

## **RED PANDA (*Ailurus fulgens*) BAG**

The following items should be in the bag, if they are not let someone in education know. If you discover a new problem with any biofact (broken pieces, loose teeth, etc.), it is your responsibility to let the staff know **and** make a notation with the date, time and your name on the sign out clipboard.

**Note:** Please return all items to their appropriate place on the cart, and make sure lids and bungee cords are secured. Things should be left exactly as you found them.

**Note:** Do not try to open the Lucite containers with the food. We are trying to prevent animals from getting into the bone room.

### **RED PANDA BAG INVENTORY**

- Red Panda skull
- Two gloves and two dowels
- Lucite box containing red panda food – folivore chow
- Lucite box containing bamboo stalks
- Red Panda resource cards

### **RED PANDA BAG INVENTORY AND TALKING POINTS**

#### **RED PANDA SPECIES INFORMATION:**

Because the red panda and the giant panda share the name “panda” and both eat bamboo, some assume that they are related. They are in fact not related. The red panda was discovered by Westerners 50 years before the giant panda and was the first to have the “panda” name. Although they are both in the Order Carnivora, the giant panda is in the bear family and can weigh up to 220 pounds. The red panda is in its own family (Ailuridae) and is more closely related to weasels and raccoons.

#### **RED PANDA RANGE**

- Can be found in broad areas of the Himalayan Mountains in Burma, Nepal, India and China
- Range elevation is generally from 4900 – 13,000 feet
- Home ranges average one square mile and are overlapping; only small portion of range used in one day

#### **RED PANDA HABITAT**

- Climate is generally cool temperate and rainy with some snowfall in the winter months
- Live in deciduous and coniferous forests, usually with an understory of bamboo and hollow trees with proximity to water

#### **RED PANDA LIFESPAN**

- 8 – 10 years wild

## RED PANDA PHYSICAL ADAPTATIONS

### 1. Skull/Dentation

- Broad skull supporting strong chewing muscles and large jaw relative to its size
- 38 strong teeth, including sharp canines and incisors in front for tearing leaves and other food and flat molars in the back for grinding and chewing

### 2. Size /Weight

- Average head and body length is 22-25"; tails add another 15-19" to length
- Average weight is 8-12 pounds

### 3. Body Coat/Fur

- Covered by very dense fur over the entire body – reddish brown on upper body and dark brown belly with white/beige face, black legs and bushy striped tail
- Coloring provides camouflage against the red moss, dark branches and white lichen in the forest
- There is no sexual dimorphism or dichromatism

### 4. Feet//Paws

- Soles of feet are covered by fur which provides warmth when cold and traction when climbing on wet, slippery branches and snowy ground
- Front and rear legs are generally the same length; front legs turn inward
- Feet have five very sharp, semi-retractable claws, which aid in fast tree climbing and can be used for defense
- Rear ankles can be rotated, enabling the red panda to descend head first from trees
- Forepaws have an extension of the wrist bone (modified radial sesamoid bone) that acts in much the same way as a thumb; this feature helps the red panda grip bamboo shoots and other food and allows it to grip branches when climbing

**NOTE:** Evidence indicates this “false thumb” is an adaptation to an arboreal life style rather than an adaptation to diet. It is a feature shared by the giant panda and by the spectacled bear (convergent evolution) \*\*\***Use red panda paw glove (read “*Get a Grip!*: Red panda demonstration glove instructions”) to demonstrate how wrist bone extension aids gripping ability.**

### ***Get a Grip!***

#### Red panda demonstration glove instructions

Purpose: A hands-on (and in!) demonstration of the red panda’s wrist bone adaptation, or “false thumb”, on its forepaws that it uses to grip bamboo shoots and branches while climbing.

Steps:

- Ask kids if they want to transform into a red panda <of course they do!>
- Have child put one hand into a glove
- Before handing the child anything, share that red pandas eat bamboo and spend most of their time at the tops of trees. They have 5 digits, like us, but use their digits differently than us. Point out the special wrist bone adaptation that red pandas use to grip bamboo and branches.
- Hand a piece of “bamboo” to the child’s “human” hand which they will likely grasp using their opposable thumb. Talk to them about their reflex to grasp with their thumb.

- Hand the second piece of “bamboo” to the child’s “red panda” hand. They will likely try to use their thumb as they normally do (no instruction, please, unless they are really struggling), but hopefully they will realize the benefit of the panda’s “false thumb.”
- While the child has a piece of bamboo in each hand, have them observe the differences and follow up with the theory that the “false thumb” adaptation is also present in giant pandas and it is thought that it was an adaptation to arboreal life and not specifically a herbivorous diet.
- If still engaged, the child can put on both gloves. Trial runs with our Zoo Camp kids showed that this final step helped them really “grasp” the concept.

## 5. Senses/Scent Glands

- Very good eyesight and hearing and excellent sense of smell
- Both sexes have a gland in their posteriors and on the soles of their feet that secrete a scent used to mark territory and to serve as a communication device with other red pandas; these scent markings are very important during breeding season

## 6. Tail

- Long, bushy tail is marked by 12 alternating reddish and buff colored rings
- Not prehensile
- Used for balance when climbing, to cover face when sleeping and to provide warmth to face in the cold of winter

## RED PANDA BEHAVIORAL ADAPTATIONS

### 1. Life Style

- Generally solitary except for when breeding or caring for young
- Primarily arboreal, sleeping on tree branches or in tree hollows
- Very agile climbers, but able to move quickly on ground
- When threatened, climb a tree to escape or stand on hind legs to look larger
- Sharp claws can be used for defense
- Spend 10-12 hours a day foraging, primarily between dusk and dawn
- Spend most daylight hours sleeping and in addition have numerous rest periods during active periods in order to conserve energy
- Gait is bear-like with forelegs swinging inward

### 2. Communication

- Use head bobbing and tail arching as visual cues
- Communicate verbally with variety of noises, including twitters, whistles and hisses
- Use extensive scent marking from scent glands and urine to demarcate territory and find breeding partner

### 3. Diet

- Although classified within the Order Carnivora, red pandas are not carnivorous, but are primarily herbivorous
- Primary food source is tender leaves and shoots of bamboo trees
- Out of a possible 40 species of bamboo, red pandas only eat 1-2 of them
- During the warmer months, when they are available, supplement diet with insects, berries, blossoms, bird eggs and leaves from various plants
- In winter months must rely on bamboo for food
- Usually drink water every day

### 4. Eating Habits/Digestion

- Red pandas have the simple digestive system of a carnivore; they lack the long gut, prolonged digestion and gut microbes that facilitate the digestion in most herbivores
- They are not anatomically equipped to process and digest the high volume of fibrous cellulose found in bamboo leaves
- Only about ¼ of the nutrients contained in the bamboo leaves are extracted during their fast digestive process, so they must eat bamboo leaves equaling up to 30% of their body weight every day
- Even though they eat about 3.3 pounds of bamboo leaves every day, it is difficult to obtain sufficient nutrition without supplementing their bamboo diet
- Activity varies throughout the year in response to temperature and feed opportunities
- During the winter months, when only bamboo is available, they further reduce their already very slow metabolism to compensate for the low-quality diet and spend more time resting; they are able to do this without reducing their core body temperature
- During the winter months, when food is more scarce, they may lose 15% of their body weight

#### 5. **Breeding/Reproduction/Growth/Parental Care**

- Breed on the ground once a year, usually between January and March, using scent markings to find mate
- Females are only fertile one to two days a year
- Gestation averages 135 days, but there are wide variations because of delayed implantation of the fertilized egg (to insure birth during the summer, usually June)
- Female builds a nest from leaves and moss in the hollow of a tree or in a rock column
- Litters can contain from one to four young, but the usual size is two.
- Newborns are blind and helpless and tiny (altricial) and are covered with grey hair
- Eyes are opened at about 18 days and young stay in the nest nursing for three months and first emerge during the night
- At about 50 – 60 days they start eating tender bamboo leaves and after 90 days eat solid food regularly
- Young stay with the mother until the next breeding season, learning skills needed for survival
- They are fully grown at 12 months and sexually mature at 18 months

#### **RED PANDA'S CO-EXISTING WITH GIANT PANDAS**

The ranges of the giant panda and the red panda intersect in some areas of China. They both depend on the same food source, bamboo. How are they able to coexist?

- The skull of the giant panda is larger and stronger than that of the red panda. It is better suited to using greater force and chomping tough bamboo stalks and branches and does not chew its food thoroughly
- The red panda's comparatively weaker skull is better suited to eating bamboo leaves and chewing its food thoroughly before swallowing
- Thus the red panda eats the bamboo leaves and giant panda can eat the stalks and stems of the bamboo

- They also prefer different terrain: The red panda needs fallen trees and shrubs around the bamboo to stand on in order to reach the leaves; the giant panda prefers more open space around the trees in order to grab the stalks

### **RED PANDA INTERESTING/FUN FACTS**

- Common names for the red panda include firefox, lesser panda, red cat bear, fox bear, the wah (for a sound they make) and Himalayan raccoon
- The Chinese word for panda translates as “bear cat”
- In Nepalese, panda means “bamboo eater”
- The red panda is the original panda; Westerners discovered it in 1825, nearly 50 years before the giant panda
- Red pandas are susceptible to heat stress in temperatures exceeding 75-80 degrees
- Although they do not tweet, they do twitter! The twittering sound is high pitched, rapid, staccato and somewhat similar to that of some birds
- The first panda displayed in a zoo was in London in May of 1869
- A red panda’s body weight equals about 5% of the body weight of a giant panda
- The red panda is the first non-primate to display a liking for an artificial sweetener, which may reflect structural variation in the red panda’s sweet taste receptor (aiding research broadening our understanding of how we detect sweet taste)
- Other species who eat bamboo as their primary food source are the giant panda, 3 species of bamboo lemurs and bamboo rats

### **Red Panda Status:**

The red panda is listed in CITES Appendix I. They have been listed as vulnerable on the IUCN Red List of Threatened Species since 2008. There are fewer than 10,000 adult red pandas, with a decreasing population trend. In China the species is thought to have undergone a decline of around 40 percent over the last 50 years and *A. f. fulgens* is equally threatened in Nepal. The distribution of *A. fulgens* in the wild is poorly known; reliable population numbers are hard to find, partly because of their mostly nocturnal habits and secretive and shy behavior.

Red pandas are protected by national laws in their range countries and hunting is illegal. However, this protection is often not enforced. Conservation efforts are highly variable between countries.

In China the red panda occurs in many reserves established to protect the giant panda, although it is not known whether these support viable populations. It also occurs in several protected areas in Nepal and India. It is not known to occur in any protected areas in Bhutan or Myanmar. Research is being conducted on the status and quality of remaining red panda habitats and the impact of human activities on the species.

### **Red Panda Threats:**

Red pandas are threatened by deforestation and other human activities. Deforestation eliminates nesting sites and sources of their primary food, bamboo, and isolates populations into small fragments separated by inhospitable habitats. Forests have been cleared for timber extraction, agriculture and human development. Fragmentation and decrease of red panda populations in certain areas is leading to a serious problem of inbreeding. *Ailurus fulgens* is the occasional target of game hunting, and it is often found in traps set for musk deer. Red pandas are also

outcompeted by local livestock for food.

The giant panda and the red panda are exploited for their pelt. While poaching of the Giant panda has declined considerably due to strict laws and greater public awareness of the panda's protected status, the Red panda is still poached regularly for its pelt and glorious tail; the fur is still used to decorate hats used in wedding ceremonies in the Yunnan province of China, as it traditionally symbolizes a happy marriage and tails are used as dusters.

### **Protection of Red Pandas**

Protecting the red panda goes hand in hand with protecting its habitat. Red pandas are important socially, scientifically and economically; many Nepalese people count on the red panda's habitat for their survival; red pandas are the national animal of Sikkim and the mascot of the International Tea Festival in Darjeeling. A new system must be developed that conserves the red panda's prime habitat while at the same time benefitting the surrounding communities - a system that educates and empowers local communities.

Conservation recommendations to reduce human impact on the species' habitat:

- Expansion and strengthening of their protected habitat
- Prevention of illegal logging
- Control of cultivation and overgrazing
- Regulation of tourism
- Education and public awareness of threatened status of this species
- Enforcement of existing legal protections

You can contribute to Red Panda Conservation by:

- Supporting organizations conducting research on the red panda such as World Wildlife Fund or the Red Panda Network
- Travelling as an Eco-tourist to national parks and other reserves supporting red pandas
- Supporting organizations working to establish sustainable agricultural practices in the red panda's range
- Boycotting tourist or gift items that use red panda pelts or tails
- Educating yourself and others on issues facing red pandas today
- Supporting zoos that serve as DNA ark for species and provide opportunities to study the physiology of red pandas in accessible settings