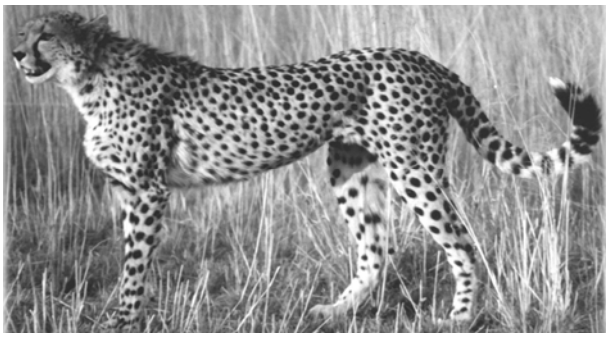
# VITAL STATISTICS

The data that is collected from the cheetahs and leopards moving through the AfriCat project provides us with information on the characteristics of the wild populations of these animals in Namibia. Before their release, the cats undergo a thorough examination and a list of procedures is carried out. Drawing blood, taking hair samples, measuring and weighing are all part of the routine tasks performed when a new cheetah or leopard comes in. The data collected from each cat is recorded in a database that allows for quick and easy access to information either on a particular cat or when providing statistics on these Namibian carnivores to researchers around the world.

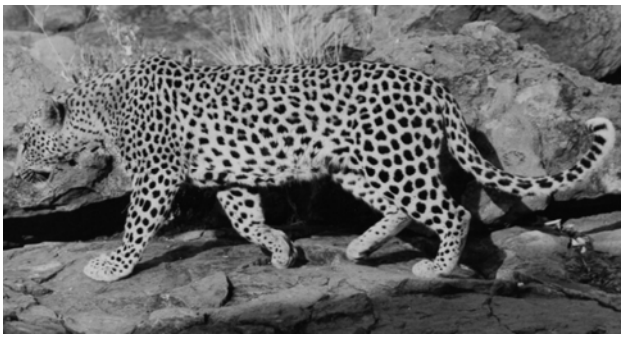
The arrival of what at first glance looked like the biggest cheetah we had ever come across prompted a search of our records to find out if this was in fact the case. Measurements of the skull, muzzle, chest, abdomen, tail, feet and canines are taken for each cat that comes in. In order to interpret overall size however, none of these measurements, or the cat's weight, can be used in isolation. Body length (tip of nose to base of tail), shoulder height and chest girth have therefore been taken into account for the purpose of calculating the overall size and determining which of the cats is the largest. After studying the data, it was confirmed that the male cheetah in question - collected from a farm in the Otjiwarongo district - was indeed the largest cheetah that AfriCat had ever recorded.

The table below shows the measurements of the largest cheetahs and leopards that AfriCat has recorded in relation to the average sizes of these cats, which have been calculated using the data collected from all the adult cats that have moved through the project.

## CHEETAH



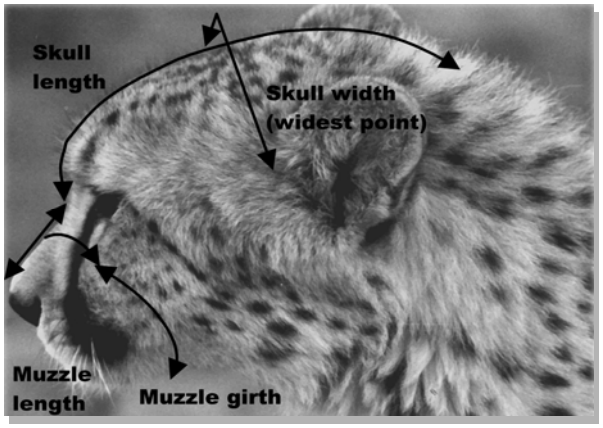
## LEOPARD



| MALE AVERAGE (n=89)* | SINGLE LARGEST MALE | FEMALE AVERAGE (n=47)* | SINGLE LARGEST FEMALE | MEASUREMENT (Centimetres) | MALE AVERAGE (n=59)* | SINGLE LARGEST MALE | FEMALE AVERAGE (n=58)* | SINGLE LARGEST FEMALE |
|---|---|---|---|---|---|---|---|---|
| 132.57 | 142 | 127.48 | 138 | BODY LENGTH (Tip of nose to base of tail) | 134.01 | 150 | 114.26 | 127 |
| 79.62 | 87 | 77.71 | 81 | SHOULDER HEIGHT | 69.14 | 78 | 60.17 | 65 |
| 74.01 | 80 | 68.28 | 75 | CHEST GIRTH | 78.47 | 89 | 62.58 | 71.50 |
| 61.14 | 64 | 56.87 | 50 | ABDOMEN GIRTH | 74.67 | 86 | 60.65 | 70 |
| 38.79 | 43.50 | 33.90 | 36 | NECK GIRTH | 51.30 | 59 | 41.10 | 43 |
| 77.35 | 89 | 73.73 | 80 | TAIL LENGTH | 83.26 | 87 | 76.40 | 78 |
| 20.32 | 23 | 19.13 | 21 | SKULL LENGTH | 20.46 | 25 | 18.83 | 21 |
| 15.88 | 18.50 | 14.93 | 16 | SKULL WIDTH | 16.80 | 21 | 13.68 | 16 |
| 7.65 | 9.50 | 6.76 | 7 | MUZZLE LENGTH | 9.06 | 11 | 7.47 | 9 |
| 29.57 | 31.50 | 26.96 | 29.50 | MUZZLE GIRTH | 34.07 | 37.50 | 28.15 | 29.50 |
| 2.32 | 2.60 | 2.21 | 2.50 | UPPER CANINE | 3.40 | 4.20 | 2.77 | 3.20 |
| 1.70 | 2 | 1.54 | 1.80 | LOWER CANINE | 2.91 | 3.40 | 2.26 | 2.80 |
| 8.46 | 9.6 | 7.79 | 8.7 | FRONT FOOT | 8.68 | 10 | 7.34 | 8.5 |
| 6.58 | 7.8 | 5.97 | 6.9 | FRONT FOOT WIDTH | 7.71 | 8.8 | 6.43 | 7.3 |
| 9.62 | 10.8 | 9.03 | 9.9 | BACK FOOT LENGTH | 8.21 | 9.2 | 7.51 | 7.8 |
| 6.84 | 8.0 | 6.16 | 7.0 | BACK FOOT WIDTH | 6.67 | 7.4 | 5.50 | 6.1 |
| 46.25 | 62 | 39.40 | 45.50 | WEIGHT (Kilograms) | 53.03 | 69 | 30.50 | 36.50 |
| 3.82 | 5 | 4.24 | 3 | AGE (Years) | 5.49 | 5.50 | 4.39 | 6 |

***** *For analytical purposes the measurements of all the cats under the age of 2½ years, as well as those that have been in captivity for any length of time, have been excluded.*

Measuring the canines of a leopard.




Measurements of a cheetah skull.

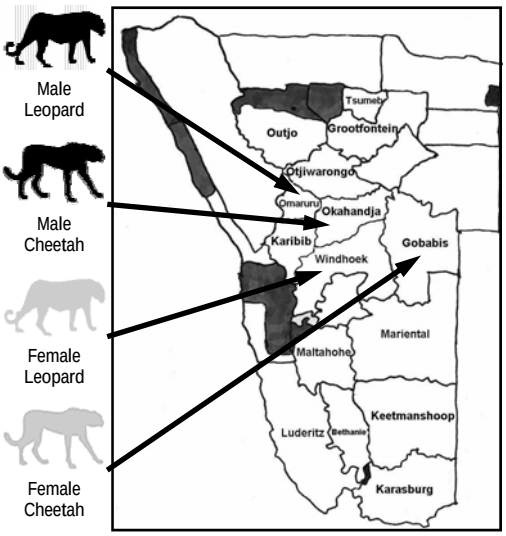
Weighing a cheetah.

Measurements taken of a leopard.

***Is there any correlation between the size of the cat and the area in which it lives?***

Discovering that the largest male cheetah, the one that came a very close second, as well as the largest male leopard were all from the Otjiwarongo area, initiated further analysis: to establish whether the sizes of the recorded cheetahs and leopards were relative to the areas in which they were caught.

Although the results did not indicate a specific area of Namibia that was yielding particularly large cheetahs or leopards, the findings highlighted certain parts of Namibia where the average sizes of the cheetahs and leopards caught were slightly larger than those captured elsewhere in the country.

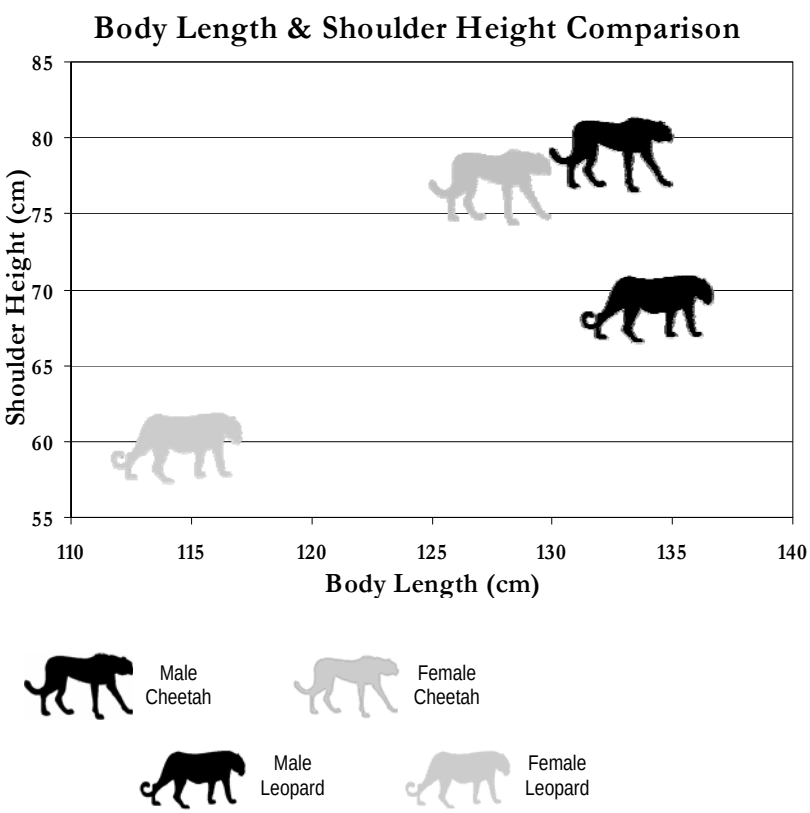


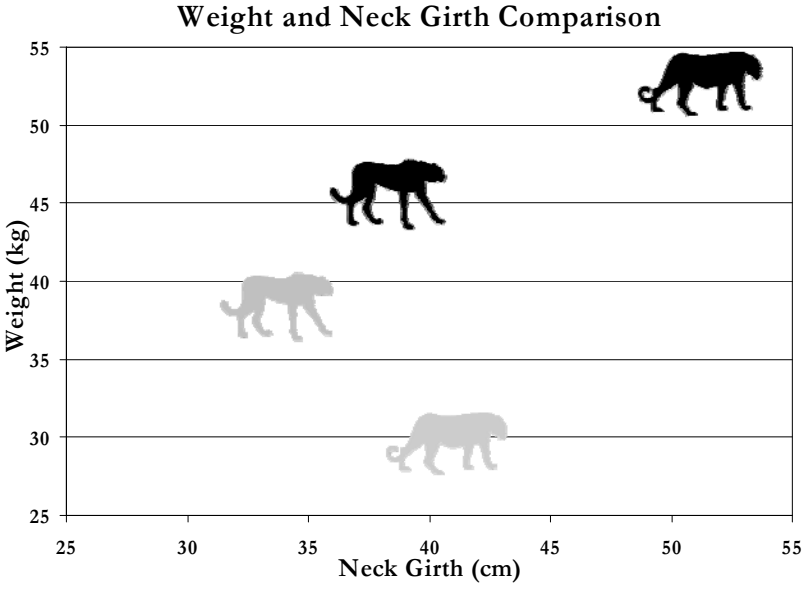
# *The Differences and Similarities between Cheetahs and Leopards*

When comparing the physiological characteristics of the cheetah and leopard, the proportional differences in size and structure can be attributed to the way their features are adapted to how each animal moves and its specific predatory techniques.

The way in which a cheetah initially approaches its prey depends on the type and number of prey animals present, the terrain and the amount of cover available. A rush, walk or stalk (to within a distance of 50 to 100 metres from the prey) is usually followed by a short high-speed chase before the cheetah knocks the prey off balance by tripping the animal or grabbing and holding on with its dewclaws, pulling it down. Large prey is generally suffocated through a bite to the throat, while smaller prey is usually bitten through the skull.
(Note: cheetahs can reach a top speed of between 100 and 115 kph which can be maintained for a few seconds only or for a distance of between 300 to 600 metres.)

The leopard either lies in ambush or approaches its prey by means of a long slow stalk until it is relatively close up (within 20 metres or less). A short chase (20 to 30 metres) may ensue before the leopard pounces and while holding the animal down, kills it by: biting the throat and throttling it, biting the back of the head or neck and crushing the skull, dislocating the vertebrae or severing the spinal chord, or suffocation through a bite to the front of the muzzle.




The average body length (tip of nose to base of tail) of the male cheetah and male leopard are very similar, with the leopard's tail being slightly longer. The cheetahs' longer limbs however, provide the additional height advantage.

The variations in size, proportions and body shape between the two cats are reflected in their bone structure. For example, the cheetah, in relation to its size, has a longer "forearm" than the leopard - the humerus/ulna length ratio being 1.0 in the cheetah and 0.9 in the leopard (Turner, 1997).

The cheetah's taller, lighter and more slender build, slim, elongated legs, thinner, shorter neck, flexible spine and slightly concave back are all ways in which its body is adapted for it's distinctive advantage - speed.

The leopard's more thickset, stocky, heavier build, muscular body, shorter legs and thicker neck are geared towards strength and power.

Generally the male cheetah is more robust and heavier than the female but there is substantial overlapping of the measurements between the two sexes and the differences are fairly insignificant in comparison to the leopards that AfriCat has recorded.

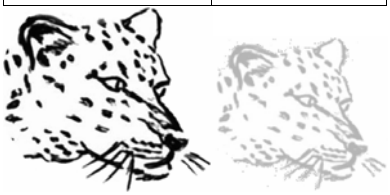
The difference in size between male and female leopards is far more distinctive. The female leopard has a much slighter physique and weighs significantly less than the male.

The difference in average body length (tip of nose to base of tail) between the male and female leopard is 14.7%, whereas in cheetahs it is only 3.8%.

The contrast in sizes between the genders of the two species is further substantiated by the variation in their average weights, with the difference being 14.8% between male and female cheetahs, as opposed to 42.5% in leopards.

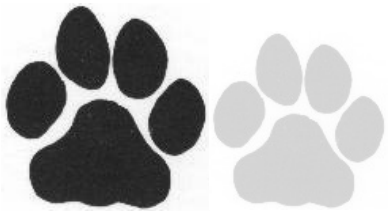
The tables below show the percentage difference in the average measurements between the male and female leopards, highlighting the significant size variation between the two sexes.

| | |
|---|---|
| Skull Width | 18.6% |
| Muzzle (Length & Girth) | 17.5% |
| Upper Canine<br>Lower Canine | 18.5%<br>22.3% |



| | |
|---|---|
| Body Length | 14.7% |
| Shoulder Height | 13.0% |
| Chest Girth | 20.3% |
| Neck Girth | 19.3% |
| Weight | 42.5% |

| | |
|---|---|
| Front Foot Width<br>Back Foot Width | 16.6%<br>17.5% |




The skull design and characteristics are determined by the animals' teeth and jaw structure and the way these are utilised during predation and feeding.

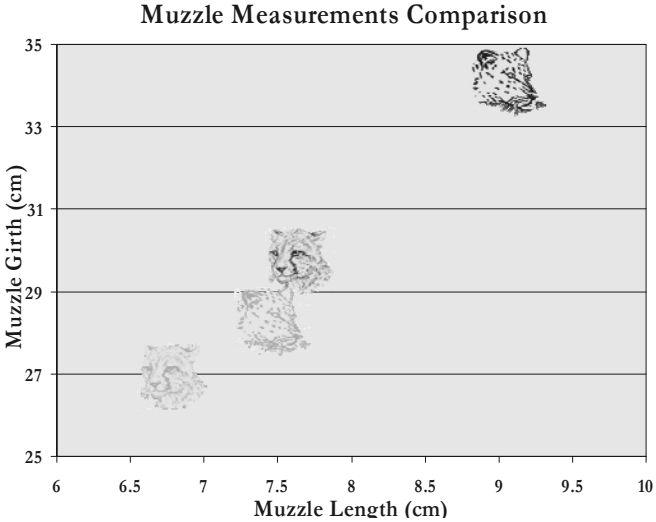
Once again using the males of the two species for comparison, there is little difference in their average skull measurements. It is the build, structure and shape of the two skulls and the sizes of the surrounding muscles that vary quite significantly, reflecting very different size and form in the external appearances of each cat.

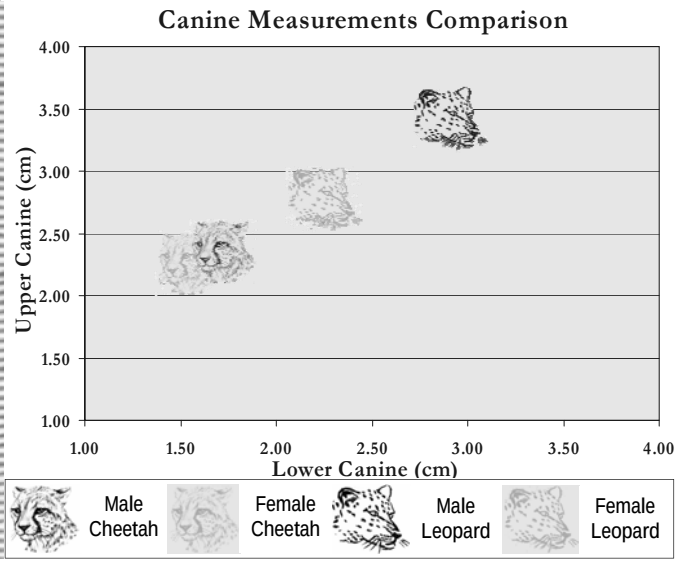
The cheetah's head is smaller and more rounded making it more streamlined in favour of running speed. The rounded head is due to the shape of the top of the cheetah's skull being more convex, whereas the leopard's is relatively flat.

The cheetah's shorter jaw contributes to a smaller muzzle with the resulting reduced weight being a further adaptation to its sprinting ability.

The leopard's heavily built skull and massive jaw, as well as the way the skull is structured to accommodate the powerful jaw and neck muscles, are some of the reasons for its head appearing bigger and broader than that of the cheetah. It is also the presence of these much thicker, stronger and more powerful neck muscles in the leopard that account for the large differentiation between the neck girth measurements of the two cats.

The size variation of the teeth, particularly the canines, contributes to the difference in muzzle measurements between the two cats. The shape and size of the canine teeth are indicative of the manner in which the cat kills its prey.




The cheetah's jaw and relatively small canines are designed to tightly grip and hold the prey by the throat as strangulation occurs.

Although the leopard uses the throat-bite method, the much bigger, sharper and more pointed canines are more suited and better designed to penetrate through the skin and neck vertebrae of its prey.

The large roots of the leopards' canines add to the size of its muzzle, while the correspondingly shorter canine roots in the cheetah allow for larger nasal cavities - an adaptation that enables an increased intake of air during sprints, as well as providing it with the ability to suffocate its prey while simultaneously recovering from the chase.

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*2004*

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