



AFRICA IS CHANGING: SHOULD ITS PROTECTED AREAS EVOLVE?

# RECONFIGURING THE PROTECTED AREAS IN AFRICA

**Author:** Bertrand Chardonnet



#### AUTHOR: BERTRAND CHARDONNET

A doctor in veterinary medicine by training, after a Doctoral Thesis in Guinea Bissau on wildlife management, he started to work in Africa in 1985 as adviser for livestock breeding in West Africa, especially for sheep and goat in Togo. Following this practice with local development, he was appointed as Chief Game warden of Bamingui-Bangoran National Park and then was working as wildlife vet for the Rinderpest control in Cameroon.



After many consultancies for Protected Areas management, he went back permanently to Africa as adviser to the Director of Wildlife in Burkina Faso. Following, as a wildlife vet, he was appointed as the head of Rinderpest eradication campaign for West and Central Africa, working in 23 countries. At the same time, he used to be co-chair of the IUCN Antelope Specialist Group.

He then moved to Chad where he was appointed as adviser to the Minister of Environment (including wildlife) for four years. Since then, he is working as a protected areas and wildlife consultant, mainly concerned with ecological monitoring, anti-poaching strategies, conservation strategies and protected areas planning. Bertrand Chardonnet has worked in 40 African countries, and today he focuses on training, ecotourism and wildlife photography.

#### THE IUCN PROGRAMME ON AFRICAN PROTECTED AREAS & CONSERVATION (PAPACO)

PAPACO aims at improving the management and governance of protected areas in Africa and their positive results on biodiversity conservation. They focus on 3 complementary domains which are: equitable governance, efficient management and long-term sustainability of PAs. PAPACO is based in Pretoria, South Africa, and works closely with the World Commission for protected Areas (WCPA).

THIS STUDY WAS FUNDED BY THE FRANCE-IUCN PARTNERSHIP.

France has entered a partnership with the International Union for Conservation of Nature (IUCN), the oldest and largest global organisation for nature conservation. Through this partnership, France and IUCN intend to respond to the global biodiversity crisis and act together for nature and development.



FRANCE-IUCN  
PARTNERSHIP  
NATURE AND  
DEVELOPMENT



TRANSLATED FROM FRENCH BY SHEILA HARDIE.

PUBLISHED IN 2019.



## Summary

There is a strong international consensus that when protected areas, whatever their type of governance, have sufficient funding, political backing and management skills, as well as the support of local communities, they can conserve biodiversity effectively<sup>1</sup>. However, rapid population growth leads in turn to a great increase in the pressure placed on natural resources. The larger, more ecologically intact protected areas are of vital importance because they provide higher biodiversity levels and greater ecosystem service benefits than smaller, more disturbed areas, including those required for addressing the climate change crisis<sup>2</sup>.

This study analyses the configuration of protected areas in order to identify the points that will help them to tackle the challenges they encounter and to secure their future. The main recommendations involve improving their size and their boundaries, in order to help conserve species, as well as their functions and their natural balances. Today, it is of vital importance to have an adequate budget for managing a protected area: this is currently estimated at 7 to 8 US Dollars/hectare per year (in Africa). Whichever management mode is adopted, if this budget is not available, the protected area will not be able to play its role.

It is no longer possible to increase the size and change the boundaries by evicting populations. Instead, the plan will be to resort to the reclassification of partially degraded protected areas or to the classification of land that helps conservation but is not recognised as a protected area. For several years, with the great decline in the big game hunting sector almost everywhere in Africa, offering the possibility of joining up certain hunting areas with protected areas –in line with the Aichi Targets– there has been a major opportunity to ensure that 17% of national territories are classified as real protected areas. The challenge will be to finance them.

The second opportunity is that of the creation of community conservancies, the democratic expression of local communities, which allow conservation and development to be integrated right alongside protected areas whilst managing human-wildlife conflicts more effectively. The global development of the tourism industry is a great opportunity for participating in the financing of these community areas.

The main risk in the future will be the lack of political commitment to conservation on behalf of governments and also their lack of momentum in performing their sovereign functions: security, rule of law, appropriate legislation and control of its enforcement. The functioning of protected areas can only be optimal in the context of the rule of law and good governance. This commitment should be extended to controlling respect for the role and rights of each of the stakeholders, without any one of them infringing on the role or rights of their neighbours.

It would be very risky to separate a protected area from its surrounding area. By integrating conservation and development, encouraging conservancies currently remains the best possible policy, by ensuring their funding through the benefits of tourism, funding for conservation as a Global Public Good, but also the funding of activities eligible for development.

Far from isolating the protected area through individual management or through a geographical separation such as fences, it is recommendable to coordinate the action of all stakeholders and the planning of their actions in a joint effort, going beyond the protected area (and not looking inwards) in order to tackle future challenges.

<sup>1</sup> Kormos, C.F., et al. 2017. World heritage, wilderness and large landscapes and seascapes. Gland, Switzerland. IUCN: viii + 70 pp. <https://portals.iucn.org/library/sites/library/files/documents/2017-028.pdf>

<sup>2</sup> Idem

## Table of contents

Summary .....	3
Introduction .....	5
1. What is the global conservation status of the PAs in Africa? .....	5
2. What are the problems? .....	7
3. Should the configuration of PAs be redesigned to anticipate the future? .....	9
3.1. Should the spatial design of PAs be improved? .....	10
3.2. Should the management category be changed? .....	11
3.3. Should legislative and regulatory texts be changed? .....	11
4. How should their surface areas, boundaries, status, roles and management categories be redefined? .....	12
4.1. Surface area .....	12
<i>What is the ideal surface area?</i>	
<i>Where can the space be found for increasing the size of PAs?</i>	
<i>What selection criteria should be used to increase the surface area of PAs?</i>	
4.2. The boundaries .....	15
4.3. Buffer zones .....	16
4.4. The role of PAs .....	17
4.5. Management categories .....	19
5. In this context, how should the periphery be managed? .....	20
6. Should all the PAs be conserved, should new ones be created or, on the contrary, should some be abandoned? .....	22
<i>Should they all be conserved?</i>	
<i>Should more PAs be created?</i>	
<i>Should some PAs be abandoned?</i>	
7. What is happening with the PADDD phenomenon currently underway? .....	25
8. Should the rights and duties of the different stakeholders involved be redefined? .....	26
9. Recommendations .....	28
9.1. Global context .....	28
9.2. Reconfiguration principles .....	28
9.3. Configuration elements .....	28
9.4. The management of peripheral zones .....	29
9.5. Configuration of the PA network .....	29
9.6. Relations between the stakeholders .....	30
Appendix 1 .....	32
Appendix 2 .....	33
Appendix 3 .....	37
Appendix 4 .....	41

## Introduction

Africa will have around 2 billion inhabitants by 2050. The population's needs are constantly growing, the fragmentation of the environment is accelerating, and there are fewer and fewer "natural" areas. In this context, the pressure on protected areas (PAs) is rising rapidly and their ability to conserve biodiversity in the long term is increasingly uncertain.

The results of protected areas in terms of conservation are very uneven in Africa, in general poor, and the studies on biodiversity carried out in recent years show a sharp decline in the latter all over the continent, including in protected areas.

Therefore, we need to consider the relevance of protected area networks as they exist today, and the options that may exist in order to make these protected areas evolve and to ensure they are more effective within the context of the predicted changes.

This study aims to examine how well prepared Africa's protected area systems are for dealing with current and future challenges. The plan is to provide a global overview that can be used for reflexion, aimed in particular at decision-makers and the managers of PAs and protected area networks.

### 1. What is the global conservation status of the PAs in Africa?

In order to answer this question, the first step is to establish the conservation status in Africa. To be more precise, we shall discuss nature conservation here, in other words, following the explanations given by IUCN<sup>3</sup>, we shall examine biodiversity conservation at genetic, species and ecosystem levels. Ecosystem conservation involves the issues of protecting the composition, the structure, the function and the evolutionary potential of biodiversity<sup>4</sup>.

Therefore, it is not just a matter of protecting genes and species, but also of protecting functional relationships between species (whose ecological pyramids show the relationships between different types of species corresponding to different trophic levels). Conservation must therefore protect balances and pseudo-balances (these are the developments around points of equilibrium that are rarely constant) between animal and plant species.

These balances, which allow for development and adaptation to new conditions, are often hard to assess, and we frequently have to monitor them by characterising:

- the number of species present, and thus the number of species that have disappeared,
- the populations of each species and their changing trend (upward or downward),
- the species' potential for survival in the medium to long term, in order to maintain its role in the balances.

Thus, for example, we could characterise a population of elephants in different ways depending on whether the animals are still present (= the species has not disappeared, three individuals remain, for example), or whether they still fulfil their role effectively as a modeller of the landscape and of the forest-savanna mosaic, which implies that their density is sufficiently high to be able to influence the ecological balance. These are the most important balances for us in the medium and long term.

In this context, the global conservation status is clearly poor in Africa. One only has to look at maps of human population density, of urban development, or of the size of agricultural areas to see that Africa has been almost entirely anthropised except for the zones where the environment is too hostile. If one looks closer and examines satellite photos, one can see that most non-anthropised areas in zones where the environment is not hostile are in fact protected areas, and their boundaries are often clearly visible on these photographs.

This is obviously a good point in favour of PAs and should be noted. However, these photographs do not tell us whether all the PAs have been conserved and/or whether only the habitat has been conserved, or whether in fact all the species (animal and plant) they contain have survived too. However, it is clear that habitat conservation is the first essential step towards the conservation of species and balances, and that

<sup>3</sup> Dudley, N., 2008, Guidelines for Applying Protected Area Management Categories, IUCN : x+96 p. <https://portals.iucn.org/library/sites/library/files/documents/PAG-021.pdf>

<sup>4</sup> Idem



PAs are sometimes quite successful at achieving this in anthropised environments; in any case, these areas survive better than if they had not been protected. This therefore justifies their existence, and the aim is for 17% of the Earth's land surface to be conserved through protected areas (Aichi Biodiversity Target 11).

It is also clear that some PAs have disappeared or their intact surface area has decreased, since they have not been able to withstand the pressure placed on them by human encroachment (agriculture, pastoralism, industry, etc.). It is significant that, in areas where no specific conservation work has been carried out, the habitat and the species that live there, as well as the functional balances, are clearly declining in the face of human development. This in turn leads to a significant decline in the areas inhabited by numerous species, as shown on maps, for example those in the Red List of Threatened Species<sup>5</sup>. Thus, the lion is a species of interest because, in addition to being one of the most emblematic species in Africa, it is a predator that needs a wide variety of prey and thus a large home range in which to find these animals, within a suitable habitat. Moreover, it comes into conflict with human populations. This is a key factor that must be considered today. Maps state that the species is found in 28 African countries, but it is probably now extinct in 7 others and it has already disappeared from 14 other African countries, whilst the reference lion populations have declined by 43% over the last 21 years<sup>6</sup>. The distribution maps indicate significant fragmentation (in other words the species is no longer distributed in contiguous areas) and the largest populations survive in places where the lion populations are managed in a sufficiently active manner<sup>7</sup>, and, in particular, these zones largely overlap the PAs.

The study of aerial photos reveals that, even if a zone is classified as a PA, this is not sufficient to ensure the protection of a species, a habitat or the ecological balance: the PA must be properly managed. PAs are thus necessary but insufficient in cases where they are not managed efficiently.

With regard to emblematic species, a 50% decrease in the number of lions in West, Central and East Africa has been observed over the last 20 years, a 50% decrease in Africa's cheetahs over the last 40 years, a 30% decrease in

the number of African elephants over the last 10 years, and a 40% decrease in the number of giraffes over the last 30 years<sup>8</sup>. The same applies to a large number of other, less emblematic species. This is largely linked to the reduction in the size of distribution ranges available for these species due to human encroachment, which leaves "fragments" of ranges inhabited to a greater or lesser extent by animal populations, and affected to a greater or lesser extent by human activities.

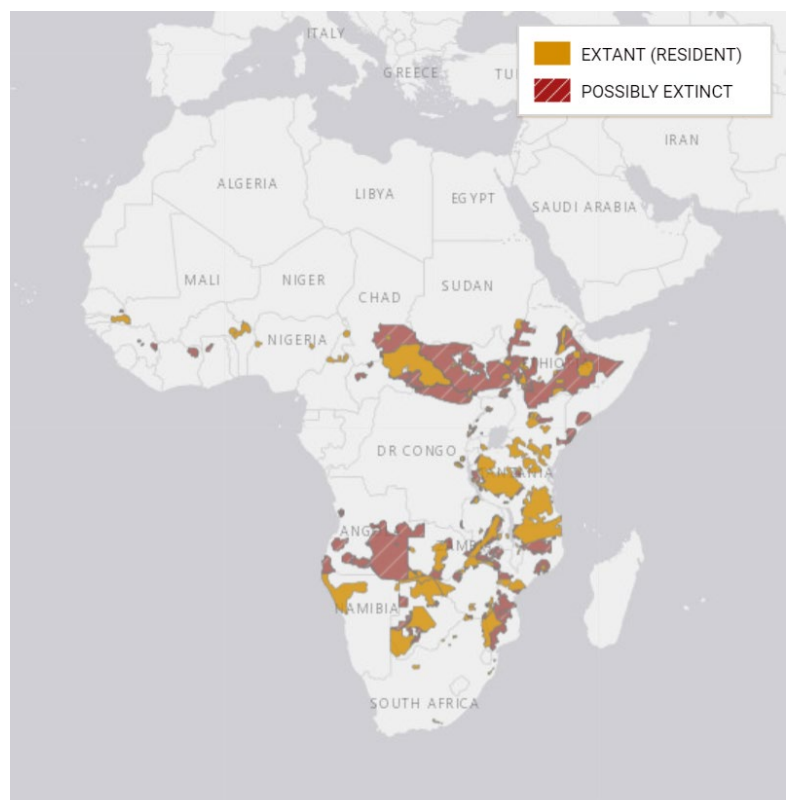


Figure 1: Distribution map of the African lion (*Panthera leo*).  
Source: [iucnredlist.org](http://iucnredlist.org)

In short, we could therefore say that nature conservation in Africa is not doing very well on a global level, but that nature is doing better in locations where it is protected, thus within PAs, and that it is doing better in places where the management of the area is sufficiently active. PAs are therefore important, but they must be managed properly and sufficiently. This means that the more the pressure increases (the disturbance that affects the well-being of nature in the PAs), the greater the means required to offset it. Naturally, this pressure is of human origin and, in particular, but not only, comes from the inhabitants of the areas surrounding PAs.

<sup>5</sup> [www.iucnredlist.org](http://www.iucnredlist.org)

<sup>6</sup> <http://www.iucnredlist.org/details/15951/0>

<sup>7</sup> Bauer, H., et al., Lion populations are declining rapidly across Africa except in intensively managed areas, PNAS 2015. <http://www.pnas.org/content/112/48/14894>

<sup>8</sup> Packer, C., WildCRU 2018. <https://www.youtube.com/watch?v=STaqmtlZfcU>

## 2. What are the problems?

Over 7,000 PAs are recognised in Africa, to which we should add the areas that help conservation (conserved areas) and are mainly managed for economic purposes, such as hunting areas, classified forests, natural resource management areas, etc.

Of these areas, the following are of note:

- Areas that are simply virtual: they only exist on paper now (the famous “paper parks”). These include areas located in conflict zones (past or present), like many parts of the Sahel, Somalia, Sudan, Angola, etc. These are areas that have not been managed at all or have been managed insufficiently. They are areas affected by agricultural or pastoral encroachment, areas where land use policies have not allowed natural resources to be preserved. In these areas, both the habitat and wildlife species have been lost, due to the absence of management, poor management or unfavourable political conditions.
- Areas that have been stripped of some of their biological values: thus we find “empty forests”, which are forests that are mainly managed for timber production, but where the protection or exploitation of wildlife has not allowed for the conservation of some or all wildlife species<sup>9</sup>. The uncontrolled exploitation of some species for domestic consumption, in particular when there are monetised sectors that target urban areas, which sell “bushmeat”, has thus led to relict populations of numerous forest species in the Congo Basin and elsewhere in both forests and on savannas<sup>10</sup>. In this case, the PA still exists, but its biological values (that were the very reason why it was protected) have declined. This is the result of poorly conceived management from the very outset (for example uncontrolled exploitation), or insufficient management: it generally costs more to protect wildlife than trees and an insufficient budget will lead to the latter being protected but not the former.

- Areas that have only conserved part of their classified space. Often, the part in contact with the periphery has been partially colonised and the habitat has been replaced by areas inhabited by humans, farmland or grazing land. This is often linked to the absence of law enforcement in connection with poor conservation policies, insufficient human means, material means or ill-conceived management. Whilst this habitat loss is clearly visible on satellite photographs, the loss of animal biodiversity often extends far beyond the colonised zone<sup>11</sup>. In these cases, the means available have generally made it possible to provide more protection for the central zone, which is further away from the pressure.
- Areas that have only conserved some of the animal species present. In these cases, some species are more difficult to protect than others because they create conflict with the population (the large carnivores, for example), they are species that are sought after for the profitable trade in their body parts (elephants for ivory, rhinoceroses for their horns, pangolins for their scales, etc.), they are protected by local cultures (as is often the case for the Chimpanzee or the Gorilla), or else they simply require large ranges (such as the African hunting Dog or the Cheetah), and the area can no longer provide the space they need. This shows that the cost of conservation varies from one species to another and that a budget that might suffice for one species may not be sufficient for another. Thus, the protection of lions is very expensive due to the large areas of land that need to be protected, the need for sufficiently numerous preys, the need to work specifically with the human populations living in the zones around the protected areas so as to reduce conflicts and take into account the opportunity costs<sup>12</sup>.

In conclusion, the fate of a protected area is largely dependent on:

- The political context: conflicts, of course, but also the political commitment to nature conservation.
- Its design: an area that is too small or too large, in a bad location (too close to centres of pressure), in an inappropriate management category, with poor governance or legislative texts that have not been adapted, will find it hard to live up to expectations.

9 The empty forest revisited. Wilkie, D.S., et al. 2011. *Annals of the New York Academy of Sciences*. <https://doi.org/10.1111/j.1749-6632.2010.05908.x>

10 Lindsey, P.A., et al. The bushmeat trade in African savannas: Impacts, drivers, and possible solutions, *Biological Conservation*, 160, (80), (2013).

11 IUCN Papaco. La grande chasse en Afrique de l'Ouest: quelle contribution à la conservation? ISBN: 978-2-8317-1204-8. <https://portals.iucn.org/library/efiles/documents/2009-074.pdf>

12 Packer, C., et al. Conserving large carnivores: dollars and fence. *Ecol Lett*. 2013 May; 16(5):635-41. DOI: 10.1111/ele.12091

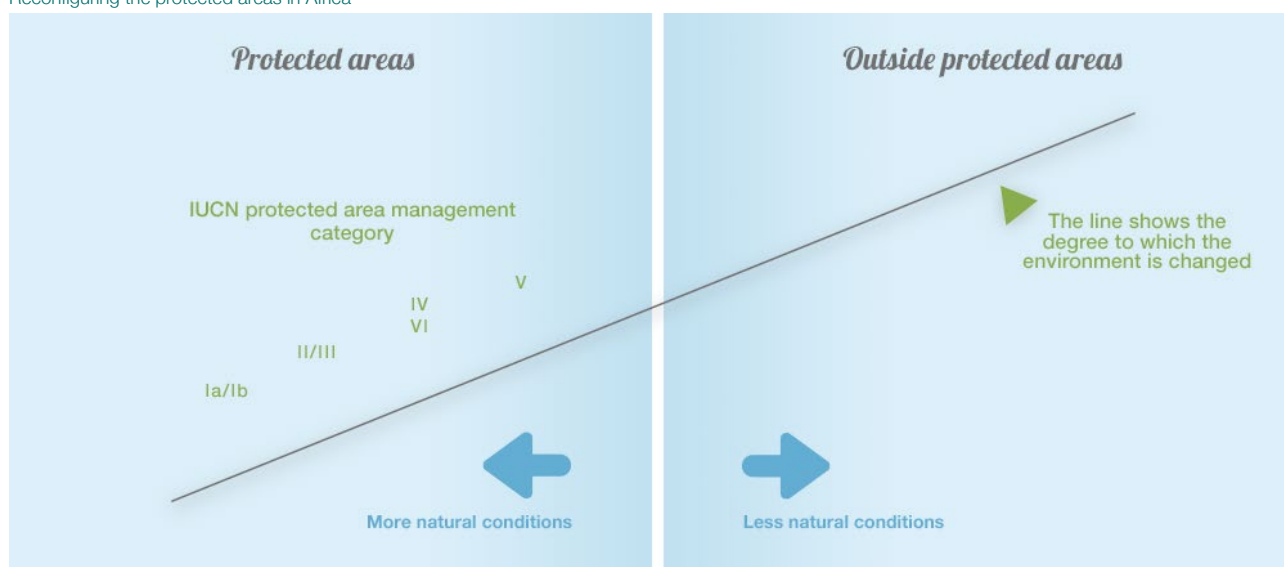


Figure 2: Natural character and IUCN protected area categories

- Its management mode: this stems from its design but, more specifically, some species require less disturbed nature in order to be conserved properly. The management mode is directly linked to the management category for a protected area, or through its method of usage for an area contributing to conservation. The most complete protection (more natural conditions) is ensured by the lowest management categories, as shown in the figure above<sup>13</sup>.
- The reality of its management: There is no point in creating suitable PAs if they are badly managed. The assessment of the management efficiency is the tool that will make it possible to evaluate and monitor the evolution in the management of PAs<sup>14</sup>. There are often many things that still need to be done to ensure that PAs are properly managed; the quality of PAs is however more important than the quantity<sup>15</sup>.
- The pressures it faces: the pressures are caused by humans and increase exponentially in line with demographic pressure. This explains why PAs are harder to manage today than they were a few decades ago, and why solutions that would work with human population density of 2 people per km<sup>2</sup> in the area surrounding the PA would probably not work with a population density of 30 or 50 people per km<sup>2</sup>. This also explains why some conservation tools used in the past no longer work today, and will be even less likely to work tomorrow, as we shall see later on. The following figure presents the evolution in human population density per km<sup>2</sup> from 1960 to 2017 in five African countries. So, a solution suitable in Kenya might work today and in the future in countries that tend to have the same demographic values. On the contrary, solutions that work in Namibia will no doubt not work in countries with a far higher population density. This explains why PAs created decades ago often face difficulties today, if their management and their configuration have not been adapted gradually to cope with today's pressures.
- Its budgets: The rise in the pressure created by the growth in the human population around the PA, increased by global phenomena such as climate change or insecurity, leads to a great increase in the cost of countering the pressures. In the 1990s and at the start of the 2000s, the cost of managing a savanna PA was often estimated at around 2 USD<sup>16</sup>/ha/year<sup>1718</sup>. Publications that appeared

<sup>13</sup>Dudley, N., 2008, Lignes directrices pour l'application des catégories de gestion aux aires protégées, Gland Switzerland, IUCN: x+96 p. <https://portals.iucn.org/library/sites/library/files/documents/PAG-021.pdf>

<sup>14</sup>Hockings, M., Stolton, S., Leverington, F., Dudley, N. and Courrau, J. (2008). Evaluating Effectiveness: A framework for assessing management effectiveness of protected areas: IUCN. xiii + 105pp. <https://portals.iucn.org/library/efiles/documents/PAG-014.pdf>

<sup>15</sup>Steiner, A.: Are protected areas failing us? New Scientist, 18 October 2003. <https://www.newscientist.com/article/mg18024172-900-are-protected-areas-failing-us/>

<sup>16</sup>USD = United States dollar

<sup>17</sup>IUCN Papaco. La grande chasse en Afrique de l'Ouest: quelle contribution à la conservation? ISBN: 978-2-8317-1204-8. <https://portals.iucn.org/library/efiles/documents/2009-074.pdf>

<sup>18</sup>Baghai, M., et al. Models for the collaborative management of Africa's. Biological Conservation, 2017. <https://linkinghub.elsevier.com/retrieve/pii/S0006320717314106>



## Evolution in the human population density (people per km<sup>2</sup>) from 1960 to 2017

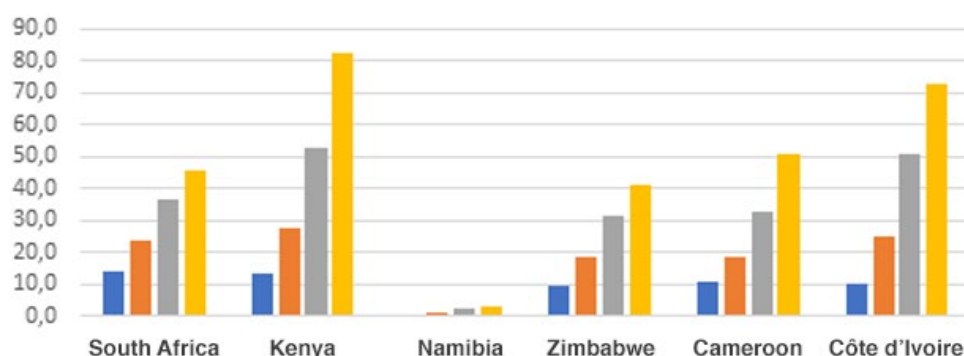


Figure 3: Evolution in the human population density in five Africa countries from 1960 to 2017  
Source: <http://countrymeters.info/fr/>

during the period 2015-2018 indicated that for the same PAs the cost was generally 7 to 8 USD/ha/year<sup>19</sup>, but this varied, depending on the problems that had to be solved (for example in the case of lions, as mentioned above) and could reach sums of around 20 USD/ha/year<sup>20</sup>. It is important to note that the cost of managing a fenced PA is far higher than managing a non-fenced PA; 7 times higher according to a recent publication<sup>21</sup>.

In conclusion, demographic growth leads to an increase in direct or indirect pressures, which in turn leads to higher management costs. Efficient conservation solutions devised several decades ago will no longer work today. The budgets required for good conservation today are far higher than those that were needed in the past. Numerous protected areas are thus suffering as a result of the application of solutions that were used in the past with budgets that are far too low. It is therefore not surprising that they do not achieve the expected conservation results. So, it is important to identify which budgetary and technical solutions can be used to improve the conservation results.

### 3. Should the configuration of PAs be redesigned to anticipate the future?

In this study, we are not going to cover several of the points mentioned above, which have an impact on the future of PAs, because they will be discussed elsewhere (see other Papaco studies): the reality of management, funding, political will or governance... Here, we are simply going to look at the points linked to the configuration of a PA. There are several different aspects to this configuration:

- The spatial design of the PA: this is the PA's location, its surface area, its boundaries, its zoning and how it fits into the landscape (surrounding area). The design should favour the best possible conservation, by protecting the populations of species interacting with one another over the long term, throughout their own cycles. It is only by doing this that we can ensure that the protection will allow species to be conserved, and therefore the ecosystem. The design must provide permanent protection for the species present in the PA, and it must facilitate management tasks.

<sup>19</sup>Lindsey, P.A., et al. Life after Cecil: channelling global outrage into funding for conservation in Africa. *Conservation Letters*, July/August 2016, 9(4), 296–301 <https://onlinelibrary.wiley.com/doi/epdf/10.1111/conl.12224>

<sup>20</sup>Packer, C., et al. Conserving large carnivores: dollars and fence. *Ecol Lett.* 2013 May; 16(5):635–41. DOI: 10.1111/ele.12091

<sup>21</sup>Creel, S., et al. Conserving large populations of lions- The argument for fences has holes. *Conservation letters* 2013. DOI: 10.1111/ele.12145

- The management category: this specifies directly which type of management will be carried out in the PA, in particular in terms of planning or management of human populations and their activities. IUCN describes six management categories, and the proper use of these management categories enables the expected conservation results to be described and, consequently, allows them to be achieved.
- Legislative and regulatory texts: in particular, those that classify the PA, describe it, detailing how it works (in other words texts that reflect its design) or texts that have a direct influence on the PA by dealing with the management of the surrounding area or the regulation of pressures. Legislative texts reflect national legislation and can differ from international standards (for example for the definition of a national park or reserve). These texts must allow for the spatial design and the choice of management category to express their full values in order to achieve the expected conservation results.

### 3.1. Should the spatial design of PAs be improved?

We need to ask ourselves whether the protection provided by PAs to areas that are to be protected is indeed permanent. For example, if a high percentage of certain populations live outside the PA, it will only enjoy partial protection. This land may gradually be colonised by agriculture for example and the home range essential for the population will be reduced by the same amount. This will not allow the PAs to play the role they have been assigned: to conserve the composition, structure, function and evolutionary potential of biodiversity<sup>22</sup>.

The PA must be large enough to ensure that the different populations to be conserved contain the minimum number required to guarantee the viability of the species. This number is often estimated at 200 individuals. The different species also need to be able to interact in order to ensure the balances required to allow the ecosystems to function. The guidelines for national parks (Category II) also state that “*the area should be of sufficient size and ecological quality so as to maintain ecological functions and processes that will allow the native species and communities to persist*”<sup>23</sup>. Thus, a large national park will be able to protect “*larger-scale ecological processes that*

*will be missed by smaller protected areas*”, and “*protect particular species and ecological communities that require relatively large areas of undisturbed habitat*”<sup>24</sup>. So, it is important to think about how the size of PAs should be increased. This point has become particularly important due to climate change: in a large PA, the climate may be favourable in one location only, and the movements made by animal species to benefit from this will always take place within the PA. If the PA were smaller, the animals would have to move outside the PA to benefit from the favourable conditions and thus no longer be protected.

Another key point is that, by increasing the size of the PA, we also increase the length of the boundaries, and the latter are thus located further from the centre of the PA. This decreases the density of human-wildlife conflicts, which have increased significantly as a result of demographic growth.

The advantages of increasing the size of a PA are summed up very well in the policy document for the management of South African PAs<sup>25</sup>:

- The maintenance of ecological integrity,
- An enhancement of biological representation,
- An enhancement of biological diversity,
- An improvement of economic viability,
- A minimisation of threats,
- An enhancement of management effectiveness.

The modification of a space encompassed by a PA naturally leads to a rethinking of the boundaries. They should be determined in order to ensure they contain the highest possible number of home ranges permanently over annual cycles. In many African countries, reserves were created as “game reserves” and they were adjacent to hunting zones, with a river (a natural boundary easy to visualise) separating the reserve from the hunting zone. During the hunting season, the same game species could thus be protected in the reserve and hunted if it crossed the river. If the hunting was carried out in a responsible, sustainable manner, this could provide the species with a certain degree of sustainable protection. As we shall see later on, the recent drastic decline in the big game sector in Africa has largely changed this system, due to the abandoning of many hunting zones, meaning that “semi-ecosystems” were protected, with

<sup>22</sup> Dudley, N., 2008, <https://portals.iucn.org/library/sites/library/files/documents/PAG-021.pdf>, Gland Switzerland, IUCN: x+96 p. <https://portals.iucn.org/library/sites/library/files/documents/PAG-021.pdf>

<sup>23</sup> Idem

<sup>24</sup> Idem

<sup>25</sup> SANParks, Coordinated policy framework governing park management plans, July 2006. 60 pp. <https://www.sanparks.org/docs/conservation/cpfjanuary2010.pdf>

one bank of the river no longer being “protected”. This can be found in numerous countries, for example along the rivers Pendjari and Arly (Benin and Burkina Faso), Faro and Bénoué (Cameroon), Luangwa (Zambia), Zambezi (Zimbabwe-Zambia-Mozambique), etc. Reconsidering these boundaries and this zoning, with the increase in the global surface area protected, is a priority action in order to improve conservation.

### 3.2. Should the management category be changed?

It is important to remember that before determining the category of a PA, it is essential that first of all the latter corresponds to IUCN's current PA definition. There are six PA management categories, whose specific features are summarised in Appendix I:

- Ia. Strict nature reserve
- Ib. Wilderness area
- II. National Park (ecosystem conservation, protection of cultural values)
- III. Natural monument or natural element
- IV. Habitat/species management area
- V. Protected landscape/seascape
- VI. Protected area with sustainable use of natural resources.

Whilst all the management categories are useful, it is clear that, in Africa, in terms of conservation of wildlife species, three categories are particularly common. II (National Park), IV (“specially managed reserves”) and VI (with sustainable use of natural resources in part of the surface area only). As we saw previously (Figure 2), and due to the gradual influence of humans, the conditions are more natural in categories I and II, and less natural when we move towards categories V and VI, which allow the environment to be modified to a certain degree. This is important because the more natural an ecosystem is, the better it functions. Moreover, we can see that the right-hand part of the graph in Figure 2 includes the words, “*Outside the protected areas*”: these zones can also evolve and change from being areas that contribute to conservation (conserved areas) to true PAs respecting the laws.

The change of management category can thus have a major influence on the fulfilment of conservation objectives. We sometimes speak of “raising the conservation status” when the management category changes from VI to I or II, in order to recall that the conditions will be more natural. This also involves the classification of areas outside the PAs. Clearly, proceeding to a reverse evolution (towards categories V or VI) potentially reveals a weakening in the ecosystem's real conservation conditions.

### 3.3. Should legislative and regulatory texts be changed?

As the area occupied by a PA changes and its management category evolves, it is essential that the texts also evolve in order to legalise the changes and allow the law to be enforced as required. If the proposed modifications are provided for by law, a regulatory text will suffice. If they are not, a modification of the law should be studied, and this should accompany the evolutions in the situation in order to ensure the PA is managed properly. This is why the texts should be reviewed periodically.

Finally, since the PA management plans are validated by the relevant authority in the form of a decree or an order (or if appropriate a formal decision made by a local authority), any new management plan (and potentially the accompanying internal regulations) drafted in accordance with the new choices, should also be validated officially, and this constitutes a modification of the texts.

In conclusion, the PAs need to be developed so that they can perform their function in a changing context. The configuration of PAs that was sufficient 50 years ago, may no longer be appropriate today and will be even less so in the future.

## 4. How should their surface areas, boundaries, status, roles and management categories be redefined?

Now we are going to look at the main technical points that it would be desirable to develop.

### 4.1. Surface area

We have seen that in order to provide better protection for functional balances, to allow the population viability threshold of many species to be crossed, to decrease the intensity of human-wildlife conflicts and take into account the problems caused by climate change, it would be advisable to increase the size of some PAs. A twofold question therefore arises: up to what surface area should they be extended? Where is the necessary space going to be found?

Once these problems have been discussed, we shall look at the selection criteria used for this increase in size.

*What is the ideal surface area?*

The reply will obviously vary greatly depending on the ecosystem, the habitats and the species to be protected, but also on the current level of the populations, which is hard to increase in view of the corresponding rise in pressure. Thus, in order to obtain a population of 200 lions, there must be a sufficiently high number of prey (ungulates mainly). This explains why, in many locations, the lion density does not exceed 2 lions/100 km<sup>2</sup> whilst, theoretically, there could be 5 or 10/100 km<sup>2</sup>. In these different cases, so as to protect a minimum population of 200 lions, a total of 10,000 km<sup>2</sup> (= 1 million hectares), 4,000 km<sup>2</sup> or 2,000 km<sup>2</sup> (=200,000 ha) would be required respectively. Similarly, large surface areas are required for wide-ranging species, such as the African hunting Dog (total population for the whole of Africa: 3,500 individuals) or the Cheetah (total population for the whole of Africa fewer than 8,000 individuals), and the small PAs cannot conserve these two species properly. For the forest elephant, whose population densities are low, it is thought that at least 5,000 km<sup>2</sup> are required for the species' long-term conservation.

So, it can be seen that there is no standard answer, not even for each individual species. However, we saw above that the cost of managing a savanna PA is currently around 7 to 8 USD/ha/year. Attempting to protect a PA without this budget is like trying to drive a car without fuel. Likewise, claiming that a PA management mode does not work when this budget is not available

is just as wrong. So, the question is, for a PA measuring 5,000 km<sup>2</sup>, which remains a desirable average size: do you have an annual budget of 4 million USD/year? If you don't have this budget, you can expect to see some populations in a conserved habitat disappear, as was the case in Northern Cameroon for example with the black Rhinoceros, the Cheetah and the African hunting Dog<sup>26</sup>, or with the Lion In Mole National Park (Ghana) and Comoé National Park (Côte d'Ivoire)<sup>27</sup>. These species require a budget that is sufficiently high to address the pressures they are faced with.

As the old saying goes, "you should not bite off more than you can chew" and, as we saw above, the quality of PAs is more important than their quantity. Finance is thus the basis for PA management. Moreover, if 5,000 km<sup>2</sup> are beyond reach due to lack of funding, it would probably be wise to limit the size of the conservation area to 3,000 km<sup>2</sup>, which seems a good compromise between the effect of conservation and the cost of conservation. And it would be advisable to organise the 2,000 km<sup>2</sup> conceded, so that this land also contributes to conservation less exclusively, and thus at a lower price.

*Where can the space be found for increasing the size of PAs?*

This issue is also essential, because one only has to look at a map of human population density in Africa to know that all zones that have surface water resources (essential for virtually all mammal species) are occupied by humans. Even in arid areas, zones near to water (basins, low-lying areas, etc.) are already occupied. Today, it is no longer possible to evict people who are already living in a given area, as occurred in the past. All extensions should be carried out voluntarily in collaboration with the owners or the holders of the rights to the land. In numerous African countries, and given the land tenure system, these are often local communities. It seems hard to ask local communities to give up their land to the State that will own the PA. A community is instead willing to manage its land itself, often by reserving an area for the management of natural resources. In some countries, this corresponds to a "conservancy", as we shall see later. Sometimes, as in the case of the creation

26Brugière, D., et al. Large-scale extinction of large carnivores (lion *Panthera leo*, cheetah *Acinonyx jubatus* and wild dog *Lycaon pictus*) in protected areas of West and Central Africa. 2015. Tropical Conservation Science Vol.8 (2): 513-527, 2015 <http://journals.sagepub.com/doi/pdf/10.1177/194008291500800215>

27Henschell, Ph., et al. The Lion in West Africa Is Critically Endangered. PLoS ONE 9(1): e83500. <https://doi.org/10.1371/journal.pone.0083500> <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0083500>



of Sena Oura National Park in Chad, the communities are the ones to take the initiative and classify the land, because the category has been judged by them to be more suitable for conserving the habitat from agro-pastoral encroachment. In this case, the communities negotiated a certain number of limited and regulated land use rights<sup>28</sup>.

Another promising way forward today is that of reclassifying land that belongs to the State, by changing the management mode and sometimes the status or category. A recent example of this is the case of the reclassification of the NG42 hunting zone in Botswana as a National Park, increasing the surface area of Chobe National Park until it adjoined Nxai Pan National Park (see Figure 4 below), thus creating a protected corridor along the migration route for zebras and wildebeest<sup>29</sup>.

This means that the State-owned land adjoining a PA can be analysed to see whether the type of management such as that carried out in a Category II PA would be beneficial for conservation. Traditionally, these peripheral areas are reserves (wildlife or forest), classified forests (as in 2018 in Malawi where Liwonde National Park and Mangochi Forest Reserve<sup>30</sup> were linked up and managed jointly, in order to increase the space available), big game hunting zones, etc.

The case of big game hunting zones is particularly topical, given the rapid decline of this sector in Africa in recent years. This process is described in detail in Appendices No. 2 and No. 3. In Tanzania, 72% of the big game hunting zones have now been abandoned because they are no longer profitable for hunting organisations, due to the decrease in the number of animals that can be hunted and agro-pastoral encroachment. This represents a surface area of around 140,000 km<sup>2</sup> in which hunting no longer takes place, in other words around four times the surface area of Tanzania's national parks (38,365 km<sup>2</sup>). Economic factors lie behind the halt in hunting management, because the organisation of big game hunting obeys the rules of the private sector, and an excessive deficit leads to the activity being discontinued. This confirms the fact that, henceforth, it will not be possible to self-fund wildlife conservation by

a consumer activity, invalidating the paradigm popular in the period from 1970 to 2010, "if it pays, it stays".

Faced with the cost of the fight against pressures, management through consumer activities is not profitable enough and the areas are thus released, potentially for the creation and management of new PAs. It should also be noted that in Zambia, 40% of the big game hunting zones are affected by agricultural encroachment<sup>31</sup>.

So, it is only in very recent times that a new opportunity has been available for PA managers: to restructure their PAs so that they are more efficient and by enlarging them and improving their boundaries, integrating all or part of former hunting zones that are no longer viable. Naturally, this absence of economic viability, which removes the big game hunting's function as a conservation tool, is not the same everywhere. In places where there is less pressure and where there is still sufficient wildlife density for hunting, the latter can still act a conservation tool for a few more years (see Box No. 1 for details on the current situation of the decision point). However, huge areas are already available, as long as action is taken quickly enough, because if not they will be affected by agro-pastoral encroachment.

#### *What selection criteria should be used to increase the surface area of PAs?*

The increase in the surface area mainly aims to take greater account of the ecological features of the different species that are to be protected. This may include:

- **Conserving all the hotspots for wildlife species and sensitive habitats.** These are more often than not watercourses, which constitute an almost essential concentration point, especially in the dry season, and which beyond providing drinking water are also a source of food (low-lying areas, perennial grazing land, aerial pastures for grazing animals), and afford shade, protection, etc. We have seen that very often watercourses, natural boundaries, have been used to demarcate PAs, in particular in the initial approach to "game reserves". Thus, only half of the watercourse is protected when the hunting activity is not sustainable. Protecting only half of an ecosystem is a real gamble, because pressure is placed directly on the centre of the most important biodiversity zones. It is thus a priority to classify both banks of the rivers in PAs as quickly as possible,

28 [http://pfbc-cbfp.org/docs/rapports\\_act/CCRKinshasa\\_2010/10\\_SENAOURA.pdf](http://pfbc-cbfp.org/docs/rapports_act/CCRKinshasa_2010/10_SENAOURA.pdf)

29 Naidoo, R., et al. A newly discovered wildlife migration in Namibia and Botswana is the longest in Africa. *Oryx*, 2016, 50(1), 138–146 [https://www.cambridge.org/core/services/aop-cambridge-core/content/view/2E54A55B5EB63E70E4FE918CDD904704/S0030605314000222a.pdf/newly\\_discovered\\_wildlife\\_migration\\_in\\_namibia\\_and\\_botswana\\_is\\_the\\_longest\\_in\\_africa.pdf](https://www.cambridge.org/core/services/aop-cambridge-core/content/view/2E54A55B5EB63E70E4FE918CDD904704/S0030605314000222a.pdf/newly_discovered_wildlife_migration_in_namibia_and_botswana_is_the_longest_in_africa.pdf)

30 Liwonde National Park in Malawi will expand to include Mangochi Forest Reserve. <http://www.tourismupdate.co.za/article/178845/Key-Malawi-wildlife-reserves-link-up>

31 Watson, F.G., et al. Human encroachment into protected areas network in Zambia. *Reg environ change* 2014. DOI: 10.1007/s10113-014-0626-5



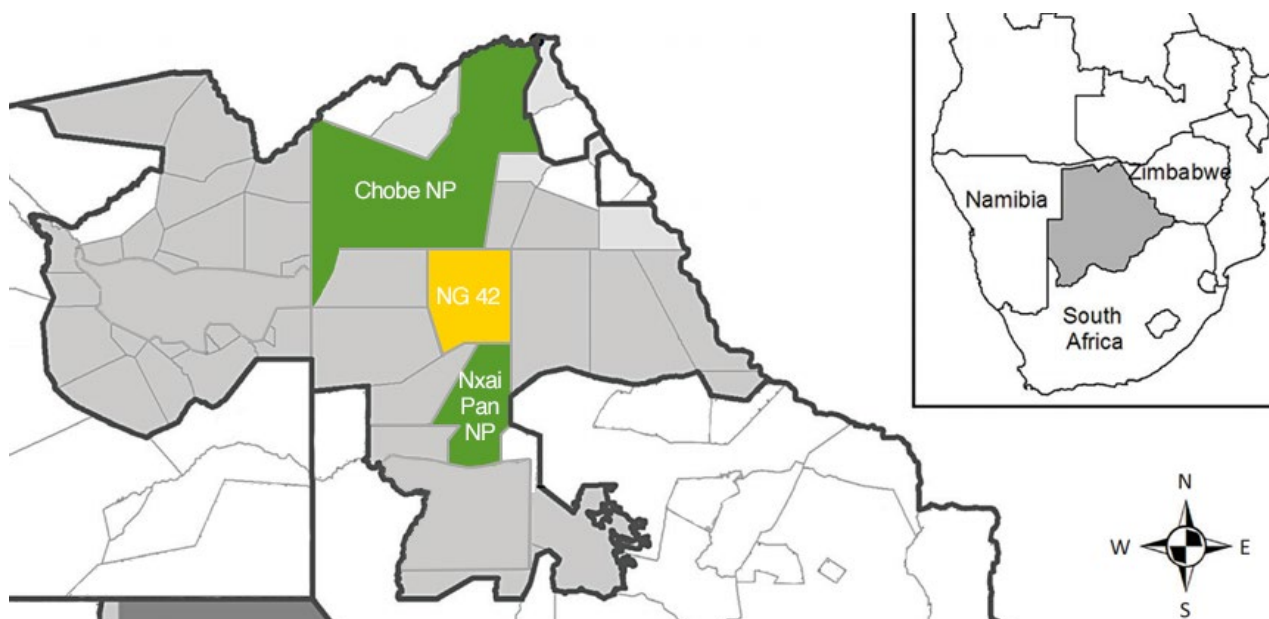


Figure 4: Extension of Chobe and Nxai Pan National Parks in Botswana reclassification of the NG42 hunting zone as a National Park.

preferably with the same management category or at least the same type of land use. This will allow the ecosystem to work in optimal conditions, distance the vulnerable centre of the PA from areas of pressure and provide better protection to the distribution ranges of wildlife species. At the same time, by distancing the boundaries of the PA from the species hotspot at the origin of the human-wildlife conflict, the latter will be reduced. This measure involves a large number of PAs in Africa, in particular in places where there are (or used to be) peripheral big game hunting zones.

- **Conserving all the home ranges of the main species.** Most wildlife species have a home range that they use throughout the year. Due to the great disparity between the dry and the rainy seasons, home ranges often change. In the dry season, they are generally concentrated around water points (rivers, ponds, etc.) whilst in the rainy season, taking advantage of the surface water available all over, they extend to areas that cannot be used during the dry season (in other words beyond the distance that an animal of a given species can cover by walking each day) to exploit food resources that are conserved during the dry season. This phenomenon

is sometimes called “partial migration”<sup>3233</sup>. By taking these environmental features into account, we will protect a higher percentage of these species with large home ranges that vary over the course of the seasons for longer. It is thus important to know these home ranges and their variation upstream, for example by carrying out remote monitoring using telemetry tracking collars. An important additional point is that we will thus reduce some of the human-wildlife conflicts, the home range no longer extending beyond the PA, which is generally an area in which human activities are carried out. It should be noted that in some species, certain individuals move very far from their family’s home range<sup>34</sup>. Generally, it is not possible to predict these movements, which in most cases are not repeated. These movements generally involve young males looking for females, the males being known for spreading their genes more widely in spatial terms than the females, even if they do tend to return to the area close to their birthplace (philopatry)<sup>35</sup>. It is clearly impossible to protect all locations where one

32Tshipa, A., et al. Partial migration links local surface-water management to large-scale elephant conservation in the world’s largest transfrontier conservation area. *Biological Conservation* 215 46-50 (2017). <https://www.sciencedirect.com/science/article/pii/S0006320717309047>

33Naidoo, R., et al. Home on the range: factors explaining partial migration of African buffalo in a tropical environment. *PlosOne* 7 (5): e36527. DOI: 10.1371/journal.pone0036527

34Loveridge, A. *Lion hearted*, p. 150-151. Regan Arts. New York, April 2018. ISBN 978-1-68245-120-5

35Greenwood, P.J., Mating systems, philopatry and dispersal in birds and mammals. *Anim. Behav.* 1980, 28 1140-1162. [https://doi.org/10.1016/S0003-3472\(80\)80103-5](https://doi.org/10.1016/S0003-3472(80)80103-5)

individual of a species is found! Attempts will be made to protect most of a population's (and not an individual's) home ranges, whilst being limited by land availability and management costs.

- **Contributing to connectivity.** Here we prefer to talk about connectivity rather than corridors. Indeed, a corridor is not always functional, since this depends on whether the species use it. It must correspond to a real movement that is sufficiently important. Connectivity involves a continuity of home ranges<sup>36</sup>, and generally corresponds more to the reality of the distribution of species, through continuity rather than migration. With regard to large animal species, there are only five true migrations in Africa (the elephants of Gourma - Mali/Burkina Faso; South Sudan/Ethiopia with the white-eared Kob mainly; the migration in the Maasai area - Kenya/Tanzania - with wildebeest, zebras, gazelles, etc.; the migration in Barotseland/ the Barotse Floodplain - Angola/Zambia - for wildebeest and zebras; and, finally, the migration in Northern/Central Botswana for zebras and wildebeest above all). Some corridors are moreover only used as an extension of an animal's habitat and not for movements, as was recently noted in the case of the Mount Kenya elephants<sup>37</sup>.

It will be particularly important to maintain connectivity, in other words retain a sufficiently large connection in order to encompass home ranges, in places where human encroachment is increasing and risks isolating two PAs. This is notably the case in places where big game hunting zones are situated between two PAs, as in Zambia for example between Luangwa North National Park and Luangwa South National Park, or in Northern Cameroon between Boubandjida, Bénoué and Faro national parks. Earlier, we saw that Botswana had just classified hunting zone NG42 as a national park, to ensure connectivity (for true migration) between Chobe and Nxai Pan national parks.

It should be noted that, by maintaining this connectivity, we can also reduce human-wildlife conflicts, by avoiding farmland encroaching on wildlife habitats.

However, it is important to note that it is not always possible to maintain this connectivity. This is particularly the case when the human density becomes too high. Thus, since 2006 South Africa's official policy has recognised that the free movement of animals in a fragmented PA network, with areas with human presence, is no longer possible and it is carrying out the required genetic transfers by translocation and not by creating corridors<sup>38</sup>. This case will become increasingly common in many countries with population growth.

The classification of connectivity areas rather than corridors is thus a very interesting instrument, in particular because the natural state is the best, since it allows for a larger number of natural functions<sup>39</sup> and will have a better impact on conservation. Ideally, of course, the connectivity area should be classified as a PA, but this is not always possible.

Moreover, the connexion between two PAs plays an essential role in the framework of climate change, allowing species to "follow" the habitat that suits them if it is affected<sup>40</sup>.

## 4.2. The boundaries

One of the consequences of the modification of the size of a PA is the change in its boundaries. As we saw earlier, the main point is to avoid the boundary being a line such as a large river where there is a high wildlife density. Ideally, in order to protect and reduce human-wildlife conflict, areas of high wildlife density and large rivers should be situated at the centre of the PA. Ridge lines thus make better boundaries than rivers. However, the latter are very often used as "natural boundaries".

It is also important to correct boundary lines in order to attain a more regular shape and thereby eliminate any boundaries that are too long with regard to the PA's surface area. This reduces both entry areas for poachers

36 Benett, A.F. (1998, 2003). Linkages in the landscape: The role of corridors and connectivity in wildlife conservation. IUCN, Gland, Switzerland and Cambridge, UK. Xiv + 254 pp. <https://portals.iucn.org/library/efiles/documents/fr-021.pdf>

37 Green, S., et al. Patterns of use and movement in the Mount Kenya Elephant Corridor: is it an effective corridor or simply an extension of habitat? September 2016 Conference: EAZA Annual Conference 2016 At: Belfast Affiliation: Marwell Wildlife, University of Southampton [https://www.researchgate.net/publication/311426529\\_Patterns\\_of\\_use\\_and\\_movement\\_in\\_the\\_Mount\\_Kenya\\_Elephant\\_Corridor\\_is\\_it\\_an\\_effective\\_corridor\\_or\\_simply\\_an\\_extension\\_of\\_habitat](https://www.researchgate.net/publication/311426529_Patterns_of_use_and_movement_in_the_Mount_Kenya_Elephant_Corridor_is_it_an_effective_corridor_or_simply_an_extension_of_habitat)

38 SANParks, Coordinated policy framework governing park management plans, July 2006. 60 pp. <https://www.sanparks.org/docs/conservation/cpfjanuary2010.pdf>

39 Worboys, G.L., et al. (2016) Advanced draft, Areas of connectivity conservation guidelines. IUCN. [http://conservationcorridor.org/wp-content/uploads/acc\\_advdraft\\_guidelines\\_28may2016-1.pdf](http://conservationcorridor.org/wp-content/uploads/acc_advdraft_guidelines_28may2016-1.pdf)

40 Idem 37

and human-wildlife points of contact at which conflicts can arise. This is particularly important when the boundary has indentations that allow inhabited areas to “penetrate” the PA, greatly increasing the risk of poaching and also human-wildlife conflict when animal species cross the indentation to get from one part of the PA to another. This aspect is even more important for inhabited enclaves within a PA.

With regard to the management of PAs, the monitoring of boundaries is of key importance: in a certain number of cases, the boundaries (and even sometimes the PA itself) have disappeared as a result of human activities. For everyday management, it is occasionally necessary to create a large mark (using machinery) at the end of the undisturbed natural zone, below the legal boundary, in order to define the area where any human activities should stop. This does not bode well for the modification of the PA's status, as we shall see later on. The last resort for demarcating a threatened boundary is the installation of a fence along the problematic boundary line.

A key point concerns the peripheral boundary of a PA complex, which constitutes a conservation block and may contain a national park, a reserve, hunting zones, community natural resource management zones, etc. This complex will be demarcated by a common external boundary, which is monitored by different bodies, with different legal statuses and a wide variety of budgetary means. These components will evolve in different ways, the national parks generally resisting more than the other bodies, as we can see in Chad where practically all the reserves and classified forests have disappeared, but where the national parks remain intact<sup>41</sup>. This phenomenon occurs in many countries, where there is a progressive disappearance of hunting zones and some reserves, whilst the national parks are not threatened by human encroachment, as in Northern Cameroon, for example<sup>42</sup>. This means that the boundaries and conservation potential of a conservation block made up of different bodies will be threatened by humans in varying intensities. Boundary management is thus also a question of status and management category. It will thus perhaps be necessary to consider this point in order to contemplate a long-term conservation effect. A

PA cannot be isolated from its peripheral context. This point is even more valid for conservation areas within a block, which do not correspond to the definition of a PA. In other words, their management is not assured in the long term, like a community area in which the community decides, legitimately, to modify the internal zoning boundaries in its management plan. This point leads us to buffer zones.

### 4.3. Buffer zones

Historically, most PAs were provided with a buffer zone around their officially classified area. This is most often a strip, measuring 3-10 km wide, for example, in which the inhabitants are not allowed to carry out certain activities judged to be harmful for the PA. These activities may include hunting, deforestation, farming, grazing, the permanent installation of houses or industrial buildings, etc.

In the vast majority of cases, these buffer zones have disappeared. The reason for this is that the inhabitant (who has the land use or property rights) cannot do whatever they want on their land. This is in fact a matter of a limitation of their rights, which is imposed on them by the PA management authority (often the State), and this is seen as being unacceptable. Rather than opposing the authority directly, the inhabitants often preferred to allow development encroachment (agro-pastoral in most cases) to advance silently, especially in the rainy seasons when movements and controls are difficult. Finally, the manager is faced with a *fait accompli*: the buffer zone has disappeared.

The alternative is to favour a peripheral area over a buffer zone: this is a legal spatial entity that specifies the activities that can be carried out (such as grazing in a reserve, or hunting in a hunting zone), which is created centrally by the State or in a participatory manner by local communities. This worked quite well whilst hunting was a conservation tool, but it is far from being the case today<sup>43</sup>. The creation of community areas, sometimes called “conservancies” is currently being developed on the periphery of some PAs, such as in Kenya for example where 160 conservancies manage 6.36 million hectares for the benefit of 700,000 households<sup>44</sup>. We shall study this later on in this study.

41 IUCN Papaco. Evaluation de l'efficacité de gestion des aires protégées de la République du Tchad, 2008, 56 pp. <http://papaco.org/wp-content/uploads/2015/09/Rapam-Tchad.pdf>

42 Omondi, P., et al. Total aerial count of elephants and other wildlife species in Faro, Benoue and Bouba Ndjidda NPs and adjacent hunting blocks in Northern Cameroon, WWF 2008, 75 pp. [http://www.elephantdatabase.org/system/population\\_submission\\_attachments/files/000/000/060/original/svyFCCMNOR2008AT.pdf](http://www.elephantdatabase.org/system/population_submission_attachments/files/000/000/060/original/svyFCCMNOR2008AT.pdf)

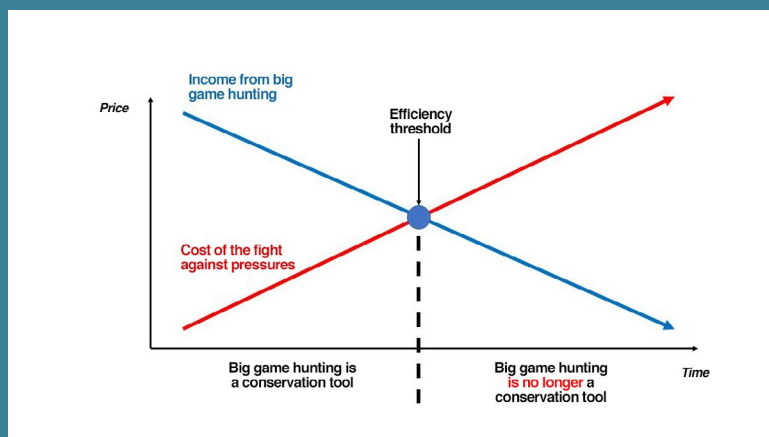
43 IUCN Papaco. La grande chasse en Afrique de l'Ouest: quelle contribution à la conservation? ISBN: 978-2-8317-1204-8. <https://portals.iucn.org/library/efiles/documents/2009-074.pdf>

44 <https://kwcakenya.com/conservancies/status-of-wildlife-conservancies-in-kenya/>

## Box 1: Beyond which threshold is big game hunting no longer a conservation tool?

Big game hunting works like a private financial company, which generates the money it needs for its investments and its operations. It should be noted that a wild animal forms part of the biodiversity that constitutes a public good. However, when the animal is killed by a hunter, it becomes a private good. Hunting cannot therefore be funded by donations of public money. Hunting is profitable when the expenses incurred for a given income are low: safaris can be sold without spending a lot of money to carry them out. This was the case for many years, when the human density was low, in very remote areas. Today, population pressures have increased considerably, as has the cost of curbing them.

When the hunting organisation does not spend (or cannot because the cost is too high) the amounts required to maintain the desirable conservation status faced with agro-pastoral encroachment and poaching, the size of habitats decreases (= a decrease in the size of hunting zones), animal populations decrease in number (= decrease in the number of animals that can be shot), the number of hunters decrease (not enough animals to shoot, price of hunting too high), and, finally, the hunting organisation's income decreases.



The calculations (see Appendix 2) show that to conserve a lion for hunting costs around 4 million USD, whilst the market price for its hunt is around 50,000 USD. And, in the absence of the hunting of flagships species, hunters are no longer interested in the area in question. This distortion reveals the incapacity of big game hunting to fund conservation and its activity. This is summed up in the following figure.

All areas do not cross the efficiency threshold at the same time. It depends on the human density, the geographical location of the zone and its context, as well as the State's political will to support conservation, etc. Many countries and zones have already exceeded this threshold and cannot go back. This is what we are seeing in many places nowadays. This sea change is often difficult for people to understand and accept, because it has many political and behavioural implications.

It is important to use this change as an opportunity and also to use it to achieve protected areas with better configurations, which will conserve nature better.

### 4.4. The role of PAs

It is important to define the role assigned to a PA. First of all, we need to bear in mind the definition of a protected area: a protected area is “a geographical space” managed “to achieve the long-term conservation of nature with associated ecosystem services and cultural values”<sup>45</sup>. Consequently, “for IUCN, only areas where the main objective is conserving nature can be considered protected areas; this can include many areas with other goals as well, at the same level, but in the case of conflict, nature

*conservation will be the priority.*”<sup>46</sup> This means that even if PAs contribute to the economy and to development, this is not their priority goal and they must first and foremost be managed to conserve nature.

Next, we must keep in mind how the categories are assigned: “The choice of category should be based on the primary objective(s) stated for each protected area...” “All categories make a contribution to conservation but objectives must be chosen with respect to the particular situation; not all categories are equally useful in every situation”<sup>47</sup>.

<sup>45</sup> Dudley, N., 2008, <https://portals.iucn.org/library/sites/library/files/documents/PAG-021.pdf>, Gland Switzerland, IUCN: x+96 p. <https://portals.iucn.org/library/sites/library/files/documents/PAG-021.pdf>

<sup>46</sup> Idem 44

<sup>47</sup> Idem



The role played by a PA thus depends primarily on the objectives it is assigned, and we will recall that the conditions become less natural as we move from Category I to Category VI, since the extent to which the environment has been modified increases (Figure 1).

Now let us try to imagine some of the possible roles PAs can play and let us look at how the configuration of the PAs can allow them to achieve this:

- **Main role: Protection of ecosystem services.** In order to achieve this, we need to preserve as many ecosystem functions and balances as possible, which requires nature to be undisturbed by humans (close to its primary state). The PA must thus ideally contain within its boundaries an entire watershed (water production) including wetlands (filtration, purification, fight against flooding) or an entire forest (significant carbon stocks, the absence of nuisance effects on forest edges). Categories I and II are probably those that best fulfil this role.
- **Main role: wildlife tourism.** This is an activity that is widespread in African PAs, given the presence of this continent's iconic species and its landscapes. The turnover from tourism in sub-Saharan Africa was 66 billion USD in 2016<sup>48</sup>, with wildlife tourism generating a significant percentage of that total. So, it plays a very important role. We should also note the key social role it plays, with tourism in sub-Saharan Africa in 2016 accounting for 8.4 million direct jobs, and 20.7 million indirect jobs<sup>49</sup>. This implies that the tourists' expectations are met, since generally they can see the iconic or rare animals in good conditions, in "virgin" nature and are able to understand and appreciate nature, etc. The "wild, open spaces" aspect is very important and it is not a coincidence that one of the main companies to organise ecotourism in Southern and East Africa is called Wilderness Safaris, referring directly to these wild open spaces. Therefore, any association with hunting is out of the question, as is the presence of human infrastructures and activities other than traditional ones and in limited numbers. So, Categories I to IV are probably the most relevant.

- **Main role: use of natural resources.** This is possible in Category VI, but the PA must first correspond to the IUCN definition. We have seen that some hunting zones, no longer managed when the allocated quotas are reduced, do not correspond to the definition of a PA. The main objective of Category VI is "*to protect natural ecosystems and use natural resources sustainably, when conservation and sustainable use can be mutually beneficial*"<sup>50</sup>. If our area is indeed a PA, the use must also comply with certain rules. "*In general, IUCN recommends that a proportion of the area is retained in a natural condition, which in some cases might imply its definition as a no-take management zone. Some countries have set this as two-thirds*". "*Category VI protected areas aim to conserve ecosystems and habitats, together with associated cultural values and natural resource management systems*"<sup>51</sup>. This means that modern and industrial exploitations are not desirable or accepted. Category VI PAs certainly have an important role to play in landscapes and help conserve ecosystem services.

In conclusion, the choice of the role to be played by the PA is thus essential, in particular at present when the economy for PA management is evolving. The increase in pressure due to population growth has changed the consumer management paradigm, as summed up by Professor Packer (University of Minnesota - USA, University of Oxford - United Kingdom):

- From 1920 to 1960, the paradigm was: "wildlife pays for its conservation",
- From 1960 to 2010, the paradigm was: "wildlife must pay for its conservation",
- In 2010, the paradigm became: "wildlife cannot pay for its conservation"<sup>52</sup>

This point is discussed in detail in appendices 2 and 3. This paradigm shift is of crucial importance when it comes to allocating roles to our PAs: the consumptive use of wildlife is far less favourable than we thought, and that must be taken into account when allocating roles to PAs. This thus leads directly to a revision of the choice of management categories.

48WTTTC (World Travel & Tourism Council) 2018, [www.wtttc.org](http://www.wtttc.org)

49Idem

50Idem 46

51Dudley, N., 2008, <https://portals.iucn.org/library/sites/library/files/documents/PAG-021.pdf>, Gland Switzerland, IUCN: x+96 p. <https://portals.iucn.org/library/sites/library/files/documents/PAG-021.pdf>

52Packer, C., 2018. <https://www.youtube.com/watch?v=STaqmtIZfcU>



#### 4.5. Management categories

The above points will lead some to wonder which management categories will be best able to protect nature in the future. There is no clear-cut answer, but we can think about this issue considering the following priority issues

- **Habitat conservation and respect for boundaries.** We saw earlier how in many countries, a number of wildlife reserves, hunting reserves and classified forests have been colonised by humans. This was noted in a previous study by IUCN-Papaco<sup>53</sup>. Let us take the case of Côte d'Ivoire, for example: deforestation and the influence of farming activities have affected classified and non-classified forests and reserves that have practically disappeared. The phenomenon has also affected some small national parks, mainly during political conflicts. However, two of the country's larger national parks (Taï and Comoé) are virtually undisturbed and only slightly degraded<sup>54</sup>. This trend is repeated in many countries. Moreover, the management budget is not always a criterion that explains the respect for the area: in Northern Cameroon, hunting zones surrounding Bénoué National Park managed by the private sector have budgets per hectare that are higher than those of the park, but the latter has not been colonised whilst the hunting zones have been colonised and can no longer be used for hunting. However, we must compare like with like and note that some national parks are not managed as Category II protected areas. This is the case, for example, of the Boucle du Baoulé National Park (Mali), which was managed as a Category VI area and this led to the degradation of the habitat, agro-pastoral encroachment and a sharp decline in the wildlife present<sup>55</sup>.

This shows the real need for a “true” national park to be managed as a Category II protected area. Some leading experts such as R. Leakey, the former chairman of the board of the Kenya Wildlife Service, believe that in the future the only areas that

will still be protected and capable of contributing to conservation in Africa will be the national parks<sup>56</sup>. He may well be right.

- **Conservation of wildlife species.** With regard to this point and, more specifically, to large animals (weighing over 10 kilos, for example), it is clear that in many countries they are generally only found in national parks, at least in terms of populations (a few isolated individuals can still be found in other locations). We have just discussed Côte d'Ivoire but this is also the case in Senegal (Niokolo Koba National Park), Togo, Niger, Nigeria, Chad, the Far North Region of Cameroon, Sudan, Ethiopia, Uganda, DRC, Malawi, etc. It can be seen that these are mainly countries with a high human population, and this foreshadows the future. A Papaco study showed that, where management levels are similar, the national parks have higher wildlife densities than those of the peripheral conservation zones<sup>57</sup>. The *Great Elephant Census* showed the importance of protected areas. Broadly speaking, 84% of the 350,000 elephants counted on the African savannas in 18 countries surveyed were in PAs<sup>58</sup>, but equally, with an average density twice as high, there were 0.44 elephants/km<sup>2</sup> in the PAs compared with 0.23 /km<sup>2</sup> outside the PAs. More specifically, in Tanzania, the same *Great Elephant Census* revealed the sometimes enormous differences between a national park like the Serengeti whose elephant population rose from 2,143 in 2003 to 6,087 in 2014, whilst the number of elephants in the Selous Game Reserve dropped from 70,400 in 2006 to 13,200 in 2014. Therefore, this means a 16.7% annual increase for the Serengeti National Park and an annual decrease of 9% for the Selous Game Reserve. The differences in management for two management types, in the same country, are thus clear and favour national parks.

53 IUCN Papaco. La grande chasse en Afrique de l'Ouest : quelle contribution à la conservation ? ISBN: 978-2-8317-1204-8. <https://portals.iucn.org/library/efiles/documents/2009-074.pdf>

54 IUCN-Papaco, Evaluation de l'efficacité de gestion des aires protégées de Côte d'Ivoire, 2007. <http://papaco.org/fr/wp-content/uploads/2015/07/Rappam-Ivory-Coast.pdf>

55 Lauginie, F., 2009. IUCN-Papaco & Afrique Nature International. Evaluation externe indépendante de la gestion des Aires protégées du Mali. 109 p. <https://portals.iucn.org/library/sites/library/files/documents/Rep-2009-021.pdf>

56 [https://www.iucn.org/crossroads-blog/201803/protected-areas-hope-midst-sixth-mass-extinction?utm\\_campaign=2055382\\_Protecting%20the%20Planet%20-%20March%202018&utm\\_medium=email&utm\\_source=IUCN&dm\\_i=2GI3,181XY,40EIEG,3VLOV,1](https://www.iucn.org/crossroads-blog/201803/protected-areas-hope-midst-sixth-mass-extinction?utm_campaign=2055382_Protecting%20the%20Planet%20-%20March%202018&utm_medium=email&utm_source=IUCN&dm_i=2GI3,181XY,40EIEG,3VLOV,1) and <http://papaco.org/wp-content/uploads/2018/05/lettreNAPA-119-0518-EN.pdf>

57 IUCN Papaco. La grande chasse en Afrique de l'Ouest: quelle contribution à la conservation? ISBN: 978-2-8317-1204-8. <https://portals.iucn.org/library/efiles/documents/2009-074.pdf>

58 <http://www.greatelephantcensus.com/final-report/>

- **Socio-economic impacts.** This is an important point. Since the pressures are of human origin, it is important that a significant number of people have financial interests in the proper functioning of the PAs in order to encourage a larger number of people to respect them. Thus, in Kenya, tourism, with the country's wildlife being the main attraction, generated a turnover of 2.8 billion USD in 2017, which directly supported 429,500 jobs<sup>59</sup>. Similarly, in Botswana, in 2017 wildlife tourism generated a direct turnover of 687 million USD for 26,000 direct jobs<sup>60</sup>. The socio-economic impacts will play a key role in the future of PAs, by involving a large number of people (one paid job providing a livelihood for around ten people in Africa) who have a vested interest in ensuring that the PAs are in good condition. This is particularly the case thanks to wildlife tourism, which is mainly carried out in PAs and especially in Category II protected areas (national parks). Thus, in June 2018, Tanzania announced that it was going to upgrade five wildlife reserves to national parks, in order to develop wildlife tourism<sup>61</sup>.
- **Running cost.** The cost of technical management, including development (trails, bush fire management, etc.) and monitoring, in order to achieve the same management result, is the same for a given surface whatever the management category or even outside the PA (this is the case of areas that contribute to conservation). This cost currently stands at around 7 to 8 USD/hectare/year in unfenced savanna zones, as seen above. A fenced zone costs much more (as much as 7 to 8 times more, as mentioned earlier), due to the cost of installing the fences (in Namibia, in 2018, the cost of 1 km of fence in Etosha National Park to stop wildlife escaping, including elephants and large carnivores, is 700,000 Namibian Dollars, in other words 53,000 USD<sup>62</sup>), and then one has to add the costs of the daily monitoring and maintenance. It has also been estimated that one dollar protects more lions in an unfenced zone than in a fenced

zone<sup>63</sup>. For the future, it is important to fund the conservation of PAs with the highest potential, in other words those with the greatest chances of success in conserving natural values in accordance with the current and future levels of pressure and threats.

- In conclusion, there is no easy answer; each case is unique. However, all things being equal, the Category II protected areas appear to have a series of advantages, which puts them in a good position for the future. Since pressures on natural values mainly originate in the periphery, it is important to know how to manage them as well as possible, in order to conserve both the interests of the PA and those of the surrounding communities. It is impossible to separate these two entities.

## 5. In this context, how should the periphery be managed?

The periphery of a PA starts at the boundary. More often than not, the State-owned property stops at the boundary and, depending on the case and the country, the private sector or communities have jurisdiction over the periphery. There may or may not be a land title, and sometimes only usage rights are vested in the communities. As we have seen, most PA buffer zones have disappeared. Mainly due to the usage restrictions imposed by the State on the rights holders. For several years now, we have seen peripheral areas emerge that were created on a voluntary basis by the rights holders, who continue to govern and manage them. They lay down the rules and reap the benefits.

These voluntary, democratic peripheral areas are of great interest because they make it possible to create a transition zone between the conservation area (PA) and the development zone, whilst retaining the natural features that favour the sustainability of the PA's values, and also foster the development of communities and the private sector. In many cases, these areas are called "conservancies". Moreover, it should be noted that a conservancy is sometimes situated on the periphery of a PA, but not always. There is a detailed analysis of conservancies in Appendix 4.

59 <https://www.wttc.org/-/media/files/reports/economic-impact-research/countries-2018/kenya2018.pdf>

60 <https://www.wttc.org/-/media/files/reports/economic-impact-research/countries-2018/botswana2018.pdf>

61 The East African, 5 June 2018. <http://www.theeastafrican.co.ke/business/Tanzania-woos-tourists-to-parks/2560-4596772-otv8wwwz/index.html>

62 New Era, Namibia, 4 June 2018. <https://www.newera.com.na/2018/06/04/completion-of-etosha-fence-to-cost-government-over-490-million/>

63 Creel, S., Ecology Letters 2013, DOI: 10.1111/ele.12145. <http://www.mjkelly.info/Publications/Creel%20Lions%202013.pdf>

There are private conservancies for which an owner has a land title and devotes his/her property to the management of natural resources and fauna. Sometimes several owners get together and manage their land using the same management type. In accordance with the country's land tenure, we can thus find this kind of entity right on the periphery of a PA. Examples of these entities include those flanking the western boundary of the Kruger National Park in South Africa (Sabie Sands Game Reserve, Timbavati Game Reserve, etc.).

There are also community conservancies in which community land is governed by a democratically elected body, which adopts a management plan for its land, reserving part for the management of natural resources and wildlife, part for cattle breeding, part for farming, part for houses and infrastructures, and part for development. The zone reserved for natural resources only represents a part, a variable proportion of the conservancy.

In other cases, such as on the periphery of the Maasai Mara National Reserve in South-Western Kenya, the communities have individual land titles and the owners met to create conservancies, which are managed for wildlife and cattle, thanks to a grazing land management plan that evolves over the course of the season and in accordance with periods of drought. This thus allows for adaptation to the vagaries of the climate. In this case, thanks to tourism, wildlife management generates the majority of the conservancy's funding. These conservancies are of great interest because they are created voluntarily and democratically, and increase the amount of protected land on a voluntary basis, funded by wildlife tourism, without excluding development.

A key point is the importance of the economic benefits, as communities will take ownership of conservation action only when benefits are significant for them.

In Namibia, there are 82 conservancies, which cover 165,000 km<sup>2</sup>, in other words 20% of the country's total land area. However, this does not imply that 20% of the country is covered by additional PAs: it means that 20% of the country is subject to community management with a natural resources management plan. The parts that are really conserved (the central or core areas) only represent a (variable) part of this 20%. More often than not, they are not adjacent to a PA, and conservation areas between neighbouring conservancies are not generally joined. This does not favour the conservation of large species that are of interest in wildlife tourism, but it can increase the number of human-wildlife conflicts, since human habitats are scattered among the areas assigned

to fauna. The economic benefits for the 200,000 people inhabiting the conservancies are generated by the association of wildlife tourism with big game hunting, which generated 7.4 million USD. The most profitable activity is tourism (although this only concerns less than 50% of the conservancies), generating 58.3% of the income and creating 950 jobs. The analysis shows that the income is insignificant per person, with big game hunting providing around 1.5 million USD/year to all the conservancies<sup>64</sup>, in other words 0.09 USD/ha per conservancy or 7.5 USD/person per year. These very low figures are perhaps still of interest in the context of Namibia, which is very sparsely inhabited, but they would not be in the vast majority of other African countries.

This analysis allows us to draw the following conclusions that can improve the management of PAs in the future, whilst making populations a more integral part of their management:

- Favour the creation of community conservancies on the periphery of protected areas wherever possible.
- Favour the development of wildlife tourism on the basis of these conservancies, in the conservancies but also (and especially) in PAs, promoting private sector-community partnerships.
- Favour the hosting structures in these conservancies and not within the PAs, in order to maximise the profits from tourism for local communities, thereby maximising the effect of the conservancies.
- We must not only favour the conservancies that adjoin a PA (plus those that do not), but, during the planning stage, we must also ensure that the conservation zone (core area) is directly adjacent to the PA. If this is not the case, the conservation effect will be reduced and human-wildlife conflicts will increase.
- The coordination between conservancies must also be promoted to ensure that, when they are being planned, their conservation zones are adjacent. This will favour the conservation effect by increasing the global useful surface area conserved and encourage connectivity. It will also favour tourism and thus the economic returns and, finally, the sustainability of the action.

<sup>64</sup>Naidoo, R., et al. Complementary benefits of tourism and hunting to communal conservancies in Namibia, 2016. *Conservation Biology*. DOI: 10.1111/cobi.12643. <https://www.ncbi.nlm.nih.gov/pubmed/26537845>

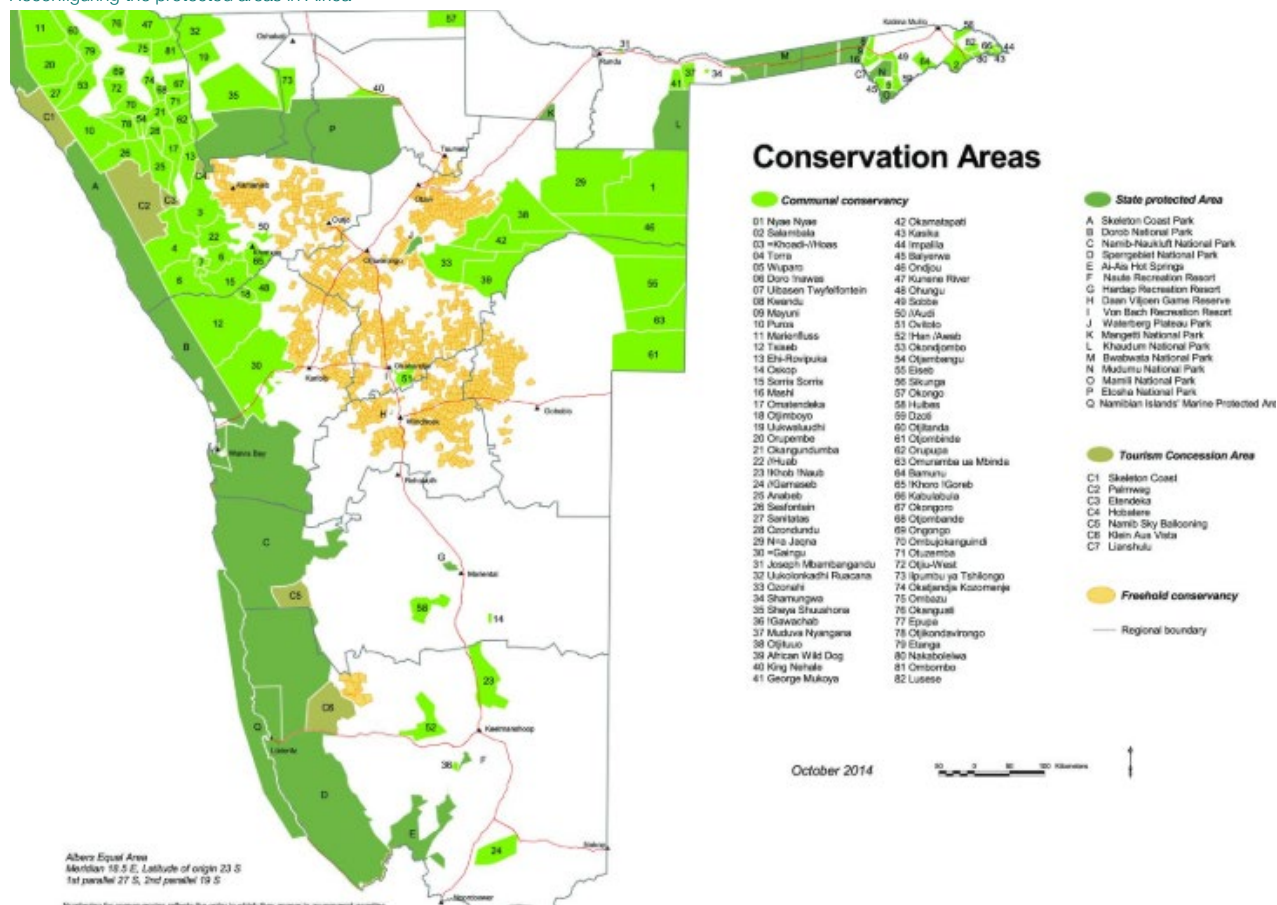


Figure 5: Map of conservation areas in Namibia.  
Source: NACSO

- The governance must be planned at several levels: for each conservancy, for all the conservancies, for all the protected landscapes, and by linking the conservancies and the PAs.

## 6. Should all the PAs be conserved, should new ones be created or, on the contrary, should some be abandoned?

In order to answer this question, first of all we need to remember the objective: to expand the global protected area network to 17% of the Earth's land surface, irrespective of the category. Areas not considered as PAs (classified forests, most hunting zones, etc.) are added to this 17% without contributing to it. The next question is logically: what percentage of PAs do we have in our country?

Let us take the example of a country like Tanzania, which has 57,000 km<sup>2</sup> of national parks for a total national land surface area of 945,000 km<sup>2</sup>, in other words 6.0%<sup>65</sup>. Additionally, there are 176,300 km<sup>2</sup> of other types of PA (in accordance with Tanzanian law), including the Ngorongoro Conservation Area, 28 wildlife reserves (that are all or partially hunting zones) and 43 Game Controlled Areas<sup>66</sup> (which are hunting zones), in other words 18.7%. However, much of this land is in fact used for hunting and does not match the IUCN definition of a PA. Additionally, there are other types of PAs, making a total of 233,000 km<sup>2</sup>, in other words 24.65% of Tanzania's land surface area. Thus, we can see that the 17% objective has been substantially exceeded, but that many of these PAs (18% of the country's surface area)<sup>67</sup> are not PAs in the international

65 Tanzania National Parks, 2018. <http://www.tanzaniaparks.go.tz/index.php/2016-02-03-12-30-54/2016-02-03-12-31-41>

66 Ministry of Natural Resources and Tourism, Tanzania <http://www.mnr.go.tz/about/category/ministry-overview>

67 Big game hunting is possible on 300 000 km<sup>2</sup> of land in Tanzania, all categories combined, in other words 31.7% of the country! <http://www.conservationforce.org/tanzania-hunting-operator-report>



sense, and they are largely degraded or unused, as mentioned earlier.

We can thus ask ourselves whether it is appropriate to exceed the 17%, and finally note that these PAs are not protected areas, or they have become degraded and are no longer protected. It seems important:

1. To cover 17% of a country's land surface in PAs that correspond to IUCN recognised categories.
2. That this 17% of the land is made up of real, efficiently managed PAs. This implies that the necessary budget needs to be available. Managing 17% of the surface area of Tanzania efficiently requires a budget of at least 120 million USD per year to manage 16 million ha.

In reality, very little money is spent outside of national parks for conservation in Tanzania (see Appendices 2 and 3): the hunting advocacy group "Conservation Force" stated that between 2013 and 2015, 27 hunting operators exploiting 121,400 km<sup>2</sup> spent 2.24 million USD, in other words 0.18 USD/ha/year<sup>68</sup>. Today, no one can achieve proper management with such modest management budgets.

This example clearly shows the importance of choosing the role, the status, the category of a PA and finally of having a sufficiently large budget for the management before deciding whether it is desirable to realign a protected area network. We can propose several simple elements in response to the questions below, to serve as a basis for reflection:

### *Should they all be conserved?*

If we analyse the real management categories of all the PAs, country by country, we will reach the conclusion that, for most countries, the 17% target has not been reached. However, countries present as PAs, areas that do not meet the IUCN PA criteria, even though they contribute to conservation on another level. Thus, the total number of PAs wrongly represents an extremely high percentage of the national surface area.

So, according to Lindsey<sup>69</sup>: Central African Republic, Tanzania, Zambia and Botswana have totals (PAs + Big game hunting areas) of 43%, 40.5%, 29.2% and 41% respectively of the country's land surface area supposedly devoted to conservation.

As we have seen, the income generated by wildlife does not fund its conservation, since it is extremely inadequate. This means that no State can budget the sums of money required for the management of 40% of its land simply for conservation. Moreover, the benefits for the communities are very limited: between 2013 and 2015, the above-mentioned 27 hunting operators in Tanzania distributed to the communities an average annual sum of 1.04 million USD, in other words 0.08 USD/hectare per year<sup>70</sup>. So, hectares of land with extremely low productivity for conservation (or hunting in this case) are taken from the populations<sup>71</sup>. In these conditions, it is inconceivable that 40% of a country could be devoted to an activity that does not generate the well-being expected by its inhabitants. It would probably even be counterproductive. Many people believe it is legitimate to take back from the State what it is giving to wildlife to the detriment of its population.

Thus, except perhaps in very sparsely populated countries that are also quite rich, such as Botswana, the response will be not to exceed the 17% threshold, but rather to manage it properly, starting by funding it sufficiently.

69Lindsey, P.A., et al. Economic and conservation significance of the trophy hunting industry in Sub-Saharan Africa. Biological conservation 134 (2007) 455-469. <https://www.perc.org/wp-content/uploads/2015/08/Economic-and-conservation-significance.pdf>

70Conservation Force, Tanzania Hunting Operator Enhancement Audit, 2016, <http://www.conservationforce.org/tanzania-hunting-operator-report>

71Tanzania has an average human population density of 62 people per Km<sup>2</sup>, in other words 0.62 per hectare. <http://countrymeters.info/fr/Tanzania>

68Conservation Force, Tanzania Hunting Operator Enhancement Audit, 2016, <http://www.conservationforce.org/tanzania-hunting-operator-report>



*Should more PAs be created?*

A simple map of Africa's human density shows us that it is practically impossible to find significant areas to classify in order to extend the PA network further. Nowadays, it is no longer conceivable to remove inhabitants from their land in order to create a PA. The only land that can still be categorised as PAs is land that is considered marginal for humans. But is this land important for conservation beyond what has already been classified? It would appear preferable to carry this process out in two stages:

- *Analyse the gaps in the PA network*<sup>72</sup>, and identify the biological features (habitats, species, etc.) not covered properly by the network. Then, study to what extent it is possible to take them into account in the PA network. Bearing in mind what we have seen above, there is surely a need for a greater focus to be placed on the reclassification of protected areas and areas that contribute to conservation (conserved areas) than on the creation of new zones.
- Analyse the current network of PAs and areas that contribute to conservation to see to what extent it is possible to make them more effective by improving the configuration (surface area, boundaries, management category, real PA). In many cases, we may only focus on part of the existing area to take the realities into account: the effective agricultural encroachment, human settlements, balancing the land with the available management budget, the need to straighten boundaries (avoiding indentations, for example).

The taking into account of realities (human density, existing human settlements, the available management budget, etc.) will probably lead more to the reconfiguration of a certain number of PAs, the classification of part of the areas that contribute to conservation as PAs, than to the creation of new PAs, within the threshold of 17% of the country's land surface.

*Should some PAs be abandoned?*

The two above-mentioned analyses should give us a good idea of the utility and the reality of numerous PAs. It is clear that some have already disappeared, and others are simply paper parks. In a context where the available budget is essential and fragmentation leads to the

deterioration of the whole, it is clear that prioritisation should be carried out by allocating the necessary budgets to the main PAs. The question is therefore to find out how one determines whether a PA is of high priority, if all the PAs contribute to the quality of the network? If they are not prioritised, there is a risk that everything will be lost. In other words, should one car be given enough fuel to allow it to reach its destination or should all cars be given a little fuel so that none of them arrives? In practice, it is likely that some PAs will be better funded than others. The objective remains first of all to increase the budget available for the network. Thus, in Kenya, in 2015 the Kenya Wildlife Service (KWS) had a budget of 68 million USD<sup>73</sup> to manage a network representing 8% of the country's 580,000-km<sup>2</sup> surface area, in other words 46,400 km<sup>2</sup>. The budget therefore corresponds to 14.65 USD/ha/year. Whilst this level is already excellent, very few countries have budgets of this size (above the recommended average). It should also be noted that all PAs are not funded in the same way: national parks are under the exclusive jurisdiction of KWS, whilst national reserves are controlled by the regions (decentralisation), which have to finance them. Moreover, KWS provides support for community and private conservancies, whose surface area extends beyond the 8% of the proportion of the national PA network. So, this example shows that the budget must be sufficiently large but that it must also take the periphery and the communities into account. The budget must therefore be differentiated without the PAs being prioritised, since they are all important.

We must stress that the act of abandoning PAs is not insignificant. When the latter were gradually colonised illegally by agro-pastoral encroachment, degazetting the PAs and allowing them to be encroached by agriculture was a victory to illegality and was thus validated. Since the first condition of nature conservation is respect for the state of law, we put future wildlife conservation on the wrong track by degazetting illegally colonised areas. In terms of communication, it is the worst possible message you could send. It is a clear incentive to continue the degradation of the PAs.

To address this issue, we need to focus on reclassification rather than degazettement, and on budgetary prioritisation rather than the prioritisation of categories.

<sup>72</sup>Identification and Gap Analysis of Key Biodiversity Areas. 2011. Gland, Switzerland: IUCN. xiii + 128pp. <https://portals.iucn.org/library/efiles/documents/PAG-015.pdf>

<sup>73</sup><http://www.kws.go.ke/content/annual-reports>

To sum up, the objective is indeed to ensure that 17% of a country's land is covered in real PAs (and not areas contributing marginally to conservation). In many densely populated countries, the additional percentages of so-called conservation areas are not well received by the population, especially when we know that the economic benefits they generate are not sufficient to ensure conservation. In an insufficient budgetary context, they may even have a negative effect, causing the whole network to be underfunded. This would not allow priority conservation to succeed and would incite communities to remove illegally these excessively large parts of the land that they need to live. This point now leads us to discuss the PADD phenomenon ("Protected Area Downgrading, Downsizing and Degazettement" in other words the decrease in categorisation, in surface area and the declassification of PAs).

## 7. What is happening with the PADD phenomenon currently underway?

The phenomenon of the downgrading, downsizing and degazettement of PAs refers to the modification in the legislation that decreases the land use restrictions (human activities) on PAs, the boundaries of a PA or totally eliminates the legal protection<sup>74</sup>. It is an important phenomenon and over 3,000 cases have been documented in 70 countries<sup>75</sup>.

Listed below are a few real cases from Africa that were published in the literature<sup>76</sup>.

- In Central African Republic, the authorisation given to the Ba'Aka pygmies to use 2/3 of the former Dzanga-Sangha National Park led to the classification texts being changed and the protected area being called the Dzanga-Sangha Special Reserve. This is classified as downgrading. Changing usage rights in conservation is thus not insignificant.
- The surface area of Akagera National Park in Rwanda was reduced (downsizing) after the invasion by the population during the events of the 1990s, the North of the park having ceased to be an effective conservation area.

- In Tanzania, the Ruvu Game Reserve was abolished after being encroached by the population and in order to develop agro-pastoral activities (degazettement).

In addition to these actions that have been implemented, we should mention those that have been proposed and often concern planned industrial infrastructures. For example, this is currently the case of the planned hydroelectric dam in the Selous Game Reserve<sup>77</sup>, a World Heritage Site in Tanzania. This construction would significantly change the ecological functioning of this reserve. Another example is the case of a planned uranium mine<sup>78</sup> in the same reserve, which would reduce the size of the latter by 0.7%.

Many well-known infrastructure development projects and other legal actions are undertaken within the framework of PADD. However, they probably only represent a tiny part of the insidious phenomenon resulting from the gradual occupation by local communities of numerous PAs or areas that contribute to conservation. Let us take the example of Zambia: we mentioned earlier that 40% of the hunting areas in Zambia, which represent 21.3% of the country, were occupied by agriculture<sup>79</sup>, in other words 8.5% of the entire country. Although this downsizing is not recognised in the official texts, it is highly significant. Moreover, it is accompanied by downgrading, which was not officially recognised in the regulations (in other words, the authorisation given to the communities to farm in hunting areas) but was recognised in 2008, in its consequences, by the official classification of areas rich in wildlife (Category I), moderately rich in wildlife (Category II) or depleted of wildlife<sup>80</sup>.

It is however unusual for national administrations to recognise they have failed to conserve what they were responsible for, just as they are very reluctant to admit that an animal they were supposed to protect has become extinct. Extinctions are generally announced by the international community rather than national administrations<sup>81</sup>. Moreover, it should be noted that when PAs or areas that contribute to conservation are concessioned for exploitation (consumptive or

<sup>74</sup><https://www.conservation.org/projects/Pages/PADD-Protected-Area-Downgrading-Downsizing-Degazettement.aspx>

<sup>75</sup><http://www.paddtracker.org/>

<sup>76</sup>Mascia, M.B., et al. Protected area downgrading, downsizing, and degazettement (PADD) and its conservation implications. *Conservation Letters* 2010, <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1755-263X.2010.00147.x>

<sup>77</sup><https://www.wwf.de/fileadmin/fm-wwf/Publikationen-PDF/WWF-Report-Selous-True-Cost-Of-Power.pdf>

<sup>78</sup><https://www.bbc.com/news/world-africa-13989264>

<sup>79</sup>Watson, F.G., et al. Human encroachment into protected areas network in Zambia. *Reg environ change* 2014. DOI 10.1007/s10113-014-0626-5

<sup>80</sup>Lindsey, P.A., et al. Underperformance of African Protected Area Networks and the Case for New Conservation Models: Insights from Zambia, 2014. *PlosOne*. <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0094109>

<sup>81</sup><http://news.bbc.co.uk/2/hi/science/nature/5167266.stm>

otherwise), for their entire surface area or part of it, the price is often based on the number of hectares allocated. Accepting that the land to be rented out (very often State land) has decreased entails accepting that the administration has not protected the land it was meant to manage properly and accepting a reduction in the State resources from the concession, which is problematic. This results in these degradations not being reported or even being hidden. These areas account for a considerable amount of land in Africa.

The main question conservationists are asked is: what should be done with these degraded areas and zones? Should their loss be legalised by introducing a legal act?

Let us consider first of all the case of part of a PA, which makes an important contribution to nature conservation. It will be important to keep it in the network, either by increasing its protection status to ensure that its natural resources are less degraded, or by adding another PA adjacent to this area. The boundaries of this new body must be clearly defined, for example via a large track created mechanically or, in extreme cases, by a fence (not to “enclose” the PA, but instead to mark out one of its threatened boundaries).

So, what should be done with the other part of the PA that has been degraded? We have seen that official degazettement would send out the wrong message, inciting populations on the periphery to continue to encroach on the PA. We have also seen that it was not easy for the administration to admit to its management failures through an official act in cases where it had not carried out its mandate properly. In many instances, maintaining the status quo is not a bad solution. The absence of a solution could be a practical and acceptable way out.

In some cases, it will be possible to implement community management of the periphery, but the crucial point remains the voluntary approach: good community management is an emanation of the community, and not of the central government. A top-down approach has every chance of failing and, after a few years, we will be faced with agro-pastoral encroachment instead of a community area. If, on the other hand, there is a real community demand, on the land for which they are the rights holders, it will be appropriate to support the approach. However, community management is not designed for being implemented on land that belongs to the State.

In short, the wisest course of action seems to be to reclassify what is required for the functional PAs and not degazette what is less important.

## 8. Should the rights and duties of the different stakeholders involved be redefined?

In the field of PAs, discussions are constantly being held on who has the right or the duty to do or not to do something, regarding the different stakeholders. The different stakeholders mainly include:

- The State: in charge of sovereign functions (legislation, safeguarding public order, control and justice), and it is the State that is finally responsible for management of State land.
- Technical and financial partners that include the international donors, who provide funding, which is sometimes accompanied by technical support.
- Conservation NGOs: they take care of technical implementation and governmental advocacy, and it is hard to balance these two tasks.
- Private sector: it carries out certain activities within its area of interest, since the private sector cannot carry out loss-making activities.
- Local communities: these are the neighbours of the PAs, supporting their opportunity cost and more often than not they receive very little in exchange. Most of the pressures that are placed on PAs come from these communities.

However, in practice, this distribution is not so simple and one of entities frequently does not play its part or encroaches on land belonging to others. Numerous management problems then arise. As the saying goes: “good fences make good neighbours”. Thus, if the State is unwilling to exercise its sovereign functions, no other body will be able to replace it. Good governance is the basic element of conservation<sup>82</sup>. The desire to replace it cannot be a guarantee of success in the long term.

<sup>82</sup>Minister Tshekedi Khama, Botswana, May 2018. <https://www.facebook.com/WeAreAfricaTravel/videos/1534375810001231/UzpfSTE3Mjg4NTI4MzMwOToxMDE1NTU5ODQ4OTEzODMxMA/>

On the ground, it is common to see an entity wanting to have more power and trying to take the place (and the rights) of others. They give many reasons for this: “The State is not doing its work”, “such-and-such organisation does not have the skills”, “the local communities are being robbed and should have more power”, “the local communities are indigenous and thus know more about how to manage the land”, etc.” These arguments show no sign of stopping. As the essayist La Rochefoucauld once said, “*Quarrels would not last long if the fault were only on one side*”<sup>83</sup>.

It is the State’s duty to establish the governance framework, in other words for each geographical entity, to specify who makes the decision and how. It is then its duty to ensure the rules are enforced properly. Thus, the management rules for the State’s land are established for the smooth running of the State: for example, the central bank’s safe is not managed by people in the street. The PAs, the safes of biodiversity, will therefore not be managed by their opponents who, *in fine*, want it to disappear. Similarly, community land is meant to be managed by the community itself and not by another community, an association of communities or another body. It is the principle of subsidiarity. A private property will be managed by its owner, respecting rules (legislation).

In this context, the main aspects that we feel it is important to improve are, for each of the partners:

- The State: it should achieve good governance and the rule of law. It should prevent socio-political conflicts, which are the prelude to the destruction of nature and of PAs. It should draw up a PA strategy that can be funded and to build capacities at all levels in order to implement it. Finally, it must manage the State land, which is a public good.
- Technical and financial partners: they should take into account the real financial needs of the PAs and help finance them. They should provide funding in accordance with the PAs’ national strategy in order to maintain a uniform approach and fund all the PAs and activities that deserve it. Public funding is essential for financing public goods such as PAs, the intention being that a global public good (biodiversity in this case) should be financed by international public funds.
- Conservation NGOs: they should not mix the search for funding, political lobbying, environmental advocacy, and technical substitution, or follow short-term trends.
- Private sector: it should devote itself to the implementation of operations from which it will benefit financially, which is its mission. It is an occasional service provider for indispensable infrastructures, its role in tourism, etc. Besides, private companies (private goods) are not eligible for the donation of public funding.
- Local communities: they should be able to govern themselves, and thus choose what they want to do with their land. Forcing them to make a choice would be synonymous with failure. Imposing a method of implementation on them (without respecting the principle of subsidiarity, for example), would also lead to failure. The actions chosen by the community must be compatible with those implemented in the neighbouring PA. One important point is that the local communities are eligible for public funding for development. This development must be conservation-dependent, in other words the funds really must depend on the conservation result generated.
- In this context, there needs to be a consultation framework between the partners. This framework must be set up by the State and comply with good governance. This is a key point and everyone should have the chance to express themselves and to be heard, in particular via forums represented in decision-making boards of directors. Transparency is essential, as is the absence of corruption and any dictatorial excesses. Each entity should feel that they are a partner in the PA’s global policy, because if any of them feels left out this will inevitably generate frustration and a feeling of rejection, to the detriment of conservation and biodiversity.
- This consultation framework must be situated at a local level, for each PA, bringing together all the partners involved in the PA and on its periphery, allowing them all to express themselves, and for the decisions to be taken in accordance with the governance and after they have all been able to express themselves (representative and inclusive character).

<sup>83</sup> François de La Rochefoucauld, *Réflexions ou sentences et maximes morales*, Paris, 1665



## 9. Recommendations

### 9.1. Global context

Nature conservation in Africa is in a bad state, but it is improving in areas where nature is protected, in particular within PAs. It is important to develop PAs, so that they can perform their role more efficiently in a changing context. The main causes of this change are population growth (locally) and climate change (globally).

- Having a PA is therefore important, but it is not enough: they must be managed properly and sufficiently.
- Since the pressure is increasing, we also need to increase the means required to offset it, with the budget being the essential element.
- Numerous protected areas are thus suffering today, as a result of the application of solutions used in the past with budgets that are far too low. It is therefore not surprising that they do not achieve the expected conservation results. So, it is important to identify which budgetary and technical solutions can be used to improve their results.

### 9.2. Reconfiguration principles

The function assigned to PAs is to conserve the composition, structure, function and evolutionary potential of biodiversity. The PA must be large enough to allow the different populations that are to be conserved to have sufficient numbers in order to ensure their viability, and to ensure that the different species can interact to guarantee the necessary balances in the functioning of ecosystems. This takes climate change into account: in a large PA for example, the rain may only fall in only one location and the movement of animal species to benefit from this will always take place within the PA.

- In order to provide better protection for functional balances, to allow the population viability threshold of many species to be crossed, to decrease the intensity of wildlife-human conflicts and take into account the problems caused by climate change, it would be advisable to increase the size of some PAs.

- Up to what surface area should the size of PAs be extended? The cost of managing a savanna PA is currently around 7 to 8 USD/ha/year. Budgetary availability is essential in order to define the extension of a PA. In practice, and in accordance with the budget, in a savanna zone, a surface area of 3,000 to 5,000 km<sup>2</sup> brings together numerous environmental objectives and budgetary requirements.
- Where will we find the necessary space? Nowadays, it is no longer conceivable to evict human populations in order to make PAs larger. Today, we can restructure part of former PAs or favour the emergence of zones protected by communities, which are voluntary instruments (conservancies).
- Recently, a new opportunity arose: to integrate into the PAs all or part of former hunting zones that are no longer viable.

### 9.3. Configuration elements

The size of the surface area and the redefinition of the boundaries of a PA should take the following points into consideration:

- The conservation of all the hotspots for wildlife species and sensitive habitats.
- The conservation of all the distribution ranges of the main species.
- The contribution to connectivity. The classification of connectivity areas rather than corridors is a very interesting instrument, in particular because the natural state is the best, since it allows for a larger number of natural functions and will have a better impact on conservation. Naturally, the ideal is for the connectivity area to be classified as a PA, but that is not always possible.
- The main point is to avoid the boundary being a line such as a large river where there is a high wildlife density.
- The alternative is preferring a peripheral area to a buffer zone.
- The choice of the role to be played by the PA is essential, in particular at present when the economy of the consumptive management of wildlife has been undermined.

- The consumptive use of wildlife is less favourable than we thought, and that must be taken into account when allocating roles to PAs. Today, wildlife cannot pay enough for its conservation.
- The change of management category can have a major influence on the fulfilment of conservation objectives. We sometimes speak of “raising the protection status” when the management category changes from VI to I, as a reminder that the conditions will be more natural.
- All things being equal, Category II protected areas appear to have a series of advantages, which put them in a good position for facing the future.
- Since pressures on natural values mainly originate in the periphery, it is essential to know how to manage them in order to conserve both the interests of the PA and those of the surrounding communities. It is impossible to separate these two entities.
- Fencing a PA is one solution that is sometimes recommended. We should bear in mind that one dollar protects more lions in an unfenced zone than in a fenced zone. The fence will first of all be seen as a tool for limiting local conflicts more than for isolating the PA from the periphery.
- It is important to fund the conservation of PAs with the highest conservation potential, in other words those with the greatest chances of success in conserving natural values in accordance with the current and future levels of pressure and threats.
- When the main income comes from wildlife, the communities are able to see the benefits of their actions to protect the wildlife directly. This is a “conservation-dependent” action, which is very important.
- These conservancies are going to allow for the creation of an ideal peripheral area for the neighbouring reserve, by integrating development and conservation, if the management plans are well designed and applied.
- If these community management structures are elected, representative and inclusive, they will allow for greater insight into the management of human-wildlife conflicts, improving agro-pastoral practices by basing them on prevention.
- We shall promote the importance of the economic benefits (therefore tourism) because, depending on whether they are significant or not for local communities, the latter will take ownership of the conservation action or not.
- Thus, we shall promote the development of tourism structures (that respect the environment) inside conservancies instead of inside PAs. The tourists will thus visit PAs starting off in the conservancies.

#### 9.4. The management of peripheral zones

Community conservancies have many advantages and it would be a good idea to promote their creation and functioning:

- To promote conservancies on a truly voluntary and democratic basis, respecting the principle of subsidiarity (small entities), which favours improved appropriation.
- To favour conservancies directly on the periphery of a PA because they can benefit from the natural and economic value of this PA (if there are no consumer activities, so as to avoid limiting the natural values of the PA).
- These conservancies can be largely financed by wildlife tourism, which increases the conservation effect. In the absence of benefits generated by the wildlife, the development role of the conservancy will take precedence over the conservation role.

#### 9.5. Configuration of the PA network

The objective is to classify 17% of the Earth's land surface as PAs, irrespective of the category. The areas not considered as PAs (classified forests, most hunting reserves, etc.) can be added to this 17%, without them contributing to it. Therefore, it seems important:

- To ensure 17% of a country's land surface is classified as internationally recognised PAs.
- That this 17% is made up of real, efficiently managed PAs. This implies that the necessary budget needs to be available.

We shall be able to attain these objectives by answering the following questions:

- Should they all be conserved? We shall try to avoid exceeding the threshold of 17% of the country's land surface, and attempt to manage it well, starting by financing the PAs properly.
- Should more PAs be created? Taking the realities into account will probably lead more to the reconfiguration of a certain number of PAs, the classification of part of the areas that contribute to conservation as PAs, than to the creation of new PAs, within the threshold of 17% of the country's land surface.
- Should some PAs be abandoned?
- Priority will be given to reclassification over degazettement, and to budget prioritisation rather than prioritising management categories.
  - The percentages over 17%, in many densely populated countries, are not well received by the population, especially now that we know that the economic benefits they generate are not sufficient to ensure conservation.
  - In an insufficient budgetary context, zones over 17% may even have a negative effect, dragging the whole network towards an underfunding situation, which will not allow priority conservation to succeed and will incite communities to remove illegally these excessively large parts of the land that they need to live.
- What should be done with the part of the PA that has been degraded? We have seen that official degazettement would send out the wrong message, inciting populations on the periphery to continue to encroach on the PA. The wisest course of action seems to be to reclassify what is required for the functional PAs and not to degazette what is less important.

## 9.6. Relations between the stakeholders

The operation of a PA is ensured thanks to the joint actions of different stakeholders. Discussions about the rights and duties of the different stakeholders are ongoing and sources of conflict and inefficiency. The essential points to implement are that:

- Each stakeholder should respect their role and not encroach on other people's role.
- The State must be willing to exercise its sovereign functions, since no other body can replace it.
- Good governance is the basic element of conservation.
- It is the State's duty to establish the governance framework, in other words for each geographical entity, to specify who makes the decision and how.
- It is then its duty to ensure the rules are enforced properly.
- There needs to be a consultation framework between the partners. This framework must be set up by the State and comply with good governance.

More specifically, the following recommendations concern each category of partner:

- The State should:
  - Achieve good governance and the rule of law.
  - Prevent socio-political conflicts, which are the prelude to the destruction of nature and of PAs.
  - Draw up a PA strategy that can be funded and to build capacities at all levels in order to implement it.
  - Finally, it should manage the State land.
- The technical and financial partners should:
  - Take into account the real financial needs of the PAs and help finance them.
  - Finance the activities in accordance with the PAs' national strategy in order to maintain a uniform approach and fund all the PAs and activities that deserve it.
  - Play their part; public funding is essential for financing public goods such as PAs.

- Conservation NGOs.
  - They should focus on their core activities and not mix different types of action such as the search for funding, political lobbying, environmental advocacy, technical interventions, or follow short-term trends. Thus, they lose their independence and therefore their capacities.
- The private sector.
  - Should devote itself to the implementation of operations from which it will benefit financially, which is its mission.
  - Its role is above all that of an occasional service provider for indispensable infrastructures, its role in tourism, etc.
  - Private companies (private goods) are not eligible for the donation of public funds.
- Local communities.
  - Should be able to govern themselves, and thus choose what they want to do with their land. Forcing them to make a choice would be synonymous with failure.
  - Forcing on them a method of implementation (without respecting the principle of subsidiarity, for example), would also lead to failure.
  - The actions chosen by the community must be compatible with those implemented in the neighbouring PA.
  - One important point is that the local communities are eligible for public funding for development.
  - This development must be conservation-dependent, in other words the funds generated or received really depend on the conservation result generated.



## Appendix 1

The PA management categories:

Protected area management category and international name	Management objectives
1a - Strict nature reserve	Strictly protected areas set aside to protect biodiversity and also possibly geological/geomorphological features, where human visitation, use and impacts are strictly controlled and limited to ensure protection of the conservation values. Such protected areas can serve as indispensable reference areas for scientific research and regular monitoring.
1b - Wilderness area	Large unmodified or slightly modified areas, retaining their natural character and influence, without permanent or significant human habitation, which are protected and managed so as to preserve their natural condition.
II - National park (ecosystem protection, protection of cultural values)	Large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible spiritual, scientific, educational, recreational and visitor opportunities.
III Natural monument or feature	These are areas set aside to protect a specific natural monument, which can be a landform, sea mount, submarine cavern, geological feature such as a cave or even a living feature such as an ancient grove. They are generally quite small protected areas and often have high visitor value.
IV Habitat / species management area	These areas aim to protect particular species or habitats. Many category IV protected areas will need regular, active interventions to address the requirements of particular species or to maintain habitats..
IV Habitat / species management areas	These areas aim to protect particular species or habitats. Many category IV protected areas will need regular, active interventions to address the requirements of particular species or to maintain habitats.
V Protected landscape / seascape	A protected area where the interaction of people and nature over time has produced an area of distinct character with significant ecological, biological, cultural and scenic value: and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values.
VI Protected area with sustainable use of natural resources	These protected areas conserve ecosystems and habitats, together with associated cultural values and traditional natural resource management systems. They are generally large, with most of the area in a natural condition, where a proportion is under sustainable natural resource management and where low-level non-industrial use of natural resources compatible with nature conservation is seen as one of the main aims of the area.

## Appendix 2: The decline of big game hunting in Africa

The dire state of the big game hunting sector in Africa and its low potential for conservation in the future were highlighted in a study published by IUCN-Papaco in 2009<sup>84</sup> and later confirmed by other publications<sup>85,86</sup>.

This decline, beyond any partisan discussions, is characterised by the evolution in three indicators:

- **The progressive disappearance of big game hunting zones** faced with agro-pastoral encroachment linked to population growth. In some countries, big game hunting zones have practically disappeared, and have lost over 90% of their surface area (Senegal, Niger, Chad, CAR, DRC, Sudan, Malawi, Angola...), in other countries, the choice was made to close big game hunting (Kenya, Gabon, Botswana, Côte d'Ivoire...), finally, in countries where big game hunting is still carried

out, the degradation of both the biotope and the populations of game species has led to the non-use of 40% of big game hunting zones in Zambia<sup>87</sup>, and 72% in Tanzania<sup>88</sup>. In addition to these unused areas, in Zambia, for example, certain active zones contain no game species. These include zones classified as "depleted"<sup>89</sup>. This disappearance of hunting zones is linked to population growth, as shown in Figure A1: human density (in blue) does not leave any room for big game hunting (in red, % of the country's land occupied by big game hunting zones) and they evolve inversely<sup>90</sup>.

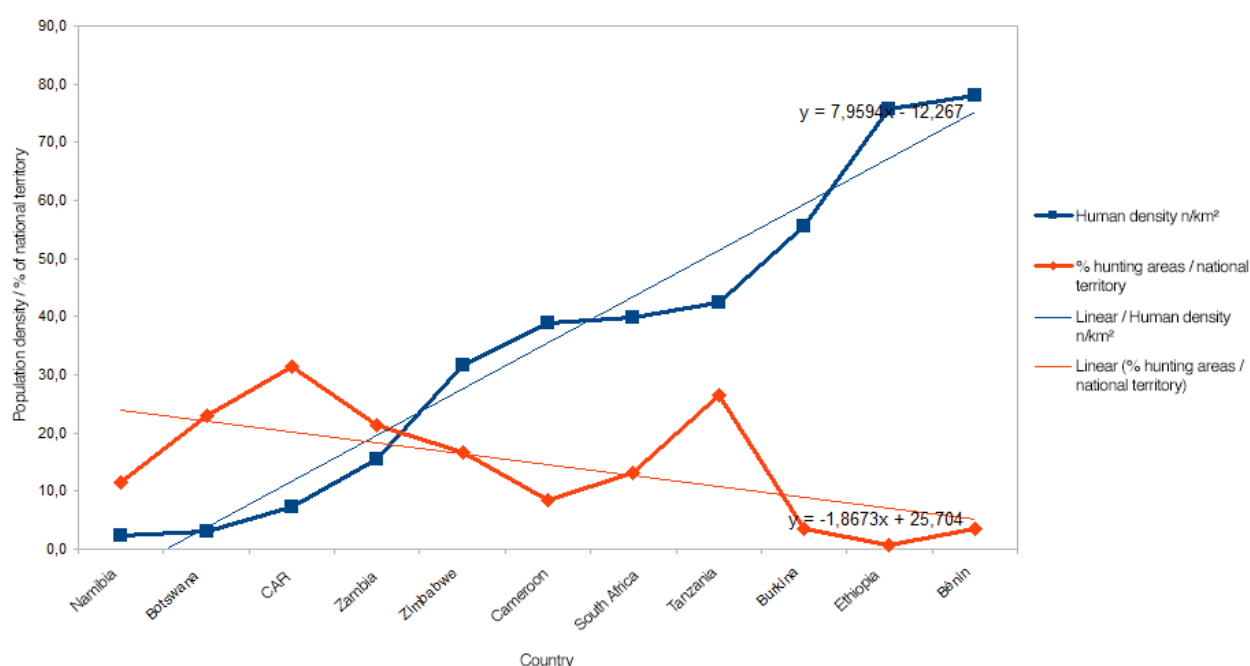


Figure A1: Evolution in human densities and the national land allocated to big game hunting

84 IUCN Papaco. La grande chasse en Afrique de l'Ouest : quelle contribution à la conservation? ISBN: 978-2-8317-1204-8. <https://portals.iucn.org/library/efiles/documents/2009-074.pdf>

85 Economists at large, the lions share? On the economic benefits of trophy hunting, 2017. Melbourne, Australia. <http://www.hsi.org/assets/pdfs/economists-at-large-trophy-hunting.pdf>

86 Economists at large, The \$200 million question. How much does trophy hunting really contribute to African communities? 2013. Melbourne, Australia. <http://www.ecolarge.com/wp-content/uploads/2013/06/Ecolarge-2013-200m-question-FINAL-lowres.pdf>

87 Watson, F.G., et al. Human encroachment into protected areas network in Zambia. Reg environ change 2014. DOI 10.1007/s10113-014-0626-5

88 Packer, C., 2018. Minnesota University & Oxford WildCRU. <https://www.youtube.com/watch?v=STaqmtZfcU>

89 Lindsey, P.A., et al. Underperformance of African Protected Area Networks and the Case for New Conservation Models: Insights from Zambia, 2014. PlosOne. <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0094109>

90 IUCN Papaco. La grande chasse en Afrique de l'Ouest: quelle contribution à la conservation? ISBN: 978-2-8317-1204-8. <https://portals.iucn.org/library/efiles/documents/2009-074.pdf>

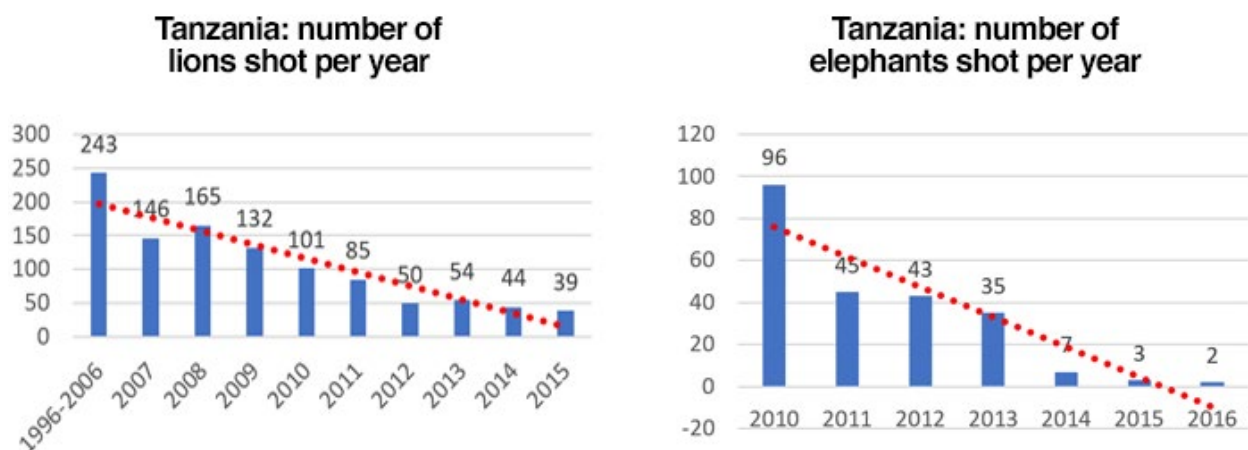


Figure A2: Evolution in the number of lions (left) and elephants (right) shot each year in Tanzania, and trend lines (in red)

- The decrease in the number of shot animals.** This phenomenon started several years ago. Thus, in the Northern Cameroon, the hunting taxes paid by hunters to the State when they kill an animal halved between 2008 and 2016<sup>91</sup> indicating a 50% decrease in the numbers harvested with a similar number of hunters. In Tanzania, the leading country for big game hunting in unfenced areas, the evolution in the number of lions shot per year is shown in Figure A2 below<sup>92</sup>. The decline is highlighted by the trend line (the red dotted line). It can be seen that, although the country introduced a 6-year minimum age limit for shooting lions, in 2015, 66.7% of the lions shot were 5 years old or under, underlining the fact that there were simply no lions of the correct age left to be shot. During the same period, the annual quota attributed by the Wildlife Division was 315 up to 2015 and 207 since 2016. These quotas are not at all in line with sustainable management and this mismatch is what has led certain Western countries to controlling or banning imports of sport-hunted lion trophies.

This same thing occurs with elephant hunting, as shown in Figure A2<sup>93</sup>: the decline in the numbers harvested started in 2011, with the large upsurge in poaching focusing on hunting zones, targeting

elephants with ivory tusks. Since Tanzanian law requires that only elephants with tusks over 1.6 m long or weighing over 20 kg can be shot, hunting has practically stopped due to the absence of individuals possessing these characteristics. Given the slow growth rate of tusks, it will take several decades of protection with no hunting before elephant hunting can start again respecting minimum measures, which is not sustainable for hunting operators from a commercial point of view. It can be seen that the authorised hunting quota for elephants was 200 up to 2013, and has been 100 since 2014, which is completely inconsistent with reality. The suspension of imports of sport-hunted trophies to the USA dates back to 11 August 2014<sup>94</sup>, and thus occurred after the decline. Therefore, this decision only sanctioned the reality and is not the cause of the decline in big game hunting, as is claimed by big game hunting operators.

In Tanzania, the income from lion and elephant hunting represented 23.5% of the global revenue from tourism operators before 2010, in other words around 1 USD/ha/year on a turnover of 4.24 USD/ha/year. This is therefore a significant loss, and not the only one, which turns the economic operation into a loss maker, the profit margins already being low or even negative<sup>95</sup>.

91 Lescuyer, G., et al. Does trophy hunting remain a profitable business model for conserving biodiversity in Cameroon? (2016). *International Forestry Review* Vol. 18(2) <https://agritrop.cirad.fr/582098/1/IFR%20Lescuyer%20et%20al.pdf>

92 Source: Wildlife Division & TAWA, Ministry of Natural Resources & Tourism, Tanzania

93 Source: Wildlife Division & TAWA, Ministry of Natural Resources & Tourism, Tanzania

94 <https://cites.org/sites/default/files/notif/E-Notif-2014-037.pdf>

95 Lindsey, P.A., et al. The Significance of African Lions for the Financial Viability of Trophy Hunting and the Maintenance of Wild Land, *PlosOne*, January 2012. <http://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0029332&type=printable>

### Namibia: number of foreign hunters from 2007 to 2013



Figure A3: Evolution in the number of foreign hunters in Namibia from 2007 to 2013

- The decrease in the number of hunters.** Above all, this decrease involves the hunters' countries of origin. In the USA, the main country of origin, the number of hunters dropped from 14.1 million in 1991 to 11.5 million in 2016, in other words a decrease of 18.5% in 25 years, with only 4.4% of the population hunting<sup>96</sup>. The same is true for France for example, where the number of hunters dropped from 2.3 million in 1975 to 1.15 million in 2016<sup>97</sup>, in other words a decrease of 50% in 40 years. For African countries the number of hunters is sometimes hard to ascertain. However, in South Africa the number of foreign hunters dropped from 16,594 in 2008 to 6,539 in 2016, in other words a decrease of 60.5% in 8 years. Since there are 9,000 hunting game farms in South Africa, that total does not even represent one hunter per game farm per year. Some game farms have started to get rid of their game and return to cattle breeding<sup>98</sup>. In Tanzania, the latest statistics are not available, however, at the start of 2018, the former President of the Tanzania Hunting Operators Association said that the number of lion and elephant safaris had been reduced to a handful<sup>99</sup>. In Namibia, Figure A3 shows the decline curve (in red) of the number of foreign hunters from 2007 to 2013<sup>100</sup>.

The decline is thus clear for the three indicators, and explains why the big game hunting economy, which was already precarious during the 2000s<sup>101 102</sup>, has become so bad that the situation has declined rapidly in recent years.

The causes of this decline are poaching and agro-pastoral encroachment, since hunting associations did not invest the necessary amount of money to counter these phenomena. It has been seen that in Tanzania, the average expenditure for anti-poaching was 0.18 USD/ha/year in hunting zones, much lower than the current standards of 7 to 8 USD/ha/year and the Kenya Wildlife Service's figure of 14 USD/ha/year. By only financing 2% of the necessary operations, big game hunting has not been able to maintain biodiversity in these areas. It has not contributed significantly to the well-being of Tanzanian communities either, with an average redistribution of 0.08 USD/ha<sup>103</sup>, whilst in the same period the Maasai Mara conservancies in Kenya pay 40 USD/ha/year without counting the redistribution linked to the entry-fees and employees' salaries. Moreover, the amounts collected were not all used in Tanzania, as highlighted in the Panama Papers<sup>104</sup> financial scandal, which underlined the poor governance of the sector.

The hunting market does not have the means to pay the real price of safaris. A very good hunting zone has a lion density of 2/100 km<sup>2</sup> and thus it needs a hunting surface area of 5,000 km<sup>2</sup> (= 500,000 ha) to shoot one lion per year sustainably<sup>105</sup>. The annual upkeep alone of this area costs around 4 million USD (and probably more for a lion population of this type, due to the management of conflicts with the populations). The sales price of a safari to hunt lions is on average 50,000 USD (the price paid by the hunter who killed the lion called Cecil in Zimbabwe in 2015<sup>106</sup>), in other words 1.25% of the cost price.

96 USFWS, 2016. [https://wsfrprograms.fws.gov/subpages/nationalsurvey/nat\\_survey2016.pdf](https://wsfrprograms.fws.gov/subpages/nationalsurvey/nat_survey2016.pdf)

97 Ministère de la transition écologique et solidaire, France, 2018. <https://www.ecologie-solidaire.gouv.fr/chasse-en-france>

98 Flack, P., 2018. <https://www.peterflack.co.za/hunting-statistics-2016/>

99 Interview E. Pasanisi, [www.fieldsportschannel.tv/us-trophy-ban-starts-to-kill-wildlife/](http://www.fieldsportschannel.tv/us-trophy-ban-starts-to-kill-wildlife/)

100 Source NAPHA-NACSO in: Venter, R., Impact of a hunting ban on commercial cattle farms in Namibia, 2015. <http://www.theeis.com/data/literature/Impact%20of%20a%20hunting%20ban%20on%20commercial%20cattle%20farms%20in%20Namibia.pdf>

101 Idem 111

102 Lescuyer, G., et al. Does trophy hunting remain a profitable business model for conserving biodiversity in Cameroon? (2016). *International Forestry Review* Vol.18(2) <https://agritrop.cirad.fr/582098/1/IFR%20Lescuyer%20et%20al.pdf>

103 Conservation Force, Tanzania Hunting Operator Enhancement Audit, 2016, <http://www.conservationforce.org/tanzania-hunting-operator-report>

104 <https://corporatewatch.org/article/panama-papers-leak-reveals-safari-companies-africa-use-tax-havens>

105 Bauer, H., et al. 2017. Lion trophy hunting in West Africa: a response to Bouché et al. *PlosOne* 12 (3). <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0173691>

106 Loveridge, A. *Lion hearted*, p. 150-151. Regan Arts. New York, April 2018. ISBN 978-1-68245-120-5



No one will pay 4 million USD to shoot a lion, and this shows how hunting is powerless to fund its conservation. Moreover, since a dead lion becomes the private property of a hunter, the donations from public funds are not normally eligible for funding hunting.

In conclusion: the facts and indicators reveal a very rapid decline in big game hunting in Africa over several years: it does not protect the natural habitat from agro-pastoral encroachment, it can only finance a small percentage of the sum required for its conservation, and its socio-economic benefits are too low.

Hunting used to be a conservation tool, but in the great majority of cases it no longer plays this role and will not do so in the future either. Before many hunting zones are colonised, it is important to recover part of some of them to improve the configuration of certain protected areas and, through this, nature conservation.

## Appendix 3: Main spatial and socio-economic parameters of big game hunting in Africa in 2018

### 1. Example of Tanzania

Tanzania is the African country with the highest annual turnover in “open” (in other words not fenced) areas for big game hunting and the killing of the highest number of emblematic animal species (elephants, lions, leopards, etc.).

Tanzania has 154 big game hunting zones, but 72% of them, in other words 110 zones, have now been abandoned because they are no longer profitable for hunting organisations, due to the decrease in the number of animals that can be hunted and agro-pastoral encroachment. This represents a surface area of around 140,000 km<sup>2</sup> in which hunting no longer takes place, in other words around four times the surface area of Tanzania’s national parks (38,365 km<sup>2</sup>).

Economic factors are at the origin of the hunting management decision: the cost alone of the “correct” management of 200,000 km<sup>2</sup> devoted to hunting in Tanzania would be over 150 million USD, without counting the administration, tourism operation and marketing fees, whilst the annual turnover is around 30 million USD, since the virtual ban on elephant hunting following the huge upsurge in poaching in the 2010s, which led to the killing of 70,000 elephants in five years (in other words a 60% decrease) most in the big game hunting zones (Selous)<sup>107</sup>.

The organisation of big game hunting obeys the rules of the private sector, and an excessive deficit leads to the activity being discontinued. This confirms the fact that, henceforth, it will not be possible to self-fund wildlife conservation by a consumer activity, invalidating the paradigm popular in the period from 1970 to 2010, “if it pays, it stays”. Faced with the cost of the fight against pressure, management through consumptive activities is not profitable enough and the areas are thus released, potentially for the creation and management of new PAs.

Moreover, it can be seen that the fact that the management of hunting zones stopped when insufficient game numbers were killed, makes it contradictory for these areas to belong to the family of PAs: a PA is defined as “a geographical area” managed “to achieve the long-term conservation of nature”<sup>108</sup>. This is clearly not the case for hunting zones in Tanzania.

In Tanzania and elsewhere, such as Zambia where 40% of the big game hunting zones have been colonised by agriculture<sup>109</sup>, or in the Northern Cameroon where a large part of the big game hunting areas are no longer used and where the number of animals killed in sport hunting decreased by half between 2008 and 2016<sup>110</sup>, there is therefore a real possibility of recovering large areas, on the periphery of existing PAs.

### 2. Example of game farms in South Africa

The phenomenon that wildlife conservation cannot be self-financed through a consumptive activity is also confirmed by some of the best specialists in this consumptive wildlife management.

Thus, in 2011, Peter Flack, currently one of the leading authors on hunting and a defender of hunting and game farms, published a study entitled, “The South African conservation success story”<sup>111</sup>. However, in 2018 he wrote in his blog that after a 50% decrease in the number of foreign hunters in just a few years, many game farmers were killing their wild animals and replacing them with cattle, given the poor economic situation of the game farming sector<sup>112</sup>.

This follows the attempts to manipulate the wild, ethical character to keep these exploitations economically viable using artificial means, first of all through the hunting of lions kept in small enclosures (canned hunting), widely criticised in an international campaign that has led to a sharp decrease in this phenomenon<sup>113</sup>, then through the

107 Chase, M.J., et al. Continent-wide survey reveals massive decline in African savannah elephants (2016). PeerJ 4:e2354 <https://doi.org/10.7717/peerj.2354>

108 Dudley, N., 2008, <https://portals.iucn.org/library/sites/library/files/documents/PAG-021.pdf>, Gland Switzerland, IUCN: x+96 p. <https://portals.iucn.org/library/sites/library/files/documents/PAG-021.pdf>

109 Watson, F.G., et al. Human encroachment into protected areas network in Zambia. Reg environ change 2014. DOI 10.1007/s10113-014-0626-5

110 Lescuyer, G., et al. Does trophy hunting remain a profitable business model for conserving biodiversity in Cameroon? (2016). International Forestry Review Vol.18(2) <https://agritrop.cirad.fr/582098/1/IFR%20Lescuyer%20et%20al.pdf>

111 <https://www.peterflack.co.za/hunter-conservationist-books-dvds/south-africa-conservation-success/>

112 “He asked whether there was anything that could be done to reverse the current situation as he was aware of a number of game ranches reverting to domestic livestock, as evidenced by the large amounts of game meat on the market – shot to make way for the re-introduction of cattle”. <https://www.peterflack.co.za/hunting-statistics-2016/>

113 <http://www.bloodlions.org/>

genetic manipulation of ungulates to produce animals with different colours or larger trophies sought after by hunters. These manipulations have also been met with international condemnation, including by groups of IUCN specialists<sup>114</sup> and the prices of these animals have now dropped to their lowest level<sup>115</sup>. This leaves numerous game farms without real sources of income and thus without any means of funding their conservation.

### 3. Example of bushmeat in dense forest

The particular case of areas of dense forest where the bushmeat trade is omnipresent is not very different. The harvesting of animals for bushmeat is not considered sustainable when the human density exceeds 1 inhabitant/km<sup>2</sup><sup>116</sup> (a density that is far exceeded in very many regions) and the products are exported to monetised urban centres. The decrease in animal densities greatly increased the size of urban supply basins and led hunters to opt for non-discriminatory hunting methods (metal snares), killing both females and their young, eliminating any possibility of sustainability. In a virtually general regional context of poor governance<sup>117</sup>, and sometimes of conflict such as in those in Cameroon<sup>118</sup>, DRC<sup>119</sup> or CAR<sup>120</sup>, we need to be particularly optimistic to think that a rational management of this widespread phenomenon will be possible in the future at a significant scale for conservation.

Conclusion of these three examples.

This paradigm shift is essential in order to assign a role to our PAs: the consumptive use of wildlife is far less promising than we thought, and that should be taken into account in the role we assign to PAs. This therefore leads us directly to reviewing the choice of management categories.

### 4. Socio-economic impacts.

This is an important point, since the pressures are created by humans, it is important that a significant number of people have financial interests originating in the proper operation of PAs to encourage a larger number of people to respect them. The more animals can be seen, the more tourism can be developed, as can its associated effects.

Thus, in Kenya, tourism, which is mainly generated by the country's wildlife, recorded a turnover of 2.8 billion USD in 2017 for 429,500 direct jobs<sup>121</sup>.

In the neighbouring country, Tanzania, the figures were 1,975 billion USD and 446 000 direct jobs respectively<sup>122</sup>. In the case of Tanzania, 100,000 km<sup>2</sup> of wildlife reserves and 100,000 km<sup>2</sup> of classified hunting zones are reserved for hunting (compared with 57,800 km<sup>2</sup> for wildlife tourism, including 38,300 km<sup>2</sup> in national parks) but only generate a turnover of around 30 million USD, with around 4,300 direct jobs<sup>123</sup>. It is clear that, in this case, the vast surface areas of hunting reserves and zones do not have a significant socio-economic impact.

This has also been proven in Botswana, which closed big game hunting in 2014, which at that time represented a turnover of under 20 million USD/year (and 1,000 jobs) for a surface area of 134,500 km<sup>2</sup><sup>124</sup>, for the promotion of wildlife tourism. In 2017, Botswana generated a turnover of 687 million USD from tourism for 26,000 direct jobs<sup>125</sup>.

114 [https://www.iucn.org/sites/dev/files/import/downloads/asg\\_igm\\_posnment\\_2015\\_final\\_19may\\_2015.pdf](https://www.iucn.org/sites/dev/files/import/downloads/asg_igm_posnment_2015_final_19may_2015.pdf)

115 <https://www.peterflack.co.za/hunting-statistics-2016/>

116 Robinson, J. & Bennett, E., *Hunting for Sustainability in Tropical Forests*, Columbia University Press, 2000. ISBN: 9780231109772, <https://cup.columbia.edu/book/hunting-for-sustainability-in-tropical-forests/9780231109772>

117 [https://www.transparency.org/news/feature/a\\_redefining\\_moment\\_for\\_africa](https://www.transparency.org/news/feature/a_redefining_moment_for_africa)

118 <http://www.africanews.com/2018/03/03/cameroon-s-south-west-region-imposes-curfew-amid-anglophone-crisis/>

119 <https://www.worldvision.org/disaster-relief-news-stories/drc-conflict-facts>

120 <https://www.aljazeera.com/indepth/opinion/2017/06/world-neglected-conflict-rages-car-170601100006071.html>

121 <https://www.wttc.org/-/media/files/reports/economic-impact-research/countries-2018/kenya2018.pdf>

122 <https://www.wttc.org/-/media/files/reports/economic-impact-research/countries-2018/tanzania2018.pdf>

123 Lindsey, P.A., et al. Economic and conservation significance of the trophy hunting industry in Sub-Saharan Africa. *Biological conservation* 134 (2007) 455-469. <https://www.perc.org/wp-content/uploads/2015/08/Economic-and-conservation-significance.pdf>

124 Idem

125 <https://www.wttc.org/-/media/files/reports/economic-impact-research/countries-2018/botswana2018.pdf>

The socio-economic impacts will play a key role in the future of PAs in Africa, by involving a large number of people (a paid job providing a livelihood for around ten people in Africa) who have a vested interest in ensuring that the PAs are in good condition. This is particularly the case thanks to wildlife tourism, which is mainly carried out in PAs and especially in Category II protected areas (national parks). Thus, in June 2018, Tanzania announced that it was going to upgrade five wildlife reserves to national parks, in order to develop wildlife tourism<sup>126</sup>.

## 5. The real and optimal cost of managing hunting zones

It should be noted that the land assigned to hunting in Tanzania under the aegis of the Tanzania Wildlife Management Authority -TAWA-, in other words around 150,000 km<sup>2</sup> (TAWA that currently manages the wildlife outside PAs has a mandate for 170,000 km<sup>2</sup> or 18% of the surface area of Tanzania)<sup>127</sup> has a theoretical annual management cost for the private companies that use them of around 112 million USD (retaining an average management cost of 7.5 USD/ha/year), whilst they generate a turnover of around 30 million USD. No private company can lose such a large amount of money each year: they could not spend this amount of money and nature has clearly become degraded.

The amount actually spent to combat poaching was even lower: the Friedkin Conservation Fund that manages 1.1 million hectares for 6 hunting associations spent 1.5 billion Tanzanian Shillings per year on the fight against poaching between 2013 and 2015, in other words 0.6 USD/ha/year<sup>128</sup>.

This is also the case for the Tanganyika Wildlife Safaris (TAWISA) hunting zones, whose president said he spent 650,000 USD each year to protect half of the Selous Game Reserve, which represents 0.25 USD/ha/year<sup>129</sup>. These two groups of big game hunting operators announced that they stopped their hunting activities. The first is now focusing on upmarket photographic safaris<sup>130</sup>, whilst the second group surrendered its

hunting blocks to the Tanzanian Government<sup>131</sup>. The hunting advocacy group, "Conservation Force", also stated that, between 2013 and 2015, 27 hunting operators exploiting 121,400 km<sup>2</sup> spent 2.24 million USD, in other words 0.18 USD/ha/year<sup>132</sup>.

Today, no one can achieve proper management with such modest management budgets. The lack of management expenditure thus led to a lack of nature conservation results, since the private sector cannot cover the required budget. It should be noted that hunting concerns a private good (the trophy), which cannot be financed freely by public money.

## 6. Percentage of each country's land in big game hunting zones and socio-economic benefits for the population

According to Lindsey<sup>133</sup>, CAR has allocated 11.5% of its land to national parks and 31.5% to hunting zones, Tanzania has allocated 14.1% of its land to national parks and reserves and 26.4% to hunting zones, Zambia has allocated 7.9% of its land to national parks and 21.3% to hunting zones, and Botswana has allocated 18% of its land to national parks and 23% to Wildlife Management Areas (WMA) (former hunting zones). These represent the respective totals of 43%, 40.5%, 29.2% and 41% of the countries' land supposedly allocated to conservation.

As we have seen, the income generated by wildlife does not fund its conservation, as it is extremely inadequate. This means that no State can budget the sums of money required for the management of 40% of its land. Moreover, the benefits for the communities are very limited: between 2013 and 2015, the above-mentioned 27 hunting operators in Tanzania distributed an average annual sum of 1.04 million USD to the communities, in other words 0.08 USD/hectare per year<sup>134</sup>. So, hectares of land with extremely low productivity for conservation (or hunting in this case) are taken from the populations<sup>135</sup>. In these conditions, it is inconceivable that 40% of a country could be devoted to an activity that does not generate the well-being

126 The East African, 5 June 2018. <http://www.theeastafrican.co.ke/business/Tanzania-woos-tourists-to-parks/2560-4596772-otv8wwz/index.html>

127 Tanzania Wildlife Management Authority, <http://www.tawa.go.tz/>

128 The Citizen, 27. February 2018, <http://www.thecitizen.co.tz/News/How-Sh4-5bn-initiative-helped-net-2-617-suspected-poachers/1840340-4321148-nim7u/index.html>

129 Interview Eric Pasanisi, Chasses Internationales n° 10 (May-July 2018), p. 14. <http://www.editions-lariviere.fr/chasses-internationales/>

130 <http://www.legendaryexpeditions.com/>

131 [www.fieldsportschannel.tv/us-trophy-ban-starts-to-kill-wildlife/](http://www.fieldsportschannel.tv/us-trophy-ban-starts-to-kill-wildlife/)

132 Conservation Force, Tanzania Hunting Operator Enhancement Audit, 2016, <http://www.conservationforce.org/tanzania-hunting-operator-report>

133 Lindsey, P.A., et al. Economic and conservation significance of the trophy hunting industry in Sub-Saharan Africa. Biological Conservation 134 (2007) 455-469. <https://www.perc.org/wp-content/uploads/2015/08/Economic-and-conservation-significance.pdf>

134 Conservation Force, Tanzania Hunting Operator Enhancement Audit, 2016, <http://www.conservationforce.org/tanzania-hunting-operator-report>

135 The average human population density of Tanzania is 62 people per Km<sup>2</sup>, in other words 0.62 per hectare. <http://countrymeters.info/fr/Tanzania>



expected by its inhabitants. It would probably even be counterproductive. Many people believe it is legitimate to take back from the State what it is giving to wildlife to the detriment of its population.

## Conclusion

As was already stated in the Papaco study published on this subject in 2009<sup>136</sup>, the economic returns from big game hunting are not sufficient to ensure its sustainability. The figures mentioned here clearly show that the sums spent by the companies that organise big game hunting are insufficient and that this leads to the degradation of wildlife resources and their habitat in the face of the growing pressures. Moreover, the benefits for the populations are so low that they cannot accept classifications over and above the 17% of the national PA network (often on a scale of 20% more) without receiving actual financial compensation.

The absence of the economic profitability of big game hunting, confirming that consumptive management (and thus big game hunting) cannot generate sufficient income to conserve nature, does not make this management an adequate conservation tool for the future.

The solutions thus now involve the funding of public goods, which involves living animals, and not the development of conservation actions based on the commercialisation of dead animals.

---

<sup>136</sup> UICN Papaco. La grande chasse en Afrique de l'Ouest: quelle contribution à la conservation? ISBN: 978-2-8317-1204-8. <https://portals.iucn.org/library/efiles/documents/2009-074.pdf>

## Appendix 4: Analysis of different types of conservancy

The periphery of a PA starts at the boundary. More often than not, the State-owned property stops at the boundary and, depending on the case and the country, the private sector or communities have jurisdiction over the periphery. There may or may not be a land title, and sometimes only usage rights are vested in the communities. As we have seen, most PA buffer zones have disappeared. Mainly due to the usage restrictions imposed by the State on the rights holders. For several years now, we have seen peripheral areas emerge that were created on a voluntary basis by the rights holders, who continue to govern and manage them. They lay down the rules and reap the benefits.

These voluntary peripheral areas are of great interest because they make it possible to create a transition zone between the conservation area (PA) and the development zone, whilst retaining the natural features that favour the permanence of the PA's values, and also foster the development of communities and the private sector. In many cases, these areas are called "conservancies". Moreover, it should be noted that a conservancy is sometimes situated on the periphery of a PA but not always.

### 1. Different types of conservancy

There are:

- Private conservancies for which an owner has a land title and devotes their property to the management of natural resources and wildlife. Sometimes several owners get together and manage their land using the same management type. In accordance with the country's land tenure, we can thus find this kind of entity right on the periphery of a PA, such as for example those flanking the western boundary of the Kruger National Park in South Africa (Sabie Sands Game Reserve, Timbavati Game Reserve, etc.). The fence that used to form the boundary of the park was moved to the West of these private reserves, thereby making the protected area larger, whilst maintaining the governances specific to each land tenure.

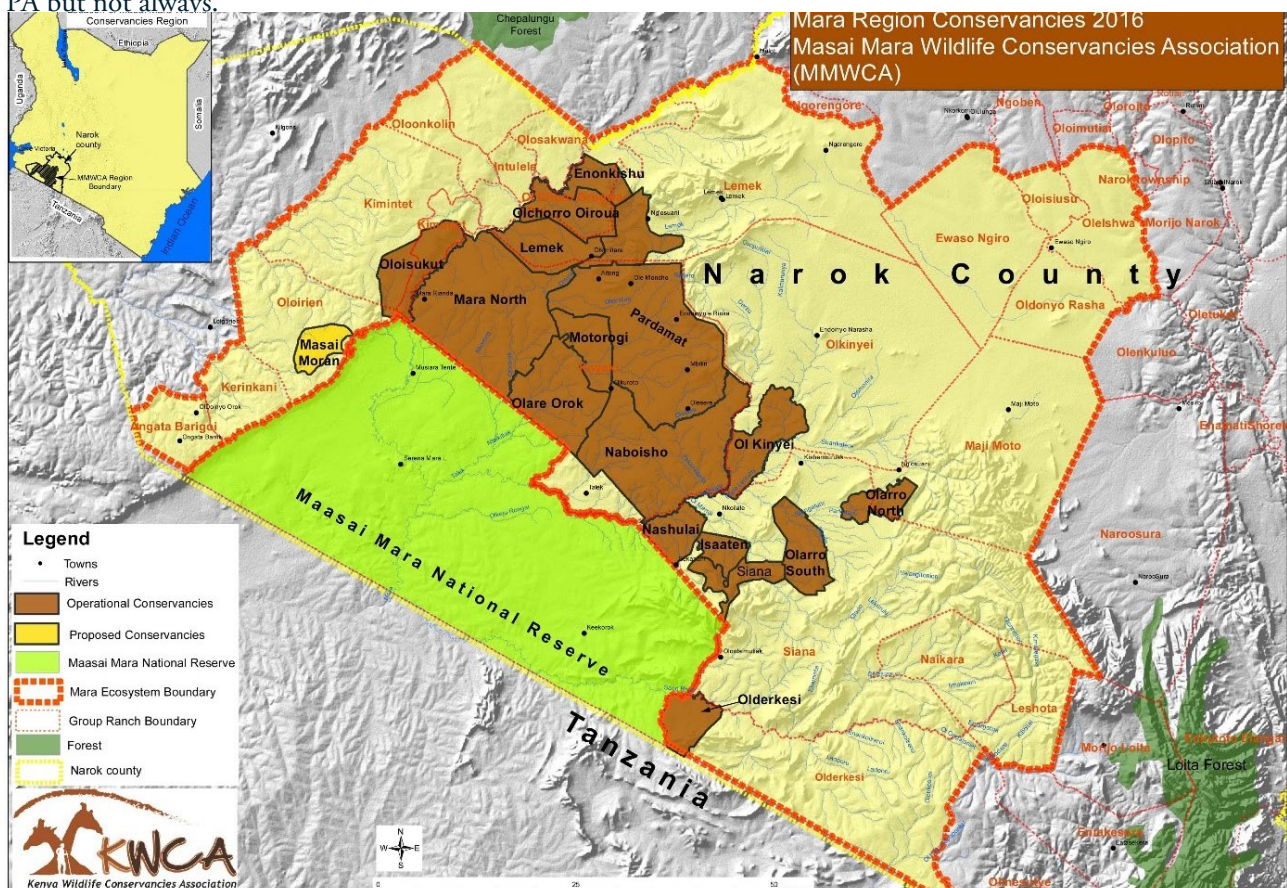


Figure 3.1: Map of the conservancies and the Maasai Mara National Reserve, Kenya

- Community conservancies whereby community land is governed by a democratically elected body, which adopts a management plan for its land, reserving part for the management of natural resources and wildlife, part for cattle breeding, part for farming, part for houses and infrastructures, and part for development. The zone reserved for natural resources only represents part, a variable proportion, of the conservancy. The conservancy management plan specifies which objectives are democratically adopted. Natural resources are not necessarily the main objective of a conservancy. Often, the main objective is development; for example in the case of the management plan for the Nakuprat-Gotu Conservancy<sup>137</sup> in Northern Kenya where wildlife conservation is in 9th place in its list of objectives, with the first three being cattle breeding, health and the fight against drought. The improvement of grazing for cattle is the conservancy's main objective. Thus, one should not expect the benefits of natural resources management to finance the conservancy: it is a development operation and is traditionally financed by development partners. Optimal conservation benefits should not be expected either, as shown by the results of the latest censuses for Grevy's Zebra (whose distribution range is mainly within these community conservancies), which revealed that its numbers dropped from 2,400 individuals in 2008 to 1,897 in 2012 then 1,621 in 2017. Conservation is not the top priority<sup>138</sup>.

In the neighbouring Sera Conservancy, the priorities are not classified but are all presented as important, with water, health and education being listed as those of greatest importance. The management plan<sup>139</sup> provides for a conservation zone of 51,740 ha for a total surface area of community land of 340,450 ha, in other words 15.2%. This is a substantial area that has allowed the Kenya Wildlife Service to reintroduce a black Rhino population, since the communities had secured the area perfectly, and to develop tourism there<sup>140</sup> through a

private sector-community partnership. In this case, the profits from the wildlife management are added to the funding from development aid.

- In other cases, such as on the periphery of the Maasai Mara National Reserve in South-Western Kenya, the communities have individual land titles and the owners met to create conservancies, which are managed for wildlife and cattle, thanks to a grazing land management plan that evolves over the course of the seasons and in accordance with periods of drought. This thus allows for adaptation to the vagaries of the climate. Here, we also find a private sector-community partnership, with the private sector renting the land to owners for a lump sum decided democratically. This currently amounts to 42 USD/ha/year for the Mara North Conservancy. This sum is paid by the 12 tourist camps that the conservancy was given the authorisation to set up on 20,000 ha of its land, which represents 154,800 USD/month, paid each month to the 750 owners<sup>141</sup>. In addition, 560 jobs are generated by tourism, mainly for members of the community, which affects around 4,500 people including the families. Moreover, the conservancy employs 41 community guards, and each foreign tourist pays a daily entry fee of 80 USD. In this case, thanks to tourism, the wildlife management generates the majority of the conservancy's funding. Today, there are 13 conservancies in the area around the Maasai Mara, which represent 179,200 ha, involving 102,000 households, and (excluding tourism) employing 241 community guards and 64 management staff. As can be seen in the following map<sup>142</sup> (Figure A4), the conservancies (in brown) have added a conservation area larger than the Maasai Mara National Reserve (that covers 151,000 ha, in green on the map), and this is carried out on a voluntary basis and by integrating development.

137 Plan de gestion du conservancy de Nakuprat-Gotu 2015-2019, Northern Rangeland Trust. [https://static1.squarespace.com/static/5653e896e4b0a689b3fafd97/t/56bdd06f22482eca15884d64/1455280257418/ConservancyManagementPlan\\_NakupratGotu\\_A5\\_FinalDraft\\_Jan2015.pdf](https://static1.squarespace.com/static/5653e896e4b0a689b3fafd97/t/56bdd06f22482eca15884d64/1455280257418/ConservancyManagementPlan_NakupratGotu_A5_FinalDraft_Jan2015.pdf)

138 <http://www.kws.go.ke/content/results-censuses-elephant-buffalo-giraffe-and-grevy%E2%80%99s-zebra-counted-five-key-ecosystems>

139 Plan de gestion du conservancy de Sera 2015-2019, NRT. [https://static1.squarespace.com/static/5653e896e4b0a689b3fafd97/t/5706158f7c65e471991586b1/1460016570659/ConservancyManagementPlan\\_Sera\\_October2015.pdf](https://static1.squarespace.com/static/5653e896e4b0a689b3fafd97/t/5706158f7c65e471991586b1/1460016570659/ConservancyManagementPlan_Sera_October2015.pdf)

140 <http://www.sarunirhinotracking.com/en-gb/the-community>

141 Mara North Brochure. <http://maranorth.org/wp-content/uploads/2017/09/Mara-North-Conservancy-Brochure.pdf>

142 Maasai Mara Wildlife Conservancies Association, <https://kwakenya.com/wp-content/uploads/2017/08/Maasai-Mara-Wildlife-Conservancies-Association.jpg>



- In Namibia, there are 82 conservancies, which cover 165,000 km<sup>2</sup>, in other words 20% of the country's total land area. However, this does not imply that 20% of the country is covered by additional PAs: it means that 20% of the country is subject to community management with a management plan for natural resources. As in Kenya, the parts that are really conserved (the central or core areas) only represent a (variable) part of this 20%. More often than not, they are not adjacent to a PA, and conservation areas between neighbouring conservancies are not generally joined. So, it is more like a series of (small, dispersed) conservation points than a conservation area. This does not favour the conservation of large species aimed at by wildlife tourism, but it can increase the number of human-wildlife conflicts, since human habitats are scattered among the areas assigned to wildlife.

The economic benefits are obtained by 53 partnerships between the private sector and the communities<sup>143</sup> (joint ventures), which generated an income of 111 million Namibian Dollars in the conservancies in 2016, 52 million of which was in cash, in other words 7.4 and 3.5 million USD respectively. The most profitable activity is tourism (even though it only involves 38 conservancies), providing 58.2% of the income and creating 950 jobs. Consumptive activities (hunting + harvesting of meat + sale of live animals) carried out in 55 conservancies provided 38.7% of the income (in decline by 9% compared with 2015) and created 136 permanent jobs. The amounts distributed in cash to Namibian citizens for the whole country was 2.15 million USD for wildlife tourism and 0.24 million USD for hunting. Since the population of these conservancies was 200,000 people, the analysis shows that the income per person is tiny. Thus, big game hunting generates approximately 1.5 million USD/year for all conservancies<sup>144</sup>, (around the same amount as that generated by a single 25,000-ha conservancy in Kenya) in other words 0.09 USD/ha per conservancy or 7.5 USD/person per year. These very low figures are perhaps still of interest in the context of the very sparsely inhabited Namibia, but they would not be in the vast majority of other

African countries. The combination of hunting and wildlife tourism appears complementary, but it is not, because whilst it is possible to hunt in a wildlife tourism area, it is not possible to carry out wildlife tourism in a hunting zone. Besides, hunting only accounts for 1 to 2% of the tourism turnover in a given country<sup>145</sup>

## 2. Analysis of three types of community conservancies

Within the framework of the improvement of the efficiency of PAs that we were aiming at, these conservancies like the Maasai Mara have many advantages, with the main ones being:

- They are created on a voluntary and democratic basis.
- They are largely funded by wildlife tourism, in other words communities receive the benefits of the presence of wildlife directly, but only if they protect the wildlife as a result of the financial mechanism put in place. This is thus a benefit that is perfectly dependent on the success of conservation, which is ideal.
- They constitute an ideal peripheral area for a neighbouring PA, by integrating development and cattle breeding, through management and grazing plans and their application.
- They increase the amount of land protected on a funded, voluntary basis, and without excluding development.
- They create an elected, representative community management structure, which allows for greater insight to be gained into the management of human-wildlife conflicts, improving agro-pastoral practices by basing them on prevention.
- They generate benefits from the wildlife, which are highly significant for the communities, and this is thanks to wildlife tourism.

One key point is the importance of the economic benefits, because if they are significant or not, communities will take ownership for conservation or not.

<sup>143</sup> NACSO, State of Community Conservation 2016. <http://www.nacso.org.na/sites/default/files/State%20of%20Community%20Conservation%20book%20web.pdf>

<sup>144</sup> R. Naidoo et al. Complementary benefits of tourism and hunting to communal conservancies in Namibia, 2016. Conservation Biology. DOI: 10.1111/cobi.12643. <https://www.ncbi.nlm.nih.gov/pubmed/26537845>

<sup>145</sup> Economists at large, The \$200 million question. How much does trophy hunting really contribute to African communities? 2013. Melbourne, Australia. <http://www.ecolarge.com/wp-content/uploads/2013/06/Ecolarge-2013-200m-question-FINAL-lowres.pdf>



### 3. Conclusion for improving the management of PAs

This analysis allows us to draw the following conclusions that could improve the management of PAs in the future, whilst making populations a more integral part of their management.

Favour the creation of community conservancies on the periphery of protected areas wherever possible.

- Favour the development of wildlife tourism based on these conservancies, in the conservancies but also (and especially) in PAs, promoting private sector-community partnerships.
- Favour the hosting structures in these conservancies and not within the PAs, in order to maximise the profits from tourism for local communities and thus maximise the effect of the conservancies.
- We must not only favour the conservancies that adjoin a PA (plus those that do not) but, during the planning stage, we must also ensure that the conservation zone (core area) is directly adjacent to the PA. If this is not the case, the conservation effect will be reduced and human-wildlife conflicts will increase.
- The coordination between conservancies must also be promoted to ensure that, when they are being planned, their conservation zones are adjacent, which will favour the conservation effect by increasing the global useful surface area conserved and encourage connectivity. This will also favour tourism and thus the economic returns and, finally, the sustainability of the action.
- The governance must be planned at several levels: for each conservancy, for all the conservancies, for all the protected landscapes, and by linking the conservancies and the PAs.

