

ANIMAL POPULATIONS DECLINE

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Why is Africa's wildlife in protected areas in widespread decline?

The alarm bells are ringing in the scientific world and conservation circles – Africa's wildlife inside National Parks and Game Reserves is in widespread decline and it has little to do with poaching or bad conservation management!

It appears that there is a crisis in wildlife conservation in Africa. A recent paper in the Journal of Zoology by Joseph Ogutu and colleagues documents how many ungulate species (large hoofed herbivores) in the famous Masai-Mara reserve have declined in recent times.

The same goes for most other East African National Parks, such as Nairobi National Park and Tarangire where wildebeest numbers especially have plummeted.

Similarly, wildebeest numbers in Etosha National Park in Namibia and Kruger National Park in South Africa have also declined greatly. We need look no further than our own Central Kalahari Game Reserve (CKGR) to see that an estimated 250 000 wildebeest in the 1970's and 1980s has crashed to several thousand today.

The same is true for eland, hartebeest and zebra in the CKGR. In addition, Sable, Roan, Tsessebe and Eland populations have declined drastically in most conservation areas in Africa. This Africa-wide decline in wildlife in protected areas has sparked a recent paper in the African Journal of Ecology entitled: "When protection falters". Another paper in 2009 in the Journal Endangered Species Research was titled: "Global decline in aggregated migrations of large terrestrial mammals".

What is going wrong and why are well-managed conservation areas suddenly losing species? With current scientific understanding on what determines healthy ungulate populations it is not a difficult question to answer. Food quality and availability varies greatly over the year and in the dry season protein and energy levels in grass fall to levels well below that required to enable an ungulate to survive.

As a result many ungulates migrate between wet and dry season resources. Obtaining high quality forage during the calving period in the wet season is critical because it is at this time that females have extreme nutrient and energy demands to produce sufficient milk for their calves.

Insufficient milk supply to the calves results in slow calf growth rates making them more vulnerable to predators and they are less likely to survive the oncoming dry season.

Similarly, the adults need to obtain high levels of protein and energy in the growing season to replenish their body reserves to enable them to survive the time of low forage quality and quantity during the dry season. During the dry season ungulates migrate to areas that allow them to find some quality forage to prevent them using up their body reserves too fast.

Typical examples of high quality wet season grazing areas are the short-grass plains of the Serengeti on fertile volcanic soils or the short-grass areas on saline soils in the

Makgadikgadi or Nxai Pans Parks. A common mistake that many people make is that they attribute lots of tall grass as being good grazing.

Tall grass is not high quality forage because of all the undigestible fibre and low concentrations of protein and energy and wildlife will generally avoid these areas, preferring short-grass areas with their low amounts of stem and fiber and high concentration of protein and energy. Typical examples of dry season grazing areas are the floodplains of the Okavango or the high rainfall regions in northern Serengeti where some green grazing may be obtained in the dry season.

It's all about being able to move between quality wet-season and dry-season grazing areas. Apart from the importance of migration for gaining sufficient nutrients and energy in their diet it is now being recognized that there is another critical advantage for ungulates in migration; migration limits the size of the predator population because predators such as lions are territorial and cannot follow migrations.

Research across Africa has shown that lion numbers are determined by the availability of prey during the period when the migrations have left their territories and that lion predation has very little effect on the numbers of migratory ungulates.

When something stops ungulates migrating lions start to have a major negative effect on these ungulate populations. The same is true for wolf-ungulate dynamics in North America. Thus truly functional wildlife reserves need to include areas with the right wet-season and dry-season grazing areas so that ungulates can get the right amount of energy and nutrients in their diet at critical times of the year and can avoid excessive predation.

The problem is that when most of Africa's wildlife reserves were proclaimed conservationists did not really understand what determined a truly functional wildlife system and almost all of Africa's reserves are missing either a wet-season or a dry-season grazing area.

Despite this lack of functionality, most African reserves still functioned well enough when human population pressure around the reserves was still low and wildlife was still freely able to migrate outside the reserves when needed.

In a classic example, the Kruger National Park is proclaimed in the low-rainfall areas of the eastern Lowveld region, which is the wet-season grazing area, but misses all the very high rainfall areas in the foothills of the western escarpment, which is the dry-season grazing area. The first warden of Kruger, Colonel James Stevenson-Hamilton, in his book *Wildlife in South Africa*, had this to say: "Between 1925 and 1936 occurred a long period of drought, hardly uninterrupted by a rainfall during three of the intervening years, which, though reasonable in actual amount, fell at the wrong times, and usually in the shape of heavy storms instead of light soaking rain. The result was a general exodus of the more migratory species from the already overgrazed portions of the Park in the east, towards the more fertile and better-watered foothills of the Drakensberg and eastwards into Portuguese territory. Some such exodus had always taken place annually in the past, with a backward trek at the first rains, but owing to persistently arid conditions from year to year, culminating in 1934-5, there was less and less tendency for the herds to return to their former grazing grounds, and finally they became largely settled in the new localities. Had there been no natural migrating space available, or had the Park been enclosed by some unsurmountable obstacles, as some think it ought to be, no doubt there would have been wholesale death from starvation and disease among all the ungulate fauna".

Unfortunately for Kruger, and more recently for many other reserves across Africa, agricultural development and human settlement have largely made migration outside the reserves impossible, hence the recent crash in ungulate populations throughout Africa.

A sad story, but reality; African wildlife as we once knew it is on the way out and there is no return unless their former grazing grounds outside the reserves are returned to them, which is largely a logistical and ethical impossibility.

There are, however, several conservation regions in Africa which still encompass both functional wet-season and dry-season grazing grounds and still have healthy migrations and large ungulate populations. The four main regions of Africa are the Boma of Sudan with its magnificent migration of nearly one million white-eared kob, the famous Serengeti with its millions of wildebeest, zebra and Thompsons gazelles, the Selous-Nyassa complex on the Northern Mozambique border, and the Okavango delta-Makgadikgadi pan-Savuti-Chobe-Hwangwe complex (OMSCH complex).

The floodplains of the Okavango Delta, Kwando-Linyanti, as well as Savuti and Mababe in high flood years provide important dry-season grazing when ungulates are able to find green grazing at a time when all other areas have only dry grass. Saline soils in the outlying woodlands and especially in the Nxai pan and Makgadikgadi regions provide highly nutritious short grasses for the critical wet-season calving period.

Recent research has shown that zebra are migrating 240 km between the Moremi game reserve and Makgadikgadi, using the floodplains of Moremi in the dry season and the nutritious short-grass areas of Makgadikgadi in the wet season. Thus this region is one of Africa's last surviving functional wildlife regions and the future for wildlife in this region is very bright, provided that it remains unfragmented and intact. This region is of great conservation importance and it is critical to ensure that it remains intact and unfragmented.

By stark contrast the Central Kalahari Game Reserve is no longer a functional wildlife reserve because its key migration routes to dry-season grazing, such as on the Boteti River, Lake Ngami, and in the Southern Kalahari have been cut off by human expansion and cattle farming, hence the precipitous crash in its once great populations of wildebeest, zebra, hartebeest and eland, which can never be expected to recover so long as their dry-season grazing grounds are lost. Thus just because it CKGR is a massive area does not make it a functional area (the Kruger is another example).

This tells us that conservationists must now focus time, energy and money on conserving what still works: the functional OMSCH complex with its unbroken migration routes and large herds of game. Potential threats to the functional integrity of this region may arise, however.

The current hunting areas between the Delta and Nxai pan- Makgadikgadi pan region are a critical linkage for ungulate migration between the dry-season grazing areas of the Delta and the wet-season grazing areas of Nxai pan and Makgadikgadi as well as for elephant migration to Hwangwe National Park in Zimbabwe.

Hunting has minimal negative effects on the numbers of wildlife in the region and more importantly does not stop critical migrations between wet-season and dry-season grazing grounds.

Should these areas be lost to conservation in the future there will be a major impediment to migration and Nxai pan and Makgadikgadi will have become fragmented from the Delta. This would be a major conservation disaster because as mentioned above it is migration between wet and dry season resources that allows large ungulate populations to exist.

Moremi, Nxai pan and Makgadikgadi cannot exist in isolation from each other and if fragmented wildlife in these reserves can be expected to go into long-term decline as is happening in the rest of Africa. The OMSCH complex is one of the last surviving unfragmented conservation regions in Africa and needs to be prioritized for conservation.

Recognizing that it is critical that the vast linkage areas between Moremi and Makgadikgadi pans remain under conservation with no fences to inhibit migration we need to ensure that they remain under a form of conservation landuse that is best suited to the nature of these areas.

The Delta with its wonderful scenery and high concentrations of wildlife makes it an excellent region for the development of photographic tourism. By contrast the link areas have little scenic value with none of the floodplain and water scenery of the Delta. Moreover, game viewing is poor with little to see but elephant. In the dry-season most of the wildlife leaves these areas and it is hard to imagine how photographic tourism alone could be a viable form of landuse in this vast waterless region characterized by dense monotonous bush and poor game viewing. Hunting is able to best utilize the resources of this region as it is a seasonal business that can synchronize itself with the seasonal appearance of elephant and does not rely on great scenery and game viewing.

An estimated 150 000 elephant in the OMSCH complex provides a vast resource for both photographic tourism as well as hunting. At a conservative growth rate of 7 % a year for a herbivore population one would have to shoot over 10 000 elephant a year to start to reduce the population size. Hunting, therefore, has no impact whatsoever on the size of this population. It is now well recognized in conservation circles that conservation areas that do not viable economic form of landuse are unlikely to persist in the long term; if game does not pay it will not stay.

We believe that hunting is key to the long term viability and persistence of conservation landuse of these critical linkage areas as it brings in important foreign currency for the country and makes these areas economically viable, something that photographic tourism is unlikely to be able to achieve. Removal of hunting from these link areas will render these areas extremely vulnerable to becoming replaced in the long term by non-conservation orientated forms of landuse and the eventual ecological meltdown of the entire OMSCH complex.

It is time for conservationists to start to put emotions aside and to start to think clearly and scientifically about the long-term conservation viability of wildlife populations in Botswana. Recently authorities responsible for conservation and management of wildlife resources in Botswana pronounced changes in hunting management, arguing that hunting as it has been practiced is not complementary to the core business of wildlife conservation.

When challenged to explain what the core business of wildlife conservation in Botswana is, the authorities were not convincing all, and could not scientifically substantiate their claim that hunting is not complementary to the core business conservation.

Authorities even went on to impose a 25 km buffer around protected areas, a decision which practically bans hunting. Unfortunately and worryingly, the argument for the 25km buffer is not based on any scientific understanding, despite the fact that the Department of Wildlife and National Parks have highly qualified junior and senior personnel who should be able to advise accordingly.

Authorities must understand and note that short-term decisions based on poorly informed anti-hunting sentiment could have long-term disastrous consequences for the conservation of one of the world's last remaining functional wildlife regions. As indicated earlier in this article, there is no evidence to suggest that hunting as it has been practiced over the two to three decades is a major threat to Botswana's remaining wildlife populations. The major threat is habitat destruction and loss of connectivity. It is against this background that major efforts, intellect, energy and resources should be directed towards maintaining connectivity of key habitats of functionally systems like OMSCH as opposed to banning hunting. Fragmentation of functional wildlife systems like the OMSCH complex must be avoided at all costs if Botswana wishes to continue to lay claim to one of the world's last great wildlife systems.

Above all it is important to note that wildlife is a natural economic resource which is supposed to be used wisely to enhance livelihoods of those who live with the burden of conserving wildlife, and the national economy at large.

It is also important to note that as an ecosystem product, wildlife stands to contribute significantly to the reduction of the impact of rural poverty through adding game meat to the food basket of rural poor communities such Khwai, Phuduhudu, Mababe, Sankoyo and many other rural communities living in wildlife management areas.

A recent study (Brian Child, in preparation for publication) shows that should hunting be removed from the current areas, 40% of households that are currently above the hunger-line in Sankoyo Village will be driven below the hunger-line. It seems the authorities were not mindful of such facts when the decision to remove hunting was taken.

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