ALL ABOUT URSIDAE

BEAR EDUCATIONAL GUIDELINES

OUWEHANDS DIERENPARK

BÓRIS ZOO NYÍREGYHÁZA HUNGARY

EAZA BEAR TAG

ALL ABOUT URSIDAE

Bear educational guidelines

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Contact

Zsuzsa Petró; EAZA Bear TAG Education Adviser
E-mail: education@sostozoo.hu

Project supervisor

- **José Kok**
  - Zoological Director at Ouwehands Dierenpark
  - EAZA Bear TAG chair
- **Lydia Kolter**
  - Research advisor of the EAZA Bear TAG
  - Member of the IUCN SSC Bear Specialist Group

Writers

- **Zsuzsa Petró**
  - Member of the SSC IUCN Bear Specialist Group
  - Education Advisor of the EAZA Bear Taxon Advisory Group (TAG)
  - Head of Education Department / SóstóZoo Hungary
- **Amelia Griep**
  - Educator at Ouwehands Zoo
- **Eliza Bányácskai**
  - Graphic designer at Sóstó Zoo
- **Lydia Kolter**

Graphic designer

- **Eliza Bányácskai**

Creative designers

- **Zsuzsa Petró**
- **Eliza Bányácskai**

Lector

- **Will Walker**

Special thanks to...

- **Dave Garshelis**
  - IUCN Species Survival Commission Bear Specialist Group Chair
- **Gabriella Fredriksson**
  - Member of the IUCN SSC Bear Specialist Group and of the Sun Bear Expert Team
- **Matthew Hunt**
  - Member of the IUCN SSC Bear Specialist Group and a co-chair of the Asiatic Black Bear Expert Team
- **Nishith Dharaiya**
  - Member of the IUCN SSC Bear Specialist Group and a co-chair of the Sloth Bear Expert Team

- **Korkeasaari Zoo, Finland**
- **Ouwehands Zoo, Netherlands**
- **Riga Zoo, Latvia**
- **Orientarium Zoo, Poland**
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- **Wildlife SOS**
- **Sóstó Zoo**

- **Lajos Berde**
- **Balázs Búzás**
- **Fakhar-i-Abbas**
- **Dong-Hyuk Jeong**
- **Djuro Huber**
- **Máté Hegedűs**
- **Andrew Derocher**
- **Réka Vass**
- **Veszprém Zoo**
- **San Diego Zoo Wildlife Alliance**

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EAZA Bear TAG Mission Statement

“To ensure healthy populations of bears within EAZA collections as well as promoting and collaborating with conservation and research partners both in-situ and ex-situ.

To be at the forefront of excellence in animal welfare and husbandry, so that the bears can act as ambassadors for their wild congeners and their habitats; and to share our passion about bears to the wider community.”

Introduction

When someone mentions bears, for many people, instantly the brown bear comes to mind. However, the word "bear" covers more than just one species. In fact there are **eight bear species** in total, including some that you may never heard about, which inhabit different parts of the world.

(2)

These animals play an important role in their environment. Since most of them are omnivorous, they spread seeds of plants, clean up carcasses and in some cases may also keep the herbivore populations in check by predation.

(3)

Our goal

Being a bear does not mean they have no enemies. They face numerous natural and manmade threats and as a result, many bear species became threatened as time went by.

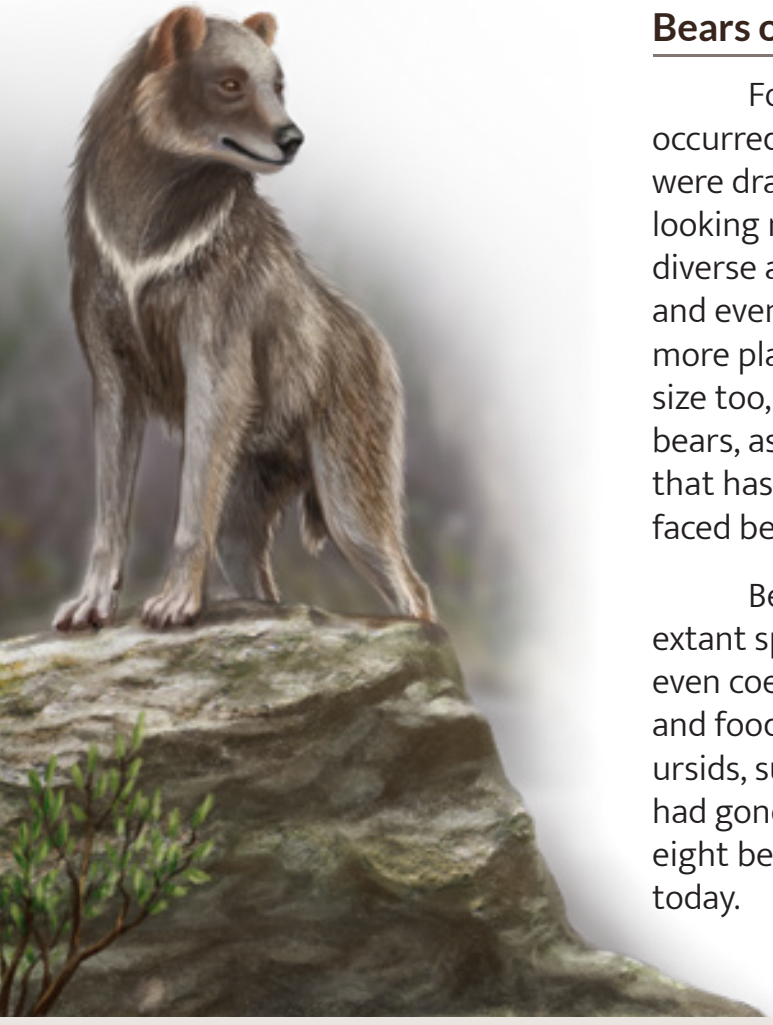
Our goal is to educate people about bears as education is a key factor to raise awarness for their importance and to understand the bears' behavior and needs better.

CHAPTER 1
Prehistoric bears

How long have bears been around?

(4)

The family of bears extend back to prehistoric times when many, now extinct, species of bears inhabited all continents except Australia and the Antarctic, sharing their habitat with other iconic prehistoric animals such as woolly rhinos, mammoths, sabertooth cats, cave lions and even direwolves.



Bears of othe past

Fossil remains indicate that these animals occurred as early as the earliest Oligocene when bears were drastically different from their later cousins, looking more canid in appearance. Their diet were as diverse as their look: some were hypercarnivorous and even pursued their prey while some preferred more plant-based food in their menu. They varied in size too, but some were even larger than today's polar bears, as the largest terrestrial mammalian carnivora that has ever lived is believed to be the giant short-faced bear *(Arctotherium angustidens)*.

Bears of later epochs were more similar to the extant species and some from the Pleistocene were even coexisting with humans competing for shelter and food. During the last Ice Age, many notable ursids, such as the Cave and Giant Short-faced bear, had gone extinct. However, the family survived with eight bear species, around the world, being alive today.

Early bears

Skull representation of Hemicyon ursinus ▲

The very first bears that roamed on our planet lived roughly around 34 to 19 million years ago which encompasses the period between early Oligocene to early Miocene. These animals belong to the extinct subfamily *Hemicyoninae,* also known as "dog-bears", and looked nothing like the bears we know today.

Compared to modern Ursidae some genera, such as the Hemicyon, had a longer back, and their feet structure indicates digitigrade posture. Hemicyoninae bears are believed to have been omnivores but examinations of the dental structure and body proportions suggests that some genera were more of a hypercarnivore, thus consumed more meat and hunted actively.

The three subfamilies of bears known today (Ursinae, Tremarctinae, Ailuropodinae) have developed from this ancient, odd-looking bear.

Rise of modern-age bears

There are many extinct bear species in the family Ursidae, however the most well-known of all are the cave and the short-faced bears.

Cave bear *(Ursus spelaeus)*

The history of modern-age bears began 1.5 million years ago. The cave bear *(Ursus spelaeus)* appeared in Europe 250 to 300 thousand years ago. Its name comes from the fact that its bones were found in large numbers mainly in European caves where they hibernated.

Cave bears lived throughout Europe and became extinct 24,000 years ago during the last Ice Age. The reason for their disappearance is speculated to be depleted food sources, but evidence indicates that humans also played a major role in their extinction.

Skeleton of a *Cave bear* exhibited in the Natural History Museum of Denmark (5)

Giant short-faced bear *(Arctodus simus)*

One of the most formidable bears that have ever lived are some of the short-faced bears, among which the largest species comes from the Arctotherium genus.

The most well known, however is the **Giant short-faced bear** *(Arctodus simus)*. Compared to modern bears it had unusually short muzzle, slimmer limbs and elongated forelegs with a height of 1-1.5 m at the shoulder, whilst reached over 2.5-3 m tall when standing up. Its average weight was around 700 to 800 kg, and in some individuals even 1000 kg. They could have competed with saber-toothed cats, dire wolves and lions for food. Its extinction, at the end of the last Ice Age around 11,000 years ago, may have been caused by the disappearance of the large herbivores, and competition with brown bears.

Other prehistoric ursids

There are many lesser-known extinct bear species with unique and interesting features. Let's check out some of them!

Ballusia orientalis | Agriotherium africanum | Kretzoiarctos beatrix

Agriotherium africanum is the only bear known to have inhabited sub-Saharan Africa.

Size differences

Ancient bears came in vastly different sizes. From as small as roughly 30 cm at the shoulders *(Ballusia orientalis)* to the largest known with 1.8 m height *(Arctotherium angustidens)*. In the chart below, we compare the estimated sizes of an early bear and two of the most iconic bears of the late Pleistocene megafauna.

1	Hemicyon ursinus	*65-160 kg*	*150-230 cm*	*70-90 cm*
2	Ursus spelaeus	*300-600 kg*	*210-300 cm*	*130-160 cm*
3	Arctodus simus	*625-950 kg*	*230-290 cm*	*150-180 cm*

Cave bears were one of the many extinct species depicted on cave paintings.

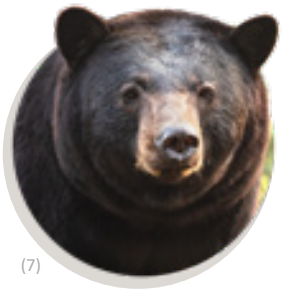
CHAPTER 2
Bears of the World

Today there are eight extant bear species inhabiting different parts of the world, adapted to various environmental conditions that results in their unique appearance, diet and behavior. Their conservation status varies: only two species are Least Concern, all others are listed as Vulnerable.

The **most commonly known** species are the brown bear, polar bear, American black bear and giant panda while the **lesser known** ones are the Asiatic black bear, sloth bear, sun bear and Andean bear.


(6)

Andean bear
VULNERABLE


(7)

American black bear
LEAST CONCERN


(8)

Asiatic black bear
VULNERABLE


(9)

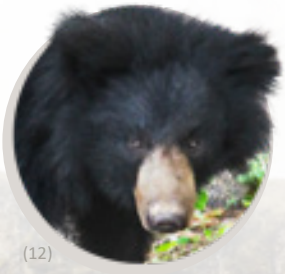
Brown bear
LEAST CONCERN


(10)

Giant panda
VULNERABLE


(11)

Polar Bear
VULNERABLE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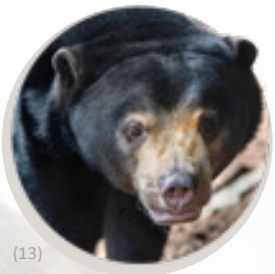
Sloth bear
VULNERABLE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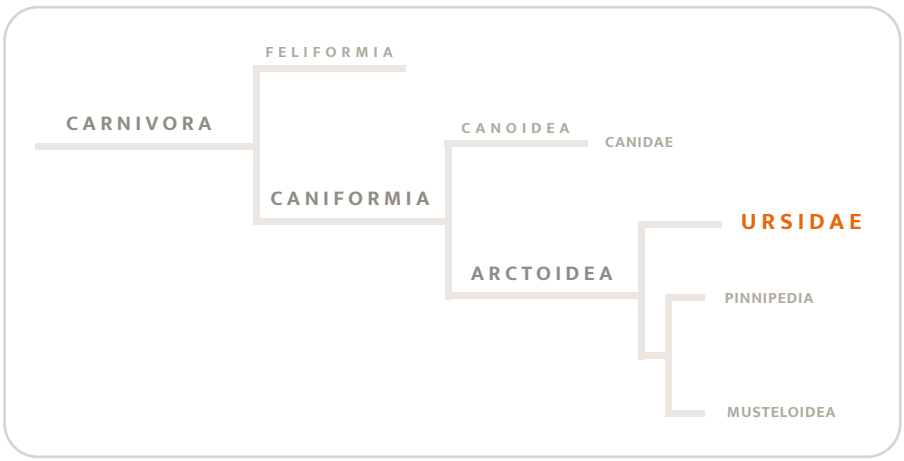
Sun bear
VULNERABLE

Global conservation status of bears based on the IUCN Red List.

Family tree



Family
Subfamily
Genus

URSIDAE

URSINAE

TREMARCTINAE

AILUROPODINAE

URSUS

HELARCTOS

MELURSUS

TREMARCTOS

AILUROPODA

Brown bear
(Ursus arctos)

Polar bear
(Ursus maritimus)

Asiatic black bear
(Ursus thibetanus)

American black bear
(Ursus americanus)

Sun bear
(Helarctos malayanus)

Sloth bear
(Melursus ursinus)

Andean bear
(Tremarctos ornatus)

Giant panda
(Ailuropoda melanoleuca)

Characteristics

(14)

The eight bear species vary in size and shape. Their appearance is so distinct that one can easily distinguish them from each other. Not only their coat colour varies but also they have many physical traits that make each species unique.

They are all bears, so why are they different?

Main reason is **adaptation to the environment.**

These characteristics match their lifestyle, and with these differences, they fit into their environment perfectly. For example, most bears have strong claws and bare feet that aids in climbing. The exception to this is the giant panda and polar bear, whose feet are mostly covered in fur, which helps in insulation and also to not slip on the ice.

(15)

How to tell bears apart?

The shape and size of their body alone can tell a lot. When taking a closer look, the smaller details become more noticable, such as the length and shape of the snout, claws, legs and ears.

Aside from these traits, another telltale is the coat: is it shaggy, thick or short? It is important to note the colour as well, and if any markings are present, notably on the chest.

General features

Though each bear species has features that make them unique and different, there are some key characteristics that all bears have in common.

(16)

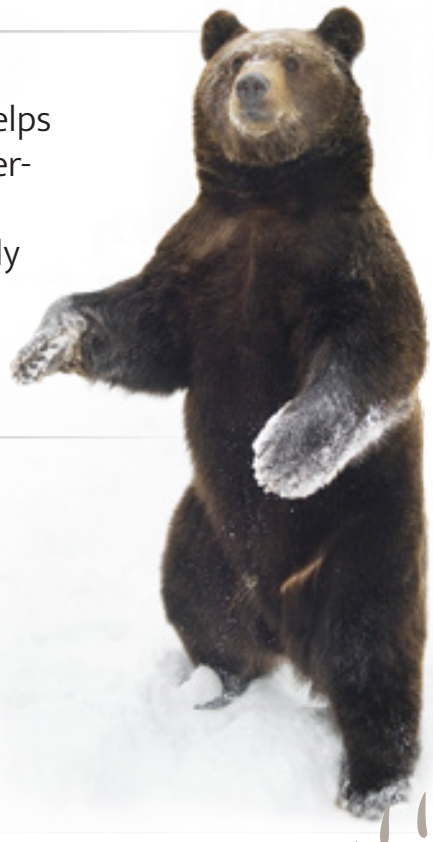
Body structure

- **They are quadruped animals,** which means that they walk on all fours.
- All bears are **plantigrade** on their hind legs, meaning the heel touches the ground. Additionally, the "big toe" happens to be on the outside. However in several bear species (brown bears, American black bears, polar bears) the heel of front feet are raised off the ground.
- Although **they vary in sizes**, they all have a somewhat **stocky appearance**.

Their body is covered with fur

Their **fur is double-layered**: the denser bottom layer helps with the insulation, and the thinner top coat has a water-repellent effect like a "raincoat".
The bottom layer, which not all bears have, is completely shed out in summer.

Coat colour, fur length and thickness differ by species.



(17)

- Their **hind legs bear the weight of their whole body;** therefore, they can stand or even walk on them. (Sun bears are especially good at this.)
- **They have five curved and non-retractable claws** on their feet, which aids in finding food and climbing.

Small features

- **Small, forward-looking eyes,** which allow focusing and three-dimensional vision.
- **Ears are small and rounded** (with the exception of the Asiatic black bear).
- **Tail is relatively short.**
  (Longest tail is of the giant panda.)

(18)

(19)

Teeth

Bears have large canines and flat molar teeth. Apart from Sloth bears, they share the same dental formula with some variation in the numbers of premolars.

Senses

- They have **sensitive hearing** that helps them detect danger from a distance. They can hear in a wide frequency range and can even hear high-pitched sounds, just as dogs can.
- We know that some bears have **at least dichromatic vision**: they see some colours but not in a wide range as humans or primates do. Colour vision is important when searching for fruits and berries.
- Bears have a **keen sense of smell** that helps them find food and detect other bears too. They gain an extensive amount of information from their environment through their olfactory sense.

(see "Communication" chapter for more information)

(20)

Skills

(21)

Bears in general are **very good climbers,** but some species are better at it than the others. Smaller species, like the sun bear, are more arboreal and use their climbing skills to find food, shelter and resting place. Larger species, like the brown bear, however, are more terrestrial and not as adept climbers.

Their habitat also makes a difference. For example, polar bears have no need to climb trees. Instead, they use their climbing skills to traverse the harsh terrain of their environment.

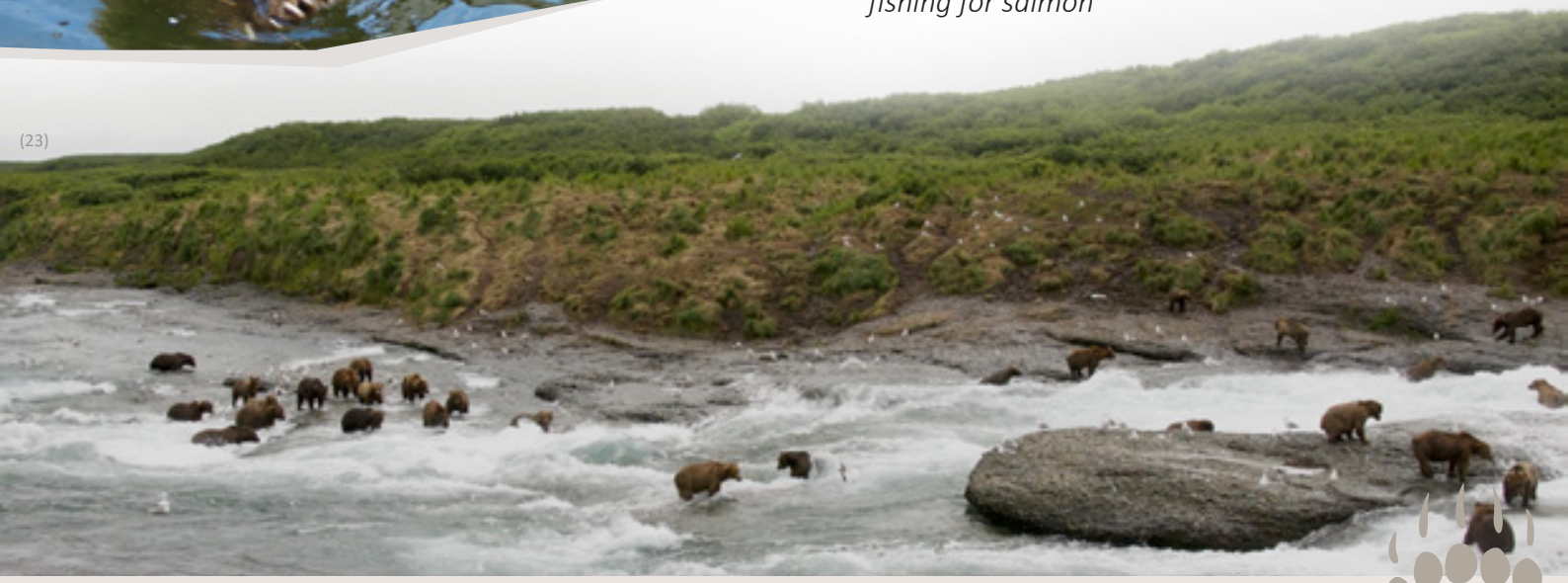
(22)

They are **good swimmers** and they cover short distances with ease. Some bears also acquire food from water sources, like the brown bears that feast on salmon.

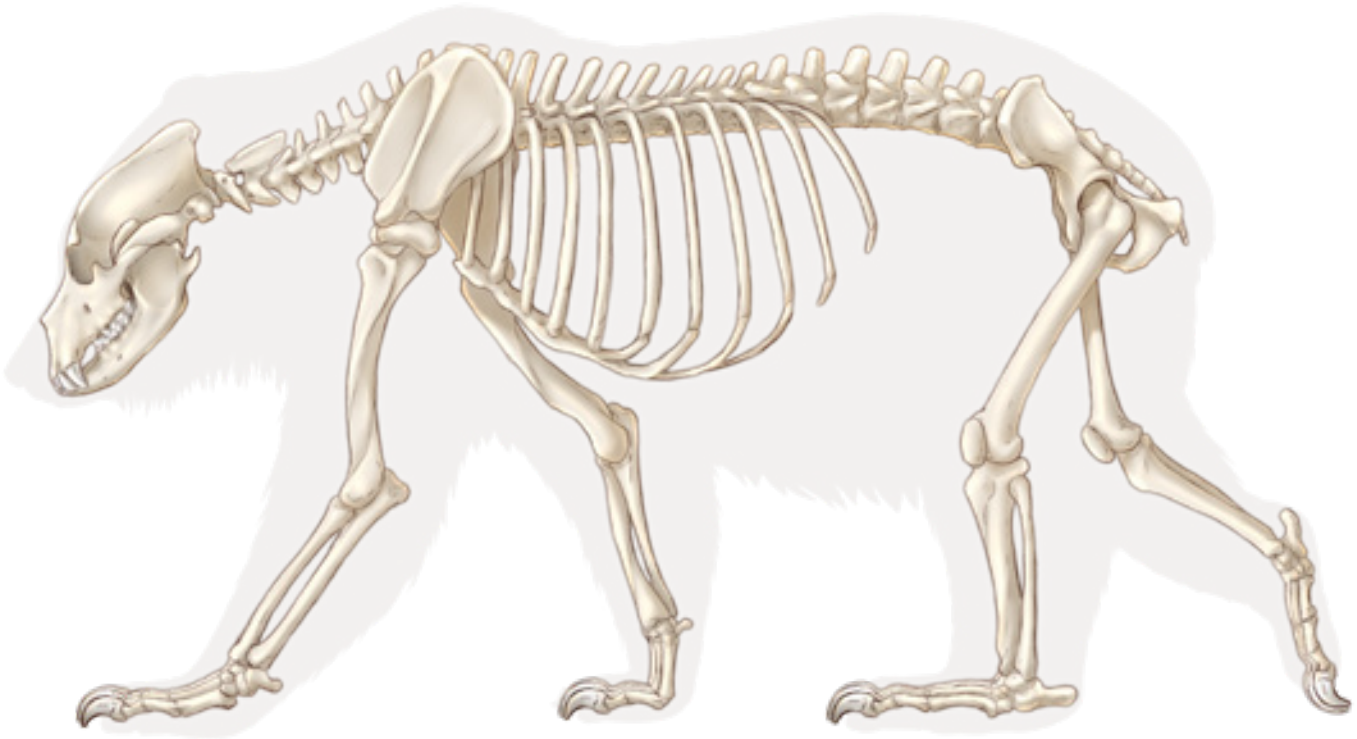
Out of all the bear species, polar bears are the most adept swimmers, and have been known to swim large distances. They also dive for seaweed and to approach a basking seal.

◀ *McNeil River, Alaska - Brown bears fishing for salmon*

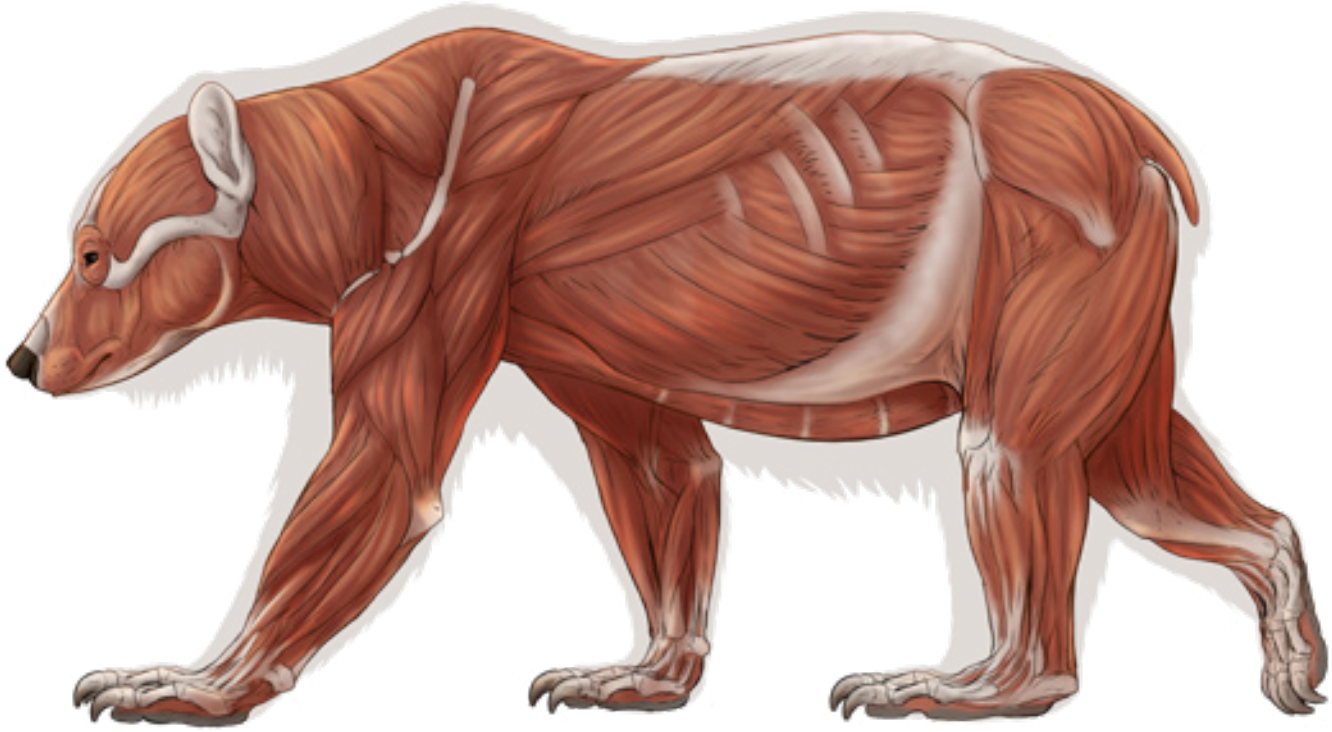
(23)



Anatomy



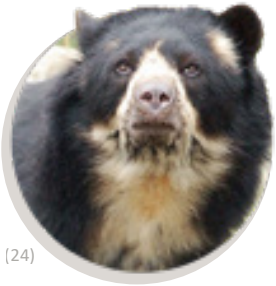
Skeletal anatomy



Muscular anatomy

Andean bear

(Tremarctos ornatus)



(24)

- They are **medium sized** bears with adult females being a third smaller than males.
- Even though taxonomically they are the only "short-faced" bear species alive today, their **shorter muzzle** compared to other bear species is an optical illusion.

Coat and markings

Their coat colour is **black or dark reddish-brown** sometimes with a yellowish-white **spectacle-shaped marking** around the eyes, which may stretch down to the chest. The name "spectacled bear" comes from this facial feature. This face marking varies between bears from very pronounced eye rings to complete absence.

Legs and feet

Andean bears are good climbers and spend part of their life high up, among the foliage. They climb steep rocky outcrops and trees in search of food.

- To aid climbing, they have **longer forelimbs** than hindlimbs. Their **soles are bare** whilst the distant parts of the feet, close to the toes, are haired.

(25)

Strong, curved and laterally flattened claws helps the Andean bear to hold on to trees.

- Similar to giant pandas they also have a small **false thumb** that might help grabbing, and hold on to their food. This also makes arboreal activity easier.

(26)

Key features in a nutshell

30-200 kg

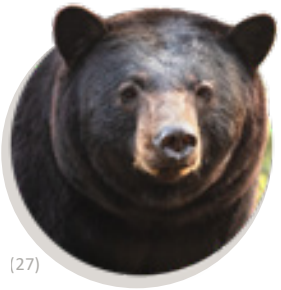
88-220 cm

60-90 cm

- **Size, build:** medium sized
- **Features:** seemingly short muzzle, face marking
- **Coat:** black or dark reddish-brown
- **Markings:** yellowish-white markings on face, throat and chest
- **Legs:** longer forelegs, bare soles, false thumb, strong and curved claws

American black bear

(Ursus americanus)



(27)

- They are **medium sized** bears with massive legs and thick neck. Despite their blocky appearance, they are agile and quick over short distances. They can reach speeds of up to 50km/h.
- They have a **straight face**, more **pronounced ears,** and prehensile-like tongue that aids them to feed on small animals such as ants, and is also helpful when picking fruits and berries.

Coat colour variations

Their coat **colour varies** mainly **from black to various shades of brown** with a pale coloured muzzle. In some cases, a white spot or larger crescent is present on the chest called "chest blaze". Other colour variations also occur like **bluish-grey and blonde**. In some populations **white** bears rarely occur. *(See "Colour variations" page)*

Adaptability

American black bears are highly adaptable and are able to live in very different environments such as decidious forests, arctic tundra, deserts, and sub-tropical forests.

- They are excellent swimmers and often cross rivers whilst searching for food. With their **strong, recurved claws,** they are also skillful at climbing trees and rocky surfaces.
- Whilst they have **strong shoulder musculature;** there is no hump which means no larger muscle mass around the shoulder blade.

(28)

(29)

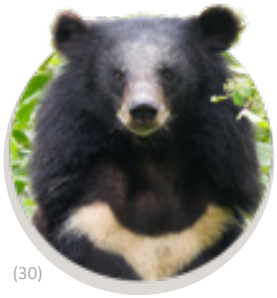
Key features in a nutshell

- **Size, build:** medium sized, blocky build
- **Features:** straight face, pronounced ears, pale colored muzzle
- **Coat:** black, brown, blonde, bluish-grey, white
- **Legs:** massive limbs, strong and recurved claws

60-300 kg
120-200 cm
70-105 cm

Asiatic black bear

(Ursus thibetanus)



(30)

- They are **medium sized** bears with a stocky build, straight face and **huge, rounded ears**.
- Their typical **coat colour is black** however, rare colour variations are also possible such as dark reddish-brown and blonde. Muzzle colour also varies from light to dark brown, sometimes with a white chin, but generally it is dark in colour.

Chest marking

A **"V" or crescent shaped white, cream or yellowish marking** is generally present on the chest but rarely can be absent in some individuals. Its size, thickness and shape varies from bear to bear.

The common name "moon bear" is derived from this crescent-shaped chest marking.

Fur

They have longer fur around the neck that forms a characteristically **large mane**. Its size differs so much that in some regions it is barely recognised. Along with the mane, hair length and thickness also varies regionally.

(31)

They are good climbers. Bare and large soles along with **short but strong claws** aid in climbing steep rocks and trees where they rest and forage.

(32)

Key features in a nutshell

- **Size, build:** medium sized, stocky build
- **Features:** huge and rounded ears, large mane
- **Coat:** black, rarely dark reddish-brown and blonde
- **Markings:** V or crescent shaped white, cream or yellow coloured chest marking
- **Legs:** large soles, short and strong claws

50-200 kg

110-190 cm

60-100 cm

Brown bear

(Ursus arctos)

(33)

- They are **large bears** with a robust and strong build. After the polar bear, they are the second largest bears and are the most widespread bear species; therefore, their look is widely known.
- They have a **massive head** and prominent nose, sometimes with a noticable forehead slope.

Coat

They generally have long and thick fur with sometimes longer hairs around the neck. The colour of the coat is **brown but its shade varies from as dark as almost black to as light as blonde**. Often they have darker legs and lighter brown head.

In some populations they may also have a cream-coloured "collar" on the chest that wraps around the neck.

Adaptability

Like American black bears, brown bears are also adapted to various environments inhabiting regions from the far north to even the Gobi Desert.

(34)

To help the bears dig effectively, they have larger muscle mass around the shoulder blade that gives them the **characteristical shoulder hump**.

- **Straight, long claws** at the forepaws are excellent for digging out roots, tubers and cavities but not as good for climbing trees.

(35)

Key features in a nutshell

- **Size, build:** large sized, robust and strong build
- **Features:** massive head, prominent nose, shoulder hump
- **Coat:** various shades of brown
- **Legs:** strong legs, long claws

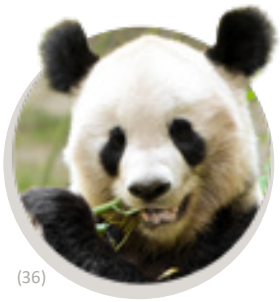
90-400 kg

140-220 cm

70-150 cm

Giant Panda

(Ailuropoda melanoleuca)



(36)

- They are **medium sized** bears with massive, wide head and short muzzle. They have strong jaw muscles that gives them a high bite force, highest among all bears.
- The **shape of their nose** is different from that of other bears as it is more **flat and broad**.

Coat

Their fur is dense and oily. Its thickness helps to maintain their body temperature while the fur's oily layer protects them from rain.

Their coat is yellowish-white with black legs, strip across the shoulders, patches around the eyes and ears. In the Qinling population brownish fur colour instead of black were also spotted.

(37)

Front paws have a **false "thumb"** or sixth finger. It is a finger-like elongation of a wrist bone which makes it easier to grab and hold the bamboo shoots.

(38)

Key features in a nutshell

- **Size, build:** medium sized
- **Features:** massive and wide head, short muzzle, flat and broad nose, sixth "finger"
- **Coat:** yellowish-white with black legs, ears, strip across the shoulder, patch around the eyes

70-150 kg

120-150 cm

60-100 cm

Polar bear

(Ursus maritimus)

(39)

- Polar bears are the **largest of all bears** and the largest living land carnivore. They have long, slender neck and head with the male's head being less wide than their neck.
- Their **ears are quite small** compared to other bear species, which results in reduced heat loss.

Coat

Coat colour is **seemingly white**, but in reality, the long guard hairs are actually **hollow and transparent** while the thinner undercoat is colourless. The hollow hairs trap and reflect the light that gives the bears their white appearance.

In contrast, they have **black skin**, nose and paw pads.

Adaptability

Polar bears are cosidered as marine mammals since they mainly live on sea ice and are adapted to the harsh conditions of the Arctic.

- Their **large paws** act like paddles in the water, making them strong swimmers whilst on land they act like snowshoes, making it easier to walk on snowy surfaces.

(40)

The **soles are hairy** which not only help the bear with thermal insulation but also with walking on ice without slipping.

(41)

Key features in a nutshell

- **Size, build:** large sized
- **Features:** slender neck and head, small ears, black skin, nose and paw pads
- **Coat:** seemingly white, hollow and transparent fur
- **Legs:** strong legs, large paws, hairy soles, dark claws

180-600 kg
190-240 cm
120-160 cm

Sloth bear

(Melursus ursinus)

(42)

- They are **medium sized** bears with a fluffy looking appearance due to their **shaggy and loose coat**.
- Fur can even reach 30 cm in length and are especially long around the neck and back of the head which also covers the ears completely. In contrast they have a nearly naked muzzle and have no insulating undercoat.

Chest marking

The coat colour is **black with a cream-coloured "U" or "V" shaped marking** on the chest. Lighter coat colour variations occur, but are rare.

Adaptability

Sloth bears mainly eat fruits and social insects, such as termites and ants. They've adapted to their insect diet, which is called *myrmecophagy*, with several unique features.

- They have a **long snout and a large, elongated nose** with closeable nostrils, which is useful whilst feeding on insects.
- The **two upper incisors are missing**, which aids in sucking up termites.

(43)

They have completely bare and wide soles. Due to their **long, curved claws** they are not good climbers but it helps them in digging and breaking up termite mounds.

(44)

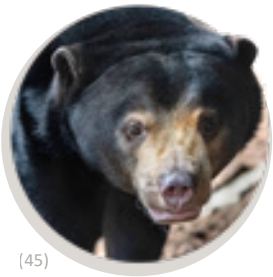
Key features in a nutshell

- **Size, build:** medium sized
- **Facial features:** long snout and elongated nose, missing two upper incisors
- **Coat:** black, loose and shaggy coat
- **Marking:** cream-coloured "U" or "V" shaped chest marking
- **Legs:** bare and wide soles, long and curved claws

60-140 kg
140-170 cm
65-85 cm

Sun bear

(Helarctos malayanus)



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- They are the **smallest bears** with a lighter and more slender build compared to other bears.
- Their **skin is very loose** and can form wrinkles especially on the forehead.

Coat and marking

Their coat is **black** whilst the muzzle is pale in colour which typically also surrounds the eyes.
There is a **crescent marking** on the chest which shape and thickness varies individually and is ocassionally speckled.
Its colour ranges from whitish to sun-yellow and orange.

(46)

They have **long and narrow tongue** to help them extract insects from tree crevices and reach honey deep inside the beehive. It is the longest tongue among bears, which can be up to 46 cm long.

- Their **forelimbs are slightly bowed inwards** with **strong, long, curved claws** that can reach up to 10 cm in length. These are useful tools to peel back tree bark and break into termite mounds.

(47)

Key features in a nutshell

- **Size, build:** small sized, more slender build
- **Features:** loose skin, long and narrow tongue
- **Coat:** black with pale-coloured muzzle
- **Marking:** white-yellow crescent shaped chest marking
- **Legs:** forelimbs slightly bowed inwards, strong, long claws

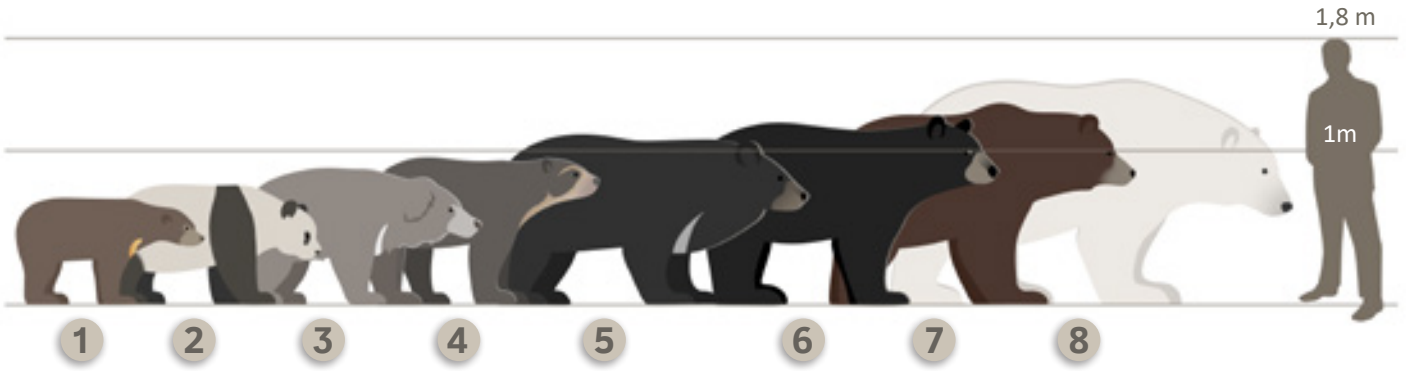
30-90 kg

100-140 cm

50-70 cm

Size differences

We've learned that the eight bear species differ from each other in size. These differences are due to diet and other environmental features they adapted to during evolution. There are some local differences too, due to nutrition. On this chart, we characterise their sizes by weight, length and shoulder height.

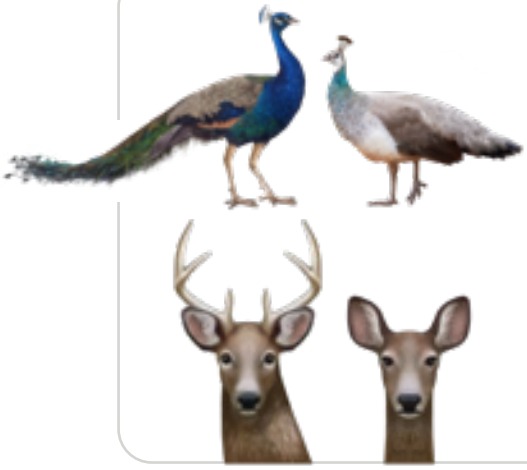


1	Sun bear	*30-90 kg*	*100-140 cm*	*50-70 cm*
2	Giant panda	*70-150 kg*	*120-150 cm*	*60-100 cm*
3	Sloth bear	*60-140 kg*	*140-170 cm*	*65-85 cm*
4	Andean bear	*30-200 kg*	*88-220 cm*	*60-90 cm*
5	Asiatic black bear	*50-200 kg*	*110-190 cm*	*60-100 cm*
6	American black bear	*60-300 kg*	*120-200 cm*	*70-105 cm*
7	Brown bear	*90-400 kg*	*140-220 cm*	*70-150 cm*
8	Polar bear	*180-600 kg*	*190-240 cm*	*120-160 cm*

Standing on their hind legs some bears can easily outsize an adult human.

Sexual dimorphism

In general



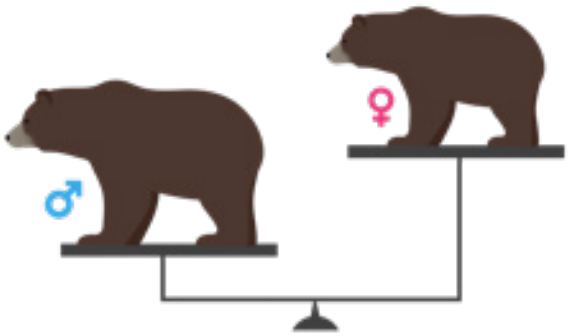
It means that there are morphological differences between the males and females of the same species. These differences can occur in size, weight, colouration and markings.

For example males of many bird species exhibit more colorful plumage, just think about the majestic peafowl. Among deer, aside from a few exceptions, males grow antlers as opposed to females.

In bears

As is the case with most mammals, sexual dimorphism in bears are shown in their sizes: in general, **male bears are larger than females**.

The extent of it, however, depends on the species. The larger the bear species, the more pronounced the size difference between the two sexes.



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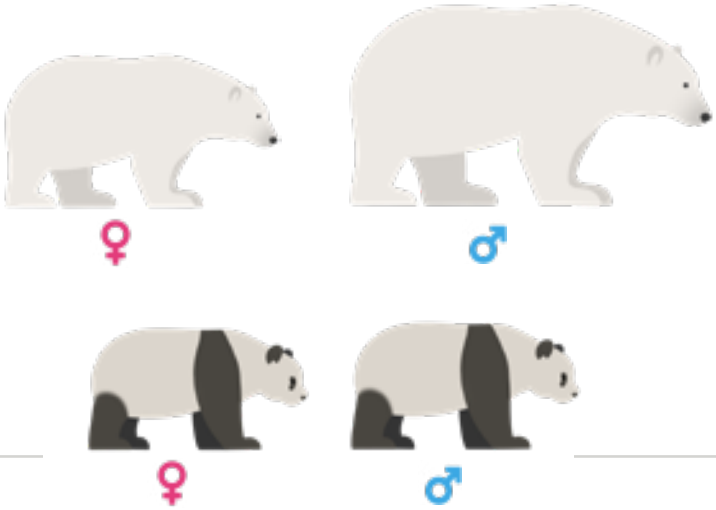
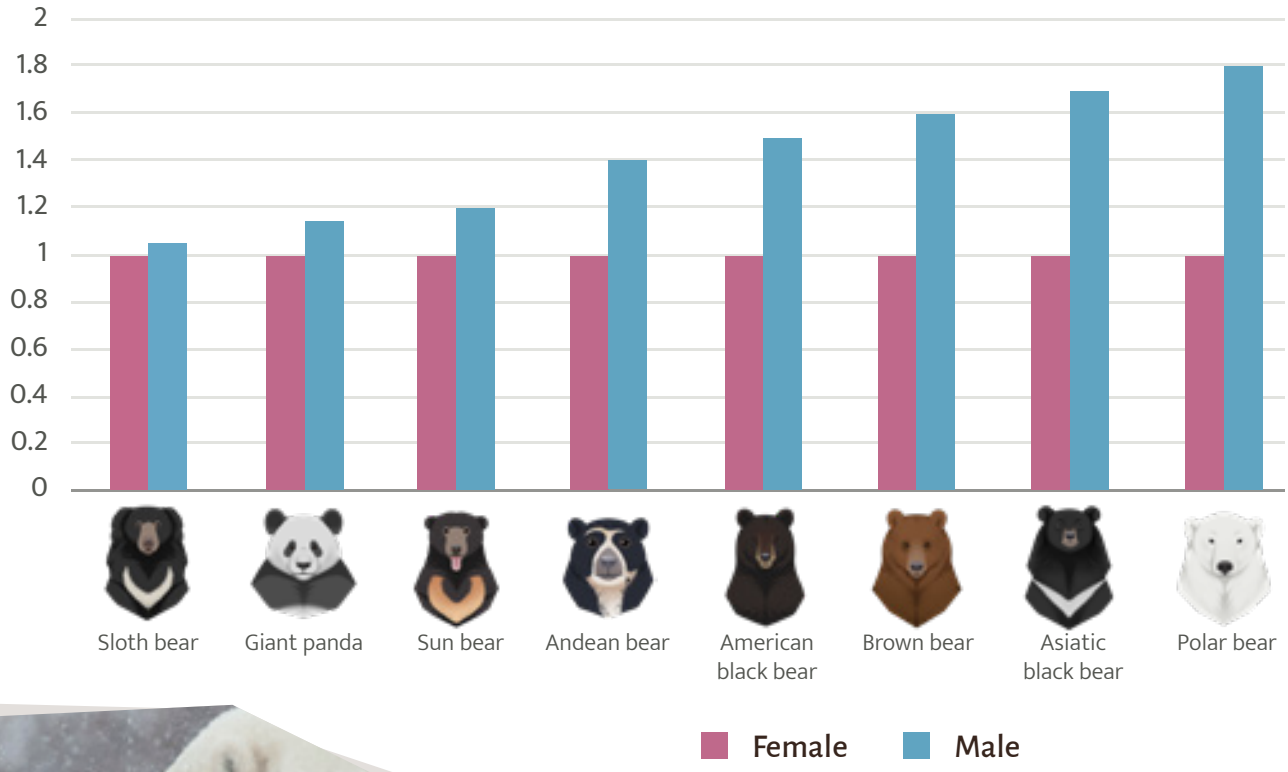
For example, a polar bear male can be **twice as heavy** as a female whilst a giant panda male is **only 20% heavier**, so the difference between the sexes is smaller.



Size ratio between sexes in all bear species



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Polar bear males have bigger canines than females, probably because they use them when fighting with other males. Researchers often find that the canines of older males are worn or even broken.

Colour variations

Whilst the appearance of each species vary drastically, some bear species are living in such a wide range that some populations adapted to different environments with distinctively coloured coats.

These are called colour variations and most notably occur in American black bear and brown bear populations.

Brown bear with varying coat color and white collar ▶

(48)

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In Asiatic black bears, Andean bears and Sloth bears dark reddish-brown and blonde colours may rarely occur.

◀ *Asiatic black bear color variation*

Some individuals in the giant panda population in the **Qinling mountains** have a brownish fur colouration to their markings instead of the common black.

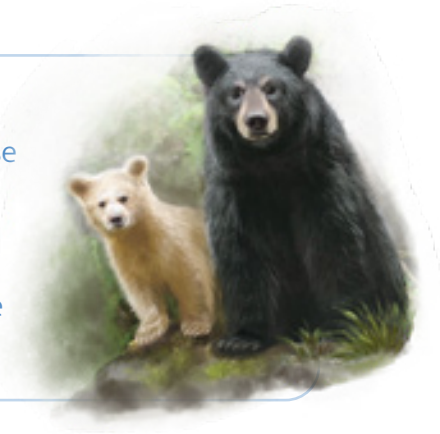
Brown bear colour variations

Brown bears live in diverse environments with different coat colours which can be varying shades of brown from very light to almost black. Let's check out some different colouration!

American black bear colour phases

The American black bear's colour variations are called phases. Depending on where the bear lives their fur **can come in different colouration.** Brown coats are more common in the western U.S. whereas black coats prevail in the eastern and northern parts of North America.

The **Kermode bear** is an exception however because they are normally black in colour. To have a white coloured offspring both parents need to carry the required gene.



Black

Brown

Blonde

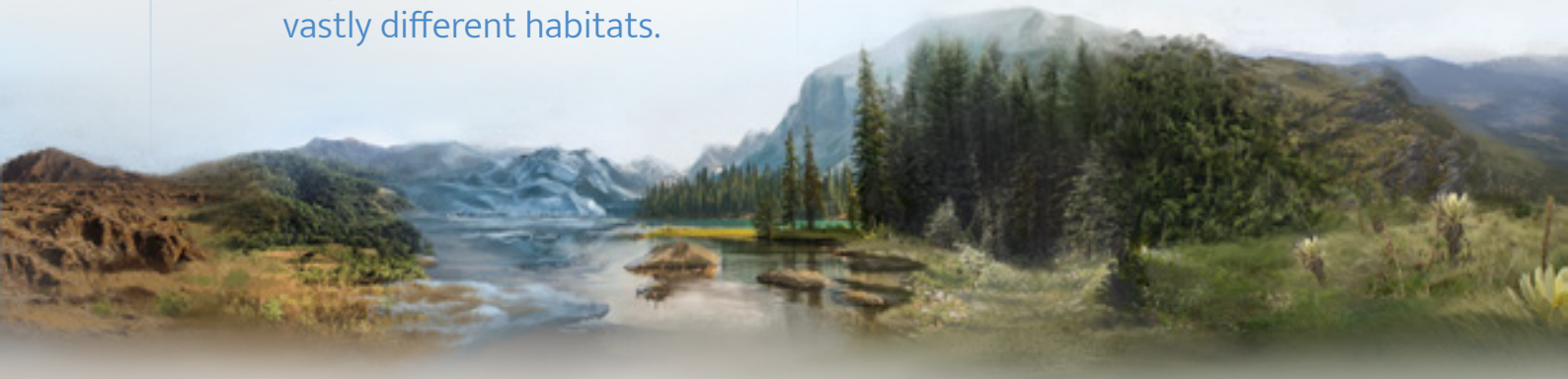
Cinnamon

Glacier

Kermode - Spirit bear

CHAPTER 3
Habitat and diet

The eight bear species are adapted by morphology and behaviour to vastly different habitats.



Their distribution and seasonal availability of food determine the feeding ecology of the species.

Beyond food and water, opportunities for resting and rearing young are essential habitat features.

(50)

▲ *Cohuila, Mexico - American black bear mother with cubs*

Diet of bears

Generally, most bears are omnivorous which means they eat both plant and animal-based food. Many species have plants as their main food source. However, what makes up the bulk of their diet varies greatly.

(51)

For example, polar bears mostly eat seals, as that is what their icy habitat offers, whilst giant pandas eat primarily bamboo.

(52)

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◀ *Termite mound*
Remnants from foraged terrestrial bromeliad ▲

Termites and fruits make up the bulk of sloth bear food. Sun bears too search for insects and their larvae in rotting wood whilst also consume fruits. Whereas bromeliads and figs are essential dietary components of Andean bears.

Generalists among bears

Bears living in more Northern regions, like brown bears, American black and Asiatic black bears are **more generalists** than other bear species.

(54)

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Their menu is changing with the seasons as in the spring carcasses of hoofstock, tubers and fresh vegetation are available, in summer fruits and in autumn nuts and mushrooms.

Mammals, including livestock, but also insect larvae make up part of their diet. In some regions salmons swimming up the rivers are an important food source.

East coast Russia - brown bear feeding on salmon ▶

(56)

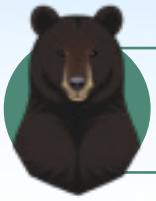
Do they really like honey?

Almost every bear species loves this sweet delicacy. Visiting the "honey bar" of bees in their habitat, bears can easily open up the beehives, located on ground or in trees, with their strong claws. Since their thick fur protects them from the stings, they can eat as much as they want.

Bears do not only lick up the honey, but they also eat the larvae (which appears to be more important than the honey itself) and the comb.

Distribution

Andean bear
(Tremarctos ornatus)



American black bear
(Ursus americanus)

Asiatic black bear
(Ursus thibetanus)

Brown bear
(Ursus arctos)

Giant panda
(Ailuropoda melanoleuca)

Polar bear
(Ursus maritimus)

Sloth bear
(Melursus ursinus)

Sun bear
(Helarctos malayanus)

- The Andean bear is the only bear species, found in South America.
- Bears never lived in Australia, Antarctica and Oceania.
- They are extinct in Northern Africa.

Andean bear

Also called as spectacled bear,
the only bear species in South America

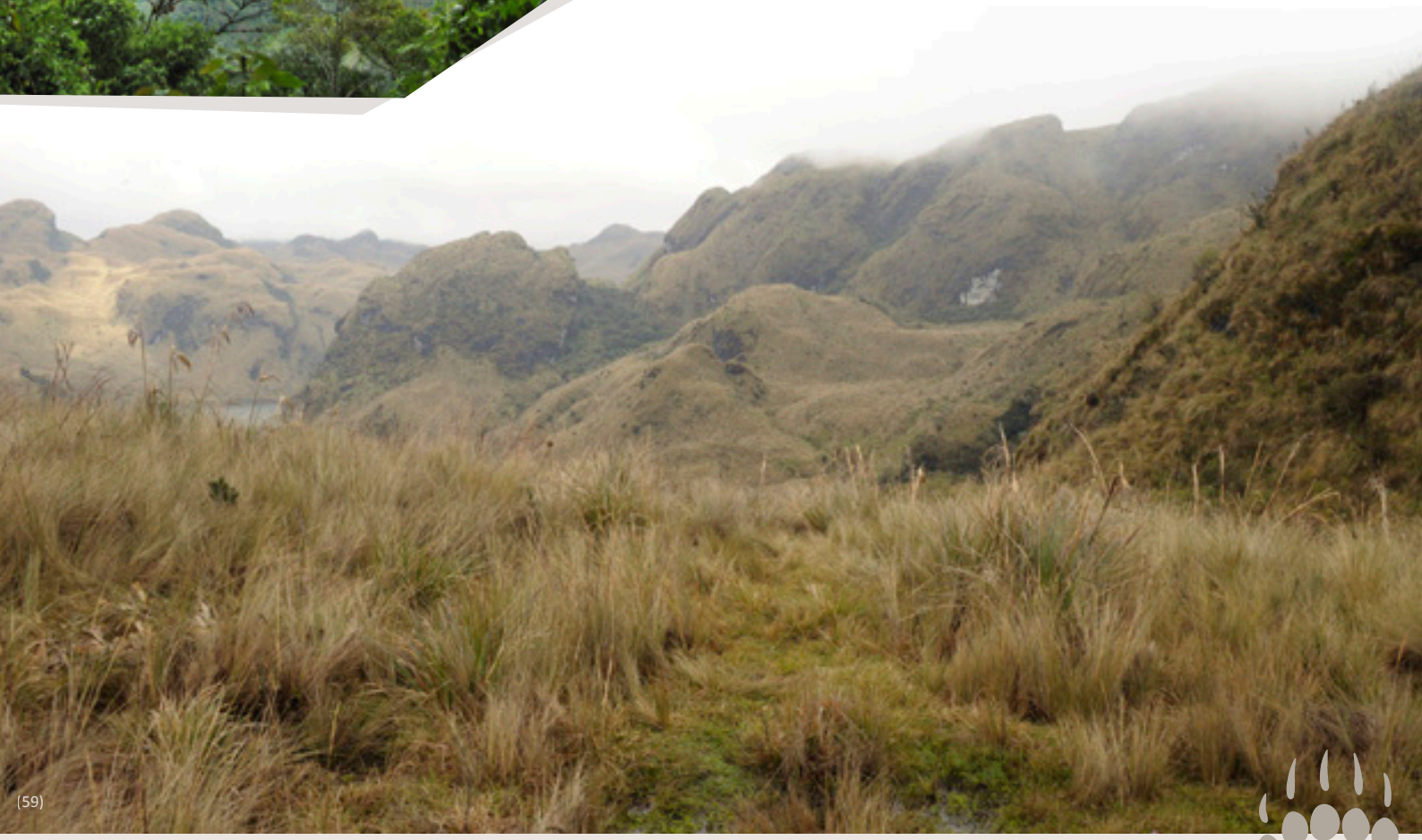
(58)

Distribution

(57)

They inhabit different ecosystems of the tropical Andes between Venezuela and Bolivia. Their main habitat is the mountainous cloud forest at elevations above 1000 m.

◀ *Quispicanchi cloud forest, Peru*



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However, where available in their range, they also use the paramo and alpine steppes above the tree line up to 4000 m and visit lower dry forests or even coastal shrub deserts as low as 200 m above sea level.

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▲ *Cayambe Coca National Park - resting Andean bear*

◀ *Papallacta, Ecuador - adult female with subadult*

▼ *Gusca, Colombia - lake in paramo*

(62)

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Andean Bears are mainly terrestrial but they are also **good climbers.**

They climb into steep rocks and on high trees to search for bromeliads and fruits.

Kcosñipata, Peru - epiphytic bromeliads growing on tree ▲

(64)

By breaking twigs and pulling them under their body, they **build platforms,** which, similarly to Asiatic black bears and sun bears, they also use for resting and as a retreat.

(65)

Andean bear family in the treeless paramo ▲

Living in the tropics with at least some food always available Andean bears **do not hibernate**.

Only females look for remote places in rock cavities in the cloud forest or even at high elevations in the treeless paramo to give birth and rear their young.

(66)

Nests are covered and insulated by plant materials from the surroundings.

◀ *Ecuador - cub in maternal den*

(67)

Diet

(68)

Andean bears are omnivorous, their primary source of food is made up of **plants**.

Within their wide geographic range a large variety of plant species are known to be eaten, among which bromeliads make up a major part of their diet.

Cattle apple (Hesperomeles obtusifolia) ▶

(69)

Where these are rare, **fruits, berries, figs and palm petioles** comprise the bulk of their diet.

◀ *Sapote fruit (Colicodendron scabridum)*

Cayambe Coca National Park, Ecuador - bear with consumed terrestrial bromeliad ▶

(70)

Seed dispensers

In some parts of their range, individual bears cover considerable altitudinal distances in search for food passing through several ecosystems in a very short while, as seeds from the lowland found in faeces deposited in the cloud forest demonstrate.

These findings show that Andean bears might be important seed dispersers, and thus crucial for forest regeneration.

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Aside from plants, Andean bears **also consume animal-based food,** which mainly includes insects, snails and small rodents, which are good sources of protein. Occasionally they scanvenge or even hunt deer.

Ecuador - Llama carcass eaten by a bear ▶

Colombia - Andean bear eating maize ▼

(74)

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However, in areas with settlements and agricultural encroachment into the forests, natural food sources are decreasing.

Here, bears come in conflict with humans as they raid crops. Larger males might even prey on domestic animals. Therefore, farmers chase them away or even kill them.

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According to some researchers their food is only **7%** of animal origin.

Diet in a nutshell

They mainly consume plants: they feed mostly on bromeliads, fruits (such as figs and opuntia lindheimeri's fruit), fresh shoots, domestic sugarcane and corn.

The small portion of their diet which is animal-based consists of various insects, small vertebrates such as rodents and sometimes larger mammals. In some cases livestock can become part of their diet causing human-bear conflicts.

American black bear

Highly adaptable bears
of North America

(77)

(78)

Distribution

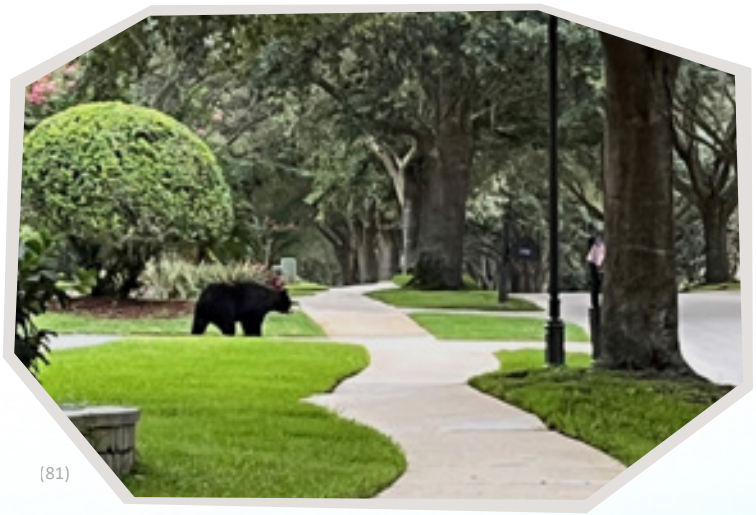
American black bears are omnivourous animals and are highly adaptable regarding habitat and diet. They occur throughout parts of North America, from Alaska to central Mexico regions, occupying very different environments.

(79)

Highly adaptable bears

Their main habitat are **temperate deciduous forests**. However, in their northern range they also live in the **Arctic tundra.** In the southern parts of their range they occupy **deserts** and **sub-tropical forests.**

They roam near to settlements and agricultural areas as long as they can retreat in dense vegetation in the vicinity.



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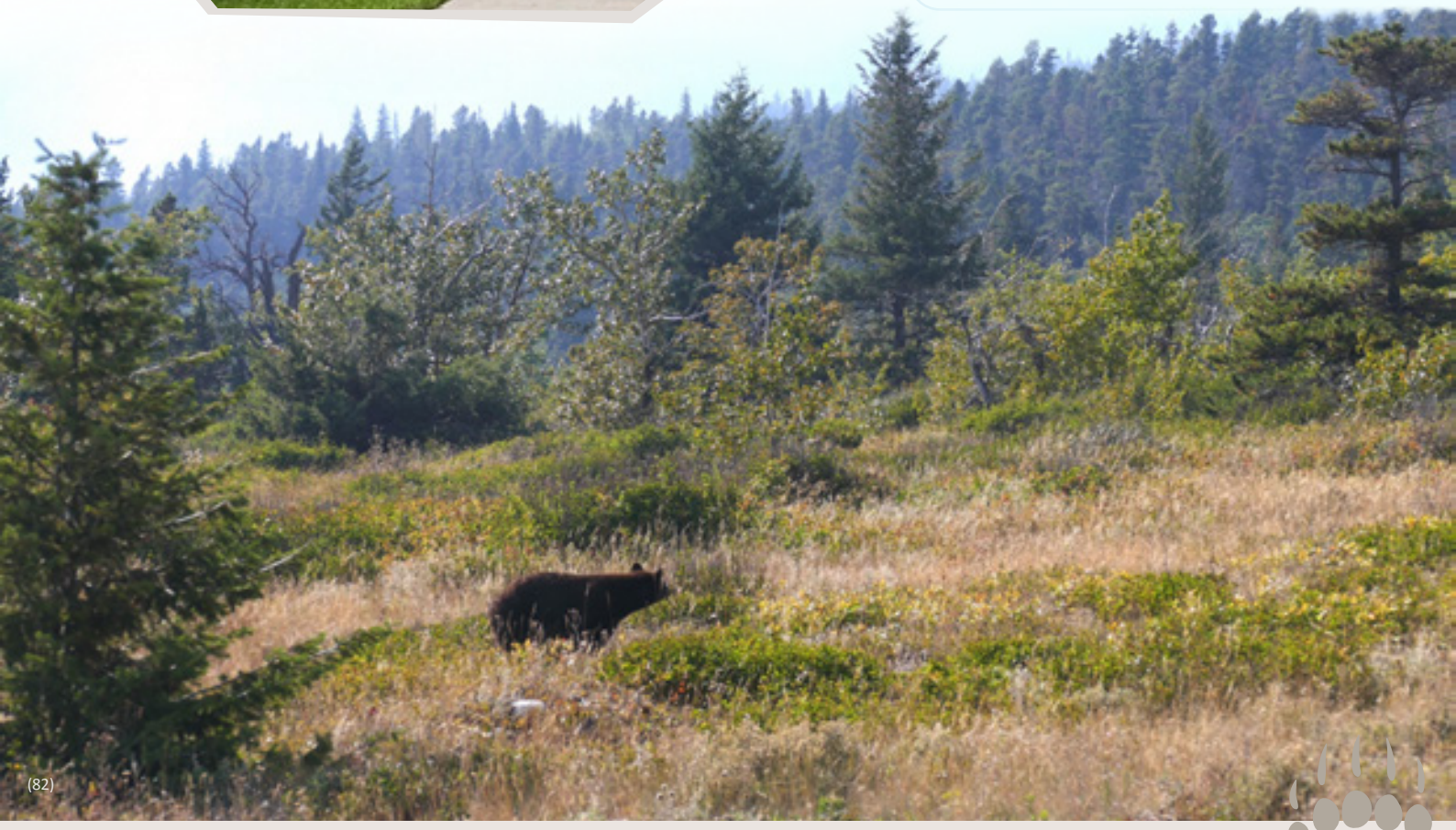
American black bears are excellent swimmers and skillful at climbing trees to escape predators, to rest or to eat buds or fruits.



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Even though most of their forested habitats offer them a selection of food almost on a tray, some wander outside their natural habitats to feed at places with high abundance of food.

They might locate these areas by using their excellent sense of smell.

(85)

This activity, which can include the crossing of rivers and roads is influenced by varying availability of food, which is changing seasonally.

▼ *Coahuila, Mexico - bear habitat*

(84)

Diet

In early spring, after emergence from the dens American black bears forage on **fresh growing grass and forbs** which are rich in easily digestible protein.

Later they wander around the river valleys, which are rich in food at this time of the year.

(88)

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There they tend to draw back to the shrubs that line the banks and eat whatever is available.

◀ *Prince William Sound, Alaska - bear consuming sedge along shoreline*

(87)

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In the summer, they prefer the deciduous forest and the edges of clearings, which provide food and cool places for resting.

Minnesota - aspen parkland black bear habitat ▶

Foraging black bear in forest ▼

(90)

Occasionally they prey on neonates of ungulates.

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In **early autumn** American black bears search for **high caloric food** such as hazelnuts, chestnuts, beech nuts, acorns and pine nuts, which are rich in fat.

Where this hard mast is rare they feed on **berries and fruits**, so called soft mast.

Minnesota - pin cherry tree pulled over by feeding bear

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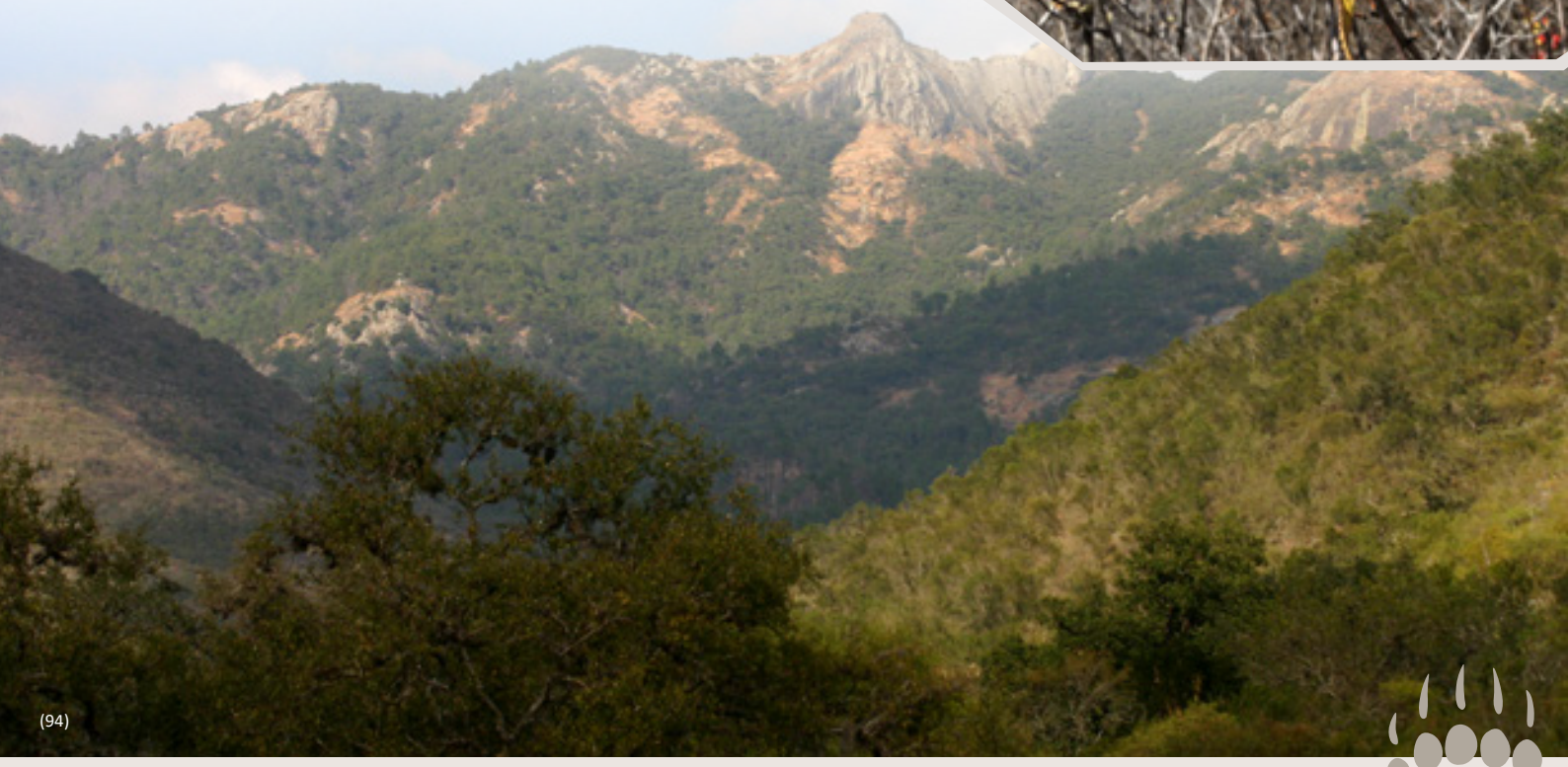
Food high in calories is necessary to put on fat in order to be able to hibernate.

Idaho - Mountain Ash, soft mast



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When due to **droughts** or late frosts the production of hard or soft mast is low, human-bear conflicts may arise when the animals search for other food sources, for example at garbage dumps or in crop fields.

An indication that they do not avoid landscapes shaped by humans.

◀ *Coahuila, Mexico - water hole that sustains bears during droughts*

▼ *Iowa - black bear in cornfield*

(96)

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Near human settlements, especially in farms, they may do great damage in cornfields and might occasionally take livestock.

Minnesota - consuming waste corn after harvest ▼

In **late autumn** and early winter, they are looking for suitable places for hibernation, which might last up to six months depending on the region. They use a wide variety of dens like caves dug into mounds, holes under roots, under fallen trees or in rock crevices.

Minnesota - underground den, typical hibernating posture ▶

(98)

(99)

In Minnesota, many black bears sleep on top of a self made nest with almost no cover. In forests, and in areas that flood in spring (e.g. swampy habitats) they might use big trees with large enough holes to den in.

◀ *Minnesota - mother denning with her two yearlings (one black, one brown)*

▼ *Minnesota - female raking bedding material into den*

(100)

(101)

The population of American black bears is growing recolonizing parts of its former range. Their numbers are twice as large as all other bear species put together.

This not only due to restricted hunting regulations but also to the species' adaptability to changing landscapes and food conditions.

Diet in a nutshell

Being opportunistic omnivores their diet mainly consists of plants such as wild celery, cow parsnip, dandelion, fresh grasses, sedges, berries, fruits, all sorts of nuts and agricultural crops.

They also consume animal-based food which include insects, small mammals, neonates of ungulates, fishes, birds, eggs, reptiles, and even amphibians.

Asiatic black bear

Also called as Moon bear, are native to parts of Asia

(102)

(103)

Distribution

The geograpic distribution of the species is fragmented. Small populations live at the western edge of their range in southeastern Iran and southern Pakistan, where they inhabit dry subtropical thorn forests.

◀ *Habitat in Iran*

(104)

(105)

These are isolated from the more northern populations ranging from the Hindukush in Afghanistan over the western and eastern Himalayas from Pakistan, India, Nepal and Bhutan to China.

In Southeast Asia the species occurs in Myanmar, Thailand, Laos, Cambodia and Vietnam. Asiatic black bears also live on the Korean Peninsula, the Russian Far East, in Japan and Taiwan.

◀ *Sichuan, China - Asiatic black bear denning habitat*

▼ *Hormozgan province, Iran - Asiatic black bear habitat corridor*

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They mainly inhabit **mountainous regions** with a variety of habitat types depending on latitude and altitude. Preferred habitats in the temperate and in higher, northern parts of their distribution are **broad-leaved,** often oak dominated **forests**.

In some regions, they also live in mixed coniferous-decidious forests up to elevations of 4000-4500 m.

▲ *Russian Far East - Asiatic black bear in coniferous forest habitat*

▼ *Pakistan - Asiatic black bear, mountainous habitat*

(108)

(109)

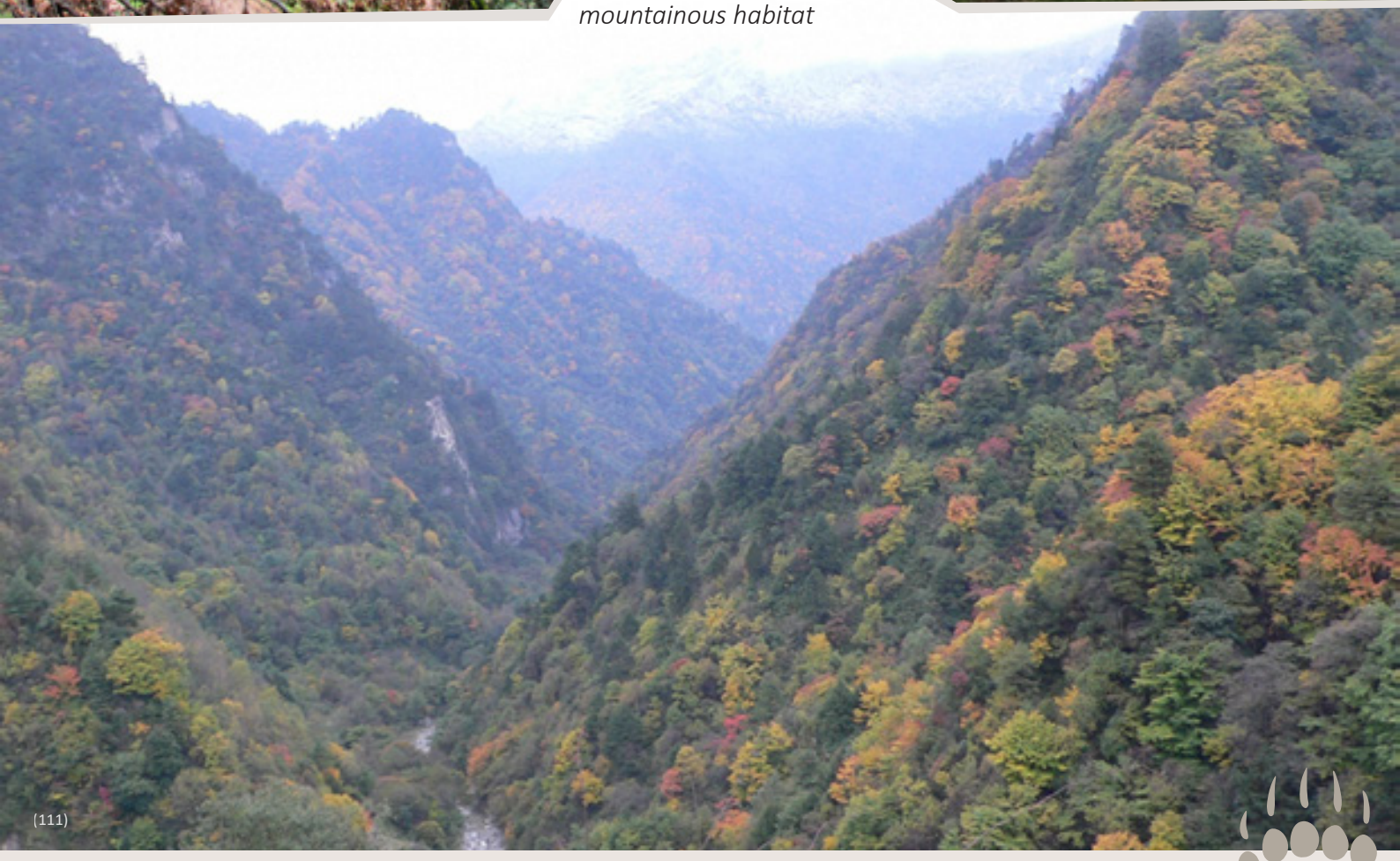
In India and parts of Southeast Asia and Taiwan, they occur in **tropical or subtropical forests** with evergreen or deciduous trees.

◀ *Lao PDR - tropical habitat*

▼ *Myanmar - bear habitat*

(110)

China - temperate mountainous habitat ▼



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Diet

(112)

They are omnivores and are **food opportunists,** which means that they eat a wide variety of food depending on what they find. Their **diet is highly seasonal** in the northern part of their range, because the type and the amount of food varies greatly throughout the year.

In temperate zones, Asiatic black bears hibernate from late autumn to spring. Prior to that period, they search for **high caloric food** like berries, all sorts of nuts and acorns to put on fat.

They use caves in steep rocks, holes in trees, or use fallen trees and roots to create dens where they spend the **winter**.

(113)

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In **spring** after emergence from the dens, they feed on fresh green material from forbs, which is easily digestible.

◀ *Asiatic black bear munching on greens found in log pile*

In **summer, they move upwards** to exploit fruiting trees. There they forage and might even rest in trees.

They descend to lower elevations when winter creeps closer.

(116)

Sichuan, China - bear food, berries ▲

(115)

In the southern part of their distribution without snowfall (e.g. Thailand, Taiwan), where food is always available, Asiatic black bears **do not hibernate** except pregnant females, which give birth and rear their offspring in dens.

(117)

(118)

▲ *Taiwan - bear food, acorns*

◀ *Asiatic black bear cubs in den*

▼ *Russian Far East - mother and cub rubbing on tree*

(119)

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Only in the hot arid parts of Iran and southern Pakistan do Asiatic black bears prefer to rest in caves **waiting for nightfall** to forage. In most other regions, they are active during the day.

In rural areas, they also might use the dark hours to scavenge for food close to settlements. This behavior can result in **human-bear conflicts**.

(122)

Southern Iran - Asiatic black bear in date palm tree ▶

(123)

(124)

▲ *Animals Asia facility, Sichuan, China - bear entering a tree nest*

◀ *Sichuan China - feeding platform*

During feeding they sometimes **create "nests"** out of branches by placing them under their body.

Diet in a nutshell

They primarily consume plants, which include forbs, berries, fruits, nuts, roots and tubers of e.g. Asian skunk cabbage.

They also feed on animal-based food such as larvae, insects, small vertebrates, wild animals and livestock, which they scavenge or kill.

Brown bear

The most widespread bear species, the Brown bear

(125)

Distribution

Brown bears have several populations ranging from Europe through Asia to Japan, and in North America from the Kodiak Archipelago through Alaska and parts of Canada.

(126)

◀ *Northern Tien-Shan Mountains, central Asia - typical bear habitat*

(127)

(128)

In the past 100 years most brown bears in the western US down to Mexico were **extirpated**. An isolated population remained in the Greater Yellowstone Ecosystem (living in the states of Idaho, Montana, Wyoming and Washington) and some populations on the Canadian border.

In North America, they occur in more open landscapes, whereas in Europe brown bears use a wide variety of habitats.

▼ *Interior British Columbia, Canada - bear with grizzled coat*

(129)

(130)

In their northern distribution, from Scandinavia through the Russian Federation, they live in coniferous, mixed, and even managed **woods** mainly in mountainous regions. They also occupy the almost treeless scrub rich **tundra,** high up in the north.

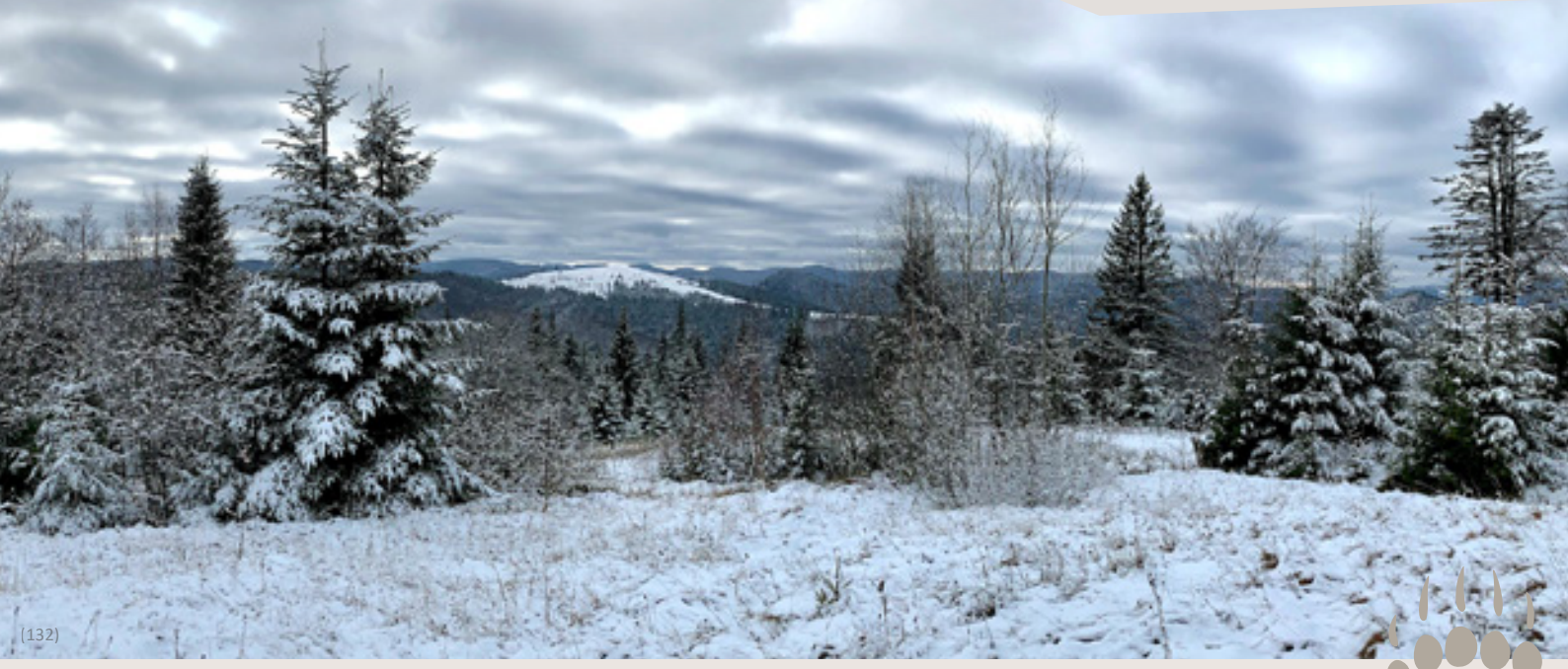
(131)

Pakistan, Himalaya habitat ▶

Habitat in Ukraine ▼

?

In North Africa, there was a brown bear population that once inhabited the **Atlas Mountains**.



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In the Russian Far East and in Japan, they use **coastal boreal forests**. In their southern distribution in Asia, they also roam on **subalpine steppes** and grassland.

A small population even lives in the Gobi Desert in Mongolia.

Gobi desert Mongolia - Gobi bear ▶

(134)

The distribution in their southern range is fragmented and scattered. **In Europe,** there are small populations in northern Spain, in Italy, France, Poland, Slowenia and larger populations in the Balkan states and Scandinavia.

◀ *Trentino, Italian Alps - brown bear mountainous habitat*

(135)

The selected habitats must provide sufficient high quality **food and shelter**, like forest cover or rugged terrain with opportunities for hibernation.

(136)

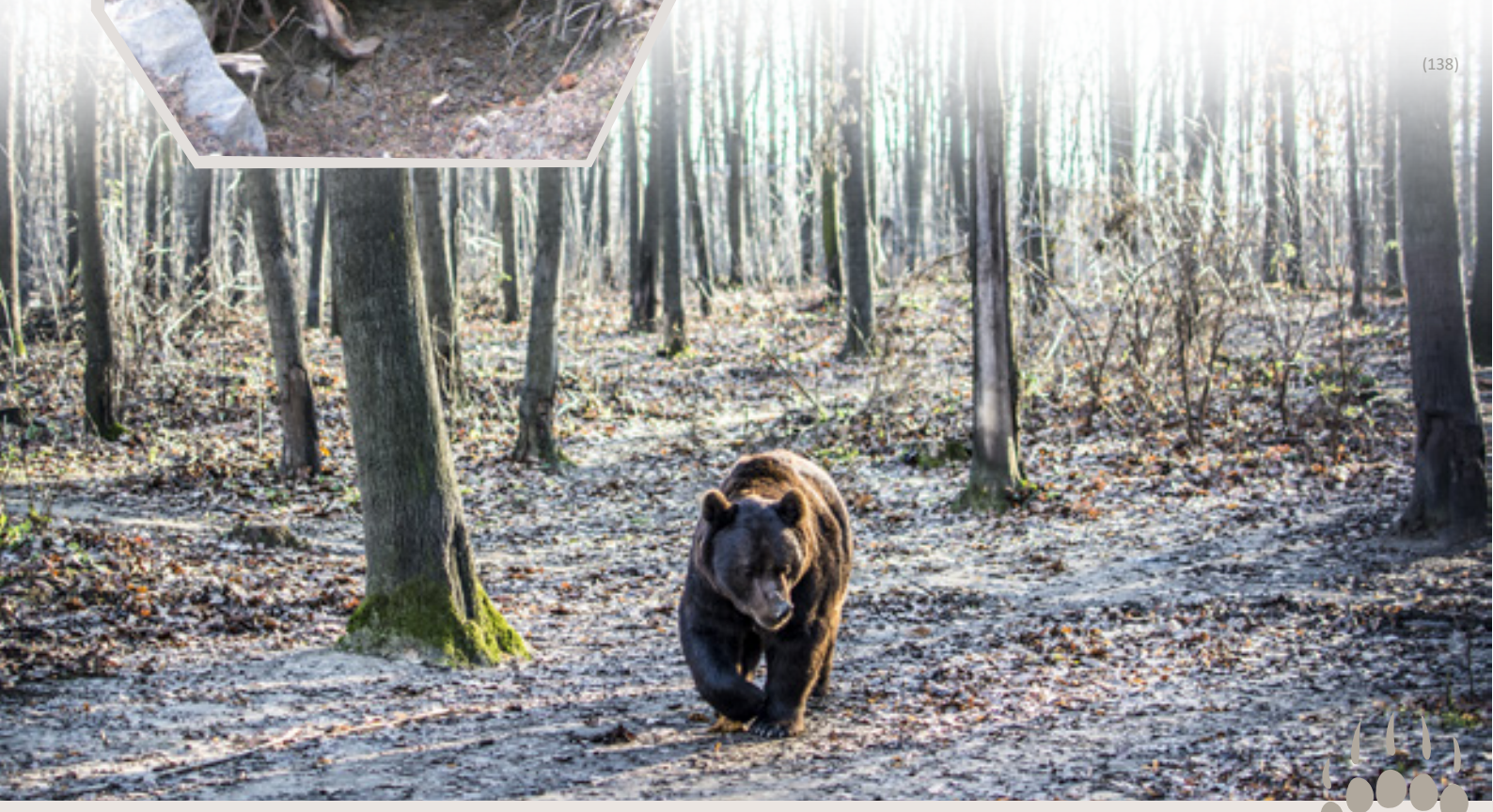
British Columbia Canada - excellent spring mountian habitat ▶

(137)

Depending on the habitat, they sleep in natural cavities, under rocks or tree roots, in self-excavated caves in the ground or old anthills, but open nests are also used.

◀ *Alberta, Canada - hibernation den*

(138)



Diet

(139)

They are **true omnivores,** which means they consume animal and plant-based food and eat whatever they come across.

Food availability and quality varies seasonally and geographically so does food selection and intake.

(141)

In most parts of their range, the majority of their food is of **plant origin**.

They love berries and nuts and spend a lot of time digging for tubers and sniffing out their favourite mushrooms, the morels.

◀ *Huckleberry - a brown bear favorite*

(140)

(142)

In their **southern range** brown bears mainly consume large amounts of s**oft and hard mast** for example fruits and nuts.

◀ *Tajikistan, Central Asia - Ground squirrels a favorite bear food*

(143)

Whereas in **northern regions,** the easily digestible and highly nutritious, meat of **small mammals** and ungulates make up a bigger part of their diet along with pine nuts.

Yellowstone National Park, USA - brown bear protecting a dead bison before feeding ▶

West coast British Columbia, Canada - family fishing for salmon ▼

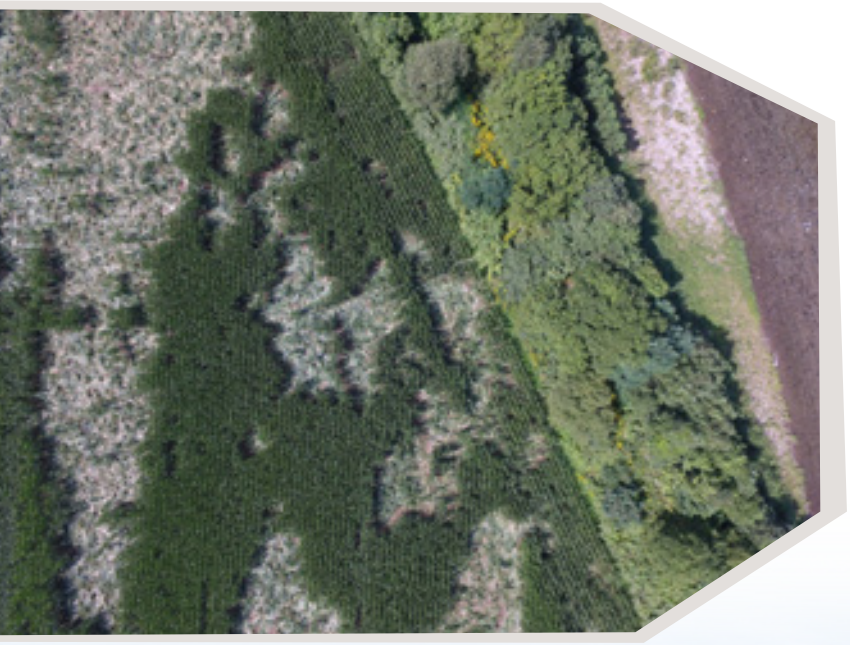
(144)

In human dominated landscapes, brown bears also eat domestic animals, fruits and cereals, thus bringing them in conflict with farmers.

(145)

British Columbia, Canada - bear shot and killed by landowner defending livestock ▶

(146)



In these areas, most bears are crepuscular meaning they are active at dawn and dusk or even during night. In remote regions with low human impact, they are active foraging during daytime.

◀ *Hokkaido, Japan - corn damage by brown bear*

▼ *Croatia - bear habitat near city*

(147)

(148)

There are differences in food composition between northern and southern European populations in particular during the autumn months, when brown bears are **hyperphagic** and daily feeding time increases substantially to prepare themselves for hibernation. This might last from a few weeks in their southern range, up to half a year in the more northern parts of their range.

(149)

?

Alaska and Russia is where the largest brown bears occur. During autumn, they catch **salmon**, which is their most favourite delicacy.

Diet in a nutshell

Their diet is mostly plant-based which include berries, fruits, nuts, green shoots, roots, tubers and mushrooms.

Where available, they hunt for herbivorous mammals, mainly their calves (such as deer and moose), even catch rodents, fishes and smell out carcasses, but also take insect larvae.

They also raid beehives for honey, which ends up in human-bear conflict.

Giant panda

Let's learn about the "bamboo bear"

(150)

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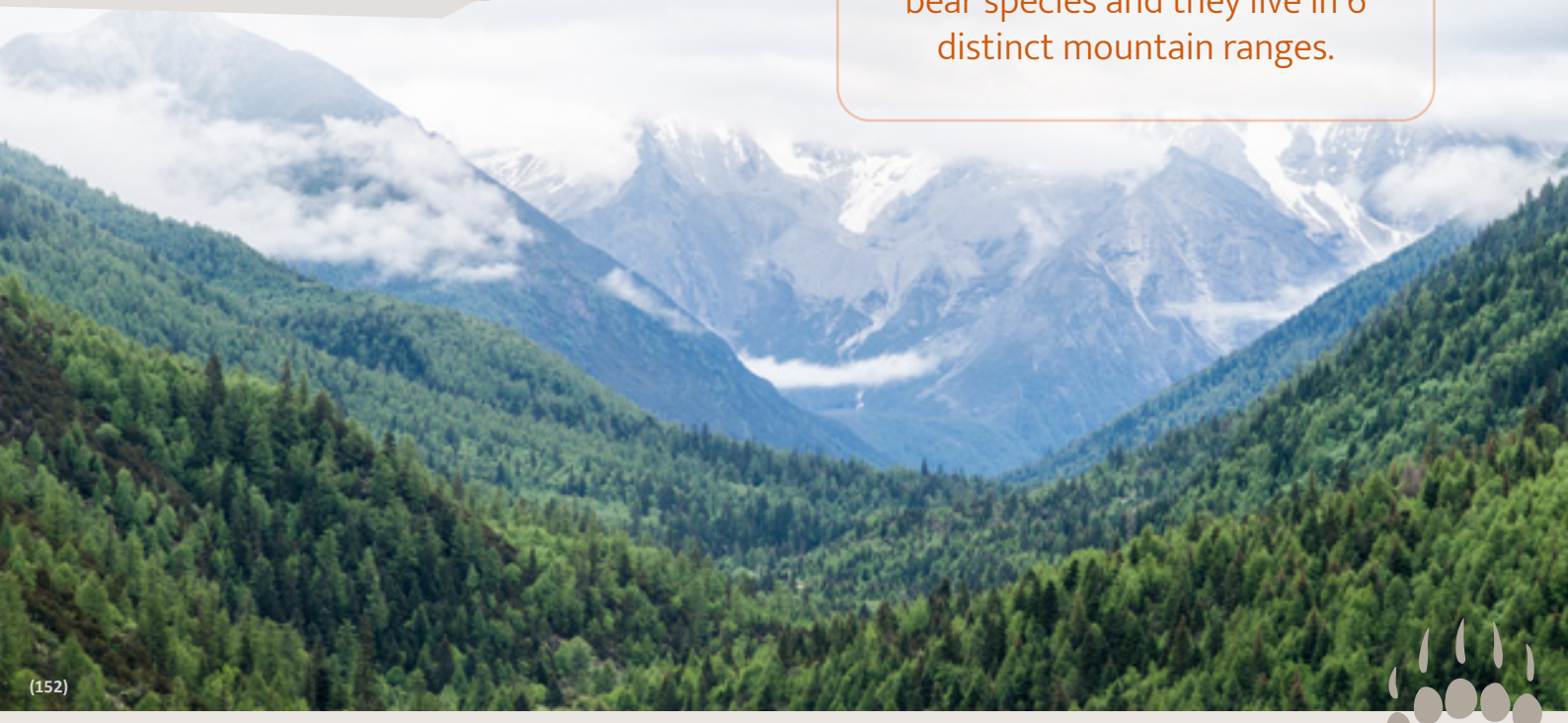
Distribution

The occurrence of giant pandas today is restricted to a few isolated mountain ranges in western China.

Their habitat is the most fragmented out of the eight bear species and they live in 6 distinct mountain ranges.



(152)

The best habitats for giant pandas are **prime coniferous and mixed forests** with sufficient understory bamboo.

Foping Nature Reserve - Giant panda in tree ▶

(153)

(154)

◀ *Foping Nature Reserve - understory bamboo habitat*

▼ *Niuweihe Nature Reserve - mountain habitat in fall*

(155)

(156)

Other essential habitat features are appropriate **maternity dens** in rock and tree caves with small openings and close to water sources.

◀ *Foping Nature Reserve - cave den used for rearing cub*

(157)

Trees with rough bark to facilitate **olfactory communcation** by marking behaviour are necessary habitat features to bring the sexes together for breeding.

Wanglang Nature Reserve - habitat in conifer forest ▶

Qinling Mountains - bear smelling scent marked tree ▼

(158)

(159)

Diet

These black-and-white bears are called "**bamboo bears**" in some languages, which is quite fitting since their main source of food is bamboo, a plant that belongs to the grasses.

(160)

Digesting bamboo

In mature grasses the cells with the nutrients are enclosed by fibrous walls consisting of cellulose and lignin, which are indigestible for animals.

Whereas grazing herbivores like horses have a long hindgut and a large appendix where they harbour bacteria, which downgrade the cell walls, so that the nutritious cell content becomes available.

(161)

Giant panda faeces contains a lot of leftover bamboo.

It is different for pandas...

Like all bears, giant pandas have a simple and short digestive tract and no appendix. Cellolytic bacteria in their intestines might help to digest fibres; however, their efficacy is restricted due to the quick gut passage rate of just a few hours.

Several morphological, physiological and behavioural **adaptations** are important to deal with food low in energy and nutrients.

Morphological adaptations

(162)

The head is massive and wide with short muzzle. The **strong muscles of mastication** allow a high bite force, the highest of all bear species.

(163)

The posterior premolars and molars are much **larger and wider** than the teeth of other species in the family. They are the **largest molars** in the order of carnivora, enabling them to crack the fibrous food.

(164)

▲ *Giant panda holding a carrot using its false thumb.*

Another peculiarity of the species is the **false "thumb"** or sixth finger, which is a finger-like elongation of a wrist bone on the front paw.

It acts as a thumb during eating and helps to **grab and hold bamboo**.

Giant pandas make seasonal altitudinal migrations to follow plant phenology and to select the most nutritious bamboo parts.

(165)

In spring and early summer, these are shoots, later in the year they utilise the green leaves and in winter mainly the stems.

To meet their nutritional requirements from the low energy diet they forage through 14 hours distributed over the 24 hours of a day and consume on average 10-12 kg of bamboo while sitting.

(166)

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To reduce energy expenditure **they walk slowly** and their daily movements between bamboo stands are short, unless they migrate up to altitudes of 3000 m to search for young bamboo.

Anzihe Nature Reserve - active in winter because food is available

(168)

They **do not hibernate**, since food is available in all seasons.
If it wasn't the case, they still wouldn't hibernate. This is because despite high selectivity for the most nutritious bamboo parts and energy saving life style, giant pandas **cannot accumulate sufficient fat to go into hibernation**.

98% of its diet consists of bamboo and they consume **40 out of 200** bamboo species.

Diet in a nutshell

Main source of food is bamboo.
However, they may also eat other plants like iris and crocus flowers.

Very occasionally, they also consume
eggs and smaller vertebrates such as pikas.

Polar bear

Largest of all bears and largest living land carnivore

(169)

(170)

Distribution

They inhabit the circumpolar Arctic. Here they prefer the ice covered, shallow continental shelves, where the water is less than 300m deep and their prey is more abundant then in deeper waters.

(171)

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(173)

Their habitat varies geographically and seasonally.

In northern Canada, Greenland, and the Canadian archipelago there is multiyear ice, which provides them with a hunting platform year round.

The annual sea ice, which drifts along the coasts of Alaska and Eurasia, melts in summer and forces the bears either ashore or to venture further to the north where permanent ice cover can be found.

Diet

(174)

Polar bears are the most carnivorous bear species and are evolved to prey primarily on seals.

Just like seals and whales, polar bears are also considered as marine mammals since their survival is closely tied to the ocean where they hunt for food.

(175)

(176)

Bearded seal out on ice ▲

Polar bear feeding on seal carcass ▼

(177)

Fat for survival

To thrive in the harsh environment of the Arctic they need to consume considerable amounts of seal blubber, which provide enough calories for polar bears to build up their fat reserves.

Along with their two-layered fur, they rely on their fat to keep them warm. Especially in water, since wet fur is not that good for insulation, thus fat keeps the cold out more.

The seal species they consume include ringed and bearded seal, but polar bears will also predate on larger seal species.

?

It might be surprising, but polar bears are not known to catch fish.

(178)

Occasionally narwhals and belugas might also become prey when trapped in openings in the ice.

Walruses are rarely caught since their large size, tusks and their group living makes them a dangerous prey.

◀ *Belugas*

▶ *Walrus*

Polar bear waiting for seal ▼

(179)

In regions where whales strand polar bears also scavenge on their carcasses.

Hunting for seals

(180)

Polar bears prefer habitats at edges of high and low concentration ice, where seals are able to scratch holes.

Areas close to open water are also favored where the bears sit and wait to catch seals when popping up for breathing or hauling out for resting.

This hunting strategy minimizes energy expenditure.

◀ *Polar bear waiting for seal*

(181)

Adult males often consume only the fat layer, blubber. They leave the rest of the carcass, which is utilised by other bears.

Growing individuals and lactating females in particular need meat to meet their protein requirement.

(182)

While most polar bears prefer waiting for the seals, some individuals swim below ice floes to stalk seals basking on the surface. They **dive** multiple times before approaching and ambushing their prey.

However, this way of hunting requires more energy thus bears prefer the sit-and-wait strategy.

(184)

Excellent swimmers

Polar bears are considered as marine mammals and as such, they are **excellent swimmers**.

(183)

They can cover a great distance while swimming which they can keep up for days.

Polar bears also use their diving skills to reach and feed on **seaweed** at depths of even 3-4 m.

Their wide paws help them to swim fast, propelling themselves forward in the water in a dog-paddle style.

(185)

As the drift ice is constantly changing polar bears travel relatively **long distances** to find favorable hunting conditions.

Whilst on ice they walk an average **10 km/day** in search for food.

Polar bears **do not hibernate**, however during times of low seal availability and harsh weather conditions they stay **inactive in snow drifts** and live on the fat reserves they accumulated.

(186)

When **ashore in summer**, they mainly fast, and decrease their activity to save energy. In the Hudson Bay they scratch shallow depressions or even dig dens to evade heat and insects.

(187)

A rarer diet when ashore

When available they may also consume other types of food which can include terrestrial prey like **eggs** of ground nesting birds, **small mammals** or **reindeer** that makes up a minor part of their diet when coming ashore.

(189)

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▲ In summer, they also consume **grass, moss, lichen, kelp** and **berries**.

Human-bear conflicts occur, when they search for food in human garbage.

With the lose of sea ice due to climate change, polar bears are slowly losing their primary food source, seals.

Could they switch to eat other food instead?

While occasionally they do consume other food items other than seals, these dietary items DO NOT sustain a polar bear long-term. Why?

- Other food sources are limited, and the bears' adaptations to the Arctic lifestyle creates a disadvantage on land. Chasing prey would make them overheat quickly and burn more energy than the amount they would gain. They would also be outcompeted by brown bears.
- These food items do not provide enough calories to maintain their massive body, and to build up fat to survive the Arctic conditions.

At the **end of summer,** pregnant females of the coastal populations walk inland to their maternity area. They dig dens into steep peat banks at lakes and other steep structures where snow accumulates in winter.

(190)

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Females on permanent ice excavate dens into the snow. They spent almost half a year in the den to give birth and rear their young.

◀ *Polar bear den with claw marks on the interior*

(192)

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Whilst searching for prey, they may cover a distance of even **70 km** a day and they can run at speeds of up to **40 km/h** but only for a very short while, as they quickly overheat.

Among mammals, polar bears have the highest proportion of fat in their diet.

Diet in a nutshell

98% of their diet consists of marine mammals such us ringed seal, bearded seal, narwhals, belugas, whale carcasses and rarely walruses.

Terrestrial prey like eggs of ground nesting birds, small mammals or reindeer makes up a minor part of the diet of bears coming ashore.

In summer, they also consume grass, moss, lichen, kelp and berries. They may also search for food in human garbage.

Sloth bear

Bears that are known for their unique **feeding style**

(194)

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Distribution

Their distribution range includes India, Nepal and Sri Lanka. They live in moist and dry forested areas as well as scrub and grasslands where boulders, shrubs and trees provide shelter and resting places.

◀ *Karnataka, India - scrub bouldery habitat*

▼ *Jessore Wildlife Sanctuary, Gujarat*

(196)

Resting places

Apart from sufficient food and water, the habitat has to offer **shelter** where the bears can spend the daytime and are protected from predators and heat.

These resting dens are found under rocks or overhanging stone, in crevices between boulders and even in caves. Spaces under fallen trees, between roots and in bush thickets are also used.

(197)

(198)

These places are very variable in terms of size and entrance dimensions.

- ▲ *Daroji bear Sanctuary, India - bear leaving den in boulder field*
- ◀ *Karnataka, India - bear emerging from den*
- ▼ *Mount Abu Wildlife Sanctuary, Rajasthan*

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Sloth bears do not hibernate, except perhaps pregnant females.

Rarely, they dig their dens into the ground but most times they select complex caves with several chambers to use as **maternity dens**.

These dens, which are used by the females to give birth and rear the cubs for the first 3-6 weeks, are more secluded than those used for resting only.

(201)

◀ *Karnataka, India - bear in boulder field*

▼ *Ratanmahal Wildlife Sanctuary, Gujarat - sloth bear outside the maternal den*

Diet

Sloth bears are omnivores consuming **fruits and insects**. Their food composition varies between seasons and habitats and also according to regions. In the dry season, they mainly consume insects, which include termites and ants.

This ant and termite based feeding style is scientifically called **myrmecophagy**.

(202)

▲ *Sloth bear sniffing the ground for termites*

◀ *Botha forests, Maharashtra - Termite mound*

(203)

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Chhotaudepur district, a corridor connecting two wildlife sanctuaries in central Gujarat

Morphological adaptations

(205)

They are adapted to their insect diet with several unique features.

In adults the **upper incisors are missing**, which makes it easier for them to suck up the insects while their nostrils can be closed to prevent the dirt and insects from entering their respiratory passages.

Their muzzles are like **vacuum cleaners** as they form a "tube" with their flexible lips and long tongues and suck out the insects with a strong vacuum.

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▲ *Sloth bear showing flexible lips*

◀ *Sloth bear sucking a feeding pipe*

(208)

With strong, long claws they can easily dig the ground or open up even the hardest of termite mounds.

(209)

▲ *Front foot pad of a sloth bear*

◀ *Chitwan, Nepal - digging termite mound*

▼ *Sloth bears drinking at water hole*

(210)

(211)

The other side of their diet

During the monsoon period, they consume **more fruits,** including Indian plum, figs and, when food is scarce, even domestic fruits.

They are also very fond of **honey** and how they acquire it is somewhat unique: clinging to trees they remove the honeycomb and then consume it on the ground.

(212)

In times of food scarcity, they can cause human-bear conflicts when raiding orchards and crops on farmlands.

▲ *Melghat tiger reserve, Maharashtra, India - sloth bear raiding honey bee hive*

◀ *Gujarat, India - sparsely vegetated bear habitat*

Although they prefer to eat fruits during the monsoon period, in the dry season insects might make up **95%** of their diet in Nepal. In the other countries, their proportion is 15-20% lower.

Diet in a nutshell

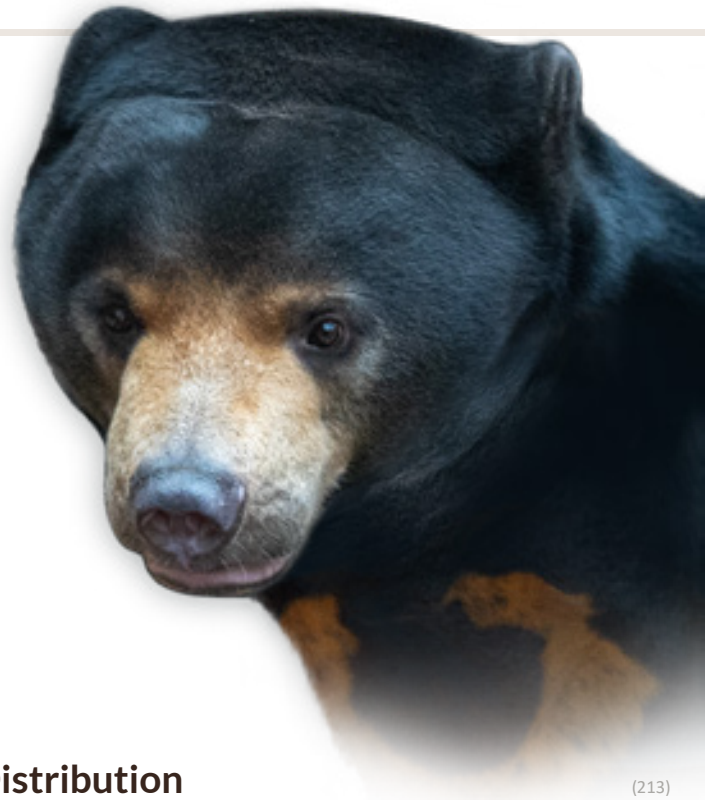
During the monsoon period, they prefer fruits such as Indian plum and figs. Crops are also consumed when food is scarce.

In the dry season their diet includes more insects mainly termites and ants.

They also raid beehives for honey.

Sun bear

Smallest bear with the longest tongue



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Distribution

Sun bears occur from northeastern India, Burma through South-east Asia to Sumatra and Borneo.

◀ *Indonesia - Sun bear*
▼ *forest habitat*

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They inhabit a **variety of forests** which include semi-evergreen, mixed deciduous and mountain evergreen forests. In their southern range they occupy mainly evergreen tropical forests, swamp forests and forested mountainous areas.

There they quickly move through the forests sniffing the ground in search for food.

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Skillful climbers

Sun bears **easily climb trees** and can spend quite some time above ground to forage for food, escape from predators and rest.

Their small size, weight and strong claws are a great advantage when climbing and clinging to trees for longer periods of time.

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▲ *Kalimantan, Indonesia - Climbing liana*

◀ *Resting on giant Dipterocarp tree branch*

They sometimes use **branches to build a nest** for resting; however, they mainly sleep on the forest floor, on or under fallen trees or in tree cavities. Parturient females use such places to give birth and raise cubs.

(221)

Diet

Sun bears are **omnivores** and eat a wide variety of fruit and insect species as well as honey.

On Borneo, where many tree species only fuit synchronously during masting events, which occur in supra-annual cycles, sun bears **gorge on fruits in large amounts** during a short period of time.

(222)

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◀ *Durio dulcis, a favourite fruit*

In other years when fruits are less abundant, invertebrates and **figs** are the main staplefoods.

(224)

In the forests of the Southeast Asian mainland, fruiting is more predictable and there are always some fruit species to feed on.

Insects such as termites are the main diet in Borneo, especially at times of food scarcity.

With their long, sharp claws they are able to tear open **termite mounds** to reach the insect eggs and larvae inside.

Feeding on Dicuspiditermes termites. ▶

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They also feed on **ants and their brood, beetles** and their **grubs, bee larvae** and ocassionally they may consume smaller vertebrates, or carrion, aswell.

◀ *Feeding on beetle grub in rotting*
▼ *wood (left), and underground termites (bottom).*

(227)

Stingless bees nest raider

Sun bears can climb up and hold onto trees for a long period of time and can **open nests of stingless bees** with their strong canine teeth and claws.

Stingless bees nest in tree hollows, and after raiding honey, big cavities are left in the tree which later can become occupied by hornbills for nesting.

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Sun bears lick out the **honey and larvae** with their surprisingly long tongue, which is a useful tool to reach insects deep within mounds and tree crevices.

▲ *Sun bear breaking into stingless*
◀ *bee nest.*

(231)

▲ *Interface of oil palm plantation and forest.*

Away from human influence, in undisturbed forests, sun bears are diurnal, however close to settlements and agricultural activity they become more nocturnal.

Close to forest edges, sun bears can **enter orchards and oil palm plantations** during the night. They do so to avoid humans and to escape high temperatures during the day.

Here they feed on **domestic fruits, coconut and oil palm fruits** or shoots. Therefore, they can be considered a pest in some regions and human sun bear conflicts are inevitable.

(232)

They do not hibernate

Because some type of food is always available in their tropical habitat, they **do not have to hibernate** and build up fat stores for a longer resting period.

? Their tongue is very long. It can reach up to **46 cm** in length.

Diet in a nutshell

They consume a large variety of fruits: more than 110 fruit species were recorded in their diet in one study site.

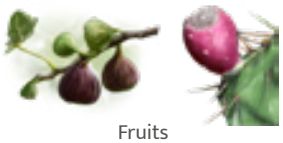
Their animal-based diet consists mostly of insects: many species of termites (larvae and alates), ants (eggs and larvae), stingless bee larvae and honey, forest cockroaches, beetles and their grubs. Occasionally they might eat carrion if encountered.

Food chart

● Consumed in food scarcity ● Rarely consumed

Andean bear


Bromeliads


Fruits
(like figs and opuntia lindheimeri's fruits)


Fresh shoots


Domestic sugarcane and corn ●


Livestock ●


Small vertebrates ●


Insects ●

American black bear


Grasses and other herbaceous plants
(like sedges, dandelion, cow parsnip)


Berries and fruits


Nuts


Agricultural crops


Insects


Reptiles and amphibians


Neonates of ungulates


Small mammals


Birds


Fishes


Eggs

Asiatic black bear


Forbs


Berries and fruits


Nuts


Wild animals and livestock


Roots and tubers
(like of Asian skunk cabbage)


Insects


Insect larvae


Small vertebrates

Brown bear


Berries and fruits


Nuts


Green shoots


Roots and tubers


Mushrooms


Small vertebrates


Herbivorous mammals,
mainly their calves


Fishes


Insect larvae


Carcasses

Giant panda

Bamboo
(40 out of 200 bamboo species)

Iris and crocus flowers

Eggs ●

Smaller vertebrates ●
(like picas)

Polar bear

Seals
(like ringed and bearded seals)

Belugas

Narwhals

Walruses

Eggs of ground nesting birds ●

Small mammals ●

Whale carcasses

Grasses, moss and lichen ●

Kelp ●

Reindeer ●

Berries ●

Sloth bear

Fruits
(like Indian plum and figs)

Insects
(like termites and ants)

Crops ●

Sun bear

Fruits
(more than 110 fruit species)

Termites
(larvae and alates)

Carrion ●

Ants
(eggs and larvae)

Stingless bee
(larvae and honey)

Insects (like forest cockroaches)
Beetles (and their grubs)

Most bears love to raid beehives for honey.
Exception to this is the polar bear and giant panda.

CHAPTER 4
Hibernation

We all heared about bears sleeping through the winter months in a cave without anything to eat, right?

In reality not all bears do that and not always in a cave.

Hibernation in general

(233)

Hibernation is an adaptation of mammalian species that aids them to fast for an extended period in regions where food is less available during the winter months.

In order to survive, hibernators accumulate a significant reserve of fat during the seasons rich in food and then switch their metabolism into an "energy-saving mode".

(234)

◀ *Alberta, Canada - brown bear hibernation den*

Hibernation in bears

Most **brown bears, American black and Asiatic black bears** hibernate, however not in all regions. There seems to be a north-south gradient with males and non-pregnant females in the Southern part of their range hibernating only when food is scarce.

Among **polar bears** only pregnant females have a prolonged-denning period of up to six months.

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(236)

Giant pandas, Andean, sloth and **sun bears** do not hibernate at all.

However, the females of these species, too, stay in the dens with the cubs for several weeks up to 3 months without feeding. It is unknown whether they use the same physiological mechanism as the hibernating bears.

(237)

Foping Nature Reserve - Giant panda mother with cub in a cave den ▲

Ramdurga, India - Sloth bear returning to a resting den in a cave ▶

Prepairing for hibernation

(238)

As soon as autumn arrives, these hibernating bears begin to prepare for their long rest. They spend most of their time **feeding and gaining fat** for the upcoming months of food scarcity, along with looking for a place where they can stay for the chilly season. In high latitudes hibernation migh last up to 8 months.

They are not really fussy about their place of stay as it can be either a cave, fallen log or cavities. Bears can also dig a den or collect branches and grasses to build an open nest.

(239)

▲ *Jirisan National Park, South Korea - Asiatic black bear tree den*

They begin to move in when cold creeps closer, while pregnant females den earlier. Then they hibernate through the cold season and emerge with cubs when food becomes plenty again.

Body functions

(240)

For a while, bears have not been considered true hibernators, however according to new studies, this statement proved wrong as they decrease their metabolism, just like small hibernators do.

There is a difference though that comes down to body temperature.

(241)

Body temperature of small hibernators

Bats and various rodents (such as dormouses, ground squirrels) and insectivores like hedgehogs reduce their normal body temperature of 37-39°C down to 1-9°C and thus save energy.

However, they have to warm up periodically to normal body temperature and they urinate and defecate.

Body temperature of bears

(242)

Hibernating non-pregnant bears also save energy by **lowering their metabolism to 25%** of the basal metabolic rate.

They neither ingest, nor defecate or urinate, instead they recycle water and the toxic waste products of metabolism.

Their core temperature only drops from 37ºC to 32-36 ºC. This enables them to become active and react quickly when predators, like wolves, threaten them in their dens.

(243)

Body temperature near normal is also necessary for lactating and warming the cubs, which are born during hibernation.

Jirisan National Park, South Korea - Asiatic black bear mother nursing her cub ▲

(244)

Heart rate and breathing

During hibernation their heartbeat and breathing **slows down greatly**, whilst almost all of their bodily functions continue smoothly except digestion.

(245)

Their heart rate slows down from 85-90 bpm (beats per minute) to **20-25 bpm** whilst hibernating and becomes synchronized with their breathing which also slows down to **2-4 breath per minute**.

This synchronity is called "respiratory sinus arrhythmia" which allows the heart to rest for 5-30 sec depending on breath frequency.

(246)

Disruption to this synchronity pattern is a clear sign that the bear is either; giving birth, responding to some external factor, or hibernation is ending.

▲ *Minnesota - American black bear in open nest*

◀ *Minnesota - American black bear mother with cubs born in open nest during hibernation*

Coagulation

(247)

Since blood can be stagnant while the heart is resting, which could cause stroke and heart attack, coagulation (clotting time) is tripled which means that it takes **three times longer** for blood clot to form.

However, that only occurs inside the veins thus its not affecting the healing of external injuries. Therefore, if bears suffer an injury before or during hibernation, for example due to attacks, **wounds would heal up normally**.

Jirisan National Park, South Korea - Asiatic black bear mother in open nest

(248)

Do all bears hibernate?

Whilst it is commonly known that bears hibernate through the winter, in reality not all of them take advantage of, or need this adaptation. **Some bear species do not even hibernate at all.**

(249)

The reason behind this is due to the environment they live in. For some bears **food is available all year round** thus hibernation is not needed for their survival.

So only bears living in northern areas hibernate.

(250)

(251)

Brown and American black bears

Brown and **American black bears** are great examples of such behavior. All bears in high latitudes hibernate. There are only few exceptions from that pattern in North America. Brown bears in Southern parts of Europe with relatively mild winters may not hibernate, or only do so for a few weeks.

◀ *Minnesota - pregnant female in open nest*

(252)

Asiatic black bears

Similarly, **Asiatic black bears** hibernate in the northern reaches of their range and at elevations above 2500m. Below this elevation hibernation varies with snow cover. In their southern range, e.g. Thailand and Cambodia, the species does not appear to hibernate.

Jirisan National Park, South Korea - Asiatic black bear mother hibernating in cave den ▶

(253)

Polar bears

Polar bears stay active during the colder months when they prey on seals.

They can even forage in complete darkness during the Arctic winter. In the southern part of their range, during summer they undergo a prolonged period of fasting on shore.

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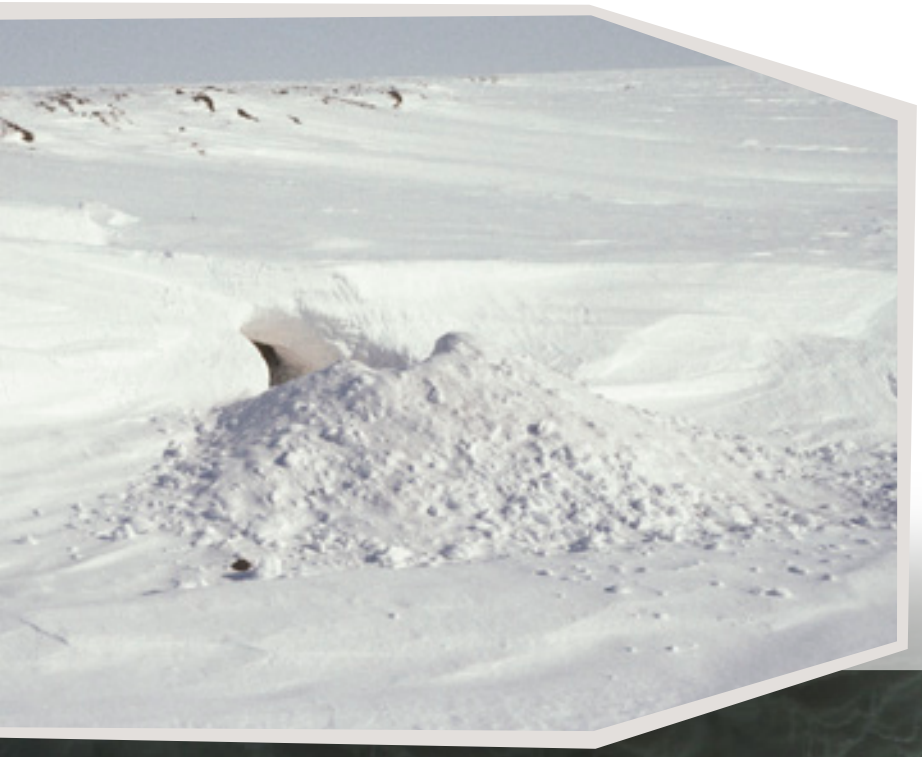


Pregnant bears dig a maternity den into the snow in which they give birth and care for their offsprings until spring.

Like other hibernating bear species, they lower their heart rate and metabolism and slightly reduce their body temperature.

(255)

◀ *Polar bear den excavated into*
▼ *the snow*

(257)

Giant pandas

Even though the **giant panda's** habitat can become quite cold during the winter, they do not hibernate. Their low-fat diet (which consists mostly of bamboo) does not allow them to store enough fat for the cold season, so they migrate to lower but warmer areas instead whilst also constantly looking for food.

(258)

Andean, sloth and sun bears

Andean, sloth and sun bears do not hibernate, because food is available all year round in their region. Altitudinal migrations are only known from an Andean bear population.

(259)

Which species hibernate and when?

	Hibernating?	When?
Andean bear 	**No**, eventually periparturient females in some parts of their range.	——
American black bear 	**Yes**, in most of their range.	November-April
Asiatic black bear 	**Yes**, in some regions and higher altitudes.	November-March
Brown bear 	**Yes**, in most of their range.	November-April
Giant panda 	**No.**	——
Polar bear 	**No**, only pregnant females den.	**Denning:** October-March
Sloth bear 	**No**, perhaps pregnant females.	——
Sun bear 	**No.**	——

CHAPTER 5
Reproduction

Just like nearly all mammals, bears are **viviparous** meaning they give birth to living young, which developed inside the mother's body. However, bears stand out with some **remarkable features**.

Let's learn more about bear reproduction!

(260)

Mating season of bears

Most bears have similar mating season **mainly in spring and early summer**. Depending on the species and its range, it can vary slightly.

(261)

Data from zoos and from the field suggest that mating season of Andean bears differ with latitude. While sun bears have no mating season at all, as they can mate year round at least under human care.

(262)

	Mating season	Time from implantation to birth	Total gestation period	Litter size
Andean bear 	March-October*	+-60 days	6-8 months	1-3 usually two
American black bear 	May-July	+-60 days	6-8 months	1-5 usually 2-3
Asiatic black bear 	June-July	60-70 days	6-8 months	1-2 rarely three
Brown bear 	May-July	+-60 days	6-8 months	1-4 usually 1-3
Giant panda 	February-May	45-55 days	3-6 months	1-2 in the wild only one survives
Polar bear 	March-June	+-60 days	6-8 months	1-4 usually two
Sloth bear 	May-July	+-60 days	4-7 months	1-3 usually two
Sun bear 	year-round	+-60 days	3-3.5 months	1-2 usually one

* in the Peruvian dry forest December and January

Attracting mates

(263)

The sexes find each other by communicating with scents.

For example, polar bear males can find a female based on the smell of her footprints. Urine marks also contain information about reproductive status, sex and location.

To attract mates giant pandas additionally use distinctive vocalizations that sound like bleating or chirping.

(See "Communication" chapter for more information.)

(264)

▲ *Foping Nature Reserve - Giant panda scent marking by handstand*

▼ *Far East Russia - Brown bear smelling marked tree*

(265)

Competition

Females are accompanied by cubs for at least 1.5 years. During this time they do not breed. Thus, there are always **less females than males ready to mate**. This results in **high competition** between males.

Several males might follow females, which are coming in estrous, and often fight with each other for mating opportunities.

The most dominant males mate first.

(266)

In **giant pandas** just one male gains access to the female. The fertile period, when fertilisation is successful, is restricted to 1-3 days, in some cases just to a few hours.

(267)

In the other bear species, this period **lasts longer**. It might consist of several reproductive cycles. During each cycle, ovulated eggs can be fertilised even if successful fertilisation occurred during the previous cycle.

As both sexes mate with multiple partners, cubs can have different fathers within the same litter. So litter mates might be just half-siblings.

(268)

◀ *Estrous female giant panda in tree courting male at base.*

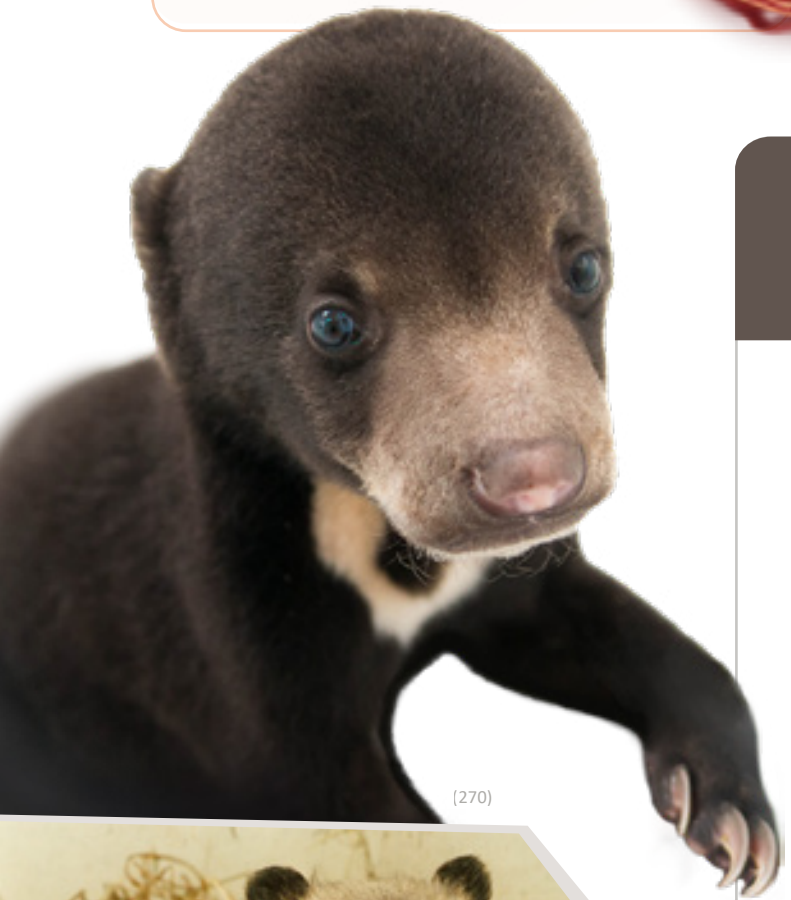
Cub developement

Delayed implantation

(269)

Like in some other carnivores (wolverines, badgers etc.), the development of the embryo stops at the blastocyst stage preventing implantation for several months.

This mechanism is called **delayed implantation**



(270)

Delayed implantation can vary considerably depending on the time of mating.

- In **most bear species,** it lasts 10–27 weeks.
- That of **giant pandas** is with 8–17 weeks shorter.
- Hormonal data suggest that even **sun bears** with their gestation length of just 95–107 days might delay implantation for a short period of 2 weeks.

(271)

Free the Bears sanctuary - Asiatic black bear cub ▲

▲ *Free the Bears sanctuary - Sun bear cub*

◀ *Riga Zoo, Latvia - Brown bear cub*

Timing of birth

(272)

Embryonic growth continues after implantation in **November/December** in brown bears, American black bears and Asiatic black bears in temperate zones.

◀ *American black bear cubs*

▼ *33 days old Asiatic black bear cub*

(273)

Jirisan National Park, South Korea -
Asiatic black bear nest made from branches ▼

(274)

(275)

Tiny cubs are born approximately **60 days** after implantation during mid-winter, when the mother hibernates and relies on her fat reserves gained in autumn.

Mother and cubs emerge from the dens in **April/May**, when food starts to become available again.

◀ *Romania - Brown bear mother with cubs*

▼ *Changqing Nature Reserve - Giant panda mother and cub in cave den*

(276)

However, 75% of giant panda births occur in **August and September** after an even shorter duration of implantation.

(277)

Timing of birth in the Southern species (Andean bears, sloth bears and sun bears) is more variable. Sun bears cubs are born in any month at least in captivity.

According to current information, Andean bears give birth between February and September in their natural range.

In zoos of the Northern hemisphere, they are born in winter, those in zoos south of the Equator are born between May and October.

Andean bear family in maternal den ▶

(278)

Sun bear mother with cub ▲

Sloth bear cub climbing tree ▶

(279)

Altricial young

(280)

Bears give birth to tiny young meaning they are born helpless, vulnerable and dependant on their mother. She will need to nurse, warm and protect them from adverse effects safely in a den, either self-made or in natural caves and hollow trees.

◀ *Wanglang Nature Reserve - hollow tree used as birthing den by giant panda mother*

(281)

Their eyes and ears are still closed and fine short fur covers their body.

(282)

Due to the short period they are nourished through the placenta, after implantation cubs are born highly altricial.

(283)

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This is because developing the fetus further in the womb would require huge amount of energy that would reduce protein and muscle mass, which is not ideal for fasting mothers, therefore switching to milk production helps the cubs develop outside the womb instead, which is more favorable and requires less energy.

◀ *Croatia - Nursing brown bear mother*

?

The cubs' birth weight relative to that of adults is (**200–500 g**) very low. It makes up **0.5-1%** of the mother's weight.

Newborn giant pandas only weigh on average **112 g**, which is **0.1%** of the mother's weight. This is the **lowest** relative birth weight of all eutherian mammals.

Leaving the den

After three months cubs start to wander out of the den following their mother who introduces them to the area they live in.

During the first days or weeks after emergence, females of the northern species often stay close to the dens and hardly feed.

(285)

▲ *Andean bear mother with cub resting in tree*

(286)

◀ *Polar bear mother with cub*

Whilst mothers of southern species and also giant pandas, which do not hibernate but are just inactive for some days or weeks leave the cubs in the dens when they resume foraging in general just for a short time.

However, in most cases the mother is close and ready to defend her cubs from intruders and attackers.

(287)

McNeil River Falls, Alaska - Brown bear mother protecting yearling ▲

(288)

Bear cubs stay with their caring, protective mother for around 1.5-3 years before they are independent enough to go on with their lives on their own.

The mother will teach them the survival skills they need for their life ahead.

◀ *Minnesota - mother with 3 yearlings in tree*

▼ *British Columbia, Canada - Brown bear mother with young cubs*

When cubs become independent?

- Cubs of most species are independent when they are **16-17 months** old.
- Polar bears, and sometimes Grizzly bears stay **2.5 years or longer** with their mother.

In general, the mother will chase them away, when coming into estrous and the cycle begins again.

(289)

(290)

Sexual maturity is reached between 3–5 years. It differs for each species, and also depends on food availability.

◀ *Brown bear mother and cub in Armenia*
▼ *Fighting polar bears*

(292)

Males and females mature around the same time. However, younger males usually do not get the chance to breed successfully because younger males are outcompeted by older, more dominant males when fighting for females.

▼ *Far East, Russia - Asiatic black bear cubs*

(291)

(293)

Related females often settle adjacent to their mother's home range, which might result in some overlap. Males however travel further away, except giant pandas.

Research indicates that giant panda males stay closer to their mothers' range than males of other species do, whereas females leave the maternal area.

Sometimes bear cubs even ride on their mother's back. This behaviour is common with sloth bears for at least the first 3 months after emergence from the den, at about the age of 10 weeks.

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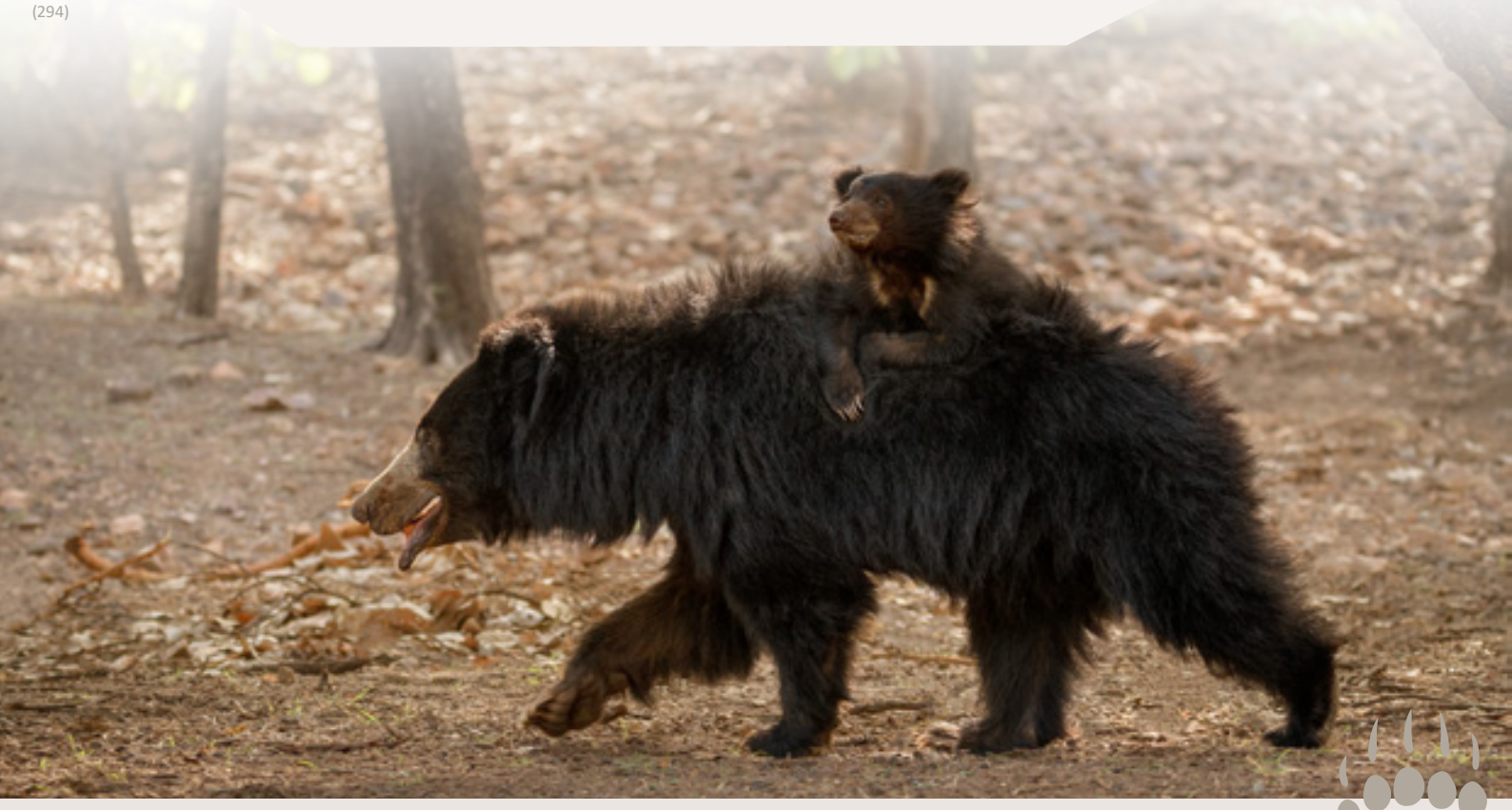
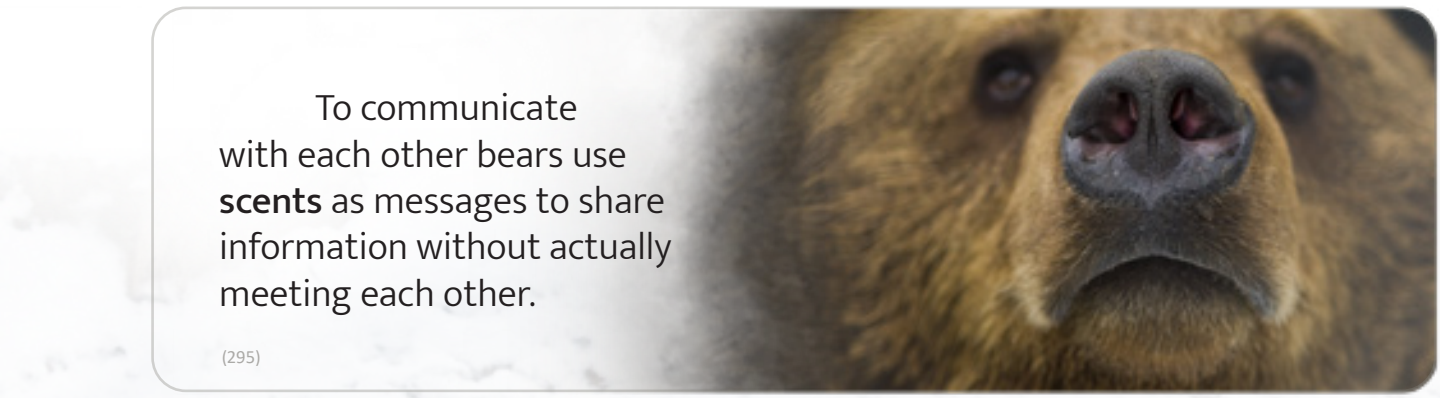


CHAPTER 6
Communication

Like many other animals, bears also use their sense of vision, smell and hearing to find food, detect danger and get information from their surroundings.

To communicate with each other bears use **scents** as messages to share information without actually meeting each other.

(295)



When they meet however, **body language** and **vocal communication** is used to communicate their intentions towards each other.

(296)

Communication with scents

(297)

A bear "sees" the world in scents as their sense of smell is extraordinary. They use their nose not only to find food but also to sniff out smelly messages left behind by other bears.

(298)

When you see a bear scratching their back or other parts of the body against a tree trunk this is rarely done just to relieve an itch. By rubbing the tree the bear leaves behind a scent mark for other bears to smell out.

All species do this, except for **polar bears,** which is not surprising because there are hardly any trees in their habitat.

The kind of tree matters

Some bear species also have preferences for certain trees when scent marking. **Large coniferous trees** of tree species rare in the area are preferred by brown and black bears.
They often remove the bark by scratching and biting and thus leave a visual sign. Not just the mark itself but also its placement is informative too.

(299)

(301)

Rubbing trees are found close to regularly visited game trails. Both sexes display rubbing behaviour - males more frequently than females. In brown bears, rubbing peaks during the non-breeding season!

If polar bears do not mark trees, do they leave other marks?

Yes they do! Polar bears spread scents through their feet. In the breeding season males sniff females' footprints and follow their tracks to find them.

(300)

The "**pedal scent**" is not exclusive to polar bears however, as other bear species also have glands in their soles. When you see a bear rubbing the ground with its paws, they are likely scent marking.

(302)

Scents as messages

Scents left at rubbing trees, by footprints, and by urine or faeces, contain information about sex and dominance status, which conspecifics receive when smelling at them.

(303)

Fresh sun bear claw marks on tree. ▲

Giant panda males have the most conspicious form of marking behaviour: they back up against a tree trunk and do a handstand to place their scent mark produced in special anal glands as high as possible.

The higher the mark is, the bigger the male therefore it is more likely to catch the interest of females.

Why are scent marks so important for bears?

Bears are solitary animals and by using scent marks they can communicate without actually meeting each other.
In this way they can convey information on their individual identity, sex, age, rank and reproductive state. This prevents conflicts and makes it possible to leave a message for other bears that lasts for a long time.

Visual communication

Although chemical communication is important, posture of body, head and ears are means to communicate their intentions when coming in closer contact.

Opened mouth, exposed teeth and flattened ears signal threat. During fights, bites and paw strike are common.

(304)

(305)

If bears feel threatened, they might imitate a charge or lunge.

(306)

Those that just want to play however will have a relaxed face and their movement is more restrained. For example, they do not bite hard, and do not swipe their paws at full-force.

Play-fighting Asiatic black bears ▶

(307)

Agra, India - Playing sloth bears

(308)

Tail communication

For many mammals, the movement of the tail can convey messages as well like dogs that wag their tail when they are excited.

A bears' tail is very short, so it is generally not used for communication with **one exception, the giant panda**.

When a female is in estrus and ready to mate she will lift her tail and present her backside to the male.

Vocal communication

(309)

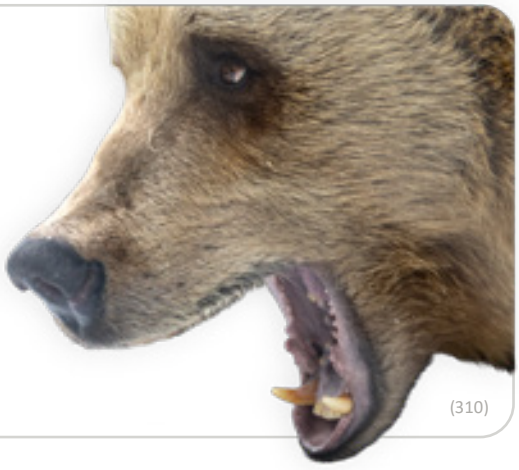
Humming

A sound unique to bears is "humming". Cubs mostly produce it when they are content and generated during breathing out. During humming the cub has a teat, part of the mother's fur or one of its own paws in its mouth.

Humming has been compared to purring, like in cats, but it sounds more like a steady, rhythmic pulse. Bear cubs also make sounds called **screams, moans** and **squeals,** which signal discomfort.

Other sounds bears make

- **Chuffing:** blowing air vigorously through the mouth (very common in polar bears, when excited)
- **Snorting:** blowing air through the nose
- **Jaw pop:** gnashing the teeth
- **Growling**



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Species-specific sounds

Sun bears generate **goat like vocalisations** e.g. when calling their cubs, whereas Andean bear females **trill** to communicate with their offspring and Asiatic black bears utter **popping sounds** like opening a wine bottle.

When a giant panda is in estrus and invites a male to come closer, she makes **"bleating" sound** or even **chirps**. Giant panda vocalisations, which are well studied, contain as much information as their scents.

(311)

CHAPTER 7
Threats and conservation

Bears, however big and strong they may be, are **exposed to many threats** which endanger populations and reduce the chances of their survival. Conservation efforts are going on to help bears overcome the dangers they face.

(312)

There were times when bears occured in large numbers around the World inhabiting wastly sized habitats.

However, in the past 70 years many species faced decline in population and became endangered due to several threats ranging from natural to man-made.

(313)

Taiwan - Asiatic black bear caught in snare ▶

Ecuador - land clearing with fire ▼

The importance of bears

Bears have a vital role in keeping the life cycle of their environment healthy.

For example, they **clean up carcasses,** and in some cases they **control herbivore populations** when hunting. Overpopulation of herbivores would cause great damage to vegetation, and with that their habitat too.

(314)

Bears, like the Andean bear, also help forest regeneration by spreading seeds of plants with their faeces.

Gujarat, India - Sloth bear scat with date palm seeds ▲

Main threats to bears are

- Habitat loss and fragmentation
- Poaching and other illegal activities
- Human-bear conflicts
- Climate change

(315)

Habitat loss and fragmentation

One of the major threats to bears is habitat loss and fragmentation, from which human-bear conflicts arise.

All bear species are threatened by the continuing loss of their habitat, which is decreasing immensely on a daily basis.

For example, the forests which they live in are logged or converted to agricultural areas for growing crops or cattle grazing.

(316)

Myanmar - Sun bear habitat, forest cutting ▶

(317)

Mei Gu Nature Reserve, China - Giant panda habitat, yaks and livestock above treeline encroach into forested habitat ▼

(318)

Habitat loss by conversion into agricultural land or industrial areas, and fragmentation by roads, dams and hydroelectric powerplants, are the most severe threats to all bear species.

China - dam in Asiatic black bear habitat ◀

(319)

This has a huge impact on populations since bears have large home ranges. They require a lot of space to find all the food they need to meet their nutritional requirements.

Karnataka, India - Sloth bear habitat fragmentation ▶

(320)

Southern British Columbia, Canada - fragmented brown bear habitat from major highway and settlement. ▼

Because of natural food production in disturbed habitats is not sufficient to sustain bears, they are forced to look for food near human settlements which causes conflicts between us and them.

(321)

(322)

▲ *Croatia - Penned sheep preyed upon by brown bear.*

◀ *China - Cropfield damaged by Asiatic black bears*

▼ *Kalimantan, Indonesia - Habitat destruction, sustainable development*

(323)

Giant pandas in danger

The most fragmented habitat is that of giant pandas'. They live in six distinct mountain ranges. 33 subpopulations, due to habitat loss and fragmentation have been identified, however it is unclear how isolated they are.

(324)

(325)

Foping Nature Reserve - roads and other infrastructure fragments giant panda habitat ▲

Small isolated populations lose genetic diversity rapidly and the risk of inbreeding and its effects on health is high. So finding a mate from a separate area is essential for the bears' survival.

How to help?

There are ongoing efforts to help giant pandas by connecting populations separated by human activities with green corridors thus providing bears a safe passage between areas. There is also a national conservation project for the species that increased the size of proteced area, enforced anti-poaching laws forbids logging and other uses.

Human-bear conflict

So, habitat loss and increased human activity leads to more human-bear encounters from which conflicts can arise. These confrontations can lead to major, often times fatal injuries, and even death to either or both sides.

Encounters with bears can happen:

- In agricultural areas where crops are grown and livestock are raised.
- Near settlements. Bears can show up near family homes and might even wander into gardens.
- Roads, especially in rural areas.
- While hiking in bear habitat.

(326)

Bears near agricultural areas

Sometimes bears raid plantations for food and bee hives for honey. They may even kill and consume livestock.

(328)

(327)

▲ *Slovenia - Brown bear predation on apiary*

◀ *Minnesota, USA - American black bear feeding on sunflowers which are highly attractive to bears, in the field or in a birdfeeder.*

Farmers try to protect their crops and animals by surrounding them with snares and might even shoot bears on sight.

Washington state, USA - Damage to Douglas fir tree on commercial plantation caused by American black bear feeding on cambium. ▶

(329)

(330)

Bears near settlements

(331)

Hungry bears can be attracted by the smell of garbage and food therefore they may show up near family homes or even wander into gardens which poses danger to both the bear and to the unsuspecting family and pets living there.

(332)

Minnesota - Damage to birdfeeder caused by American black bear ▶

Washington state, USA - American black bear killed for taking advantage of household attractants ▼

(333)

Bears near roads

Roads also pose great threat to both bears and humans as car accidents can happen leading to injuries and death.

(334)

(335)

▲ *Cayambe Coca National Park, Ecuador - Andean bear family crossing highway*

◀ *Florida - American black bear killed in collision with car*

▼ *Greece - Brown bear road sign*

(336)

Bear encounters in the wild

(337)

When people are out in the wilderness to collect timber, fruits, or just for a leisure, they may encounter bears. It does not happen often but its important to know what the right behavior in such situations is.

Chitwan, Nepal - Sloth bear on trail in grasslands ▲

Chitwan, Nepal - forest road through lowland forest sloth bear habitat ▶

(338)

How to help?

- Follow guidelines to avoid human- bear conflicts.
  (See "How to avoid human-bear conflics" chapter)
- Do not leave garbage out in your backyard.
- When driving, do not exceed speed limit and pay extra attention on rural roads through natural habitats.

Poaching and illegal activities

Bears, no matter which species we are talking about, are hunted for several of their body parts mostly for decorational, culinary or medicinal uses.

(339)

China - Traps found in Asiatic black bear habitat ▲

(340)

▲ *Myanmar - poacher entering forest caught on camera trap*

▼ *Malaysia - Sun bear caught in snare*

(341)

Legal hunting

Bear hunting is legal where populations are large enough.

American black bears and brown bears are hunted in most parts of their range. Asiatic black bears in Japan and the Russian Far East are also hunted.

(342)

For example, in Scandinavia and the Balkan states management plans exist which regulate hunting activities and control poaching. The population development is monitored. The outcome is used to determine the hunting quota.

Fees requested for hunting licenses are returned to bear conservation activities, like paying compensation for damages by bears.

Illegal hunting

(343)

However, even Least Concerned species have populations that are threatened and can face **extirpation** (local extinction), if anti-poaching measures are not implemented and enforced.

▲ *British Columbia, Canada - legally hunted brown bear*

◀ *Kurdistan, Iraq - Syrian brown bear killed illegally purportedly in self-defence*

Any other bear species are illegal to hunt but that does not stop poaching and illegal trade.

(344)

For example, some bears such as the Andean bear, Asiatic black bear, sun bear and sloth bear are poached for their body parts especially their gallbladder.

◀ *Assam, India - Sloth bear killed by village mob after attacking people in abandoned tea plantation*

(345)

China - poaching camp ▶

Taiwan - damaged paw from poacher's snare ▼

In many cases bears are caught inadvertently in snares that were set up for other wildlife like wild boar and deer. In these cases the bear is normally killed (if not already dead) and their parts sold. Luckier bears will be anesthetised and removed from the snare by local wildlife authorities.

(346)

Fortunately giant pandas do not face the dangers of poaching anymore.

Bears are hunted for...

- **Skin**
- **Meat, fat**
- **Paws** (delicacy)
- **Gallbladder** (for bile)
- **Claws and skull** (for jewelry and trophy)

(347)

Bangladesh near Myanmar border - Sun bear skin (possible hybrid)

(348)

Colombia - Yukpa amulet Andean bear canine and claw

(349)

China - farmed bear bile

(350)

Taiwan - Asiatic black bear caught in snare and died

Bear bile harvesting

Out of all the products bears are poached for, their bile is especially popular, since it is used in Traditional Chinese Medicine to treat health problems including liver diseases and gallstones.

Bear bile contains Ursodiol also called UDCA (ursodeoxycholic acid) and has many proven medicinal benefits. Mostly hibernating species have it, presumably to delay cell death during hibernation. Bears seem to have the highest concentration of it.

Poaching for bile

(351)

The majority of bears poached for their bile are Asiatic black bears. In South-East Asian countries, and previously in China, most of them were caught in the wild. This has caused decline in some populations.

◀ *China - bear farm*

▼ *China - farmed bear bile*

To battle declining populations, the Chinese government made guns illegal, tackled down on poaching, and begun to promote bile farming as a conservation measure. Since the farmed bears are from captive breeding, it also might have helped to reduce poaching in the country.

(352)

China - bear farm bile milking ▲

Bile is obtained from the gallbladder of dead bears or extracted from live bears on bear farms using needles. They are kept in small cages and lived in unhealthy conditions. Chronic low grade inflammation of the hepatobiliary system are the consequence.

Meanwhile in China standards are set for keeping bears on farms. Among others, the needle-extraction method was changed to the free-drip method with a catheter.

Fortunately bile harvesting from wild bears became illegal in all countries. In China bear farms are legal but with strict rules for keeping bears and a better way to extract bile.

There are synthetic and herbal alternatives to bear bile, however in Traditional Chinese Medicine it is deemed less effective. In Western countries there are products that solely contain synthetized UDCA.

Bear paw harvesting

(355)

Bears are also poached for their paws as it is considered to be an expensive delicacy.

There is an odd but illegal soup delicacy prepared in some Asian countries which requires a bear's paw as its main ingerdient. This dish is called "Bear paw soup" and was served at some restaurants with a high price tag.

(356)

Fortunately this trade has been put to an end, but there are still poachers around.

Drying sun bear paws ▲

Nanning, China - bear paw seizure, 2012, 141 paws ▶

How to help?

Avoid using anything that comes from illegally hunted bears.
Educate yourself about the products you are using to find out if it contains anything bear related. For example:

- **Buy alternatives to bear bile:** there are many synthetics and even herbs with similar medicinal properties. In Western countries medicinal products only contain synthesized UDCA.
- For decorations use **bear pelt imitations** created with synthetic fur. Same for claws and skulls.
- Avoid any restaurants that are offering bear paw soup in regions, where bear hunting is illegal.

Bears for entertainment

Bears, just like many other animals, have always been used in many ways to satisfy the needs of people, be it for medicinal, culinary uses or for entertainment.

(357)

▲ *Tajikistan - Brown bear cub bound for captivity or for medicinal purposes*

Aside from being hunted for their parts, for centuries they were also used in various ways for entertainment (e.g. in circuses) and as a means to sustain a living (like the Kalandar people).

They were forced to perfom in front of a crowd making people smile but leaving bears miserable.

Bears were used as entertainment...

- as dancing bears
- in bear-baiting
- in circuses
- as pets

(358)

▲ *Pakistan - Bear-baiting (bear-dog fight)*

(359)

▲ *Sloth bear as dancing bear*

Dancing bears

(360)

For roughly 400 years bears were used to perform on village streets to amuse people. Dancing brown bears were also known from Europe. Rare cases were reported even from the early decades of the last century in the West and even longer in the Eastern countries.

Sloth bears in India were originally "danced" to entertain the mughals. Later the Kalandars took the bears to the streets for tips etc. They were called "**dancing bears**" and while this does not sound too terrible it was actually really painful for the animals.

As cubs, their noses were pierced all the way to the top of the muzzle and a rope, or a brass ring, was lead through the sensitive area. When pulled, the animal was forced to stand up due to the pain and move as if dancing.

(361)

A dancing bear entertaining the crowd. ▲

Dancing bear with rope through the muzzle. ▶

Fortunately, this practice is a thing of the past as now this act is illegal thus it was banned in many countries and nearly all dancing bears have been rescued giving them a second chance in life.

Circus bears

Life of a circus bear was not a fulfilling one either. Their whole life was about entertaining people, just like that of dancing bears, whilst getting nothing in return aside from a small cage and a life-long torture.

They were trained to do uncomfortable and unnatural tricks in a way that caused the animals to live in fear of suffering.

Their training was hard and cruel as they were forced to perform difficult tasks such as riding a bicycle, walking upright for a long period of time, and other tedious tricks, which was achieved by causing pain to the animal and therefore performed out of fear.

They would live in a small cage where they barely had space to move, whilst the food they were served was low in nutritients. The conditions they were kept in left them with both physical and psychological distress.

Luckily most countries have already banned the exploitation of bears in circuses and theatres. Many dancing and circus bears were rescued and are now living in sanctuaries.

Bear-baiting

Bear-baiting was a cruel blood sport where chained, declawed and defanged bears were forced to fight against dogs - a practice which was first established at European courts in former centuries.

The bears had no chance to protect themself and after the ordeal their injuries were not treated.

(362)

Pakistan - Wounded bear after a bear-dog fight ▶

(363)

Another version of the practice in California in the 19th century involved the now extinct brown bear subspecies, the Californian grizzly bear, that was forced to fight a bull instead of dogs.

◀ *Pakistan - Bear-baiting*

Now, blood sports in general face limitations in most parts of the world and bear-baiting in particular have become illegal and are now a thing of the past.

Bears as pets

(364)

▲ *Malaysia - Sun bear cub used in pet trade*

Bear cubs caught in the wild were often kept as pets for example in private households, near petrol stations or restaurants. The places they were kept did not meet the animals' needs and they did not get food with the right nutritional value, so pet bears did not live a fulfilling life.

In many countries using bears for entertainment became illegal. This also goes for owning a bear privately, as a pet bear is not possible anymore in most countries. However, law enforcement is often weak or absent and therefore many cubs still end up as pets.

Bears need more than a backyard

As you will read in the "Zoo life of bears" chapter, EAZA zoos have high standards of keeping bears. Bears need large naturalistic enclosures with enough opportunities to express natural behaviours such as foraging, swimming and digging. This cannot be realised in someone's backyard or in a small cage.

How to help?

- Do not go to a circus with performing animals or visit restaurants and playgrounds that keep bears.
- If you see a bear living in bad conditions, report it to organisations such as
  - **Four Paws** www.four-paws.org
  - **Bears in Mind** www.bearsinmind.org
  - **Animals Asia** www.animalsasia.org
  - **Free the Bears** www.freethebears.org

Climate change

Human induced climate change is a huge issue for many animal (and plant) species and that also includes bears.

As the climate of their habitat gradually changes so does plant and animal life, which lowers the bears' chance of survival.

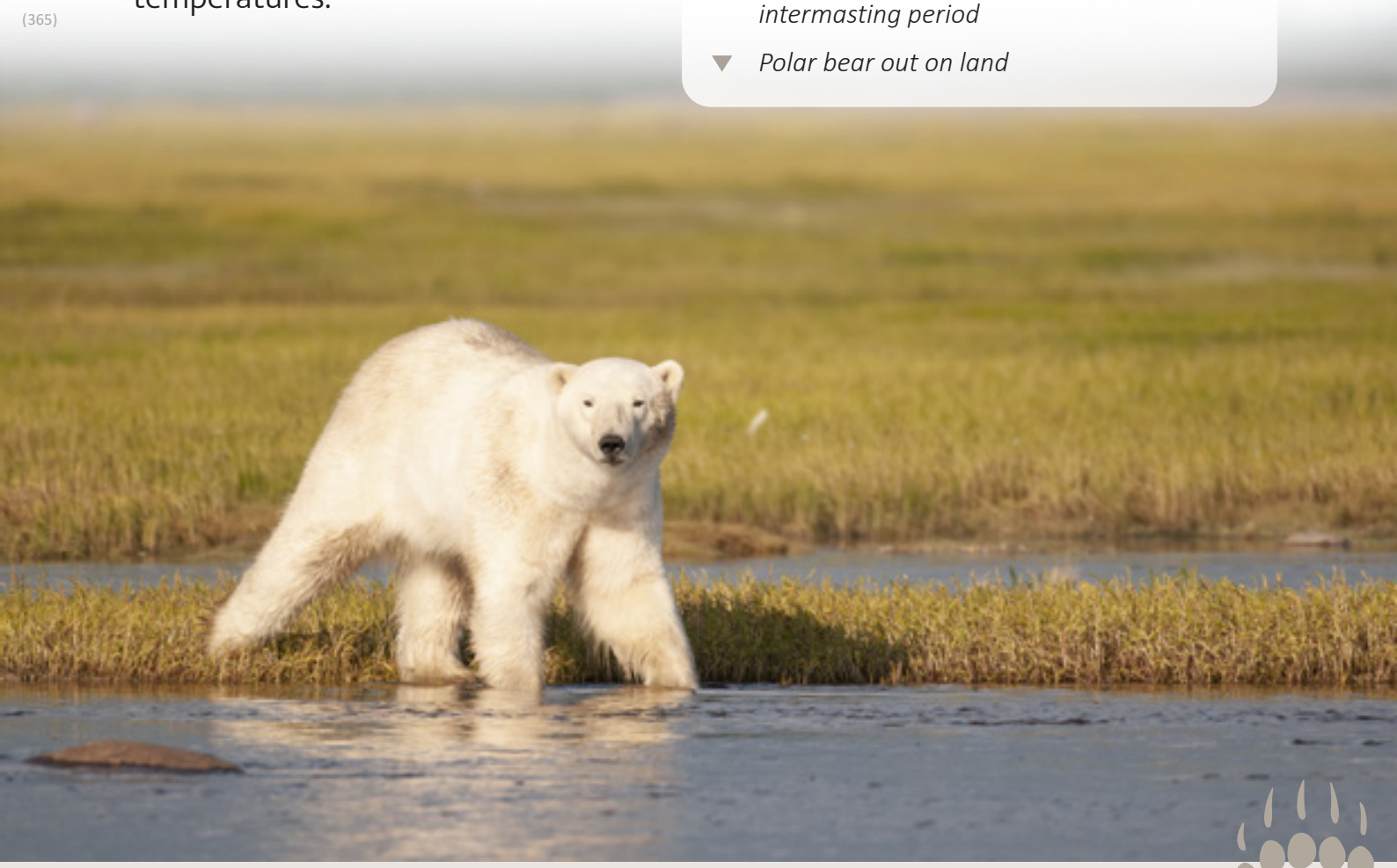
This might not only leave bears in **food shortage,** but rising temperatures can also affect the **duration of their hibernation**, as den entry and exit are associated with falling winter and rising spring temperatures.

(503)

▲ *Sabah, Malaysia - starving sun bear during intermasting period*

▼ *Polar bear out on land*

(365)



Polar bears, symbols of climate change

(366)

With their habitat melting away as the earth warms up, polar bears have become the symbol of all species that suffer from the consequences of global warming and climate change.

These animals are evolved to live in the freezing conditions of the Arctic. Their survival is highly dependant on sea ice, which is continuously melting due to global warming.

(367)

With less ice to travel on, polar bears have to cover huge areas while swimming instead of walking over the ice. This uses a **huge amount of energy** and the opportunity to catch seals and get the energy back is significantly lower.

Polar bears **need ice platforms** to catch said prey, and although they are very good swimmers, even they can't outswim a seal in the water.

Polar bears don't just use the ice for hunting, they also travel, mate and occasionally den on it.
The ice is their life.

The importance of sea ice

Its not just polar bears that benefit from the ice in the Arctic. Sea ice is actually frozen ocean water which supports an entire ecosystem, our planet, and therefore us too.

▶ "Soil" of the Arctic

Sea ice supports the Arctic ecosystem. Due to the salt getting pushed out when the ocean water freezes tiny channels appear inside the ice where algae grows. Microorganisms thrive on this algae on which intern fish, like the Arctic cod, feast. Seals and other marine mammals feed on these fish, and at the top of the food chain polar bears enjoy their calorie-rich seal prey.

▶ Earth's air conditioner

Oceans and sea ice helps to regulate temperature around the planet. They absorb the sun's heat and, alongside nutrients and moisture, circulate it through the planet's climate system. Arctic sea ice is a vast, white surface that helps to control heat absorption by reflecting away much of the sun's rays, thus cooling the entire planet and preventing the temperature reaching too high.

This effects all ecosystems around the world, therefor losing sea ice is a problem to all life including us.

(368)

Other bear species are affected as well, as modelling studies indicate that their current habitat will decrease in the future due to climate change.

(369)

For example, Andean bears also face high risk of habitat loss.

Climate models show that mountain biomes could be largely affected by climate change in a way that the suitable habitat of these bears will decrease considerably and will draw back to higher elevations. This could cause huge impact on survival and on their habit of moving between different altitudes as seasons change.

How to help?

Reduce your impact on the climate by

- saving energy
- buying more used and second-hand items instead of new
- eating sustainable (local) products and less meat

Take part in and celebrate

- International Polar Bear Day *(February 27th)*
- Arctic Sea Ice Day *(July 15th)*
- EAZA Bear TAG Happy Bear Day *(May 10th)*
- Pole to Pole Campaign (www.poletopolecampaign.org)

Check out www.polarbearsinternational.org for more information.

Conservation status of bears

All bears (like many other species) are included in a special list, called IUCN Red List, where their conservation status is stated.

What is the IUCN Red List?

Its short for *International Union for Conservation of Nature Red List of Threatened Species*.

The IUCN was created in 1948 and is a now a network of more than 1400 governmental and non-governmental member organisations. 15000 experts contribute with their knowledge on the status of species and habitats, which is necessary to safegard the biodiversity of our planet.

One tool is the IUCN Red List.

Its goal is to assess the status and **extinction risk** of all species by following a very strict set of criteria. Range and habitat, the size of populations, ecology, use and threats as well as necessary conservation actions are described.

The Red List is regularily updated and revised by the corresponding specialist groups, in the case of bears the Bear Specialist Group. Currently mammals and birds are best represented in the Red List. There are nine categories a species can be classified into.

The nine categories

- Not evaluated (NE)
- Data deficient (DD)
- Least concern (LC)
- Near threatened (NT)
- Vulnerable (VU)
- Endangered (EN)
- Critically endangered (CR)
- Extinct in the wild (EW)
- Extinct (EX)

More than 42,100 species are threatened with extinction

That is still 28% of all assessed species.

Amphibians	Mammals	Conifers	Birds	Sharks and rays	Reef corals	Selected crustaceans	Reptiles	Cycads
41%	27%	34%	13%	37%	36%	28%	21%	69%

Classification of the conservation status of bear species

EX — *Extinct*

EW — *Extinct in the wild*

CR — *Critically endangered*

EN — *Endangered*

VU — *Vulnerable*

NT — *Near Threatened*

LC — *Least Concern*

The other bear species are all listed as **Vulnerable,** as they considered to be at high risk of extinction, thus human intervention is needed to ensure that they would not slide even further down on the list.

There are several populations of brown bear (e.g. the Atlas bear of Northern Africa) which are already **extinct**. Conservationists are hard at work to help extant bear populations that are at risk, to prevent their extinction.

Only the **brown bear** and the **American black bear** are listed as **Least Concern**, meaning it is unlikely for them to reach endangered or extint status in the forseeable future. However, there are several small brown bear populations in Europe and Asia which are at risk of extinction.

The giant panda was downlisted from endangered to vulnerable in 2016, due to an increase of population size and of habitat. But as Vulnerable, there is still a high risk of extinction.

		Conservation status	Population trend
Andean bear		Vulnerable	Decreasing
American black bear		Least Concern	Increasing
Asiatic black bear		Vulnerable	Decreasing
Brown bear		Least Concern	Stable
Giant panda		Vulnerable	Increasing
Polar bear		Vulnerable	Decreasing
Sloth bear		Vulnerable	Decreasing
Sun bear		Vulnerable	Decreasing

Threatened brown bear populations

Although brown bears are listed as Least Concern, there are several small populations that are threatened and might face local extinction.

For example, in Italy's mountain range the **Apennines** (Abruzzo), there is a population of around 50 bears. There is also a very small population of around 45 bears in the **Pyrenees** as well, which is listed as **Critically Endangered** in an appendix to the brown bear Redlist assessment.

(370)

(371)

Coastal British Columbia, Canada - varying coat color ▶

Kamchatka - dark coat color ▼

?

Some of these small brown bear populations in Europe are increasing, like that in the Cantabrian Mountains (Spain) and that in the Italian Alps, which have been re-introduced more than 20 years ago.

(372)

Kodiak bear (Ursus arctos middendorffi) ▲

Pakistan - Himalayan brown bear ▼

For many of these isolated populations, there is an **ongoing debate** whether they belong to a certain subspecies.

A well known example are the brown bears that live on the **Kodiak Archipelago**. They are isolated by a 37 km stretch of ocean from the mainland, and are known for their **salmon consumption**.

Even though they are not assessed as a separate subspecies on the IUCN Red List, they are generally considered to be a unique population.

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Subspecies of North America

The **Kodiak bear** *(Ursus arctos middendorffi)* of the Kodiak Archipelago is one, and the other is the **grizzly bear** *(Ursus arctos horribilis)* inhabiting the mainland.

(374)

British Columbia, Canada - distinctive round concave face ▶

(375)

Populations of Eurasia

There are several populations scattered across Europe and Asia with varying numbers and conservation status. Due to lack of genetic sampling across this huge area, subspecies in Eurasia are still up to debate.

(376)

◀ *Western China - varying coat color and collar around the neck*

▼ *Qinghai, China - brown bear with light coat*

(377)

Pakistan - light coat color

For example, those living in the **Himalayas** are Endangered and their numbers are dwindling, whilst those living in the **Gobi Desert** are listed as Critically Endangered, with around 20-40 individuals found in their habitat.

Some brown bear populations are listed as Least Concern, however there are several other which are considered to be highly endangered.

(378)

Gobi Desert Mongolia - Gobi bear

(379)

Some populations however have not enough data to give them a conservation status.

Threats in a nutshell

	Habitat loss and fragmentation	Human-bear conflict	Poaching and illegal activities	Climate change
Andean bear	✗	✗	✗	✗
American black bear	✗	✗		
Asiatic black bear	✗	✗	✗	
Brown bear	✗	✗		
Giant panda	✗			✗
Polar bear	✗			✗
Sloth bear	✗	✗	✗	
Sun bear	✗	✗	✗	

How to avoid human-bear conflicts

If you live in areas where you can **encounter bears** or if you are wandering out in the open, be educated about what to do and what to leave when you find yourself face to face with a bear.

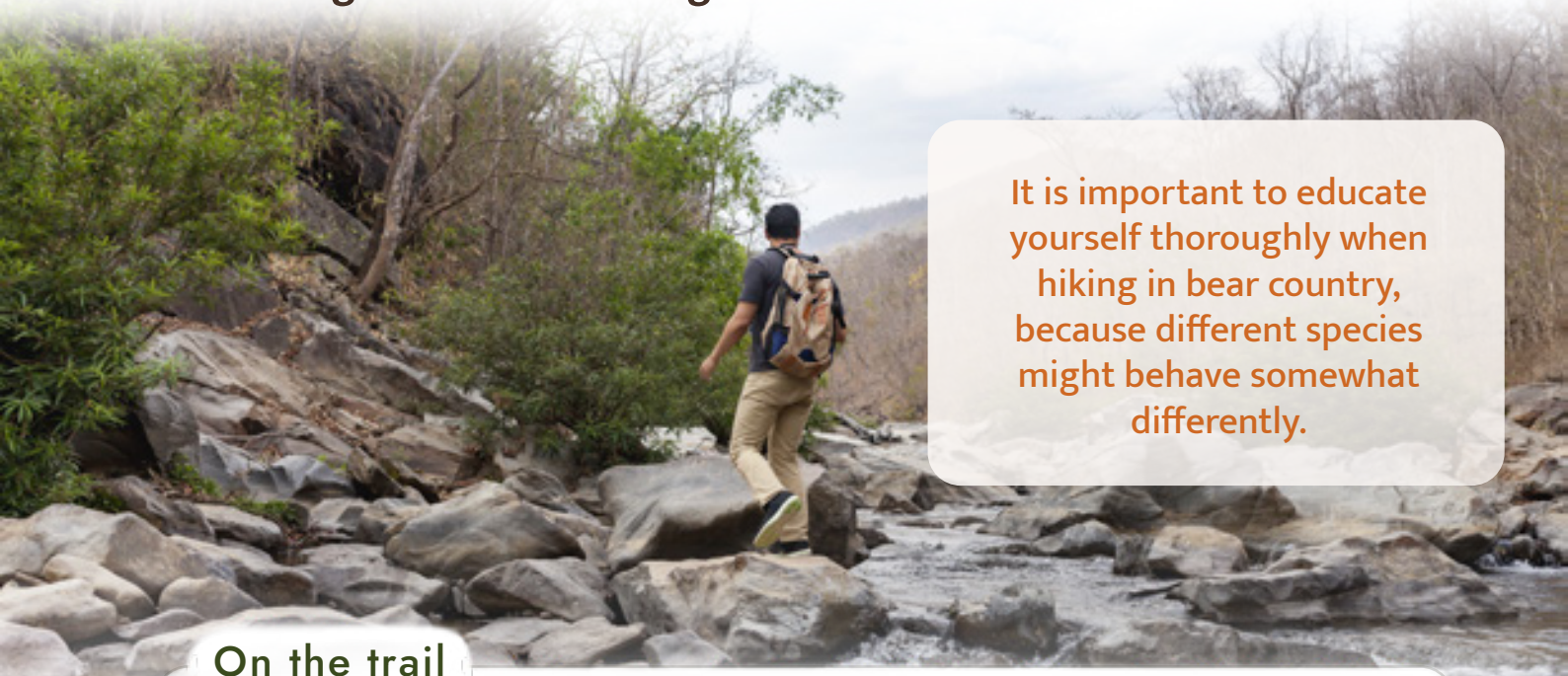
The following guides offer advice that can be applied to your trips into the wilderness and also give you ideas how to protect your farmland from bears.

(380)

Minnesota - American black bear coexisting with people ▶

(381)

Avoiding conflict during a hike



It is important to educate yourself thoroughly when hiking in bear country, because different species might behave somewhat differently.

On the trail

- **Be noisy:** talk when in company, make noise when alone.
- **Pay attention to your surroundings:** look for anything that indicates there is a bear close by such as fresh bear tracks and scat.
- **Stay on the trail:** don't stray away from designated hiking trails and avoid thick bushes on the way.
- **Walk your dog on a leash:** without leash the fleeing dog, with the bear following behind, will run back to its owner for protection.
- **Stay away from cubs:** if you see bear cubs during your trip do not approach them as their mothers are nearby and ready to do everything to protect their cubs and may even attack a human in defence.

Bears have an excellent sense of smell!

- **Do not take strongly smelling food with you.**
- **Do not leave any food scraps behind:** pack them in an odorless manner and do not take them out while hiking.
- **At your campsite store your food safely:** put it in a food storage locker, if there are any, or hang it up in a tree away from your tent.

If you encounter a bear...

- **but the animal has not noticed you:** you should back off from the place unobtrusively and quietly if possible while keeping an eye on the bear.
- **If the bear has noticed you:**
  - Do not try to chase it away.
  - Do not look it in the eye.
  - Do not try to take a close-up photo (e.g. a selfie).
  - Do not turn your back on it.
  - Do not run away.
  - DO retreat slowly.

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Risk of a surprise encounter

Unexpected encounters can occur especially while cycling or jogging in the woods or when the bear suddenly emerges from behind a boulder or a bush. Or you can even meet a bear atop a mountain by approaching from opposite sides.

Most bears try to avoid any encounter with humans under natural conditions.

They only attack if feeling threatened!

Enjoy the bears… in the distance.
It is strongly suggested that people go watching with an official guide.


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Possible reasons for a bear attack

- Presence of cubs that the mother bear is determined to protect.
  Do not approach cubs!
- Presence of a carcass on which it feeds.
  Do not examine the carcass!
- A surprise encounter, when the bear starts a counter-attack out of fear.
  Be careful while hiking!

If the bear stands on its two hind feet, do not panic, it is not an explicit sign of attack yet. It might just be scanning its surroundings.

What should you do if you find yourself face to face with a bear?

- Back away slowly, do not run and do not turn your back on the bear. That way you should try to retreat and make sure the bear also has an escape route.
- Make yourself as large as possible, for example by standing on something or raising your hands above your head.
- Talk to the bear in a low voice.
- Do not feed it!
- Avoid direct eye contact but keep your eyes on the bear.
- **Use a bear spray:** This is an effective tool for deterring an aggressive bear. It is recommended that you carry bear spray when hiking in bear country. However, some country do not allow the possession or use of bear spray. Check country regulations before your trip.
- Do not try to run away or climb a tree as bears are faster than you and skilled climbers.
- If the bear comes closer do not provoke it or make sudden movement!
- If you are in a car while meeting a bear, do not leave the vehicle!

(385)

British Columbia - Conservation Officer teaching the use of bear spray to repel bear encounters

Sloth bears are one of the most aggressive out of all the bear species. Make noise and carry bells to avoid sloth bear attacks. If possible go in a group and not alone when you walk in India's countryside.

Avoiding conflicts around farming areas

Livestock, bee hives, and farming land should be protected

(386)

- Grazing animals should never be left unattended. Large sized guard dogs could be used for protection.
- Intensify protection of livestock animals during the night. They should be kept in a closed building.

(387)

- Electric fences could also be used, in particular, to protect bee hives.

Greece - Shepherd with guard dogs providing protection from brown bears.

Electric fencing to repel bears from commercial bee hives.

Controlling waste

- Waste should be kept in a closed bin that cannot be accessed by animals.
- If that is not possible, waste should be removed on a daily basis.

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Brown bear searching for food in garbage in an open bin.

The Bear calendar

To highlight the plights of bears there are several events and days you can attend to and celebrate. Show your care for these animals!

Polar Bears International made sure the plight of polar bears gets attention by establishing two special days.

For more information, see their website at www.polarbearsinternational.org

International Polar Bear Day

The 27th was chosen because at this time, mother bears with cubs are in their dens. The day is all about the need to protect denning polar bear families in the Arctic. These bears face more and more challenges as their habitat warms up, thus the survival of every single cub is essential.

February 27th

Focuses on denning polar bear families

Arctic Sea Ice Day

Polar bears need sea ice, but the period without sea ice gets longer every year due to climate change. And this is not only a problem for polar bears. On Arctic Sea Ice Day, we raise awareness about climate change and how it affects sea ice, polar bears and everything around them.

July 15th

Focuses on arctic sea ice, climate change, polar bears

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World Bear Day

A day to celebrate all bear species around the world and to learn more about their biology, importance, the threats they face and how we can help them.

March 23rd

Focuses on all bear species

Happy Bears' Day

The EAZA Bear TAG started to organize this event with a dual purpose: firstly, educating people about the eight bear species and the threats they face. Secondly, fundraising for the in-situ programs of bears that live in the wild. *(See "Happy Bears' Day event" subchapter for more information.)*

May 10th

Focuses on all bear species, education, fundraising for in-situ bear programs

- **Giant panda Day** - Celebrating Giant Pandas — March 16th
- **Sun Bear Day** - Celebrating Sun bears — Third Friday in March
- **Black Bear Day** - Celebrating American black bears — First Saturday in June
- **Andean Bear Day** - Celebrating Andean bears — July 21st
- **Moon Bear Day** - Celebrating Asiatic black bears — August 8th
- **Sloth Bear Day** - Celebrating Sloth bears — October 12th

Happy Bears' Day event

The role of zoos has been reassessed during the recent decades. Whilst entertainment was the main goal in the past, today education, research, and species conservation are the most important tasks of zoos.

Zoos have a great attitude-shaping role and reach millions of visitors around the world. The Bear Taxon Advisory Group of the European Association of Zoos and Aquaria (EAZA) started to organize the Happy Bears Day program from 2019.

(390)

Wingham Wildlife Park ▲

This one-day event in May has a dual purpose: firstly, to **educate** the visitors about the 8 bears species in the world and the threats they face. Secondly, **fundraising** for in-situ programs of bears that live in the wild as part of the event's programs.

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How this day looks like

On previous events, the EAZA bear-keeping zoos were informed about the event through circular emails and social media. They could download not only the program's logo but also numerous **bear education panels** *(such as the Bears of the World map in 8 different languages, the bear cube or the Bears' family tree)* from the website of Sóstó Zoo, and they could also read tips on fundraising.

◀ *Bear education at Port Lympne Hotel and Reserve*

(392)

The in-situ programs were chosen by the EAZA Bear TAG Members. The zoos which joined the event were free to choose which one they would like to support. Many EAZA member zoos applied for the Happy Bears' Day and a really colourful program was offered to the guests.

There were not only public feedings and lectures next to the bears' enclosures, but there were zoos that created enrichment items for their bears with involvement of the visitors.

On the educational stands, teachers were waiting for the guests and zoo educators showed them interesting things like the composition of the bears' diet, or the different dentition of the bear species.

Some zoos offered handicraft corners, while others offered bear face painting to the guests, and even honey could be tasted in some zoos.

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Wildlife Reserve Singapore ▲

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There were many donations, some zoos sold teddy bear muffins or teddy bear ice creams, and in one zoo a person in a teddy bear costume was hugging the guests in exchange for funds for the little bears.

For the future

We hope that more and more zoos will join this event in the future (10th of May) and we can raise even more funds for the bear species living in the wild.

Conservation

Organizations and zoo projects

There are many organisations and zoo projects whose main focus revolves around bears: how to help them and increase their chance of survival. Some organisations actively try to **protect bears in-situ**. We want to highlight the work of some of them here.

- **Free the Bears** - Sun and Asiatic black bear
  www.freethebears.org

- **Pro Natura Foundation** - Sun bear
  www.pronaturafoundation.org

- **Wildlife SOS** - Sloth bear
  www.wildlifesos.org

- **Polar Bears International** - Polar bear
  www.polarbearsinternational.org

- **WCB Research Foundation** - Sloth bear
  www.wcbresearch.in

- **Bears in Mind** - Brown and other bears
  www.bearsinmind.org
  www.bearalert.org

- **Moscow Zoo programs** - Polar bear
  www.moscowzoo.ru

Free the Bears

www.freethebears.org

They work to protect threatened Sun bears and Asiatic black bears across Southeast Asia, with a particular focus on imperilled bears in Cambodia, Laos, and Vietnam.

(396)

▲ *Students on a tour of the Bear Discovery Centre at Free the Bears Cambodia sanctuary.*

Free the Bears and other wildlife conservation organizations are working with governments to strengthen laws and increase capacity for enforcement through the development of suitable sanctuaries to house rescued bears, working with consumers and traditional medicine practitioners to promote synthetic and herbal alternatives to bear bile, conducting field surveys to identify at-risk populations of wild bears and guiding conservation action planning for the species.

(395)

Laos Lake Rescue 2014 ▲

Many of their rescued bears are rescued from poachers, exotic pet owners, or people planning to use them in traditional medicine.

(397)

By now over 1000 bears has been rescued and rehabilitated!

Pro Natura Foundation

www.pronaturafoundation.org

(398)

The Pro Natura Foundation, based in East Kalimantan (Indonesian Borneo) was formally established in March 2013. Several core members of Pro Natura have been active in sun bear and forest conservation in the region since the early 1990s.

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Pro Natura currently focuses on sun bear habitat conservation, through facilitating community patrols, fire prevention activities and monitoring wildlife populations in a key water catchment area.

▲ *Kalimantan Indonesia - Patrol team.*
◀ *Fire prevention and fire fighting are core activities.*

A second mission of the organization is to build up a local conservation constituency and raise awareness on environmental issues through development of the first environmental education centre in Kalimantan, with a strong focus on sun bears, and facilitating forest training programmes for a next generation of forest conservationists.

Kalimantan Indonesia - Visitors to KWPLH sun bear education centre ▶

(400)

Wildlife SOS

www.wildlifesos.org

(401)

Wildlife SOS was established in 1995 by a small group of individuals inspired to start a movement and make lasting change to protect and conserve India's natural heritage, forest, and wildlife wealth.

Dancing bear project ▶

(402)

Today, the organization has evolved to actively work towards protecting Indian wildlife, conserving habitat, studying biodiversity, conducting research, and creating alternative and sustainable livelihoods for erstwhile poacher communities or those communities that depend on wildlife for sustenance.

◀ *Tribal rehabilitation program*

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Although Wildlife SOS is internationally renowned for its landmark work in resolving the problem of "Dancing Bears across India", they have several active projects to rehabilitate Leopards, Elephants, Tigers, Reptiles, and other animals. Other projects are targeted at environment and biodiversity conservation as well as reducing the human carbon footprint.

Elephant conservation and care project ▶

Polar Bears International

www.polarbearsinternational.org

Polar Bears International (PBI) is the only nonprofit with a sole focus on polar bears and their sea ice habitat.

> Our mission is to conserve polar bears and their sea ice home.

(404)

▲ *Setting up the remote camera system which is powered by solar panels*

We inspire people to care about polar bears and the fragile Arctic ecosystem they depend on. Our research leads to a greater understanding of polar bears and informs sound policy, and our education and advocacy efforts instill hope and inspire action.

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▲ *We are the only conservation organization dedicated solely to wild polar bears.*

Join us and share our annual awareness events with your community:

- **International Polar Bear Day** - Februrary 27th

  Take part in this special day by learning all about polar bear moms & cubs, donating, tuning into our live events, and participating in our "Protect Moms & Cubs" challenge.

- **Arctic Sea Ice Day** - July 15th

  We created Arctic Sea Ice Day to draw attention to the ice loss taking place in the Arctic, why it matters, and how we can reverse this trend.

- **Polar Bear Week** - First week of November

  Join us the first week of November to celebrate the bears and support our efforts to reduce conflict, keeping polar bears and people safe.

WCB Research Foundation

www.wcbresearch.in

(406)

Wildlife & Conservation Biology (WCB) Research Foundation is a non-profit organization established on September 10, 2020 with the goal of accelerating action-oriented research and enhancing the capacity of conservation professionals for effective research in the field of wildlife and conservation biology.

Camera trapping ▶

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Sloth bear conservation project. ▲
Research on sloth bear biology, feeding style - termite mounds. ▶

We also study the ecology, distribution and behaviour of sloth bear as well as other Indian wildlife through field research and monitoring. ”

“ We are committed to science-based conservation and outreach activities through research. “Aatmavat Sarvabhuteshu” is our featuring project, under which we are working with local community living around sloth bear habitat and conducting awareness and bear safety education to mitigate the human-sloth bear conflicts and inculcate the tolerance to co-exist with sloth bears.

(408)

Bears in Mind

www.bearsinmind.org

www.bearalert.org

Bears in Mind supports and initiates projects to protect bears in the wild and help captive bears in need. The foundation works together with local organizations, universities and governments on projects focusing on nature conservation, welfare, education & awareness.

Collaring bears in Romania ▼

(409)

(410)

Their projects mainly focus on European brown bears, but as they operate worldwide, there are projects for the conservation of other bear species as well. Bears in Mind was established in 1993 when they created the first Bear Forest, which is situated in The Netherlands. In the forest, bears with tragic histories of abuse or neglect are offered a safe haven where they can regain their natural behaviours and be bears again.

Orphaned bear cubs at the rehab center in Romania. ▲
Camera trap training of rangers in Sungai Wain Borneo Indonesia. ▼

(411)

Over time, the organization expanded to include projects that also focus on bear conservation in-situ. Other projects from Bears in Mind are for example: exploring methods of reducing human-wildlife conflicts, population research, rehabilitation, education of local communities on co-existing with bears, habitat protection and others that have the protection of bears, in mind.

Moscow Zoo programs

www.moscowzoo.ru

The Moscow Zoo is a participant of two programs on the polar bear in-situ.

(412)

"Stay in Nature" is a program that allows you to explore the possibility of leaving lonely cubs in nature at the age of one to two. An algorithm for studying the components of indicators for making a decision on orphaned cubs, finding places to export animals from settlements, methods of transportation, tagging animals and many other issues that have been solved. Verification of the algorithm was successful. Under favorable conditions, the cubs are quite independent after a year and are able to solve complex life tasks quite successfully.

Chukotka 2019 Animal support on walrus carcasses from December to March. The return of the animal for the next year was recorded. ▲

The second program is developing in two directions:

- **Preparation of mobile teams for the prompt resolution of issues with "conflict" polar bears** - It is held on the basis of the Moscow Zoo for representatives of the Arctic regions (veterinarians, representatives of indigenous settlements, environmental protection regional ministries). Lectures are given on the biology of the polar bear, transportation, the state of the artificial population, zoopsychology and social behavior of the polar bear, on statistics and causes of conflict situations, the practical application of deterrents is being worked out, and much more.

(413)

▲ *Working out the immobilization of polar bears, pyrotechnics on a model in the Nursery of Rare species of the Moscow Zoo.*

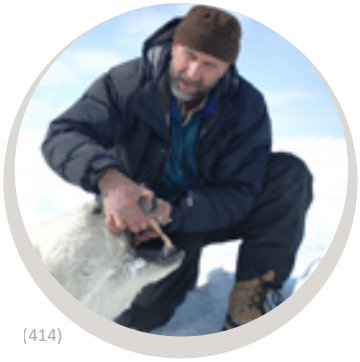
- **Training on conflict resolution between polar bears and humans** - the training is conducted directly in the places of the most frequent contacts of the population with the polar bear. The population is not indigenous and the training has its own nuances(training takes place at weather stations and in the administration of settlements, where hunters, police, employees of the Ministry of Emergency Situations, etc. are invited.). As part of such courses, patrols are formed from the most active volunteers. Attention is focused on the state of waste collection sites and in parallel shows the population how problems are formed in their settlements. Assistance is provided for the purchase of repellents, communication equipment and snowmobiles.

Bear experts

Many people around the world are working tirelessly to protect bears.

- **Researchers** study bears to gain more knowledge about the ecology, genetics, and behavior in order to inform authorities responsible for the conservation of nature on best protection measures.
- **Conservation biologists** are involved in mitigating human bear conflict, planning of protected areas, counteract poaching, prevent forest fires, or teach local people how to behave when they encounter a bear.

All these people share a common goal: to make sure people and bears can co-exist. In this chapter some bear experts will talk a little bit about their daily work and how it contributes to bear conservation.


(414)

Andrew Derocher
Research of polar bears


(415)

Djuro Huber
Research of brown bears


(416)

Russ van Horn
Research of Andean bears


(417)

Nishith Dharaiya
Research and conservation of sloth bears


(418)

Gabriella Fredriksson
Research and conservation of sun bears


(419)

Matthew Hunt
Conservation of sun and Asiatic black bears

Andrew Derocher

Focuses on the research of polar bears

Andrew is a Professor of Biological Sciences at the University of Alberta, Canada, and is a member of the IUCN Polar Bear Specialist Group. He has studied polar bears for almost 40 years.

Aim of your research?

“The focus of my research is to understand how changes in sea ice are affecting the ecology of polar bears. It is easy to look at the declines in sea ice with a satellite, but understanding how the actual habitat of the polar bear changes is much more complex.

Part of my focus is to understand the links between seals, the energy polar bears obtain from eating them and how this influences their reproduction and movement.”

What methods and techniques do you use?

“Most of my research is done on the sea ice and we track a small sample of bears using satellite telemetry. I use satellite collars on adult females (adult males cannot wear collars as their necks are wider than their heads). For subadults that are growing, and adult males, I am using eartag satellite transmitters to track these groups.”

What is satellite telemetry?

Researchers use satellite telemetry to track animals. The animals have something on their body, such as a small device or a radiocollar, that sends a signal to the satellites that orbit the earth. With this signal, you can calculate the location of the animals. It works similar to the GPS system on your phone.

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How does your research contribute to bear conservation?

“When you study polar bears, it is important to know the duration of the ice-free period. During this period the bears rely on their stored fat reserves as their main energy source. If the ice breaks up earlier in the year and freezes up later, this can reduce the number of cubs a bear raises successfully or lower their survival.

Understanding the dynamics of sea ice loss and its effects on polar bears has allowed managers and scientists to predict the effects of warming. Further, such research is broadly understood by the public and was one of the earliest indicators of climate warming impacts on biodiversity.”

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What are you most proud of?

“Over almost 40 years of research on polar bears, I have contributed to the science on polar bears and brought that information to a broad audience. Making our research accessible to the public is of critical importance and I believe polar bear scientists collectively have done an amazing job of conveying the perils of climate change on polar bears.”

What would you like to do next?

“I plan to continue my research and communicate our findings more broadly to the public. There is an insatiable interest in polar bears, and it is a species that many feel connected to, even if they may never see one in the wild. Changing human behaviour is challenging, but polar bears and the risks they face in a warming Arctic is a motivating element for many people.”

What is the greatest challenge?

“Studying polar bears is incredibly complicated and expensive. Maintaining long-term data collection is a never-ending challenge. For a species like polar bears that can live for over 25 years, we need data collected over decades to gain meaningful insights.”

A typical day

“No day is typical! Between research, teaching, and administration of projects, every day is different. The only common theme in my work day is polar bears. It’s almost impossible to not think about them even when I’m not working. I’m incredibly lucky in that my work is also my hobby – the natural world is an amazing context for one’s employment.”

(422)

Djuro Huber

Focuses on the research of brown bears

Djuro's research focuses on brown bears and other carnivores in Croatia. He is a member of the IUCN SSC Bear Specialist Group (BSG) and co-chair of the European Brown Bear Expert Team, a subunit of the BSG and many other bear associations and he is a professor emeritus at the University of Zagreb.

Aim of your research and techniques used?

"Djuro has been conducting research on brown bears and other large carnivores in Croatia for many years. His research combines radio telemetry data, mortality surveys (how, where and when bears die) and DNA samples to determine the population status and threats to brown bears in Croatia. Monitoring populations is important because it can identify problems and inform conservation management."

What are you most proud of?

"Djuro is proud of the functioning brown bear management plan for Croatia that he helped establish. One of his best achievements is his research that uses data about brown bear movement to understand where and why they cross roads. Based on this research, measures could be taken to reduce accidents between cars and bears, such as building a green bridge so bears can cross the roads.

Djuro's next goal is to achieve population level management for the entire Dinara-Pindos bear population, which spans nine countries."

A typical day and challenges

"Currently Djuro is employed by the Faculty of Veterinary Medicine at the University of Zagreb and works for the NGO 'Carnivora Magna'. He describes his typical day as a lot of desk work: writing, editing, and reviewing manuscripts. Doing more fieldwork would be his preference.

He describes his greatest challenge as 'lack of time'. He is happy that research data is being increasingly applied in conservation but there is always room for improvement."

(423)

Russ van Horn

Focuses on the research of Andean bears

Russ is a scientist at San Diego Zoo Wildlife Alliance and conducts research on Andean bears in Peru. He has studied many other mammal species as well and he is a member of the IUCN SSC Bear Specialist Group (BSG) and co-chair of Andean Bear Expert team, a subunit of the BSG.

Aim of your research?

“The overall goal of our research is to gather more quantitative and objective information that will help guide actions for the conservation of Andean bears and other Andean forest mammals.

We’re currently conducting or planning work on 5 themes focused on the Andean bear: genomic diversity (look at the genetic variation of the entire DNA), nutritional ecology, physical characteristics and body condition, temporal and spatial ecology (how an animal moves and behaves at different times and different places), bear endoparasites.

Along with our research focused on Andean bears, we’re opportunistically conducting research on other Andean forest mammals.”

What methods and techniques do you use?

“My collaborators and I use a variety of techniques, from cutting edge technology to classic field methods: data and samples from bears living at zoos around the world, machine learning and computer vision, genomics (looking at the structure and function of the whole DNA), camera traps, observations of wild bears, locations of foraging sites of bears, and conversations with local community members.”

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How does your research contribute to bear conservation?

Our work contributes to bear conservation in four general ways:

- We provide objective knowledge needed for effective conservation planning.
- We address priority themes in the Peruvian conservation plan for Andean bears.
- We develop new tools, based on work with bears living at zoos, so that researchers can more efficiently gather information in the field.
- We train local biologists in research methods and project management, enhancing the ability of Peruvians to conduct additional work for bear conservation.

What are you most proud of?

I think my best achievements so far are building a network of collaborators across most countries in the Andean bear's range, and linking bears living in zoos to conservation of wild bears.

What would you like to do next?

I'd like to expand our collaborative network to include partners that more directly focus on human-bear coexistence, because conflict with humans is thought to be a threat to the conservation of Andean bears.

In addition to continuing our conservation research, I'd like to continue supporting the training of biologists in the Andean bear's range, to effectively support Andean bear conservation in the long term.

(425)

Nishith Dharaiya

Focuses on the research and conservation of sloth bears

Nishith is an associate professor of Environmental Science in Gujarat, India. He has studied sloth bears since 2006 and is a member of the IUCN SSC Bear Specialist Group (BSG) and a co-chair of the Sloth Bear Expert Team, a subunit of the BSG.

Aim of your research?

“To understand habitat requirements, find out a potential corridor and its functionality and to study the ecology of sloth bears to understand human-sloth bear interactions.”

What methods and techniques do you use?

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- **Remote sensing:** getting (geographical) data from satellites.
- **GIS and modeling:** using geographical data to make models that can predict things like: suitable sloth bear habitat or areas where human-bear conflicts are likely to happen.
- **Sign surveys:** look for scats, claw marks, pug marks to determine sloth bear presence.
- **Scat analysis:** determine the diet based on what remains in the poop.
- **Interviews with locals:** To understand the drivers for human-sloth bear coexistence.
- **Camera trapping:** To monitor sloth bear.

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How does your research contribute to bear conservation?

“It will reveal the habitat requirements and food preference of sloth bears. We have identified potential corridors within sloth bear habitat and suggested habitat improvement in these areas. Our ecological research on sloth bears has raised awareness among locals and government authorities for the conservation of this species.”

What are you most proud of?

“Identification of a sloth bear corridor, mapping of sloth bear habitat and assessment of human-sloth bear conflicts are important findings. I consider them as achievements because they help the state forest department with species and habitat recovery plans and formulating conservation strategies.

I am also proud of the involvement of locals in this research project and their appreciation for the conservation of sloth bears in the area. Several international organizations have come forward to support our research work.”

What would you like to do next?

“As a follow up, me and the team are interested in continuing this research in bordering areas (adjoining states) and study resource utilization patterns of sloth bears. We also want to understand the causes of increasing sloth bear attacks on humans.”

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Gabriella Fredriksson

Focuses on the research and conservation of sun bears

Gabriella is a conservation biologist who was one of the first researchers to study wild sun bears. She has established the Pro Natura Foundation which protects sun bear habitat, and she has helped create a sun bear education centre in Indonesia. She is a member of the IUCN SSC Bear Specialist Group (BSG) and of the Sun Bear Expert Team, a subunit of the BSG.

Aim of your research?

“The aim of my research on sun bears was initially to find out as much about the ecology of this bear species as possible, as it had never been studied in the wild before I started my fieldwork.

Due to key threats happening immediately during my fieldwork (fires, poaching, forest destruction), much of my fieldwork focused on the effects of these threats on sun bears.”

What research methods or techniques do you use?

“We looked at sun bear sign through transects to understand habitat use, we sampled food resources through phenology plots and assessing insect abundance; we radio-collared wild bears to look at home ranges, activity patterns, habitat use; we carried out direct observations of rehabilitant sun bears to understand feeding behaviour and other aspects of their forest use; and we analyzed more than 1000 sun bear scats to understand fluctuations in diet over the years.”

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Phenology plots

Phenology studies investigate the timing of certain biological events and how these are influenced by factors such as rainfall, temperature or climate change. Examples are: when a plant starts to flower or when an insect larvae hatches from an egg.

How does it contribute to bear conservation?

“Although we learned a lot about the ecology and needs of sun bears, what threatens them is fairly simple: destruction of their habitat and poaching. It seems very little scientific information is needed to start tackling these issues. It is political will to halt destruction of the forest and law enforcement to stop the killing.

So fairly soon into my research, much time went towards lobbying local government and their relevant agencies to become active in protecting the forest. After some years of close collaboration and lobby, the sun bear became the local mascotte of the region, and a dedicated forest protection agency was established for the forest I worked in, which was funded by the local government.”

What are you most proud of/ what is your best achievement?

“I'm probably most proud of getting around 100.000 ha of sun bear habitat allocated as protected area in Sumatra, which was scheduled for logging and mining. I'm also proud that, through the local NGO I set up, we still keep the forest protected where I carried out my initial sun bear research in Kalimantan, despite huge threats and challenges.

I'm also proud of the sun bear/environmental education center we set up in Kalimantan, a first of its kind in Indonesian Borneo, and very popular with more than 50.000 local visitors annually. Here at the center, I have transformed the results of my research on sun bears to be understandable and interesting to the wider public in Indonesia, rather than just the small science/conservation communities. I am proud of what we managed to build up here in terms of awareness, outreach and conservation work, but these forests needs so much more!”

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What would you like to do next?

“If the world/nature was not in such an appaling state, I would probably love to just continue with research in the forest and find out more about the ecology of sun bears and their habitat.

But sadly, I have not seen much use of any scientific outputs relating to wildlife research being implemented to improve conservation in Indonesia. What these bears need is pretty simple: healthy forest with minimal human interference. How to achieve this is much more difficult!”

What organization are you working with?

“Initially my conservation work was not with any organization, but as a concerned ‘student/scientist’ I worked with local community members whom I hired to be eyes and ears to any illegal activities, and I established good relations with local government and law enforcement officials myself, as there were no organizations working on protection of this forest.

Over the years I tried to get various organizations involved with habitat and species protection efforts, and I worked with several different NGOs. Currently, I help the Pro Natura Foundation, a local NGO based in Kalimantan, which I helped establish in 2013.”

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What does a typical day look like for you?

“Fires, poachers, encroachment, illegal logging, and large-scale conversion of forest areas for plantation development are the main threats to sun bears. Lack of awareness on the importance of forest, especially its key ecosystem functions, are key contributors to allowing these threats to continue unabated. Lack of law enforcement still prevails in Indonesia, so to protect any forest area under such conditions, constant vigilance is needed.

All of the above issues need to be tackled, but to keep the forest safe whilst more difficult things get addressed, a dedicated team of local rangers has been enabled, and they are the bastion to keep the forest as safe as possible from fires, poachers and other illegal activities that are attempted non-stop. My day now is focused on how to keep these rangers and local teams achieving conservation for sun bears in the field!”

How is your work contributing to bear conservation?

“Without safe forest habitats, sun bears will not survive far into the future. Without our work to safeguard forest in Kalimantan, the protected area we focus on would have been burned down several times over the last decades. So, in short it can be said, that by our efforts to get forest protected and to keep it standing, we contribute to keeping sun bears, as well as all other wildlife that share their habitat, protected.”

What is the greatest challenge?

“We are now in a race against time, as climate change has caught up as well. Sadly, there is not a strong conservation constituency in Kalimantan or Indonesia as a whole, who are willing to stand up and put up a real fight for the conservation of remaining nature. Without this local drive, and with ever increasing pressures from human population numbers, increasing consumerism, and ecological shifts due to climate changes, the tropical forests that are home to these amazing bears face a fickle future.”

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Matthew Hunt

Focuses on the conservation of sun bears and Asiatic black bears

Matt is Chief Executive Officer at Free the Bears where he manages bear sanctuaries in six countries throughout Asia. He also is a member of the IUCN SSC Bear Specialist Group (BSG) and a co-chair of the Asiatic Black Bear Expert Team, a subunit of the BSG.

A typical day

“There is no such thing as a “typical day” in my job as I oversee a team of almost 100 people spread across four countries and with more than 270 bears in our care. Inevitably each day does involve an element of fire-fighting issues (emergencies, unexpected challenges etc.), a surprising amount of desk-based work and, on the best days, time spent at the sanctuaries getting to see how the bears are doing!”

How does your research contribute to bear conservation?

“Probably the single-biggest threat to bears in Southeast Asia is the illegal wildlife trade – whether this is the poaching of bear cubs to sell as trophy pets or tourist attractions, killing of adult bears for their body parts or trafficking of bears to supply bear bile farms.

Our sanctuaries fulfil a vital role in supporting government-led wildlife law enforcement to combat this insipid trade and help ensure that wild bear populations are allowed to recover.”

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What are you most proud of?

“Probably my best achievement has been the creation of new sanctuaries, built to world-class standards, that not only support wildlife law enforcement efforts but also raise the bar for the welfare of captive bears worldwide.

I am most proud of the incredible teams we've built in each country, some of whom have been working with Free the Bears for more than 20 years now and are leaders in their fields of bear husbandry, veterinary care and research.”

What is the greatest challenge?

“It should come as no surprise that finding the money to support the ongoing care of 270+ bears (many of which arrive as cubs and may live for upwards of 40 years) while continuing to focus efforts on addressing the illegal wildlife trade and ensuring we are able to keep our promise of no bear in need ever being turned away, is a huge challenge. We are fortunate to enjoy the support of a global network that includes some of the best zoos and wildlife parks in the world, for this I remain eternally grateful.”

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CHAPTER 8
What can YOU do?

We live in a world full of natural wonders that we are ought to preserve for future generations.

No matter what life form we look at, they all play an important role in the ecosystem, however small they may seem. Everything shares a delicate connection, depending on each other to thrive and grow.

However, the cycle of life and death is a natural and necessary process, thus the world can be as deadly as its beautiful and is in constant change.

▲ *Bioluminescent planktons can make the ocean water look glowy blue. They are tiny but highly toxic to the marine environment and humans.*

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Just like anything else, our actions also have a great impact on the environment, be it positive or negative.

Even though nothing is permanent by nature, the way we currently interact with our surroundings cause drastic and rapid changes that can lead to circumstances where even we struggle to survive.

◀ *Aftermath of forest fires - Sun bear habitat*

▼ *Ruined village, Villa Epecuén* (437)

Our effects on our planet are numerous:

- We are shaping our environment, very often in a destructive way, creating more disadvantage than advantages to many living things.
- We are speeding up processes that would otherwise occur only very slowly over thousands of years, if at all, like climate change and its effect on the weather.

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- We are creating problems that would never exist were it up to nature only, e.g. pollution by toxins, plastic etc.

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- We drive species to extinction either directly by our own hands or indirectly by the changes caused to the environment, like shifting natural habitats like forests and steppes to intensely used areas for agriculture and industry.

EX *Tasmanian tiger (Thylacine)*

EX *Dodo (Raphus cucullatus)*

All these interactions with nature contribute to increased habitat loss which, alongside many other threats, can lead to extinctions.

Every and each species, be it animal or plant, has an important role to play and if one vanishes, others might follow.

Keeping the balance is important

A predator might be frightening especially when you meet face-to-face with a bear or tiger. But they are needed to keep the herbivores in check to avoid overpopulation which could cause great damage to vegetation.

Impact on us, humans

Sometimes we do not realize that the damage we cause to our planet has an impact on our quality of life aswell.

Polluted lands bear no fruits and no crops. Poisoned bodies of water hold no fish and do not quench thirst. Eradication of forests provide neither shade, nor oxygen nor retain soil and water. And the list could go on and on.

In short, we too, need our environment strong and healthy in order to live a fulfilling life.

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Solution is in our hands

We can cause drastic changes, and have an impact on our surroundings. **Its up to us, however, to create changes for the better.**

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The first step to help is to understand the importance of a healthy environment, realize that every little puzzle-piece is part of a bigger picture. Seeing the connection we all share, the interdependance is key to act consciously.

Even with the smallest of acts we can make a difference, we just have to reach out and lend a hand.

Let's see what YOU can do to help the environment.

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Think globally act locally

Organisations work hard to help nature regain its former glory by cleaning up pollution, reforestation, reintroduction of species and saving those that are on the brink of extinction.

With small daily acts however, we can also achieve much when it comes to caring for our environment.

Green tips for home!

- **Avoid unnecessary printing.** Use both sides of the sheet. That saves trees and reduces trash.
- **Turn the heat down.** If you lower the thermostat with 1 degree Celsius, you might save 10% of your heating bill and you might decrease the carbon dioxide emission of your household by 300 kgs yearly.
- **Walk, ride a bicycle, or use public transport.**
- **Insulate your home.** Walls, roofs and floors with improper insulation might let 50% of the heat through.
- **Plant trees.** One single adult tree processes 53 kgs of carbon dioxide from spring till autumn.
- **Buy local.** This reduces transports and their carbon dioxide output.
- **Turn off the tap.** If you turn it of during toothbrushing, you save more litres of water. Pay attention to dropping taps.
- **Do not leave the empty roof rack on your car.** Your inattention might cause even 10% increase in petrol consumption and carbon dioxide emission.
- **Do not use plastic bags.** When you go shopping, do not ask for plastic bag. Bring your own basket or textile bag instead.

- **Use energy saving LEDs.** Turn off the lights in unoccupied rooms. Even one light bulb might cause an emission of 400 kgs of carbon dioxide.
- **Do not leave your electronic devices in standby mode.** The little light on the monitor, for example, shows that even if it is switched off it can be turned on by remote control at any time, so it is in standby mode. It still consumes electricity that can be responsible for up to 10% of a household's energy consumption.
  Solution: turn your devices off completely by hand. Remove your mobile phone charge adapter from the socket when you are not charging your phone.
- **Stop buying bottled water.** Single-used bottles not always get recycled and thus end up in landfill or the ocean. Reuse bottles instead of throwing them away.
- **Do not litter.** Use trash cans, or if you are out in nature keep litter until you find a bin. Do not throw it away! Trash thrown away can be fatal for animals and can also pollute the land.
- **Start recycling.** Try to reuse objects you no longer need or dispose them into the appropriate recycle bin. Many items can be recycled, thus avoiding trash ending up in nature and it saves resources. You can also donate unused items like mobile phones which contain valuable recyclable materials.
- **Use organic cleaning products.** Most chemical products we use are outright harmful for the environment, able to kill animal and plant life alike. Organic products on the other hand use eco-friendly ingredients that is safer for us and our surroundings.
- **Collect rainwater.** It can be as easy as putting a barrel under your roof gutter. The collected water can be used to water your garden.
- **Do not buy things you do not really need.** Ignore/skip Black Friday!

Caring for wildlife

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- **Spay/neuter your pets.**
  You can avoid unwanted litters and help in reducing the number of stray animals. Strays can suffer from hunger and diseases and can be a danger to humans and wild animals alike.

- **Check the source of products you buy.**
  Avoid products that come from questionable sources, or from sources where animals are not treated well (e.g. fur farms, bile farms).

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CHAPTER 9
Zoo life of bears

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The role of the zoos has changed over time.

While in the past their main aim was to present a high diversity of species in order to inform the public about the many forms of animal life, today they are engaged in species conservation, education on biology and conservation and research. Animal welfare aspects guide the design of facilities and of daily routines.

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Think of it like modern day Noah's Arks: they keep these amazing animals safe in large naturalistic enclosures and provide excellent animal welfare.

In the past, animals in a zoo could often be observed begging for food from visitors, or to move in a stereotyped way. This was particularly true for carnivores.

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As the zoo culture and mission has developed and field studies revealed the species' biology, animal welfare became more and more important.

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Keepers contribute to the animals' well-being by furnishing their enclosures, establishing appropriate ways of offering food, and regular provision of objects to fit their physiological and behavioural needs and to avoid the development of stereotypic behaviour.

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Cologne zoo, Germany - food for sun bears in wobble tree ▶

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◀ *Lisieux Zoo, France- Brown bear enclosure*

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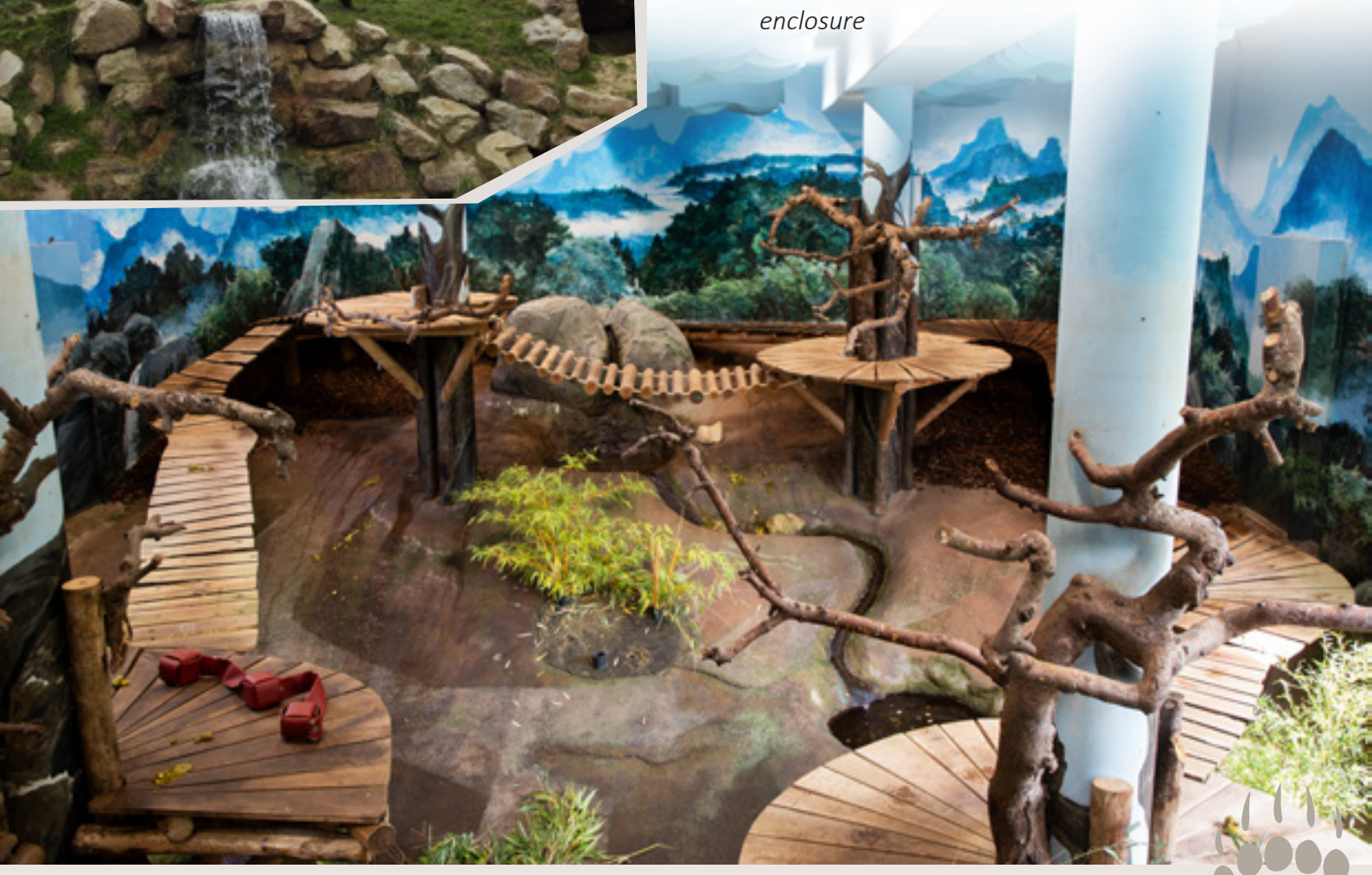
▼ *Ouwehands Zoo, Netherlands - Giant Panda enclosure*



The eight bear species in zoos

The 8 bear species of the World live in very diverse habitats; they are found on the arctic ice, in tropical forests, grasslands and deciduous forests alike.

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Allwetterzoo, Muenster, Germany - small sun bear exhibit ▶

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The various species utilize different parts of their natural habitat depending on their adaptations acquired during evolution. They are also intelligent and adaptable animals with great physical strength.

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When the zoo professionals design their enclosure, they take these facts into account.

Sóstó Zoo, Nyíregyháza - swimming polar bear ▲

Alpenzoo, Innsbruck, Austria - small brown bear exhibit ▶

What should be considered when designing a bear enclosure?

If you go to a zoo where bears are kept, you will see that they are massive animals with strong claws, so designing their enclosure needs thoughtful planning and caution.

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- They do not just dig with their claws, most of them are also very good climbers. Bears will use stable and strong surfaces like rocks, or structures made of logs for climbing, and for scent marking by rubbing back and shoulders on these items.

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- Living vegetation, like grass and bushes, different soil types and substrateslike moss, bark litter, wood chips, straw or sand stimulate natural behavior: such as digging, nest building or foraging, when food is scattered into the materials.

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- Shallow pools provide fresh drinking water, while the deeper ones serve as an excellent opportunity for swimming.

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Zoos encourage species-specific behaviour of animals by taking into accout the species-specific needs when developing enclosures and on top to that with a variety of environmental enrichment options.

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Environmental enrichment

Environmental enrichment is a term used to describe structural (fixed) and variable elements of the captive environment to increase activity levels by stimulating natural behaviour patterns.

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Why is this necessary?

There are a lot of challenges in the wilderness animals must overcome: bears have to find and acquire sufficient food, water, hiding places and resting places and everything else they need every day. For successful reproduction males have to find and defend mates, whilst females have to struggle to gain the body condition needed to rear cubs.

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These challenges are missing in zoos since the animals get everything they need provided to them. They do not need to spend hours per day looking for food, or appropriate shelters and resting places. This means, they have a lot of spare time and walk around apparently unintentional or even stereotypice.

◀ *Korkeasaari Zoo, Finland- Environmental enrichment in brown bear enclosure*

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The purpose of environmental enrichment is to provide structures and materials so that species-specific behaviours can be performed in a normal way, e.g. **nest building** by offering appropriate substrates.

Cologne Zoo, Germany - Sun bears, roofed nest basket ▶

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For polar bears which scratch shallow depressions in the ground, these might be soil, sand, wood etc.

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Whereas sun bears, Andean bears and Asiatic black bears which spent time in the trees, should additionally have twigs and branches at higher places like platforms to meet their needs for nestuilding.

Korkeasaari Zoo, Finland - Brown bear digging through wood substrate ▲

Zlin Lesna Zoo, Czech Republic - high platfrom with branches in sloth bear enclosure ▶

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Proper design of their enclosures, with a variety of equipments and furnishings placed within them, as well as often changing objects for exploration and the stimulation of species-specific foraging.

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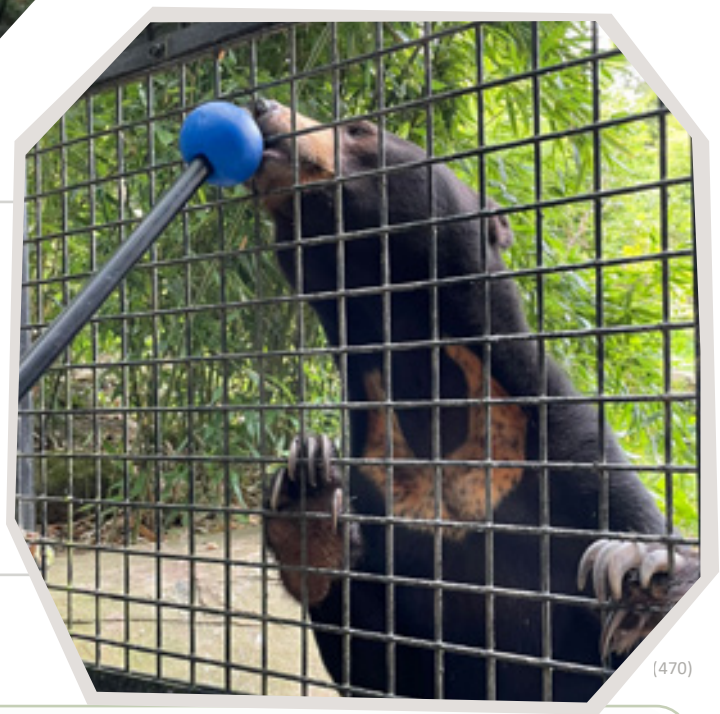
Training sessions keep the animals open for learning and can improve welfare. Trained bears voluntarily let keepers and vets to check the teeth, paws etc. which makes it easier to spot problems.



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All these measures aim at stimulating and maintaining normal behavior and physical and mental health of the animals. Moreover, the general public see bears engaged in functional activities and recognizes their amazing skills.

Hiding places

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Do you always like to be the center of attention?

No? Neither do the bears.

The professionals designing the enclosures make sure that the inhabitants can not only evade from adverse weather conditions but also from enclosure mates and visitors. Various structures like rocks, huts and bushes also act visual barries that the bears can use to hide and be out of sight.

Tip

If you do not immediately see the bear during your visit to the zoo, go back to the enclosure later. Bears' activity varies by the time of day.

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Diet of bears in zoos

Bears are generally omnivorous; however, their menu varies from species to species. For example, polar bears feed primarily on seal fat and meat whilst sloth bears search for delicious termites to sate their hunger. *(See "Diet" chapter.)*

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In zoos however, zookeepers cannot offer seals or thousands of termites to these bears, instead they provide them special food that includes all the necessary nutrients.

For example, polar bears get fatty meat in spring and summer, when they are particularly hungry. Whereas sloth bears get special food preparation which consists of vegetables, chicken, few fruits and special pellets which is minced.

Keepers pay close attention to the animals' diet so most bears also get vegetables and fruits.

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Methods of offering food

Its not only the diet composition, but also the methods of offering food is important. Bears of all species spend a lot of time in search for food to meet their nutritional needs in the wild.

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Conditions for species-specific foraging – processing and acquistion of food - have to be mimicked in zoos for example:

- by scattering small pieces of food over the enclosure to encourage searching.

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- hiding it in substrates to provoke digging.

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- pressing it in holes of wooden logs, concealing it in jute bags or cardbord boxes which need to be opened by using claws and teeth.

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- or hanging it high up so that the bears have to climb.

There are many more options for behaviourally appropriate feeding.

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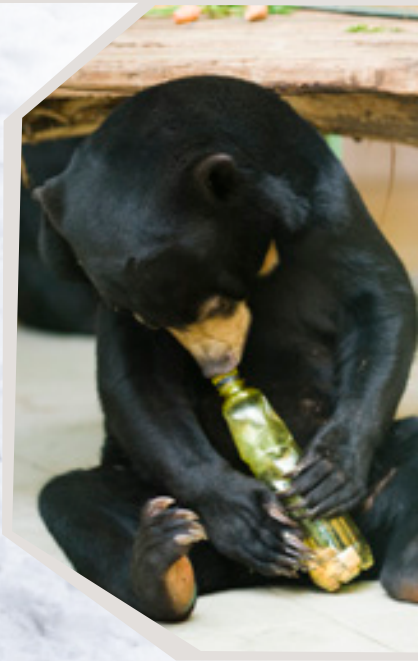

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Reproduction in zoos

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Usually male and female bears are kept separately and only put together for a short time during their mating season.

When a female nears her receptive period the keepers observe the bears' behavior carefully. When both female and male show positive interest in each other they are mixed together temporarily.

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Depending on the species this period can be as short as a couple of hours or just a few days (for giant panda) or longer (several days or weeks for polar bears).

When the male and female lose interest or even start to act aggressively to each other, they are split up again.

After a succesful mating a long period of waiting, and hoping, starts. Because of the cubs' small size, the mother bear does not gain a lot of weight during pregnancy. Therefore, careful observations of her behavior have to be done in order to determine if she is really pregnant.

(489)

Apart from the behavioral signs bears can show during pregnancy, we can also look at hormone levels. Some bears are trained to urinate on command, so the keepers can collect the urine and do a hormone assay test.

However, all bear species can have pseudopregnancy when their hormone levels are similar to that when they are pregnant. Sometimes the females display pregnant-like behaviours even when they are not truely expecting. They might even produce milk.

◀ *Ouwehands Zoo, Netherlands - One months old giant panda cub*

General signs indicating birth

- reduced appetite
- restlessness
- licking
- swollen vulva
- nest building
- digging

(490)

It is very important that around and after giving birth the mother is not disturbed. Therefore zookeepers do not feed the mother, or clean the enclosure during the first days/weeks.

However, babymonitors and cameras facilitate remote monitoring of the events in the den and the development of the cub(s).

Riga Zoo, Latvia - Brown bear cubs ▶

Special den for mothers

To mimic the dens that wild bears give birth in, zoos create special denning areas for mother bears.

Korkeasaari Zoo, Finland - Brown bear den, cave imitation ▶

(491)

(492)

◀ *Ouwehands Zoo, Bear Forest, Netherlands - bear den, falleng log imitation*

▼ *Ouwehands Zoo Netherlands - brown bear den, cave imitation*

(493)

(494)

The dens usually have a small "box" area filled with nesting material, which is an important feature for successful birthing and rearing of cubs.

(495)

▲ *Cologne Zoo, Gemany - brown bear pulling nest material into den*

◀ *Parco Natura Viva, Bussolengo, Italy - Andean bear nest*

▼ *Ouwehands Zoo, Netherlands - polar bear in den with cubs*

(496)

Next to this „box" is a larger area where the female can stretch her legs and cubs can play when they are older.

(497)

▼ *Korkeasaari Zoo, Finland - brown bear den*

Conclusion

Bears are fantastic animals coming in many shape and form, adapted to vastly different environments with unique traits to each species.

They are an important part of the environment they live in and are needed to keep the life cycle healthy.

(498)

They face many threats be it natural or man-made that drives them closer to extinction day by day.

(499)

(500)

After learning about the eight bear species that inhabit our planet, it is not a question anymore that they, as many other species aswell as our environment, need our help.

(501)

We don't need to think big. We can help from home with the smallest of acts that could create a big difference.

Follow green tips to help the environment and follow guides to avoid human-bear conflicts when out in bear territory!

Thank you for educating yourself!

(502)

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Educational materials

Downloadable materials

The following materials are available for educational purposes, in jpg format, as free download. Do not remove the logos and credits!

▶ Bear species fact sheets

Fact sheets containing the key informations about each bear species from characteristics, diet, habitat to threats.

▶ Guide for hiking

A poster about the proper behavior, dos and don'ts during a hike in bear territory. It helps to avoid injuries and human-bear conflicts.

▶ Other infographics

Several unique infographics that contain useful information about the eight bear species.

▶ The Bear Book?

Learn about the eight bear species from a colorful audiobook created for children.

Useful links

The IUCN Red List of threatened species
www.iucnredlist.org

Bear Specialist Group (BSG) website
www.globalbearconservation.org