

21 “Most Asked” questions about White Lions answered!



Q & A with Jason A. Turner, Lion Ecologist and Senior Scientific Consultant of the Global White Lion Protection Trust
Updated 2023

Q1: Are the White Lions albinos?

Turner: No, they are not. In 1997 a study by Cruickshank & Robinson determined conclusively that White Lions are not albinos. They have blue or gold colouration in their eyes, black features on the tip of their noses, as well as “eye-liner” and dark patches behind their ears (“follow-me signs”). By contrast, albino lions, which lack pigmentation, have a characteristic pink or red colouration to their features. White colouration in White Lions is similar to blue eyes in humans, which is similarly due to a recessive

Q2: Where do White Lions originate from?

Turner: The White Lions are a natural occurrence in a specific distribution range in South Africa: the Greater Timbavati and southern Kruger Park region. White Lions are a significant contribution to the biodiversity of that region. Studies have shown that White Lions survived successfully in their natural distribution range for at least 56 years – and, in all likelihood, much longer.

Q3: How did White Lions disappear historically from the Timbavati and Kruger National Park?

Turner: After they were “discovered” by Europeans in the 1970s, White Lions were artificially removed from the wild to captive breeding and hunting operations. These captive operations, as well as zoos, specifically bred White Lions because of their rarity, and exploited them for financial gain. Along with these removals, lion culling in the Kruger National Park (especially in the late 1970s) and trophy hunting of pride male lions in the Timbavati (leading to killing of cubs by rival male lions - infanticide), depleted the gene pool. This has contributed to the drastic decline in the frequency of occurrence of White Lions and, ultimately, a 12-year technical extinction in the wild. In 2006, White Lions started once again being born in the Timbavati and neighbouring private nature reserves, proving that the White Lion is a natural occurrence and that the gene still exists in the Greater Timbavati Region.



In 2014, the first white cubs were once again born in the Kruger National Park (Nwanetsi-Singita Lebombo Concession) – a region in which there is no lion trophy hunting, so there is much hope for the long-term survival of White Lions. Despite the continued commercial trophy hunting of lions in the Greater Timbavati region, there have now been several occurrences of White Lions over an extensive area, proving the conservation value of this rare phenotype to the biodiversity of this wilderness region.

Q4: Now that the genetic marker is known, how can this research protect the White Lions?

Turner: In 2013, after a 7 year study led by the White Lion Trust in partnership with seven other countries, the genetic marker for the White Lion was finally identified. This research will be used to determine the frequency of occurrence of White Lions in the Greater Timbavati / Kruger Park Region, and have ALL lions in this region better protected, under the IUCN conservation category of Critically Endangered and CITES Appendix I. This follows the international precedent of the Spirit or Kermode Bear (*Ursus americanus kermodei*) in British Columbia, Canada: this is a rare variant of the Black Bear (*Ursus americanus*) that has significant cultural value to the First Nations Kitasoo people, is a flagship for protecting 4000 000 ha of wilderness (Great Bear Rainforest), and is therefore protected by law from being hunted.



Image supplied courtesy of SpiritBear.com

Trophy hunting still takes place in a core part of the natural distribution range of the White Lions, and the captive breeding/canned hunting operations have put the gene pool under duress. The White Lion Trust has established a protected conservation area for free-roaming White Lions, and introduced 3 prides of the highest genetic integrity. A 10-year study by the White Lion Trust was conducted on the white lion reintroduction, their ecology and hunting behaviour, providing ground breaking evidence that White Lions are apex predators hunting as effectively as the wild tawny lions studied in the same free-roaming wildlife area [Turner, Vasicek & Somers 2015]. This forms part of a PhD study on the 'Ecology of White Lions' being conducted by lion ecologist: Jason A. Turner.

The White Lion Trust is partnering with local communities to encourage them to conserve natural heritage and wildlife through keeping land suitable for wildlife from being converted to farmland or developed for commercial reasons. The genetic research process provides a necessary foundation to have the White Lions listed on the Schedule of Threatened & Protected Animals of National Importance.

Q5: Are the White Lions currently classified as an “endangered species / animal”?

Turner: No, they are not. Presently, the White Lions are listed as *Panthera leo melanochaita*, under CITES Appendix II and, therefore, fall under the IUCN classification of ‘Vulnerable’, ie. ‘species that are not necessarily now threatened with extinction, but that may become so, unless trade is closely controlled’. Of serious concern is that at the present time (2022), the conservation authority in South Africa (Department of Environmental Affairs - DEA) has down-listed the conservation status of ALL lions in South Africa from ‘Vulnerable’ to ‘Least Concern’. This will increase the hunting of wild lions in South Africa, and increase the availability and therefore the demand for lion parts / bones, putting lions under greater threat of extinction.

Appendix II means that the White Lions or their derivatives (eg. animal parts) can be sold, hunted and traded. In reality, every permit issued to hunt a lion (*Panthera leo*) can be used to hunt a White Lion. Since there are currently (2023) only 18 White Lions in the wild, in their endemic range, White Lions are critically endangered. Any White Lions born or reintroduced to the wild are not protected.

Q6: Why are White Lions not classified as “endangered” and officially protected if they are so rare in the wild?

Turner: White Lions are classified as *Panthera leo* and, as such, can be hunted or traded to extinction – although there are only 18 White Lions in the wild in their natural habitat at the present time (2023). In accordance with the international precedent of the Kermode or Spirit Bear (*Ursus americanus kermodei*) in Canada, the entire lion population in the region where White Lions occur, and which carries the white lion gene, needs to be protected by law from being hunted – this requires an uplisting of the conservation status of lions in South Africa to Appendix I according to CITES, and to ‘Endangered’ or ‘Critically Endangered’ according to the IUCN conservation categories.

Q7: Is there any “evidence” indicating that White Lions can be classified as a sub-species?

Turner: The sub-speciation topic is and always will be a contentious issue. There are those geneticists / scientists that oppose sub-classification and are of the opinion that everything should be ‘lumped’ together as a single species. Other geneticists / scientists support sub-classification arguing that “to protect the whole you need to protect all the parts”. The opinion of the Global White Lion Protection Trust is that the categorising of animals as species or according to subspecies is in reality just a human pigeon-holing system, what is important is that the ENTIRE SPECIES is protected, and that means protecting every ‘part’ or ‘sub-category’. For example, lions in West Africa are critically endangered and are therefore given a higher conservation status of CITES Appendix I, as compared to all other African lions which are classified as CITES Appendix II – according to Appendix I hunting is not permitted and there is a much stricter regulation of trade in animal parts.



A recent study refutes the hypothesis that African lions consist of a single panmictic population, and highlights the importance of preserving populations in decline, rather than prioritising larger-scale conservation efforts [Antunes, et al. 2008]. Phylogenetic data and morphological divergence suggest there are at least four lion groups in Africa – the south-western populations, the populations to the east and west of the Rift Valley, and the Sabie Sands population [Dubach, Patterson, Kays, et al. 2005; Christiansen, 2008]. The lion populations in west and central Africa could possibly be characterised as ‘critically endangered’ however, because their status as a separate lion sub-species *Panthera leo senegalensis* is unclear, the desperate status of their conservation situation has not been officially recognised [Nowell & Jackson 1996; Chardonnet 2002]. While taxonomic distinctions await further sampling for resolution on the sub-speciation issue, these populations define evolutionary significant units (ESU) [Dubach, Patterson, Kays, et al. 2005] as defined by Crandall et al. (2000) [Crandall, Mace & Wayne 2000] and, accordingly, need preserving for biodiversity conservation [Christiansen 2008].



Similarly, the White Lion could be classified as a critically endangered sub-species or, at least, an evolutionary significant unit of *Panthera leo* that needs preserving. Alternatively, the White Lions may represent a unique characteristic of the Sabie Sands population, as White Lions have only ever been found within the greater Timbavati region, which borders, but is not separated from, the Sabie Sands Game Reserve. This could warrant for White Lions to be classified as a critically endangered regional polymorphism (variation) of *Panthera leo*, or even of the possible Sabie Sands sub-species. Little is known about White Lions and scarcely any scientific studies have been done on White Lions, in terms of our present day understanding and techniques [Robinson & De Vos, 1982; Cruickshank & Robinson 1997; McBride 1977; McBride 1981; Tucker 2003] After seven years of genetic research, led by the White Lion Trust in collaboration with seven other countries, the genetic marker for the white lion was finally identified in 2013. Using this research, in accordance with international precedents set by groups working with other species (s.a. Kermode Bear in Canada) White Lions could be classified as a sub-species or, at least, as being genetically distinct and in need of protection.

Q8: What is the main focus of the Global White Lion Protection Trust?

Turner: The primary aim of the Global White Lion Protection Trust is to re-establish White Lions within their natural distribution range, in the way they once occurred naturally. This is done in strict accordance with current conservation principles. The White Lion Trust takes a holistic approach: protecting the entire ecosystem – Lions, Land and People, as a unique contribution to the biodiversity of the Greater Timbavati region – and as an animal that is revered by the indigenous people of the region – the White Lion must be protected. The White Lion Trust initiated ground-breaking research to identify the genetic marker for the White Lion, and succeeded in October 2013, together with geneticists from Korea, China, Namibia, USA and RSA. The next step is to determine the frequency of occurrence of the white gene in the lion sub-populations of Timbavati and southern Kruger Park, and ultimately harness the White Lion to better protect all lions in the Greater Kruger Park Region, as well as the Kruger to Canyons Biosphere.

Q9: Their white colour makes them conspicuous in the wild – can White Lions camouflage themselves in order to hunt for themselves?

Turner: Yes, studies show that White Lions are endemic to one place only on earth: the Greater Timbavati region and Central Kruger Park in South Africa. This region is characterised by white sandy riverbeds and, in the winter, the long grass in this area is scorched pale. In this habitat, they are very well camouflaged. In fact, photographic evidence shows that the White Lions may be within a 20 meter radius, and yet they cannot be seen with the naked eye.



Of course, in sparsely vegetated areas like the Karoo or the lush green grasslands of KwaZulu- Natal (where they are not in their natural environment), they are more conspicuous.

In their natural habitat, the White Lions are “apex predators”, ie. they have been recorded as hunting successfully during the day, and at night, killing prey as large as giraffe, as effectively as wild tawny lions [Turner et al. 2015; Cesare, M. 2011. Man-eaters, marulas and Mambas: A Game Ranger’s Life in the Lowveld]. It is important to note that most lion prey animals are partially colour-blind and, therefore, the difference in sightability between tawny and White Lions is not nearly so drastic. Also, lions hunt co-operatively, in groups, and mostly at night [Smuts 1982] and hence, hair colouration is less significant than it would be in diurnal or solitary predators. Our research indicates that White Lions were often dominant in their prides in the wild, successfully raising litters and leading hunting expeditions. There are records of them hunting and

providing for their tawny prides. Moreover, our own scientific monitoring team recorded more than 95 kills within our founding pride’s first year of release in the Lions’ natural habitat [Turner et al. 2015] Significantly, the founding pride was an all- white pride, and did not require a wild tawny lion to teach them how to hunt!



Q10: How do the White Lion Trust’s objectives fit into those of the IUCN?

Turner: Our research objectives are in complete accordance with those of the IUCN:

- i) we aim to restore the natural biodiversity of the area;
- ii) we aim to enhance the long-term survival of a species;
- iii) we aim to provide long-term economic benefits to the local community;
- iv) we aim to re-establish a key-stone species in both the ecological and cultural sense; and
- v) we aim to promote conservation awareness.

Q11: You indicated that the Global White Lion Protection Trust is following precedents to classify the White Lions. Can you elaborate?

Turner: One important example is the global precedent set by a scientific team working in British Columbia (Canada) with the so-called “Spirit Bear” (aka the Kermode Bear). Similar to the White Lion, the Spirit Bear is a unique genetic variant of the Black Bear (*Ursus americanus*), and occurs in only one place in the world: the temperate rainforests of British- Columbia. Also, similar to the White Lion, the white coat of the Spirit Bear is believed to be the result of a double recessive allele. The Spirit Bear has significant cultural importance to the First Nations’ Kitasoo People, has been protected by law, 220 000ha set aside for the protection, and is a flagship for protecting 4000 000 ha of wilderness area (Great Bear Rainforest).

Q12: What evidence exists to show that the Global White Lion Protection Trust’s “Scientific Reintroduction Project” has been successful?

Turner: The aim of the Reintroduction Programme is to reintroduce White Lions back to the wild in their natural distribution range in the Greater Timbavati Region. Our reintroduction protocol was developed over ten years with input from experts and specialists in numerous fields. The White Lion Trust’s Reintroduction Programme utilizes pedigreed White Lions – meaning that they are of the highest genetic integrity – whose lineage is directly traceable to Timbavati.

By 2013, three prides of un-imprinted White Lions had been successfully reintroduced to the free-roaming conditions on the White Lion Trust's 2000 hectare wildlife area in the natural habitat of the Greater Timbavati / Kruger Park Region, and were hunting as effectively as the wild tawny lions studied in the same free-roaming wildlife area [Turner et al. 2015]. Two of the White Lion groups were then successfully integrated with wild tawny lions, since White Lions were naturally born to tawny prides. A new blood line of white lions of high genetic integrity was introduced in 2017 - two free-roaming white lions donated by Pumba Game Reserve, South Africa.



Q13: Some say the White Lions in your Reintroduction Programme are being "bred in captivity" because the lions are kept in cages. Is this true?

Turner: No, the White Lions participating in our project are not kept in cages. This would oppose everything our project stands for. The White Lions in our Reintroduction Programme have been reintroduced to free-roaming conditions in a 2000ha wildlife area, in their natural endemic habitat in the wild. The Reintroduction Programme is in line with current strategies for lion conservation that follow the "meta-population" management approach. This approach is already in use in southern Africa [Nowell & Jackson 1996; Barnett et al. 2006]. In order to completely introduce White Lions back into the wild, and to ensure genetic diversity, the White Lion Trust aims to establish and manage a number of separate sub-populations, before reintegrating the White Lions with resident tawny prides within the Greater Timbavati / Kruger Park Region, when internal fences are eventually dropped to form the Joint Protection Zone (JPZ) bordering onto the Kruger National Park.



The only time the Trust's White Lions are temporarily held in an enclosed area, or boma, is for the standard acclimation period, when introducing lions to a new area, or when bonding the White Lions with wild tawny lions prior to reintroduction. We follow the IUCN's (World Conservation Union) "soft release" approach and, in his way, the White Lions are being progressively introduced to larger sized wildlife areas within their natural distribution range.

Q14: How do you monitor the progress of the White Lions in your Reintroduction Project?

Turner: Our scientific monitoring team monitors and records the behavioural and predation patterns of the White Lions in the Reintroduction Programme everyday, during their peak activity periods. The Lions are radio-collared so as to track them whilst hunting. The Lions are never approached on foot. We have a strict scientific protocol, and any visitor to the project must be accompanied by a member of the monitoring team. The cubs are raised by their mother, and are never approached or touched. We are completely opposed to the concept of "lion petting", as human imprinted lions cannot be easily reintroduced to free-roaming conditions.

Q15: Can one expect any casualties in your Reintroduction Programme?

Turner: With the risks involved in hunting in the wild, lion mortality is high – 40% to 80% of lion cubs do not survive to become adults. White Lions have to face these odds over and above all the dangers, which humans pose for them. The risks of fatal injury whilst hunting dangerous prey such as buffalo or giraffe, poacher's snares, disease (such as Bovine Tuberculosis), mean that casualties are unfortunately a reality. Despite a few casualties, the White Lion Trust has successfully released 3 white lion prides, and all of the cubs of the founder white lion cubs survived to adulthood.

Q16: When were White Lions last spotted being born wild in the Timbavati region? Can any lion produce white offspring?

Turner: In May 2006, two White Lion cubs were born – amidst tawny cubs – in the Umbabat Private Nature Reserve (neighbouring Timbavati). In October 2006, another two cubs were born at Tabby's Crossing in the Timbavati Reserve. Unfortunately, none of the white cubs – or their tawny siblings – survived. At the best of times, the survival rate of lion cubs to adulthood is only 20%. Trophy hunting in the region made it even less likely that the cubs would survive. One of the two dominant male lions of both prides that gave birth to the white cubs was trophy-hunted [reported in Sunday Independent, 28 May 2006]. This increased the likelihood that a nomadic coalition killed the cubs. Between 2006 and 2015 there have been 15 births of White Lions to at least 4 different prides in the Timbavati-Umbabat-Klaserie Private Nature Reserves.

Only lions that are white, or are carrying the rare White Lion gene, can produce white offspring. Both parents need to be carrying the gene, to ensure the possibility that some of the offspring will be white.



According to Mendel's principles of gene inheritance:

- i) if both parents are tawny and carrying the white gene, they have a 25% chance of having white cubs;
- ii) if one parent is white and the other is tawny but carries the white gene, there is a 50% chance of white cubs; and
- iii) if both parents are white, 100% of the offspring will be white.

In 2008, three white cubs were born to the White Lion Trust project and, since that time, eight more white cubs (from three different prides) have been spotted on neighbouring reserves of Timbavati, Klaserie and Umbabat. At the time of writing (2023) only 3 of these white lions had survived, due to negative effects of lion trophy hunting and high impact tourism. Only time will tell whether the management policies (especially regarding hunting and eco-tourism impact) in these reserves will allow these cubs a fair chance of survival.

Q17: When were White Lions first spotted in the wild, and how many are there worldwide?

Turner: They were first spotted by a European witness in 1938 and documented in the 1970s, although African records indicate they were resident in this region for a much longer period. There were 12 recorded births in nine prides in the Timbavati and Kruger National Park between 1975 and 1980. Due to the artificial removals in Timbavati [McBride 1981; Tucker 2001] and the lion culling in the KNP in the 1970s [Mills, Biggs & Whyte 1995], there were less than a handful of births from 1980 to 1993, and none from 1993 to 2006.] Between 2006 and 2015 there have been 15 births of White Lions in the Timbavati-Umbabat-Klaserie Private Nature Reserves, and 2 births of white cubs in central Kruger National Park. At the present time (2023), there are only 18 White Lions in their natural habitat: 13 White Lions at the White Lion Trust's wildlife area, 2 Adult Female White Lions in Timbavati-Umbabat-Klaserie Reserves, 1 young Adult Male white lion in the central Kruger National Park, and 2 white cubs at AndBeyond's Ngala Game Lodge traversing area.



It is hard to determine exactly how many White Lions there are in captivity today, because they are held in captive breeding and canned hunting operations, which don't keep adequate records. Based on available evidence, we estimate there are less than 300 White Lions worldwide.

Q18: Has anyone else ever tried to reintroduce White Lions back into the wild?

Turner: Yes, there were two attempts made by the Timbavati themselves: the first was in the late 1980s, and the second took place in 1993. Sadly, reintroduction techniques were not as sophisticated as they are today and the attempts failed. Since then, reintroductions have been increasingly proposed and practiced as a conservation strategy and method to return "extirpated" populations to their former range.

Two reintroductions of White Lions have taken place outside of their natural distribution range: (1) Sanbona Wildlife Reserve in the Karoo of Western Cape, and (2) Pumba Game Reserve in Eastern Cape. However, no scientific data were available for these reintroductions.

Q19: Will the White Lions in your project ever be in contact with other lions?

Turner: Yes, they will. The White Lion Trust has already integrated the reintroduced White Lions with wild tawny lions at the White Lion Trust's wildlife area. Our Trust's ultimate goal is to once again integrate the wild-born White Lion offspring into the Greater Kruger Park lion population within their natural distribution range – in accordance with the regional conservation strategy of removal of internal fences to open up natural wildlife corridors to the Kruger National Park. In this way, the natural dynamics of their endemic region will be restored. Also, if successful, this will help validate the 'meta-population management' approach for lions in South Africa.



Q20: What is your response to the "purist" scientific view that "nature should take its own course"?

Turner: In reality, there are very few ecosystems today that are not, in some way, "managed". The Kruger National Park (KNP, in spite of its large size (greater than 20 000km²), is not an entirely 'self-contained system in nature'. It is managed: ie. vegetation is burnt on a rotational basis; species are translocated to and from the Kruger National Park (KNP), roads and tourist camps have been constructed. If indeed we were to follow pure conservation principles, we should acknowledge that:

- i) White Lions occurred naturally in the wild in Timbavati and Central KNP and continue to occur;
- ii) their frequency of occurrence in Timbavati has repeatedly increased until human intervention and they were artificially removed from the Timbavati; and
- iii) their gene pool in the KNP was depleted by the lion culling programme in the 1970s (Smuts 1982). Strictly speaking then, White Lions should rightfully be restored within their natural distribution range. White Lions are a unique contribution to the biodiversity of the Greater Timbavati / KNP region, and they are culturally significant to indigenous communities in the area. The balance was once disturbed through human intervention, and we need to restore it.

Q21: What are the "critical next steps" to having the White Lions protected?

Turner: South African legislation pertaining to the management of large predators has to change drastically. Currently, White Lions are not protected by South African law, because they are not classified appropriately on the Schedule of Threatened & Protected Animals of National Importance. In fact, in 2019, the conservation authority in South Africa (Department of Environmental Affairs (DEA)

down-listed the IUCN conservation status of ALL lions in South Africa from 'Vulnerable' to 'Least Concern'. This change increased the hunting of lions in the wild, and thereby increased the availability of and therefore the demand for lion parts and bones, putting the lion at greater risk of extinction.

White Lions are important because of their conservation and eco-tourism value, but also their enormous cultural and spiritual significance for the indigenous communities of the K2C Biosphere Region. A PhD study is being done (2018 to 2023) by Jason A. Turner on the 'Ecology of the White Lion' which will show that the White Lion is a capstone animal for protecting the lion population in the Greater Kruger National Park, and the Kruger to Canyon Biosphere – third largest canyon in the world.

With the breakthrough discovery of the genetic code / marker for the White Lions in October 2013, a next step for the White Lion Trust is to estimate the frequency of occurrence of the white gene in the Greater Timbavati / Kruger Park Region, to show that any one of the tawny lions in this region could be carrying the white lion gene, and use this to get protection for the entire lion population in the Greater Kruger Park Region, as well as the Kruger to Canyons Biosphere - this is based on the international precedent used in Canada, whereby the Spirit / Kermode bear is helping to protect the entire Black Bear population in that region.



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