

# Giant panda

## Giant panda



Giant panda at Ocean Park, [Hong Kong](#)

## Conservation status



[Endangered \(IUCN 3.1\)](#)<sup>[1]</sup>

## Scientific classification [ e ]

Kingdom: [Animalia](#)  
Phylum: [Chordata](#)  
Class: [Mammalia](#)  
Order: [Carnivora](#)  
Family: [Ursidae](#)  
Genus: [Ailuropoda](#)  
Species: *A. melanoleuca*

## Binomial name

*Ailuropoda melanoleuca*  
(David, 1869)

## Subspecies

- [A. melanoleuca melanoleuca](#)
- [A. melanoleuca qinlingensis](#)



Giant panda range

This article is about the mammal in the bear family. For the red panda, see [Red panda](#). For the hip hop group, see [Giant Panda \(group\)](#). For other uses, see [Panda \(disambiguation\)](#).

The **giant panda**, or **panda** (*Ailuropoda melanoleuca*, literally meaning "black and white cat-foot")<sup>[2]</sup> is a [bear](#)<sup>[3]</sup> native to central-western and south western [China](#).<sup>[4]</sup> It is easily recognized by its large, distinctive black patches around the eyes, over the ears, and across its round body. Though it belongs to the order [Carnivora](#), the panda's diet is 99% [bamboo](#).<sup>[5]</sup> Pandas in the wild will occasionally eat other grasses, wild tubers, or even meat in the form of birds, rodents or carrion. In captivity they may receive honey, eggs, fish, yams, [shrub leaves](#), oranges, or bananas along with specially prepared feed.<sup>[6][7]</sup>

The giant panda lives in a few mountain ranges in central China, mainly in [Sichuan](#) province, but also in the [Shaanxi](#) and [Gansu](#) provinces.<sup>[8]</sup> Due to farming, [deforestation](#) and other development, the panda has been driven out of the lowland areas where it once lived.

The panda is a [conservation reliant endangered species](#).<sup>[4]</sup> A 2007 report shows 239 pandas living in captivity inside China and another 27 outside the country.<sup>[9]</sup> Wild population estimates vary; one estimate shows that there are about 1,590 individuals living in the wild,<sup>[9]</sup> while a 2006 study via [DNA analysis](#) estimated that this figure could be as high as 2,000 to 3,000.<sup>[10]</sup> Some reports also show that the number of pandas in the wild is on the rise.<sup>[11][12]</sup> However, the [IUCN](#) does not believe there is enough certainty yet to reclassify the species from Endangered to Vulnerable.<sup>[1]</sup>

While the [dragon](#) has historically served as China's [national emblem](#), in recent decades the panda has also served as an emblem for the country. Its image appears on a large number of modern Chinese commemorative silver, gold, and platinum coins. Though the panda is often assumed to be docile, it has been known to attack humans, presumably out of irritation rather than predation.<sup>[13][14][15]</sup>

## Description

A Giant Panda cub. At birth, the Giant Panda typically weighs 100 to 200 grams (3 ½ to 7 oz) and measures 15 to 17 centimeters (6 to 7 in) long.<sup>[16]</sup>

The Giant Panda has a black-and-white coat. Adults measure around 1.5 meters (5 ft) long and around 75 centimeters (2 ft 6 in) tall at the [shoulder](#). Males can weigh up to 150 kilograms (330 lb). Females (generally 10–20% smaller than males)<sup>[17]</sup> can weigh up to 125 kilograms (280 lb).<sup>[4]</sup>

The Giant Panda has a body shape typical of [bears](#). It has black fur on its ears, eye patches, muzzle, legs, arms and shoulders. The rest of the animal's coat is white. Although scientists do not know why these unusual bears are black and white, some speculate that the bold coloring provides effective camouflage in its shade-dappled snowy and rocky surroundings.<sup>[18]</sup> The Giant Panda's thick, wooly coat keeps it warm in the cool forests of its habitat.<sup>[18]</sup> The Giant Panda has large [molar teeth](#) and strong jaw muscles for crushing tough bamboo.<sup>[19]</sup>

The Giant Panda's [paw](#) has a "thumb" and five fingers; the "thumb" is actually a modified [sesamoid bone](#), which helps the Giant Panda to hold bamboo while eating.<sup>[20]</sup> [Stephen Jay Gould](#) discusses this feature in his book of essays on [evolution](#) and [biology](#), *The Panda's Thumb*.

The Giant Panda's tail, measuring 10 to 15 centimeters (4 to 6 in), is the second longest in the bear family. The longest belongs to the [Sloth Bear](#).<sup>[17]</sup>

The Giant Panda usually lives around 20 years in the wild and up to 30 years in [captivity](#).<sup>[21]</sup>

## Behavior

In the wild, the Giant Panda is a [terrestrial animal](#) and primarily spends its life roaming and feeding in the bamboo forests of the Qinling Mountains and in the hilly Sichuan Province.<sup>[22]</sup> Though generally alone, each adult has a defined territory and females are not tolerant of other females in their range. Pandas communicate through vocalization and scent marking such as clawing trees or spraying urine.<sup>[4]</sup> The Giant Panda is able to climb and take shelter in hollow trees or rock crevices but does not establish permanent dens. For this reason, pandas do not [hibernate](#), which is similar to other subtropical mammals, and will instead move to elevations with warmer temperatures.<sup>[23]</sup> Pandas rely primarily on [spatial memory](#) rather than [visual memory](#).<sup>[24]</sup>

Social encounters occur primarily during the brief breeding season in which pandas in proximity to one another will gather.<sup>[25]</sup> After mating, the male leaves the female alone to raise the cub.<sup>[26]</sup>

## Diet

Despite its [taxonomic](#) classification as a [carnivoran](#), the Giant Panda's [diet](#) is primarily [herbivorous](#), consisting almost exclusively of bamboo.<sup>[21]</sup> However, the Giant Panda still has the digestive system of a carnivore, as well as carnivore-specific genes,<sup>[27]</sup> and thus derives little energy and little protein from consumption of bamboo. Its ability to digest [cellulose](#) is ascribed to the microbes in its gut.<sup>[28]</sup> The average Giant Panda eats as much as 9 to 14 kg (20 to 30 pounds) of bamboo shoots a day. Because the Giant Panda consumes a diet low in nutrition, it is important for it to keep its digestive tract full.<sup>[21]</sup> The limited energy input imposed on it by its diet has affected the panda's behavior. The Giant Panda tends to limit its social interactions and avoids steeply sloping terrain in order to limit its energy expenditures.<sup>[29]</sup>

Two of the panda's most distinctive features, its large size and its round face, are [adaptations](#) to its bamboo diet. Panda researcher [Russell Ciochon](#) observed that: “[much] like the vegetarian [gorilla](#), the low body surface area to body volume [of the giant panda] is indicative of a lower metabolic rate. This lower metabolic rate and a

more sedentary lifestyle allow the giant panda to subsist on nutrient poor resources such as bamboo.”<sup>[29]</sup> Similarly, the Giant Panda's round face is the result of powerful jaw muscles, which attach from the top of the head to the jaw.<sup>[29]</sup> Large molars crush and grind fibrous plant material.

Pandas eat any of twenty-five bamboo species in the wild, such as *Fargesia dracocephala*<sup>[30]</sup> and *Fargesia rufa*.<sup>[31]</sup> Only a few bamboo species are widespread at the high altitudes pandas now inhabit. Bamboo leaves contain the highest protein levels; stems have less.<sup>[32]</sup> Given this large diet, the Giant Panda can defecate up to 40 times a day.<sup>[33]</sup>

Because of the synchronous flowering, death, and regeneration of all bamboo within a species, the Giant Panda must have at least two different species available in its range to avoid starvation. While primarily herbivorous, the Giant Panda still retains decidedly ursine teeth, and will eat meat, fish, and eggs when available. In captivity, zoos typically maintain the Giant Panda's bamboo diet, though some will provide specially-formulated biscuits or other dietary supplements.<sup>[34]</sup>

## Genomics

The giant panda [genome](#) was sequenced in 2009 using a [next-generation sequencing technology](#).<sup>[35]</sup> Its genome contains 20 pairs of [autosomes](#) and one pair of sex chromosomes.

## Classification

For many decades the precise taxonomic classification of the Giant Panda was under debate because it shares characteristics of both bears and [raccoons](#).<sup>[36]</sup> However, [molecular studies](#) suggest that the Giant Panda is a true bear and part of the [Ursidae](#) family,<sup>[37][38]</sup> though it differentiated early in history from the main ursine stock. The Giant Panda's closest ursine relative is the [Spectacled Bear](#) of [South America](#).<sup>[39]</sup> The Giant Panda has been referred to as a [living fossil](#).<sup>[40]</sup>

Despite the shared name, habitat type, and diet, as well as a unique enlarged bone called the *pseudo thumb* (which helps them grip the bamboo shoots they eat), the Giant Panda and [Red Panda](#) are only distantly related. [Molecular studies](#) have placed the Red Panda in its own family [Ailuridae](#), and not under [Ursidae](#).

## Subspecies

Two subspecies of Giant Panda have been recognized on the basis of distinct cranial measurements, color patterns, and [population genetics](#) (Wan et al., 2005).

- The nominate subspecies *Ailuropoda melanoleuca melanoleuca* consists of most extant populations of panda. These animals are principally found in [Sichuan](#) and display the typical stark black and white contrasting colors.
- The [Qinling Panda](#), *Ailuropoda melanoleuca qinlingensis*<sup>[41]</sup> is restricted to the [Qinling Mountains](#) in [Shaanxi](#) at elevations of 1300–3000 m. The typical black and white pattern of Sichuan Giant Pandas is replaced with a dark brown versus light brown pattern. The skull of *A. m. qinlingensis* is smaller than its relatives, and it has larger molars.

## Uses and human interaction

### Early references

In the past, pandas were thought to be rare and noble creatures – the [mother of Emperor Wen of Han](#) was buried with a panda skull in her vault. The grandson of [Emperor Taizong of Tang](#) is said to have given [Japan](#) two pandas and a sheet of panda skin as a sign of goodwill. Unlike many other animals in [Ancient China](#), pandas were rarely thought to have medical uses. The few known uses include the Sichuan tribal peoples' use of panda urine to melt accidentally swallowed needles, and the use of panda pelts to control [menses](#) as described in the [Qin Dynasty encyclopedia Erya](#).<sup>[42]</sup>

The creature named *mo* (貘) mentioned in some ancient books has been interpreted as giant panda.<sup>[42]</sup> The dictionary [Shuowen Jiezi](#) ([Eastern Han Dynasty](#)) says that the *mo*, from [Shu](#) (Sichuan), is bear-like, but yellow-and-black,<sup>[43]</sup> although the older [Erya](#) describes *mo* simply as a "white leopard".<sup>[44]</sup> The interpretation of the legendary fierce creature [pixiu](#) (貔貅) as referring to the giant panda are also common.<sup>[45]</sup>

The comparative obscurity of the giant panda throughout most of China's history is illustrated by the fact that, despite there being a number of depictions of bears in [Chinese art](#) starting from its most ancient times, and the bamboo being one of the favorite subjects for Chinese painters, there are no known pre-20th-century artistic representations of giant pandas.<sup>[46]</sup>

## Modern "discovery"

The West first learned of the Giant Panda in 1869 because the [French missionary Armand David](#)<sup>[36]</sup> received a skin from a hunter on March 11, 1869. The first Westerner known to have seen a living Giant Panda is the German zoologist [Hugo Weigold](#), who purchased a cub in 1916. [Kermit](#) and [Theodore Roosevelt, Jr.](#), became the first Westerners to shoot a panda, on an expedition funded by the [Field Museum of Natural History](#) in the 1920s. In 1936, [Ruth Harkness](#) became the first Westerner to bring back a live Giant Panda, a cub named [Su Lin](#)<sup>[47]</sup> who went to live at the [Brookfield Zoo](#) in [Chicago](#). In 1938, five Giant Pandas were sent to London;<sup>[48][49]</sup> these activities were later halted because of wars and for the next half of the century, the West knew little of pandas.

## Panda diplomacy

Main article: [Panda diplomacy](#)

Loans of Giant Pandas to [American](#) and [Japanese](#) zoos formed an important part of the [diplomacy](#) of the [People's Republic of China](#) in the 1970s, as it marked some of the first cultural exchanges between the People's Republic and the West. This practice has been termed "Panda diplomacy".

By 1984, however, pandas were no longer used as agents of diplomacy. Instead, China began to offer pandas to other nations only on 10-year loans. The standard loan terms include a fee of up to [US\\$1,000,000](#) per year and a provision that any cubs born during the loan are the property of the People's Republic of China. Since 1998, due to a [WWF lawsuit](#), the [United States Fish and Wildlife Service](#) only allows a U.S. [zoo](#) to import a panda if the zoo can ensure that China will channel more than half of its loan fee into [conservation](#) efforts for the Giant Panda and its habitat.

In May 2005, China offered a breeding pair to [Taiwan](#). The issue became embroiled in [cross-Strait relations](#)—both over the underlying symbolism, and over technical issues such as whether the transfer would be considered "domestic" or "international," or whether any true conservation purpose would be served by the exchange.<sup>[50]</sup> China's offer was initially rejected by [President Chen](#) of Taiwan. However when the presidency changed hands China's offer was accepted at the beginning of [Ma Ying-jeou's](#) presidency in 2008, and the pandas themselves arrived in December of that year. A contest to name the pandas was held in China, resulting in the politically charged names "Tuan Tuan" and "Yuan Yuan" (from *tuanyuan*, meaning "reunion", i.e. "reunification").<sup>[51]</sup>

## Conservation

The Giant Panda is an [endangered species](#), threatened by continued [habitat loss](#) and by a very low birthrate, both in the wild and in [captivity](#).<sup>[21]</sup>

The Giant Panda has been a target for poaching by locals since ancient times and by foreigners since it was introduced to the West. Starting in the 1930s, foreigners were unable to poach Giant Pandas in China because of the [Second Sino-Japanese War](#) and the [Chinese Civil War](#), but pandas remained a source of soft furs for the locals. The population boom in China after 1949 created stress on the pandas' habitat, and the subsequent famines led to the increased hunting of wildlife, including pandas. During the [Cultural Revolution](#), all studies and conservation activities on the pandas were stopped. After the [Chinese economic reform](#), demand for panda skins from [Hong Kong](#) and Japan led to illegal poaching for the [black market](#), acts generally ignored by the local officials at the time.

Though the [Wolong National Nature Reserve](#) was set up by the PRC government in 1958 to save the declining panda population, few advances in the conservation of pandas were made, due to inexperience and insufficient knowledge of ecology. Many believed that the best way to save the pandas was to cage them. As a result, pandas were caged at any sign of decline, and suffered from terrible conditions. Because of pollution and destruction of their natural habitat, along with segregation due to caging, reproduction of wild pandas was severely limited. In the 1990s, however, several laws (including gun control and the removal of resident humans from the reserves) helped the chances of survival for pandas. With these renewed efforts and improved conservation methods, wild pandas have started to increase in numbers in some areas, even though they still are classified as a [rare species](#).

In 2006, scientists reported that the number of pandas living in the wild may have been underestimated at about 1,000. Previous population surveys had used conventional methods to estimate the size of the wild panda population, but using a new method that analyzes [DNA](#) from panda [droppings](#), scientists believe that the wild panda population may be as large as 3,000.<sup>[21]</sup> Although the species is still endangered, it is thought that the conservation efforts are working. As of 2006, there were 40 panda reserves in China, compared to just 13 reserves two decades ago.<sup>[10]</sup>

The Giant Panda is among the world's most adored and protected rare animals, and is one of the few in the world whose natural inhabitant status was able to gain a [UNESCO World Heritage Site](#) designation. The [Sichuan Giant Panda Sanctuaries](#), located in the southwest [Sichuan](#) province and covering seven natural reserves, were inscribed onto the World Heritage List in 2006.<sup>[52][53]</sup>

Not all conservationists agree that the money spent on conserving pandas is money well spent. [Chris Packham](#) has argued that breeding pandas in captivity is "pointless" because "there is not enough habitat left to sustain them".<sup>[54]</sup> Packham argues that the money spent on pandas would be better spent elsewhere,<sup>[54]</sup> and has said that he would "eat the last panda if I could have all the money we have spent on panda conservation put back on the table for me to do more sensible things with,"<sup>[55]</sup> though he has apologized for upsetting people who like pandas.<sup>[56]</sup> He points out that "The panda is possibly one of the grossest wastes of conservation money in the last half century."<sup>[55]</sup>

## Reproduction

Initially the primary method of breeding Giant Pandas in captivity was by [artificial insemination](#), as they seemed to lose their interest in [mating](#) once they were captured.<sup>[57]</sup> This led some scientists to try extreme methods such as showing them [videos of giant Pandas mating](#)<sup>[58]</sup> and giving the males [Viagra](#).<sup>[59]</sup> Only recently have researchers started having success with captive breeding programs, and they have now determined that

Giant Pandas have comparable breeding to some populations of the [American Black Bear](#), a thriving bear family. The current reproductive rate is considered one young every two years.<sup>[12][22]</sup>

Giant Pandas reach sexual maturity between the ages of four and eight, and may be reproductive until age 20.<sup>[60]</sup> The mating season is between March and May, when a female goes into her [estrous cycle](#) which lasts for two or three days and only occurs once a year.<sup>[61]</sup> When mating, the female is in a crouching, head-down position as the male mounts her from behind. [Copulation](#) time is short, ranging from thirty seconds to five minutes, but the male may mount her repeatedly to ensure successful fertilization. The [gestation](#) period ranges from 95 to 160 days.<sup>[61]</sup> Cubs weigh only 90 to 130 grams (3.2 to 4.6 ounces), which is about 1/800 of the mother's weight.<sup>[36]</sup>

If twins are born, usually only one survives in the wild. The mother will select the stronger of the cubs, and the weaker will die. It is thought that the mother cannot produce enough milk for two cubs since she does not store fat.<sup>[62]</sup> The father has no part in helping raise the cub.

When the cub is first born, it is pink, blind, and toothless.<sup>[63]</sup> A Giant Panda cub is also extremely small, and it is difficult for the mother to protect it because of the baby's size. It nurses from its mother's breast 6 to 14 times a day for up to 30 minutes at a time. For three to four hours, the mother may leave the den to feed, which leaves the cub defenseless. One to two weeks after birth, the cub's skin turns gray where its hair will eventually become black. A slight pink color may appear on cub's fur, as a result of a [chemical reaction](#) between the fur and its mother's [saliva](#). A month after birth, the color pattern of the cub's fur is fully developed. A cub's fur is very soft and coarsens with age. The cub begins to crawl at 75 to 80 days;<sup>[36]</sup> mothers play with their cubs by rolling and wrestling with them. The cubs are able to eat small quantities of bamboo after six months,<sup>[64]</sup> though mother's milk remains the primary food source for most of the first year. Giant Panda cubs weigh 45 kg (100 pounds) at one year, and live with their mothers until they are 18 months to two years old. The interval between births in the wild is generally two years.

In July 2009, Chinese scientists confirmed the birth of the first cub to be successfully conceived through artificial insemination using frozen sperm.<sup>[65]</sup> The cub was born at 07:41 on 23 July that year in [Sichuan](#) as the third cub of You You, an 11-year-old.<sup>[65][66][67]</sup> The technique for freezing the sperm in [liquid nitrogen](#) was first developed in 1980 and the first birth was hailed as a solution to the problem of lessening Giant Panda semen availability which had led to in-breeding.<sup>[67][68]</sup> It has been suggested that panda semen, which can be frozen for decades, could be shared between different zoos to save the species.<sup>[65][66]</sup> It is expected that zoos in destinations such as [San Diego](#) in the [United States](#) and [Mexico City](#) will now be able to provide their own semen to inseminate more Giant Pandas.<sup>[68]</sup>

Attempts have also been made to reproduce giant pandas by [interspecific pregnancy](#) by implanting cloned panda embryos into the uterus of an animal of another species. This has resulted in panda fetuses, but no live births.<sup>[69]</sup>

## Name

There is no conclusive explanation of the origin of the word "panda". The closest candidate is the [Nepali](#) word *ponya*, possibly referring to the adapted wrist bone. The [Western world](#) originally applied this name to the Red Panda. Until 1901, when it was erroneously stated that it was related to the Red Panda, the Giant Panda was known as "mottled bear" (*Ailuropus melanoleucus*) or "particolored bear".<sup>[70]</sup>

In most encyclopedic sources, the name "panda" or "common panda" originally referred to the lesser-known [Red Panda](#),<sup>[71]</sup> thus necessitating the inclusion of "giant" and "lesser/red" prefixes in front of the names. Even as of 2010 the *Encyclopædia Britannica* still used "giant panda" or "panda bear" for the bear<sup>[72]</sup> and simply "panda" for the [Ailuridae](#),<sup>[73]</sup> despite the popular usage of the word "panda".

Since the earliest collection of Chinese writings, the [Chinese language](#) has given the bear 20 different names, such as 花熊 (hua xiong) "spotted bear" and 竹熊 (zhu xiong) "bamboo bear".<sup>[74]</sup> The most popular names in China today are 大熊貓 (dà xióng māo), literally "large bear cat", or just 熊貓 (xióng māo), "bear cat". The name may have been inspired by the Giant Panda's eyes, which have pupils that are cat-like vertical slits - unlike other [bear species](#), which have round pupils.<sup>[75]</sup>

In [Taiwan](#), the popular name for panda is the inverted 貓熊 (māo xióng) "cat bear," even though many encyclopedia and dictionaries in Taiwan still use "bear cat" as the correct name. Some linguists argue that, in this construction, "bear" instead of "cat" is the base noun, making this name more grammatically and logically correct, which may have led to the popular choice despite official writings.<sup>[74]</sup>

## In popular culture

The first sequences of pandas in the wild were shot by Franz Camenzind for [American Broadcasting Company](#) (ABC) in about 1982. They were bought by the [British Broadcasting Corporation](#) (BBC) Natural History Unit for their weekly magazine show *Nature*.

Recently, [Natural History New Zealand](#) (NHNZ) has featured pandas in two documentaries. *Panda Nursery* (2006) featured China's [Wolong National Nature Reserve](#) in the mountains in [Sichuan](#) Province; forty Giant Pandas and a dedicated team of staff play a crucial role in ensuring the survival of the species. As part of the Reserve's panda breeding program, a revolutionary new method of rearing twin cubs called 'swap-raising' has been developed. Each cub is raised by both its natural mother and one of the Reserve's veterinarians, Wei Rongping, to increase the chances of both cubs surviving. *Growing Up: Giant Panda* (2003) featured Chengdu Giant Panda Center in south-west China as one of the best in the world. Yet with female pandas' short fertility cycles and low birth rates, raising the captive panda population is an uphill battle.