

Special Issue

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Cats of the world – snapshots





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Original contributions and short notes about wild cats are welcome. **Send contributions and observations to ch.breitenmoser@kora.ch**

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Cats of the World

Cats are – as every true cat enthusiast knows – the pinnacle of evolution. Admittedly, by rights this spot can be claimed by many other creatures, but at least among mammals, cats have, in their 10 million year long evolutionary history, become perfect and highly specialized predators that are second to none within the order of Carnivora. With their sharp gaze and good hearing, their sleek, muscular body, their sharp claws and the strong bite of their canines in their short jaws, they are plainly the perfect hunters. They are not only perfect, but also highly specialized carnivores. Of the species that are well studied, we know that they often depend on very few, sometimes even only one, prey species. In the following short portraits information on the “Feeding Ecology” section is often scant simply because we know precious little about many of the smaller cat species. We are neither familiar with their ecology nor with their behaviour and information about their distribution is often based on rough guesses which makes it difficult to assess their population status.

A high degree of specialisation takes its toll: it makes a species vulnerable to environmental changes. Cats are intelligent and adaptive animals, but they are sensitive to degradation of their habitat or decline of their prey species. Changes in their environment are often accompanied by increased persecution as humans penetrate the cat’s realms and claim resources. Not only the lion seizing Massai cattle, the lynx taking the hunter’s roe deer or the snow leopard which for want of ibex is forced to change to domestic goats incur the wrath of humans; also the small and inconspicuous guinea pig that snatches poultry is killed while in the chicken run.

Ultimately it is not decisive how many cats are killed, it is more important how many can survive. The tiger, the most powerful cat of our time, now only populates less than 10% of the range he roamed over a hundred years ago. Cheetahs and lions have been reduced to pitiful population sizes in Asia. Slash and burn agriculture and logging continually reduce the habitat of cat species from the ocellular to the jaguar in the Amazon basin and the forests of western Africa are almost stripped of their wildlife. Long have cats been able to resist the strain imposed upon them by humans. No cat species has disappeared since the massive alterations at the end of the last glacial period. But in the last 50 years the populations have diminished drastically. A few subspecies have already become extinct and many more are in an alarming state. On the other hand a more positive development can also be observed: the puma in North America and the lynx in Europe have experienced remarkable comebacks within the last few decades. These two examples both support the view that wild cats can also live and survive in areas strongly utilized by humans – if we protect their habitats, preserve prey populations and regard them with due respect. Why should this not be possible for other species in other regions of the earth?

It is, however, a requirement that we have to gather knowledge of what we want to preserve. These short portraits should motivate all readers to contribute to this knowledge.

Urs & Christine Breitenmoser



Andean cat *Oreailurus jacobita* (Cornalia, 1865)



© J. Sanderson

Andean cat

Andenkatze, chat des Andes

Weight	4–7 kg
Body length	57–65 cm
Tail length	41–48 cm
Longevity	unknown
Litter size	probably 1 cub

IUCN Red List: Endangered

The Andean cat is about the size of a large domestic cat and resembles the Pampas cat but has a longer tail. The Andean cat has large ears and a black nose. The coat is very long and thick, about 40 mm on the back and 35 mm on the tail. Its coat is pale silvery grey, and marked with brown-yellowish to dark grey or black blotches. The underparts are white and

marked with dark spots. The long and bushy tail measures 70 % of the cat's head and body length and is marked with 6-9 wide dark brown or black rings. The legs have narrower dark stripes or blotches.

Habitat and Distribution

The Andean cat occurs mainly in the high Andes of Peru and Bolivia, northeastern Chile and northern Argentina up to 5,000 m. Recently, the species was discovered also living at lower altitude in Patagonia down to 650 m. Its range thus covers four Andean ecoregions: the high Andes, the Puna region, the southern Andean steppe and the northern portion of the Patagonian steppe. It inhabits valleys with patchily distributed rocky walls. Because of its extreme habitats and the uneven distribution of its prey, the Andean cat has a patchy distribution.

Feeding Ecology

The Andean cat feeds on small mammals, birds or lizards. It mainly hunts mountain vizcachas which depend on vegetation along the sparsely covered and often dried up waterways.

Behaviour

Ecology and way of living of the Andean cat are hardly known. One cat was observed early in the morning shortly after sunrise on an elevation of 4,600 m. For about one hour it hunted under rocks. A radio-collared animal in Bolivia was mainly nocturnal and the activity pattern was similar to the mountain vizcachas.

Threats and Conservation

Habitat loss and degradation through oil extraction and mining are the main threats to

the Andean cat, followed by hunting. The Andean cat is hunted and used for ceremonies in many parts of its distribution range. It is considered sacred and is associated with rich harvests and the abundance and fertility of livestock. Its main prey species, the mountain vizcacha, is also hunted for meat and fur. The Andean cat has become very rare and most populations are probably isolated. In 1999, scientists founded the Alianza Gato Andino to advance research and conservation of the rare and unknown Andean cat across borders. More information on their work can be found at www.gatoandino.org.



© D. Cossios

Local person with stuffed cats used for ceremonies.



© J. Sanderson



Pampas cat *Oncifelis colocolo* (Molina, 1782)

Pampas cats look like house cats with long hair, a broad face and a pink nose. The back of the pointed ears are grey or black with a white spot. Two brown bars sometimes run from the eyes across the cheeks. The tail is only half of the head and body length and can be marked by dark rings. The coat colour and pattern show big variation across the cat's range. The colour is variable from yellowish white to greyish brown. Darker individuals with red areas or spots can occur, as well as almost unmarked forms with only a few stripes on the sides. On some animals the long hair (up to 7 cm) on the back forms a dorsal mane. On the basis of morphological variation in the skull and skeleton, it was suggested to divide the pampas cat into three species. But recent phylogenetic analysis confirms the unity of this species.



Different coat patterns of the pampas cat. Drawings from Garcia-Perea 1994 (American Museum Novitates 3096).



Habitat and Distribution

The pampas cat lives in southern Colombia, Ecuador, Peru, Brazil, Bolivia, Chile, Paraguay, Uruguay and Argentina. It is associated with open habitat such as grasslands, but it also occurs in dry open woodland, swampy wetlands, scrubs of the chaco and xeric forests. In the Andes this cat is found at altitudes as high as 5000 m, but most records are from lower elevations.

Feeding Ecology

Pampas cats feed on a diversity of small mammals, especially small rodents, and ground-dwelling birds. They have been observed to raid penguin nest for eggs and chicks in Patagonia.

Behaviour

The pampas cat is mainly nocturnal, but a recent study in Brazil has shown that cats are primarily diurnal with some crepuscular and occasionally nocturnal activity. A female in the high Andes of Bolivia did not show a clear activity pattern. The animal was active during all hours of the days. They mainly hunt on the ground, even though pampas cat in captivity are quite adept at tree climbing and often rest on trees.

Threats and Conservation

There is very little information on the pampas cat's status in the wild and on population estimates. Only recently field studies started with telemetry and camera trapping. It is believed that pampas cats suffer from habitat loss and degradation, as well as retaliation killing for preying on poultry and hunting for cultural purposes in the high



© B. Bender

Pampas cat

Pampaskatze, chat des pampas

Weight	3–4 kg
Body length	42–79 cm
Tail length	22–33 cm
Longevity	9–18 years
Litter size	1–3 cubs

IUCN Red List: Near Threatened

Andes. It used to be heavily hunted, especially in Argentina. Between 1976 and 1979, 78'000 specimens, with a value of US\$ 1.8 million, were reported to have been in trade. The number of skins in trade decreased sharply in the 1980s, due to new conservation legislation prohibiting hunting, trade, and commercial export.



© J. Pereira

Guiña *Oncifelis guigna* (Molina, 1782)



© A. Sliwa

Guiña

Kodkod, chat du Chili

Weight	1.5–3 kg
Body length	37–51 cm
Tail length	20–25 cm
Longevity	to 11 years
Litter size	1–4 cubs

IUCN Red List: Vulnerable

(30–38°S), there are no known melanistic individuals ($n = 39$).

Habitat and Distribution

The distribution of the guiña is limited to central and southern Chile, and a narrow strip of southwestern Argentina, including some offshore islands such as Isla Grande de Chiloé. It is the only endemic carnivore in the southern Andean forests. This small cat is considered to be associated mainly with *Nothofagus* dominated temperate forests in the southern part of its distribution range, and with sclerophic forest and thicket in the northern part. It is also known to utilise certain modified habitat that has replaced native forests, such as eucalyptus plantations, secondary forests and habitat bordering agricultural areas. It typically uses forest types with heavy understory, often with bamboo in the temperate forests, up to an elevation of 2500 m as well as deep ravines often along watercourses.

Feeding Ecology

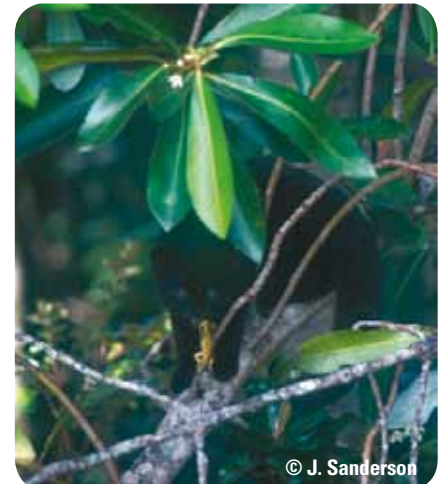
Scat analysis from southern Chile revealed that rodents and the marsupial Monito del Monte dominated the diet. Opportunistically, they feed on carrion. They also take frequently birds, lizards, and occasionally domestic chickens and geese. Prey remains on Chiloé island included besides small rodents and a lizard, an austral thrush, two lapwings, a chucaco tapaculo, a huet-huet, 16 chickens and one goose.

Behaviour

Guiñas are active day and night. This might vary between different regions in their range, as three quarter of camera trap pictures in southern Chile were made during the night and crepuscular hours. Some long-distance movements through their territories are made shortly before dawn or just after sunset with rest sites usually in dense cover near a waterway. Radiotracked guiña were relatively mobile and changed their spots from day to day. Daily distances were up to 1.80 km. But half of the dislocations were less than half a kilometre. Even though it is a good climber, the guiña usually hunts on the ground. Detailed studies of its ecology have been conducted on the island of Chiloé, in southern Chile and the Lanin National Park in Argentina.

Threats and Conservation

Population decline is caused by loss of prime habitat and reduction in prey base due to clearing forests for agriculture, leading to sever fragmentation of the population. The human pressure on the remnant temperate Valdivian rainforest in south-central Chile is particularly high, and some of the fragments in central Chile do hold very low numbers of animals. The status in southern Chile seems to be more stable as lower human density and larger protected areas contribute to more favourable conditions for the guiña. The population in Argentina seems to be small. Unknown numbers of this cat are shot annually when they kill poultry. These illegal killings are quite frequent throughout the species range, supposing an additional threat for its populations. Though heavily overhunted in the past, the guiña is now fully protected in Argentina and Chile.



© J. Sanderson



The guiña is the smallest cat in the Western Hemisphere. Males are larger than females, and there is a latitudinal gradient in body size: Individuals from lower latitudes are larger than individuals from higher latitudes. The guiña is quite similar in appearance to the closely related Geoffroy's cat but has a thicker tail and distinctive facial marking: from the inside corner of each eye a solid line of black crosses the cheek under the eye and another solid black stripe rises vertically on either side of the nose to the crown. The coat is buff or grey-brown, marked with small black spots. The belly is marked with black dots. The bushy, black ringed tail measures about half its head and body length. The backs of the low-set, rounded and small ears are black with a white central spot. Melanistic individuals are quite common in higher latitudes. The proportion varies from one region to another, e.g. 29% and 66% in two sites in southern Chile, respectively. In the northern part of their distribution range

Geoffroy's cat *Oncifelis geoffroyi* (d'Orbigny & Gervais, 1844)

About the size of a large housecat, Geoffroy's cat has a shorter tail and a somewhat flattened head. Four subspecies vary considerably in coat colour and in size, southern larger than northern animals. The coat is generally grey to tawny with a white belly and small regular black spots. On the limbs and the tail these spots tend to form bands. The cheeks are marked with two dark teardrop streaks with a small triangular dark undereye patch, and several dark longitudinal lines occur on the crown and neck. The backs of the ears are black with a central white spot. There is also a melanistic form found more often in the forested or wetland areas.

Habitat and Distribution

Geoffroy's cats are found in the Andes of southern Bolivia, southern Brazil, Paraguay, Argentina, Uruguay and southern Chile, from sea level up to an elevation of 3,300 m. They inhabit the pampas grasslands, marsh-grasslands, dry shrublands, arid woodlands and arid steppe uplands but prefer areas with dense vegetation.

Feeding Ecology

The Geoffroy's cat has been described as an opportunistic predator feeding mainly upon introduced brown hares and small rodents. In a study in central Argentina Geoffroy's cat diet was dominated by mammals throughout the year, with rodents as the most common prey group. Birds were well represented in the diet during spring and summer, whereas European hares made lesser contributions in all seasons. In southern Chile, however,

hares composed the bulk of its diet. They are known to also occasionally take frogs and fish. They are more generalist predators when compared to the sympatric pampas cat. Geoffroy's cats tend to use habitats with dense vegetation and probably high prey density.

Behaviour

Geoffroy's cats spend most of their time on the ground, though they can climb well and spend some time in trees. They are predominantly nocturnal, resting during the daytime in thickets or in hollow trees. They are solitary and can disperse over long distances (>100 km).

Threats and Conservation

The fur trade has taken a heavy toll of Geoffroy's cat: theirs is the second most commonly sold cat pelt in the international market; only bobcat sells more. EU restrictions and some protective measures may have limited recent trade but lack of standardization in managing and reporting harvest activity throughout the various countries with Geoffroy's cat population makes it difficult to assess the current effect of ongoing hunting. In central Argentina human-related mortality made up 62% of the known cases, including poaching, killing by domestic dogs, and vehicle collisions. A recent threat comes from the exotic pet market: it is captured illegally and hybridised with the domestic cat to supply the pet market with a new "safari cat". Some animals are also shot for meat and when they kill domestic poultry.



© A. Sliwa

Geoffroy's cat

Salzkatze, chat de Geoffroy

Weight	3–6 kg
Body length	43–88 cm
Tail length	23–40 cm
Longevity	to 14 years
Litter size	1–3 cubs

IUCN Red List: Near Threatened

Crucial habitat is being lost over the range of this cat due to deforestation. However recent studies in Argentina indicate that this species may utilize the resulting open areas when plantations are created.



© J. Pereira

Oncilla *Leopardus tigrinus* (Schreber, 1775)



© A. Sliwa

Oncilla

Onzilla, oncille

Weight	1.8–3.5 kg
Body length	38–59 cm
Tail length	20–42 cm
Longevity	15–21 years
Litter size	1–4 cubs

IUCN Red List: Vulnerable

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The oncilla, also called little tiger cat or little spotted cat, is with an average weight of 2.4 kg one of the smallest of the American cats and has a slender body. The ears are large and have black backsides with a central white spot. The fur colour is light to dark ochre, and

the pelt is marked with black or dark brown spots and rosettes. The paler belly fur is covered with dark spots and large black spots form seven to thirteen irregular rings on the tail. The black-tipped tail measures about half the head and body length. The muzzle is narrow and the eye colour is light brown. Melanistic individuals are not uncommon. Hybridization with the closely related Geoffroy's cat in contact zones of the two species has been observed in southern Brazil and hybrids with pampas cat in central part of the country. The ocelot lineage is the youngest of all cat lineages (see p. 34). The species of this lineage are all still very closely related and hybridization is not rare.

Habitat and Distribution

Oncillas are found from Central America into South America as far as northern Argentina. This small cat shows a widespread distribution but probably only at low densities. Although the species is found in the Amazon Basin its distribution there could be patchy. They inhabit a wide variety of habitats that include savanna, tropical and subtropical forest, semiarid thorny scrub and coastal scrub beach vegetation. In Brazil, where most of the range of the species lies, 61.7% of known locations are below 500 m. They occur also in degraded habitat especially near small agricultural fields close to natural cover, taking advantage of an increase in rodent abundance and where ocelots have disappeared.

Feeding Ecology

Oncillas feed on small vertebrates like mice, birds and lizards, most prey weighing less

than 100g. They eventually also eat larger prey (> 500 g) such as small primates and agoutis. Insects could be eaten, but are not an important part of their diet.

Behaviour

Oncillas are excellent climbers, but they spend most of the time on the ground, as most of their prey is terrestrial. This species can be active at anytime of the day as a strategy to avoid being preyed upon by the larger sympatric ocelot. Home ranges of oncillas are 2.5 times larger than would be expected based on body size. This could also be a strategy to avoid larger guild-members.

Threats and Conservation

Deforestation, fragmentation and, to a lesser extent, persecution by humans are considered to be the main threats to this felid species. The preferred habitat of cloud forests in Colombia is being lost to coffee plantations or eucalyptus cultivation. As the species is extremely rare in the Amazon Basin, vast tracts of forests there do not serve as a safeguard for this species. Most of its area in Brazil is in the most threatened habitats, the Atlantic forest, the savanna and semi-arid scrub. Additionally, oncillas typically show very low density in protected areas where the ocelot is found. Thus, the ever declining natural areas outside preserves are very important for its conservation. The oncilla is poorly studied and not much is known about its status in the wild but observations of captive animals indicate that typically only a single kitten is produced making it quite vulnerable if numbers are declining.



© A.Sliwa



Margay *Leopardus wiedi* (Schinz, 1821)

The margay is smaller than the ocelot and bigger than the oncilla. Sexual dimorphism is low - males and females weigh 2-5 kg. Its long tail measures up to 70% of the head and body length and is marked with dark rings. The head is more round than an ocelot's, and margays' eyes are distinctly large. They have two cheek stripes. The margay is slimly built and has a soft, thick and yellowish brown coat. The fur is marked with dark brown or black rosettes or elongated spots arranged in longitudinal rows. The undersides and belly are white and the back of the ears are black with central white spots.

Habitat and Distribution

The margay ranges from the lowlands of northern Mexico, into Central America and South America to Uruguay and northern Argentina. Habitats include predominantly forests, tropical evergreen forests, premontane humid and very humid forests, montane cloud forests, gallery forests of savannas, and wet-swampy savannas. It is only found in forest enclaves within the semi-arid Caatinga scrub of Brazil.

Feeding Ecology

The margay feeds on small mammals, both terrestrial and scansorial, birds, and, to a lesser extent, on reptiles and larger medium-sized mammals like squirrels, rabbits, agoutis and, small monkeys. Most of the margay's prey are nocturnal and hunting is mostly on the ground but could also be arboreal. Average mean prey weight is about 220 g. Typically, rodents form the bulk of the diet. In one study site in Belize most mammalian prey was arboreal, whereas at sites in Brazil they

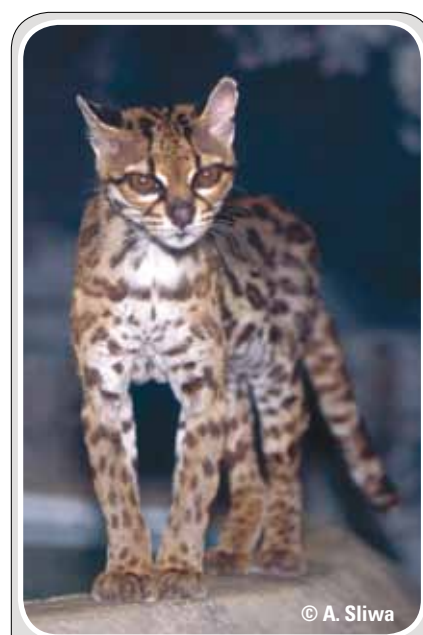
were terrestrial.

Behaviour

Margays are mainly nocturnal. However, in one site in southern Brazil there was no difference in activity levels between daytime and nighttime, and between winter and other seasons combined. They rest mainly in trees where they could also hunt, making it the most arboreal of the new world felids. They may travel quite long distances. Margays are very agile and acrobatic climbers and are able to descend a tree head first - their hind feet can rotate 180 degrees, allowing them to grip equally well with the hindlimbs or forelimbs while the long tail and the wide paws help keep balance. The basal rate of metabolism is unusually low for such a carnivore and home range size is larger than expected by its body size. Margays are solitary and territorial animals. Margay females have only two teats and the litter size is almost always one. Only in two occasions were twins observed. As with other smaller Neotropical cats, margay tend to be rare where ocelots thrive. Due to their similar dietary cranial morphology margay and jaguarundi tend to favor different habitats, are active at different time presumably to avoid competition.

Threats and Conservation

Deforestation, fragmentation and destruction of its habitats are considered to be the major threats to this forest dependent cat. It can tolerate disturbed habitat and can be found adjacent to small scale agricultural fields as long as there is enough forest cover. Combined with a low reproductive rate and presu-



Margay
Marguay, margay

Weight	2.3–4.9 kg
Body length	46–79 cm
Tail length	23–52 cm
Longevity	up to 22 years
Litter size	1–2 cubs

IUCN Red List: Near Threatened



Ocelot *Leopardus pardalis* (Linnaeus, 1758)



© Projeto Gatos do Mato, Brasil

Ocelot

Ozelot, ocelot

Weight	8–15.1 kg
Body length	50–101.5 cm
Tail length	30–50 cm
Longevity	16–20 years
Litter size	1–4 cubs

IUCN Red List: Least Concern

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The ocelot is a mid-sized cat with rounded ears, black on the backside with characteristic central white dots. It has relatively short stout legs. The front paws are larger than the hind paws. Its coat is short, even and covered with spots and rosettes which are smaller on

the limbs. Spots tend to form open rosettes that tend to coalesce to form the species typical longitudinal bands on the sides. The fur colour varies from white to tawny, reddish and grey. The dark markings occasionally form 4-5 lines along the back. The throat and belly are white. Its tail is short with black rings or bars on the top side.

Habitat and Distribution

Ocelots are found from southern Texas, along the coast of Mexico, in Central America, and in South America to the north of Argentina. The biggest population lives in the Amazon Basin of Brazil. They inhabit a vast variety of habitats including evergreen forest, dry thorn forest, tropical and subtropical forest, savanna, semiarid vegetation of chaparral, caatinga and chaco, mangroves and seasonally flooded savanna. It is very adaptable, even to disturbance, as long as there is cover and high prey density. They clearly avoid totally open areas.

Feeding Ecology

As a generalist, ocelots feed on a variety of small to medium sized prey, like rodents, opossums, mice, rats and hares. They also hunt birds, snakes, lizards, and occasionally take tortoises, fishes and insects. It was recently shown that larger prey such as agoutis, pacas, monkeys, sloths and ungulates are an important part of their diet. Ocelots need these to complement the intake of small mammals in order to sustain and thrive in an area.

Behaviour

The ocelot is the most abundant and best studied small felid in the new world. It is noctur-

nal resting during daytime in trees, bushes, or thickets and in ground depressions. Ocelots hunt generally on the ground and are solitary. At night they may travel from 3-7 km. Ocelots are excellent climbers and escape to trees when threatened. They are also very good swimmers.

Threats and Conservation

The population is not known exactly but presumed to be declining over its range. Habitat destruction from deforestation is the primary threat due to loss of prey base. The ocelot population was heavily decimated by fur trade, with hundreds of thousands taken, during the 1970's and 80's. Today, the ocelot is protected in most of its range, but hunting losses remain a problem. Some legal hunting combined with poaching and persecution after domestic animal attacks remove an unknown number of animals each year. Many ocelots are killed by vehicles in the Texas population and mitigations are now in place to decrease this effect.

The "Ocelot Effect"

Most of the neotropical smaller cats in South America overlap distribution zones. The ocelot as the largest, perhaps the most adaptable to habitat change, and as a generalist carnivore dominates the guild. All records indicate that this species is the most abundant species of the smaller cats. Presumably Geoffroy's cat, oncilla, margay and jaguarundi, being smaller, must avoid the ocelot because of predation or the threat of predation since wherever these species are sympatric, ocelot numbers are high and the other small cats low.



© Projeto Gatos do Mato, Brasil



Jaguarundi *Herpailurus yaguarondi* (Saint-Hilaire, 1803)

The jaguarundi is an odd looking cat - its elongated, low-slung body somewhat resembles an otter and some behaviours are more similar to a puma than to other small sympatric species. The jaguarundi has short legs, a slender body and a long tail. Its small, slim head has short, rounded, widely separated ears. Their eyes are small and set closely together. Apart from a few faint markings on the face and belly, its short, sleek, black, greyish or red-brown fur is uniform in colour. The lighter colour phase is found in drier areas, the darker colour phase in more humid habitats such as rainforests. Phylogenetically the jaguarundi is placed close to the cheetah and the puma. Like the cheetah, the jaguarundi cannot completely retract the claws on their hind paws.

Habitat and Distribution

The jaguarundi's range extends from southern USA to Argentina. In Central and South America the jaguarundi is thought to be the most abundant felid species. Nevertheless its biology and behaviour is not well understood. Jaguarundis live in a wide variety of habitats from semiarid thorn forest to wet grasslands and from sea level to elevations as high as 3,200 m. They seem to use more open areas than the other small felids, but are most often seen in areas close to dense cover. A radio-collared animal in Belize used old fields and second-growth forest. It preferred areas with riparian habitat near streams.

Feeding Ecology

Jaguarundis feed primarily on small prey weighing less than 1 kg. It hunts mainly ro-

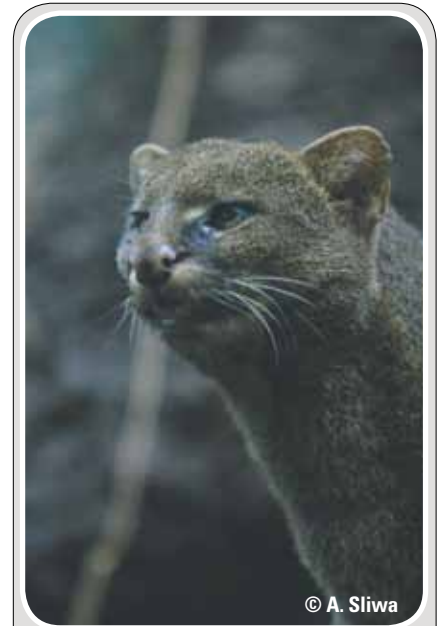
dents, birds and reptiles. Some slightly bigger prey such as rabbits, opossums and armadillos are likely important opportunistically. Jaguarundis also ingest fruits and leaves. Like jaguarundi, most prey species identified have predominantly diurnal and terrestrial habits.

Behaviour

As a strictly diurnal and ground based hunter, the jaguarundi is able to avoid competing with the sympatric nocturnal ocelot and arboreal margay. A radio telemetry study in Belize found the peak activity period to be from 1,400 to 1,600 hours, with only very little activity after sunset. A camera trap investigation in Argentina confirmed this pattern. Jaguarundis are agile climbers and good swimmers. They can jump up to 2 meters in the air to catch birds. They may travel up to 7 km per day and are solitary carnivores. Ranging behaviour is not well understood. A study in Mexico showed that both sexes had an average home range size of 8 km². Individuals in captivity often mark their territories by scent marks. Jaguarundis have an unusual and wide vocalization with at least 13 distinct calls identified. They purr, whistle, chatter, yah and chirp like a bird.

Threats and Conservation

Since this species is not restricted in habitat use to primary forest, it may be more resilient to deforestation than the other felids. They were not hunted for fur on a large scale and even now they probably are killed only when they prey upon domestic animals. Still not much research has been conducted on jaguarundi ecology considering how ubiquitous



© A. Sliwa

Jaguarundi

Jaguarundi, jaguarondi

Weight	3–7 kg
Body length	53–76 cm
Tail length	31–52 cm
Longevity	10–20 years
Litter size	1–4 cubs

IUCN Red List: Least Concern



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Jaguar *Panthera onca* (Linnaeus, 1758)



© A. Sliwa

Jaguar

Jaguar, jaguar

Weight	36–138 kg
Body length	110–170 cm
Tail length	44–80 cm
Longevity	up to 26 years
Litter size	1–4 cubs

IUCN Red List: Near Threatened

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covered with large black or dark brown rosettes with one or more black dots in their centre. The white belly, throat, and inside of the limbs are marked with oval or irregular spots. The long tail has black spots and from the midpoint to the tip several black rings. The ears are short and rounded and black on the back with a central buff-colored center. Melanistic individuals appear to be more common among jaguars than any other large cats. The largest jaguars inhabit the Pantanal of Brazil and llanos of Venezuela. Jaguars living in the forests are much smaller overall.

Habitat and Distribution

Today, the jaguar's range extends from southern Arizona through the tropical forests of Mexico and Central America to northern and eastern Colombia, Venezuela, Guyana, Suriname, French Guiana, Brazil, Peru, Bolivia, Paraguay, and northern Argentina. Although the jaguar has lost more than fifty percent of its historic range, there is good indication that connectivity still exists between the northern and southern extensions of its range. The jaguar inhabits tropical forests, swampy grasslands, evergreen forests, dry deciduous forests, and mangrove swamps, and the species is strongly associated with the presence of water.

Feeding Ecology

Jaguars are opportunistic generalist predators and more than 85 prey species are reported. However, common prey are armadillos, white-lipped peccaries, capybaras, deer, and collared peccaries. They also eat turtles and their eggs, caiman, hares, fish and domestic animals up to the size of adult cattle.

Behaviour

Jaguars are solitary and nocturnal. Home ranges of males enclose typically the territories of two females. Jaguars are excellent swimmers and are able to cross wide streams. They mark their territories with urine and feces. Both males and females can roar.

Threats and Conservation

The jaguar represents a very important species in Latin American myths and culture, both past and present, known as the "master of the forest" and as a symbol of strength. Nonetheless, farmers and ranchers kill jaguars as a threat to their livestock or in retaliation for actual losses. Clearly, the number of these cats shot on sight and poisoned indiscriminately is large and could lead to its demise on a regional level with ultimate landscape-scale repercussions, especially where such persecution overlaps with widespread habitat destruction. Protective and mitigating measures can counter these threats if they secure core areas and promote jaguar passage over corridors. Considerable ecological research and international collaboration are being directed to the future of this large cat. In particular, efforts to combat and manage human conflicts, in locally relevant approaches, are part of that ongoing program, with creative work and meaningful community involvement schemes. Fighting the massive development of landscapes for human economic benefit remains of course the ongoing battle. Generally, the primary threat to the species comes from the persistent loss of habitat across its range.



© J. Sanderson



Puma *Puma concolor* (Linnaeus, 1771)

The puma with its rounded head, slim body and long legs is very powerful. Pumas living in southern Chile and Canada weigh twice as much as pumas inhabiting the tropics, where they have to compete with the bigger jaguars. Males weigh 40-60% more than females and are larger overall. Its long spinal column provides increased lumbar flexion, similar to the closely related cheetah. The puma's coat colour varies from greyish to dark brown and shows no stripes or spots except when they are young. The chin, throat and belly are white; the sides of the white muzzle are framed in black. The ears are small, rounded, and black on the back. The long tail has a black tip.

Habitat and Distribution

The puma has the largest geographic range of any terrestrial mammal in the Western Hemisphere - from Alaska (rare) to southern Patagonia. In South America, pumas are found almost everywhere except in a few densely populated coastal regions and the high reaches of the Andes. In Canada and the USA, it was historically widely distributed but was eradicated east of the Rocky Mountains; there are recent range extensions eastwards and northwards. Pumas inhabit tropical rain forests, seasonally flooded savannahs, semi-arid brush lands and mountainous regions. Its preferred habitat includes dense stands of fir and open pine forests, cliffs, slopes, and caves. They need cover for stalking prey.

Feeding Ecology

In North America, pumas typically feed on ungulates, mostly deer and wapiti, or elk. Where the puma competes with the larger

and stronger jaguar, the puma eats smaller prey, for example pikas, hares, marsupials, wild pigs, raccoons, and armadillos. Pumas also hunt domestic animals such as sheep or cattle.

Behaviour

Pumas are solitary animals and mostly active around dawn and dusk. Although they are good climbers and often have to escape to trees when hunted by dogs, they mostly live and hunt on the ground. Pumas travel extensively while hunting. They hunt by stalking and try to attack by securing themselves on the backs of their prey. Females and males establish lifelong home ranges, although males may become displaced or die in fights when they are older. Male territories enclose home ranges of one or more females. The young stay and hunt with their mothers up to two years. Pumas mark their territories with claw marks, urine, and faeces.

Threats and Conservation

Pumas have been intensively hunted and persecuted, particularly in the USA. In western USA, the population recovered and their range has extended north and west. Status and trends of the South and Central American populations are poorly known. In some parts of North America people can legally hunt pumas for sport. Considerable annual human-puma conflict occurs when they prey on domestic animals and occasionally attack or kill people. Throughout the range of this species, a few hotspots of such problems are well known, such as Vancouver Island in Canada, and some sites in California. Research and monitoring is ongoing in the USA and



Puma
Puma, puma

Weight	30–80 kg
Body length	100–150 cm
Tail length	60–90 cm
Longevity	up to 23 years
Litter size	1–5 cubs

IUCN Red List: Least Concern



Bobcat *Lynx rufus* (Schreber, 1777)



© A. Sliwa

Bobcat

Rotluchs, lynx roux

Weight	6–20 kg
Body length	50–120 cm
Tail length	9–25 cm
Longevity	10–17 years
Litter size	1–8 cubs

IUCN Red List: Least Concern

The name says it all – this cat is easily recognized by its short tail. Although it may resemble a Canada lynx, it has distinctly shorter legs and appears stockier. Males are 30-40% heavier than females and animals in the north are bigger than in the south. In comparison to the Canada lynx, with which it overlaps in some parts of its range, the bobcat has smaller paws without heavily furred foot pads. The head is small and wide, surrounded by a ruff of fur. The tail about 14 cm and is marked with black bars, but unlike in other lynx species, the underside is white. The ears have black backs marked with a white spot and are tipped with much shorter hair tufts than in the Canada lynx. The bobcat's fur is thick and soft, tawny, brown, reddish or light grey in colour and sometimes marked with brown or black spots and stripes. Bobcat coat patterns and colouring vary remarkably from one region to another. The belly and underparts of the legs are light with dark markings. Melanistic (black) individuals and albinos occur.

Habitat and Distribution

The bobcat is distributed from southern Canada down to central Mexico. In the north its distribution is probably limited by deep snow and cold temperatures, and in the south by intraspecific competition with South American cat species. There is some recent evidence that competition and predation from sympatric coyotes may become a limiting factor in the northeastern US. Toward the north their range is expanding with forest clearing and general warmer climate. Bobcat range is also expanding into the Midwest where populations have rebounded following harvest protection. Bobcats live in a variety of habitats, from boreal coniferous and mixed forests over bottomland hardwood forest and coastal swamp to desert and scrubland. The crucial requirements are adequate prey density, cover for its hunting and shelter for den sites. Intensively cultivated large tracts of land and intensively-developed urban settings are about the only habitat type this species does not occupy.

Feeding Ecology

Bobcats mainly feed on rabbits and hares. They also hunt small rodents, rats, squirrels, beavers, birds, opossums and occasionally small ungulates. Their prey mostly weigh less than 3 kg, but can be much heavier.

Behaviour

Bobcats are generally solitary and primarily crepuscular. Depending on environmental conditions, they may also be active at night or during the day. They are solitary hunters using dense vegetation as cover to ambush their prey. Bobcats live on the ground, but

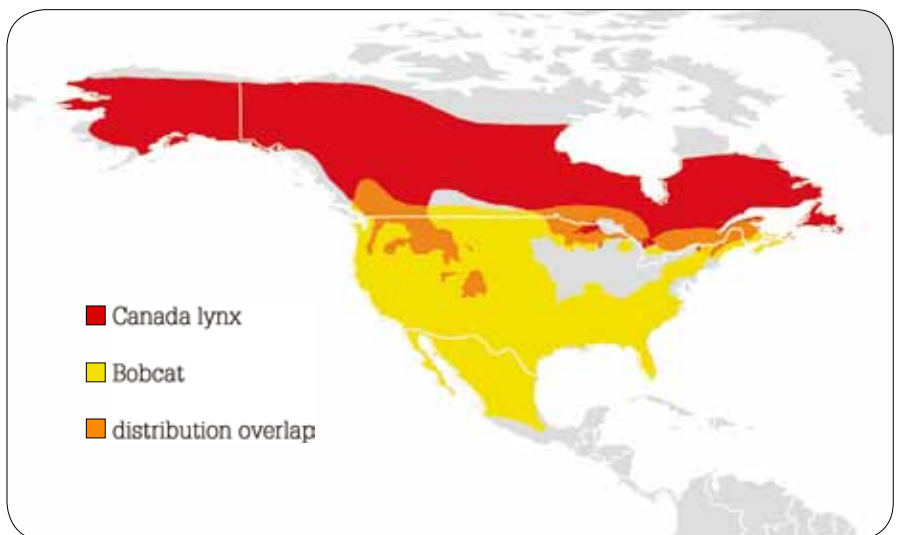
are good climbers and flee into trees or even cactuses when threatened. Home range size ranges from 6 km² for females in southern California to more than 300 km² for males in New York. Territories of males mostly enclose those of several females and female territories are generally exclusive.

Threats and Conservation

The bobcat is the most abundant and widely-distributed wild felid in North America. The bobcat provides the most commonly traded wild cat skins for the international fur trade industry. Today about 20'000-40'000 bobcats are harvested legally each year, which seems to be sustainable. Loss of habitat is the biggest threat for the bobcat, especially for the subspecies *L. r. escainapae* in Mexico. It gets locally persecuted as a pest when it opportunistically preys on domestic animals. The bobcat is the subject of many field studies, but monitoring is still not satisfactory in some of the United States and in Mexico. Bobcats were successfully reintroduced to Georgia and New Jersey.



Black bobcat in Florida.



Canada lynx *Lynx canadensis* (Kerr, 1792)

The Canada lynx is long-legged, with hind limbs much longer than the forelimbs and front paws much bigger than hind paws. There is less size variation than in the bobcat, but males are heavier than females. Canada lynx have big paws with very dense fur growing between the pads, which allow them to move in deep, soft snow more easily than bobcats or sympatric carnivores such as coyotes. Their fur is greyish-brown and spotted only on the light underside. The face is fringed by a ruff of fur and the black-backed ears tipped with hair tufts are characteristic for the lynx family. The tip of the short tail is completely black. Canada lynx are about half the weight of the related Eurasian lynx, probably resulting from

an adaptation to smaller prey, but general overall body size is not that much different.

Habitat and Distribution

The Canada lynx lives in the boreal forests (Taiga) covering most of Canada and Alaska. It depends on patches of successional growth with good habitat for snowshoe hares. In the contiguous US states, its distribution extends along the Rocky Mountains to Colorado. In the Maritime provinces, in Main, around the big lakes and in the Rocky Mountains, the distribution ranges of the Canada lynx and the bobcat overlap (see map), but the Canada lynx prefers higher altitudes with more snow.

Feeding Ecology

The distribution of the Canada lynx is closely linked to the occurrence and density of snowshoe hares, which make up 60-97 % of the Canada lynx's diet depending on the state in the cycle (see box). In times of low snowshoe hare densities and in more southern areas, the Canada lynx also eats squirrels, grouse, mice, small birds, and occasionally young ungulates or carrion.

Behaviour

Canada lynx are solitary and occupy home ranges of 15-50 km² on average, but population densities and spatial organisation depend on the snowshoe hare cycle. Individual home ranges can vary in size from 3 to



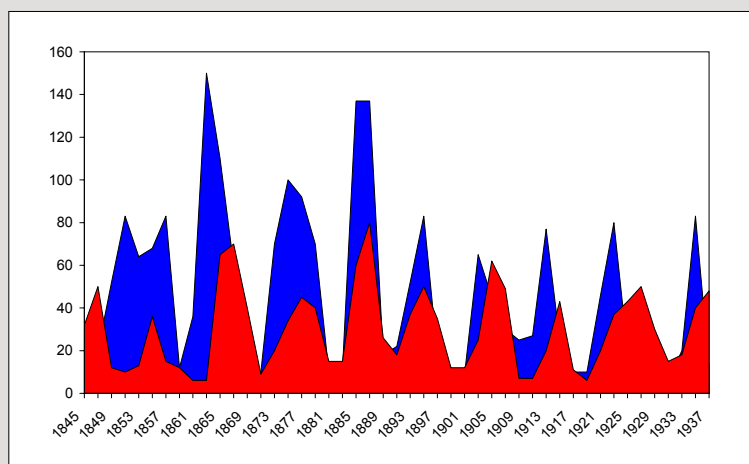
Canada lynx

Kanadaluchs, lynx du Canada

Weight	8–12 kg
Body length	73–106 cm
Tail length	10–15 cm
Longevity	up to 14 years
Litter size	1–8 cubs

IUCN Red List: Least Concern

This is the famous hare-lynx-cycle from the trapping data of the fur trade company "Hudson's Bay Company". No other cat species is as closely related to its prey as the Canada lynx to the snowshoe hare. Hare population numbers fluctuate resulting in a regular cycle of 8-11 years (blue curve). The lynx population follows this cycle with a delay of 1-2 years (red curve).



more than 500 km². When snowshoe hare densities crash, lynx may move hundreds of kilometres and have very low survival rates. When hare numbers are low, many females do not give birth. When prey abundance is high, litter size can average 4-5 kittens.

Threats and Conservation

There is a high demand for the thick winter fur of the Canada lynx in the fur industry. In Canada and Alaska, lynx have been trapped for centuries, but populations were overhunted in the 1980's. Today, the Canada lynx is one of the best studied and monitored cat species and hunting is managed sustainably. In the US, lynx are threatened by habitat fragmentation, logging practices and fire suppression and were listed as Threatened under the Endangered Species Act in 2000. Reintroductions to Colorado have been deemed successful enough to let the state consider the reintroduction of yet another carnivore, the wolverine.

Eurasian lynx *Lynx lynx* (Linnaeus, 1758)



© A. Sliwa

Eurasian lynx

Eurasischer Luchs, lynx

Weight	17–25 kg
Body length	90–120 cm
Tail length	18–23 cm
Longevity	17–24 years
Litter size	1–4 cubs

IUCN Red List: Least Concern

The Eurasian lynx is the tallest of the lynx family. It weighs about twice as much as the other three lynx species. Eurasian lynx in the northern and eastern regions are bigger than individuals from the south and west. Males are about 25-30 % heavier than females. The Eurasian lynx has long legs and in winter its large paws are covered with hair. The winter fur is long, very thick and mostly grey, but may vary from reddish to yellowish. There are four distinct coat patterns over its range with individually unique small to large spot or rosette markings. Eurasian lynx from northern areas and the subspecies *L. l. isabellinus* in Central Asia have a faint, mostly unmarked coat, whereas southern animals tend to be more spotted. The belly, chest and underparts of the legs are light coloured. Lynx have triangular ears with black backs and white centers tipped with 4-7 cm long, black hair tufts. Their short tail is also tipped black. Their head is rounded with a conspicuous facial ruff.

Habitat and Distribution

The Eurasian lynx is an inhabitant of the extended, temperate and boreal forests from the Atlantic in western Europe to the Pacific coast in the East. In Europe it is found from Mediterranean forests to the transition zone of taiga to tundra. It lives from sea level up to treeline. In Central Asia, lynx also occur in steppe habitat and the subspecies *L. l. isabellinus* is found in mountainous, treeless areas in the north part of the Himalaya and of Pamir. Lynx have been observed in this region up to 5,100 m.

Feeding Ecology

The other three species of the Lynx family hunt mainly middle sized mammals, especially lagomorphs. The main prey species of the Eurasian lynx are small ungulates like roe deer, chamois, reindeer and musk deer. Sometimes they also hunt foxes, red deer, wild pigs, beavers, birds or domestic animals such as sheep and goats, or in Scandinavia on semi-domestic reindeer. In northeastern Europe and in northern Siberia where there are no roe deer Eurasian lynx feed on arctic hares. Preliminary diet analyses of *L. l. isabellinus* showed that in this treeless habitat hares form the staple food, followed by mammals.

Behaviour

Eurasian lynx are territorial and solitary. They are mostly active at dawn and dusk. Lynx hunt by stalking and ambush. They use their excellent sense of hearing and eyesight to find prey. The home range of a male measures, depending on the prey base and on the de-

gree of latitude, 100-1000 km² and mostly encloses territories of 1-2 females. Eurasian lynx communicate by scent-marks and calls.

Threats and Conservation

In the European Union the Eurasian lynx is protected by law. In most countries, hunting is allowed under special management. In Russia the Eurasian lynx is important for skin market and pelt industry. Illegal killing of lynx results from conflicts between lynx and hunters who see the lynx as a competitor in game hunting and from lynx killing domestic animals such as sheep, goats or reindeer. In western Europe lynx lost their original habitat through deforestation. Since 1900 lynx in Europe have been endangered, but in the last 50 years it has recovered also due to reintroductions in west and central Europe. The populations in Europe are very well monitored while the status and trend of the Asiatic populations remain unknown. In Central Asia, lynx live mainly in cold semi-desert habitat with scarce vegetation harbouring important prey species. The shrubs are often the main source of fuel wood, a single household collects around 600-700 kg of wood per month.



© KORA



Iberian lynx *Lynx pardinus* (Temminck, 1827)

The Iberian lynx is closer in overall size to the Canada lynx and the bobcat and weighs about half as much as the Eurasian lynx. Males are heavier than females. The Iberian lynx has a small head, a short body and long legs, the characteristic short tail with a black tip, black hair tufts on the ears and a conspicuous facial ruff. The facial ruff of adults is more distinct than that of other adult lynx species. The fur is yellowish, reddish or brownish and marked with dark brown or black spots of varying size. From shoulder to the groin the spots merge into several parallel lines. The belly fur is lightly coloured. There are three distinct individual coat patterns.

Habitat and Distribution

Originally the Iberian lynx was found in all parts of the Iberian Peninsula. It evolved on the peninsula from a relict population from a glacial period about 1.6 M years ago. Today its distribution has shrunk to two small populations: in Andalusia with about 250 individuals in the eastern Sierra Morena and in the Doñana Protected Area and surroundings. Iberian lynx typically inhabit Mediterranean forests composed of native oaks and abundant undergrowth, scrubby swamps and rocky areas.

Feeding Ecology

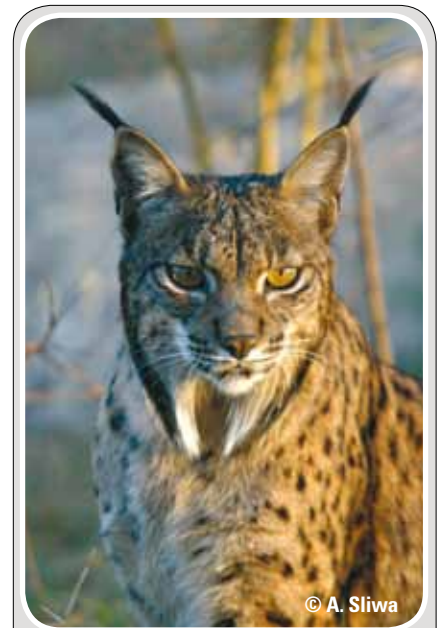
The Iberian lynx feeds primarily on wild rabbits with a dependency similar to that relationship between the Canadian lynx and snowshoe hares. Alternative prey species are rodents, partridges, hares, ducks, ungulates, and occasionally reptiles.

Behaviour

Iberian lynx are mainly crepuscular and nocturnal but sometimes also active during the day. They are territorial with male territories enclosing those of several females. They communicate by marking with urine and faeces. Mating occurs in December-February.

Threats and Conservation

The Iberian lynx is the most threatened cat species in the world: its population declined because of loss of habitat due to the destruction of Mediterranean scrub forests, habitat fragmentation, direct persecution, reduction of the rabbit population due to over hunting and epidemics, illnesses and today possibly also because of intrinsic factors. There are presently only two isolated populations in the wild: 70-80 animals live in the south of Andalusia in Doñana-Aljarafe and 170-180 individuals in the Sierra Morena. The genetic variability is very low, especially in the Doñana population. The Iberian lynx is therefore vulnerable to disease outbreaks. In 2007, a Feline Leukemia Virus epidemic killed 35% of the adult males in Doñana-Aljarafe. Since 2002, a much extended recovery program is trying to save the species from going extinct. With support of the EU, habitat and rabbit populations are being restored, and in 2009 the first lynx have been reintroduced in a new area in Andalusia. Both populations have been increasing over the past few years thanks to these conservation efforts. Portugal has joined the recovery program, which is in both countries also supported by various nature organizations. In parallel a conservation breeding program has been established with



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Iberian lynx

Pardelluchs, lynx d'Espagne

Weight	8–16 kg
Body length	65–92 cm
Tail length	11–16 cm
Longevity	up to 14 years
Litter size	1–4 cubs

IUCN Red List: Critically Endangered

animals from both populations as founders in today four breeding centres in Spain and Portugal with the goal of providing animals for reintroduction. Since 2002, 46 cubs have been born, and as of 2010 the captive population numbers 78 animals.



© A. Sliwa

Black-footed cat *Felis nigripes* (Burchell, 1824)



© A. Sliwa

Black-footed cat

Schwarzfusskatze, chat à pieds noirs

Weight	1–2.5 kg
Body length	37–52 cm
Tail length	14–20 cm
Longevity	16 years
Litter size	1–4 cubs

IUCN Red List: Vulnerable

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The black-footed cat is the smallest African felid and weighs about 1-2.5 kg, males being heavier than females. It is named after its black pads and black underparts of its feet. Its tawny fur is marked with black and brown

spots, which merge into broad bands on its neck, legs and tail. It has a rounded head similar to a domestic cat with large ears and eyes. The black-footed cat has a short tail, which measures less than half of its head and body length and is marked with a black tip.

Habitat and Distribution

The black-footed cat is endemic to southern Africa. It is found in South Africa, Namibia and Botswana, marginally in western Zimbabwe and southern Angola. It mainly inhabits dry regions and prefers open, sparsely vegetated habitat, such as savannah or short-grass steppe called 'Karoo', where it finds enough cover for hunting.

Feeding Ecology

This grassland and semi-desert specialist has a broad diet but feeds mainly on rodents, birds and invertebrates weighing less than 30-40 g. Every night it may kill up to 10-14 small rodents. During an intense study in South Africa, around 2000 kills of black-footed cats could be directly observed and more than 50 different prey species identified. Three quarters of the prey items were small mammals such as mice and gerbils, which made up 40% of the ingested biomass. Second most frequent prey were small birds. Occasionally, black-footed cats also hunt bustards and hares. When feeding on these larger species, they cache parts of their prey. They are also known to readily scavenge. Black-footed cats are well adapted to arid conditions and get all the moisture they need from their food.

Behaviour

Black-footed cats are nocturnal and solitary. During the day they rest in abandoned burrows of springhares or porcupines and are rarely seen. They stalk their prey on the ground and make use of every hiding place they find. They can also flush birds as they trot fast through grassland. As a desert dweller with its scarcity of high prey densities, the black-footed cat occupies rather large annual home ranges averaging 10km² for females and 20km² for males. Male home ranges overlap the ranges of several females. Scent-marking by spraying urine to tufts of grass and shrubs is thought to play an important role in reproduction and social organisation.

Threats and Conservation

The Black-footed cat is the rarest of the African cat species. From the small felids it is one of the best studied ones. Radio-collared animals have been observed over many years near Kimberley in South Africa, so a lot is known about its ecology and behaviour, but as it is hard to observe, we have very little information about its distribution and conservation status. The black-footed cat is threatened by the use of poison and other methods of indiscriminate pest control and overgrazing may lead to a loss of its prey base. Since it occupies such open areas, the black-footed cat is subject to predation from snakes, jackals and owls. Dogs used for jackal hunting also take this small cat opportunistically. Disease transmission from domestic cats may pose a threat to the black-footed cat.



© A. Sliwa



African golden cat *Profelis aurata* (Temminck, 1827)

The African golden cat is solidly built with stout, relatively short legs. It has two different fur colour phases – red and grey. While the throat, chest and undersides are white with large dark spots on the belly, the upper side of both, red and grey morphs, can either be plain or spotted all over. East of the river Congo, the plain red phase becomes more dominant over the grey spotted one. About 5% of all individuals are melanistic. The head with the heavy muzzle is small compared to the body size. The backsides of the rounded, untufted ears are black and some individuals have white patches around the eyes and cheeks. The tail is about one third of the head-body length.

Habitat and Distribution

The golden cat is Africa's least known felid. Most of the information comes from two studies on the cat's diet and opportunistic sightings and museum records. It is endemic to Africa's tropical forest and occurs throughout equatorial Africa, from Senegal throughout the Congo Basin over to the Albertine Rift in Uganda. It was thought to occur in Kenya, but there is no confirmed recent data from there. Although primary moist forest is its main habitat, it seems to be quite adaptable and also occurs in montane, bamboo, and secondary forests. The periphery of its range even stretches into savannah regions along riverine forests.

Feeding Ecology

In Congo and the Central African Republic, studies of African golden cat scats have re-

vealed that rodents and squirrels were the main prey items, followed by duikers (small antelopes). Primates made up 5% of the prey items in both studies, and yet golden cat hunting appears to be restricted to the ground. There is a record from western Uganda of a golden cat killing a red colobus monkey and of an individual stalking Talapoin monkey on the ground at night in Gabon. Birds, hyraxes and bats are also occasionally taken. The so far biggest study from the Democratic Republic of Congo has shown that the mean weight of the African golden cat's prey is 1.4 kg. There is some overlap with the diet of the leopard.

Behaviour

The solitary African golden cat is thought to be crepuscular and nocturnal, but is sometimes observed hunting by day. In a recent camera trap study in Gabon the majority of the pictures were taken during the day time. Although the species has been known for nearly 200 years, nothing more is known about its behaviour and social organization, and it took until 2002 for a first specimen to be photographed in the wild in Gabon.

Threats and Conservation

Loss of habitat is the main threat to the forest dependent African golden cat. It has lost about 44% of its former known range. However, due to its high adaptability, the species is not restricted to primary forests and also does well in secondary forests. There seems to be little direct hunting of African golden cats, but some skins are sold for ritual purposes and can be found



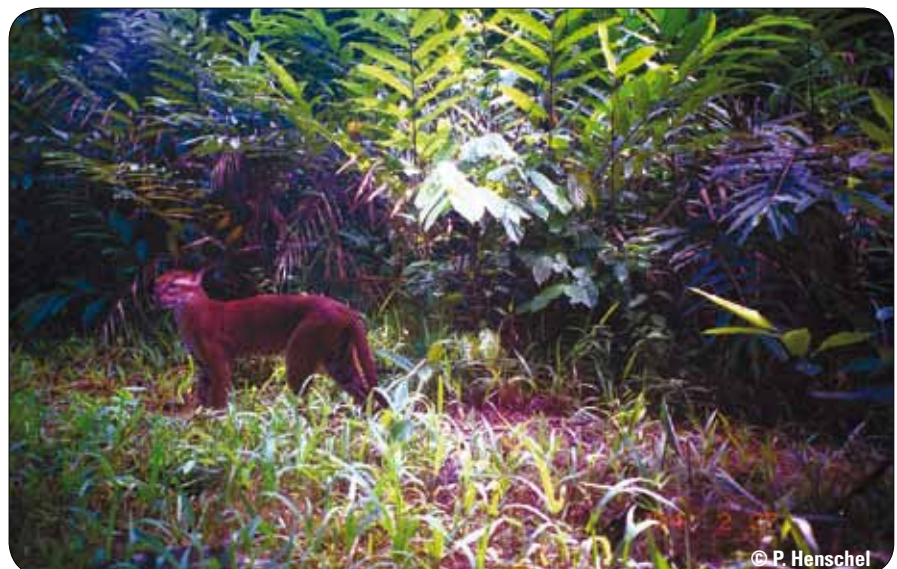
© P. Henschel

African golden cat

Afr. Goldkatze, chat doré africain

Weight	7–16 kg
Body length	65–90 cm
Tail length	28–35 cm
Longevity	to 12 years
Litter size	1–2 cubs

IUCN Red List: Near threatened



© P. Henschel

Serval *Leptailurus serval* (Schreber, 1776)



© A. Sliwa

Serval

Serval, serval

Weight	7–18 kg
Body length	59–100 cm
Tail length	20–38 cm
Longevity	up to 22 years
Litter size	2–4 years

IUCN Red List: Least Concern

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The serval is tall and proportionately has the longest legs of any other cat species. The head is small but the ears are conspicuously very large and marked with a distinct white bar on the otherwise black backside. The tail is relatively short. The fur is tawny with

black spots which vary from freckle-size to large single spots, which tend to be elongated compared to the cheetah's round spots, often merging into stripes on the neck and back. The small spot pattern is referred to as the servaline morph and is probably rare – it was recorded in a camera trap in the Democratic Republic of Congo in 2007 and has also been documented in southwestern Uganda. The servaline form is thought to be associated with dense vegetation and secondary forests, while the large spotted serval inhabits more open habitats such as grasslands and open savannahs. Black individuals have been recorded quite frequently mainly in highland areas of eastern Africa. The serval has long, mobile feet and strong curved claws that are used to capture mice and rats. The serval can be confused with cheetah in some areas.

Habitat and Distribution

The serval lives in Africa, and is widely distributed south of the Sahara. It inhabits a variety of grassland types such as reed beds, grass savannahs or marshes and forest. It prefers rather moist habitats, often along rivers. In eastern Africa the serval has been recorded up to an elevation of 3800 m. North of the Sahara it may be present in small relict populations in Morocco and Algeria as pelts may be found at local markets.

Feeding Ecology

The serval is a specialist in hunting small mammals with exceptional hearing, long legs and relatively small jaw. Rodents are especially important in the serval's diet, but it also

feeds on frogs, lizards, snakes, insects and waterfowl. In the Ngorongoro crater in Tanzania, a serval eats about 4,000 rodents, 260 snakes and 130 birds in a year.

Behaviour

Servals are solitary and territorial with males occupying larger home ranges than females. They are crepuscular and nocturnal, but will also hunt in the day during the wet season. Animals rest during the day in shade to avoid the heat of the sun. The serval uses its long legs and large ears to find small mammals in tall grass. It also grubs in holes and crevices to dig out prey. When servals cannot catch its prey in the first attempt, they repeatedly jump up and down on the spot. They can also catch airborne prey by grabbing birds with their front paws while jumping off all four feet into the air. This characteristic hunting technique enables them to catch some species that would otherwise not be available.

Threats and Conservation

In southern Africa, the serval is intensively hunted because it is thought to be responsible for attacks on domestic sheep, goats and poultry. It is also hunted for sports. Trade in serval skins is known to occur in many countries. Skins are sold only at local markets, and the extent of the serval skin trade is unknown. Serval skins are often traded as leopard skins and are used in traditional medicine and rituals. Wetland conservation is key to serval conservation. Their habitats are threatened by annual burning, and over grazing. In northern Africa the serval's distribution and status is unknown.



© S Durant



Cheetah *Acinonyx jubatus* (Schreber, 1775)

The cheetah doesn't have the stout and muscular appearance of other large cats, but has a slender, elongated body with long legs. Its coat colour is yellow or tan with small black dots and the undersides of the belly and throat are white. A rare but interesting variation in coat pattern is called the king cheetah. It has mottled markings rather than distinct spots which result from a recessive mutation. The backs of the ears are black and a black line runs from the inner corner of the eyes to the upper lip. The white-tipped tail is about half the head body length and has black stripes on its distal third. Cheetahs have large thigh muscles and a very flexible spine, which enables them to take strides up to 7 m and cover about 29 m/s. Their lungs, heart and nasal passages are enlarged. Cheetahs cannot completely retract their claws, which provides extra grip during fast turns. All these adaptations make them the fastest land mammals, able to reach top speeds of 100 km/h.

Habitat and Distribution

The cheetah was once distributed from South Africa to India, but it has disappeared from most of its range in Asia. Iran is the only country where a small population of Asiatic cheetah persists. Cheetahs are still widely distributed in southern and eastern Africa, although the range is increasingly fragmented. Their range in northern and western Africa has been highly restricted and fragmented. Population numbers are small or unknown for many countries. Cheetahs occur in open grassland and savanna, as well as in dry forest, semi-desert and shrubland.



Feeding Ecology

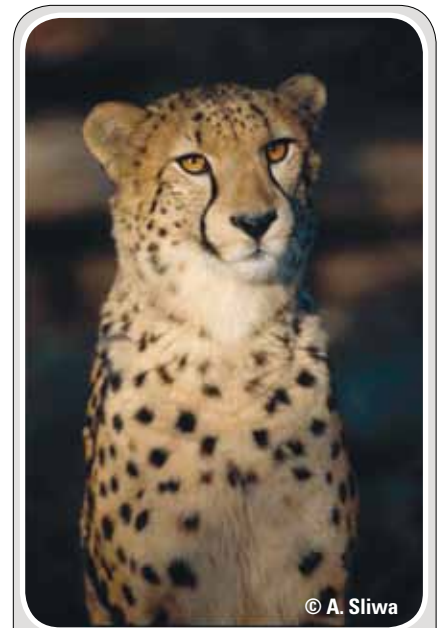
Cheetahs feed mainly on small to medium-sized ungulates like impalas, gazelles, and other antelopes. In Iran, they take wild sheep and Persian ibex. Cheetahs also hunt young of larger prey animals, small mammals like hares, and livestock. Their kills can be appropriated by lions and hyaenas.

Behaviour

Cheetahs typically stalk their prey and rush at it at full speed over short distances. They are thought to hunt mainly by day to avoid competition with stronger carnivores like lions, but kills are also made at night. The social organisation of cheetahs is unique among felids. Females are solitary, while males often live in groups of two or three. Such coalitions often consist of brothers. Female home ranges can overlap home ranges of several male coalitions. Both sexes try to mate with several partners. Therefore, young of a litter can have different fathers.

Threats and Conservation

Cheetahs are wide-ranging and occur at very low densities. Therefore, most protected areas are not large enough to sustain viable populations and many cheetahs live on farmland. Habitat loss is the primary threat followed by depletion of prey base, which leads to predation on livestock and increases conflicts with farmers. Another problem for cheetah populations comes when protected areas support relatively high lion densities. This species needs protection status outside of parks wherever it occurs. The illegal market for live animals poses a very serious threat,



Cheetah

Gepard, guépard

Weight	21–65 kg
Body length	113–140 cm
Tail length	60–84 cm
Longevity	up to 20 years
Litter size	3–4 cubs

IUCN Red List: Vulnerable

at, since the common technique is to shoot a mother and take the cubs for selling on the black market. Quotas for trophy hunting are issued in some African countries. Several conservation strategies for cheetahs have recently been developed.

Lion *Panthera leo* (Linnaeus, 1758)



© A. Sliwa

Lion

Löwe, lion

Weight	110–272kg
Body length	137–250 cm
Tail length	60–100 cm
Longevity	16–18 years
Litter size	1–7 cubs

IUCN Red List: Vulnerable

sive manes for display as well as protection during fights with rival males. The colour of the nose changes with age for both sexes and manes become even more prominent and dark. The Asian lion has a distinctive fold of belly skin, thicker fur, longer tail tassel and a smaller mane than the African lion.

Habitat and Distribution

The African lion is found south of the Sahara. Asiatic lions live only in the Gir forests of northwest India. Lions inhabit forested areas, dry forests, bushlands and deserts with a preference for open country. Their characteristic stalk and ambush hunting method requires shelter or cover but with a panoramic view.

Feeding Ecology

Gazelles, wildebeests, zebras or antelopes are the main prey, but lions can also hunt buffalo, giraffe and small elephants. In India, the diet includes sambar and chital. They feed also on birds, hares, ostrich eggs, fish, baboons and warhogs. The diet is normally dominated by 3-5 ungulates. Lions hunt in groups and have a relatively high success rate for kills. They kill unattended livestock and occasionally humans. Females do most of the hunting. Lions frequently steal kills from other carnivore species. They regularly scavenge.

Behaviour

Lions are mainly nocturnal and crepuscular, spending large parts of the day resting. Lions live in a very complex social system. The pride structure varies between the African and Asian populations and may vary locally according to conditions of extreme weather

and prey base. In the Gir forest of India 4 to 5 related females form prides and hunt in smaller territories than the males who form groups of 2 to 6 individuals. In the African population, prides may be 2 to 18 adult related females with their offspring with 1 to 7 males. The core of females tends to stay relatively stable while young males may disperse and adult males may shift pride status under competition. The normally stay with a pride for 2-4 years. The abundance of the main prey base determines the size of a pride's territory. Both sexes scent mark and this species is vocal with their roaring audible over several kilometres.

Threats and Conservation

In many parts of their range lions continue to be killed because they prey on domestic livestock, they are a trophy animal for sports hunters, and because they sometimes kill people. Up to 200 people per year are killed by lions in Tanzania, for example. Lions may be taken illegally as trophies or for cultural rights. As regular scavengers they are very vulnerable to poisoning. The biggest ongoing threat in general results from habitat loss and fragmentation as in the Gir Forest. Conservation efforts continue throughout their range to alleviate the human/lion conflicts, to promote sustainable practices for trophy hunting and to reintroduce and relocate animals where appropriate. The hunting of lions in some places could be sustainable if carefully managed to ensure that only males older than 6 years are shot. Lion bone trade for Asian medicine becomes increasingly a problem as the high prices on the black market makes them additionally vulnerable to poaching.



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Caracal *Caracal caracal* (Schreber, 1776)

The caracal has conspicuously tall, triangular ears tipped with 4-5 cm long black hair tufts similar to lynx; but the two species are unrelated. The common name derives from these extraordinary ears and means “black ears” in Turkish. The caracal’s fur is short and tawny to brick-red coloured without any markings. The underparts are whitish. Melanistic animals also occur. This mid sized cat has a slender body and long legs. It can jump two meters or more into the air. The caracal is not as long-legged as the serval and is more sturdily built. Its tail is short and measures about a third of head and body length. Stiff hairs grow between the pads as an adaptation to travelling over sand. As with other desert species, caracal have excellent sight and hearing. Near the nose and the eyes the face is marked with dark lines and white spots. Females are smaller and lighter than males.

Habitat and Distribution

The caracal lives in all kinds of dry habitats such as semi deserts, steppes and dry forests, however not true deserts. The caracal has a wide geographic range but occurs only at low densities. Its range extends from northern Africa and Turkey through the Arabian Peninsula and the Middle East to Turkmenistan and northwestern India. The caracal is also found throughout Africa except the deserts of the Sahara and Namib and the tropical forests of western and central Africa. The biggest caracal population lives in South Africa and Namibia. In the north it is considered rare.

Feeding Ecology

Despite being an adept climber, the caracal hunts on the ground. It usually catches prey

weighing less than 5 kg, such as young antelopes, hares, rodents, hyraxes, birds, mice and sometimes also invertebrates and reptiles. This cat makes use of edge habitat when seeking prey. The caracal is sometimes able to kill prey that measures 2-3 times its own body size such as adult springboks or young kudus. It preys also on domestic animals such as sheep and goats.

Behaviour

The caracal is solitary and not strictly nocturnal – they are known to be active during the day in some habitats. It prefers open terrain and it can tolerate much drier conditions than the serval. Known for its extraordinary jumping, the caracal often stalks birds and is then able to spring up and grab them when they flush. Traditionally people in India and Iran tamed and used them for sport to watch contests with fenced caracals taking pigeons in this way. Male territories are larger than those of the females. Territories may overlap and are marked with urine, faeces and claw marks.

Threats and Conservation

This is one of the few cats that are not endangered but its status does vary over its range: caracal may be rare in parts of Asia and north Africa but is common in South Africa and Israel for example. In South Africa and in Namibia the caracal is often killed because it hunts domestic sheep and goats. In many parts of its range the caracal is threatened by habitat destruction. In northern Africa and Asia not much is known about the ecology and status of the caracal. In South Africa and in Namibia the caracal is often killed because it hunts



© O. Newman

Caracal

Karakal, caracal

Weight	6–18 kg
Body length	80–100 cm
Tail length	20–34 cm
Longevity	16–19 years
Litter size	1–6 cubs

IUCN Red List: Least Concern



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Leopard *Panthera pardus* (Linnaeus, 1758)



© A. Sliwa

Leopard

Leopard, léopard

Weight	17–90 kg
Body length	91–191 cm
Tail length	51–101 cm
Longevity	13–21 years
Litter size	1–4 cubs

IUCN Red List: Near Threatened

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The leopard like the jaguar is a powerfully built cat: its relatively short legs and broad paws are distinctive and muscular, advantages when attacking large prey. Yet a long body and tail add a graceful look and aid in tree climbing at which leopards excel. With a huge geographic spread comes much variation in size and colouring; and there is also a marked difference in size and other physical features between the sexes, indicative of

different feeding ecology. Largest cats tend to be from Africa and weigh in at about 90 kg while the Arabian leopard tops 25 kg. Fur varies in texture and colour though leopards generally are spotted overall with individually unique patterns on a background ranging from yellowish to olive. Melanistic individuals are rare in Africa but are more common in Java and Malaysia.

Habitat and Distribution

The distribution of leopards represents a remarkable geographic spread, possibly the biggest for any felid – from the Russian Far East to the south of Africa, a huge belt with extreme variation in conditions and habitat types from tropical rainforest to high mountain slopes with all forest types and savannahs and bushland in between. From snow to sand, from subarctic to sub-Saharan habitat use, leopards seem only absent in the true desert zones. There is a small population in the western part of Africa about which not much scientific detail is known.

Feeding Ecology

Some particular feeding habits enable this species to use such a vast range – leopards generally prey opportunistically on a variety of prey from large ungulates to invertebrates. Capable of killing prey up to 2 or 3 times their own body weight, they prefer medium sized ungulates in any given habitat. Primates, hares, rodents, large birds and small carnivores can form an important part of their diet. As such generalists they may be more capable than similar size large cat species to withstand losses or sharp declines in ungulate populations. Their ability to use trees for caching surplus meat enables them to live close to lions and tigers and to withstand pressure from scavengers.

Behaviour

Their particular hunting style involves stalking from a very low position with long periods of time motionless if need be: they attack from very close range with a short burst of speed and a powerful strike of the front paw. Small prey are taken opportunistically without much chase. Prey are often dragged up trees for eating and caching. They are visual hunters using trees and other high points to locate prey from a distance. Leopards are solitary and territorial. They scent mark and use much vocalization. Despite such a wide distribution there are not many detailed studies available for this species.

Threats and Conservation

Although critically endangered in some parts of its range, the leopard is abundant enough to be legally hunted as a trophy in others. The hunting of this species may not be sustainable since probably too many young animals are removed from the population. Poaching takes a large number of animals throughout the vast range. The greatest threat generally comes from the expansion of rangeland for livestock breeding which tends to depress the populations of wild ungulates on which leopards depend. Leopards are persecuted when they prey on domestic livestock and when they turn to killing people. Especially in India effort is being applied to alleviate the human toll. Historically leopard numbers have drastically declined with human population expansion. Females can reproduce at about 2 ½ years and usually produce about 3 cubs, so leopards could recover under favourable conditions from depressions. Some conservation plans are underway in the most critically affected areas such as the Arabian Peninsula and the Caucasus.



© H. Gumpo



Jungle cat *Felis chaus* (Schreber, 1777)

The jungle cat, like the serval, has distinctly long legs with conspicuous stripes at the top. Its unspotted coat varies from reddish to sandy brown. The tail measures one third of the cat's head and body length and has usually dark stripes near the end, as at the tops of the legs. The jungle cat has a long, slim face with especially tall ears that are set relatively close together, reddish on the backs and tipped with small black tufts. The jungle cat has a white facial ruff with a light coloured throat and belly. Melanistic jungle cats often occur in south-eastern Pakistan and in India.

Habitat and Distribution

The jungle cat is distributed from Egypt across central and South Asia through southeast China, Myanmar, Thailand, Cambodia and, marginally, Lao PDR and Vietnam. It inhabits swamps but also dry, sandy deserts and sparsely vegetated steppes, a remarkable spread of habitat zones. It prefers moist habitats with tall grass or reeds to hide in. It does not occur in cold climates, where snow-fall is common, or in thick forest. Most of its range is under 1,000 m, but in the Himalaya

jungle cats live up to 2,400 m. It uses agricultural habitats, including around human settlements. The species has been considered common in India, but in most other regions its status is poorly known. There is only one historical specimen from Indochina, and very few recent records from there outside Cambodia, where it remains locally common in the shrinking, large tracts of open deciduous forest interspersed with grassland.

Feeding Ecology

The jungle cat's prey varies across its broad range and consists commonly of rats, hares and mice all of which weigh less than 1 kg. It also feeds on squirrels, frogs, birds, lizards, small snakes, insects and eggs of birds and even fruits. Occasionally it hunts bigger prey such as young wild pigs or gazelles. The jungle cat is an adept swimmer and even dives into pools to catch fish. Close to villages jungle cats catch domestic animals such as chickens, ducks and geese.

Behaviour

The jungle cat is solitary and active during day and night. The jungle cat rests under bushes, in caves, in the thicket or in reeds. It stalks its prey on the ground and attacks from behind, but can also jump high into the air to catch birds. It communicates via scent-markings but little is known about its social organization.

Threats and Conservation

There are no recent studies of exact population trends; it seems common in some parts of its range but rare in others. The jungle cat adapts more readily to agricultural development than most small felids but clearing of uncultivated vegetation along rivers and in wetlands poses serious threats regionally. Loss of ripa-



© A. Sliwa

Jungle cat
Rohrkatze, chat de jungle

Weight	5–9 kg
Body length	58–76 cm
Tail length	21–27 cm
Longevity	9–10 years
Litter size	3–4 cubs

IUCN Red List: Least Concern



© K. Shekhar



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Sand cat *Felis margarita* (Loche, 1858)



© A. Sliwa

Sand cat

Sandkatze, chat de sable

Weight	1–3 kg
Body length	39–52 cm
Tail length	22–32 cm
Longevity	up to 14 years
Litter size	2–8 cubs

IUCN Red List: Near Threatened

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The sand cat is one of the smallest of the wild felids at about the size of a small domestic cat. It has a longish tail with 2–6 black rings and a black tip. It has very large ears set low on the sides of the broad, flattened head and a white muzzle and well-developed cheek hair. The ears have black tips with the insides

covered in thick white hair. The large greenish-yellow eyes are surrounded by a white ring and a reddish line runs over the cheeks down the throat. The coat of the sand cat is a pale yellow or grey-brown colour, without spots or stripes. Some animals do have black markings on the legs. The belly and throat are white. In northern regions the sand cat's winter coat can be up to 6 cm long and very dense so that it can appear much larger. This thick coat and the dense dark hair growing between the toes and on the foot soles insulate against the extremes of hot desert sand and seasonal cold.

Habitat and Distribution

The sand cat lives in central and northeastern Karakum, the countries of Kazakhstan, Turkmenistan, Uzbekistan, Iran, Pakistan, on the Arabian Peninsula, in Morocco, Western Sahara, Algeria, Mauritania, Niger, Egypt, and Israel. The sand cat occurs in sandy and rocky deserts so the distribution range probably contains only pockets with low densities of these small cats. It prefers to be near rocks, sparsely covered terrain and small sandy hills. It inhabits abandoned burrows of red foxes or porcupines beneath bushes and shrubs.

Feeding Ecology

Sand cats feed on gerbils, hamsters, grouse, larks, partridges and lizards. Sand cats obtain sufficient moisture from their prey since they generally occupy waterless terrain. Nomads know them as snake hunters – preying on two viper species by hitting them hard on the head and then biting on the back of the neck for the kill. When there is surplus meat from larger prey, this small desert dweller caches

it under an insulating layer of sand for later consumption.

Behaviour

Sand cats are mainly nocturnal. At day they rest in their burrows to minimize the fluid loss. If threatened, sand cats crouch beside rocks or tussocks, do not move and are hardly visible. Sand cats are not good in climbing or jumping but excel in digging which is necessary for maintaining dens and for hunting small prey. With its exceptionally keen sense of hearing it can detect prey under the sand cover and then dig it out. Sand cats occupy large home ranges – the first studies which were done in Israel indicate that males maintain overlapping territories of about 16 km². Scent marking and vocalizations are used by both sexes to maintain social organization.

Threats and Conservation

Only a few field studies of this species have been carried out and the trends in its status and distribution are not well known. However, this is one cat which is not losing its preferred habitat – desertification is spreading across its range. The sand cat faces considerable other predictable threats: natural enemies can be locally abundant (snakes, large owls, jackals and red fox) and there may be disease transmission from domestic carnivores. They may also be killed when they prey on domestic animals and they can be a local target for the wild pet trade. On the other hand, in some places nomads consider them with respect because of their role in religious stories. Officially they are protected in only 8 countries while in 18 range countries little information is available and hunting may be allowed in some places.



© M. Khan



Wildcat *Felis silvestris* (Schreber, 1777)

Debate continues about the genetic differences of wildcats and feral domestic cats, and the very different looking types of this species whether it lives in Mongolia or South Africa. They are all simply closely related. It is difficult to describe common features except perhaps at a regional level. The main common factor relates to the species' universal dependence on small rodents. Such prey typically undergo large cyclic changes in population and this cat must be able to produce large litters frequently to withstand the fluctuations in prey base. The size of the wildcat is that of a large housecat. Colour and fur vary with local conditions. The African wildcat's (below) fur is short, reddish, tawny, sandy coloured or greyish, and marked with faint, unremarkable vertical lines and spots on the body and sides. It has long legs. The paw pads are black like those of the black-footed cat. The fur of the Asiatic wildcat (bottom right) is short, greyish or reddish and conspicuously marked with small, black or reddish-brown spots. The slightly paler forms live in dryer areas and the darker, more heavily spotted and striped forms occur in more humid areas. The thick, long coat of the European wildcat (top right) is grey-brown with dark stripes on the head, neck, limbs, and along the back. Its

legs are short and the tail is bushy and marked with dark rings and a black blunt tip.

Habitat and Distribution

The European wildcat inhabits parts of Europe and parts of adjoining Russia into central Asia. It lives mainly in forest or steppe habitats. The Asiatic wildcat is found from Iran to India, the African wildcat in almost all of Africa and the Arabian Peninsula. There it also inhabits deserts, semi deserts, savannahs and open forests in hilly and rocky terrain.

Feeding Ecology

The wildcat feeds on rodents such as rats and mice and voles. Occasionally it also hunts insectivores, hares, rabbits, birds, insects, frogs, lizards, fish, and rarely martens, weasels, polecats, and poultry.

Behaviour

The wildcat is nocturnal mostly and hunts on the ground although it is an excellent climber. This small cat primarily gets its prey by stalking followed by a quick attack. The wildcat is solitary and territorial using scent marks for communication.

Threats and Conservation

The African wildcat was long thought to be the ancestor of our domestic cat (*F. s. catus*). 4,000 years ago, wildcats lived with humans as shown in artworks of ancient Egypt. Recent investigation indicate that the origin of the domestic cat is Mesopotamia where the first grains were cultivated – people needed a hunter to keep rats and mice from destroying the crops. The wildcat is barely at risk but in some areas – probably those of low den-



© A. Sliwa

Wildcat

Wildkatze, chat sauvage

Weight	3–8 kg
Body length	45–80 cm
Tail length	ca. 30 cm
Longevity	up to 16 years
Litter size	1–6 cubs

IUCN Red List: Least Concern



© T. P. Jackson



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Chinese mountain cat *Felis bieti* (Milne-Edwards, 1892)



© J. Sanderson

Chinese mountain cat

Chinesische Bergkatze, chat de Biet

Weight	5.5–9 kg
Body length	60–85 cm
Tail length	29–35 cm
Longevity	unknown
Litter size	2–4 cubs

IUCN Red List: Vulnerable

the fur is greyish and in summer it is dark brown. In Tibetan highlands local people refer to it as the “grass cat”, the fur matching dry grass stalks so exactly. Faint horizontal brown lines run across the sides, the short legs and the cheeks. The lower lips, chin and belly are white and the throat appears pale yellowish-brown. The backs of the ears are also pale yellowish-brown and the ears are tipped with tufts of dark fur. The tail measures about 40 % of the cat’s head and body length. The last part of the tail is encircled by three or four dark rings and the tip of the tail is black.

Habitat and Distribution

Despite reports from many parts of western China the only confirmed locations for this small mountain cat are in east and northeastern edge of the Tibetan Plateau in the provinces Quighai and Sichuan. This limited range means that this small cat has adapted to the harsh climatic extremes that occur seasonally and with altitude: open, dry, windy and very hot as well as very cold. It inhabits steppe grasslands at high elevations, alpine meadows and alpine shrubland and sometimes edges of coniferous forests; it has not been found in true desert or dense forests.

Feeding Ecology

No ecological studies have been conducted on this species in the wild but considerable knowledge comes from local herders and from work done in the Xining Zoo. In their mountainous habitat this cat hunts mainly local rodents, lagomorphs and birds in the size range of pheasants and partridges. The importance of pikas as an important

prey ties the fate of this cat to human interactions: when local irruptions of voles and pikas lead governments to supply poison for pest control, this carnivore no doubt suffers the consequences. No longer widespread, the practice still occurs on a smaller scale.

Behaviour

Interviews with local people and observations at the zoo indicate that this cat is primarily nocturnal and crepuscular, resting in burrows during the day. Most burrows have been found on south-facing slopes and some as high as 3600 m. The Chinese mountain cat is solitary and not much is known of its reproductive activity in the wild.

Threats and Conservation

Population status and trends are unknown. It is clear that serious threats continue from the results of poisoning programs and from hunting for fur. In regard to the poisoning: recent work indicates that the problem of pest outbreaks result from overgrazing and by addressing this problem poison use could be eliminated with direct benefit to this carnivore. Direct loss by hunting results from the fur having value mostly locally for such products as hats and clothing but also on the market generally where furs are sold. The large scale open trade is closed but it still occurs at an unknown and unregulated level. The Chinese mountain cat is not protected over most of its range so effort is needed to monitor its status and secure conservation measures for guarding this unique species. One conservation group in China is currently planning a monitoring and survey program for this species.



© J. Sanderson



Pallas's cat *Otocolobus manul* (Pallas, 1776)

Its short legs, stocky build and long fur give the Pallas's cat a very distinctive look and make it appear bigger than it actually is. It has a broad, flat face with small ears set low on the head. These adaptations may have arisen from stalking prey in open terrain without much cover. Its eyes are bordered with white and black lines and feature a unique third eyelid which functions as protection against the high cold winds and the dust storms common over its habitat. Its bushy tail is about half as long as the body and is marked with several narrow black rings and a black tip. Its thick fur is grey, tawny or reddish; coat colour varies both seasonally and regionally. Coat markings include dark spots on the forehead, dark and white stripes on the cheeks and faint stripes on the legs. The chin, throat and belly are white. The pale fur helps the species to totally blend into its environment (see picture below).

Habitat and Distribution

Pallas's cat is found from Iran throughout central Asia. The largest populations are thought to exist in Mongolia and China. In the western part of its range, its habitat is highly fragmented. Generally little is known about the status of Pallas's cat; it seems to be rather widespread but rare. It occurs in hilly areas, montane grassland, shrub steppe and semi-deserts. It has been documented at an altitude of 5,075 m in North Sikkim, India. In Mongolia, Pallas's cats showed strong preferences for steep, rocky hill slopes which provided excellent cover from predators. They are well adapted to cold and arid climates, but permanent snow cover of more than 15 cm appears to limit their distribution.

Feeding Ecology

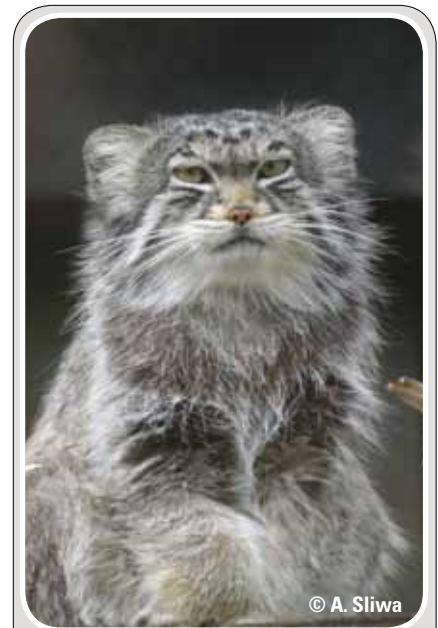
Pallas's cat feeds mainly on pikas and small rodents such as gerbils, voles and jerboas. It occasionally hunts partridge, hares, young marmots, grasshoppers and reptiles. Its prey typically weighs 50-300 grams. In spring manul, as they are known in Mongolia, may sometimes prey on lambs of Argali sheep.

Behaviour

Pallas's cat can be active at any time of the day, although it is primarily crepuscular. It uses caves, rock crevices or abandoned burrows of other animals as shelter from weather conditions and other predators. When unable to find shelter when fleeing predation, another of its anti-predator strategies is to remain still and count on its amazing camouflage. Pallas's cats are solitary and can occupy very large home ranges, in some regions up to 100 km² for males and 23 km² for females. Male home ranges overlap those of several females.

Threats and Conservation

Hunting Pallas's cat is still permitted in Mongolia and every year an estimated 2000 animals are harvested. The fur is highly valued for local use since the hairs are both thick and strong; there is also a market in Russia and China for such fur. Unfortunately regulations are not enforced and Pallas's cats are vulnerable to overexploitation. Overexploitation is known to be driven by a demand for Pallas's cats as exotic pets, and as ingredients for traditional medicines. Ongoing studies in Mongolia and Russia have increased understanding of Pallas's cat ecology and current threats to their survival. Pallas's cat is known to be susceptible to



© A. Sliwa

Pallas's cat
Manul, chat manul

Weight	3–5 kg
Body length	46–65 cm
Tail length	21–31 cm
Longevity	8–10 years
Litter size	2–6 cubs

IUCN Red List: Near Threatened

the loss of prey due to pika poisoning campaigns and degradation of habitat through overgrazing by livestock. Studies have also shown that Pallas's cats are often killed by domestic dogs and raptors, occupy a specialised niche, and have large spatial requirements; all of which are factors promoting vulnerability.



© S. Ross

Snow leopard *Panthera uncia* (Schreber, 1775)



© A. Sliwa

Snow leopard

Schneeleopard, panthère de neige

Weight	30–50 kg
Body length	90–120 cm
Tail length	80–100 cm
Longevity	10–20 years
Litter size	1–5 cubs

IUCN Red List: Endangered

With thick fur, an extraordinary long bushy tail and the light green or grey eyes, the snow leopard is one of the most beautiful of the big cats. This strong and muscularly built cat has massive front paws and long legs that help them move in deep snow. The short, rounded ears are set wide apart, and the backs of the ears are black with a light

centre. The colour of the fur is grey-brown and the underparts of the body are whitish. In the winter the fur is long and thick and protects against the cold. Black spots mark the head, neck, and limbs. The patches on the back, flanks and tail form large, dark rosettes with pale centres. The markings coalesce along the back to form two dark lines that extend from the neck to the base of the tail.

Habitat and Distribution

Snow leopards are found in the high mountains of 12 central Asian countries. They prefer rocky areas where the terrain is broken by cliffs, ridges, steep slopes and ravines. They inhabit dry alpine steppe, usually above tree line, up to an elevation of 6,000 m.

Feeding Ecology

Snow leopards primarily prey on wild sheep and goats (blue sheep, ibex, markhor, and argali). Additionally they take small prey such as marmot, pika, hare, snowcock and partridge. Domestic livestock frequently appear in their diet.

Behaviour

Snow leopards are solitary and may occupy very large territories. Recent data from South Gobi, Mongolia, show subadult males using home ranges of about 480 km². One GPS collared female in Pakistan was found to have a home range exceeding 1,000 km². Snow leopards are most active at dusk and dawn. They stalk prey from above, chasing them down steep slopes. Snow leopards are adept climbers. They communicate most often using scent-marks and scrapes.

Threats and Conservation

Snow leopards are thought to have been extirpated from relatively little of their extensive but highly fragmented range. Major threats include serious declines in their primary prey and persecution by humans. The mountain ungulates upon which this species depend are being negatively impacted by overhunting and in some areas by competition for forage with expanding domestic herds. Poaching for trade has increased in recent years because the market now includes demand for bones and other body parts used in Chinese traditional medicine as well as the valuable pelts that show up everywhere, e.g. in the Middle East or on international military bases and at tourist bazaars in Kabul, Afghanistan. For a species that requires such a large home range, and in which the young stay with their mother for up to 2 years, a decrease in numbers can be devastating on a local scale, especially when females are removed. Additional losses in snow leopard numbers arise from the demand for live animals. The extent of the illegal taking of snow leopards is not known. Several international groups are now working with local herders to address both poaching and conflict issues. Community-based initiatives seek to improve local livelihoods, offset the economic losses of livestock depredation and thereby reduce poaching and retaliatory killing of snow leopards. An innovative collaborative (Mongolian/international) program to research the ecology, including the human dimension, of this cat in South Gobi of Mongolia addresses for the first time the long-term status and condition of snow leopards where they share landscape with people.



© R. Jackson



Tiger *Panthera tigris* (Linnaeus, 1758)

As the largest and the only one with stripes, tigers are one of the most recognizable species on earth and widely considered a symbol of wilderness and strength. Tigers are characterized by their wide geographic distribution. The average size of adult tigers can vary considerably across their range from 75 kg in the tropics to 325 kg in the Sikhote-Alin region of Russia. The characteristic striped pattern of the fur provides excellent camouflage, enabling the stalking technique used in hunting. Physically designed for hunting and killing large ungulates, tigers have relatively large skulls with extraordinary canines and a powerful overall build.

Habitat and Distribution

With a current distribution over 13 range countries from the island of Sumatra in Indonesia to Siberia in Russia, tiger habitat varies from tropical forests to mixed hardwood and conifer forest, and even to dry high altitude areas such as in Bhutan at 4,000 m. Some basic habitat needs remain constant: high densities of the local large ungulates, dense cover for stalking and water.

Feeding Ecology

Tigers rely primarily upon large ungulate prey. Kills are often taken to nearby cover to be eaten, with some legendary distances and weights observed. Usually tigers alternate eating and resting, caching any unconsumed meat. They usually return until all is eaten even in places where decomposition occurs.

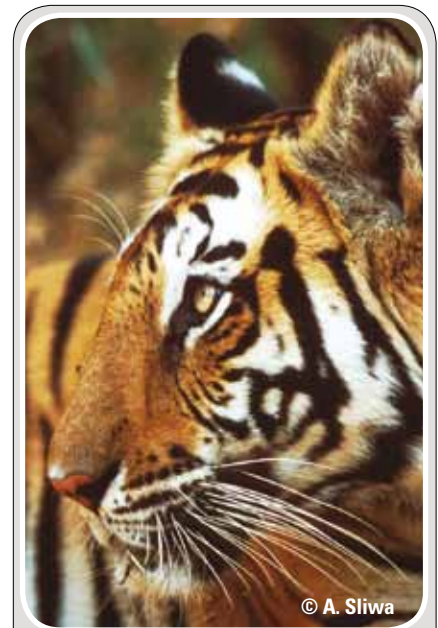
Behaviour

Tigers hunt and live as individuals except that cubs stay with their mother for 18 to 28 months. Females require and maintain indi-

vidual territories. Males disperse sometimes long distances and their territories often overlap. The size of individual home ranges can be large and females must aggressively defend the resources within their home range while males have to search extensively and compete for available mates. Tigers do reproduce well under favourable conditions.

Threats and Conservation

Wild tiger populations have declined precipitously in recent decades: it is estimated that only about 3200-3500 individuals exist in the wild in 2011, whereas a century ago there may have been 100,000. Three subspecies have gone extinct: the Bali tiger, the Javan tiger, and the Caspian tiger. Major reasons for this decline include habitat loss and degradation, illegal harvesting of tigers and prey, and human-wildlife conflict. Concern over this decline has caused governments and conservation organizations to commit to unprecedented actions to reverse this trend. Political leaders of tiger range states and representatives of conservation NGOs and donor organizations signed the St. Petersburg Declaration in 2010, committing impressive financial resources with the goal to stabilize and eventually double the population of wild tigers by 2022. Landscape analyses have estimated that tiger reserves could support more than double today's numbers but that national and international commitment and cooperation for conservation will be crucial for success. "Source" populations and core protected tiger areas are unevenly distributed and represent only 6% of current tiger range. Protecting and monitoring these remaining breeding populations, establishing and protecting corridors and transboundary conser-



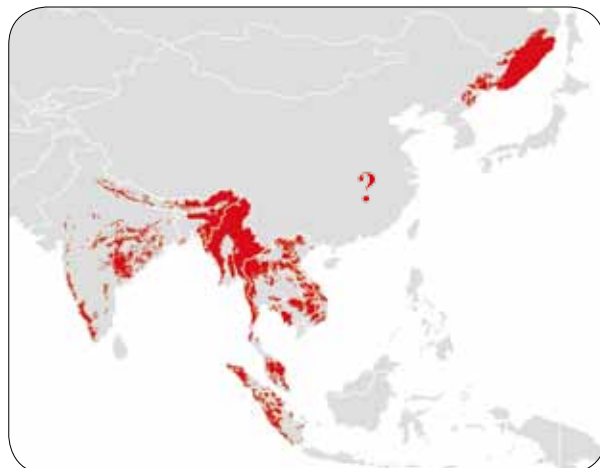
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Tiger

Tiger, tigre

Weight	75–325 kg
Body length	150–230 cm
Tail length	90–110 cm
Longevity	12–15 years
Litter size	1–5 cubs

IUCN Red List: Endangered



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Leopard cat *Prionailurus bengalensis* (Kerr, 1792)



© A. Sliwa

Leopard cat

Bengalkatze, chat léopard du Bengale

Weight	1.6–8 kg
Body length	45–65 cm
Tail length	20–30 cm
Longevity	to 13 years
Litter size	2–3 cubs

IUCN Red List: Least Concern

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The leopard cat looks like a miniature, long-legged and more slender version of a leopard. It has a round head, a short narrow muzzle and big rounded ears. Leopard cats in the north of their range are larger and heavier with a pale greyish colour and a thick fur. The smaller cats from the south have ochre,

yellow or brownish fur with white underparts. The size and shape of the black markings covering the body and limbs are also highly variable. Sometimes the spots form lines along the neck and back. The tail is about half as long as the body, spotted and can bear a few rings near the black tip. The ears have black backs with a white central spot and the face is marked with two dark stripes on the forehead. The cat has two narrow black cheek stripes enclosing a white spot. The largest cats are found in northern regions, they are also known as Amur cat.

Habitat and Distribution

The leopard cat is widespread throughout southeast Asia. It occurs from tropical rainforests to temperate broadleaf and dry coniferous forests, as well as in shrub and grasslands up to 3,000 m. It also thrives in disturbed habitats such as secondary forests or oil palm plantations. Leopard cats probably depend on areas with enough cover and proximity to water. In the north, their distribution is limited by snow cover.

Feeding Ecology

The leopard cat feeds mainly on small mammals, especially rats and mice. In a study in Thailand and Borneo, murids dominated the diet. It also takes lizards, amphibians, birds and insects. They are sometimes viewed as poultry pests.

Behaviour

Leopard cats are mainly nocturnal, although they can also be active during the day. They are solitary but can sometimes be seen in pairs and with dependent young. Home range

size varies from 3 to 14 km² depending on the region. They tend to use larger home ranges during the wet season than the dry season. They are mainly nocturnal and crepuscular. However, males show more diurnal activity than females. Leopard cats use forest and understorey for resting and breeding. They are adept climbers and good swimmers.

Threats and Conservation

Many felids in southeast Asia suffer from habitat loss through deforestation. The leopard cat seems to be less threatened by habitat alteration, since it can also live in cultivated areas and it remains the most common wild cat in south Asia. They have been heavily exploited in the past – up to 400,000 skins per year are reported sold for the fur industry during the 1980s in China, the country with the biggest population. The harvest of leopard cats for fur and in some places for meat continues but it is not closely monitored or managed for sustainability. This cat is protected in some parts of its range. Leopard cats can interbreed with domestic cats and hybrids are sold as pets under the name of “bengal cat” or “safari cat”. This increasing trend puts pressure on local populations but the numbers are not known. Population status and trend of the leopard cat are generally unknown but estimated to be stable. They show up frequently as by-catch in many Asian photo trap sessions. The subspecies *P. b. rabori* of the Philippines is Vulnerable and the Iriomote cat *P. b. iriomotensis*, living only on the island of Iriomote, is even listed as Critically Endangered in the IUCN Red List. The latter is very well studied and a lot of conservation efforts have been made for years.



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Fishing cat *Prionailurus viverrinus* (Bennett, 1833)

The fishing cat is a middle sized cat. The fur is short, coarse and grey or olive brown. The head and body are conspicuously marked with small black spots and stripes. On the face, back and neck the spots merge into short lines. Its belly is white and there are two dark collars on the throat. The head is relatively big and broad with small and rounded ears. The backs of the ears are black with white central spots. The thick tail measures about one-third of the head and body length and is muscular near the body. It is marked with 5-6 black rings and a black tip. The claws have incomplete sheaths and the hind feet are webbed. It is often confused with the leopard cat.

Habitat and Distribution

The fishing cat inhabits much of mainland tropical Asia and the large islands of Sri Lanka and Java. Its presence on Sumatra is disputed as there are no confirmed records, and photos first identified as fishing cat all turned out to be leopard cat on a second look. Its actual distribution and also the phylogenetic relation between isolated populations require further investigation. The fishing cat lives near water and thick cover in habitats such as mangroves, marshes and along watercourses. In Sri Lanka, India and Nepal they live in forests, shrubs, reed beds and tall grass areas. It might have disappeared from Java as there are no recent confirmed records.

Feeding Ecology

The fishing cat takes a wide range of mostly aquatic prey. It dives into water to catch fish, ducks or coots. It also feeds on frogs,

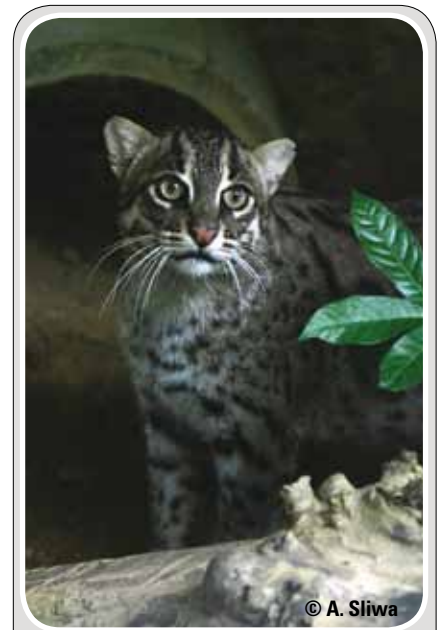
small mammals, snakes, snails, crustaceans, and is known to sometimes take young deer and carrion. The fishing cat travels along rivers and changes its hunting site about every fifteen minutes. Occasionally it kills dogs and domestic animals up to the size of calves.

Behaviour

The fishing cat is nocturnal and spends most of its time in dense cover. It is an excellent swimmer and diver over long distances. The fishing cat hunts alone. It has been observed hunting mostly in shallow water where it uses the webbed feet to push itself along leaving the front feet ready to grab fish. Territories of males enclose several female home ranges and both sexes use scent for marking.

Threats and Conservation

Wetland, marshes and grasslands are increasingly lost to agricultural land development. Thus the fishing cat loses crucial habitat. Increasingly pollution in the waterways of Asia pose an obvious indirect threat as it consumes lethally contaminated prey. It is killed both for its fur as well as the meat which is locally considered a delicacy. Unknown numbers of live fishing cats are exported into western countries for the exotic pet market. Fishing cats which hunt domestic animals are also killed, poisoned, and snared. In Thailand a current conservation project includes a strong public education feature as it attempts to reverse the trend of persecution of this unusual felid. An Indian conservation organisation also recently started a public fishing cat survey and an



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Fishing cat

Fischkatze, chat pêcheur

Weight	7–16 kg
Body length	65–85 cm
Tail length	25–30 cm
Longevity	to 10 years
Litter size	2–3 cubs

IUCN Red List: Endangered



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Rusty-spotted cat *Prionailurus rubiginosus* (Saint-Hilaire, 1831)



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Rusty-spotted cat

Rostkatze, chat rougeâtre

Weight	1–2 kg
Body length	35–48 cm
Tail length	20–25 cm
Longevity	up to 18 years
Litter size	1–3 cubs

IUCN Red List: Vulnerable

The rusty-spotted cat is the smallest wild felid of Asia and about half the size of a domestic cat. The ears are rounded and small and the tail is about half the length of the head and body. The brownish grey fur tinged with a rufous colour is short and soft. There are horizontal bars on legs and chest. The head is rounded and their relatively large eyes are marked with a white streak along the inside edge. Each cheek is marked with two dark streaks and four dark stripes extend from above the eyes backward over the head and to the neck. The back and sides are marked with red-brown blotches, which merge into lines. The belly, chest and throat are white and covered with large dark spots and bars.

Habitat and Distribution

Rusty-spotted cats are limited to India and Sri Lanka. Presence of this small cat is confirmed as far northwest as the Gir Forest and recently also in the Terai. Preliminary observations from a study in western India show a new

distribution record for this small cat - it was detected in a forest region of eastern Gujarat. The rusty-spotted cat uses dry forests, tropical thorn forests, scrub forests, grasslands and rocky areas. In Sri Lanka the rusty-spotted cat is also found in humid forests and in arid coastal belts.

Feeding Ecology

The main prey for this small cat is likely birds and small mammals with opportunistic hunts on insects, lizards and frogs and occasionally poultry. In the Gujarat area rodents were recorded as the main prey.

Behaviour

The rusty-spotted cat is mainly nocturnal, resting during the day in hollow tree trunks or in thickets. It is said that the rusty-spotted cat is extremely agile and active. Even though it is a good climber, it probably hunts mainly on the ground but sometimes in trees as well. This arboreal activity was confirmed recently by a study in western India. It flees when threatened into the trees. The rusty-spotted cat has many enemies such as jackals, foxes and other cat species.

Threats and Conservation

Population densities and dynamics are poorly known. Rusty-spotted cats are described as rare. Recent observations lead to the assumption that this small cat is not that uncommon and is able to survive close to villages. In W. Maharashtra, rusty-spotted cat cubs were found in sugarcane fields during harvest. Future studies should also look at the agricultural landscape. It probably suffers from loss of natural habitat and from a decline of its prey base, as with most wild animals in India. However, it may also benefit from clearing and low intensity agriculture, when this promotes high rodent populations. This type of ecological question needs further investigation. Although many point observations have been reported, there is no clear picture yet in regard to details of the ecology and behaviour of the species. Rusty-spotted cats are frequently killed for meat which is sold as a delicacy in some parts of India. In Sri Lanka rusty-spotted cats are regularly shot because they are mistaken for small leopards. The rusty-spotted cat does not fare well in captivity and only a few are held in European zoos outside its natural distribution.

The 8 cat lineages

Based on genetic research cats today are classified into 8 lineages:

Panthera lineage: lion, tiger, jaguar, leopard, snow leopard, clouded leopard

Borneo bay cat lineage: Borneo bay cat, Asiatic golden cat, marbled cat

Caracal lineage: caracal, Africal golden cat, serval

Ocelot lineage: ocelot, margay, Andean cat, pampas cat, Geoffroy's cat, guiña, on-cilla

Lynx lineage: Iberian lynx, Eurasian lynx, Canada lynx, bobcat

Puma lineage: Puma, jaguarundi, cheetah

Leopard cat lineage: Pallas's cat, rusty-spotted cat, leopard cat, fishing cat, flat-headed cat

Domestic cat lineage: domestic cat, wild-cat, Chinese mountain cat, sand cat, black-footed cat, jungle cat



© K. Patel



Asiatic golden cat *Pardofelis temminckii*

(Vigors & Horsfield, 1827)

The Asiatic golden cat is a medium sized cat, sturdily built with relatively long legs. It looks similar to the African golden cat *Profelis aurata*, except that the Asian species is heavier with a longer tail. The two species are, however, not related. The fur colour varies from golden to red brown, dark brown or grey with almost no markings. There is also a spotted form called 'ocelot morph' and a melanistic form. Both uniform and ocelot morph have white lines bordered with black in the face and on the inner side of the legs. The most distinct features of this cat are the white lines bordered with dark brown to black running across the cheeks, and from the inner corners of the eyes up to the crown. The rounded ears have black backs with a grey spot. The underside of the tail is white.

Habitat and Distribution

The Asiatic golden cat ranges from China over India and Nepal to Indochina, Malaysia and Sumatra. It inhabits tropical and subtropical

evergreen, mixed and dry deciduous forest up to an elevation of over 3,500 m. Sometimes it occurs in more open areas.

Feeding Ecology

The Asiatic golden cat feeds mainly on rodents and other small mammals, as well as on birds, snakes and lizards, but also on small ungulates like muntjacs or small sambar deer. In Peninsular Malaysia, scat analysis revealed that golden cats also prey on monkeys and mouse deer. It may be capable of hunting mammals up to the size of small deer and is also known to prey on poultry.

Behaviour

The ecology of the Asiatic golden cat is not well known. It is a terrestrial hunter and is active at night and in twilight hours. The home ranges of two radio collared golden cats in Thailand were 33 km² (female) and 48 km² (male) and overlapped in 78% of their area. In captivity a variety of different vocalisations and scent marking behaviours have been observed.

Threats and Conservation

The Asiatic golden cat is rarely observed in nature and its population status is largely unknown. However, it has repeatedly been photographed during recent camera trapping surveys, suggesting that it may be more common than previously thought. The biggest threat to the Asiatic golden cat is habitat loss, as Southeast Asian forests are undergoing the world's fastest regional deforestation rates. Although they are protected, Asiatic golden cats are still hunted for their fur and



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Asiatic golden cat

Asiat. Goldkatze, chat doré d'Asie

Weight	9–16 kg
Body length	71–105 cm
Tail length	40–56 cm
Longevity	to 17 years
Litter size	1–3 cubs

IUCN Red List: Near Threatened



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Marbled cat *Pardofelis marmorata* (Martin, 1837)



© J. Sanderson

Marbled cat

Marmorkatze, chat marbré

Weight	2–5 kg
Body length	45–62 cm
Tail length	36–55 cm
Longevity	to 12 years
Litter size	1–2 cubs

IUCN Red List: Vulnerable

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The marbled cat is about the same weight as a very large domestic cat, but gives the impression of being more slender and elongated. Marbled cats are often compared to small clouded leopards, as both species bear the distinctive marbling pattern on their coats, with the combination of large, irregular shaped dark blotches, margined with black. The background colour is brownish-grey to reddish-brown. Melanistic individuals have been observed in Sumatra. The tail is nearly as long as the head and body length and very bushy. The tail is marked with black spots proximally and rings distally. While walking, they bear it stretched out horizontally and do not drag it on the ground like a snow leopard. The foot structure, relatively short legs and the long tail indicate the arboreal adaptations of this small cat. The spots on the forehead merge into narrow longitudinal stripes on the neck and back. This small cat has a more rounded head than most other felids with a broad

face and also rounded ears that have white bars on the back.

Habitat and Distribution

The marbled cat is found from Nepal, Bhutan and northeastern India to parts of Indochina. It also occurs in Malaysia, Sumatra and Borneo. The marbled cat's favoured habitats are remote moist forests. It inhabits tropical rain forests, evergreen mountainous forests and deciduous forests from sea level up to an elevation of 3,000 m. The only radio-collared cat was trapped in a mixed hill evergreen/bamboo forest. Although they most commonly inhabit primary forest habitats, individuals have also been documented in agricultural plantations.

Feeding Ecology

Marbled cats feed on birds, tree squirrels, fruit bats, rats, and presumably also on lizards and frogs. There have also been several documented instances of marbled cats preying on monkeys. Exact eating habits are difficult to assess because of their preference for dense forest habitat, they are only rarely observed. They seem rare compared

to sympatric felid species, but this might be because they are easily overlooked. It is referred to as the Old World margay for its arboreal activity.

Behaviour

Ecology and behaviour of the marbled cat are poorly known. Presumably it is crepuscular and nocturnal. The marbled cat is thought to spend most of its time in the trees, however they are showing up in some photo trap projects so they obviously spend some time on the ground as well. A radio-tagged female in Thailand used an area of 6 km².

Threats and Conservation

Status and distribution of the marbled cat are poorly studied and population trends are unknown. Marbled cat populations surely are susceptible to negative impacts from the destruction of their habitats through deforestation. The marbled cats seem especially sensitive to changes and disruptions caused by human. Although hunting is prohibited in Bangladesh, Cambodia, Indonesia, Malaysia, Myanmar, Nepal and Thailand, marbled cat parts are still found displayed in markets.



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Clouded leopard *Neofelis nebulosa* and *N. diardi*

(Griffith, 1821; Cuvier, 1823)

The clouded leopard is comparable in size to a small leopard with a tail nearly as long as the head and body and relatively short legs. However some features make this cat stand out: the hind legs are very much longer than the front; the skull is long with canine teeth proportionally longer than those of any other extant cat; and its unique coat makes this cat easy to recognize. On a light background cloud-like rosettes with dark outlines and lighter centres form distinct markings over the back and sides. Two long stripes run along the spine and the tail has 6 crosswise stripes. Colouration and markings vary geographically and separate clouded leopards from the mainland (photo to the right) and the Sunda islands (picture below).

Habitat and Distribution

Clouded leopards are distributed from Nepal, Bhutan and southern China throughout Southeast Asia to Indochina and Malaysia. The clouded leopards living on Sumatra and Borneo are separated from the continental species and listed as a separate species, the Sunda clouded leopard (*N. diardi*). In some

parts of its wide range it may be common but not that much detail is known about its population trend since it inhabits typically very dense vegetation. Recent studies in Thailand and Borneo are increasing the understanding of the ecological niche of this elusive cat. In Borneo a programme for research and conservation studies combines capacity building with public awareness and conservation initiatives based on local input. Clouded leopards throughout their range occupy mainly the deepest parts of evergreen forests and up to 1,300 m.

Feeding Ecology

Clouded leopards feed on both arboreal and terrestrial vertebrates - for example on small deer, monkeys, squirrels and birds. Occasionally they hunt domestic poultry and goats but are apparently not interested in carrion.

Behaviour

Clouded leopards are solitary and mostly nocturnal and crepuscular. They move easily through the trees and are excellent climbers, one of the few cats which can also climb headfirst down a vertical trunk and hang from



Clouded leopard

Nebelparder, panthère nébuleuse

Weight	16–23 kg
Body length	69–108 cm
Tail length	61–91 cm
Longevity	15–17 years
Litter size	1–2 cubs

IUCN Red List: Vulnerable



branches by their hind feet. The clouded leopard can also travel over quite long distances on the ground. They are solitary animals and mark their territories with scent.

Threats and Conservation

Clouded leopards suffer from crucial habitat loss when forests are converted to agricultural land and in some areas its prey base is seriously overhunted for local meat markets. Hunting for the valuable fur and traditional medicine market makes the mainland species especially vulnerable to human exploitation. Some trade in live animals for the exotic pet market keep the monetary value for this species high in some places and therefore subject to further population decline though protected from hunting over most of its range. There is a recognized need for more studies and monitoring for both species. Current work on Borneo will shed light on the ecology of *N. diardi*.

Borneo bay cat *Catopuma badia* (Gray, 1874)



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Borneo bay cat

Borneokatze, chat bai

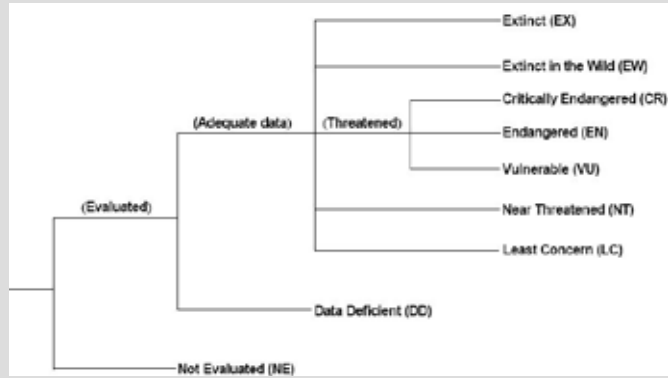
Weight	3–4 kg
Body length	53–67 cm
Tail length	32–40 cm
Longevity	unknown
Litter size	unknown

IUCN Red List: Endangered

Little is known about many of the small cat species, but the Bornean bay cat is the least known of all. It was discovered in 1855 and was described from only few skins and skulls. It looks similar to a small Asiatic golden cat and was initially mistaken for an island form of this species. It took until 1998 to get a photo of this small cat and they showed up only in 2002 in the wild in a photo trap project. The first live Bornean bay cat scientifically examined was a female captured in 1992 and it weighed 2 kg. However, this animal was emaciated and healthy cats probably weigh 3-4 kg. Genetic samples from this individual confirmed that this is indeed a unique species. Bornean bay cats have a very long tail, a rounded head, and small rounded ears. The coat is either mahogany red or grey. The belly and the underside of the tail are light. The forehead is marked with faint dark stripes and there are light markings at the inner corners of the eyes. The backs of the ears are dark, lacking white spots.

The IUCN Red List Categories

Species that have been assessed for the IUCN Red List are placed into one of the following categories: Extinct, Threatened (comprising the categories Critically Endangered, Endangered, and Vulnerable) or Near Threatened. Near Threatened species also need attentive surveillance, as they may quickly end up in one of the Threatened categories. If a species is not at risk of extinction it is classified as Least Concern.



Habitat and Distribution

The Bornean bay cat is endemic to the island of Borneo. It is probably forest dependent and has been reported from lowland and hill forests up to 800 m, as well as swamp forests and regenerating logged forests as confirmed by the innovative Bornean Wild Cat Programme. Presence in the disturbed forests, whether selectively logged or regenerating, indicates some level of adaptability but presumably the numbers are lower than in the primary forests. All species in the felid guild were recorded in the logged and unlogged forest mosaic surveyed by the team over three years but what is more threatening than logging is the alarming rate of clearing forest for palm oil plantations. In this type of disturbed landscape only one species was found, the leopard cat. Ongoing and future research will answer more details about the Bornean Bay cat's habitat use.



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Feeding Ecology

There are no formal studies on the diet of the Bornean bay cat.

Behaviour

Today, behaviour, ecology and reproduction of the Bornean bay cat remain unknown. As it is rarely observed, it was thought to be nocturnal, but several recent camera trap pictures have also been taken during the day. All photographs are of single animals, suggesting that the bay cat is a solitary species.

Threats and Conservation

The Bornean bay cat is protected. Its limited distribution makes it endangered. Habitat loss and fragmentation caused by logging and conversion of forest to palm oil plantations are the main threats to this species. Another threat may be the high demand on this rare cat by foreign zoos and breeding facilities.



Flat-headed cat *Prionailurus planiceps* (Vigors & Horsfield, 1827)

A rather odd-looking cat, the flat-headed cat resembles more a civet than a felid: its head is long and narrow with a flattened forehead with small rounded ears. The tail is short, measuring only a quarter of the cat's head and body length and is heavily furred. The underside of the tail is light in colour. It has long and narrow feet with some webbing. That feature along with the very pointed teeth that are backward facing, indicate some adaptations to at least some level of aquatic activity. The flat-headed cat's long and soft fur is reddish brown on top of the head and dark brown on the body. The hairs are tipped with white, which gives its fur a silvery appearance. The chin, muzzle and belly appear white. The face is lighter in colour than the body and two prominent whitish streaks run on either side of the nose. The noticeably large eyes of the flat-headed cat are set closer together than those of other cats, giving it better stereoscopic vision and suggest a nocturnal activity pattern. The flat-headed cat bears also the characteristic trait of partial claw retraction. That is, the claws are pulled into a sheath which leaves two thirds protruding.

Habitat and Distribution

The flat-headed cat's range extends from southern Thailand to Malaysia, Sumatra and Borneo. It inhabits tropical rainforests and marshes and is found along rivers and streams. Generally it is closely associated with watercourses. Almost all photo records are from extreme lowland areas, generally below 100 m.

Feeding Ecology

The flat-headed cat is believed to feed mostly on fish, but also eats frogs, mice, rats,

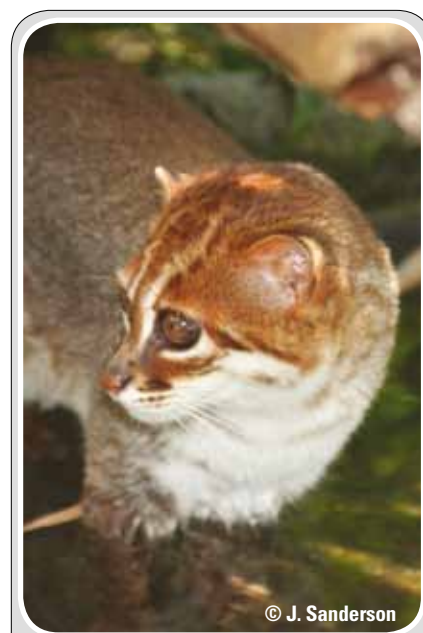
crustaceans or fruits. The particular dental structure of this small cat help it grab and hold the slippery main prey items that it hunts.

Behaviour

Very little is known about the behaviour of this secretive cat. It is believed to be a solitary, nocturnal and crepuscular animal. Behavioural observations come exclusively from the few individuals kept in captivity. They are extremely difficult to observe in the wild. Most sightings there were made of flat-headed cats walking on riverbanks. Their prey is caught in the water, but flat-headed cats carry their hunts away from the bank before consuming it. They have been observed swimming across rivers. Similar to other cats it sprays urine marks, but does so unlike any other cat: it walks forward in a crouching position leaving a trail on the ground.

Threats and Conservation

Records of sightings near oil palm plantations where they are supposed to feed on rodents lead to the assumption that flat-headed cats have some tolerance of modified habitats. However, recent work indicates that the flat-headed cat might not be as tolerant as previously believed as it ultimately depends on tropical lowland and peat swamp forests. These habitats show the highest degradation rates and only a low percentage is protected by law. Therefore the flat-headed cat can be considered a flagship species for the protection of other species associated with this type of habitat. In addition, the flat-headed cat suffers from pollution of watercourses mostly due to oil, chlorides and heavy me-



© J. Sanderson

Flat-headed cat

Flachkopfkatz, chat à tête plate

Weight	ca. 2 kg
Body length	45–52 cm
Tail length	13–17 cm
Longevity	to 14 years
Litter size	1–2 cubs

IUCN Red List: Endangered

tals. Fish are poisoned with direct consequences for this predator. It is protected over most of its range but not in Brunei and Singapore, where it no longer occurs. First conservation projects that aim to establish large tracts of forest with connecting corridors are underway in Borneo, but more conservation efforts and detailed studies of this rare cat are urgently needed.



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