



A Hunter's Guide to Aging Lions in Eastern and Southern Africa

by Karyl L. Whitman and Craig Packer



CONSERVATION FORCE

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Cover: Adult male and cub in the Serengeti National Park,
Tanzania

This is a guide to making trophy selection. The guide contains the most scientifically up-to-date data on judging the age of African lion. The foremost scientific experts in Eastern and Southern Africa have joined together with Conservation Force to provide this information. The objective is to apply science for better or best hunting practices.

This is part of a larger collaborative effort between Conservation Force and the African lion scientific community. Conservation Force has led the hunting community's increased efforts to conserve the African lion with dozens of projects and programs across most of Africa. Tourist hunting has a critical role to play in conserving lion beyond the borders of protected areas. Most lion habitat and prey are in Africa's tourist hunting areas.

In those areas tourist trophy hunting can maximize the value of lion to the authorities and local people who will ultimately determine its fate. Moreover, the biological consequences of taking lion can be minimized if the lion are six years of age or older. The strategy of limiting the harvest to older males is in harmony with trophy hunting and it raises the esteem of this important game species. It is the best management practice.

More trophy lion will be available if young males are spared. The overall take will be less because fewer lion live to the age of six or more. The whole lion population will be more robust. It's time that safari hunters stop settling for anything less than a mature lion. Who has more to lose than the safari hunting world if African lion don't survive?

This guide aims to increase the conservation value of lion as well as serve as an aid to hunters. The fact of being a game animal can serve a species well. Being a true trophy serves it even better.

Conservation Force is endeavoring to better forge hunting into a force for conservation. We hope that you find the guide useful and wish you luck in your quest to genuinely make the King of Beasts part of your life experiences.



John J. Jackson, III
Chairman of Conservation Force

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Content for this guide was made possible by long-term scientific research on known-aged lions in Serengeti National Park, Tanzania conducted by the Serengeti Lion Project (SLP) over the last 40 years. The SLP is in a unique position to provide precise ages for all of the lions in its study area. Unless otherwise indicated, all photographs used in this book are either the property of the authors or the Serengeti Lion Project. All photographs and illustrations contained herein are protected by copyright.

We thank several researchers affiliated with the Serengeti Lion Project over the years for contributing to the extensive demographic records and library of photos used for this guide: Peyton West, Grant Hopcraft, Meggan Craft, Iain Taylor, Audie Hazenburg, Maria Finnigan, Henry Brink, Kirsten Skinner, Ingela Jansson and Jonathan Packer.

Paul Funston, Andy Loveridge, Luke Hunter, Christian Sperka, Alessandra Soresina and Bernard Kissui generously provided photographs of known-aged lions from their respective study areas. We also thank Paul for bringing our attention to the leg markings observed on some males.

We appreciate the thoughtful suggestions by reviewers of this guide: John J. Jackson III, Luke Hunter, George Hartley, Markus Borner, Debbie Peake, Shane Mahoney, David Erickson, Sarel van der Merwe, Philippe Chardonnet, and Bertrand des Clers.

Finally, many thanks are due to Kathleen Nolan for her assistance in putting this guide together and for her many hours making it so visually appealing.

Karyl Whitman & Craig Packer



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The African lion (*Panthera leo*) is the King of Beasts. Although lions can be found throughout various parts of sub-Saharan Africa, the best studied lion population resides in Serengeti National Park, Tanzania. George Schaller began the first research on lions there in the late 1960s and the Serengeti lions have been continuously studied for the last 40 years by a multitude of researchers. Because of this long-term research, the Serengeti Lion Project (SLP) is in the unique position of having detailed observations of all the lions in the study area since research first began. And because lions can be individually identified by their whisker spots and other natural markings, the SLP has been able to track thousands of individuals and entire prides through time.

This book is a practical guide to making trophy selection through age judgment in the field. It has been written in collaboration with Conservation Force as part of its many projects and programs

to better use tourist hunting as a force for conservation of the African lion. Many authorities believe that tourist hunting can be an important conservation tool and means of alleviating the primary threats to the survival of the African lion. The objective of Conservation Force and Savannas Forever is to develop the best practices for the conservation of African lion. The guidelines presented in this guide are not thought to be applicable in Western and Central Africa

Also, recent research has shown that trophy hunting may only be sustainable when off-take is restricted to mature males. The shooting of males under 6 years of age can be extremely detrimental to the population as a whole, since the dependent cubs of a trophy male are vulnerable to infanticide by subsequent resident males. For this reason it is critical that hunters endeavor to accurately estimate the potential trophy lion's age.

Because numerous safari books thoroughly review lion behavior, we focused our efforts on identifying key criteria that can be used to age lions and on presenting a useful set of little-known factoids about lion ecology.

It is important to collect as much information as you can about the lion you encounter, so it would be useful to familiarize yourself with various criteria for aging lions before you set out on safari. We know from first-hand experience that too often the lion will move out of sight while you are nose-deep thumbing through your guidebooks, trying to find the right picture.

Also, aside from the key physical traits that we outline below, pay careful attention to the lion's behavior—not only does this make a lion more interesting, but it sometimes will provide you not only with clues to his likely age, but also with valuable insight about a lion's status in his world.

A Brief Overview of Lion Natural History



The lion is the largest cat in Africa, with a pronounced difference in size between the sexes. Males weigh from 330 to 550 pounds (150–249 kilos) and females weigh 260 to 400 pounds (118–181 kilos). A male is 8 to 10 feet (2.4–3.1 m) long when fully grown, not including the tail. The lion is the only species of cat to possess a mane. The mane is a light sandy color in younger males but generally darkens with age.

Lions live in social groups called ‘prides,’ consisting of 2 to 18 adult females and their dependent offspring. All females in the pride are related and will occupy and defend the same territory for years. Males, however, leave their mother’s pride at about 2 to 3 years of age and form ‘coalitions’ of up to nine individuals. These coalitions actively compete for ‘residency’ in a pride—only pride males are able to successfully raise cubs to maturity. Coalitions may reside in one to four prides at a time and tenure is typically about 2 years. Large coalitions have a competitive advantage over smaller ones and are better able to defend their prides for longer periods of time.

When a female within the pride is in heat, the first male to encounter her will form a possessive “consortship” that may persist

for as long as a week. Lions typically mate every 30 minutes for 4 days—and several females within the same pride may go into heat around the same time. Actively mating or courting males can be extremely aggressive



About 100–120 days after conception, the lioness secretly gives birth to a litter of one to six cubs, with the average being two to three in East Africa and three cubs in Southern Africa. Cubs typically weigh less than 5 pounds (2.3 kilos) at birth. The cub's eyes open by about 3 weeks. Between 4–7 weeks of age, mothers will 'introduce' their cubs to the other members of the pride. Because breeding is somewhat synchronized, pridemates often produce cubs within a few months of each other thereby forming large 'creches' of cubs. After 3 months, cubs accompany their mother on hunting trips and they are dependent upon their mother for the first 2 years.

Lions kill their prey by ambush and seize mostly large to medium-sized animals like the buffalo, zebra, wildebeest, warthogs, and gazelle. A pride will often hunt as

a group—although males will take the 'lion's share'. About a quarter of the hunts are successful. Males can eat about one-third of their body weight at one sitting, but on average need about 15 pounds (6.8 kilos) of meat each day; females can eat about one-quarter of their weight, or about 11 pounds (5 kilos) per day on average.




Whitman

Due to their large size, lions have few predators besides man and each other. Lions are extremely territorial and they will kill unrelated intruders. Males also kill small cubs when they first take over a pride—eliminating the offspring of their predecessors so that they can breed more quickly with the pride females. Nearly one-quarter of annual cub mortality is a result of infanticide by incoming males.

If prey is scarce, young cubs can easily starve. Other common causes of cub mortality are predation by hyenas, leopards, and neglect by inexperienced mothers. In the Serengeti, males reach sexual maturity by about 2 years of age and are fully grown at 4 years; females typically have their first litter between 3–4 years of age. Males rarely reach 12 years of age in the wild, while females may live up to 19 years.

Using this Guide to Age Lions

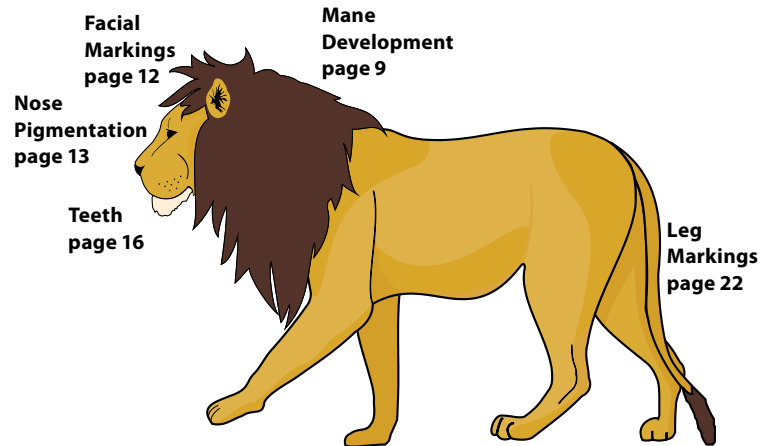
It is best to use a combination of traits to estimate a lion's age. Because there can be a large degree of variation in the expression of each trait, relying on only one factor can easily be misleading. The most reliable age estimate will be a composite of multiple factors.

This guide is broken down into five key areas on the body that provide clues as to a lion's age: (1) Mane, (2) Nose, (3) Teeth, (4) Facial Characteristics, and (5) Leg Markings. Throughout this guide you will also see the symbol  which highlights key points of interest.

Most of the material in this guide comes from the Serengeti, and we provide detailed information for aging Serengeti females and cubs. For Serengeti males, we explicitly break down development according to age, providing several examples within each age class to illustrate the range in variation. Although the mane is a notoriously unreliable indicator of a male's age, it does have use within context, so we provide cartoon examples that best depict the 'average' male at each age. Whenever possible, we also note the actual age of each lion pictured.

In this guide we have emphasized methods to age lions non-invasively, however we have also included preliminary results from ongoing studies in the Serengeti showing how tooth x-rays and tooth wear can be used to estimate lion age post-mortem. We also provide photographs of known-age males from Hwange National Park, Kruger National Park, Phinda Game Reserve, and Tarangire National Park. We hope that later editions of this guide will provide more extensive coverage of other ecosystems besides the Serengeti.

Finally, we have included a section at the end that covers common misconceptions about lions that can lead to inaccurate assumptions about a lion's age.



Function

It has been a long-held belief that the lion's mane largely functions to protect the male's neck and throat. However, recent research¹ has effectively shown that the mane provides minimal defense against aggressive attacks by other lions, and it is more likely that the mane has evolved as a reliable indicator of the male's physical condition. The color and length of the mane broadcast the overall 'quality' of its owner. Males who possess darker manes have higher levels of testosterone, live longer, and produce cubs that are more likely to survive. It's not surprising that females prefer males with darker manes.

¹ See West & Packer 2002 and West et al. 2006

Differences between populations

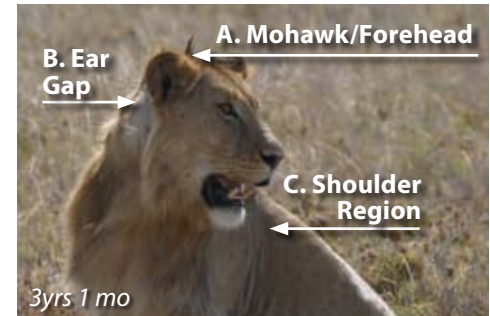
A male's mane can vary across seasons and with age—and if he is wounded, it can even fall out entirely until he regains his health. Across populations, males that live in hot climates generally have shorter and lighter colored manes. Although some of this may be genetic, a male that is translocated from a hot climate to a cold climate will grow a longer mane. Likewise, males in captivity (who are fed a nutritious diet) will grow impressive manes. Further, unrelated males from the same habitat may have very similar looking manes, whereas brothers may look nothing alike!

Development

Of all areas of the mane, the chest develops earliest, followed by the back of the neck then the shoulders. Although the hair on the forehead darkens first, it is the last to develop in length, so that

young males typically have a 'Mohawk' between the ears on the forehead (A) and have little to no mane hair on an area immediately behind the ears (B) referred to here as the 'Ear Gap'. Although some males develop full manes much earlier.

Since manes develop at different rates in different habitats, keep in mind that the following chronology refers to the timing of mane growth in the Serengeti—manes develop 1–2 years later in Tsavo males.



Mane Development

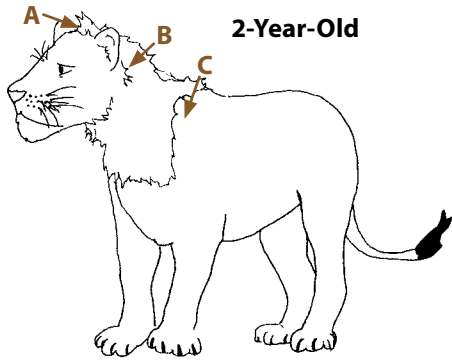
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Between the ages of 1 and 3 years the mane around the neck is generally longer and darker than on the shoulder. But as Serengeti males approach 3½ to 4 years, these two areas become similar in length and color. The chest is almost always the darkest part of the mane and continues to darken with age. As young males become reach about 4 years of age, the chest and shoulder regions become darker than the neck or forehead.

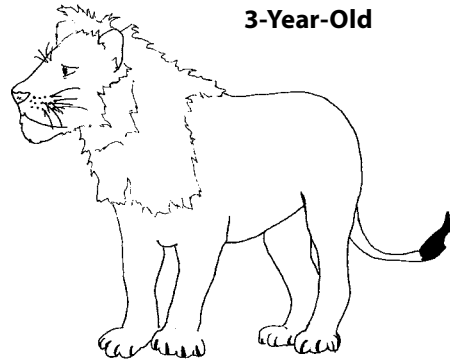
Serengeti males possess a maneless area of fur between the back of the neck and the chest around the (C) shoulder blade which fills in between 5–6 years of age as the mane grows. As the lion ages beyond 7 years, his mane slowly loses condition—the mane hairs frazzle and split and take on a progressively more 'fuzzy' look. From about 8 onwards most manes lose some of the length of their younger years.



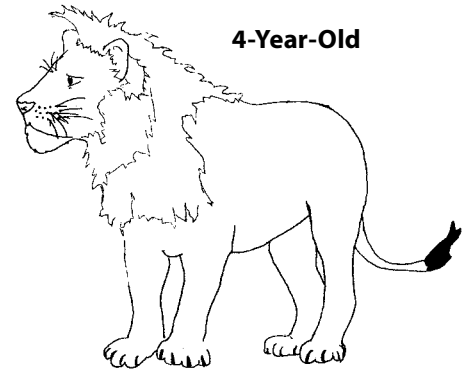
The same Serengeti male photographed between 2 and 6 years of age.



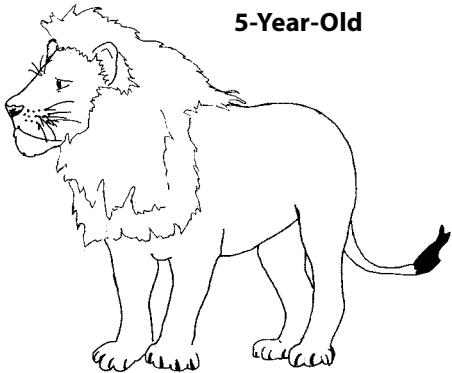
2-Year-Old



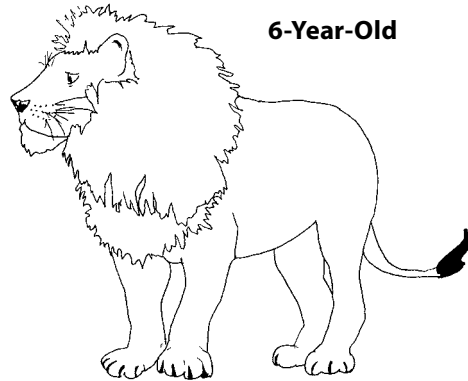
3-Year-Old



4-Year-Old



5-Year-Old



6-Year-Old

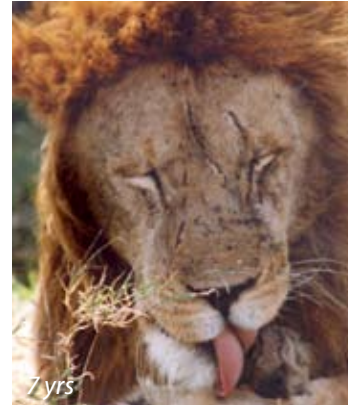


Key Areas of the Mane

A. Mohawk/Forehead

B. Ear Gap

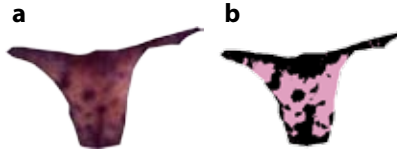
C. Shoulder Region



Young males tend to have smooth glossy fur on their face. As males mature, their face will broaden and attain a more massive appearance. The fur on the face begins to appear duller as they age and will start to thin somewhat causing the skin to look dark, especially on the top of the muzzle. This usually becomes visible around 5–6 years of age. Once lions are about 8–9 years of age, their whisker spots are less apparent because of a general lack of contrast due to accumulating scars and thinner hair on their muzzle. The fur begins to appear pock-marked around 8½–9 years and lions older than that usually begin to have a loose or slack-jawed expression.



Whitman



Photograph of a 3½ year old Serengeti lion and the corresponding (a) excised nose tip and (b) graphic rendering of the pigmentation pattern.

* In some cases young lions may also have grey, not pink noses. In certain light these grey-morphs will appear dark, however and freckles or speckling will still be visible when it starts to appear around 3 years. By approximately 4 years the freckle pattern is also apparent in the grey-morphs.



In the Serengeti, a clear relationship exists between a lion's age and the amount of pigmentation on his nose. After about 3 months of age, the fleshy part of the lion's nose turns a pink to light grey.

Once the lion is 3 years old, he will start developing tiny freckles on it*. As the lion continues to age, these freckles coalesce and become more liver-spotted until the nose is entirely black by about 8 years of age. The cause of this is currently unclear, however it is thought that environmental conditions may act upon a genetic component. It is not yet certain if the rate of pigmentation is the same in other populations. Domestic cats, tigers, mountain lions, and leopards also show some nose freckling, but none of the other cats express the trait to the same degree as lions do.

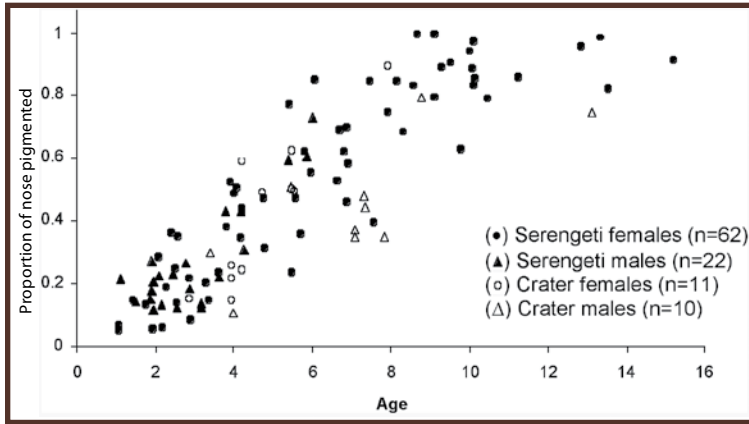
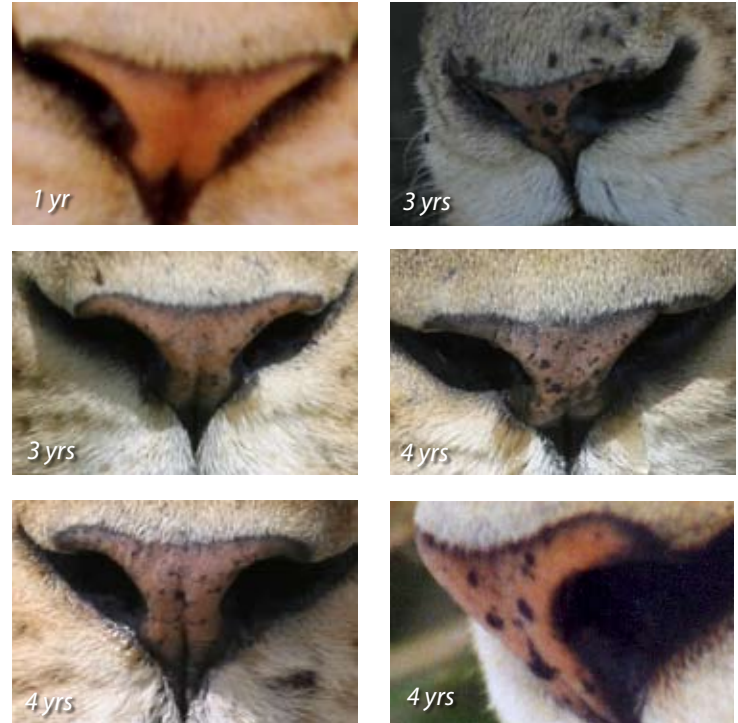


Figure 1. Relationship between known age and nose pigmentation for adult male and female lions in Serengeti and Ngorongoro Crater: (●) Serengeti females (n=62); (▲) Serengeti males (n=22); (○) Crater females (n=11); (△) Crater males (n=10) (Whitman, et al. 2004). Males with at least 60% of the nose pigmented are about 6 yrs old.

Right: Photographs of fleshy nose tips from immature (<5 yrs) lions

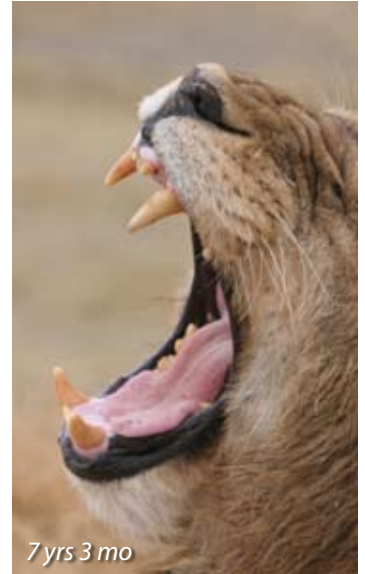




Above: Serengeti male

*Right:
Noses of lions 5–8 years old.*






Christian Sferka

Teeth can be a useful indicator of age, although accuracy is much improved during a post-mortem exam. All 30 permanent teeth are visible between 15–17 months and teeth are initially sharp and white. As a lion ages, its teeth turn yellow, wear down, break, and often fall out, although there can be a great deal of variation within each age class. The next few pages detail the approximate rate at which these events occur.



 At 3–4 years the permanent teeth are fully erupted, sharp, and mostly white. Only a small amount of wear on the incisors, canines, and premolars may be apparent. Slight yellowing of canines, but incisors are typically white.



Left: Note damage to lower left canine; **Right:** Upper right canine from a male, 3 yrs 3 mo. Note prominent longitudinal ridge (red arrow) with little wear on the lingual side.



Tooth Wear 3–4 Years



6 yrs 8 mo

Christian Speerka



At 5–6 years there is obvious wear on canines, incisors, the upper P3, and lower P4, but the upper P2 and lower P3 show little wear. However this can be very difficult to see at a distance. Canines are often yellow and the distal longitudinal ridge is often chipped. The cheek teeth and incisors can vary from white to various degrees of yellow. There can be considerable variation at this age in the coloring, wear, and damage—thus it is best to use a composite approach to aging, especially for this age group.



Upper



5 yrs 5 mo



5 yrs 1 mo



6 yrs 3 mo



Lower

Left: Prepared skull from male 6 yrs 2 mo. The teeth are white due to processing.



6 yrs 3 mo



6 yrs 3 mo



6 yrs 10 mo



From 7–9 years all teeth show wear; with it being most obvious on the canines and incisors. The incisors show the most wear on the upper and lower outer most tooth and some incisors might be missing. The distal ridges are worn completely and nearly all teeth show some degree of yellowing.



From 9+ years onwards, there is obvious wear on the teeth. Canines are often broken or missing, and one or more of the incisors may be worn down to the stumps or missing entirely. All teeth are yellow.



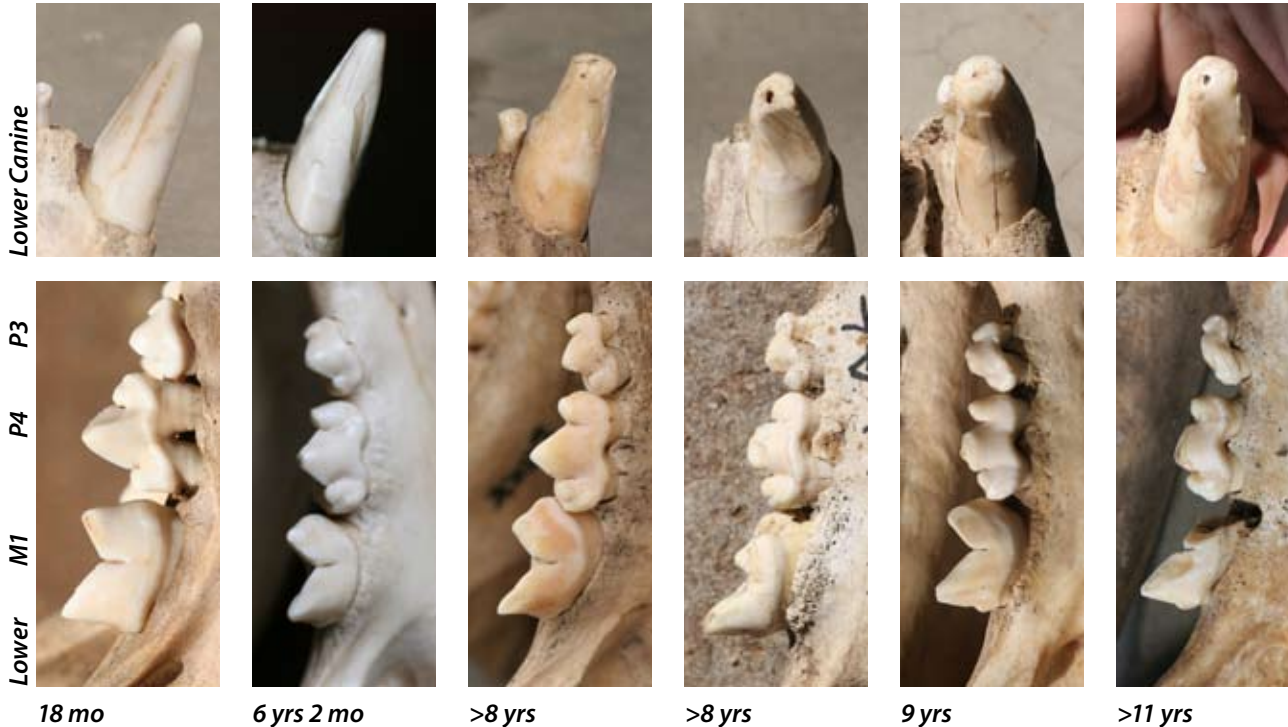
Above center: male >9 yrs. Distal longitudinal ridge on canine and two incisors missing.
Above lower: male >11 yrs, note conspicuous wearing of all cheek teeth.



Tooth Wear >7 years

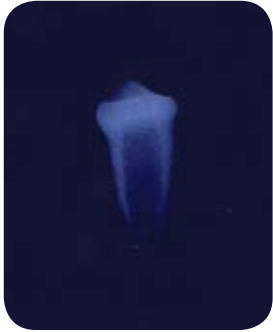
Comparative Tooth Wear

20



Teeth from known-aged Serengeti lions:

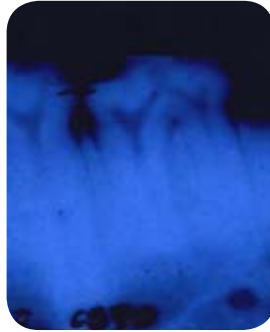
By 8 years of age, a wide groove has developed on the back surface of the lower canines. The wear-pattern of the cutting edge of the carnassial (M1) teeth becomes broader, and the tooth becomes thinner and often breaks.



16 mo



18 mo



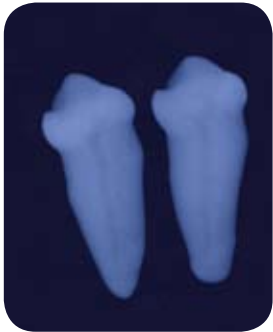
3 yrs 1 mo



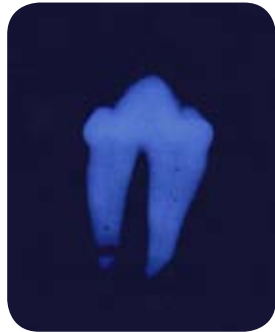
3 yrs 3 mo



4 yrs 9 mo



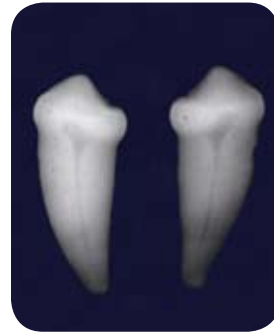
6 yrs 2 mo



7 yrs 11 mo



8 yrs 11 mo

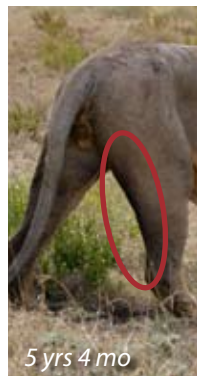
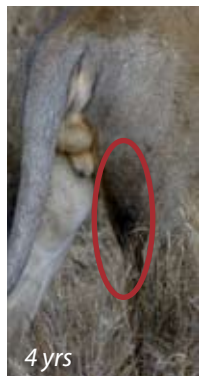



9 yrs 2 mo

Post mortem x-rays of the lion's teeth can help estimate their age at death. The pulp cavity (red arrow above left) is initially quite wide at 3 yrs 3 mo and fills in by about 4 yrs 9 mo of age. All photos on this page are from known-age Serengeti lions.

Closure of Pulp Cavity

Leg Markings



 *Hunters should avoid confusing prominent dark markings with the narrow strip of black guard hairs that grow on the back of the legs.*



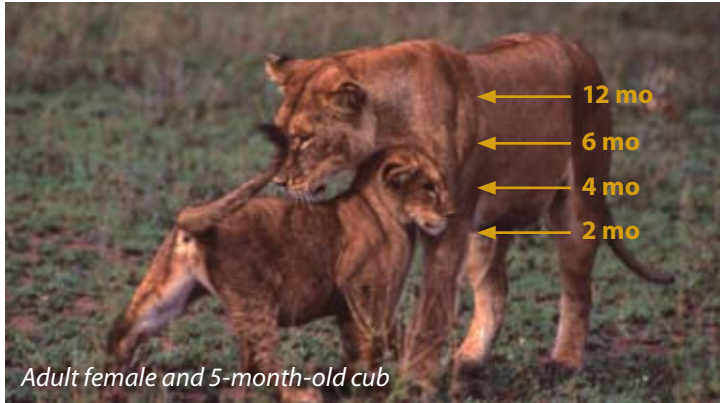
Male lions often have a narrow strip of black guard hair on the back of their hind legs and those who have recently become residents in a pride actively scent mark and develop conspicuous dark markings on their hindquarters. In the Serengeti, these markings are most likely to be found on males that are between the ages of 3–7 years but are most prominent between 4–5 years and taper off with age. Males with prominent dark markings are still at the beginning of their reproductive careers, having just become territorial and started defending their pride ranges against rival males.



Serengeti male (>7 years) investigates female while her cub looks on. Photo: Whitman.

Sex and Age Classes and How to Tell them Apart 23

How to age cubs: Cubs are able to walk well at >3 weeks and accompany their mother at around 5–6 weeks. They are no longer carried around 6–7 weeks and can keep up with the pride at >8 weeks. The eyes are greyish-blue up until 2–3 months; nose tips are 'pink' or light grey by 3 months. Their coat is woolly at 3 months, then attains an adult texture by about 5 months. The tail tuft does not appear until 5 months and it is obvious by 7 months. Cubs are usually weaned by 8 months and about the size of a leopard (~45 kg) by 12–15 months.



Whitman

Top right: Adult Female.

Lower right: cub <3 months, note the lack of a tail tuft.

Left: Adult female and 5 month old cub. Yellow arrows mark relative height of cub against mother's body according to age. At 4 months cubs reach the elbow joint; at 6 months the cub is approximately two-thirds the shoulder height; at 12 months the cub reaches about half of the shoulder height. Note the conspicuous tail tuft of the cub—also this mother has lost the tip of her tail.



Whitman





15 mo

Whitman

Male cub. Note the starting of a mane on the chest and 'peach fuzz' on the cheeks.

Distinguishing between adults and sub-adults: 2-year-old females are about two-thirds the size of an adult female. 2-year-old males however, are much larger than their same aged sisters and they are usually taller than their mothers at this age. Males can reach the size of an average adult male by 2½ years.

Likewise, by 2½ years females can reach the full height of an adult. It is difficult at a distance to age a 3-year-old female since they appear full-grown. Beyond this age, females cannot be aged by body size, therefore teeth, nose, and facial markings are better indicators.

Because females usually do not conceive their first litter until at least 3½ years, a lactating female is almost always older than 4 years.



Whitman

Lactation stains on nursing lion.



19 mo

Whitman

Male cub



Whitman

APPEARANCE: 2-year-old males are usually larger than adult females, especially in height; they often have a gangly and awkward appearance and some may have already reached the size of an adult male by 2 years 6 months to 2 years 8 months. They weigh about 90–100 kg.

BEHAVIORAL CHARACTERISTICS: Around 2 years of age, males will start to scuff mark and spray vegetation (when still in their mother's pride). They will roar alongside their natal pride, but not when alone. Generally they keep a low profile even in the company of their natal pride. Shortly they will leave and form young nomadic coalitions, either with similarly aged brothers or independently. 2-year-old females will help to defend their natal pride against unknown lions, 2-year-old males behave less predictably—some come to the aid of their mothers, others do not.



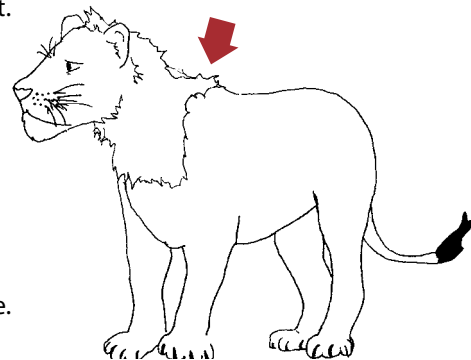
Christian Speerka

NOSE PIGMENTATION:

Pink with 0–30% of nose pigmented (usually ~ 20%).

TEETH: Fully erupted, white, little wear except for slight chipping on the enamel ridge on the back of the canines.

MANE: Mohawk obvious and ears clearly visible. Shoulders fully exposed (red arrow).







Mane development has considerable variation at this age. Both males shown above are 3 yrs 10 mo.

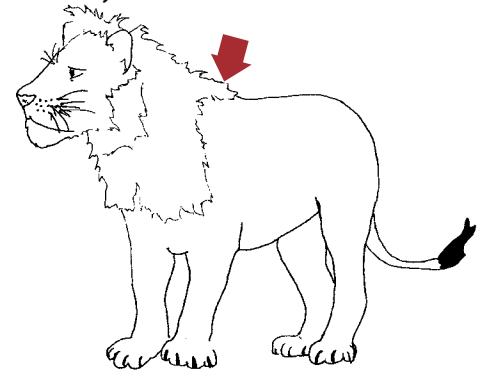
APPEARANCE: 3-year-old males are not yet fully mature. Although some may have attained the size of an average adult male, others may not have attained their full size yet and may not necessarily have the muscle mass of older males. Mane development is highly variable, but even in males who have more fully developed manes, the ‘mohawk’ is visible on the forehead and the shoulder patch has not yet filled in (red arrow below).

BEHAVIORAL CHARACTERISTICS: Except under unusual circumstances 3-year-olds do not typically have an opportunity to breed. They have recently left the protection of their mother’s pride and are living on their own or have formed a coalition with other males. They do not defend territories, will not scent mark, and will avoid encounters with resident lions, especially males. As ‘nomads’ they almost never roar.

NOSE PIGMENTATION:
15 to 30% of nose pigmented.

TEETH: Fully erupted, white, and little wear except for slight chipping on the enamel ridge on the back of the canines.

MANE: Usually obvious mohawk and shoulder blade exposed.





3-Year-Old Males



4 yrs 3 mo



4 yrs 4 mo

Mane development still has considerable variation at this age. The male on the top is 4 yrs 3 mo, the male on the bottom is one month older.

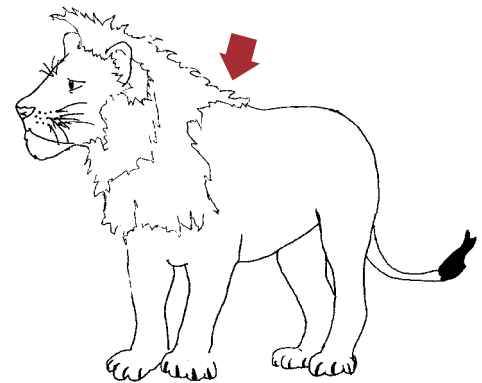
APPEARANCE: The mane is still highly variable in appearance and development between males. However, generally it is usually very full on the cheeks, forehead, and chest, but is not yet filled in completely between or behind the ears. Nearly all males have achieved their full body size, although some may continue to put on mass, especially in the shoulders.

BEHAVIORAL CHARACTERISTICS: Depending upon his competitive ability, he may either be a nomad or a newly resident male. If he is a pride male, it will often be his first chance to successfully raise cubs. If a nomad, he will keep a low profile (by not roaring or scent marking) until he ventures to challenge a resident coalition. He may have a coalition of his own or be solitary.

NOSE PIGMENTATION: Pink, 25–50% of nose pigmented, usually ~40% black

TEETH: Fully erupted, white and little wear except for slight chipping on the enamel ridge on the back of the canines.

MANE: Mohawk present and shoulder blade exposed, some males may have well developed manes between ears, but the mane on the shoulder region will still be incomplete (see red arrow).





4-Year-Old Males



Peyton West

Serengeti brothers, 5 yrs 4 mo



5 yrs 7 mo

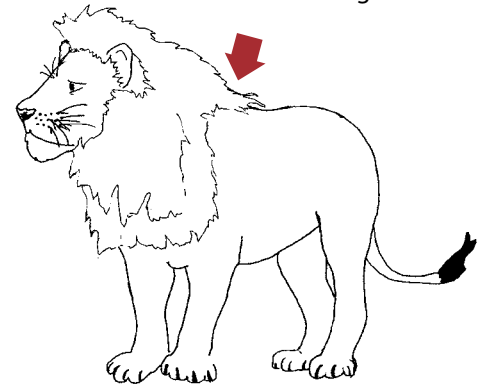
APPEARANCE: Five-year-olds are full grown and appear massive. Their chests and foreheads are broad and they have put on much muscle mass, especially in the shoulders.

BEHAVIORAL CHARACTERISTICS: In their prime, the average 5-year-old will be in a coalition of other males and be actively looking for a pride if he does not already have one. As a resident he will roar and scent mark—as a nomad, his behavior depends on his intention—run for cover or challenge the current pride males!

NOSE PIGMENTATION: Usually about 50% of nose is pigmented (range 35–60%).

TEETH: Canines are slightly yellow and have a little wear on the inside back ridge. The incisors will have marginal wear but are rarely missing or heavily worn. Overall the teeth will be cream colored to slightly yellow, with the canines having the most discoloration. Canines may also begin to show breakage.

MANE: Nearly fully grown and in excellent condition. By about 5½ years the mane is typically filled between the ears on the top of the head. Usually a small patch of maneless shoulder still remains, but this will fill in completely by about age 6–6½.





Peyton West



5-Year-Old Males



Top:
Serengeti brothers,
both 6 yrs 11 mo

Bottom: 6 yrs 2 mo



Christian Speerka

APPEARANCE: Males are full grown, in their 'prime' and massive. They should stand about 1.2 m tall and weigh 126–272 kg and be about 2.4–3.3 m long (excluding the tail).

BEHAVIORAL CHARACTERISTICS: Often affiliated with prides at this age—they will conspicuously roar and scent mark if resident.

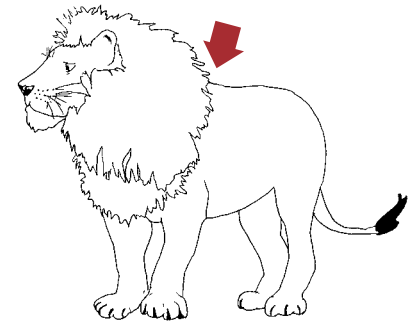
NOSE PIGMENTATION: Usually at least 60% of the nose is pigmented, but the range is 37–85% (see photo on right).



The range in the extent of nose pigmentation found at this age: 37% (left) to 85% (right).

TEETH: Usually some slight wear on the canines and incisors. The enamel ridge on the back of the canine usually chipped. No pulp chambers for incisors should be visible. The cheek teeth should be slightly yellow, and the tips of the canines should be less yellow than the bases or the cheek teeth.

MANE: Fully developed, with forehead section fully filled between ears. The inside lobe of the ears is usually difficult to see. The shoulders have filled in and the mane is nearly continuous from the ridge of the back to the chest.





6-Year-Old Males



APPEARANCE: Generally considered to be fully mature and in his 'prime'. The hair on the muzzle may be thinner and appear slightly 'pock-marked' or worn away, but overall the lion is in good condition. Muzzles and flanks can be heavily scarred.

BEHAVIORAL CHARACTERISTICS: Typically a pride male or recently ousted. May be paired up with males of similar age or even younger. They conspicuously roar and scent mark when resident.

NOSE PIGMENTATION: 50–85% pigmented, usually ~75%.

TEETH: Conspicuously yellow and all teeth will show some wear. Canines often show some breakage and a few incisors maybe missing.

MANE: Fully developed especially between and behind the ears and around the face. Hair tips generally still smooth, although some manes may now appear 'fuzzy' as hair shafts begin to split. Mane color often is dark, especially on the chest.



APPEARANCE: An 8-year-old typically is in his last year of his 'prime'. Facial hair is worn away in some sections, becoming conspicuously 'pock-marked' or scarred by 10 years. Whisker spots become increasingly more difficult to discern. As they become older, they develop a somewhat 'slack-jawed' expression.

BEHAVIORAL CHARACTERISTICS: These males will usually have had the opportunity to breed and successfully raise several sets of cubs. If they are still resident, they will roar and scent mark—if they have been ousted from their pride(s) they usually will not have another opportunity to be a pride male so they no longer roar or scent mark. Once ousted, they do not usually survive more than 1–2 years on their own.

NOSE PIGMENTATION: 75–100% pigmented; >10 years 100% black.

TEETH: Conspicuously yellow, all teeth will show heavy wear. Canines often show some breakage, incisors may be missing or worn down to stumps. From 10–14+ years, broken canines common and pulp chambers of incisors clearly visible.

MANE: Fully developed especially between ears, behind the ears and around face, usually >8 years, the end of the hair start looking frayed and the mane may thin or fall out in sections as the lion loses condition.





3 yrs 6 mo



3 yrs 6 mo



3 yrs 6 mo

Photos this page courtesy of Andy Loveridge



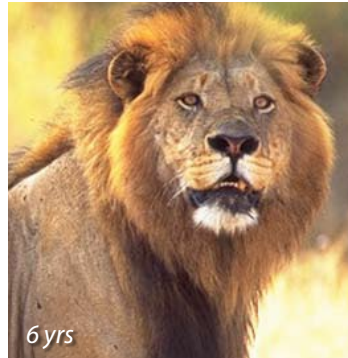
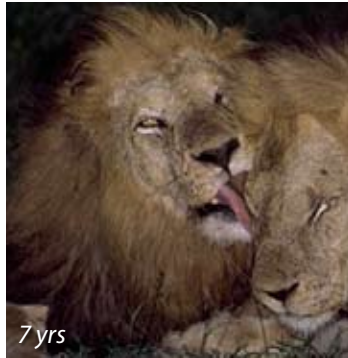
7 yrs 6 mo



5 yrs 6 mo

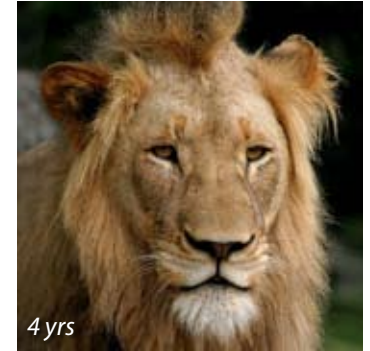
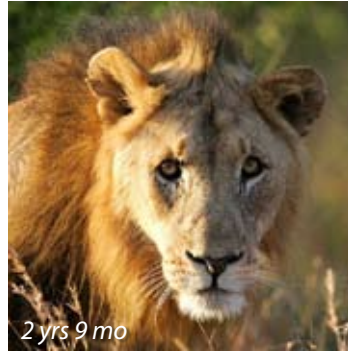


4 yrs



All photos this page courtesy of Paul Funston

Phinda Game Reserve, Republic of South Africa 40



Luke Hunter



Christian Sperka



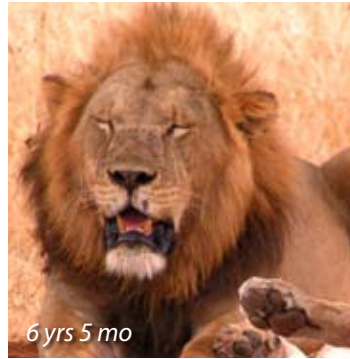
**Phinda lions are descendents from founders translocated from Kruger region (1992 and 1993) and Pilanesberg/Madikwe reserves (2003).*



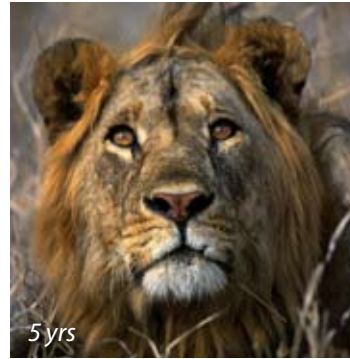
Photos this page courtesy of Alessandra Soressina, unless otherwise noted



Bernard Kissui



Bernard Kissui



Common Misconceptions About Lions

42



Whitman

 **Only old lions have a 'sway' back.**

FALSE: Sway backs are not a sign of old age; some lions have curved spines their entire lives, and most older lions have straight backs. (see examples a and b)

 **Only mature males have elbow tufts.**

FALSE: Some males grow dark prominent elbow tufts at an early age, whereas some males never develop elbow tufts. (see examples c and d)

 **Older males have grey or 'donkey-skinned' coats.**

FALSE: Coat color remains the same throughout a lion's life. Individual lions vary from grey, pale yellow, tawny to dark ochre. Grey-colored lions may be young or old, and old lions may be yellow or orange. (see example e and f)

From top left: a. Male cub with a 'sway back'; b. 9 yr 6 mo male with straight back; c. 4 yr 6 mo male with prominent black elbow tufts; d. 8-year-old with no elbow tufts, straight back; e. male, 9 yr 6 mo, with dark coat; f. 14-year-old with blonde coat and mane, straight back, no elbow tufts.



Christian Sperka

Males only mate in their 'prime.'

FALSE: Males as young as 18 months are physically capable of reproducing. However, breeding opportunities are generally restricted by the lion's social system, and males typically do not become resident in a pride until they are about 4 years of age. This is determined by the amount of competition in an area, with older males and males in larger groups (coalitions) having a competitive advantage over younger or solitary males. So if there are fewer males around, the age at which a male breeds drops significantly.



A proportion of males are maneless in the same way that some elephants are tuskless.

FALSE: All male lions are capable of growing manes. A male may temporarily lose his mane when he is injured, but it grows back once he has recovered (*see examples a and b*). Males in hotter climates grow shorter manes and their manes take a year or two longer to grow, but if a hot-climate male is translocated to a cooler climate, anecdotal evidence suggests that his mane will become fuller. Thus regional variations in ambient temperature prevent absolute mane size from being a reliable yardstick for estimating a male's age. However, within any given geographical area, males with relatively large manes are much more likely to be fully adult than are so-called maneless males.

Thorny bush or scrub is responsible for the lack of mane observed in some males.

FALSE: Thorny bushes have no effect on the lack of mane or overall mane development.

Left: Same male (**a**) photographed at 8 yrs 7 mo then (**b**) 10 months later after he lost condition due to a leg injury and his mane started to fall out.

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Karyl Whitman

Dr. Karyl Whitman is originally from New Jersey and began her academic career as an anthropologist and graduated from Rutgers University in 1993. She completed her PhD in Ecology at the University of Minnesota in 2006. Karyl was the first scientist to evaluate the impact of trophy hunting on lion population dynamics, and she led the way for the development of a detailed simulation model published in 2004 that provided invaluable insights into the consequences of different trophy-hunting strategies on lion conservation. Karyl also pioneered techniques for accurately estimating the ages of male lions in the field.

While conducting her graduate research, Karyl received a MacArthur Graduate Fellowship from the John D. and Catherine T. MacArthur Foundation and she was the recipient of the Louis T. Dosdall Fellowship for Women of Science. Her research was partly funded by a grant from the Wildlife Conservation Society Research Fellowship Program and the Big Game Special Projects Foundation and in-kind support from Friedkin Conservation Fund.

Craig Packer

Dr. Craig Packer was born in Texas and graduated from Stanford University in 1972 and completed his PhD at the University of Sussex in 1977. He studied baboons in Gombe National Park, Tanzania, intermittently from 1972-2000, and has headed the Serengeti lion project since 1978. Craig currently has students working on lions in Tarangire and Serengeti National Parks, Selous Game Reserve, as well as Ngorongoro Conservation Area, Tanzania. In addition to his lion work, Craig is the Principal Investigator of collaborative research projects in the Serengeti funded by the NSF program in the Ecology of Infectious Diseases and the NSF initiative on Biocomplexity. Craig is the author of "Into Africa," which won the 1995 John Burroughs medal. He is currently a Distinguished McKnight Professor in the Department of Ecology, Evolution & Behavior at the University of Minnesota and a member of the American Academy of Arts and Sciences. Craig and his wife, Susan James, are co-executive directors of Savannas Forever.

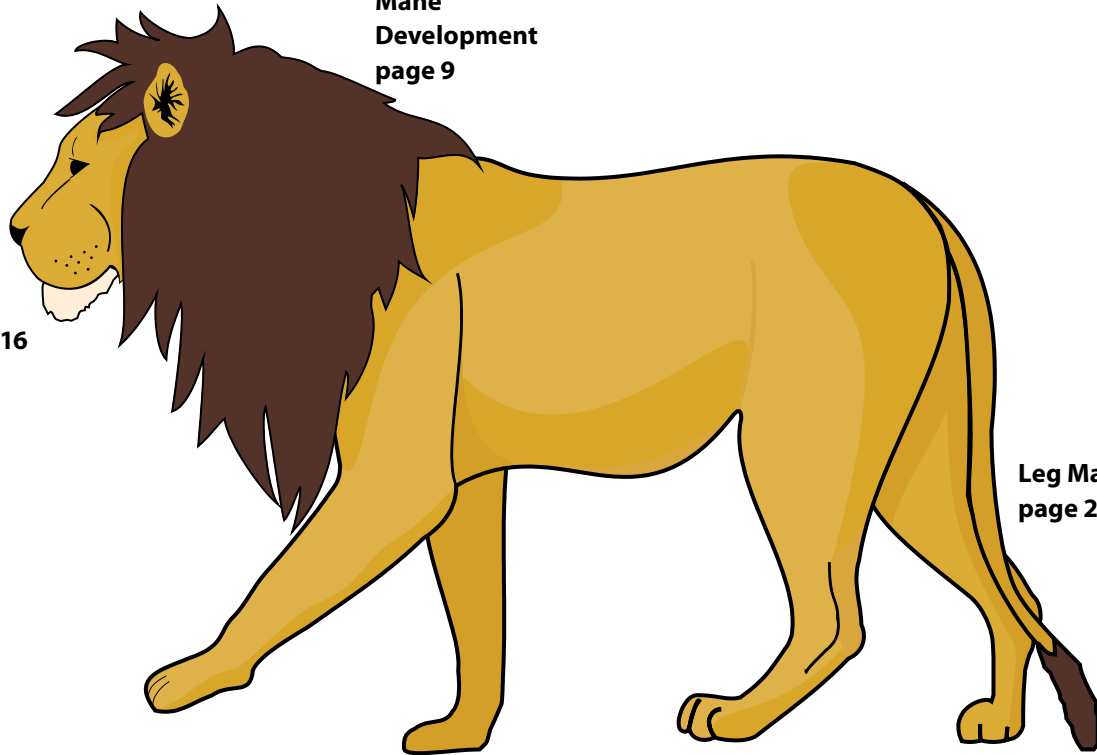
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