

EVERYTHING YOU EVER WANTED TO KNOW ABOUT CATS

The Wild Cat Book

FIONA SUNQUIST AND MEL SUNQUIST

WITH PHOTOGRAPHS
BY TERRY WHITTAKER



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From the ancient Egyptian cat goddess, Bastet, to the prophet Muhammad's favorite cat, Muezza, and our contemporary obsession with online cat videos, felines have long held a place of honor in their human counterparts' homes and cultures. But the domestic cat is just one of many feline species, and in *The Wild Cat Book* cat experts Fiona and Mel Sunquist introduce us to the full panoply of the purring, roaring feline tribe.

Illustrated throughout with Terry Whittaker's spectacular color photographs as well as unique photos from biologists in the field—some the only known images of the species pictured—*The Wild Cat Book* not only tantalizes with the beauty of cats, but also serves as a valuable and accessible reference on cat behavior and conservation. Comprehensive entries for each of the thirty-seven cat species include color distribution maps and up-to-date information related to the species' IUCN conservation and management statuses, while informative sidebars reveal why male lions have manes (and why dark manes are sexiest), how cats see with their whiskers, the truth behind our obsession with white lions

and tigers, and why cats can't be vegetarians. *The Wild Cat Book* also highlights the grave threats faced by the world's wild cats—from habitat destruction to human persecution.

From the extraordinary acrobatics of the arboreal margay, able to cling to a tree branch by a single paw thanks to its unusually flexible ankles, to modern declines in African lion populations, *The Wild Cat Book* is an instructive and revealing ode to felines of every size and color. Combining science, behavioral observations, and stunning photography, this book will captivate cat fanciers the world over.

FIONA SUNQUIST is a science writer, photographer, and for fifteen years was a roving editor for *International Wildlife Magazine*. **MEL SUNQUIST** is professor emeritus in the Department of Wildlife Ecology and Conservation at the University of Florida, Gainesville. Together they are the authors of *Florida: The Ecotravellers' Wildlife Guide*, *Tiger Moon: Tracking the Great Cats in Nepal*, and *Wild Cats of the World*, the latter two published by the University of Chicago Press. They live in Melrose, FL. **TERRY WHITTAKER** is a UK-based photographer specializing in wildlife conservation and the environment. He lives in Folkestone, Kent.

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Lion

PANTHERA LEO

After watching countless TV specials, most of us associate lions with the prey-rich, rolling short-grass plains of the Serengeti, but these conditions exist in only a small part of the lion's geographic range; most lions live in woodlands, dry forests, scrublands, and even deserts.

Lions are unique among cats in that the core of their social system is the pride. Prides are composed of related females—mothers, sisters, daughters, and aunts and all of their cubs—which live together in groups to defend the best territories. The well-known lion biologist Craig Packer has likened lion prides to “street gangs competing for turf.” Successful prides of lionesses and their offspring often occupy the same area for generations. In the Serengeti, a pride of lions usually consists of two to eighteen adult females, their cubs, and one to seven males. Breeding coalitions

of males compete with other coalitions for females, and their tenure with a pride can be as short as a few months or last for several years.

While the pride is the central unit of the lion's social system, this system is not inflexible. During a prolonged drought in the central Kalahari, prey numbers declined to such a low level that the normal social system collapsed. Pride males and females abandoned their territories and became nomadic, traveling well outside their normal haunts. Females cooperated with unrelated females in hunts, and associations changed frequently.

But lions also inhabit forested areas in both Africa and Asia, where they lead much more solitary lives. In these forested habitats, male and female lions rarely associate with one another except for mating. Studies of lions in India show that males tend to travel alone, make their own kills, and maintain their territories by scent marking and roaring. Females live alone or in pairs, with their young.

Physically, lions and tigers are built along very similar lines. Well-muscled forequar-

King of the beasts and symbol of power, the lion has been immortalized in history and legend. Their images appear on buildings, flags, in art, and as team mascots.

The mane story: Why do male lions have manes?



Why do male lions, alone among all the cats, have manes? Until recently, there were several different theories, but no completely satisfactory answers. It was only in 2002 that Peyton West, a graduate student at the University of Minnesota working in the Serengeti, resolved the mane question once and for all with a set of elegant experiments. West showed convincingly that the lion's mane is a signal that advertises male condition. She ran a series of experiments in which she used life-size dummy lions with manes of different color and length, and presented them to wild, free-ranging lions. It turns out that lionesses use manes to choose the best mates, and male lions used manes to assess the condition of rival males and to avoid tangling with stronger males.

Male lions begin to develop manes as they become sexually mature, and the mane continues to grow until they are about four or five years old. A lion's mane reflects its physical condition—injured males have shorter, patchy manes and sometimes lose their mane altogether.

West combined the results of her experiments with thirty years of data collected on a population of Serengeti lions. She found that males with darker manes generally had higher levels of testosterone, which meant they were more aggressive fighters. Aggressive males are better able to chase off wandering groups of bachelor males who would kill cubs in a pride takeover. Males with dark manes also have a longer life expectancy and are more likely to survive when wounded, and their cubs have higher survival rates.

So, it transpires that the crowning glory of the king of beasts is a vital symbol and a signal to all around him. Lions in good condition have a full dark mane, and lionesses prefer males in good condition because a strong male increases the chances their cubs will survive. Males, on the other hand, want to avoid fighting with other males who are stronger than them, so they use the mane to calculate the strength of a rival.



Jaguar

PANTHERA ONCA

Jaguars and leopards are closely related and quite difficult to tell apart. However, the jaguar is heavier than the leopard and looks like a much more powerful animal. It lacks the leopard's lithe grace; instead, it is a strong, deep-chested, stocky-looking cat, with an unusually large head and short, sturdy limbs. Large or small, the jaguar gives the impression of unassailable power. Even a 70-pound (31 kg) jaguar looks as if it could overpower an ox. Its killing technique reflects the extraordinary strength of its muscles and teeth—the jaguar's canine teeth are more robust and deliver a more powerful bite than those of the other big cats.

A million years ago, huge European jaguars were common in the river forests of central Germany and France. Almost twice the size of today's jaguar, these early jaguars hunted

With a broad, powerful-looking head and massive canine teeth, jaguars are well equipped to tackle very large prey. Their bite has more force than that of other big cats, and they can bring down a full-grown Brahman bull by biting through the animal's skull between the ears or horns.

deer and pigs in the warm floodplain forests of Europe, living alongside ancestral versions of the lynx and puma. Jaguars arrived in the Americas comparatively recently. Both fossil and molecular studies suggest that these cats entered North America via the Bering Strait roughly 800,000 years ago. Then, even more recently—some 280,000 to 510,000 years ago—jaguars moved south and colonized their current home in Central and South America. At that time South America was home to about twenty-five species of large herbivores. However, some 12,000 years ago, during the Pleistocene extinctions, all native South American mammals larger than about 145 pounds (65 kg) disappeared. The only relatively large prey species that avoided extinction were tapirs, capybaras, large armadillos, peccaries, and a couple of deer species.

Jaguars are clearly built to grapple with the ghosts of the Pleistocene fauna. Their broad head, massive canine teeth, and short, stocky limbs equip them to tackle prey two to three times larger than their own body



Since the early 1970s, the jaguar has been on the list of totally protected species in most South American countries. Though the threat from the commercial skin trade has abated, the jaguar is still losing ground to habitat destruction, and many are shot as cattle killers every year.

weight. However, today these powerful cats live in a landscape that lacks the large animals they are equipped to kill. Despite their robust physique and heavy-duty weaponry, modern jaguars manage to survive on a diet of surprisingly small animals such as armadillos, rodents, birds, and marsupials. Natural prey for today's jaguar is limited to peccaries, brocket deer, pampas deer, caimans, and capybaras, all of which generally weigh less than 110 pounds (50 kg). Really large natural prey like the occasional tapir and marsh deer are few and far between, so small prey is often the only thing on the menu.

In Peru, Belize, and Costa Rica—where jaguars survive on armadillos, agoutis, iguanas, and sloths—they have become much smaller in body size and weigh scarcely more than a large Labrador retriever. But despite the reduction in body size, these mini jaguars have retained the massive head, powerful teeth, and robust forelimbs of a large-prey specialist.

About 500 years ago, early colonists brought cattle and horses to the New World and inadvertently reintroduced Pleistocene-size prey to the South American landscape. The cattle multiplied and roamed semi-wild in large herds, and the jaguar took to this new

Jaguars in North America?: A small number of jaguars appear to be residing in Arizona

Jaguars once roamed North America from Oregon to Pennsylvania, and though these cats disappeared from most of the United States before Columbus's time, the species continued to hang on in Arizona, Texas, and New Mexico until recently. Sixty-two jaguars have been killed or captured in the United States since 1900, most of them within 62 miles (100 km) of the border between the United States and Mexico.

There were so few sightings or records of jaguars in the United States over the following decades that the cat was believed to have disappeared from the United States. Then, in March 1996, in southeastern Arizona, a mountain lion hunter and his dogs were hot on the trail of what they thought was a puma. When the dogs treed the cat, the hunter was very surprised to discover the cat was a male jaguar. Six months later another male jaguar was photographed in the mountains of south-central Arizona. These observations prompted Arizona biologists to initiate a series of trail-camera surveys, and between 2001 and 2007, they accumulated more than seventy photos of at least four different male jaguars. Though there has yet to be any evidence of females, two of the males have been repeatedly photographed in the same area for several years, indicating they are residents. These borderland jaguars are thought to be a small segment of a larger jaguar population in Sonora, Mexico.

In 1997 the U.S. Fish and Wildlife Service formally listed the jaguar as an endangered species in the United States.

food source with alacrity. Already physically equipped to kill large prey, jaguars grew to record size on the millions of feral cattle that resembled its ancestral prey. Today Brazil—with more than 2 million head of cattle—is home to the world's largest commercial cattle herd.

There is no such thing as an average-size jaguar; the weight of this cat can vary by more than 100 percent, depending on where it lives. The smallest jaguars are found in Peru, where males weigh about 80 pounds (37 kg) and females, 70 pounds (31 kg). The largest jaguars are found in the floodplains of the Pantanal region of Brazil and the Venezuelan llanos, where males weigh about 225 pounds (102 kg) and females, 160 pounds (72 kg).

Jaguars have an unusual method of killing large prey. Lions, tigers, and leopards usually kill large animals by biting them on the throat or the neck. The jaguar also employs a third killing technique that the other

big cats don't use: biting through an animal's skull. A cow killed by a jaguar often has two holes punched through the thick bones on the top of the head behind the ears. Jaguars kill capybaras with a bite to the back of the head, piercing the brain case with their canines: skulls have been found showing that the jaguar had inserted a canine neatly into each ear of the capybara.

Although turtles may seem like a rather unlikely prey for a big cat, these reptiles form an important part of the jaguar's diet in many parts of South America. River turtles can weigh as much as 70 pounds (31 kg), and female turtles are quite vulnerable when they come out of the water to lay eggs. Jaguars use their powerful bite to break open the lower edge of the turtle's shell to get to the body cavity. On exceptionally large turtles, the space between the top and bottom shells is large enough for the jaguar to insert its paw and scoop out the



Serval

LEPTAILURUS SERVAL

As a light breeze shuffles the grass in Tanzania's Serengeti Plain, a serval's spotted shape dissolves and reappears, fading in and out of focus. The long-legged cat waits, still as a sentinel. Its eyes are almost closed as if in a trance, but its enormous, dish-shaped antenna ears slowly turn, listening intently. Minutes pass, then suddenly the ears focus, pinpointing the exact source of the sound. Two cautious steps and the cat springs, floating above the meter-high grass. Its body swerves and twists in midair, reorienting to each move of the rat. Two forepaws slam into the dirt. The pounce connects. Another meal is secured.

Like the cheetah, the serval is one of the more specialized members of the cat family. Stalking through the grasslands on their stilt-like legs, servals look strangely un-catlike in

The serval is a tall, lightly built cat with a small, slim face dominated by very large oval-shaped ears. Built for height rather than speed, the serval uses its long legs in combination with its large ears to capture small rodents in long grass.

shape. These tall, lightly built cats have a small, slim face dominated by very large oval-shaped ears. Rather than the sleek, muscular, crouching body plan of most felids, servals seem to have been designed for maximum height. For its size, the serval has the longest legs and feet of any member of the cat family; it stands as tall as a German shepherd dog, but weighs only half as much. Strictly speaking, it is not the length of the serval's legs that allow it to tower over other cats, but rather the length of its feet. Elongated metatarsal bones in the palms and soles of the serval's feet add extra inches to this cat's height.

Long legs usually mean speed, but the serval is not a particularly fast runner; rather, its legs are long so it can hear better. For sound-hunting to work most efficiently, ears need an elevated platform. Servals are so tuned into noises that they often stop and sit with their eyes closed for ten minutes or more, just turning their heads and listening. Unless they are extremely hungry, these cats rarely bother to hunt in windy weather—wind



Iberian Lynx

LYNX PARDINUS

The Iberian lynx is the world's most endangered felid and the only wild cat to be classified as Critically Endangered. About 250 individuals remain in the wild in two small, isolated populations in southern Spain. Over the past twenty-five years, lynx numbers have been in free fall, and despite current Herculean efforts to rescue the species from extinction, the Iberian lynx is likely to be the first cat to go extinct since the European cave lion.

Some 2 million years ago, a lynx-like cat known as the Issoire lynx roamed Europe and northern Asia. Recognized as the common ancestor of all of today's lynx, the Issoire lynx had shorter legs than modern lynx and, judging by its jaw morphology and teeth, was more of a generalist predator, living on roe deer-size animals.

The Critically Endangered Iberian lynx is a rabbit specialist, and the cat's numbers have plummeted as disease and habitat change have decimated rabbit numbers throughout the Iberian Peninsula. Only 250 Iberian lynx remain in the wild.

About 1 million years ago, when the quaternary ice ages swept south through Eurasia, wildlife retreated in advance of the cold, moving south to warmer parts of Europe. The Iberian Peninsula—Spain and Portugal—became a refuge for a variety of species, including the lynx. At about the same time, the European rabbit appeared in the fossil record of the Iberian Peninsula. All indications are that this now-widespread rabbit originated in the Iberian Peninsula and, indeed, until 10,000 years ago was found only in Spain and Portugal and southern France. Isolated in the Iberian Peninsula with this new abundant source of food, the lynx began to focus on rabbits, which at that time were larger than their present-day relatives. Over time the cat became a rabbit specialist, and its distribution mirrored the natural range of the European rabbit.

Today the Iberian lynx is a unique species, somewhat smaller in size than the ancestral Issoire lynx and now completely dependent on rabbits. Eighty to 99 percent of

the Iberian lynx's diet consists of rabbits, and this cat has become a virtual prisoner of its specialized diet. Rabbits are the ideal prey for a medium-size carnivore. Rabbits are relatively large and not too difficult to catch, have several litters a year, and live at high densities. Lynx need to kill about one rabbit per day to sustain themselves and cannot live in places where rabbits are absent or scarce.

The Iberian lynx might have been better equipped to survive twenty-first-century life in Europe if it had not become a rabbit specialist but had remained a more generalized carnivore like its ancestor. Today habitat change and disease—first myxomatosis in the 1950s, then rabbit hemorrhagic disease in the 1980s—have combined to reduce the Iberian rabbit population by 95 percent since the 1950s. Despite its legendary ability to procreate, the once-abundant European rabbit is now languishing. The IUCN has officially classified the rabbit as Near Threatened in Spain and Portugal, and sadly the fate of Iberian lynx is tied to its dwindling prey.

Iberian lynx are about twice the size of a domestic cat but with longer legs. They stand 15 to 20 inches (40 to 50 cm) at the shoulder and weigh 17 to 35 pounds (8 to 16 kg). Like all lynx, they have a short tail, a short body, tufted ears, and a relatively small head. Both sexes have prominent facial whiskers and ears tipped with long, erect tufts of black hair.

Not surprisingly, lynx are closely associated with scrublands, meadows, and open forests—all habitats that are favored by

rabbits. Breeding lynx females need safe places for birth dens, such as hollow trees or rock cavities, and a regular supply of water. While nonbreeding lynx can survive on a mix of prey, breeding females require an abundant and reliable source of rabbits. Litters of two to three kittens are born in March or April. Young are born blind and helpless, unable to regulate their own body temperature, so for the first few weeks the mother must spend a great deal of time in the den, nursing the kittens and keeping them warm. Kittens are born with their ears folded and tiny tufts of black hair on the tops of their ears. Mothers tend to keep their kittens in the birth den for about a month, then begin moving the young to different dens every few days. Kittens become highly competitive when they are about six or seven weeks old; they fight intensely, and siblings sometimes kill one another.

With the help of the international conservation community, Spain and Portugal have mounted extensive efforts to save the Iberian lynx. Experts believe that if the lynx is to survive, conservation efforts will have to include habitat restoration, reintroductions, supplementary feeding, and captive breeding. Many of the cats have been killed while crossing roads, so wildlife underpasses have been constructed to reduce road kills.

In 2003 a large-scale captive-breeding program was initiated. Though there have been several setbacks, at least forty-six kittens have been born, and in 2009 sixteen young lynx were sent to Portugal to start a separate breeding program. Also in 2009 the first cats were released from the captive-breeding pro-



gram into the wild near Córdoba. Provided with supplemental food in the form of rabbits, the lynx survived and bred. Further releases are planned as more lynx become available from the breeding efforts. The current captive population includes about eighty-four breeding females.

STATUS: *IUCN Red List—Critically Endangered*

WEIGHT: 17–35 pounds (8–16 kg)

HEAD-BODY LENGTH: 25–36 inches (65–92 cm)

TAIL LENGTH: 4–6 inches (11–16 cm)

LITTER SIZE: 1–4 kittens



The flat-headed cat resembles a fishing cat, and both share a preference for rivers, streams, and ponds, where they hunt fish, frogs, and small mammals.

Flat-Headed Cat

PRIONAILURUS PLANICEPS

The odd little flat-headed cat has short, stumpy legs; a short tail; and a long, flat head with tiny, low-set ears. Smaller and shorter than a house cat, it looks like a mini fishing cat and shares the fishing cat's preference for fish, frogs, and small mammals. The few flat-headed cats that have been seen in the wild have all been along mud banks, near rivers, or at the edge of small streams and ponds.

These little cats seem to be designed for finding and catching food in the water. Their teeth are pointed and specialized for seizing and gripping slippery prey; and their large eyes are set farther forward and closer together than those of other cats, giving them better binocular vision. The flat-headed cat also has the uncommon trait of having so-called non-retractile claws. The claws actually retract, but the covering sheaths are reduced, such that about two-thirds of the claws are exposed. Only the flat-headed cat, the fishing cat, and the cheetah share this trait.

Flat-headed cats live only in the tropical forests of southern Thailand, Malaysia, Su-

matra, and Borneo. Flat-headed cats are rare and elusive; even in areas with many camera traps, they are rarely photographed. Most of what we know about this cat's behavior has come from observations of captive animals. In zoos flat-headed cats show a great affinity for water. They search for food on the bottom of pools with their paws spread wide, like a raccoon feeling for prey in the water. Kittens play in water for hours, submerging their entire head to seize pieces of fish.

The Bornean Clouded Leopard Programme aims to advance and enhance the understanding and conservation of all wild cats on Borneo. For more information on the organization, field updates, camera-trap photos, or to make a donation to their work, go to www.wildcru.org.

STATUS: *IUCN Red List—Endangered*

WEIGHT: 3–5 pounds (1.5–2.2 kg)

HEAD-BODY LENGTH: 18–20 inches (45–52 cm)

TAIL LENGTH: 5–7 inches (13–17 cm)

LITTER SIZE: 1–2 kittens

Small cat swimmers keep it in the family: Three closely related cats are excellent swimmers



Everyone knows cats hate getting their feet wet. Well, it's true—mostly. The majority of cats avoid water and rarely swim unless pressed. However, there are three closely related small cats from Asia that are excellent swimmers. Three members of the leopard cat lineage—the leopard cat, fishing cat, and flat-headed cat—are all completely at ease in the water. In zoos the kittens of all three species spend a great deal of time playing in the water.

Flat-headed cats live on mud banks along rivers and streams and in flooded areas in Borneo, Sumatra, and Malaysia. They are very rarely seen in the wild, but in captivity they play in water for hours, plunging their head underwater to seize frogs and pieces of fish. They also use their forefeet like raccoons to grope around in the mud on the bottom of pools.

Leopard cats are also excellent swimmers, completely at ease in the water. In Sumatra we watched one playing belly-deep at the edge of a small river; it eventually swam confidently into the swift-flowing deep water and crossed to the other side.

The few zoos that keep fishing cats have found that when provided with a pond and live fish, these cats make striking exhibits. Fishing cats are very much at home in the water and can swim long distances, even underwater. One fishing cat chased by dogs was seen to swim “a considerable distance down a narrow channel without exposing any part of its body. It appeared to have its eyes open the whole time and propelled itself with powerful strokes of its hind feet.”

Among the small South American cats, the only one known for its swimming ability is the ocelot. In some areas, ocelots live in seasonally flooded savannahs and during the wet season routinely swim between points of high ground while hunting.

Among the larger cats, only the tiger and jaguar spend a lot of time in the water. During the hot dry season, tigers will spend the day submerged up to their neck in a lake or water hole.
