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ELEPHANT FOOTPRINTS

Pachyderm cooling strategies

How do elephants survive extreme high temperatures? The answer lies mainly in the physiology of their skin and ears.



PHOTOS: KELLY LANDEN

Skin protection

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Mid-November, temperatures of 42° Celsius and we are still waiting for 'pula,' rain. In Kasane we have not had rain since May. It has been an unusually long dry season and unfortunately the rains are coming later than hoped for. Humidity is slowly building while the sun still beats heavily overhead. There is no green grass, leaves or vegetation and the herbivores are suffering.

Every afternoon we witness elephant herds slowly making their way out of the forest, hesitating to cross the road, then quickening their pace towards

the Chobe River. They have lost much of their body weight over the season and the calves are tired. It is a wonder that they can survive; some don't, but most do. So how does the largest land mammal manage to keep cool under such harsh conditions?

Elephants' strategic survival skills, knowing where and when to move or migrate towards needed resources, is key. However, to cool an elephant by a single degree, you must cool over 6000 kilograms of flesh, which takes a lot of heat transfer! Keeping cool depends on the elephant's body design. Considering elephants do not sweat, the solution lies within their skin.



Skin protection

Elephants are called pachyderms, which means thick-skinned animals. They are wrinkled in appearance. The wrinkles act as a cooling mechanism by increasing the skin's surface area and trapping moisture. The trapped moisture takes a longer time to evaporate, therefore wrinkles keep elephants cooler for longer than if they had smooth skin.

The skin is extremely sensitive and can be damaged by the sun's UV rays. Yes, elephants can get sunburn. Elephants

rest under the shade of trees during the hottest times of the day. However, water conducts heat faster than air, so cooling off in water is much more effective.

Elephants bathe, but also suck water up into their trunks, up to 14 litres at a time, to spray on their bodies. They will then blow dirt and mud over themselves, which dries and acts as a protective sunscreen, blocking UV radiation and heat. Without regular mud baths to protect from burning, an elephant's skin would suffer

serious damage.

The skin is extremely tough around most parts of the body and about is 2.5 cms thick. However, the skin of an elephant's ears is very thin, stretched over cartilage with a rich network of blood vessels. Over 300 litres of warm blood are circulated through an elephant's ears every 20 minutes.

On hot days, elephants flap their ears, constantly creating a breeze which cools the blood vessels on the back side of the ears. The hot blood entering the ears can be cooled as much as 8° Celsius before returning to circulate throughout the rest of the elephant's body. So the large flapping ears of

an elephant act much like a radiator in a vehicle and are very important for temperature regulation.

Keeping these facts in mind, one realises how important water is to the survival of an elephant herd and why they will defend their right and paths to get to and utilize such a vital, lifesaving resource, especially at this extremely tense time of year... waiting for the rains. We as people might be a little uncomfortable, but for the sake of the elephants and wildlife, every morning we must chant in hope for Pula! Pula! Pula!

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Elephants Without Borders (EWB) is a charitable organization, working throughout southern Africa, dedicated to conserving wildlife and natural resources; through innovative research, education, and information sharing with all people, we encourage mankind to live in harmony with wildlife and the natural world. Considering wildlife don't use passports, the notion of elephants and "conservation without borders" is crucial for preserving biodiversity and a healthy landscape. Using African elephants as an inspiration, EWB strives to identify wildlife migratory corridors, secure wild habitats and elevate conservation of all wildlife. The largest mammal that walks the earth is now leading the way to help save vast areas of wild lands and the biodiversity they support.

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