

Aonyx congicus - Lönnberg, 1910

ANIMALIA - CHORDATA - MAMMALIA - CARNIVORA - MUSTELIDAE - *Aonyx congicus*

Common Names: Congo Clawless Otter (English), Cameroon Clawless Otter (English), Kleinkrallen-Fingerotter (German), Kongo-Fingerotter (German), Loutre à joues blanches du Cameroun (French), Loutre à joues blanches du Congo (French), Nutria Inerme de Camerún (Spanish; Castilian), Paraonyx tacheté (French), Small-clawed Otter (English), Small-toothed Clawless Otter (English), Zaire Clawless Otter (English)

Synonyms: No Synonyms

Taxonomic Note:

Allen (1924) and Davis (1978) treated *A. capensis* and *A. congicus* as being conspecific, arguing that they represent clinal variations of the same species. However, mainly based on tooth size and skin differences, Rosevear (1974), Van Zyll de Jong (1987), Wozencraft (1993), and Larivière (2001) considered *A. capensis* and *A. congicus* as separate species, but this remains debated, and Wozencraft (2005) did not retain *A. congicus* as a valid species, contrary to the opinion of the IUCN SSC Otter Specialist Group (www.otterspecialistgroup.org) (Jacques *et al.* 2009). The name *Aonyx congica* is often found in the literature but *A. congicus* is the correct spelling as *Aonyx*, from the Greek 'onux', is masculine (Van Bree *et al.* 1999).

Red List Status

NT, A3cde (IUCN version 3.1)

Red List Assessment

Assessment Information

Date of Assessment: 31/01/2020

Reviewed: 27/02/2020

Assessor(s): Jacques, H., Reed-Smith, J., Davenport, L. & Somers, M.J.

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Assessment Rationale

All of Africa's otter species are threatened by alteration and/or degradation of freshwater habitats and riparian vegetation which are the preferred settlements of human population. Congo Clawless Otters have been protected by the remoteness of the Congo forest and the difficulty of catching them. However, firearms are growing in prevalence in the region, providing a possible 10-fold increase in hunters' success rate over traditional practices (Levi *et al.* 2009). Road-building opening up the forest for timber exploitation and construction of large hydroelectric projects could also reduce the protection afforded to date.

Habitat loss by direct causes (clearing, inundation) and indirect causes (pollution, invasive species introduction) and competition for fisheries is increasing with the growing human population in concert with declining returns from an unsustainable bushmeat trade (Wilkie *et al.* 2005). These combined factors predict a severe reduction of otter habitat and populations. Increased global temperature and resultant climate change may also increase periods of drought, with additional losses to otter populations (Davenport *et al.* 2011). Consequently, all African otter species are likely to be more affected in the next 20 years (generation length 6.5 as proposed by Pacifici *et al.* 2013). Thus, the species is assessed as Near Threatened under criteria A3cde, based on a suspected decline of at least 25% over the next three generations due to the observed decline in habitat quality and other threats to the species. This is a precautionary listing.

Reasons for Change

Reason(s) for Change in Red List Category from the Previous Assessment: NA

Distribution

Geographic Range

The Congo Clawless Otter occurs in the rainforests of the Congo basin including Equatorial Guinea, Gabon, Republic of Congo, the Democratic Republic of the Congo, as well as southern Cameroon, southern Central African Republic, northern Angola, and extending eastward to the forests and the wetlands of Rwanda, Burundi and Uganda (Rowe-Rowe 1990, Larivière 2001, Jacques *et al.* 2009). The limits of the species' distribution range

are still unclear, partly due to the species' possible confusion with the Cape Clawless Otter; there are, as yet, no confirmed records from Nigeria (Jacques *et al.* 2009).

Area of Occupancy (AOO)

Estimated area of occupancy (AOO) - in km²: 475.440 km²

Continuing decline in area of occupancy (AOO): NA

Extreme fluctuations in area of occupancy (AOO): NA

Extent of Occurrence (EOO)

Estimated extent of occurrence (EOO)- in km ²	EOO estimate calculated from Minimum Convex Polygon	Justification
460000	-	-

Continuing decline in extent of occurrence (EOO)	Qualifier	Justification
Yes	Projected	-

Extreme fluctuations in extent of occurrence (EOO)	Justification
Yes	-

Locations Information

Number of Locations: NA

Continuing decline in number of locations: NA

Extreme fluctuations in the number of locations: NA

Very restricted AOO or number of locations (triggers VU D2)

Very restricted in area of occupancy (AOO) and/or # of locations: NA

Elevation / Depth / Depth Zones

Elevation Lower Limit (in metres above sea level): 0

Elevation Upper Limit (in metres above sea level): 2200

Depth Lower Limit (in metres below sea level): 0

Depth Upper Limit (in metres below sea level): 0

Depth Zone: Shallow photic (0-50m)

Map Status

Map Status	How the map was created, including data sources/methods used:	Please state reason for map not available:	Data Sensitive ?	Justification	Geographic range this applies to:	Date restriction imposed:
Done	-	-	-	-	-	-

Biogeographic Realms

Biogeographic Realm: Afrotropical

Occurrence

Countries of Occurrence

Country	Presence	Origin	Formerly Bred	Seasonality
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Angola	Extant	Native	-	Resident
Burundi	Presence Uncertain	Native	-	-
Cameroon	Extant	Native	-	Resident
Central African Republic	Extant	Native	-	Resident
Congo	Extant	Native	-	Resident
Congo, The Democratic Republic of the	Extant	Native	-	Resident
Equatorial Guinea	Extant	Native	-	Resident
Gabon	Extant	Native	-	Resident
Nigeria	Presence Uncertain	Native	-	-
Rwanda	Extant	Native	-	Resident
Uganda	Extant	Native	-	Resident

Population

This is a very poorly known species. It may be common in certain undisturbed rainforest locations, but is otherwise thought to be rare to very rare (Jacques *et al.* 2009). In certain places, locals attest that they see fewer “big otters” (*A. congicus* versus *H. maculicollis*) (Jacques 2002b, c; Jacques *et al.* 2002a; Jacques 2003, 2006; Davenport *et al.* 2011). A number of documented cases of *A. congicus* (including mother and cub) being killed by locals in Cameroon, Gabon, Congo and the Democratic Republic of the Congo would suggest that although otters are rarely seen and are difficult to catch, otter populations may suffer from hunting pressure in Congo Basin (Jacques 2002b). This will likely increase in the future as human population grows and the demand for preferred bushmeat species increases.

Population Information

Current Population Trend: Decreasing

Number of mature individuals (=population size): NA

Extreme fluctuations? (in # of mature individuals): NA

Severely fragmented?	Justification
No	-

Continuing decline in mature individuals? YES

Continuing decline % in mature individuals within 1 generation or 3 years, whichever is longer (up to max. of 100 years in the future): NA

Continuing decline % in mature individuals within 2 generations or 5 years, whichever is longer (up to max. of 100 years in the future): NA

Continuing decline % in mature individuals within 3 generations or 10 years, whichever is longer (up to max. of 100 years in the future): NA

Extreme fluctuations in the number of subpopulations: NO

Continuing decline in number of subpopulations: NA

All individuals in one subpopulation: NO

Number of mature individuals in largest subpopulation: NA

Number of Subpopulations: NA

Population Reduction - Past

Percent Change in past: NA

Past Population Reduction Basis: NA

Causes of past reduction reversible? NO

Causes of past reduction understood? YES

Causes of past reduction ceased? NO

Population Reduction - Future

Percent Change in future	Reduction or Increase	Qualifier	Justification
25%	Reduction	Suspected	-

Basis?

c) a decline in area of occupancy, extent of occurrence and/or quality of habitat, d) actual or potential levels of exploitation, e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites)

Population Reduction - Ongoing

Both: Percent Change over any 10 year or 3 generation period, whichever is longer, and must include both past and future, future can't go beyond 100 years: NA

Both Population Reduction Basis: NA

Reversible?

No

Understood?

Yes

Ceased?

No

Quantitative Analysis

Probability of extinction in the wild within 3 generations or 10 years, whichever is longer, maximum 100 years	Justification
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0

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Probability of extinction in the wild within 5 generations or 20 years, whichever is longer, maximum 100 years	Justification
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0

-

Probability of extinction in the wild within 100 years	Justification
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0

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Habitats and Ecology

The Congo Clawless Otter occurs in tropical rainforests and lowland swamps of the Congo River basin (Larivière 2001, Jacques *et al.* 2009). They are observed in swampy forest clearings (bais), for example, at Langoué Bai in Gabon, and Mbeli Bai in Nouabalé-Ndoki National Park (N.P.) and in Odzala N.P. in the Republic of the Congo (Jacques *et al.* 2009). They also inhabit some rivers, for example Dji Dji River (Gabon) (Davenport *et al.* 2011), and Sanaga River (Cameroon) (Jacques 2006). They are recorded up to 2,200 m on the Kahuzi Massif (Rahm and Christiaensen 1963). With one exception (Davenport *et al.* 2011), all records report the presence of only one young with the mother (Jacques 2002b).

IUCN Habitats Classification Scheme

Habitat	Season	Suitability	Major Importance?
1.6. Forest -> Forest - Subtropical/Tropical Moist Lowland	Resident	Suitable	Yes
1.7. Forest -> Forest - Subtropical/Tropical Mangrove Vegetation Above High Tide Level	Resident	Suitable	Yes
1.8. Forest -> Forest - Subtropical/Tropical Swamp	Resident	Suitable	Yes
5.1. Wetlands (inland) -> Wetlands (inland) - Permanent Rivers/Streams/Creeks (includes waterfalls)	Resident	Suitable	Yes
5.2. Wetlands (inland) -> Wetlands (inland) - Seasonal/Intermittent/Irregular Rivers/Streams/Creeks	-	Suitable	No
5.3. Wetlands (inland) -> Wetlands (inland) - Shrub Dominated Wetlands	-	Suitable	Yes
5.4. Wetlands (inland) -> Wetlands (inland) - Bogs, Marshes, Swamps, Fens, Peatlands	Resident	Suitable	Yes
5.5. Wetlands (inland) -> Wetlands (inland) - Permanent Freshwater Lakes (over 8ha)	Resident	Suitable	Yes
5.6. Wetlands (inland) -> Wetlands (inland) - Seasonal/Intermittent Freshwater Lakes (over 8ha)	-	Suitable	No
5.7. Wetlands (inland) -> Wetlands (inland) - Permanent Freshwater Marshes/Pools (under 8ha)	Resident	Suitable	Yes
5.8. Wetlands (inland) -> Wetlands (inland) - Seasonal/Intermittent Freshwater Marshes/Pools (under 8ha)	-	Suitable	No
5.13. Wetlands (inland) -> Wetlands (inland) - Permanent Inland Deltas	-	Marginal	-
15.2. Artificial/Aquatic & Marine -> Artificial/Aquatic - Ponds (below 8ha)	-	Marginal	-
15.9. Artificial/Aquatic & Marine -> Artificial/Aquatic - Canals and Drainage Channels, Ditches	-	Marginal	-

Continuing Decline in Habitat

Continuing decline in area, extent and/or quality of habitat?	Qualifier	Justification
Yes	Observed	-

Life History

Generation Length	Justification	Data Quality

6.45	Based on Pacifici et al. 2013	good
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Age at maturity: female or unspecified

2.5 (Not specified)

Age at Maturity: Male

2.5 Years

Movement Patterns

Movement Patterns: Not a Migrant

Congregatory: NA

Systems

System: Terrestrial, Freshwater (=Inland waters)

Use and Trade

General Use and Trade Information

Species not utilized: False

No use/trade information for this species: False

In addition to threats such as habitat loss, degradation, depletion of prey base and pollution, otters are occasionally hunted for meat. They are seldom recorded in bushmeat reports (S. Lahm and A. Willox pers. comms., Jacques 2002b). The price is quite similar to other bushmeat. While meat is sought after in Congo and Cameroon, this is not the case in Gabon.

Moreover, in Gabon, otters are sometimes considered dangerous, giving an electrical shock when caught with a spear. In Central and West Africa, their meat is considered as an aphrodisiac (as it is with many other species). In some areas, the otter is said to possess magical powers: by wearing a piece of fur one can become invisible to an opponent, or escape an enemy as otters escape fish traps.

In the Democratic Republic of the Congo (DRC), killing has exponentially increased over the recent decade with the proliferation of weapons and munitions, making the shooting of otters from pirogues and the river bank much more common (Thompson pers. comm.). Skins of *A. congicus* are used in Cameroon to make drums (Alary *et al.* 2001). According to Carpaneto and Germi (1989), Mbuti pygmies in north-eastern DRC use the skins of Congo Clawless Otters to make hats.

Subsistence:	Rational:	Local Commercial:	Further detail including information on economic value if available:
Yes	-	-	-

National Commercial Value: No

International Commercial Value: No

End Use	Subsistence	National	International	Other (please specify)
1. Food - human	true	-	-	-
3. Medicine - human & veterinary	true	-	-	-
10. Wearing apparel, accessories	true	-	-	-
12. Handicrafts, jewellery, etc.	true	-	-	-

Is there harvest from captive/cultivated sources of this species? No

Trend in level of total offtake from wild sources: Unknown

Trend in level of total offtake from domesticated sources: Not domesticated

Harvest Trend Comments: NA

Non- Consumptive Use

Non-consumptive use of the species? true

Explanation of non-consumptive use: The species may be a subject for scientific research since there is a lack of knowledge about its ecology and behaviour. Also, may serve as a flagship species along with other African otter species for otter and wetland conservation in Africa.

Threats

Aonyx congicus may not be under threat where their habitat is still well preserved (Gabon and parts of Congo). Nevertheless, road opening for wood exploitation could adversely affect the sustainable use of the forest with hunters using these roads for their illegal activities. Deforestation has dramatically increased in Cameroon and the Democratic Republic of the Congo, and will probably be an even bigger problem in future. As a result of the high human density, lakes and rivers are subjected to pollutants from human activities such as washing, agricultural run-off and soil erosion.

Overfishing has become a critical threat to otter populations as fish community structure has been decimated across the central Congo Basin. Fishes contribute from 23 to 50 per cent of the animal protein trade in Central Africa (<http://www.fao.org/docrep/t6800e/t6800e03.htm>) and studies of morphometric measurements have documented the evidence of widespread overfishing for human consumption.

In addition to the escalation of hunting for bushmeat and skins, habitat loss, habitat degradation, and overfishing, otter populations in Central Africa are also susceptible to pressure from the development of hydro-electric power projects, under-representation of otter habitat in Protected Areas, fishermen using nylon fishing nets, a growing prevalence of arms and munitions, as well as a dramatic decline in other species (such as the Common Hippopotamus) that contribute to the aquatic-ecosystem functioning and which support otter food supplies. Some of these threats are major, but more important is the combined effect of these threats on the otters.

The Congo Clawless Otter seems to average one pup in a litter and may abandon any area of occupancy with high human activity. In one study on the Dji Dji River in Gabon (Davenport *et al.* 2011), reproductive Congo Clawless Otters disappeared from a site previously observed to harbour high densities of the species (alongside *Hydrictis maculicollis* which did decline to the same degree). Low rainfall in the previous wet season was thought to be the reason, but nothing is known about the adaptability of otters, their seasonal movements or the whereabouts of Congo Clawless Otters in response to drought conditions. As global climate change is predicted to increase the frequency and severity of droughts, these conditions may impact survival and reproduction of the species in the future.

Threats Classification Scheme

No past, ongoing, or future threats exist to this species. False

The threats to this species are unknown. False

Threat	Timin g	Timin g Score	Scope	Severity	Impact Score	Impact Category
2. Agriculture and aquaculture -> 2.1.2. Small holder farming	Ongoing	3	2	3	8	High
Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects					
2.2 Wood and pulp plantation -> 2.2.1. Small holder plantation	Ongoing	3	2	3	8	High
Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects					
4.1. Transportation & service corridors -> Roads & railroads	Ongoing	3	1	2	6	Medium

	Stresses: 1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species stresses -> 2.1. Species mortality					
5.1.1. Biological resource use -> Hunting & trapping terrestrial animals -> Intentional use (species is the target)	Ongoing	3	2	2	7	Medium
	Stresses: 1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species stresses -> 2.1. Species mortality					
5.3.3. Biological resource use -> Logging & wood harvesting -> Unintentional effects: (subsistence/small scale) [harvest]	Ongoing	3	2	2	6	Medium
	Stresses: 1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species stresses -> 2.1. Species mortality					
5.3.4. Biological resource use -> Logging & wood harvesting -> Unintentional effects: (large scale) [harvest]	Ongoing	3	2	2	6	Medium
	Stresses: 1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species stresses -> 2.2. Species disturbance					
5.4.3. Biological resource use -> Fishing & harvesting aquatic resources -> Unintentional effects: (subsistence/small scale) [harvest]	Ongoing	3	3	2	8	High
	Stresses: 1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species stresses -> 2.1. Species mortality 2. Species stresses -> 2.3. Indirect species effects -> 2.3.2. Competition					
9.1.2. Pollution -> Domestic & urban waste water -> Run-off	Ongoing	3	1	1	5	Low
	Stresses: 1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects					
11.2. Climate change & severe weather -> Droughts	Future	1	1	1	5	Low
	Stresses: 1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects					

Conservation

Congo Clawless Otter is present in several protected areas across their range, including Dzanga-Sangha N.P. in Central African Republic, Ivindo Gabon, and Nouabalé-Ndoki and Odzala National Parks in Congo Republic (Jacques *et al.* 2009). Thus, they are incidentally conserved with other target species. It is listed on CITES Appendix II (as *Aonyx capensis*). Appendix II lists species that are not necessarily now threatened with extinction but that may become so unless trade is closely controlled. There is a need for a detailed study on the biology, ecology, and distribution of this species.

In addition to threats already cited, the general lack of awareness of the presence of the Congo Clawless Otter and lack of conservation efforts by the institutions in charge of wildlife conservation in most African countries, is

further accelerating the decline of the species. The initiative of the Wildlife Conservation Society to include otters in their document 'Setting conservation and research priorities for larger African carnivores' (Ray *et al.* 2005) could aid in greater awareness and promotion of more research on African otters. Otters could be used as symbols of water quality and preservation, and this may contribute to environmental education. The Congo Clawless Otter should be given legal protection status in Gabon, Congo, DRC and Cameroon until more information is collected about its status.

Conservation Actions In- Place

Action Recovery Plan	Note
No	No recovery plan yet

Systematic monitoring scheme	Not e
No	-

Conservation sites identified: NA

Occur in at least one PA	Not e
Yes	-

Percentage of population protected by PAs (0-100): NA

Area based regional management plan	Not e
No	-

Invasive species control or prevention: NA

Harvest management plan	Not e
No	-

Successfully reintroduced or introduced benignly	Not e
No	-

Subject to ex-situ conservation	Not e
No	-

Subject to recent education and awareness programmes	Not e
No	-

Included in international legislation	Note
Yes	CITES Appendix II (as <i>Aonyx capensis</i>)

Subject to any international management/trade controls	Note
Yes	CITES Appendix II (as <i>Aonyx capensis</i>)

Important Conservation Actions Needed

Conservation Actions	Not e
1.1. Land/water protection -> Site/area protection	-
3.2. Species management -> Species recovery	-
3.4.1. Species management -> Ex-situ conservation -> Captive breeding/artificial propagation	-
4.1. Education & awareness -> Formal education	-
4.3. Education & awareness -> Awareness & communications	-

Research Needed

Research	Not e
1.1. Research -> Taxonomy	-
1.2. Research -> Population size, distribution & trends	-
1.3. Research -> Life history & ecology	-
1.5. Research -> Threats	-
3.1. Monitoring -> Population trends	-

Bibliography

- Alary, F., Moutou, F. and Jacques, H. 2001. Still on the tracks of the Congo clawless otter (*Aonyx congicus*): first mission in Cameroon. *IUCN Bulletin Otter Specialist Group* 19(1).
- Allen, J.A. 1924. Carnivora collected by the American Congo expedition. *Bulletin American Museum Natural History* 47: 85-108.
- Carpaneto, G.M. and Germe, F.P. 1989. Mustelidae and Viverridae from north-eastern Zaire: ethnozoological research and conservation. *Mustelid & Viverrid Conservation* 1: 2-4.
- Davenport, L., Jacques, H. and Yedi, M. 2011. Rapport sur le projet: "Écologie et conservation de la loutre à joues blanches du Congo (*Aonyx congicus*). In: Report to CENAREST (ed.). Centre National de la Recherche Scientifique et Technologique, Libreville, Gabon.
- Davenport, L.C., Jacques, H. and Terborgh, J. W. 2011. A Whole Otter World. *Gabon Magazine*.
- Davis, J.A. 1978. A classification of the otters. In: N. Duplaix (ed.), Otters: proceedings of the First Working Meeting of the Otter Specialist Group, pp. 14-33. Morges, Switzerland.
- De Barros Machado, A. 1967. *Mamíferos de Angola ainda não citados ou pouco conhecidos*. Museo do Dundo, Lisboa.
- Jacques, H. 2002b. *Aonyx congicus*, Mission Gabon. Grenoble.
- Jacques, H. 2002c. *Aonyx congicus*, Mission Congo. Grenoble.
- Jacques, H. 2004. *Aonyx congicus*, Mission Niger. Grenoble.
- Jacques, H. 2006. *Aonyx congicus*, Mission Cameroon. Grenoble.
- Jacques, H., Moutou, F. and Alary, F. 2002a. On the tracks of the Congo clawless otter (*Aonyx congicus*) in Gabon. *IUCN Bulletin Otter Specialist Group* 19(1).
- Jacques, H., Parnell, R. and Alary, F. 2013. *Aonyx congicus*. In: J. Kingdon and M. Hoffmann (eds), *The Mammals of Africa. Volume V: Carnivores, Pangolins, Equids and Rhinoceroses*, Bloomsbury Publishing, London.
- Jacques, H., Veron, G., Alary, F. and Aulagnier, S. 2009. The Congo Clawless Otter (*Aonyx congicus*) (*Mustelidae: Lutrinae*): a review of its systematics, distribution and conservation status. *African Zoology* 44(2): 159-170. doi: <http://dx.doi.org/10.3377/004.044.0204>.
- Larivière, S. 2001. *Aonyx congicus*. *Mammalian Species* 650: 1-3.

- Levi, T., Shepard Jr., G.H., Ohl-Schacherer, J., Peres, C.A. and Yu, D.W. 2009. Modelling the long-term sustainability of indigenous hunting in Manu National park, Peru: landscape-scale management implications for Amazonia. *Journal of Applied Ecology* 46(4): 804-814.
- Lönnberg, E. 1910. A new species of clawless otter (*Aonyx capensis congica*) from Lower Congo. *Arkiv för Zoologi* 7: 1-8.
- Pacifici, M., Santini, L., Di Marco, M., Baisero, D., Francucci, L., Grottolo Marasini, G., Visconti, P. and Rondinini, C. 2013. Generation length for mammals. *Nature Conservation* 5: 87-94.
- Rahm, U. and Christiaensen, A. 1963. Les mammifères de la région occidentale du Lac Kivu. *Annales Musée Royal de l'Afrique Centrale, Sciences Zoologiques ser. 8* 118: 1-183.
- Ray, J.C., Hunter, L. and Zigouris, J. 2005. Setting conservation and research priorities for larger African carnivores. Wildlife Conservation Society, New York, USA.
- Rosevear, D.R. 1974. *The Carnivores of West Africa*. Trustees of the British Museum (Natural History), London, UK.
- Rowe-Rowe, D.T. 1990. Recent information on the Congo clawless otter. *IUCN Otter Specialist Group Bulletin* 5: 27-27.
- Van Bree, P.J.H., Bosscha Erdbrink, D.P. and Roescher, F.J. 1999. A second find of *Aonyx antiquus* in the Netherlands, and some remarks on *Aonyx* and allied forms (Mammalia, Carnivora, Mustelida). *Deinsea* 7: 313-323.
- Van Zyll de Jong, C.G. 1987. A phylogenetic study of the *Lutrinae* (Carnivora; Mustelidae) using morphological data. *Canadian Journal of Zoology* 65: 2536-2544.
- Wilkie, D.S., Starkey, M., Abernethy, K., Effa, E.N., Telfer, P. and Godoy, R. 2005. Role of prices and wealth in consumer demand for bushmeat in Gabon, Central Africa. *Conservation Biology* 19: 268-274.
- Wilson, D.E. and Reeder, D.M. (eds). 2005. *Mammal Species of the World: A Taxonomic and Geographical Reference*. Third edition. John Hopkins University Press, Baltimore.
- Wozencraft, W.C. 1993. Order Carnivora. In: D.E. Wilson and D.M. Reeder (eds), *Mammal Species of the World: A Taxonomic and Geographic Reference. Second Edition*, pp. 279-344. Smithsonian Institution Press, Washington, DC, USA.
- Wozencraft, W.C. 2005. Order Carnivora. In: D.E. Wilson and D.M. Reeder (eds), *Mammal Species of the World: A Taxonomic and Geographic Reference. Third Edition*, pp. 532-628. Johns Hopkins University Press, Baltimore.