SOUTHERN TWO-TOED SLOTH (*Choloepus didactylus*) ADAPTATIONS TALKING POINTS

SOUTHERN TWO-TOED SLOTH INVENTORY

- Sloth skull
- Sloth Resource Cards

GENERAL SLOTH INFORMATION:

Southern Two-toed Sloth or Linnaeus's Two-toed Sloth is native to the tropical rainforests of South America and are adapted for arboreal lifestyle. They get their common name from the two toes found on their front limbs. Sloths move slowly and deliberately, spending a large portion of their time hanging upside down. This, combined with the humid wet climate they inhabit, allows algae to grow on their pelage giving them a greenish tint and aiding in camouflage.

SOUTHERN TWO-TOED SLOTH RANGE/HABITAT (see map)

- Range in the amazon basin of South America- found in Colombia, Venezuela, the Guianas, Ecuador, Peru, and northern Brazil
- Habitat is well-established lowland and montane tropical forests from sea level up to 7,999 ft.
- Sloths are strictly arboreal; they stay high in the canopy of trees with interlacing crowns, which allows for lateral movement without descending to ground.
- Southern two-toed sloths prefer crowns of trees with lianas to provide cover from predators and shelter from sun during the day. (Lianas are long- stemmed, woody vines that are rooted in the soil at ground level and use trees, as well as other means of vertical support.)

SOUTHERN TWO-TOED SLOTH PHYSICAL ADAPTATIONS

1. **Head/Neck/Skull/Dentation** (see skull)
    - Sloths have small, simple molars, with 10 upper teeth and 8 lower teeth. There are no incisors or canines.
    - Premolar looks like a canine, especially of a carnivore species; these sharp, blade-like teeth are used for aggression, such as biting. Upper premolars are sharpened by rubbing against the lower one. Premolars are separated from other teeth by a diastema (spacing).
    - Teeth are not coated with enamel and are continuously growing but constantly being worn down by their chewing.
    - Forward facing eyes give them depth perception in the trees.
    - Two-toed sloths possess 6-7 cervical vertebrae and can rotate their heads 90 degrees. (Note: Three-toed sloths have 8-9 neck vertebrae and can rotate heads 270 degrees. Nearly all other mammals have 7 neck vertebrae)
2. **Size /Weight/Lifespan**
    - Southern two-toed sloths weigh between 8 – 17 pounds; they are light weight for a mammal their size, which is helpful when harvesting leaves from long, thin branches.
    - Southern two-toed sloths are between 21 – 29 inches in length.
    - Southern two-toed sloths can live up to 20 years in the wild and 30 – 40 years in captivity.
3. **General Physical Characteristics**
    - Elongated limbs and trunk are adaptations to acrobatic, hanging lifestyle.
    - Two-toed sloths have two sharp claws (3 - 4 inches) on front limbs and three claws on hind limbs that form “hooks” they use to hang from branches; long curved claws enable the sloth to latch onto tree branches with little exertion. Their claws maintain

such a tight grip on a tree limb that sloths don't fall out of trees, even when sound asleep. The two digits on each forefoot are closely bound with skin their entire length.
- Extreme wrist mobility provides a wide range of movement, allowing the sloth support for the body in many positions
- Soles of forefeet and hind feet are leathery to help gain a better grip on wet branches.
- Reinforced lumbar vertebrae make upside-down lifestyle possible (xenarthrous vertebrae - extra articulations between the lumbar vertebrae). Pelvis connects with more of the spine than in other mammals. These adaptations to the spine give extra support, particularly to the hips.
- Internal organs including the stomach, spleen and liver are located in different areas from other mammals, due to upside-down lifestyle. Sloths effectively tape their internal organs to their ribs and hips, preventing them from pressing down on the lungs in this position; fibrous adhesions that anchor the liver and stomach to the lower ribs, and the kidneys to the hip bones.
- Tail is vestigial and only .5 – 1.5 inches in length. With a low activity level, sloth's do not need tail for balance.

4. **Pelage/Fur/skin**
   - Fur has evolved for wet, tropical weather.
   - Long coarse guard hairs and dense, smooth undercoat provides good insulation and protects against cooling.
   - Hairs have 8-11 longitudinal furrows. Furrows in hairs store water and encourage algae growth, which gives a greenish tint to the sloth and camouflages it from predators. (see photo)
   - Fur parts in the middle of abdomen, growing out and down (opposite direction of other mammals). This helps to slough off water.
5. **Thermoregulation**
   - A sloth's body temperature (91.4-96.8°F) varies with temperature of the environment and is lower than most mammals. (ave. mammal temperatures range from 97–103°F)
   - Sloths regulate their body temp by moving about the canopy, seeking shade or sun.
   - Sloths have difficulty maintaining their body temperature on rainy days.
   - Sloths cannot shiver to keep warm because of the unusually low metabolic rates and reduced musculature. (Note: They have the lowest muscle mass relative to overall body weight of any mammal)
6. **Senses/Scent Glands/Glands**
   - Sense of smell is well developed in the sloth; olfactory bulbs are well developed.
   - Near-vision is poor; eyes are very mobile and adapted for night vision; sloths rely on olfaction to obtain food and make contact with other sloths
   - Hearing is poor; ears are small, close to the head, and imbedded in fur.
   - Sweat glands are present especially on their snout, but none on pads of feet. Sweat glands help sloths from overheating in a tropical environment

SLOTH BEHAVIORAL ADAPTATIONS

1. **Life Style**
   - Sloths are typically solitary, but females occasionally feed in the same tree.
   - Southern two-toed sloths are primarily nocturnal; they sleep in the trees 15 to 20 hours every day and are active at night. Algae growth on fur is good camouflage and their slow moving provides protection during the day.
   - Southern two-toed sloths spend most of their time high up in the forest canopy, only

coming to the ground once a week to defecate. Two-toed sloths may also defecate from the canopy.
- Most two-toed sloths change to a different tree each night.
- Sloths descend to ground to change trees or to defecate; they prefer descending head first. Sloths deposit dung and urinate in middens; they defecate in the same spot each week, digging a hole and covering it afterwards.
- Due to its slow metabolism and high-cellulose diet, defecation and urination occur only once a week.
- Sloths are clumsy on ground and vulnerable to predators including jaguars, coyotes and feral dogs as well as their aerial predator, the harpy eagle.
- A sloth will charge a suspected aggressor, pulling them to their mouth with forearms and biting them. They will also use their claws to defend themselves.
- Young sloths puff up their hair, almost doubling their size, when frightened.
- Sloths are good swimmers, having a streamlined body and long arms.

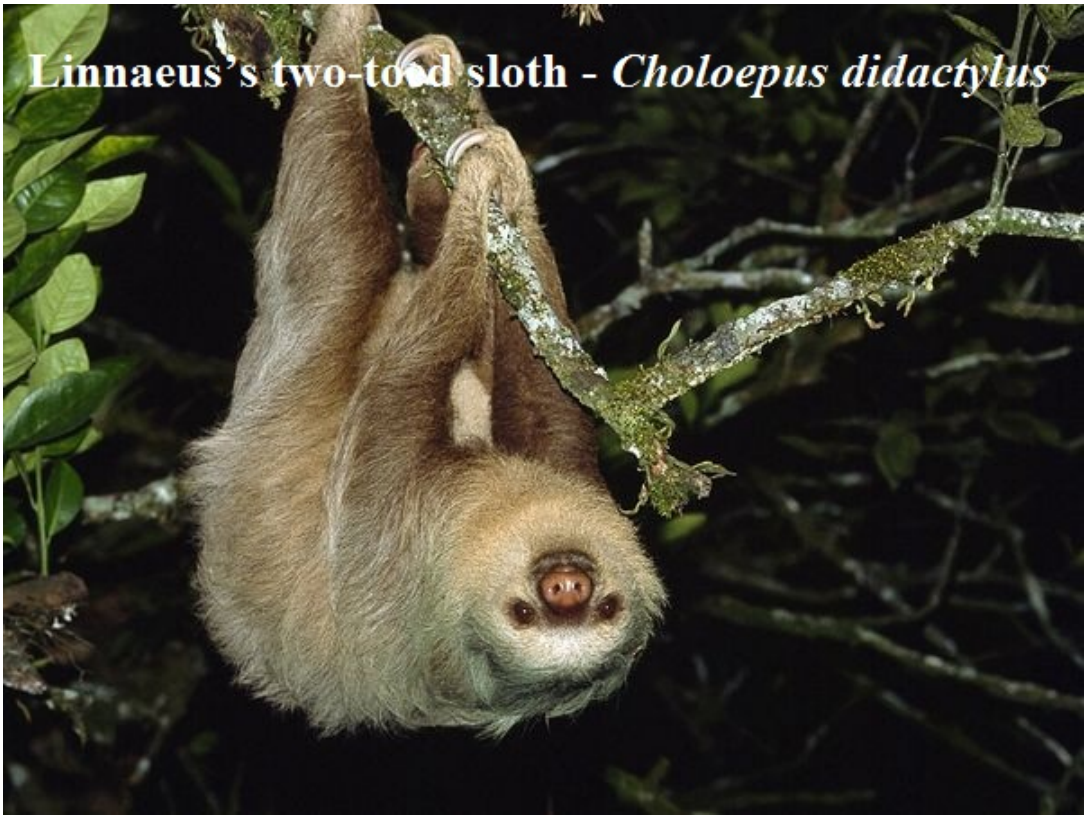
2. **Communication**
   - Two-toed sloths are generally silent but can let out hisses and low cries or moans if distressed.
3. **Diet/Eating Habits/Digestion**
   - Sloths are primarily folivorous with a complex stomach for digesting the plant material; a four-chambered stomach is aided by bacteria, which helps ferment the cellulose from the consumed plant matter (foregut fermentation).
   - They feed on leaves, twigs, berries, fruits and the occasional insect or small animal.
   - A slow metabolic rate (40 - 60% that of similar sized animals) means they can survive on a small amount of nourishment. Their diet of vegetation takes a long time to digest and food can remain in the digestive tract for up to a month.
   - Sloths get almost all of their water from juicy plants or by lapping dew.
   - To compensate for a lack of sharp teeth, they use their hardened lips to shear and crop leaves.
   - They have a large thick tongue, densely covered with sharp, backward-directed spines to help in moving food backward for swallowing. The tongue protrudes from their mouths 10 to 12 inches, allowing them to gather leaves just out of reach.
   - It is believed that the sloth will eat some of the algae and may also absorb some of the nutrients from the algae through its skin.
4. **Breeding/Reproduction/Growth/Parental Care**
   - Females in estrus appear to initiate mating and are able to reproduce about every 16 months. Mating occurs throughout the year, although some have observed a marked mating season in March and April.
   - Gestation period is six months.
   - Sloths mate and give birth while hanging in the trees; they do not build nests. Mother gives birth on ground or in upside down, hanging position; infant grabs onto her fur and makes its way to her chest to nurse. Milk is higher in fat (6.9 %) and protein (61%) than cow's milk.
   - Females have two mammae (one pair).
   - Gripping reflex enables young to climb to mother's abdomen. Single young carried for six to nine months and are independent at 12 months but may keep a close association for up to two years.
   - By 6 months, young sloths are able to defecate in the same manner as adults.
   - Females reach sexual maturity at three years and males between four and five years.

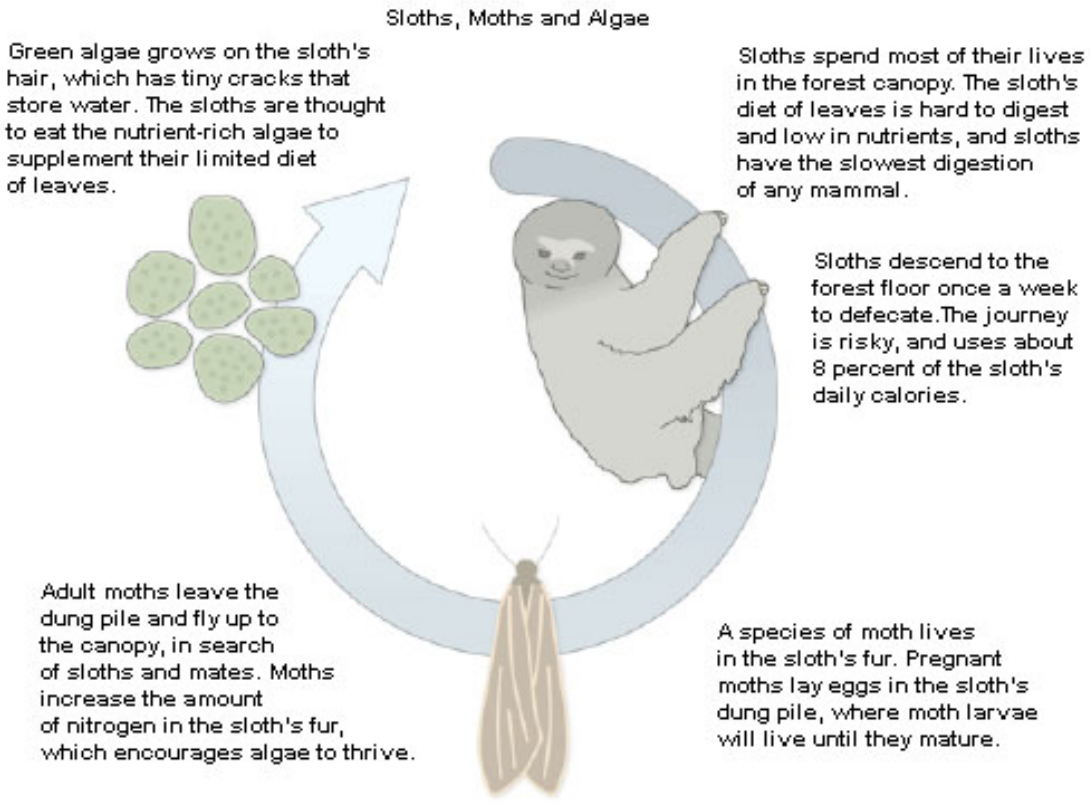
SLOTH INTERESTING/FUN FACTS

- There are two species of two-toed sloths: *C. didactylus* and *C. hoffmanni,* both native to the tropical rainforests of Central and South America (the zoo has the southern two-toed sloth: *C. didactylus*)
- Sloths are identified by the number of long, prominent claws that they have on each front foot. There are both two-toed and three-toed sloths which are quite different; two-toed sloths are nocturnal, larger, faster and their diet is more varied.
- Sloths, moths and algae maintain a beneficial relationship; a species of moth lives nowhere but in the sloth's fleece and a dedicated species of algae grows in special channels in the sloth's grooved hairs (see diagram). The pyralid moth may transport nutrient-rich waste from sloth dung or perhaps add nitrogen to sloth fur to replace that which has decomposed and live happily in a safe, protected environment. The furrows in the sloth's fur has the capacity to hold water and provides a good environment for the algae of which the moths help fertilize. Algal growth is a key source of food for sloths.

SOUTHERN TWO-TOED SLOTH CONSERVATION TALKING POINTS

- Southern two-toed sloths are listed as Least Concern on the IUCN Red List. Sloth populations are presumed large, widely distributed, and occur in a number of protected areas. It is unlikely to be declining fast enough to qualify for listing in a threatened category.
- Destruction of trees in their habitat due to logging, agriculture and urban expansion has put pressure on many sloth species.
- Traffickers buy young sloths from children ($5-$30), who take them from deforested areas.
- Sloths are hit by cars, as they slowly crawl cross the street.
- The Southern two-toed sloths is probably hunted opportunistically, but there is no serious bushmeat trade as they are usually found high in the canopy, motionless and virtually invisible and there are taboos against their consumption by some native groups.


Linnaeus's two-toed sloth - *Choloepus didactylus*



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