# The 2008 IUCN red listings of the world's small carnivores

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### **Abstract**

The global conservation status of all the world's mammals was assessed for the 2008 IUCN Red List. Of the 165 species of small carnivores recognised during the process, two are Extinct (EX), one is Critically Endangered (CR), ten are Endangered (EN), 22 Vulnerable (VU), ten Near Threatened (NT), 15 Data Deficient (DD) and 105 Least Concern. Thus, 22% of the species for which a category was assigned other than DD were assessed as threatened (i.e. CR, EN or VU), as against 25% for mammals as a whole. Among otters, seven (58%) of the 12 species for which a category was assigned were identified as threatened. This reflects their attachment to rivers and other waterbodies, and heavy trade-driven hunting. The IUCN Red List species accounts are living documents to be updated annually, and further information to refine listings is welcome.

*Keywords*: conservation status, Critically Endangered, Data Deficient, Endangered, Extinct, global threat listing, Least Concern, Near Threatened, Vulnerable

## Introduction

The IUCN Red List of Threatened Species is the most authoritative resource currently available on the conservation status of the world's biodiversity. In recent years, the overall number of species included on the IUCN Red List has grown rapidly, largely as a result of ongoing global assessment initiatives that have helped expand its coverage both geographically and taxonomically (Rodrigues et al. 2006). The 2008 IUCN Red List of Threatened Species holds species-based information on more than 45,000 individual species, including assessments for many never before assessed, such as all reef-building corals. The 2008 IUCN Red List also provides a complete reassessment of the Class Mammalia, marking the first time that all mammals have been globally assessed since 1996 (see IUCN 1996). Such reassessments are vital because IUCN Red List assessments lapse after 10 years - indeed some 3,300 mammal species assessments have been flagged as 'out-ofdate' since 2006 - and because re-evaluation permits determination of the changing status of biodiversity over time (Butchart et al. 2006).

In contrast to the 1996 assessment for mammals, a significant advance for 2008 is the move towards 'comprehensive' assessments, in which each species-level assessment is underpinned by a detailed set of peer-reviewed supporting documentation. Textual information was collected about the distribution, population, habitat and ecology, threats, and conservation measures for each species. In addition a digital map of current known limits of distribution was created for each species in a Geographic Information System. General information was derived from the literature, refined at workshops and via correspondence by expert knowledge, and later cross-checked for consistency. The result is a documented and peer-reviewed assessment for all mammals of the world.

The current paper reports briefly on the results of the 2008 IUCN Red List for small carnivores. The term 'small carnivore' is used herein to define the subset of the Order Carnivora that falls under the remits of the IUCN/SSC Small Carnivore Specialist Group (SCSG) and the IUCN/SSC Otter Specialist Group (OSG). Family-level taxonomy within these groups has been relatively unstable, and the analysis used the following families: Ailuridae (Red Panda *Ailurus fulgens*; one species), Eupleridae (endemic to Madagascar; nine species), Herpestidae (mongooses; 34), Mephiti-

dae (skunks and stink-badgers; 12), Mustelidae (weasels, martens, otters, badgers and allies; 59), Nandiniidae (African Palm-civet *Nandinia binotata*; one), Prionodontidae ([Asian] linsangs; two), Procyonidae (raccoons, coatis and allies; 14), and Viverridae (civets, including oyans [= 'African linsangs']; 33). The data reported on herein are freely and publicly available via the 2008 IUCN Red List website (www.iucnredlist.org/mammals).

The processes and the methodologies used in the assessment of the world's mammals are detailed elsewhere (Schipper et al. 2008). Specifically, as concerns small carnivores, the nine species of Malagasy carnivores (Eupleridae) were reviewed at a workshop held in Antananarivo, Madagascar, in April 2005, as part of a larger workshop to assess the status of the island's entire mammal fauna. European and Asian small carnivores were assessed at a workshop held in Cuc Phuong National Park, Vietnam, over 3-7 July 2006, where all species were evaluated by more than 20 participants. Although the status of the mainland African species was also considered during this workshop, the latter were subjected to a process of additional expert consultation between 2006 and 2008, with documentation compiled in partnership with the forthcoming Mammals of Africa (Kingdon & Hoffmann in press). Additional information on the small carnivores of Europe and the Mediterranean countries was collected through initiatives to undertake regional IUCN Red Lists for mammals of these two regions. Finally, New World species were evaluated via expert consultation during 2006–2008, and a mini-workshop held in Zamorano, Honduras, on 30 January 2008, to review the assessment results.

## Threat status of small carnivores

Presented here is a brief synopsis of the results of the 2008 IUCN Red List for small carnivores; a more detailed analysis and discussion of the findings and their implications for conserving small carnivores is in preparation and will appear elsewhere. Small carnivores are ecologically diverse, including species that spend time on land, in freshwater and/or in the sea; ranging from entirely arboreal to entirely ground-dwelling; and occupying a range of habitats from desert to moist tropical forests to taiga, and from below sea level to more than 4,000 m asl.

As with mammals in general, small carnivores are not equally distributed around the world, being more concentrated in tropi-

cal areas. The greatest number of species occur in the Afrotropical realm (57 species/30%): 48 occur on the mainland, and nine live only in Madagascar. The second highest richness is the Indomalayan realm (47 species/26%), followed by the Neotropical realm (33 species/18%), the Palaearctic realm (16 species/16%) and the Nearctic realm (18 species/10%). Percentages exceed 100% because a number of species inhabit more than one realm. No native small carnivores are known from the Antarctic, Australasian or Oceanic realms.

Of the 165 species assessed (Appendix 1), two (Sea Mink *Neovison macrodon* and Giant Fossa *Cryptoprocta spelea*) are extinct (EX), one (Malabar Civet *Viverra civettina*) is Critically Endangered (CR), ten are Endangered (EN), 22 Vulnerable (VU), ten Near Threatened (NT), 15 Data Deficient (DD), and 105 Least Concern (Figure 1). Therefore, some 22% of the small carnivores for which sufficient information was available to make a reliable assessment of extinction risk were categorised as threatened (CR, EN and VU). However, given that around 9% of small carnivores are listed as Data Deficient, the actual percentage of species that are threatened could lie anywhere between 20% and 30% (if, respectively, none or all DD species are in fact threatened).

In general, populations of small carnivores were assessed as decreasing (40%) or unknown (35%), with fewer being stable (22%) and only 2% (three species) increasing.

# Threats and criteria for listing

Although some species of small carnivore thrive in humandominated landscapes (such as Northern Raccoon *Procyon lotor* and Hooded Skunk *Mephitis macroura*), most do not. They are increasingly impacted by habitat conversion, overexploitation (hunting; intentionally or as by-catch), contamination (especially in freshwater), and disease.

The IUCN Red List Categories and Criteria (2001) facilitates the evaluation of each species against quantitative thresholds for population decline, geographic range size, small populations and decline and very small or restricted populations. This makes it pos-

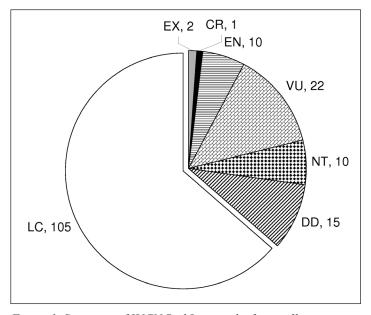


Figure 1. Summary of IUCN Red List results for small carnivores, by categories. Letters refer to categories and number to the number of species in each category.

sible to compare species using the same standards and methods. However, the precision and accuracy of the species assessment is often driven by the state of knowledge for the species: the more that is known, the better the criteria can be applied. Therefore, the species accounts in the 2008 IUCN Red List are 'living documents' and further information on all species is welcomed. Full documentation for the categories and criteria used are available at http://www.iucnredlist.org/info/categories criteria2001.

Of the 33 species identified as threatened (CR, EN and VU), 23 (69%) are listed using the A Criterion (population decline), seven (20%) using the B Criterion (geographic range size), three (8%) using the C Criterion (population size and decline; one of which is also listed under B), one (3%) using the D Criterion (very small or restricted population), and none using the E Criterion (quantitative analysis).

Of the 23 species identified as threatened based on population decline, only one listed the decline as reversible and having ceased: Sea Otter *Enhydra lutris*. Nineteen species were listed using data from the past (over a three-generation time-span defined per species) and six species were listed using projected future declines (three used both past and future). Of all these 23 species, 95% are declining because of a reduction in area of occupancy (AOO), extent of occurrence (EOO) and/or habitat quality, while 60% are assessed as declining from actual or potential levels of exploitation.

## The future of small carnivores

Some small carnivore species have proven resilient and adaptable to various threats. Some have recolonised areas from which they were extinguished or have recovered from low populations when threats were reduced. Thus, if threats can be reduced significantly, many species currently threatened are likely to recover. An example is Black-footed Ferret *Mustela nigripes*, formerly Extinct in the Wild (EW) which is now, following a massive conservation effort to reintroduce populations in its native range, categorised as Endangered (EN).

Small carnivores may be faring slightly better than mammals overall: 22% of the small carnivore species for which a category was assigned other than DD were assessed as threatened (CR, EN and VU), compared with 25% for all mammals. Overexploitation can be devastating, as was the case with the now extinct Sea Mink. As suitable habitats decline (most notably in Southeast Asia), exploitation may result in additional localised extirpations leading, in aggregate, to losses of species.

Emerging threats that could affect small carnivores include contagious disease and climate change. Among the most susceptible to numerous threats are the aquatic and semi-aquatic species, partially due to their restricted, often linear, distribution along rivers and water bodies (where humans also frequent) and because freshwater systems themselves are threatened by contamination, eutrophication, overexploitation (of prey and even water itself) and, increasingly, water shortage and/or flooding. Among small carnivores, otters are most threatened, with seven (58%) of the 12 species for which a category was assigned identified as threatened (CR, EN and VU).

## Acknowledgements

Assessing the conservation status of all the world's mammals was an enormous undertaking as shown by the list of acknowledgements in Schipper

et al. (2008); we repeat our thanks to all these bodies and individuals here. Specifically for the small carnivores, most of all we thank the many workshop participants and correspondents who assessed these species. The Old World small carnivore workshop was hosted by IUCN in collaboration with the IUCN/SSC Small Carnivore Specialist Group, the Carnivore & Pangolin Conservation Program, and the Institute of Applied Ecology, Rome. Particular thanks are due Scott Roberton and Tran Quang Phuong for their help with the local logistics; Wes Sechrest, Mike Hoffmann, Jan Schipper, Noura Bakkour, Beth Polidoro, Hank Shugart, Monica Rulli and Gianluca Catulo facilitated. Participants at this meeting included: Alexei Abramov, Amy Dunham, Annette Olsson, Anwaruddin Choudury, Mohd Azlan J., Barney Long, Belden Giman, Budsabong Kanchanasaka, the late Chris Wozencraft, Nguyen Xuan Dang, Divya Muddapa, Jason Hon, Michael Lau, Philippe Gaubert, Pralad Yonzon, Rob Timmins, Scott Roberton, Than Zaw, Wang Ying-xiang and Will Duckworth. Madagascar mammals, including the small carnivores, were assessed with support from the CI-Madagascar Center for Biodiversity Conservation, and we are grateful to Leon Rajaobelina and Frank Hawkins for facilitating this support and to Harison Randrianasolo for helping with logistics. Frank Hawkins, Joanna Durbin, and Luke Dollar, among others, provided useful input, and Frank Hawkins kindly reviewed the final assessments and supporting documentation. An impromptu evaluation of the proposed assessments of New World small carnivores was made during an IUCN Red List workshop in Honduras, and we would like to especially thank those who contributed: Alfredo Cuaron, Louise Emmons, Jose Gonzalez-Maya, Kris Helgen, Tim McCarthy, Fiona Reid, Ramael Samudio and Robert Timm.

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Appendix 1. The 2008 IUCN Red List for small carnivores.

Taxon <sup>1</sup>	English Name	Category	Criteria
Family AILURIDAE			
Ailurus fulgens	Red Panda	VU	C1
Family EUPLERIDAE			
Cryptoprocta ferox	Fossa	VU	A2cd
Cryptoprocta spelea	Giant Fossa	EX	
Eupleres goudotii	Falanouc	NT	A2cd
Fossa fossana	Fanaloka	NT	A2cd
Galidia elegans	Malagasy Ring-tailed Mongoose	LC	
Galidictis fasciata	Broad-striped Mongoose	NT	
Galidictis grandidieri	Giant-striped Mongoose	EN	B1ab(i,ii,iii,v); C2a(ii)
Mungotictis decemlineata	Malagasy Narrow-striped Mongoose	VU	B1ab(ii,iii,v)
Salanoia concolor	Brown-tailed Mongoose	VU	B1ab(ii,iii)
Family HERPESTIDAE			
Atilax paludinosus	Marsh Mongoose	LC	
Bdeogale crassicauda	Bushy-tailed Mongoose	LC	
Bdeogale jacksoni	Jackson's Mongoose	NT	A2cd
Bdeogale nigripes	Black-footed Mongoose	LC	
Bdeogale omnivora <sup>2</sup>	Sokoke Bushy-tailed Mongoose	VU	A2c
Crossarchus alexandri	Alexander's Cusimanse	LC	
Crossarchus ansorgei	Ansorge's Cusimanse	DD	
Crossarchus obscurus	Common Cusimanse	LC	
Crossarchus platycephalus	Cameroon Cusimanse	LC	
Cynictis penicillata	Yellow Mongoose	LC	

Taxon <sup>1</sup>	English Name	Category	Criteria
Dologale dybowskii	Pousargues's Mongoose	DD	
Helogale hirtula	Somali Dwarf Mongoose	LC	
Helogale parvula	Common Dwarf Mongoose	LC	
Herpestes brachyurus	Short-tailed Mongoose	LC	
Herpestes edwardsii	Indian Grey Mongoose	LC	
Herpestes² flavescens	Kaokoveld Slender Mongoose	LC	
Herpestes fuscus	Brown Mongoose	VU	A2c
Herpestes ichneumon	Egyptian Mongoose	LC	
Herpestes javanicus	Small Asian Mongoose	LC	
Herpestes naso	Long-nosed Mongoose	LC	
Herpestes <sup>2</sup> ochraceus	Somali Slender Mongoose	LC	
Herpestes <sup>2</sup> pulverulentus	Cape Grey Mongoose	LC	
Herpestes <sup>2</sup> sanguineus	Slender Mongoose	LC	
Herpestes semitorquatus	Collared Mongoose	DD	
Herpestes smithii	Ruddy Mongoose	LC	
Herpestes urva	Crab-eating Mongoose	LC	
Herpestes vitticollis	Stripe-necked Mongoose	LC	
Ichneumia albicauda	White-tailed Mongoose	LC	
Liberiictis kuhni	Liberian Mongoose	VU	A2cd
Mungos gambianus	Gambian Mongoose	LC	
Mungos mungo	Banded Mongoose	LC	
Paracynictis selousi	Selous's Mongoose	LC	
Rhynchogale melleri	Meller's Mongoose	LC	
Suricata suricatta	Meerkat	LC	
Family MEPHITIDAE	Witten		
Conepatus chinga	Molina's Hog-nosed Skunk	LC	
Conepatus humboldtii	Humboldt's Hog-nosed Skunk	LC	
Conepatus leuconotus	American Hog-nosed Skunk	LC	
Conepatus semistriatus	Striped Hog-nosed Skunk	LC	
Mephitis macroura	Hooded Skunk	LC	
Mephitis mephitis	Striped Skunk	LC	
Mydaus javanensis	Sunda Stink-badger	LC	
Mydaus marchei	Palawan Stink-badger	LC	
Spilogale angustifrons	Southern Spotted Skunk	LC	
Spilogale gracilis	Western Spotted Skunk	LC	
Spilogale putorius	Eastern Spotted Skunk	LC	
Spilogale pygmaea	Pygmy Spotted Skunk	VU	A2c
Family MUSTELIDAE	Tyginy spouva sname	, 0	1124
Aonyx capensis	African Clawless Otter	LC	
Aonyx cinereus <sup>3</sup>	Asian Small-clawed Otter	VU	A2acd
Aonyx congicus <sup>2</sup>	Congo Clawless Otter	LC	
Arctonyx collaris	Hog Badger	NT	
Eira barbara	Tayra	LC	
Enhydra lutris	Sea Otter	EN	A1a
Galictis cuja	Lesser Grison	LC	
Galictis vittata	Greater Grison	LC	
Gulo gulo	Wolverine	NT	
Ictonyx libycus³	Libyan Striped Weasel	LC	
Ictonyx striatus	Zorilla	LC	
Lontra canadensis	North American Otter	LC	
Lontra felina	Marine Otter	EN	A3cd
Lontra longicaudis	Neotropical Otter	DD	AJOU
Lontra provocax	Southern River Otter	EN	A3cd
Lutra lutra <sup>2</sup>	Eurasian Otter	NT	AJU
Lutra tutra- Lutra maculicollis		LC	
	Spotted-necked Otter	EN	Alad
Lutra sumatrana	Hairy-nosed Otter	EIN	A2cd

Taxon <sup>1</sup>	English Name	Category	Criteria
Lutrogale perspicillata	Smooth-coated Otter	VU	A2acd
Lyncodon patagonicus	Patagonian Weasel	DD	
Martes americana	American Marten	LC	
Martes flavigula	Yellow-throated Marten	LC	
Martes foina	Stone Marten	LC	
Martes gwatkinsii	Nilgiri Marten	VU	B1ab(iii,iv)
Martes martes	European Pine Marten	LC	
Martes melampus	Japanese Marten	LC	
Martes pennanti	Fisher	LC	
Martes zibellina	Sable	LC	
Meles anakuma	Japanese Badger	LC	
Meles leucurus	Asian Badger	LC	
Meles meles	Eurasian Badger	LC	
Mellivora capensis	Honey Badger	LC	
Melogale everetti	Bornean Ferret Badger	DD	
Melogale moschata	Small-toothed Ferret Badger	LC	
Melogale orientalis	Javan Ferret Badger	DD	
Melogale personata	Large-toothed Ferret Badger	DD	
Mustela africana	Amazon Weasel	LC	
Mustela altaica	Altai Weasel	NT	
Mustela erminea	Ermine	LC	
Mustela eversmanii	Steppe Polecat	LC	D1 1 ('' ''')
Mustela felipei	Colombian Weasel	VU	B1ab(ii,iii)
Mustela frenata	Long-tailed Weasel	LC	
Mustela itatsi	Japanese Weasel	LC	
Mustela kathiah	Yellow-bellied Weasel	LC	
Mustela lutreola	European Mink	EN	A2ce
Mustela lutreolina	Indonesian Mountain Weasel	DD	
Mustela nigripes	Black-footed Ferret	EN	D1
Mustela nivalis	Least Weasel	LC	
Mustela nudipes	Malay Weasel	LC	
Mustela putorius	European Polecat	LC	
Mustela sibirica	Siberian Weasel	LC	
Mustela strigidorsa	Stripe-backed Weasel	LC	
Mustela subpalmata	Egyptian Weasel	LC	
Neovison macrodon	Sea Mink	EX	
Neovison vison	American Mink	LC	
Poecilogale albinucha	African Striped Weasel	LC	
Pteronura brasiliensis	Giant Otter	EN	A3cd
Taxidea taxus	American Badger	LC	
Vormela peregusna	Marbled Polecat	VU	A2c
Family NANDINIIDAE			
Nandinia binotata	African Palm-civet	LC	
Family PRIONODONTIDAE			
Prionodon linsang	Banded Linsang	LC	
Prionodon pardicolor	Spotted Linsang	LC	
Family PROCYONIDAE	I		
Bassaricyon alleni	Allen's Olingo	LC	
Bassaricyon beddardi	Beddard's Olingo	LC	
Bassaricyon gabbii	Gabbi's Olingo	LC	
	Harris's Olingo	DD	
Bassaricyon lasius	_		
Bassaricyon pauli	Chirique Olingo	DD	
Bassariscus astutus	Ringtail	LC	
Bassariscus sumichrasti	Cacomistle	LC	
Nasua narica	White-nosed Coati	LC	
Nasua nasua	South American Coati	LC	

Taxon <sup>1</sup>	English Name	Category	Criteria
Nasuella olivacea	Mountain Coati	DD	
Potos flavus	Kinkajou	LC	
Procyon cancrivorus	Crab-eating Raccoon	LC	
Procyon lotor	Northern Raccoon	LC	
Procyon pygmaeus	Cozumel Raccoon	EN	B1ab(ii,iii) + 2ab(ii,iii)
Family VIVERRIDAE			
Arctictis binturong	Binturong	VU	A2cd
Arctogalidia trivirgata	Small-toothed Palm Civet	LC	
Chrotogale owstoni	Owston's Civet	VU	A2cd
Civettictis civetta	African Civet	LC	
Cynogale bennettii	Otter Civet	EN	A2ce
Diplogale hosei	Hose's Civet	VU	A2c+3c
Genetta abyssinica	Ethiopian Genet	LC	
Genetta angolensis	Miombo Genet	LC	
Genetta bourloni	Bourlon's Genet	NT	A2cd
Genetta cristata	Crested Genet	VU	A2cd
Genetta genetta	Common Genet	LC	
Genetta johnstoni	Johnston's Genet	VU	A2cd
Genetta maculata	Central African Large-spotted Genet	LC	
Genetta pardina	West African Large-spotted Genet	LC	
Genetta piscivora	Aquatic Genet	DD	
Genetta poensis	King Genet	DD	
Genetta servalina	Servaline Genet	LC	
Genetta thierryi	Hausa Genet	LC	
Genetta tigrina	South African Large-spotted Genet	LC	
Genetta victoriae	Giant Genet	LC	
Hemigalus derbyanus	Banded Civet	VU	A2cd+3c
Macrogalidia musschenbroekii	Sulawesi Palm Civet	VU	A2c
Paguma larvata	Masked Palm Civet	LC	
Paradoxurus hermaphroditus	Common Palm Civet	LC	
Paradoxurus jerdoni	Brown Palm Civet	LC	
Paradoxurus zeylonensis	Golden Palm Civet	VU	B1ab(i,iii,v)
Poiana leightoni	Leighton's Linsang	DD	
Poiana richardsonii	African Linsang	LC	
Viverra civettina	Malabar Civet	CR	C2a(i)
Viverra megaspila	Large-spotted Civet	VU	A2cd+3cd
Viverra tangalunga	Malay Civet	LC	
Viverra zibetha	Large Indian Civet	NT	
Viverricula indica	Small Indian Civet	LC	

<sup>&</sup>lt;sup>1</sup>Genus and species limits and spellings mostly follow Wozencraft (2005), selected to be a readily available, widely used, source.

<sup>&</sup>lt;sup>2</sup>Divergences from Wozencraft (2005), to align the present list's limits with those of Kingdon & Hoffmann (in press), and to consider *Lutra nippon* conspecific with *L. lutra*.

<sup>&</sup>lt;sup>3</sup>Divergences from Wozencraft (2005), reflecting that *Aonyx* and *Ictonyx* are masculine genera and these species' names are thus correctly *A. cinereus* and *I. libycus*, not *A. cinerea* and *I. libyca*.