.J. Taylor, D. Jacobs & F. Cotterill, F. 2017g. *Kerivoula lanosa. The IUCN Red List of Threatened Species 2017*: e.T10977A22021700. DOI:10.2305/IUCN.UK.2017-2.RLTS.T10977A22021700.en.

Monadjem, A., Cotterill, F., Ratrimomanarivo, F.H., Jenkins, R.K.B., Mickleburgh, S., Fahr, J., Bergmans, W., Ranivo, J., Racey, P.A. & Hutson, A.M. 2017h. *Mops midas. The IUCN Red List of Threatened Species 2017*: e.T13841A22079278. DOI:10.2305/IUCN.UK.2017-2.RLTS.T13841A22079278.en.

Monadjem, A., T.C. Demos, D.L. Dalton, P.W. Webala, S. Musila, J.C. Kerbis Peterhans & B.D. Patterson, 2021. A revision of pipistrelle-like bats (Mammalia: Chiroptera: Vespertilionidae) in East Africa with the description of new genera and species. *Zool. Journ. Linnean Society,* 191(4): 1114–1146.

Monfort, A., 1972. Densités, biomasses et structures des populations d'ongulés sauvages au Parc de l'Akagera (Rwanda). *Revue d'Ecologie, Terre et Vie*, 2: 216–256.

Monfort, A., 1992. Première liste commentée des mammifères du Rwanda. *Journ. Afr. Zool.,* 106: 141–151.

Monfort, A. & N. Monfort, 1977. L'opération "éléphant" au Rwanda. Structure de la population au Bugesera et transfert de jeunes au Parc National de l'Akagera. *Terre & Vie*, 31: 355–384.

Monfort, N., 1985. *Les mammifères du Rwanda: Inyamaswa zonsa zo mu Rwanda* (translated by Pélagie Murebwayire). Kigali: Rotary-Club de Kigali. 142 pp.

Moodley, Y., M.W. Bruford, C. Bleidorn, T. Wronski, A. Apio & M. Plath, 2009. Analysis of mitochondrial DNA data reveals non-monophyly in the bushbuck (*Tragelaphus scriptus*) complex. *Mammalian Biology*, 74(5): 418–422. DOI: 10.1016/j.mambio.2008.05.003.

Moore, J.F. & P. Niyigaba, 2018. First records of the Central African oyan (*Poiana richardsonii*) in Rwanda. *Afr. Journ. Ecol.,* 56:828–830. DOI:10.1111/aje.12576

Moore, J.F., M. Nyiratuza, E. Akampurira & T. O'Brien, 2018. Sightings of Lestrade's Duiker (*Cephalophus weynsi lestradei*) in Rwanda and Uganda. *Gnusletter*, 35(1): 14–20.

Moore, J. F., E. Uzabaho, C. Kayijamahe, M. Nyiratuza, I. Kambogo & F. Mulindahabi, 2019. Photographic evidence of the African golden cat in Rwanda. *Cat News*-IUCN/SSC Cat Specialist Group, 70, 1–3.

Muller, Z., F. Bercovitch, R. Brand, R. Brown, D. Brown, M. Bolger, *et al.*, 2018. *Giraffa camelopardalis* (amended version of 2016 assessment). *The IUCN Red List of Threatened Species 2018: e*.T9194A136266699. DOI:10.2305/IUCN.UK.2016-3.RLTS.T9194A136266699.en. Accessed on 30 August 2025.

Mullina, S.K., N. Pillaya & P.J. Taylor, 2005. The distribution of the water rat *Dasymys* (Muridae) in Africa: a review. *South Afr. Journ. Sci*., 101: 117–124

Mund, J.-P. & T. Christ, 2002. *Land Degradation in the Akagera National Park (former and actual ANP) in Rwanda: Estimating the rate and processes*. Unpublished report to ORTPN and GTZ.

Nicolas, V., P.-H. Fabre, J. Bryja, C. Denys, E. Verheyen, A.-D. Missoup, A. Olayemi, P. Katuala, A. Dudu, M. Colyn, *et al.,* 2020. The phylogeny of the African wood mice (Muridae, *Hylomyscus*) based 601 on complete mitochondrial genomes and five nuclear genes reveals their evolutionary history and undescribed diversity. *Mol. Phylogen. Evol.,* 144:1–37. DOI:10.1016/j.ympev.2019.106703.

Nicolas, V., O. Mikula, L.A. Lavrenchenko, R. Šumbera, V. Bartáková, A. Bryjová, Y. Meheretu, E. Verheyen, A.D. Missoup, A.R. Lemmon, *et al*., 2021. Phylogenomics of African radiation of Praomyini (Muridae: Murinae) rodents: First fully resolved phylogeny, evolutionary history and delimitation of extant genera. *Mol. Phylogen. Evol.*, 163: 107263. DOI: 10.1016/j.ympev.2021.107263.

National Institute of Statistics of Rwanda (NISR). https://www.statistics.gov.rw/(accessed on 15 September 2025).

O'Brien, T.G., J. Ahumada, E. Akampurila, L. Beaudrot, K. Boekee, T. Brncic, J. Hickey, P.A. Jansen, C. Kayijamahe, J. Moore, *et al*., 2020. Camera trapping reveals trends in forest duiker populations in African National Parks. *Remote Sensing in Ecol. and Conserv.*, 6 (2): 168–180. DOI: 10.1002/rse2.132.

O'Connor, D., J. Stacy-Dawes, A. Muneza, J. Fennessy, K. Gobush, M.J. Chase, M.B. Brown, C. Bracis, P. Elkan, A.R.M. Zaberirou & T. Rabeil, 2019. Updated geographic range maps for giraffe, *Giraffa* spp., throughout sub-Saharan Africa, and implications of changing distributions for conservation. *Mammal Review.* 49(4):285–299.

Offutt, K., 1990. *The Nyungwe Forest Reserve.* Nyungwe Forest Conservation Project. ORTPN: Kigali.

Oguge, N., R. Hutterer & K. Howell, 2016. *Crocidura jacksoni* (errata version published in 2017). *The IUCN Red List of Threatened Species 2016*: e.T41325A115178261. DOI: 10.2305/IUCN.UK.2016-3.RLTS.T41325A22308229.en.

Olayemi, A., V. Nicolas, J. Hulselmans, A.D. Missoup, E. Fichet-Calvet, D. Amundala, A. Dudu, T. Dierckx, W. Wendelen, H. Leirs & E. Verheyen, 2012. Taxonomy of the African giant pouched rats (Nesomyidae: *Cricetomys*): molecular and craniometric evidence support an unexpected high species diversity. *Zool. Journ. Linn. Soc*., 165: 700–719. DOI: 10.1111/j.1096-3642.2012.00823.x.

Onditi, K.O., T.C. Demos, J. Kerbis Peterhans, Z.-Z. Chen, J. Bryja, L.A. Lavrenchenko, S. Musila, E. Verheyen, F. Van de Perre, B. Dudu Akaibe, *et al*., 2021. Historical biogeography, systematics, and integrative taxonomy of the non-Ethiopian speckled pelage brush-furred rats (*Lophuromys flavopunctatus* group) *BMC Ecol. Evol.*, 21:89. DOI: 10.1186/s12862-021-01813-w.

Osgood, W. H., 1936. New and imperfectly known small mammals from Africa. *Zoological Series of Field Museum of Natural History*, 20(21), 217–256.

Owiunji I., D. Nkuutu, D. Kujirakwinja, I. Liengola, A. Plumptre, A. Nsanzurwimo, K. Fawcett, M. Gray & A. McNeilage, 2005. *The Biodiversity of the Virunga Volcanoes.* Technical Report. Wildlife Conservation Society: New York

Patterson, B.D., P.W. Webala, M. Bartonjo, J. Nziza, C.W. Dick & T.C. Demos, 2018. On the taxonomic status and distribution of African species of *Otomops* (Chiroptera: Molossidae). *Peer J.*, 6:e4864.

Patterson, B.D., P.W. Webala, T.H. Lavery, B.R. Agwanda, S.M. Goodman, J.C. Kerbis Peterhans, T.C. Demos, 2020. Evolutionary relationships and population genetics of the Afrotropical leaf-nosed bats (Chiroptera, Hipposideridae). *ZooKeys,* 929: 117–161. DOI: 10.3897/zookeys.929.50240.

Pirlot, P., 1957. Associations de Rongeurs dans les régions hautes de l'Est du Congo belge et du Ruanda-Urundi. *Rev. Zool. Bot. Afr.*, 55:221–236.

Plumptre, A.J., M. Masozera, P.J. Fashing, A. McNeilage, C. Ewango, B.A. Kaplin & I. Liengola, 2002. Biodiversity Surveys of the Nyungwe Forest Reserve In S.W. Rwanda. *WCS Working Papers,* 18. 92 pp.

Plumptre, A.J., Behangana, M., Davenport, T., Kahindo, C., Kityo, R., Ndomba, E. *et al*., 2003. The Biodiversity of the Albertine Rift. *Albertine Rift Technical Reports,* 3, pp 105, Wildlife Conservation Society: New York.

Plumptre, A.J., T.R.B. Davenport, M. Behangana, R. Kityo, G. Eilu, P. Ssegawa, *et al*., 2007. The biodiversity of the Albertine Rift. *Biol. Conserv.,* 13 : 178–194.

Rahm, U., 1967. Les Muridés des environs du Lac Kivu et des régions voisines (Afrique centrale) et leur écologie. *Rev. Suisse Zool*., 74: 436–519.

Ralph, T.M., L.R. Richards, P.J. Taylor, M.C. Napier & J.M Lamb, 2015. Revision of Afro-Malagasy *Otomops* (Chiroptera: Molossidae) with the description of a new Afro-Arabian species. *Zootaxa*, 4057(1):1–49.

Raposo, M.A., R. Stopiglia, G.R.R. Brito, F.A. Bockmann, G.M. Kirwan, J. Gayon & A. Dubois, 2017. What really hampers taxonomy and conservation? A riposte to Garnett and Christidis (2017). *Zootaxa*, 4317(1): 179–184. DOI:10.11646/zootaxa.4317.1.10.

RECOR, 2011. *Prospective inventory of biodiversity in natural remnant forests of Rwanda: case of Kibilizi-Muyira, Sanza and Nyamakanda relict forests*. Unpublished report. Kigali, Rwanda: Rwanda Environment Conservation Organization. 52 pp.

REMA, 2023. *Environmental and Social Framework (ESF) instruments for Volcanoes Community Resilience Project (VCRP)*. Kigali.

REMA/UNEP/UNDP, 2011. Economic Analysis of Natural Resouces use in Rwanda, case of Rugezi Wetland.

Roche, E., 1991. Evolution des paléoenvironnements en Afrique centrale et orientale au Pléistocène supérieur et à l'Holocène. *Bull. Soc. Géograph. de Liège*, 21: 187–108.

Roche, E., 1996. L'influence anthropique sur l'environnement à l'Age du Fer dans le Rwanda ancien. Seminar on Gearcheology in Tropical and Mediterranean Regions (Brussels; 24 April 1996). *Geo-Eco-Trop*, 20(1-4):73–89.

Ryder, O.A., 1986. Species conservation and systematics: The dilemma of the subspecies. *Trends in Ecology & Evolution,* 1:9–10.

Schlitter, D. 2019. *Hylomyscus aeta. The IUCN Red List of Threatened Species 2019*: e.T10593A22451242. DOI:10.2305/IUCN.UK.2019-1.RLTS.T10593A22451242.en.

Schouteden, H., 1934. Les mammifères du secteur meridional du Parc National Albert (Kivu). *Rev. zool. bot. afr*., 25: 291–304.

Schouteden H. 1943. Catalogue des mammifères du Congo belge et du Ruanda-Urundi. *Rev. zool. bot. afr.*, 37: 102–125.

Schouteden H. 1947. De Zoogdieren van Belgisch Congo en van Ruanda-Urundi. *Annalen van het Koninklijk Museum voor Midden Afrika, Zoologische Wetenschappen* (2), 3: 1–576.

Schouteden H. 1948. Faune du Congo Belge et du Ruanda-Urundi. I. Mammifères. *Annalen van het Koninklijk Museum voor Midden Afrika, Zoologische Wetenschappen,* Ser. 8, 1: 1–331.

Simberloff, D., 1998. Flagships, umbrellas and keystones: is single species management passé in the landscape era? *Biological Conservation*, 83: 247–257.

Somers, M.J. & J.A.J. Nel, 2013. *Aonyx capensis*. In: J. Kingdon and M. Hoffmann (eds), Mammals of Africa. V: Carnivores, Pangolins, Equids and Rhinoceroses. Bloomsbury Publishing: London.

Stephenson, P.J., 2016. *Micropotamogale ruwenzorii. The IUCN Red List of Threatened Species 2016*: e.T13394A21287768. DOI: 10.2305/IUCN.UK.2016-1.RLTS.T13394A21287768.en.

Steppan, S.J. & J.J. Schenk, 2017. Muroid rodent phylogenetics: 900-species tree reveals increasing diversification rates. *PLoS ONE* 12(8): e0183070. DOI: 10.1371/journal.pone.0183070.

Steppan, S.J., R.M. Adkins & J. Anderson, 2004. Phylogeny and Divergence-Date Estimates of Rapid Radiations in Muroid Rodents Based on Multiple Nuclear Genes. *Syst. Biol*., 53(4): 533–553. DOI: 10.1080/10635150490468701

Storz, M. 1982. *La Forêt Naturelle de Nyungwe et sa Faune*. Projet Pilote Forestier, Direction des Eaux et Forêts, MINAGRI. Coopération Technique Suisse. 70 pp.

Šumbera, R., J. Krásová, L.A. Lavrenchenko, S. Mengistu, A. Bekele, O. Mikula & J. Bryja, 2018. Ethiopian highlands as a cradle of the African fossorial root-rats (genus *Tachyoryctes*), the genetic evidence. *Mol. Phylogen. Evol*., 126: 105–115.DOI: 10.1016/j.ympev.2018.04.003.

Sun, P., J.D. Bariyanga, T. Wronski, 2018. A literature review of mammalian research respective to the Akagera ecosystem in Rwanda. *Rwanda Journal, Series D*. 2(1):1–16. DOI:10.4314/rj.v2i1.1D.

Sun, P., P. Umuntunundi & T. Wronski, 2022. Species richness, relative abundance and occupancy of ground-dwelling mammals denote the ineffectiveness of chimpanzee as flagship species. *Mammalian Biology*, 102: 1835–1850. DOI: 10.1007/s42991-022-00289-5.

Svensson, M., E. Bersacola & S. Bearder, 2019. *Galagoides demidoff. The IUCN Red List of Threatened Species* 2019: e.T40649A17962255. DOI:10.2305/IUCN.UK.2019-3.RLTS.T40649A17962255.en

Svensson, M. & S. Bearder, 2019. *Galagoides thomasi. The IUCN Red List of Threatened Species 2019*: e.T40653A17962691. DOI:10.2305/IUCN.UK.2019-3.RLTS.T40653A17962691.en.

Taylor, P. 2016a. *Epomophorus minor*. *The IUCN Red List of Threatened Species*, 2016: e.T84458822A84458832. DOI:10.2305/IUCN.UK.2016-1.RLTS.T84458822A84458832.en.

Taylor, P.J., 2016b. *Dasymys incomtus*. *The IUCN Red List of Threatened Species*, 2016: e.T6269A115080446. DOI: 10.2305/IUCN.UK.2016-3.RLTS.T6269A22436584.en

Taylor, P.J., A. Macdonald, S.M. Goodman, T. Kearney, F.P.D. Cotterill, S. Stoffberg, A. Monadjem, M.C. Schoeman, J. Guyton,

P. Naskrecki, & L.R. Richards, 2018. Integrative taxonomy resolves three new cryptic species of small southern African horseshoe bats (*Rhinolophus*). *Zoological Journal of the Linnean Society*, XX: 1–28.

Tuyisingize, D., B.A. Kaplin, W. Eckardt, A. Musana & D. Caillaud, 2023. Distribution and conservation status of the golden monkey *Cercopithecus mitis kandti* in Rwanda. *Oryx*, 57(1):98–106. DOI:10.1017/S0030605321001009.

Tuyisingize, D., J.C. Kerbis Peterhans, G.N. Bronner & T. Stoinski, 2013. Small mammal community composition in the Volcanoes National Park, Rwanda. *Bonn zool. Bull.*, 62(2): 177–185.

Van Cakenberghe, V., G.C. Gembu Tungaluna, P. Musaba Akawa, E. Seamark & E. Verheyen, 2017. The bats of the Congo and of Rwanda and Burundi revisited (Mammalia: Chiroptera). *European Journal of Taxonomy,* 382: 1–327.

Van der Straeten, E., Lavrenchenko, L. & Abdel-Rahman, E.H. 2016. *Lemniscomys macculus*. *The IUCN Red List of Threatened Species* 2016: e.T11492A115102917. DOI: 10.2305/IUCN.UK.2016-3.RLTS.T11492A22439152.en.

Van der Straeten, E. & J.C. Kerbis Peterhans, 1999. *Praomys degraaffi*, a new species of Muridae (Mammalia) from central Africa. *South African Journal of Zoology*, 34(2):80–90. DOI:10.1080/02541858.1999.11448492.

Van der Straeten, E. & W.N. Verheyen, 1983. Nouvelles captures de *Lophuromys rahmi* et *Delanymys brooks*i en République Rwandaise. *Mammalia*, 47: 426–429.

Vande weghe, J.P., 1990. *Akagera, land of water, grass and fire*. WWF: Kigali. (256 pp).

Vande weghe, J.P., 1998a. Evolution des populations d'ongulés et de l'écosystème terrestre du Parc National de l'Akagera, Rwanda. *Cahiers d'Ethologie*, 18(2): 207–254.

Vande weghe, J.P., 1998b. Les introductions et réintroductions d'espèces au Parc National de l'Akagera, Rwanda. *Cahiers d'Ethologie,* 18(2): 255–260.

Vande weghe, J.P. & P. Dejace, 1991. *Rapport scientifique du projet 3747 du Fonds mondial pour la nature (WWF Belgium) au Parc National de l'Akagera et au Domaine de Chasse du Mutara. I. Etude de l'écosystème de savanes*. agcd, Rapport final inédit du Projet Tourisme et Parcs Nationaux: Bruxelles.

Vande weghe, J.P. & G.R. Vande weghe (in prep.). *Rwanda: the landscapes, the people, and conservation*. Kigali: Ilume. 256 p.

Van Grunderbeek, M.C., E. Roche & H. Doutrelepont, 1982. L'Age du Fer Ancien au Rwanda et au Burundi. Archéologie et environnement. *Journal des Africanistes*, 52(1-2): 5–58.

Verheyen W., J. Hulselmans, T. Dierckx, M. Colyn, H. Leirs & E.Verheyen, 2003. A craniometric and genetic approach to the systematics of the genus *Dasymys* Peters, 1875 and the description of three new taxa (Rodentia, Muridae, Africa). *Bull. Inst. Roy. Belg. Sci. Nat*., 73: 27–71

Verheyen, W., J.L.J. Hulselmans, T. Dierchx & E. Verheyen, 2002. The *Lophuromys flavopunctatus* Thomas 1888 *s.l.* species complex : a craniometric study, with the description and genetic characterization of two new species (Rodentia - Muridae - Africa). *Bull. Inst. Roy. Sci. Nat. Belg.: Biologie*, 72: 141–182.

Verschuren, J., 1965a. *Cheiropteres. Exploration du Parc National de Ia Kagera*. *Inst. Parcs Nat. Congo Rwand*a, 1 (2): 67–75

Verschuren, J., 1965b. Contribution a l'Ecologie des grands Mammiferes. *Explor. Parc Nat. Kagera. Inst. Parcs Nat. Congo-Rwanda*, 1: 1–66.

Verschuren, J., 1985. *Mission Ecologie-Girafes. Parc National de l'Akagera*. ORTPN: Kigali.

Verschuren, J., 1987. Liste commentée des Mammifères des Parcs Nationaux du Zaire, du Rwanda et du Burundi. *Bull. Inst. Roy. Sci. Nat. Belg.: Biol.*, 57: 17–39.

Verschuren, J., 1988. Notes sur l'évolution des habitats et de la grande faune depuis 1948. *Explor. Parc Nat. Akagera, deuxième série, fascicule 3*. Fondation pour Favoriser les Recherches Scientifiques en Afrique (FFRSA): Bruxelles.

Voelker, G., J.W. Huntley, J. Bryja, C. Denys, R. Šumbera, T.C. Demos, L. Lavrenchenko, V. Nicolas, T.P. Gnoske, J.C. Kerbis Peterhans, 2021. Molecular systematics and biogeographic history of the African climbing-mouse complex (*Dendromus*). *Mol. Phylogen. Evol.*, 161: 107166. DOI: 10.1016/j.ympev.2021.107166.

Wang, X., C.-E; Tingskov Pedersen, G. Athanasiadis, G. Garcia-Erill, K. Hanghøj, L.D. Bertola, M.S. Rasmussen, M. Schubert, X. Liu, Z. Li, *et al*., 2022. Persistent gene flow suggests an absence of reproductive isolation in an African antelope speciation model. Preprint. DOI:10.1101/2022.12.08.519574;

Webala, P., Flanders, J., Frick, W.F. & Fahr, J. 2021. *Rhinolophus hilli*. *The IUCN Red List of Threatened Species* 2021: e.T44781A203829053. DOI: 10.2305/IUCN.UK.2021-3. RLTS.T44781A203829053.en.

Weber, W. & A. Vedder, 2001. *In the kingdom of Gorillas: Fragile Species in a Dangerous Land*. Simon & Schuster: New York.

Wilson, D.E. & R.A. Mittermeier, 2011. Bovidae. Pp 444–779 *in: Handbook of the Mammals of the World – Volume 2. Hoofed Mammals*. Lynx Edicions: Barcelona.

Wilson, D.E. & D.A. Reeder (Eds.), 2005. *Mammal Species of the World. A Taxonomic and Geographic Reference* (3rd ed). Johns Hopkins University Press. 2.142 pp. https://www.departments.bucknell.edu/biology/resources/msw3/.

Zachos, F.E., M. Apollonio, E.V. Bärmann, M. Festa-Bianchet, U. Göhlich, J.C. Habel, E. Haring, L. Kruckenhauser, S. Lovari, A.D. McDevitt, *et al*., 2013. Species inflation and taxonomic artefacts — A critical comment on recent trends in mammalian classification. *Mammal. Biol.*, 78(1):1–737. DOI: 10.1016/j mambio.2012.07.083.

Zachos, F.E., L. Christidis & S.T. Garnett, 2019. Mammalian species and the twofold nature of taxonomy: a comment on Taylor *et al.* 2019. *Mammalia*, 84(1): 1–5. DOI:10.1515/mammalia-2019-0009.

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