SECTION 4: REPTILES

Rwenzori three-horned Chamaeleon, an endemic species. A.Plumptre, WCS

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4.1 SUMMARY

A total of 175 species of reptile have been recorded in 33 sites of the Albertine Rift for which we could obtain records. This is about 14% of all reptiles found on mainland Africa. There are 16 species endemic and three near-endemic to the Albertine Rift. The Virunga National Park in DRC has a recorded list of 109 species and is the richest of the protected areas in the Albertine rift. Kahuzi Biega National Park ranks second with 69 species and Kibale National Park with 56 ranks third. Virunga National Park, with 11 species, has more species endemic to the Albertine Rift than any other site followed by Rwenzori Mountains National Park (9) and Nyungwe Forest (8). Few reptiles have been classified by IUCN criteria and only 2 from the rift are threatened and a further 2 IUCN-listed. No site has more than one of these four IUCN-listed species. Nine sites can protect more than 90% of species in the rift and only seven sites are required to protect all endemic, near-endemic and threatened species.

Au total 175 espèces de reptiles ont été enregistrées dans les 33 sites du Rift Albertin pour lesquelles nous avions pu obtenir les données acceptables. C'est environ 14% de tous les reptiles du continent Africain. On compte 16 espèces endémiques et trois espèces proche de l'endémisme au Rift Albertin. Le Parc National des Virunga en RDC compte 109 espèces et il est le plus riche des aires protégées du Rift Albertin. Le Parc National de Kahuzi Biega est le deuxième avec 69 espèces et le parc National de Kibale, le troisième avec 56 espèces. Le Parc National des Virunga, avec 11 espèces, a plus d'espèces endémiques au Rift Albertin que tout autre site, suivi du Parc National des Monts Ruwenzori (9) et la Forêt de Nyungwe (8). Quelques reptiles ont été classifiées suuivant les critères de l'UICN et 2 espèces seulement du Rift sont menacées et au plus 2 sur la liste de l'UICN. Aucun site n'a plus d'une espèce des quatre espèces de reptile menacées de la liste de l'UICN.Neuf sites

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peuvent protéger plus de 90% d'espèces dans le Rift et seulement sept sites sont necessaires pour protéger toutes les espèces endémiques et menacées.

4.2 INTRODUCTION

Due to their cryptic nature and the fact that many are poisonous, reptiles are less studied than mammals and birds and hence lists for this taxon are not as complete. They tend to be less mobile than the birds and mammals though and are therefore important to include in any analysis of the biodiversity of the Rift because certain species may show high specificity to a site. Of the 175 species listed for the sites in the Rift 24 (13.7%) were only recorded from one site and 40% of species were found at three sites or fewer. Unfortunately the collections that have been made in this region tend to be by a few collectors and they only sampled in certain locations. Only 13 sites had anything like reasonable numbers on their lists and it is clear that those sites with the highest numbers are the sites that have been most intensively surveyed. It is very probable that more species could be fairly easily added to the lists for most sites.

4.3 INFORMATION SOURCES

A variety of sources were used to compile the reptile list for the 33 sites where surveys have taken place. These sources are listed below by country. However there is great discrepancy between the intensity of the surveys at these sites. The authors of this chapter have also contributed many records.

Uganda

Pitman (1974) was used as a starting point for reptiles in Uganda. Drewes and Vindum (1998) provided a species list for Bwindi Impenetrable National Park and Vonesh (1998) put together a list for Kibale National Park. Spawls et al. (2002) identify localities for species for east Africa using general maps and these were used to assign species to a site if this was either mentioned in the text or if the map distribution was unequivocal. M. Behangana, from recent surveys, provided several records.

Rwanda

Hinkel and Fisher (1988) was used to develop a list of species for Virunga volcanoes and Nyungwe forest. This was augmented by de Witte (1941) for the Virunga volcanoes. Dowsett (1990) also provided a list for Nyungwe Forest. D. Meirte extracted lists of specimen locations from the database at the Royal Museum of Central Africa in Tervuren.

DR Congo

De Witte (1941) produced a list of reptiles for Virunga National Park and mapped the distributions of chameleons in central Africa (de Witte, 1965) and Hinkel in Fischer (1996) provided a list for Kahuzi Biega National Park. D. Meirte extracted lists of specimen locations from the database at the Royal Museum of Central Africa in Tervuren.

Burundi

No data were obtained for Burundi

Tanzania
Spawls et al. (2002) was used to compile a list of reptiles for Gombe and Mahale Mountains parks.

All species names in the old lists were carefully updated to current names using the database of the collections at the Royal Museum of Central Africa, Tervuren, to ensure that species were not duplicated. The EMBL database (www.reptile-database.org) was also used to check names and query subspecies. Endemic species were determined by D. Meirte using the database at the Royal Museum of Central Africa at Tervuren.

4.4 RESULTS

4.4.1 Species richness

A total of 175 species of reptile were identified, occurring in 33 sites for which data were compiled. This is 13.6% of the total number of reptiles recorded for the mainland of Africa (total from WWF database). Virunga National Park has the highest number of reptiles with 109 species or 62.3% of the total number of reptiles from these sites in the Albertine Rift. Kahuzi Biega National Park ranked second with 69 species, and Kibale National Park came third with 56 species (Table 4.1).

Table 4.1 The total number of species compiled, number of Albertine Rift (AR) endemic and near-endemic species, number of threatened species and total number of IUCN-listed species. Virunga Park is divided into five sectors due to its size and numbers are given separately for each sector as well as the total.

Site	SPP no.	AR endemic species	Near-endemic species	Threatened CR,EN, VU	Total IUCN threatened
Murchison Falls NP	32	0	0	1	1
Bugungu WR	9	0	0	0	0
Karuma WR	15	0	0	0	0
Budongo FR	48	1	0	0	1
Bugoma FR	9	0	0	0	0
Itwara FR	10	0	0	0	0
Lendu plateau	6	0	2	0	0
Semliki WR	33	0	0	1	1
Semliki NP	49	0	1	0	0
Rwenzori Mountains NP	34	9	0	0	0
Kibale NP	56	3	3	0	0
Kasyoha-Kitomi FR	9	0	0	1	1
Kalinzu-Maramagambo FR	9	0	0	0	0
Kyambura WR	12	0	0	0	0
Queen Elizabeth	34	0	0	0	0
Bwindi Impenetrable NP	34	6	2	0	0
Mafuga FR	17	2	0	0	0
Echuya FR	4	0	0	0	0
Virunga Volcanoes	43	7	1	0	0
Virunga south	53	8	1	0	0
Virunga central	55	4	0	0	0
Virunga north	39	2	2	0	0
PNVi Rwenzori	61	6	0	0	0
PNVi total	109	11	3	0	0
West of Lake Edward	6	3	1	0	0
Nyungwe NP	43	8	2	0	1
Kahuzi Biega NP	69	7	3	0	1
Kibira NP	3	2	0	0	0
Bururi FR	1	1	0	0	0
Lac Ruzizi	3	0	0	0	0

Itombwe Massif	35	5	2	0	0
Gombe NP	1	0	0	0	0
Mahale Mountains NP	4	0	0	0	0
Mt Kabobo	6	2	0	0	0
Mbizi FR	1	0	0	0	0
Marungu Massif	6	0	0	0	0
L. Tanganyika	13	0	0	0	1
L. Rukwa	7	0	0	0	0

4.4.2 Endemism

A total of 16 Albertine Rift endemic reptiles were identified with 3 endemic subspecies (Table 4.2). Given the problems with the taxonomy of reptiles and amphibians a decision was made to focus solely on species as was made with the other taxa. Virunga National Park had 11 endemic species and three near-endemic species followed by Rwenzori National Park (9 endemic species) and Nyungwe Forest (8 endemic and two near-endemic species).

Table 4.2 The endemic and near-endemic species of reptile that occur in the Albertine Rift.

Family	Species	Endemic(END) or Near Endemic (NE)
Chamaeleonidae	*Bradypodion carpenteri*	END
Chamaeleonidae	*Bradypodion xenorhinum*	END
Chamaeleonidae	*Chamaeleo johnstoni*	END
Chamaeleonidae	*Chamaeleo rudis*	END
Chamaeleonidae	*Chamaeleo schoutedeni*	END
Chamaeleonidae	*Bradypodion adolfifriderici*	NE
Chamaeleonidae	*Chamaeleo ituriensis*	NE
Colubridae	*Lycodonomorphus bicolor*	END
Colubridae	*Philothamnus ruandae*	END
Gekkonidae	*Cnemaspis quattuorseriata*	NE
Lacertidae	*Adolfus vauereselli*	END
Scincidae	*Leptosiaphos blochmanni*	END
Scincidae	*Leptosiaphos graueri*	END
Scincidae	*Leptosiaphos hackarsi*	END
Scincidae	*Leptosiaphos luberoensis*	END
Scincidae	*Leptosiaphos meleagris*	END
Scincidae	*Leptosiaphos rhodurus*	END
Typhlopidae	*Leptotyphlops latirostris*	END
Viperidae	*Atheris nitschei*	END

4.4.3 Threatened species

Two categories of IUCN-listed species were analysed: 1. threatened (including critically threatened, endangered and vulnerable) and 2. all IUCN-listed species (CR, EN, VU and lower risk and data deficient species). Only two reptiles are threatened (*Trionyx triunguis* and *Osteolamus tetraspis*) and four (two additional data deficient species) are IUCN-listed in the Rift. This low number is a reflection of the lack of information on the distribution of these reptiles and hence the difficulty in assigning them IUCN classifications. A revised list of threatened reptiles in the process of being developed (S. Stuart pers. comm.) No site has more than one threatened or IUCN-listed species (Table 4.1).

4.4.4 Complementarity analysis

A complementarity analysis was made of the reptile data set (33 sites). The analysis selected those sites with the highest number of endemic, near-endemic and IUCN-listed species initially until all of these species had been selected and then selected those sites that contributed the most number of additional species.

Virunga National Park was selected first followed by Itombwe Massif and Lake Tanganyika. The first seven sites 'captured' all endemic, near-endemic and threatened reptiles in at least one site and also accounted for 84% of all reptile species recorded for the Rift. 18 sites were required to include all species (Table 4.3).

It is interesting how high Lake Tanganyika ranked in the complementarity analysis. This is because there is an endemic snake, *Lycodonomorphus bicolor* and an IUCN-listed crocodile, *Crocodylus cataphractus* found in the lake rather than because it is particularly rich in reptiles. These two species may well occur in Gombe Stream or Mahale Mountains national parks but we did not find any such records. Unlike the mammals and birds the complementarity analysis did not select sites in the south of the Rift. This is primarily because the data for these sites is very poor and few reptiles have been collected here rather than because they are not important.

Table 4.3 Results of the complementarity analysis indicating the minimum number of sites that together would maximise the number of reptiles protected. The sites on the left were selected first to ensure 'capture' of the endemic, near endemic and threatened species.

Sites which added endemic/near-endemic/threatened reptiles			**Sites adding additional reptiles**		
Sites	Species added	ARE/IUCN added	Sites	Species added	ARE/IUCN added
Virunga Park	109	14	Kibale NP	6	0
Itombwe Massif	9	2	Semliki NP	4	0
Lake Tanganyika	9	2	Lake Rukwa	3	0
Nyungwe Forest	5	2	Kahuzi Biega NP	2	0
Murchison Falls NP	9	1	Queen Elizabeth NP	2	0
Semliki WR	6	1	Rwenzori NP	2	0
Rusizi National Park	3	1	Kyambura NP	2	0
			Budongo FR	1	0
			Gombe Stream NP	1	0
			Karuma WR	1	0
			Mbizi FR	1	0

4.4.5 Cluster analyses

A cluster analysis was performed on the reptile data set for sites with reasonable lists of reptiles and where collections had taken place at several times. As the Virunga Park is large and extends over several habitat types it was subdivided into 5 sectors (volcanoes, south, central, Rwenzori and northern sectors) and these separate areas were included in the cluster analyses.

The clusters obtained are not very clear and are probably affected by the fact the lists are probably incomplete. There is a savanna set (Queen Elizabeth, Murchison Falls and Semliki Wildlife Reserve) although interestingly this does not cluster with the central Virunga Park, which is also savanna but has been better collected. There is a cluster of central high altitude sites (Nyungwe, Bwindi and Virunga Volcanoes) but surprisingly the northern sector of Virunga Park clusters with this group. Kahuzi Biega Park and Kibale Park cluster together but this is because these two sites have been more intensively surveyed than other sites and lists are more complete.

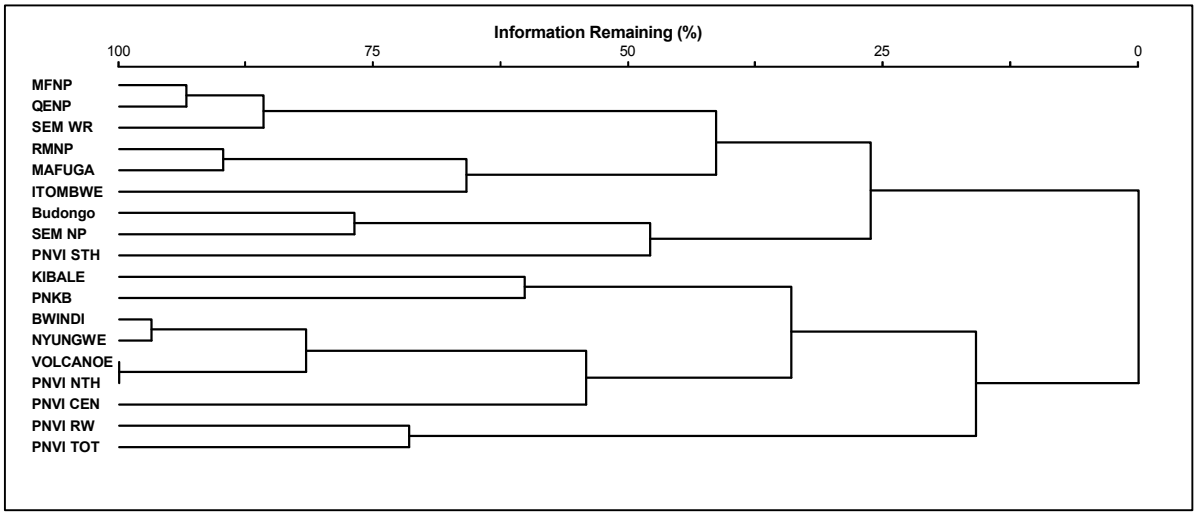

Figure 4.1 A cluster dendrogram for the reptile data set. The Virunga Park (PNVi) is separated into five subsectors (Volcanoes, south – PNVi sth, central – PNVI cen, north – PNVI nth and Rwenzori – PNVI RW). MFNP=Murchison Falls park, QENP=Queen Elizabeth park, PNKB=Kahuzi Biega park, SEM=Semliki, RMNP=Rwenzori mountains park.

4.5 Discussion

These results show that the Albertine Rift is not as rich for reptile species as it is for mammals and birds. A total of 175 species occur in this part of Africa of which 10.3% are endemic or near-endemic and 2.2% are listed under IUCN criteria. It is clear that these results are provisional and could probably be greatly increased with more collection effort in the region.

Virunga National Park is by far the richest park for species in part because it has been well surveyed but also because it is large in size and contains a variety of habitat types. Interestingly Rwenzori Park in Uganda, which is contiguous with the Rwenzori sector of Virunga Park, only has about half the number of species that are found in the Virunga sector. This may be partly due to the fact that natural vegetation only occurs above about 2,500 metres on the Uganda side but drops down to 700 metres on the Congo side but it also indicates that surveys could probably increase the number of species markedly even in sites which are thought to be one of the better surveyed sites.

Sites that deserve further attention and collection include the southern sites: Mahale Mountains and Gombe Stream National Parks, and Marungu Massif and Mt Kabobo which have very few species recorded. Other sites that need work include Itombwe Massif, Queen Elizabeth National Park, Kasyoha-Kitomi, Bugoma and Kalinzu Forest Reserves and Murchison Falls National Park. Rusizi National Park in Burundi has two species that have not been recorded from elsewhere in the sites we looked at in the rift and should be surveyed more intensively (we compiled a list of only 4 species for the park in total).

Figure 4.2 summarises the results in GIS. Species richness is relatively evenly spaced along the Rift while endemism is generally concentrated around the central portion of the Rift. Threatened species have only been found in the northern part of the rift but this is due to the low numbers of threatened species in the 2000 IUCN Redlist.

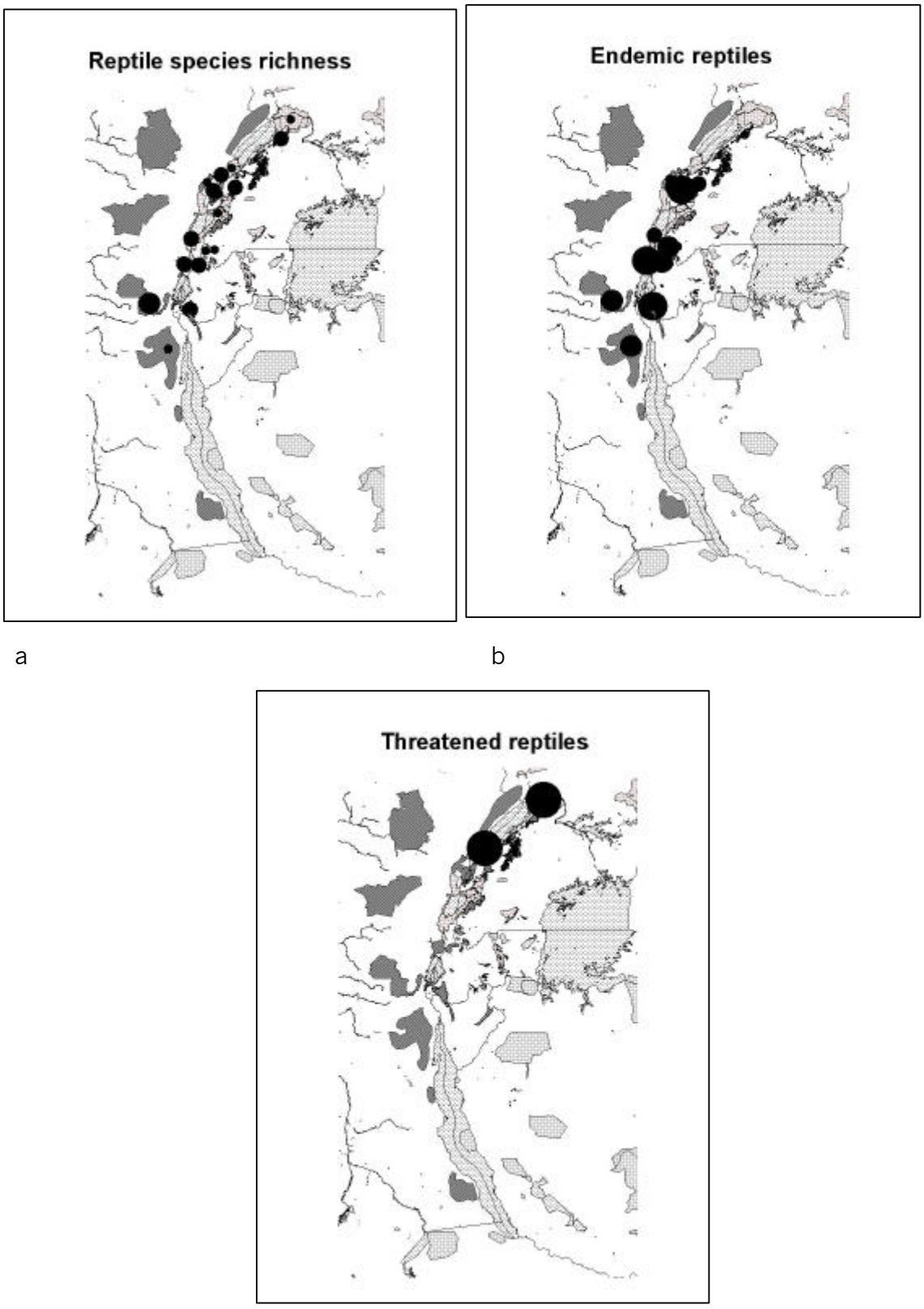

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Figure 4.2 A summary of the results for the reptile data represented geographically. Each site that has non-zero data is represented by a circle of varying size depending on the number of species. a) reptile species richness; b) endemic reptiles; c) threatened reptiles (CR, EN and VU).