

## Tarangire Ecosystem:

*A Case Of*

# HUMAN - LION C O N F L I C T

By Alessandra Soresina



Every year Tanzania draws thousands of visitors to its National Parks and Game Reserves because they provide the best nature, wildlife and trophy hunting, which contributes greatly to its economic growth. The wildlife of Tanzania constitutes a unique natural heritage and a major resource of great importance, not only within the country but also worldwide. The lion, the largest predator in Africa, represents one of the key animal species and is a major attraction.



Over the past century lion populations have been declining all over Africa and have disappeared throughout central Asia, (except for those living in the Gir Forest National Park), and the Middle East. In Africa they are now mainly confined to National Parks, Game reserves and their surrounding areas. The main cause of this decline is the loss of wildlife habitat due to the expansion of agriculture and livestock, however, in some areas, unsustainable hunting and poaching are the main limiting factors. Human expansion, in general, threatens the survival of the main African predator by reducing its numbers and by isolating the lion populations and therefore increasing the risk of in-breeding.

Tarangire National Park is a relatively small protected area in Northern Tanzania that encompasses 2,600 km<sup>2</sup>. Today, the borders of this beautiful and important protected area, are surrounded by hunting blocks and local villages that are developing quickly and are pushing for more land due to a very high population growth; approximately 15% per year. The large human immigration into this area and the development of agricultural activities has resulted in the consequent change of land use which has led to the fragmentation of the habitat, the interruption of the major migration corridors and increased wildlife - human conflicts.



**Human expansion, in general, threatens the survival of the main African predator by reducing its numbers and by isolating the lion populations and therefore increasing the risk of in-breeding.**

Since 1998 the "Tarangire Lion Project" has been collecting data in order to examine the population structure and dynamics of the lions, within the Park. This helps to determine what effect trophy hunting, as well as interaction with local communities in surrounding areas, has on the lion population's demographics. This research also directly serves in our attempt to extrapolate a population estimate for the future.

Clearly, there are many factors that come into play when determining the health and long-term viability of a given population of lions, not the least of which is prey availability. Past research has shown that population density, cub survival and dispersal rates of sub-adults are all at their highest where prey is most abundant.

Herbivore populations are directly affected by rainfall, due to their reliance on vegetation. Most migratory species, such as zebra and wildebeest, leave Tarangire National Park at the beginning of the short rains, in early November, and move into the adjacent dispersal areas and towards the main calving grounds. Thus, rainfall and prey migration indirectly affect the predators that feed on them.

One of the "Tarangire Lion Project's" principal aims is to understand how the mass movement and dispersion of the Tarangire lions' main food source, once the rains begin, affects their own dispersal in and around the Park. It is hypothesized that such a large-scale dispersal of "preferred prey" out of the Park will compel the lion population to respond accordingly and disperse as well, in order to obtain an adequate food supply while prey abundance is low in the Park. This means that for at least 5 months, every year, Tarangire lions are not protected.

Initial results show that female and cub mortality rates are the major factors impacting the lion population in Tarangire National Park and this can be attributed, in ultimate analysis, to human - lion conflicts. Thirteen villages have been surveyed, from Monduli to Simanjiro districts, and preliminary results show that almost 50 lions have been killed

by local communities in these areas between 2003 and 2004 - (Tarangire Lion Project, Progress Report, May 2005).

This high number comprises of all lions, with no distinction between ages or sex and it most probably includes many females, consequently decreasing their survival rate which is one of the major limiting factors in Tarangire's lion population long term viability.

On the other hand, high cub mortality is common in over-hunted areas and in species such as lions with a particular social structure. African lions live in stable social groups, called prides, which are made up of breeding females and a coalition of males. When male lions reach sexual maturity, at about 2.5 years, they disperse from their natal pride and live



as nomads before seeking a pride of their own. The resident coalition males father all cubs born during their control, but only remain resident for about 2 years on average; just long enough to rear a single cohort of young to independence. Rather than wait for mothers with dependent offspring to rear their current litter, incoming males typically kill all cubs younger than 1 year of age and force older sub-adults to leave, when they first take over a pride.

Trophy hunting probably increases the rate of male takeovers, as the loss of even one male from a resident coalition makes it more vulnerable towards other, bigger, incoming coalitions and the associated infanticide can become frequent enough to prevent cub recruitment into the adult population.

What has been observed in Tarangire National Park is that there are a very low number of adult males. Since 1998 no more than 10 -14 males are ever seen, per year, in the study area which is made up of 1600 Km<sup>2</sup>. If we analyse a typical lion population in Tarangire, such as the one of 2003, we find that of the 13 adult males seen in the study area, 9 were about 5 - 6 years old and only 2 individuals were older than 8 years. These are frightening numbers if we consider that generally the lion's mane reaches full size at about 4 years of age, but the peak of reproductive success is attained only at 7 - 8 years of age.

Furthermore, if we have a closer look at the hunting quotas in the surrounding blocks we can disturbingly observe, that if fully used, male lion trophy hunting is not sustainable in such numbers in this area. Between 1997 and 2000 the lion quotas in the Burunge and Lolkisale GCA only, were of 9 adult males per year. This is disturbing if we consider that these are just two of the hunting blocks bordering Tarangire National Park where, in our entire study area which stretches from the northern tip to the south, beyond Silale swamp, we have never recorded more than 11 adult males.

Since the lion can be considered a key species in Tarangire, both for its ecological role and for its value in tourist game viewing and hunting, all factors impacting the lions are obviously extremely important in sustaining a healthy population and preserving the species in the Tarangire ecosystem.

To which extent each impacting factor affects the lion



population is still difficult to say and further study is needed. However, it is obvious that the human - lion conflict beyond the park borders is of extreme importance and has to be taken into serious consideration. Because of these factors: herbivore migration, deterioration of habitat, interaction with local communities and nearby hunting areas, Tarangire National Park and its surroundings, at the moment, are at risk. The key to a long term conservation plan has to focus on all interacting elements; the environment, wildlife and people.

The population growth around the Tarangire ecosystem is difficult to control and it must be based upon a careful land use plan so as to avoid fragmentation of the habitat and blockage of main migratory routes. Working with local communities therefore becomes an essential factor in, not



**Contrary to agriculture, which alters the environment, the hunting blocks bordering the protected areas do help to maintain the habitat in a very relevant way. However, there is still little science involved in quota allocation thus resulting in a tendency to have over – hunting in places where it is not sustainable.**



only preventing habitat deterioration but also in preserving wildlife; especially in cases, such as Tarangire, where most of the species spend at least 5 months outside the protected areas.

Traditional pastoral livestock herding has always been highly compatible with wildlife conservation, but this compatible interaction is showing signs of disintegration in many areas where livestock and wildlife are now viewed as competitors. Most lions are killed by villagers because of livestock depredation. It is therefore vital to educate them on different ways to reduce these losses, for example by reinforcing their “bomas”, or by sending older people, rather than kids, to herd the cattle.

Contrary to agriculture, which alters the environment, the hunting blocks bordering the protected areas do help to maintain the habitat in a very relevant way. However, there is still little science involved in quota allocation thus resulting in a tendency to have over – hunting in places where it is not sustainable. This is only due to the simple reason that all blocks are considered in a similar way, no matter where they are located in Tanzania. In areas such as Tarangire, major concern on what’s found in the area could greatly improve both trophy hunting and game viewing in the long term and, if controlled, could bring a viability of the species which are now decreasing in numbers.

The ongoing research, being conducted by the “Tarangire Lion Project”, shows that all factors affecting the lions health and survival directly tie in to any sort of long - term management plan that ought to be developed with direct applications to habitat, wildlife and the people. The question of how the lions adapt their home ranges, when prey

becomes scarce, has direct implications for their population sustainability in the future. It is evident that as lions move outside the Park’s boundaries, they become potentially more at risk due to conflicts with the human population and trophy hunting. The number of lions killed, every year, outside the Park is huge and there is an urgent need to establish a more appropriate and sustainable balance between the local communities, habitat and natural resource conservation.

The combination of a large number of people, growth of tourism and abundant wildlife leads to an inevitable variety of human and wildlife interactions. Each interaction should be understood, by considering both the perspectives of the people and the wildlife. Understanding of how the habitat and wildlife are changing, outside the protected area, could help in the conservation of the species thus maintaining both game-viewing and hunting at a really high standard for the future.

Considering that tourism from wildlife earns Tanzania over 730 million USD every year and hunting almost 10 million USD, everyone working in this country should have a special regard towards this precious natural resource; wildlife is economically important and a premier generator of foreign revenue. The weakness’ and difficulties that we are facing could be overwhelmed by encouraging the involvement of everyone; researchers, authorities, tourists and trophy hunters. We all have to be more aware and should put major effort in working together in the development of conservation and in guiding the local communities, accordingly.



All Photos Credited to: Alessandra Soresina

