

Explore the

# Big Cats

W  
i  
k  
i  
k  
i  
i  
r  
o  
i  
E  
U  
J  
i  
i

- \* *Tigers*
- \* *Lions*
- \* *Cheetahs*
- \* *Leopards*
- \* *Pumas*
- \* *Lynx*
- \* *Panthers*
- \* *Cougars*



© Copyright 2005, Wikimedia Foundation Inc. and contributing authors, All rights reserved. Permission is granted to copy, distribute and/or modify this document under the terms of the GNU Free Document License, version 1.2. A copy of this is included in the appendix entitled "GNU Free Document License".

Authors of this book include:

Danny  
Angela Beesley  
Mkn  
Aya  
Happenstantially  
Raylena  
E Kelly Wiggins

Zanimum  
Nunh-huh  
The bellman  
ManuelGR  
Bart133  
Laura K Fisher  
Percival Ross Tiglao

Theresa knott  
Lyellin  
Naryathegreat  
Robert Horning  
Goodgerster  
John H Burkitt

And many anonymous Wikibooks.org readers

If you wish to be involved the content of this book, please visit the following internet web address:

[http://en.wikibooks.org/wiki/Wikijunior\\_Big\\_Cats](http://en.wikibooks.org/wiki/Wikijunior_Big_Cats)

The content for this book was based on the content of the above Wikibook as of December 11<sup>th</sup>, 2005



## Table of Contents

Introduction.....	1
The Big Cats.....	2
Fossil History.....	4
Lions.....	7
Tigers.....	10
Pumas.....	13
Cheetah.....	16
Lynx and bobcats.....	19
Caracal.....	22
Serval.....	24
Jaguar.....	26
Ocelot.....	29
Leopard.....	31
Snow Leopard.....	33
Clouded leopard.....	36
Marbled cat.....	38
Tigons and Ligers.....	40
In danger of extinction.....	42
Keeping cats.....	45
Glossary.....	49
GNU Free Documentation License.....	51



# Introduction

## Foreward to Parents



*Rocky the rare Barbary Lion*

Wikijunior books welcomes you to "Big Cats", a free children's book from the Wikibooks community. Big cats are some of Earth's grandest treasures, and their stories excite the imagination of kids of all ages. Many of these lords of the wild are endangered, and the children who will one day shoulder our responsibilities need to learn to admire and love our world...their world. After all we appreciate what we understand, and save what we appreciate. The importance of this task has led many experts here at Wiki to donate their time and talents to bring this volume together. All Wikibooks are free, always.

Wikibooks is a project of the Wikimedia Foundation, aimed at providing quality reading for adults and children that is free of charge and always available.

We at Wiki projects are promoting the global spread of knowledge. Our work embraces the Gandhi Principle of Benevolence: "Imagine what good could be done if it did not matter who got the ."

Wikibooks promotes the ongoing democritizing of the world by the Internet. Most traditional publishing houses make the vast majority of their income from re-issues of classic books such as Mark Twain's "Tom Sawyer." Of the remaining titles, the majority of new books are written by authors long track records, "The author of XYZ." New authors get precious little consideration, and the majority of those people are already celebrities in another field. The chances of a truly good new work being published solely on the basis of skyrocket when you overturn the traditional business model and tap the wellspring of new talent out there.

this project we have reached a crossroad between the book of yesterday, and the encyclopedia of everything for tommorow. Simply by reading this book--and hopefully telling your friends--you have advanced the cause of free , the cause of access for all, the cause of new publishing, and the cause of Wikibooks. Thank you, and welcome.

# The Big Cats

In Africa, they say that a male lion roars *Ha inchi na yanni? Yangu, yangu, yangu!* (Whose land is this? It is mine, mine, mine!). It is hard to listen to this ancient challenge without edging a little closer to the campfire. But what is behind that remarkable call? Certainly, to some degree, cats are cats around the world. You look at one of the neighborhood tabbies stalking a squirrel and you can see in miniature a tiger stalking deer on the meadows of Rhanthambore. And yet partly because they are so majestic these big cats are different from the neighbor's feline. For one thing they are the lords of their kingdom and travel confidence where small creatures scurry and hide. For many years, all they had to fear was each other, but the invention of gunpowder threatened to destroy this kingdom and send its feline lords to extinction. Fortunately there are more people like you that see big cats more as a companion to be admired rather than an enemy to be destroyed. Learn more about these great cats and their remarkable world. After all, we appreciate what we understand, and save what we appreciate.



*An African lioness surveys her domain*

## Superb Predators

Big cats are among nature's grandest predators. A grizzly bear may have a slight size advantage over a siberian tiger, but the tiger is far more agile and quick. A wolf may have a better sense of smell than a jaguar, but a jaguar can handle large prey alone. Cats have excellent night vision, sharp hearing and enormous physical strength. Their strong yet graceful movements and camouflage colors help them sneak up on their prey.

## On the Menu

Cats hunt because they need to survive. Animals that eat grass and leaves have special stomachs that allow bacteria time to break down complex plant sugars into the simpler sugars animals can digest. Cats have a very short digestive tract that quickly breaks down and extracts its energy and building materials. Cats cannot survive on a of grass.

## **Intelligence**

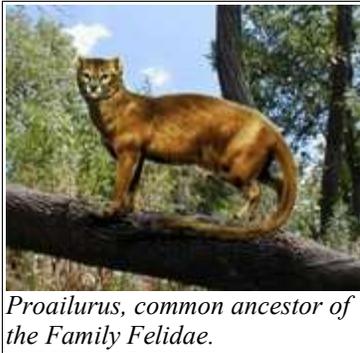
Big cats are among the most intelligent species on Earth. In intelligence they are ranked just behind primates (monkeys and apes) and cetaceans (whales and dolphins). Lions use group strategies to tackle large and dangerous prey. All cats are very curious and can learn quickly. Large predators require intelligence to be successful as hunters. Mother cats spend a long time (one to two years) teaching their offspring the many things they need to know in order to survive.

## **Found Everywhere But Safe Nowhere**

Big cats are found on all continents but Australia and Antarctica. And yet everywhere they are found, they are endangered. Big cats are often hunted for their fur or . They are also killed by people who want the animals that big cats hunt. Still other people hunt big cats for sport. Just as bad, the healthy environment that big cats need to survive is not being treated the respect it deserves. To keep these superb predators in the world our children and grandchildren will live in, we must learn to make room for other living things to use Earth's limited resources.

# Fossil History

## How carnivores are related



All living -eaters, or carnivores, are related to each other. They are descended from an ancient ancestor *Miacis*, a small -eating weasel-like tree climber which lived during the early to late Eocene period in North America, and the late Eocene period of Europe and Asia. (The Eocene was a time that began 58 million years ago and ended 36 million years ago.) It had a larger brain capacity than other carnivores of its day, which was probably why it is the father of all modern carnivores.

Order Carnivora (mammals that are carnivores) are divided into several groups of closely related animals that are called families. Big cats are obviously in the cat family (Family Felidae).

## How old is *Family Felidae*?

The fossil record of Family Felidae extends to the Late Eocene, 34 million years ago. If each of those years lasted a second, about the time it takes you to say "A thousand and one", the Cat Family would have been around for roughly one year and five weeks. By comparison, the Great Pyramid at Giza would have been around for only 83 minutes, and the Internet for less than 12 seconds (as of 2005). The first known feline was *Aelurogale*. Its descendent, *Proailurus*, gave rise to the major branches of the cat family we see today as well as the two sabre-toothed cat lines. *Proailurus* lived in Europe from 30-20 million years ago.

## Note about scientific names

Today, English is most widespread language of science. In the late 1700s Latin, the language spoken in Ancient Rome, was the language used by scientists from different countries to about their work. Even in one language like English the same animal might have many different names. Pumas, cougars and mountain lions are all the same animal. Animals also have names in other languages like Russian, Greek and French. To cut down on confusion, all scientists in the world agreed on one scientific name for each animal that came from Latin. Ancient animals that are known only from fossils never had common names. Actually, some early humans drew pictures of mammoths, mastodons, and European cave lions, but their names for these animals vanished long ago. That's why many fossil big cats have an odd scientific name like *Miracinonyx inexpectatus* but no short, graceful name like *Cheetah*.

## Notable fossil cats

- Smilodon - *Smilodon fatalis* and others - Often called the "Sabre-toothed Tiger" though it is not a tiger, and "Sabre-toothed Cat" though it was not the only line of cats sabre teeth. The most widely recognized of the fossil cats, it lived in North and South America from 3 million to 10,000 years ago. A fully grown Smilodon weighed about 450 pounds (203 kg) and had fangs 7 inches (17 cm) long that were used to subdue its large prey.
- The American Lion - *Panthera atrox* - It lived from 25,000 years ago to 10,000 years ago in North America. In life, this cat was about 1/4 larger than the African lion, even bigger than the Siberian tiger. The average male at 11.5 (3.5 m) in length would have averaged about 520 pounds (235 kg). Females were smaller, averaging about 385 pounds (175 kg). Fossil evidence indicates it had the most highly developed brain of any known cat.
- The Eurasian Cave Lion - *Panthera spelaea* - It lived from 30,000 years ago to 10,000 years ago from as far as England to as far as Siberia. The largest cat that ever lived, it was 25% larger than the African lion and even bigger than the American Lion. Ancient cave paintings and carvings indicate this cat had faint stripes, a hint of a mane in some males, tufted tails, and protruding ears.
- Miracinonyx - *Miracinonyx trumani* and others - Sometimes referred to as the "American Cheetah," it is remarkably cheetah like and relied upon the same sprinting tactic to overtake its prey. It is thought to have a common



Ancient painting showing cave lions in France

ancestor the Puma. *Miracinonyx* lived from 3 million to 10,000 years ago in the prairies and open plains of North America where it specialized in hunting newly-evolved swift herbivores such as the Pronghorn.

## Cats and humans in history

For many years the domestic cat was described as a separate species from all other cats, *Felis catus*. It is now thought to be a subspecies (slight variation) of the Wildcat (*Felis sylvestris*) and is given the name *Felis sylvestris catus*. Archeological evidence shows a relationship between man and cat for the past 8,000 years. The most unusual relationship existed among the Ancient Egyptians who considered cats as children of the goddess Bast. When a cat, family members showed grief by shaving off their eyebrows, and cats were routinely mummified and laid to great reverence.

Certain other cats have been over the years for different reasons, but these relationships have never been maintained long enough to result in true domestication. The proper term for cats such as lions or cheetahs that accept human companionship is "human socialized". This indicates that these animals still possess their entire range of wild instincts, which makes properly and safely handling them more of a challenge. There are paintings and engravings of ancient rulers big cats seated near their throne. Many people cheetahs for hunting swift prey.

Certain fossil species such as Smilodon, the Cave Lion and the American Lion were hunted by early humans, who may have contributed to their extinction. Hopefully no future scholars will find us responsible for the disappearance of more splendid animals.



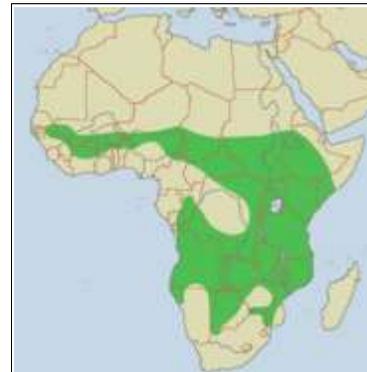
*Ancient Egyptian statue of a cat*

# Lions

The majestic lion is the embodiment of wild Africa. They are large, bold and ruggedly beautiful, fierce on the hunt, and still tender to their young and loyal to their companions. You wouldn't want to get too close, though, as lions are one of the four kinds of cats that can deliver an ear-shattering roar!

## Where do lions live?

The nickname "King of the Jungle", most lions live on the flat, grassy *savannas* in the African countries of Kenya, South Africa, Tanzania, Zambia, and Zimbabwe. A few do remain in the Gir Forest of India. A long time ago, lions lived nearly all around the world. They even lived in North Africa and parts of Europe.



*Places where lions live are colored green.*

## What do lions look like?



*A lioness*

Lions have **tawny** (sand-colored) fur. They grow to a length of about 10 (3 m) and stand about 4 (1.2 m) tall. Male lions are larger than the lionesses (females), weighing as much as five men or about 550 lb (250 kg). The more slender lioness usually weighs about as much as three and a half men or 400 lb (180 kg).

Adult males can also be recognized by the furry mane around their heads and down their necks. For some lions the mane even runs along the belly. There is no other big cat such a dramatic difference in appearance between males and females.

Both lions and lionesses have tufts on the end of their tails, something no other cat has. If you can ever get close enough to the tail of a male lion, you will feel a sharp bone tucked into the tail tuft. One old legend

claims that lions would use the tail spur to whip themselves into a frenzy before fighting.

## What do lions eat, and how do they catch their prey?

Lions eat zebras, gazelles, wild pigs and other large prey that can be easily shared their friends. By working together in hunting groups, they can hunt even larger animals like giraffes and elephants. When food becomes scarce, lions will sometimes scavenge the kills of other predators.

The females usually group together to do most of the hunting. The males' main is to protect the pride from takeover by outsiders. He is not lazy, at least by lion standards. His bulk and large mane make him a much better defender than hunter. On occasion, male lions will charge prey to chase them towards a hidden group of females. But no matter who actually kills the prey, the males eat first, followed by the females and last of all the young.



*A lioness tries to move a buffalo*

*Rogue males* (those not living in a pride) either hunt alone or join in partnerships other rogues. Rogues depend more on scavenging food killed by others. They use their superior fighting skills to drive off smaller predators like hyenas and jackals. These pride-less males take no pride in the kind of food they eat.

## How do lions raise their young?



*A lioness cubs*

Lions can have litters ranging from one to four cubs year round. Lion cubs are born spotted fur, which helps protect them as they hide alone in the grass while their mother hunts. The spots are soon lost, although some lions may always have a few spots on their legs.

The cubs are raised in *prides* which are family groups of related female lions, their cubs, and an unrelated male, who fathers the cubs. Lions are the only big cat in which adult males and females live together all year. Often more than one litter of lion cubs is born to a pride in a short time. Then the mothers share the of caring for the young, strengthening the bonds that hold the pride together.

Young male lions leave their pride when they grow up although every now and then one takes over his own pride instead. Those who leave become *rogue males* and may partner up other rogues. Having a partner makes it easier for a lion to survive and eventually win a pride of his own. This shuffling around of male



*Two juvenile lions still have their cub spots*

lions makes sure that new cubs are healthy. It also ensures that the strongest, smartest males father the most cubs and pass those superior qualities on to the generation.

## Fun facts

- The muzzle of a lion is like a fingerprint - no two lions have the same pattern of whiskers.
- Lions say hello by rubbing cheeks.
- Lions say goodbye by tugging on each other's stomachs their teeth.
- The lion is the loudest of the big cats. A male lion's roar can be heard from up to five miles (eight kilometers) away.
- Lions normally walk 2.4 mph (4 km/h), but can run up to 35 mph (60 km/h). They can also leap distances of up to 36 (12 m).
- Lions are the only kind of big cat that live in a social structure.



*A male lion has a mane of long fur around his face*

## Classification

Lions are in the *Order Carnivora*, *Family Felidae*, and have the scientific name *Panthera leo*.

## For more information

- [Wikipedia: Lion](#)
- <http://www.sandiegozoo.org/animalbytes/t-lion.html> - hear the sound of a roaring lion.
- <http://www.tigertouch.org/barbary/index.html> - learn about the rare Barbary lions of North Africa.

# Tigers

The speed and agility give the **tiger** the title of top predator over the larger but slower grizzly bear. A well rounded athlete, the tiger can climb (though not well), swim, leap great distances and pull five times the force of a strong human. The tiger is the largest and most powerful cat. The tiger is in the same group (*Genus Panthera*) as lions, leopards, and jaguars. Those four cats are the only ones who can roar.



*A Bengal tiger*

## Where do tigers live?



*Places where tigers live are marked in dark green*

They live in forests and grasslands of eastern and southeastern Asia. Tigers live in countries such as Bangladesh, Bhutan, China, India, Nepal, Cambodia, Laos, Malaysia, Myanmar, Thailand and Vietnam, Indonesia (*Java and Sumatra*), and eastern Russia. The Bengal Tiger is the national animal of India.

## What do tigers look like?

Tigers are usually orange or reddish orange very bold black stripes, and areas on the chest, neck and inside of the legs. Their stripes help them camouflage into the trees and shrubs keeps them from being seen by other animals. A few tigers, all of them descendents of tigers that lived in India, are black stripes. This bright color variation never became common in nature because it makes it harder for tigers to hide from their prey.



- Head/body length: 5 10 inches - 9 1 inch. A large tiger might be 10 (3 meters) long
- Tail length: 36 inches (91 cm)
- Weight: 350-550 pounds (160-250 kg)
- Very strong teeth and jaws
- Heavily padded paws
- Colors: , or bright fawn – reddish tan, getting lighter and eventually to

- underneath
- Uneven black stripes all over them which vary each individual tiger.
- Strong jaws
- Short and thick fur and thick long whiskers.

## What do tigers eat, and how do they catch their prey?



*A Siberian tiger chasing a deer*

Tigers mostly eat plant-eaters, or **herbivores**, like elk, deer, wild pigs, and buffalo. Like the majority of other cats, they hunt alone. Tigers often hide close to the ground and for the perfect moment to ambush their prey.

People avoid tiger attacks by using a face-mask on the back of their heads. Tigers think twice about pouncing when they can see a face, since they usually attack from behind. Fortunately, they rarely attack humans unless they are too ill to hunt their normal prey.



*Tigers have very strong jaws*

## How do tigers raise their young?



*A tiger cub explores the world*

Tigers have 1-5 cubs per litter, an average of 2-3. After 8 weeks of age the cubs begin to join the mother for hunting. They usually have learned how to successfully kill prey by the age of 6 months but are not ready for independence until 1 1/4 to 1 1/2 years of age. The father plays no role in their upbringing, though there are occasionally reports of male tigers socializing their mates and cubs outside the breeding season.

## Fun facts

Tigers are striped through and through. If you were to shave a tiger, and few ever have, you would see the stripes on the skin. *Note, please do not try this at home.*

## Classification

Tigers are in the *Order Carnivora*, *Family Felidae*, and have the scientific name *Panthera tigris*.

## For more information

- [Wikipedia: Tiger](#)
- [Save the Tiger Fund](#)



*Tigers love water*

# Pumas

According to an old Mayan legend, all the animals of the jungle once looked the same until the gods offered to make them look different. The jaguar asked, "Let me be spangled stars," and it was so. He was pleased his gift and showed it to the puma. Not to be outdone, the puma asked the gods that he be as splendid as the jaguar, and it was so. Pleased himself the puma out to hunt. Unfortunately, he fell and rolled in the dust which clinged to his still-wet design. For this foolishness he and all pumas thereafter through life the color of the earth.



*A puma hiding behind a rock*

The **Puma** is a large cat that is sometimes called a "mountain lion", though it is more closely related to the smaller cats. Like smaller cats, pumas cannot roar though they can muster a very startling snarl or a piercing cry. In some places, these cats are also called cougars, catamounts, painted cats, or painters. Scientists call them is *Puma concolor*.

## Where do pumas live?

Pumas are widely spread in North, Central and South America. They can be seen in a variety of habitats from desert to forest all the way from northern British Columbia in the north to the Southern end of the Andes mountain range. Pumas were driven out of the eastern half of North America by human pressure; a small population remains in Florida and occasionally there are puma sightings in other eastern states.



*Places pumas live are colored green*

## What do pumas look like?



*A mountain lion in Arizona*

Most pumas are a light brown color, black-tipped ears and tail. The pumas that live closest to the Equator are the smallest, and increase in size in populations closer to the poles. (This sort of size increase is seen in tigers too. The smallest ones live in the tropics, the largest Siberian tigers live far to the north where winters are very cold.) The endangered Florida Panther is the smallest of the Pumas. Like many other cats, they can retract their sharp claws into their paws, which have four toes. The largest

male pumas can be as big as eight (2.4 meters) long, and females can be as large as seven (2.1 meters). The males weigh in a bit less than the average Adult at about 150 pounds (70 kilograms), females weighing even smaller at 75 pounds (35 kilograms) or less.

Although pumas do not have a bright pattern, there are distinct black "tearstains" on their upper lips and a vivid fur around the mouth that emphasizes facial expressions. Although cougars cannot roar, when they growl their "business end" looks rather intimidating, helped along by the markings.

## What do pumas eat, and how do they catch their prey?

Pumas mostly eat large animals like deer. Because the puma can run very fast, as much as 30 mph (50 km/h), and because they can jump 20 ft (6 m) forward from a standing position, they can very easily catch slower animals. Pumas can jump 8 ft (2.5 m) straight up and can climb on rocks and in trees to hunt. Their is very strong, much stronger than a strong dog's , and their largest teeth are about twice the size of a large dog's teeth.



*"That's close enough, partner!"*

Pumas have a very powerful hunting instinct, and have sometimes been known to chase and catch humans on bicycles. A favorite food for pumas is the deer, but they will also eat smaller animals. In areas where pumas and people live close together, pumas have hunted dogs and cats for food, but they usually do not hunt people for food. If you are around a puma, it is better not to run fast or to ride a bicycle, because their instinct is to chase, catch and kill running animals.

On January 8, 2004 a puma killed and partly ate a mountain biker in Whiting Ranch Wilderness Park, in Orange County, California, but attacks on humans are rare.

## Stay safe around pumas

These are good safety ideas for areas where pumas live:

- Do not hike alone, instead, stay together in groups an adult.
- If you see a puma, do not run, because their instinct might make them chase you. Instead, stand and face the animal, and look into its eyes.
- Do not turn away from the puma; do not crouch down or do anything that would make you seem like an animal. If you or someone in your group is attacked, fight back by throwing stones, hitting or kicking. Pumas have been chased away by using rocks, sticks, garden tools and bare hands.

- The place to hit a puma is on the nose.
- Watch around you when in an area where pumas might be. Like other cats, they like to spring out from a hiding place and attack their prey from behind.
  - Don't go hiking your pet, because any animal can make a puma want to chase and kill it, because of the "chase reflex" that pumas have. Also, the puma might be attracted by your pet's food.

## How do pumas raise their young?



*Mountain lion kittens*

Pumas are born in litters of 2-4 kittens and raised by their mothers. When they are born they weigh about one pound (about half a kilogram) and are about one foot (30 cm) in length. The kittens have dark spots that fade by the time they are 8-12 months old. The mother teaches them to hunt, and when they are a year and a half to two years old (and have their adult teeth) the kittens separate from their mother and find their own territory, though the siblings might stay

together for a while after they separate from their mother.

## Fun facts

Female pumas call to potential mates a piercing cry that sounds much like a woman's scream. Every year some panicked people call the police to report an "attack" in progress.

## Classification

Pumas are in the *Order Carnivora*, *Family Felidae*, and have the scientific name *Puma concolor*.

## For more information

- [Wikipedia: Puma](#)

# Cheetah

**Cheetahs** are built for speed, a whiplike spine, long legs, and a long tail that acts as a rudder for sudden turns. They are the world's fastest land animal, able to sprint up to 70 miles per hour (110 kph) for short distances in pursuit of prey. For this reason, and because they bond well humans, cheetahs used to be raised in captivity for catching wild game. They are still sometimes known as **Hunting Leopards**.



*A swift cheetah in flight*

## Where do cheetahs live?



*Places where cheetahs live are colored green.*

Today, most cheetahs that are found in sub-Saharan Africa, though a few are still seen in Iran. In the past, they used to be found throughout northern India and Iran. They prefer to live in -deserts, savannas, prairies, and thick brush. Because they rely upon speed to hunt, they avoid dense forests.

## What do cheetahs look like?

Cheetahs are rather doglike medium-sized spotted cats long legs and slender but muscular, bodies. They have a belly and a dark stripe that looks like a tear on both sides of their face. In contrast to leopards, which have palmette shaped spots, the cheetahs have round dark spots on their fur. Adult cheetahs weigh from 90 to 140 pounds (40-65 kg), and are around 4 to 5 (112-135 cm) in length.

Cheetahs are built to do what they do : Run. They have a big chest, a narrow waist, and powerful muscles in their hind legs. They have a small head and muzzle, large nostrils for increased oxygen intake, and small round ears. All of this makes the cheetah very sleek and aerodynamic when it runs.



*Two cheetahs together*

## What do they eat, and how do they catch their prey?

Cheetahs mostly eat mammals like gazelles, impala, gnu calves, and hares, which are all about the same size as, or smaller than, an adult cheetah.

Cheetahs stalk their prey until they are closer than about thirty meters from each other, and then give chase. The chase is usually over in less than a minute and if the cheetah doesn't catch its prey quickly it will often give up rather than waste energy. This is because cheetahs use a lot of energy when chasing prey at such high speed. About half of the chases are successful.

Cheetahs must eat their catch quickly or risk losing their food to other stronger predators. Cheetahs will not fight a larger animal over food because they can't risk an injury which would mean certain starvation.

Cheetahs are well-adapted to living in arid environments. In the Kalahari desert, have been estimated to travel an average of 82 km between drinks of water. They were seen getting their water from the blood or urine of their prey, or by eating tsama melons.

## How do cheetahs raise their young?



*A family of Cheetahs*

Females give birth to three to five cubs at a time. Many cubs are killed by a lack of food or their natural enemies (lions and hyenas). An old African legend says the tear stain marks on the cheetah's face are from the mother weeping for her lost cubs. The mother cheetah must train the young cubs to hunt food for themselves so they can survive on their own. The cubs leave their mother about one or two years later, and will usually live in groups of two or three while reaching adulthood. Female cheetahs

eventually go their separate ways, but brother cheetahs usually form lifelong partnerships and share in the hunt to survive.

## Fun facts

See how much you know about the world's fastest land mammal:

- After a full-speed rush, a cheetah must rest at least 15 minutes before running again.
- Cheetahs do not roar, but they make a number of very un-catlike sounds, many of which resemble bird chirps.
- Cheetahs were leopards before leopards were. The word "leopard" is latin for a cross between a lion and an African leopard, something cheetahs

were once thought to be. The name outlived the theory, and now is used for the wrong cat.

## Classification

Cheetahs are in the *Order Carnivora*, *Family Felidae*, and have the scientific name *Acinonyx jubatus*.

## For more information

- [Wikipedia: Cheetah](#)



*A Cheetah in Kenya*

# Lynx and bobcats

These odd-shaped, ruff-faced cats are not as lordly as the lion or powerful as the tiger. They are mid-sized predators, too big to bother mice and too small to tackle a healthy adult deer. But they do one job rather well--keeping rabbits in control. their long legs and short tails, they are superbly equipped to tackle anything from a tiny cottontail to a huge snowshoe hare.



*A bobcat*

## Where do lynx live?

The four species of lynx are very widespread. The European Lynx lives in northern Europe and Asia. The Canadian Lynx lives in North America. The Iberian (or Spanish) Lynx is one of the most highly endangered cats and only lives in wild parts of Spain. Bobcats are the smallest type of lynx, living in North America. Because they hunt small prey, they live in a wide variety of habitats.

## What do lynx look like?

### LYNX

- Body Weight: Males 40 pounds (18 kg) or more, females weigh 18 to 30 pounds (8–14 kg).
- Height: 30 to 42 in (74 to 107 cm)
- Life Span: Around 15 years

### BOBCAT

- Body Weight: Males 16 to 28 pounds (7 to 13 kg), females weigh 10 to 18 pounds (5 to 8 kg).
- Height: 17 to 23 in (43 to 58 cm)
- Life Span: Around 13 years.



*A lynx*

Not all lynx look the same. Some of them have dark spots, while others have plain yellow or gray fur. All of them have bellies. Lynx have long hairs at the tops of their ears, and a beard around their jaw. A bobcat is much smaller than a regular lynx, lacks the distinctive ear tufts, and looks more like a big house cat. They have smaller and shorter legs compared to other lynx, and almost always have spots. The most unique part on the lynx and bobcat is their tail. The bobcat was named after its tail, because it is "bobbed" or short. Their tails are about half the length of a normal house cat's tail. None of the other big cats have this unique trait.

## What do lynx and bobcats eat, and how do they catch their prey?



*A lynx hunting*

Lynx eat mainly arctic hares (a large member of the rabbit family). They sometimes eat squirrels, ptarmigan (birds that look like large pigeons), and grouse (which look like fancy chickens).

Bobcats eat smaller animals like squirrels, rabbits, and mice. Their odd shape long legs, a short neck and short tail, is an adaptation to hunting prey that must be captured a sudden burst of speed and a killing pounce. In order to catch their prey, they must first sneak up as carefully and close as they can (stalking), and only make a final rushing attack when the prey makes a run for it. Obviously the closer they can approach before the run, the greater their chances of success.

They can't eat more than three pounds of at a time.

## How do lynx and bobcats raise their young?

Lynx have three to five cubs, while bobcats usually have three cubs. No male lynxes help raise their offspring. This may sound selfish, but it is not. In the animal world, the sole responsibility for finding food for the young rests upon the female. Lynx and many other carnivores would be too noisy hunting in pairs, and thus they would have less of a chance to catch their prey.



*Two lynx kittens playing*

Lynx are born from May to June or as late as July, the time of the year when prey is most abundant. Bobcats are usually born in April or May. Before winter closes in, the female must begin teaching the young how to survive on their own. Rabbits have sensitive hearing, and the mother must teach her naturally boisterous, playful cubs to use patience and stealth to get close enough to the rabbits for a good charge. Not all hunts will be successful, even when the young are skilled hunters. In fact, one common prey species for lynx, the Arctic Hare, has a secret weapon. Every year when the snow melts on the Arctic tundra (swampy grasslands) the timid animal sheds its winter coat for a new crop of brown fur. This does not happen all at once, so while the hare still has patches of , it still matches the surroundings where of snow still linger on the ground. By staying perfectly still, these hares often accomplish a great deal more than by running away. Lynx learn how to outwit their prey by watching their mother. The young tend to leave their mother at 10 months of age, and from the same litter may remain together for a while before they go their separate ways. Adult lynx are mostly solitary.

## Fun facts

- Some bobcats like to sing and will amuse themselves imitating the sounds of other animals.
- To show their toughness, people used to claim that, in a fight, they could triumph over their "weight in bobcats". However, bobcat experts would not believe this claim for a moment.

## Classification

Lynx and bobcats are in the *Order Carnivora*, *Family Felidae*, and have the scientific names:

- Canadian Lynx - *Lynx canadensis*
- European Lynx - *Lynx lynx*
- Iberian Lynx - *Lynx pardalis*
- Bobcat - *Lynx rufus*

## For more information

- [Wikipedia: Lynx](#)
- [Wikipedia: Bobcat](#)

# Caracal

The Caracal, also called Persian lynx or "African lynx", is a medium-sized wild cat. The caracal resembles a lynx and is related. Caracals are labeled as small cats but are the heaviest of all small cats as well as the fastest.



*Slanted eyes and long black ear tufts give the caracal a distinctive look*

## Where do caracals live?

Caracals are distributed over Africa and Asia. Their habitat is dry steppes and -deserts, but also woodlands, savanna, and scrub forest. They are solitary, or paired, territorial cats.

## What do caracals look like?

The length is 65 cm (about 3 ft), plus 30 cm tail (about 1 foot). It has longer legs and a slimmer appearance than a lynx. The color of the fur may be wine-red, gray or sand-colored. Young caracals bear reddish spots on the underside, while adults do not have markings except for black spots above the eyes. The caracal has long, tufted black ears, which also explain the origin of its name--"karakulak", Turkish for "black ear".

## What do caracals eat, and how do they catch their prey?



*A quiet moment*

A caracal may survive without drinking for a long period - the water demand is satisfied the body fluids of the prey. It hunts at night (but in colder seasons also in the daytime) for rodents and hares; rarely it may even attack a gazelle, a small antelope or a young ostrich.

They are picky eaters, and discard the internal organs of the mammals they catch, partially pluck the fur off of hyraxes and larger kills, and avoid eating hair by shearing neatly from the skin. But they will eat the feathers of small birds and are tolerant of rotten . Caracal ears are controlled by 20 different muscles. Tufts of fur on their ears help them pinpoint their prey accurately.

They are most well-known, however, for their skill hunting birds; a caracal is able to snatch a bird in flight, sometimes more than one at a time. Caracals can jump and climb exceptionally well, which enables it to catch hyraxes better than

probably any other carnivore.

## How do caracals raise their young?

Caracals are born in litters of 1-4 kittens, 2 on average. They stop drinking their mothers milk at ten weeks old, and stay her for up to one year before leaving.



*A caracal kitten*

## Fun facts

- The caracal is the fastest cat in its size range.
- Sometimes called a *desert lynx* or *African lynx* because of its tufted ears, it is not a lynx at all.
- Tame caracals are sometimes used to assist hunters in Iran and India.

## Classification

Caracals belong to *Order Carnivora*, *Family Felidae*, and their scientific name is *Caracal caracal*.

## For more information

- [Wikipedia: Caracal](#)

# Serval

The **serval** is a little-known but fascinating creature, a lightweight cat living in tall grass where the lions hunt gazelles and buffalo. It does not attempt to compete the mighty "king of beasts", content to tackle smaller prey. Gliding along on stilt-like limbs, a long neck and large ears, the serval looks like no other cat, and for a reason... From the tall grass a startled flock of birds takes flight only to be chased in the air. a spring of its powerful limbs, a serval shoots straight up, battering one of the birds back to earth its long front limbs.



*A Serval*

## Where do servals live?



*Places where servals live are colored green.*

Servals live in the *savannahs* (grasslands) of Africa. This allows them to see both their prey and their predators. As a medium sized cat they have to be wary of lions and hyenas. Servals are good swimmers and often live near open water where they can take an occasional dip to hunt for fish or swipe at the birds that stop by.

## What do servals look like?

The serval's lanky body gives them the most advantage for their bulk in coping the tall grass where they roam. It gives them the appearance of being larger than they really are. In fact, the smaller female ranges from less than twenty pounds up to about thirty-five pounds. Males generally weigh thirty to fifty pounds. Their large ears give them an advantage in hearing their prey before it hears them. Their fur is yellow black spots. On the back of the ears are horizontal gray bars. Servals use the position of their ears to communicate each other. They also hiss a great deal, but this sound can have friendly meanings too. People often think a captive raised serval is being aggressive that is only trying to say hello.



*The serval is built for tall grass*

## What do servals eat, and how do they catch their prey?

Servals usually eat birds, fish and small rodents. When hunting a bird, the serval will jump up in the air and bat the bird with its front paws. This stuns the bird and makes it fall to the ground. When hunting rodents, the serval uses its large ears to listen for them under the ground. It then jumps straight up into the air six or higher, and comes straight down on its prey. Like most cats, a serval will take advantage of other opportunities that come along, taking on anything it feels it can safely subdue. However a serval never poses a threat to humans.

## How do servals raise their young?

There are usually two or three young servals, called kittens, in a litter. They are born in areas of long grass, but are moved around often, because many animals eat servals. They learn to hunt from watching their mother. She will chase males away as soon as they can hunt, at about 8 to 10 months of age, but will let females stay with her for a little longer, up to a year.



*Five week old serval kitten*

## Fun facts

- Servals can jump up to 10 straight up to catch birds.
- Their hearing is so acute they can hear burrowing rodents underground and dig them up.
- A cross between a male serval and a female domestic cat is called a savannah cat.

## Classification

Servals belong to *Order Carnivora*, *Family Felidae*, and their scientific name is *Leptailurus serval*.

## For more information

- [Wikipedia: Serval](#)
- <http://www.totallywild.net/animals.php?animal=Serval>

# Jaguar

The **jaguar** is sometimes called *El Tigre* (the tiger) by South and Central Americans. Long ago, they called it *Yaguara*, the cat that kills a single spring. Both names convey the awe and reverence this largest New World cat inspires. His gold coat spangled black rosettes was said to be the stars of night. In the Mayan religion, the sun took the form of a jaguar when travelling through the underworld at night. Jaguars are closely related to lions, tigers, and leopards.



*A spotted jaguar*

## Where do jaguars live?



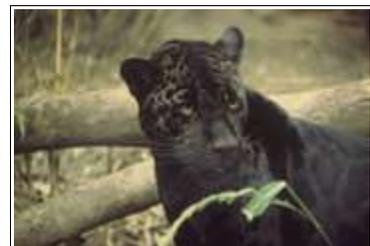
*Places where jaguars live are colored green.*

Jaguars live in the rain forests and more open countryside in South and Central America, and are the largest members of the cat family there. Jaguars are strong swimmers and climbers, and they often prefer to live by rivers, in swamps, and in dense forest thick cover for stalking prey.

Jaguars once lived as far north as the southwestern United States. The last wild jaguar in the United States around 1960, however some of these cats are once again migrating north from Mexico.

## What do jaguars look like?

Jaguars look very similar to leopards, but they behave more like tigers. The jaguar has the strongest jaw structure in the cat family. Its powerful cheek muscles and lower jaw gives the Jaguar a much more rounded face than the leopard. The purpose of all this strength is to allow these cats to kill thick shelled turtles and to crush the skull of prey animals rather than suffocating them a neck like most cats. They are also rather short-legged compared to other cats, designed for strength rather than speed.



*A black jaguar clearly showing its darker spots*

Jaguars are usually orange-yellow in color, and have numerous rings on their flanks and spots on their heads and necks. Jaguars and leopards can be

distinguished by the fact that jaguars have spots within their ring markings, while leopards do not. Also jaguars are native to the New World while leopards are native to the Old World. Some scientific evidence suggests these two cats are very closely related.

There are some jaguars that seem to be entirely black in color, but the spots can still be seen if you look closely. These are sometimes called black panthers, but they are really jaguars.

## What do jaguars eat, and how do they catch their prey?

Jaguars mostly take large prey, which they mainly hunt on the ground at night. Their very strong jaws let them hunt deer and peccaries, but they are great opportunists and will eat anything from frogs and mice to birds, fish, and domestic livestock. They can even crunch through a turtle's shell quickly. Jaguars can run quickly, but do not have much endurance and rarely make long chases.

## How do jaguars raise their young?

Jaguars usually live and hunt alone, but they do meet up during the breeding season.

Female jaguars give birth to as many as four cubs in each litter, but usually can raise no more than two of them to adulthood. The young cubs are born blind and can see after two weeks. They remain their mother for a long time, up to two years, before leaving to establish a territory for themselves.



*A jaguar cub some attention from mom*

## Fun facts

- Jaguars will sometimes by the water, hitting it occasionally their tail. When fish are attracted by this, they swipe out a paw, spearing the fish in their claws.
- One filmmaker doing a sound level check heard an odd sound coming through his headset. Looking around he saw a large male jaguar sniffing the microphone.

## Classification

Jaguars belong to *Order Carnivora*, *Family Felidae*, and their scientific name is *Panthera onca*.

## For more information

- [Wikipedia: Jaguar](#)
- Jaguar pictures and short video:  
<http://www.belizezoo.org/zoo/zoo/mammals/jag/jag1.html>

# Ocelot

The **ocelot** is a beautiful small-to-medium sized cat whose markings resemble the much-larger jaguar. That beauty once brought them close to extinction, though they have fared better in recent years legal protection.



## Where do ocelots live?



*Places where ocelots live are colored green*

Ocelots mostly live in South and Central America, but there are some as far North as Texas in the United States of America. There are eleven different types (or *subspecies*) of ocelot. These live in different parts of the south of the Americas. Three of these eleven subspecies live in Mexico, some of one of those in Texas, and a different subspecies lives in each of the Amazon Rainforest, the Northern Andes, Venezuela and Guyana, all of Central America, Argentina and Paraguay, Colombia, Ecuador and Bolivia.

Ocelots are excellent climbers, but they do most of their hunting on the ground. Ocelots mostly come out at night. During the day they sleep in trees, bushes and thick grasses. Some ocelots live alone, while others have been reported to live in pairs, maintaining contact by mewling to each other. Many ocelots in captivity become highly social certain people.

## What do ocelots look like?

Ocelots grow up to 3 and 2 inches (100 cm) in length, plus a foot and a half (45 cm) tail length. It is similar in appearance to the oncilla and the margay, who inhabit the same region, but the ocelot is larger. Their fur is gold black spots. They are very thin, have huge teeth, and can jump far.

## What do ocelots eat, and how do they catch their prey?

Ocelots like to eat small animals. They will catch monkeys, snakes, rodents and birds if they can. Almost all of the animals that the ocelot hunts are far smaller than it is. Scientists think that ocelots follow and find animals to eat (*prey*) by smell, sniffing for where they've been on the ground. They can see very well in the dark, and move very stealthily, too.

## How do ocelots raise their young?

Ocelots typically have two offspring in a litter, safely in a rocky den or hollow log. In the tropics there is no set breeding season, but further north young are usually born in the autumn months. While little is known about ocelot social structure, observers indicate that ocelot kittens stay the mother for about one year, and that they may remain in their mother's territory for up to an additional year before going out entirely on their own



*Ocelot kitten*

## Fun facts

- *Ocelot* comes from the Aztec word *tlalocelot* which means "field tiger."
- Ocelots have only 36 pairs of chromosomes while most other cats have 38. Their close relatives the margay and oncilla are the others to share this distinction.
- Ocelots often sit perfectly still for a half hour or more waiting for unsuspecting prey.
- Some observers believe that ocelots remain faithful to their chosen mates.

## For more information

- [Wikipedia: Ocelot](#)
- <http://www.totallywild.net/animals.php?animal=Ocelot>

### How to catch an ocelot?

Scientists at a wildlife refuge in southern Texas were having a hard time finding the few ocelots that lived in the area. They tried using all kinds of animal smells but the ocelots would never show up. So it was very lucky for the scientists when an amazing accidental discovery took place. A worker at the refuge wore the scent of Obsession, a men's cologne (think of it as a perfume for men). One day an excited ocelot tried to rub against the worker to better catch the scent. The scientists then knew that ocelots love Obsession! They are now trying to use the cologne to help in their project to raise the number of ocelots.



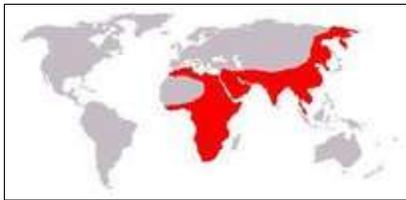
# Leopard

The **leopard** is the champion athlete of the cat world. Most big cats can pull five times as much force as the same weight of human athletes. The leopard can pull seven times as hard. It would take three olympic class weightlifters merely to achieve a draw at tug of war one 100 pound leopard. This amazing strength is demonstrated when a successful hunter scrambles up the side of a tree a full grown antelope in its jaws to eat in peace.



*Leopard relaxing in a tree*

## Where do leopards live?



Leopards live in the Middle , parts of Asia, and Africa. This means they live in more places than any other big cat. Leopards spend a lot of time in trees, often sleeping draped over a branch. They will even pull entire prey animals up into the branches where they can eat without other predators trying to steal their food.

## What do leopards look like?

Leopards are usually 6.5 to 10 (2-3 m) long, including 23-43 inches (58-110cm) of tail, and weigh about the same as a human, 65-155 pounds (30-70 kg). They stand 17.5–30.5 inches (43-78 cm) tall. Female leopards are usually only two-thirds the size of male leopards.

A leopard's coat is short and sleek. Depending on where it lives, a leopard's coat can be a pale straw color, grey, ochre, or black. Because the fur in a leopard's spots is thicker and more coarse, they can be as well as seen. All leopards have black spots, even solid black leopards. Under bright light, black leopards' spots appear darker than the surrounding purplish black fur.



*Black African leopard cubs*

## What do they eat?

Leopards eat many different animals - insects, mice, fish and big animals like antelope and even dogs. Occasionally, they will even eat carrion (dead animals). They hunt (search for their food) at night, hiding their catch in trees. They creep up on animals and attack them by biting the neck.

## Panther or black leopard?

Black leopards are sometimes called panthers, and they were once thought to be a separate species. Though they are all black, they still have black spots that are slightly darker and show up in bright light, whereas the background looks a lighter, purplish black.

## How do leopards raise their young?

Leopards are born in litter of 1 – 3 cubs. The cubs leave home after 13 – 18 months, and siblings (cubs born together) may remain together for a few months before separating.



*A young leopard practicing to pounce on a target*

## Fun facts

- Leopards are spotted through and through. If you dared to shave one, you would find their skin to be spotted.
- Shaving a leopard to see its spotted skin is very dangerous.
- Leopards are the most temperamental cats to handle in captivity. While they can be affectionate, they cause an unusually large number of animal-related injuries.

## Classification

Leopards belong to *Order Carnivora*, *Family Felidae*, and their scientific name is *Panthera pardus*.

## For more information

- [Wikipedia: Leopard](#)
- The Cyber Zoomobile  
<http://home.globalcrossing.net/~brendel/leopard.htm>
- Big Cats Online <http://dspace.dial.pipex.com/agarman/bco/fact2.htm>
- Leopards at the San Diego Zoo  
<http://www.sandiegozoo.org/animalbytes/t-leopard.html>

# Snow Leopard

Snow Leopards dare to live where icy gales would freeze a man's blood in minutes. Their bodies are adapted to survive and thrive in an icy wilderness of breathtaking beauty and great danger. Until recently no one had photographed a snow leopard in the wild. To this day very few have had the privilege of seeing one, much less taking its picture. The snow leopards like it that way--they are painted the grays and blacks of a rocky outcrop and when they want to disappear they just stay still.



*A snow leopard's coat protects it from the cold*

## Where do snow leopards live?



*Places colored green are where snow leopards live*

They live in the high mountains of China and Central Asia, such as the Himalayas. Snow leopards typically have a range of 100 square miles (260 square km), since it is hard for them to find prey.

## What do snow leopards look like?

Snow leopards have gray-and- fur rosettes on the flanks and spots on the head and neck, like jaguars. This color resembles the rocks and snow of their environment and helps them stalk their prey. Their tails are unusually long, thickly furred, and striped. Their paws are covered in fur to keep them warm and to act like snowshoes. During blizzards, they wrap their tails around their face like a muff to keep warm. Their eyes are round in shape, ranging from pale yellow to green-grey in colour. Male snow leopards weigh between 90-115 pounds (40-52 kg), and females weigh between 75-90 pounds (34-40 kg).



*Snow leopards are masters of vertical space*

## What do snow leopards eat, and how do they catch their prey?



Snow leopards eat almost anything they can catch, often eating animals three times their size. Their main sources of food include wild sheep and goats, pikas, hares, and game birds. In the summer, they eat mostly smaller prey such as marmots. Other prey include wild boars, gazelles, markhor, bobak, tahr, ibex, bharal, mice, and deer. They stalk their prey and usually attack when they are 20 to 50 (6-15 m) away.

The snow leopard's broad paws act as snow shoes to give them traction as they chase their prey. They are at their best when they can run across the hard upper crust of firm (icy, hard snow) while their hooved prey breaks through and is mired in the soft underlayer of loose snow.

## How do snow leopards raise their young?

Snow leopards give birth to two or three cubs in a litter, but there can be as many as seven. At two months old, they begin to eat solid food. At three months old, they follow their mother on hunts. They stay with her for their first winter before leaving, at around 18-22 months of age. After they leave, siblings may stay together for a while.



*Snow leopard cub*

## Fun facts

- The snow leopard has the longest tail of any cat.
- Snow leopards will attack prey weighing four times as much as themselves.
- The large, thickly furred paws of the snow leopard act as built-in snowshoes.

## Classification

Snow leopards belong to *Order Carnivora*, *Family Felidae*, and their scientific name is *Uncia uncia*. Some older works list snow leopards as *Panthera uncia* but that name is no longer used.

## For more information

- [Wikipedia: Snow Leopard](#)

# Clouded leopard

**Clouded leopards** are not truly leopards at all, but like the African leopards they spend a lot of time in trees. They are also known, because of their large markings, as **mint leopards**.



*A clouded leopard is at home in trees*

## Where do clouded leopards live?



*Areas where the clouded leopards live are colored green*

Clouded leopards live throughout southern China, the eastern Himalayan mountains, south-Asia, and Indonesia. They prefer to live in tropical or subtropical forests, yet they can also be found living in mangrove swamps and grasslands.

## What do clouded leopards look like?

The clouded leopard has short legs for its size, and the longest canine teeth for a cat its size (2 inch fangs) of any member of the cat family alive today. Only the sabretooths had longer canine teeth for their body size.

Because their major prey animals live in trees, clouded leopards are excellent climbers. Short, flexible legs, large paws, and keen claws combine to make them very sure-footed. Clouded leopards can have tails as long as their bodies, helping them balance. Surprisingly, the cats can hang upside-down under branches, and can even climb down tree trunks head-first.

The beautiful pattern of the clouded leopard is its most interesting feature. The large square rosettes look like clouds to some people, and that is how they got the name "clouded leopard." Other people think the blotches look more like mint leaves, so they are also called "mint leopards."

## What do they clouded leopards eat, and how do they catch their prey?

While not much is known about their behavior in the wild, their prey is thought to be mostly mammals that live in trees, particularly monkeys, along with small mammals, deer, birds, porcupines, and domestic livestock.

## How do clouded leopards raise their young?

Clouded leopards usually have litters of between one and five cubs. The young are blind and helpless at first, then begin to see within ten days of their birth, and are ready to leave their mother by about ten months of age. Clouded leopards are fully grown at two years old.



*A clouded leopard cub*

## Fun facts

See how much you know about the clouded leopard:

- They can climb down tree trunks head first.
- Like ocelots and margays, they will sometimes hang head-down from branches using their hind legs.
- Young clouded leopards are born with solid spots that become open squares as they get older.

## Classification

Clouded leopards are in the *Order Carnivora*, *Family Felidae*, and have the scientific name *Neofelis nebulosa*.

## For more information

- [Wikipedia: Clouded leopard](#)

# Marbled cat

The **marbled cat** is the big cat that isn't big at all, only slightly larger than a domestic cat. Scientists place it in the same closely related group as the lion, tiger and leopard, the *Subfamily Pantherinae*, and even though it's much smaller than the clouded leopard it has the same long fangs and a very similar fur pattern. Scientific examination of their blood (blood serum analysis) suggests that they are similar in form



*A marbled cat*

to the forest ancestors of the big cats some ten million years ago. However, they may have also decreased in size more recently due to competition other big cats.

## Where do marbled cats live?



*Places where marbled cats live are colored green.*

The marbled cat may be found in the forests of the Malay peninsula, Sumatra, Borneo and some neighboring small islands.

## What do marbled cats look like?

Marbled cats look similar to clouded leopards but they are smaller, have shorter faces more like a domestic cat, and have a fuzzier tail. Its beautiful, striking coat is pale brown, irregular slightly darker brown blotches sharply outlined in dark brown or black. Its long cylindrical tail is full from rump to tip and carries its body pattern.

## What do marbled cats eat, and how do they catch their prey?

Marbled cats spend a great deal of time in the trees and it is likely that they catch much of their prey there, hunting birds, squirrels, rodents, frogs and reptiles. They have been seen hunting on the ground on the island of Borneo, and this may be a local habit. Not much is known about their habits because they are rare in the wild and there are no specimens currently in zoos.

## How do marbled cats raise their young?

One female that was in captivity had four kittens. Most litters seem to be only two kittens, during any season of the year. As most cats, the father plays little, if

any role in raising the young. They are born a mottled pattern and only begin to resemble their mother as they mature. They probably become independent at around eight months of age, and they are fully mature at 21 months of age. The longest that marbled cats ever lived in captivity was 12 years.

## Fun facts

- Marbled cats make sounds similar to a domestic cat, but they purr rarely and their meow is somewhat like a twittering bird call.

## Classification

Marbled cats belong to *Order Carnivora*, *Family Felidae*, and their scientific name is *Pardofelis marmorata*.

## For more information

- [Wikipedia: Marbled cat](#)

# Tigons and Ligers

**Ligers** and **tigons** are hybrids, the offspring of the pairing of a lion and a tiger. **Ligers** have lion fathers and tiger mothers. They usually grow much larger than their parents, and female ligers (sometimes called *ligresses*) can sometimes have babies. **Tigons** all have tiger fathers and lion mothers. They are usually smaller than their parents.



*Bertram the Liger has a lion for a father and a tigress for a mother.*

## Why there are no wild tigons or ligers

Breeding offspring of a lion and tiger requires human intervention, since the two species do not live near each other in the wild. In the past, some zoos experimented breeding lions and tigers one another. Due to conservation efforts, deliberate hybridization is prohibited in most zoos. However, it happens regularly by accident, and some private breeders try to breed ligers for novelty purposes.

## What do tigons and ligers look like?

Ligers are the largest of the Big Cats. They can weigh up to about 1500 pounds (680kg), and stand up to 13 (4 m) tall on their hind legs. Tigons are sometimes called dwarfs, tions and tilons; while they do not exhibit many signs of dwarfism, fully grown tigons of both sexes usually weigh less than 350 pounds (160 kg), which is small for male lions or tigers.

Both hybrids have a combination of lion and tiger physical characteristics. However, the Ligers look more like their lion fathers a hint of light striping on their backs and faces. Tigons have more defined striping like their tiger fathers. Like tigers, each striping pattern is unique to each individual animal.

## How do they raise their young?

Ligers were originally assumed to be sterile, which is true for most hybrid species, such as the mule, a cross between a horse and a donkey. However, females can be fertile. There are such things as li-ligers and li-tigons along ti-ligers and ti-tigons — these are mixes of ligers and tigons lions and tigers.

Lions are very social animals while tigers tend to be solitary. The offspring of a lion-tiger share the conflicting instincts of both parents. Sometimes they seek out interaction other big cats, but other times they will attack them. So, they can be

a danger if they are raised other big cats. In general, however, ligers are gentle, even-tempered and tolerant.

## Fun facts

Both ligers and tigons communicate either lion roars or tiger whuffs, and when they interact full blooded tigers or lions they change their "dialect" accordingly.

## Classification

Ligers and tigons belong to *Order Carnivora*, *Family Felidae*, and as hybrids their scientific name a combination of both species: *Panthera leo x Panthera tigris*.

## For more information

- [Wikipedia: Tigon](#)
- [Wikipedia: Liger](#)

# In danger of extinction

## Extinction is Forever

Some big cats throughout history have become extinct because they were replaced by newer species better suited to the environment. The Sabretooth (*Smilodon fatalis*) is one example of a large Ice-Age predator that went extinct because the large prey it needed retreated behind the glaciers. Pumas and jaguars now roam where the mighty -toothed cats once ruled. Natural extinction is part of the grand drama of life on earth. However, many more cat species are in danger of dying out due to unnatural extinction, the killing of an entire species by man for reasons having nothing to do with fitness for survival. These species are not replaced by better ones, their mere loss leaves a hole in the fabric of life on earth.



*The only known photo of an extinct Bali tiger*

## Predation

Many big cats have been killed because they either compete with humans for the same prey animals or because they occasionally attack human-raised livestock. Some big cats that become too weak to hunt their own natural prey find domestic livestock much simpler to acquire. Other big cats develop a taste for livestock out of sheer opportunity. There are times when control of individual predators, through moving or killing, appear to be justified. However there is a much more dangerous approach to predator control where an entire population or even an entire species is classified as a pest and open to extermination. Extermination is an attempt to kill every last individual of a population or species. There were times when pumas were targeted for extermination in large areas of the American West. Bobcats and jaguars have also been targets of extermination campaigns. These days most governments in the world agree that extermination is not a viable form of human intervention, but sometimes local peoples ignore laws designed to protect species from extermination.

## Sport Hunting

The majority of people in western countries no longer give big game hunters the same reverence they once held in the writings of Ernest Hemmingway, especially when they kill animals that are the hunters rather than the hunted. The mystique of the "Great Hunter" no longer leads the majority of outdoorsmen to seek trophies for their mantles and entrance halls. However a number of people still consider locating, outwitting and defeating large predators to be the ultimate test

of courage and a satisfying form of enjoying the outdoors. While this practice is losing popularity, it should be said in all fairness that more and more sport hunters support laws and practices that prevent the species they hunt from becoming extinct.

## Poaching

People who defy existing laws to kill predators for money, animal parts, or personal reasons are called poachers. As outlaws, many poachers are dangerous people who are willing to protect their livelihood through violent means. Famous conservation leaders George Adamson and Diane Fossey were killed by poachers who saw them as a threat. Stopping poaching is very difficult because most big cat habitat is remote land that is difficult to patrol and exists in some of the world's poorest countries without many law enforcement resources. The most effective way to curb poaching is to reduce the demand for the products they provide.

## Folk Medicines

A number of people believe, without any scientific evidence, that folk medicines made from parts of big cats can treat or even cure certain illnesses and conditions. Belief in sympathetic magic, that like-causes-like, leads people to seek the attributes they most admire about big cats by using parts of their bodies. People seeking courage, strength, or a greater capacity for physical intimacy attempt to acquire those things through eating, drinking, applying or wearing parts of the animals that are supposed to possess those traits. For nearly everything supposedly treatable feline folk medicines, there are effective, safe and proven remedies available in modern medicine.

## The Fur Trade

The soft, warm, boldly patterned *pelts* (skins + fur) of big cats were long considered the ultimate expression of fashion and extravagance. Even today, most fashion items made of real fur come from carnivores such as bobcats and mink. Those legal for sale are produced from animals raised on fur farms rather than taken from the wild. The vast majority of natural leopard, ocelot, lynx and jaguar furs are banned on the international market by laws protecting endangered species.

## Habitat Loss

Habitat loss is the silent killer. An animal's habitat is an area where it can live, and for most large predators that means cover, adequate prey, freedom of movement, and water. Due to their predatory lifestyle, most big cats require large areas of land without many manmade barriers where they can hunt and raise young unmolested. Uncontrolled development of wild areas, including such wasteful practices as slash-and-burn agriculture, reduce the number of places where big cats can survive and thrive. To some degree protected areas known as Parks and Wildlife Sanctuaries help preserve endangered species habitat. However in many poor countries there is not adequate law enforcement to prevent poaching or illegal development of land inside park boundaries. In addition, animals need more land than the human race can afford to protect in parks. More enlightened use of habitat by man can increase the number of big cats and preserve their genetic diversity. For instance, a timber plantation can provide both high quality wood and habitat for predators and their prey. Using *sustainable management* techniques, land can provide a never-ending source of quality wood products while continuing to preserve wildlife.



*Habitat loss is the silent killer*

## It Is Up To You

As someone interested in big cats, you can make your love of big cats known through the way you vote, your lifestyle, and your charitable giving. Governments can only do so much to forestall extinction. For big cats to be saved, they must be saved by all of us working together. Learn what you can about the challenges facing your favorite animals, and get involved. Always remember: "We appreciate what we understand and save what we appreciate."

# Keeping cats

Captive management of big cats is part of a strategy to keep endangered species from becoming extinct. It also provides a source of education and inspiration to zoo visitors and helps us study what these cats need to survive and thrive. What follows is from an interview John Burkitt of Tiger Touch.



*Missy Cougar at Tiger Touch likes cameras ... really.*

## The Four Types of Fitness

Once zoos were terrible places for big cats. Their needs were poorly understood, and therefore poorly met. Today we understand that there are four types of fitness, all equally important. *Physical Fitness* is more than basic life support. Animals evolved in a complex environment, and meeting their whole range of needs makes their life longer and better. *Mental Fitness* is as important in captivity as it is in the wild. It promotes natural social behavior within and between species and reduces neurotic behaviors such as pacing and self-injury. *Emotional Fitness* is the cornerstone of a humane, trusting partnership between man and animal. When we bring life into the world, we owe it happiness and contentment. *Moral Fitness* is a clear understanding of rules and expectations by man and animal that promotes trust, minimizes stress, reduces accidents, and helps cooperation.

## Safety

Ideally, safety is guaranteed for the animals, their staff, and the visiting public. The animals are protected as well as possible against items thrown over the fence that may injure the cats or be eaten. When big cats eat the wrong sort of objects, such as toys or bottle fragments, it causes potentially deadly blockages of the intestines. The staff is protected by the use of "lockouts" and "air locks". "Lockouts" are areas where big cats can be confined while someone performs maintenance on their living area. It is the only safe way to remove wastes, cut grass, remove foreign objects, or repair fixtures. "Air Locks" are small chambers a door on each end that allow people to enter and a cat enclosure without having an opening clear to the outside at any one moment.



*Missy Cougar also likes love ... really.*

People come in the outer door, close it behind them, then open the inner door to enter the cat enclosure. At no time can a cat push past the keeper and escape. Guard rails around certain exhibits keep visitors at least five (1.8 meters) away from the animal's outer fence at all times. This prevents people from being tempted to touch animals through the mesh or bars and get injured. Such injuries are more often fatal to the cat than to the visitor since most states require the animal to be killed and tested for rabies if the victim refuses to take precautionary rabies vaccination shots. *Zoo visitors that follow the rules are completely safe.* One less obvious safety feature of zoos and animal parks are the off-hours security systems that protect the animals against nighttime intruders. Motion sensors, infrared cameras, and perimeter fences prevent people from disturbing the animals after hours. Finally, the animals are usually confined to smaller areas during off hours, and only released into their large enclosures shortly before opening time.

## Species Survival Plans

One function of zoos is to provide safe places where endangered animals can breed. To be effective in producing healthy cats that are *genetically diverse* (born to unrelated parents), zoos will often ship animals long distances to find mates that would make a good match. If you let closely related cats have offspring together, their young would be considered *inbred*, which means they don't have a healthy mix of different backgrounds in their physical makeup. Inbred animals are prone to be sick or even die. Computer technology helps zoos be sure which animals would make the mates for each other and avoid inbreeding.

Animals used in a Species Survival Plan are sometimes taken out of the public viewing areas for a private, less stressful area to breed and care for their offspring in the first critical weeks. Usually you can tell if animals on display in a zoo are involved in an SSP because there will be a sign posted on their enclosure.

One of the most important differences in zoos today from zoos long ago is that they are more than just living museums. They are also valuable partners in the battle to save endangered species.

## Food Preparation

Food has to be wholesome and free from disease and parasites. It may be , a prepared such as ZuPreem or Mazuri, or a combination of both. Food is served raw to prevent nutrient loss from cooking. Additives make up for the loss of calcium and micronutrients available in regular prey. Finally as part of good animal husbandry, food is individually prepared for each animal based on weight control and medication needs.



*Detonator the Tiger "Tucks In" when it's dinner time at Tiger Touch.*

## Veterinary Care

Like all other animals in captivity, zoo animals require occasional trips to the vet. The veterinarians that handle zoo animals are specially trained in *exotic medicine*, the diseases and conditions of animals not usually as . Veterinary care usually is done at the zoo in a special health care building that has the special equipment needed to fill cavities in a tiger's teeth or perform surgery on a lion.

## The Nursery

When, for one reason or another, the parents of young big cats cannot raise their own offspring, the cubs and kittens are to a nursery where specially trained zoo staff and volunteers provide them the food, stimulation, and affection. Young cats of all species cannot properly pass solid wastes on their own. A warm, wet washrag or sponge is used to wipe the backside of kittens and cubs to stimulate them to pass wastes, something they usually do in the wild when their mother cleans them her tongue. Proper nursing is especially important: cubs and kittens are never given milk while they are lying on their back. This can cause pneumonia. The milk given to cats is different than the milk given to human children in a number of ways. Zoo personnel know the right way to mix milk for the different species of large and small cats in their care. Temperature is carefully controlled since these young animals are not as good at controlling their body temperature as are adults.

## Enrichment

Keeping animals happy as well as healthy is a challenge. The way is a combination of several things: physical interaction others of its own kind or specially-trained human companions, desirable features in the enclosure such as swimming pools and ledges for perching and sleeping, and toys to play . Sometimes food is hidden about or put on ropes where it can be jerked away to stimulate chase, hunt, and play behaviors



*Nala the Lioness at Tiger Touch loves to play anything not nailed down.*

and reduce boredom. Many zoo animals are fond of visitors and develop routines to impress the people that come to see them. Large, natural enclosures give the animals more freedom of movement and encourage physical activity.

## Training

While most modern zoos do not teach animals to perform "tricks", they do train animals to respond to certain commands to make them safer to handle, move and examine. This training emphasizes rewards for good behavior rather than punishment for bad behavior. Using the reward system not only makes training easier and more humane, it avoids the ever-present danger that an angry cat may find a chance to lash out at its tormentor. That only needs to happen once briefly for tragedy to occur.

## End of Life Issues

Although it is unpleasant to think about, is a part of life. When a decision is made by the zoo staff that a certain cat is in too much pain to have a good life, the life of that cat is humanely ended. The phrase *put to sleep* or *put down* is not accurate and does not confer the dignity that usually accompanies the act. Zookeepers almost always experience grief when one of their long-term friends . Whenever possible, someone the cat loves is allowed to be them as the drug is administered. This special drug is designed to calm the cat and lull it to sleep before occurs. After has been certified by the veterinarian, a necropsy (animal autopsy) is performed to determine the exact cause of the animal's illness or injury. This information is used to help protect other animals. Many zoos, and most sanctuaries and animal parks, have special plots where beloved animals are laid to . These are rarely open to the public. Animals that are not buried are usually cremated (burned) for health reasons or used to provide skeletons and skins for educational use at the zoo or in museums and universities.

# Glossary

A glossary of terms used in this book:

- **Canine teeth:**
- **Captivity:** Animals that are by humans
- **Carnivore:** An animal that
- **Carrion:** eaten by carnivores that were not the ones that killed it
- **Classification:**
- **Conservation:** Ways of using natural resources that do not destroy them
- **Diurnal:** Active during the day and asleep at night.
- **Domestication:** Taking animals from their natural habitat into the human habitat, then changing them in ways that make them more suitable to living humans.
- **Endangered:** Animals that are almost extinct.
- **Extinction:** When all animals of a kind are gone, that kind of animal is extinct. They can never come back.
- **Family:** (as in the classification division)
- **Fertile:** Able to have offspring
- **Flanks:** The side part of an animal's body
- **Habitat:** An area able to support a type of animal
- **Herbivore:** An animal that plants such as leaves and berries
- **Hybrid:** The offspring of two animals of different but similar kinds, such as a lion and a tiger.
- **Hybridization:** When two animals of different kinds have offspring together.
- **Instinct:** An animal's inherited knowledge; knowledge that did not have to be learned.
- **Jungle:** A large forest in warm countries many different kinds of animals and plants.
- **Life span:** How long an animal usually lives
- **Litter:** A group of baby animals the same parents
- **Mammal:** A warm-blooded animal that has hair on its skin and gives its children milk to drink
- **Mane:** The furry crown around a male Lion's head
- **Muzzle:** The part of an animal's face that includes the nose and jaws
- **National Park:** Land that is in a natural state by for a variety of reasons, all of them important
- **Nature preserve:** Land that is in a natural state for conservation reasons where the welfare of plants and animals is more important than any other uses
- **New World:** North, Central and South America.
- **Nocturnal:** Active at night and asleep during the day.
- **Offspring:** The children of an animal

- **Old World:** Europe, Asia, Australia and Africa.
- **Order:**
- **Poaching:** Illegally killing an animal
- **Prairie:** A large, flat plain a lot of grass and almost no trees, such as the Great Plains of North America
- **Predator:** An animal that hunts other animals and them
- **Prey:** An animal hunted by another animal for food
- **Rainforest:** A large forest that stays warm and wet year round many different kinds of animals and plants
- **Rosette:**
- **Retract (claw):** The hiding of claws inside a paw
- **Savannah:** A large, flat plain a lot of grass and scattered groups of trees, such as in Central Africa
- **Scavenge:**
- **Scientific name:**
- **Siblings:** All the offspring from one litter, or sometimes offspring the same parents from two different litters
- **Steppes:** A large, flat plain a lot of grass and almost no trees.
- **Sterile:** Not able to have children
- **Subtropical:**
- **Tropical:**
- **Wildlife refuge:** Land that is used to protect of wild animals. Sometimes parts of a wildlife refuge are not in a natural state to give certain species of animals a little extra help. Planting rice in a water bird area is one example.
- **Zoo:** A type of living museum where animals are for people to learn about them and have fun

# GNU Free Documentation License

Version 1.2, November 2002

Copyright (C) 2000,2001,2002 Free Software Foundation, Inc.  
51 Franklin St, Fifth Floor, Boston, MA 02110-1301 USA  
Everyone is permitted to copy and distribute verbatim copies  
of this license document, but changing it is not allowed.

## **0. PREAMBLE**

The purpose of this License is to make a manual, textbook, or other functional and useful document "free" in the sense of freedom: to assure everyone the effective freedom to copy and redistribute it, or without modifying it, either commercially or noncommercially. Secondly, this License preserves for the author and publisher a way to get for their work, while not being considered responsible for modifications made by others.

This License is a kind of "copyleft", which means that derivative works of the document must themselves be free in the same sense. It complements the GNU General Public License, which is a copyleft license designed for free software.

We have designed this License in order to use it for manuals for free software, because free software needs free documentation: a free program should come manuals providing the same freedoms that the software does. But this License is not limited to software manuals; it can be used for any textual work, regardless of subject matter or whether it is published as a printed book. We recommend this License principally for works whose purpose is instruction or reference.

## **1. APPLICABILITY AND DEFINITIONS**

This License applies to any manual or other work, in any medium, that contains a notice placed by the copyright holder saying it can be distributed under the terms of this License. Such a notice grants a world-wide, royalty-free license, unlimited in duration, to use that work under the conditions stated herein. The "Document", below, refers to any such manual or work. Any member of the public is a licensee, and is addressed as "you". You accept the license if you copy, modify or distribute the work in a way requiring permission under copyright law.

A "Modified Version" of the Document means any work containing the Document or a portion of it, either copied verbatim, or modifications and/or translated into another language.

A "Secondary Section" is a named appendix or a front-matter section of the Document that deals exclusively the relationship of the publishers or authors of the Document to the Document's overall subject (or to related matters) and contains nothing that could fall directly within that overall subject. (Thus, if the Document is in part a textbook of mathematics, a Secondary Section may not

explain any mathematics.) The relationship could be a matter of historical connection the subject or related matters, or of legal, commercial, philosophical, ethical or political position regarding them.

The "Invariant Sections" are certain Secondary Sections whose titles are designated, as being those of Invariant Sections, in the notice that says that the Document is released under this License. If a section does not fit the above definition of Secondary then it is not allowed to be designated as Invariant. The Document may contain zero Invariant Sections. If the Document does not identify any Invariant Sections then there are none.

The "Cover Texts" are certain short passages of text that are listed, as Front-Cover Texts or Back-Cover Texts, in the notice that says that the Document is released under this License. A Front-Cover Text may be at most 5 words, and a Back-Cover Text may be at most 25 words.

A "Transparent" copy of the Document means a machine-readable copy, represented in a format whose specification is available to the general public, that is suitable for revising the document straightforwardly generic text or (for images composed of pixels) generic paint programs or (for drawings) some widely available drawing , and that is suitable for input to text formatters or for automatic translation to a variety of formats suitable for input to text formatters. A copy made in an otherwise Transparent file format whose markup, or absence of markup, has been arranged to thwart or discourage subsequent modification by readers is not Transparent. An image format is not Transparent if used for any substantial amount of text. A copy that is not "Transparent" is called "Opaque".

Examples of suitable formats for Transparent copies include plain ASCII without markup, Texinfo input format, LaTeX input format, SGML or XML using a publicly available DTD, and standard-conforming simple HTML, PostScript or PDF designed for human modification. Examples of transparent image formats include PNG, XCF and JPG. Opaque formats include proprietary formats that can be read and edited only by proprietary word processors, SGML or XML for which the DTD and/or processing tools are not generally available, and the machine-generated HTML, PostScript or PDF produced by some word processors for output purposes only.

The "Title Page" means, for a printed book, the title page itself, plus such following pages as are needed to hold, legibly, the material this License requires to appear in the title page. For works in formats which do not have any title page as such, "Title Page" means the text near the most prominent appearance of the work's title, preceding the beginning of the body of the text.

A section "Entitled XYZ" means a named subunit of the Document whose title either is precisely XYZ or contains XYZ in parentheses following text that translates XYZ in another language. (Here XYZ stands for a specific section name mentioned below, such as "Acknowledgements", "Dedications", "Endorsements", or "History".) To "Preserve the Title" of such a section when you modify the Document means that it remains a section "Entitled XYZ"

according to this definition.

The Document may include Warranty Disclaimers to the notice which states that this License applies to the Document. These Warranty Disclaimers are considered to be included by reference in this License, but only as regards disclaiming warranties: any other implication that these Warranty Disclaimers may have is void and has no effect on the meaning of this License.

## **2. VERBATIM COPYING**

You may copy and distribute the Document in any medium, either commercially or noncommercially, provided that this License, the copyright notices, and the license notice saying this License applies to the Document are reproduced in all copies, and that you add no other conditions whatsoever to those of this License. You may not use technical measures to obstruct or control the reading or further copying of the copies you make or distribute. However, you may accept compensation in exchange for copies. If you distribute a large enough number of copies you must also follow the conditions in section 3.

You may also lend copies, under the same conditions stated above, and you may publicly display copies.

## **3. COPYING IN QUANTITY**

If you publish printed copies (or copies in that commonly have printed covers) of the Document, numbering more than 100, and the Document's license notice requires Cover Texts, you must enclose the copies in covers that carry, clearly and legibly, all these Cover Texts: Front-Cover Texts on the front cover, and Back-Cover Texts on the back cover. Both covers must also clearly and legibly identify you as the publisher of these copies. The front cover must present the full title all words of the title equally prominent and visible. You may add other material on the covers in addition. Copying changes limited to the covers, as long as they preserve the title of the Document and satisfy these conditions, can be treated as verbatim copying in other respects.

If the required texts for either cover are too voluminous to fit legibly, you should put the first ones listed (as many as fit reasonably) on the actual cover, and continue the onto adjacent pages.

If you publish or distribute Opaque copies of the Document numbering more than 100, you must either include a machine-readable Transparent copy along each Opaque copy, or state in or each Opaque copy a computer-network location from which the general network-using public has access to download using public-standard network protocols a complete Transparent copy of the Document, free of added material. If you use the latter option, you must take reasonably prudent steps, when you begin distribution of Opaque copies in quantity, to ensure that this Transparent copy will remain thus accessible at the stated location until at least one year after the last time you distribute an Opaque copy (directly or through your agents or retailers) of that to the public.

It is requested, but not required, that you contact the authors of the Document well before redistributing any large number of copies, to give them a chance to provide you an updated version of the Document.

#### **4. MODIFICATIONS**

You may copy and distribute a Modified Version of the Document under the conditions of sections 2 and 3 above, provided that you release the Modified Version under precisely this License, the Modified Version filling the role of the Document, thus licensing distribution and modification of the Modified Version to whoever possesses a copy of it. In addition, you must do these things in the Modified Version:

- **A.** Use in the Title Page (and on the covers, if any) a title distinct from that of the Document, and from those of previous versions (which should, if there were any, be listed in the History section of the Document). You may use the same title as a previous version if the original publisher of that version gives permission.
- **B.** List on the Title Page, as authors, one or more persons or entities responsible for authorship of the modifications in the Modified Version, together at least five of the principal authors of the Document (all of its principal authors, if it has fewer than five), unless they release you from this requirement.
- **C.** State on the Title page the name of the publisher of the Modified Version, as the publisher.
- **D.** Preserve all the copyright notices of the Document.
- **E.** Add an appropriate copyright notice for your modifications adjacent to the other copyright notices.
- **F.** Include, immediately after the copyright notices, a license notice giving the public permission to use the Modified Version under the terms of this License, in the form shown in the Addendum below.
- **G.** Preserve in that license notice the full lists of Invariant Sections and required Cover Texts given in the Document's license notice.
- **H.** Include an unaltered copy of this License.
- **I.** Preserve the section Entitled "History", Preserve its Title, and add to it an item stating at least the title, year, new authors, and publisher of the Modified Version as given on the Title Page. If there is no section Entitled "History" in the Document, create one stating the title, year, authors, and publisher of the Document as given on its Title Page, then add an item describing the Modified Version as stated in the previous sentence.
- **J.** Preserve the network location, if any, given in the Document for public access to a Transparent copy of the Document, and likewise the network locations given in the Document for previous versions it was based on. These may be placed in the "History" section. You may a network location for a work that was published at least four years before the Document itself, or if the original publisher of the version it refers to gives permission.

- **K.** For any section Entitled "Acknowledgements" or "Dedications", Preserve the Title of the section, and preserve in the section all the substance and tone of each of the contributor acknowledgements and/or dedications given therein.
- **L.** Preserve all the Invariant Sections of the Document, unaltered in their text and in their titles. Section numbers or the equivalent are not considered part of the section titles.
- **M.** Delete any section Entitled "Endorsements". Such a section may not be included in the Modified Version.
- **N.** Do not retitle any existing section to be Entitled "Endorsements" or to conflict in title any Invariant Section.
- **O.** Preserve any Warranty Disclaimers.

If the Modified Version includes new front-matter sections or appendices that qualify as Secondary Sections and contain no material copied from the Document, you may at your option designate some or all of these sections as invariant. To do this, add their titles to the list of Invariant Sections in the Modified Version's license notice. These titles must be distinct from any other section titles.

You may add a section Entitled "Endorsements", provided it contains nothing but endorsements of your Modified Version by various parties--for example, statements of peer review or that the text has been approved by an organization as the authoritative definition of a standard.

You may add a passage of up to five words as a Front-Cover Text, and a passage of up to 25 words as a Back-Cover Text, to the end of the list of Cover Texts in the Modified Version. Only one passage of Front-Cover Text and one of Back-Cover Text may be added by (or through arrangements made by) any one entity. If the Document already includes a cover text for the same cover, previously added by you or by arrangement made by the same entity you are acting on behalf of, you may not add another; but you may replace the old one, on explicit permission from the previous publisher that added the old one.

The author(s) and publisher(s) of the Document do not by this License give permission to use their names for publicity for or to assert or imply endorsement of any Modified Version.

## **5. COMBINING DOCUMENTS**

You may combine the Document other documents released under this License, under the terms defined in section 4 above for modified versions, provided that you include in the combination all of the Invariant Sections of all of the original documents, unmodified, and list them all as Invariant Sections of your combined work in its license notice, and that you preserve all their Warranty Disclaimers.

The combined work need only contain one copy of this License, and multiple identical Invariant Sections may be replaced a single copy. If there are multiple Invariant Sections the same name but different contents, make the title of each

such section unique by adding at the end of it, in parentheses, the name of the original author or publisher of that section if known, or else a unique number. Make the same adjustment to the section titles in the list of Invariant Sections in the license notice of the combined work.

In the combination, you must combine any sections Entitled "History" in the various original documents, forming one section Entitled "History"; likewise combine any sections Entitled "Acknowledgements", and any sections Entitled "Dedications". You must delete all sections Entitled "Endorsements."

## **6. COLLECTIONS OF DOCUMENTS**

You may make a collection consisting of the Document and other documents released under this License, and replace the individual copies of this License in the various documents a single copy that is included in the collection, provided that you follow the rules of this License for verbatim copying of each of the documents in all other respects.

You may extract a single document from such a collection, and distribute it individually under this License, provided you insert a copy of this License into the extracted document, and follow this License in all other respects regarding verbatim copying of that document.

## **7. AGGREGATION INDEPENDENT WORKS**

A compilation of the Document or its derivatives other separate and independent documents or works, in or on a volume of a storage or distribution medium, is called an "aggregate" if the copyright resulting from the compilation is not used to limit the legal rights of the compilation's users beyond what the individual works permit. When the Document is included in an aggregate, this License does not apply to the other works in the aggregate which are not themselves derivative works of the Document.

If the Cover Text requirement of section 3 is applicable to these copies of the Document, then if the Document is less than one half of the entire aggregate, the Document's Cover Texts may be placed on covers that bracket the Document within the aggregate, or the electronic equivalent of covers if the Document is in electronic form. Otherwise they must appear on printed covers that bracket the whole aggregate.

## **8. TRANSLATION**

Translation is considered a kind of modification, so you may distribute translations of the Document under the terms of section 4. Replacing Invariant Sections translations requires special permission from their copyright holders, but you may include translations of some or all Invariant Sections in addition to the original versions of these Invariant Sections. You may include a translation of this License, and all the license notices in the Document, and any Warranty Disclaimers, provided that you also include the original English version of this License and the original versions of those notices and disclaimers. In case of a

disagreement between the translation and the original version of this License or a notice or disclaimer, the original version will prevail.

If a section in the Document is Entitled "Acknowledgements", "Dedications", or "History", the requirement (section 4) to Preserve its Title (section 1) will typically require changing the actual title.

## 9. TERMINATION

You may not copy, modify, sublicense, or distribute the Document except as expressly provided for under this License. Any other attempt to copy, modify, sublicense or distribute the Document is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

## 10. FUTURE REVISIONS OF THIS LICENSE

The Free Software Foundation may publish new, revised versions of the GNU Free Documentation License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns. See <http://www.gnu.org/copyleft/>.

Each version of the License is given a distinguishing version number. If the Document specifies that a particular numbered version of this License "or any later version" applies to it, you have the option of following the terms and conditions either of that specified version or of any later version that has been published (not as a draft) by the Free Software Foundation. If the Document does not specify a version number of this License, you may choose any version ever published (not as a draft) by the Free Software Foundation.

## [How to use this License for your documents](#)

To use this License in a document you have written, include a copy of the License in the document and put the following copyright and license notices just after the title page:

```
Copyright (c) YEAR YOUR NAME.  
Permission is granted to copy, distribute and/or modify this document  
under the terms of the GNU Free Documentation License, Version 1.2  
or any later version published by the Free Software Foundation;  
no Invariant Sections, no Front-Cover Texts, and no Back-Cover  
Texts. A copy of the license is included in the section entitled "GNU  
Free Documentation License".
```

If you have Invariant Sections, Front-Cover Texts and Back-Cover Texts, replace the "...Texts." line this:

```
the Invariant Sections being LIST THEIR TITLES, the  
Front-Cover Texts being LIST, and the Back-Cover Texts being LIST.
```

If you have Invariant Sections without Cover Texts, or some other combination of the three, merge those two alternatives to the situation.

If your document contains nontrivial examples of program code, we recommend releasing these examples in parallel under your choice of free software license, such as the GNU General Public License, to permit their use in free software.