'THE GIANT SLEEPS AGAIN?' - RESOURCE, PROTECTION AND TOURISM OF KAFUE NATIONAL PARK, ZAMBIA

Francis X. Mkanda[1*], Simon Munthali [2], James Milanzi[3], Clive Chifunte[4], Chaka Kaumba[4], Neal Muswema[4], Anety Milimo[4] and Austin Mwakifwamba[4]

*Corresponding author: francis.mkanda@gmail.com

[1] Mzuzu, Malawi
[2] Lilongwe, Malawi
[3] African Parks, Johannesburg, Republic of South Africa
[4] Department of National Parks and Wildlife, Lusaka, Zambia

ABSTRACT

The phasing out of the Kafue Programme that aimed to secure critical habitats and species in the Kafue National Park and adjacent Game Management Areas was greeted with mixed reactions. Some stakeholders, particularly tour operators, were despondent; they postulated that the park would revert to the previous state of neglect. Other stakeholders, however, contended that the programme had achieved its purpose. Moreover, such despondency merely risked discouraging potential investors in tourism, the main source of revenue for the park. This study attempts to verify if the despondency was justified. It examines the resource, resource-protection effectiveness and tourism during and after the programme. The results are varied. While populations of 'key' wildlife species continued to grow, and numbers of tourists and the associated revenue had increased four years after the programme, illegal activity also increased to the level of the pre-programme period. Therefore, to a certain extent the concern was justified, the giant sleeps again and its potential remains untapped. It is essential for the Department of National Parks and Wildlife to take measures to curb the poaching of all species affected.

Key words: challenges, concern, resource, resource protection, tourism, revenue

INTRODUCTION

Proclaimed by the Governor of Northern Rhodesia (now Zambia) on the 20 April 1950 as a Game Reserve (Moss, 1976; Mwima, 2001), the Kafue National Park (KNP), one of the largest national parks in the world (about 22,480km2), was given its full national park status on 25 February 1972 under the National Parks and Wildlife Act. The park is considered to be one of the most important wildlife areas and eco-tourism destinations in Southern and Eastern Africa offering wilderness experiences of the "Real Africa" (Zambia Wildlife Authority, 2004). It has great potential for the development of a competitive nature-based tourism because of its exceptionally large variety of wildlife, distributed throughout in varying densities and diversity. Tourism activities include game drives, game viewing by boat, walking and bird safaris, river canoeing, angling, boat cruises, hill and rock climbing, great photo opportunities and trips to hot springs. Given such attributes, KNP has long had the potential to optimise the generation of revenue from its wildlife resources and fund most of its operations. However, there have been limitations to realising that potential.

Years of neglect led to the deterioration of the park's infrastructure and natural resources to a point where it required significant investment to restore the protection and management of its biodiversity (Zambia Wildlife Authority, 2004). It also faced several challenges, which included illegal off-take of wildlife and low tourism and associated revenue.

To address the challenges, the Zambia Wildlife Authority (ZAWA) implemented a project entitled Programme for the Development of Kafue National Park as a Model of Sustainable Economic Use and Biodiversity Conservation in a Management Extensive

Environment (known as the Kafue Programme) with co-funding from the International Development Association, and the Global Environment Facility (GEF) through the World Bank and the Norwegian and Zambian governments. The goal was to reverse the loss of biodiversity in the park and its adjacent Game Management Areas (GMAs) and to develop sustainable tourism by securing critical habitats and species.

After seven years (2005–2011) of implementation, the programme improved all aspects of park management. An assessment of the park's performance using the Management Effectiveness Tracking Tool (Stolton et al., 2003) indicated that the score improved from 41 to 62 per cent, that is, from a low intermediate to a high intermediate category. The park had improved management effectiveness by successfully addressing the threats and pressures that had led to its previous state. Subsequently, the park's status changed from 'Declining' to 'Recovering'. The programme's success was echoed by the Implementation Completion and Results report by the World Bank (2012) which concluded that "a foundation has been laid which provides experiences to learn from and achievements to build on".

To ensure sustainability, an exit strategy from the Kafue Programme included the formation of a business or cost -and-profit centre in 2010 with the aim that it would retain revenue from the park and use the money to pay staff salaries and fund operations without relying on ZAWA headquarters in the long term. To nurture it, the government contributed 36 per cent of the fledgling business centre's budget. This strategy was highly applauded by tour operators, park staff and other stakeholders. However, the applause was followed by despondency when the government, for unknown reasons, withdrew its contribution to the business centre after only one year of operation. Subsequently, the centre was closed; all revenues were once again remitted to ZAWA headquarters similarly to other protected areas. Once part of the headquarters' general fund, there was no guarantee that the monies would be reinvested in KNP.

The phasing out of the Kafue Programme, compounded by the closure of the nascent business centre, led some stakeholders to postulate that the park would rapidly revert to a state of neglect. This postulation seemed logical considering that Zambia's protected areas are under-performing in ecological, economic and social terms because of underfunding, resulting in inadequate law enforcement (Lindsey et al., 2014). Similar observations regarding the funding of protected areas in Africa have been made by Emerton et al. (2006), Dlamini and Masuku (2012, 2013) and Lapeyre and Laurans (2017). The concern was heightened by the experience in the South Luangwa National Park, the first protected area in Zambia to use the business-centre approach. It took 20 years of donor support before the park could break even.

In contrast, other stakeholders argued that given the programme's achievements, the park would not deteriorate to its previous state, surmising that such a postulation would merely discourage potential investors in tourism. These views essentially concurred with those of the World Bank and the Park Business Plan developed by PMTC-Zambia Limited (2008), which projected that KNP would break even within a period of five years of its implementation. Such an achievement, however, was contingent upon institutional reforms that would entail devolving financial management to the park as a cost-and-profit centre, integrating the interests of stakeholders in its management and economic development, and improving the efficiency of management systems. In view of the foregoing, this paper attempted to find out if the postulation that, following the phasing out of the Kafue Programme that aimed to secure critical habitats and species in the Kafue National Park and adjacent GMAs, the park would revert to the previous state of neglect was supported by the evidence. Hence the question 'The giant sleeps again?" In this context, 'the giant' refers to the park, which, at around 22,480 km2 , is undoubtedly a mega park.

METHODS

Study site

Located between 25°13'–26°46' E and 14°03'–16°43' S, KNP is almost centrally situated between Lusaka and Livingstone, Zambia's administrative and tourist capital cities respectively (Figure 1). It is one of the closest tourist resorts to these towns (Zambia Wildlife Authority, 2004).

Moss (1976) and the National Parks and Wildlife Service and Japan International Cooperation Agency (1999) describe the park as having a wide range of habitats, such as long classic dambos with extensive open grassland, seasonal stream flows and perennial pools. The vegetation includes Miombo *Brachystegia* species, Mopane (*Colophospermum mopane*), termitaria, riverine woodland, forests and thickets. The area includes at least 100 km of the most attractive stretches of the middle Kafue River and western shore of Lake Itezhi-tezhi, which have mature riparian and lacustrine woodland habitats, calm reaches interspersed by rapids

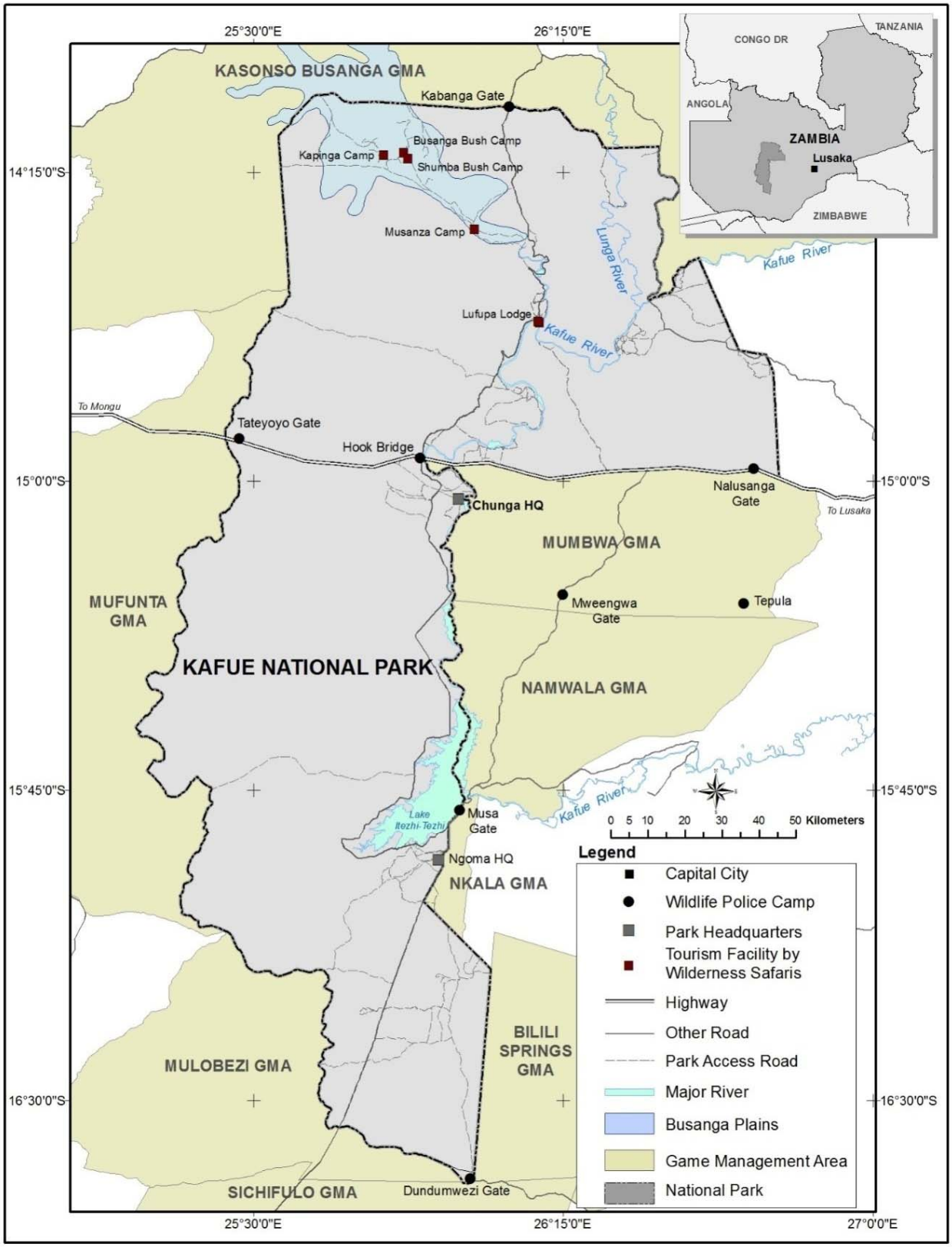


Figure 1. Map of Kafue National Park

and rocky pools, sandbars and grassy banks, offering abundant opportunities for fishing, bird watching, wilderness trails, canoeing, picnicking, and so on. Species recorded include 158 mammals, 481 birds (over half Zambia's species, and 80 per cent of all genera), 69 reptiles, 36 amphibians and 58 fishes. According to Moss (2007), the high-profile species include lion (*Panthera leo*), elephant (*Loxodonta africana*), buffalo (*Syncerus caffer*), leopard (*Panthera pardus)*, roan antelope (*Hippotragus equinus*), sable antelope (*Hippotragus niger)*, eland (*Taurotragus oryx*), cheetah (*Acinonyx jubatus*) and African wild dog (*Lycaon pictus*).

Data collection and analysis

The study analysed data on wildlife, law enforcement and tourism for the period 2005 to 2015, that is, 2005–2011 (during the programme) and 2012–2015 (post-programme). To address the study question, a trend analysis of the wildlife resource, effectiveness of resource-protection operations, and tourism was conducted. The wildlife resource was examined because it is the principal reason for the existence of the park, specifically, to control the aggressive attrition of wildlife populations (Mwima, 2001). Resource protection (law enforcement) was considered because it is a means of securing the wildlife; it minimises illegal activities, at least to a level where conservation objectives are not greatly impacted (Leader-Williams et al., 1990; Jachmann & Billiouw, 1997; Jachmann, 1998). Tourism was assessed because it is the main source of revenue for the park; the more tourists, the higher the revenue earned. Tourism also has an impact on poaching. A study by Jachmann et al. (2011) showed that there is a relationship between poaching and tourism; it declines with increasing numbers of tourists that act as a deterrent, but increases with a higher relative abundance of wildlife.

The resource

For the purposes of monitoring and evaluating the performance of resource protection efforts, the Kafue Programme had identified elephant, buffalo, puku (*Kobus vardonii*) and red lechwe (*Kobus leche leche*) as 'key' wildlife species. The Kafue Programme document does not explain why puku and lechwe, which are not even among the high-profile species (Moss, 2007), were selected as 'key' wildlife species.

Elephant tangle © Ben Coley

The authors determined the population trends of these species from the results of aerial surveys conducted between 2006 and 2015 (Zambia Wildlife Authority, 2006, 2013; Frederick, 2009, 2011; Department of National Parks and Wildlife, 2016a, b). The name of the Zambia Wildlife Authority was changed to the Department of National Parks and Wildlife (DNPW) in 2016 under the Zambia Wildlife Act No. 14 of 2014. Results of the 2013 survey were, however, excluded because no explanation was given for populations of elephant and buffalo that appeared to have increased three-and seven-fold respectively within a period of two years. These increases obviously exceeded the maximum intrinsic rates of increase of 5.5 and 12 per cent per year for elephant and buffalo respectively (Conservation Ecology Research Unit, undated; Jolles, 2007).

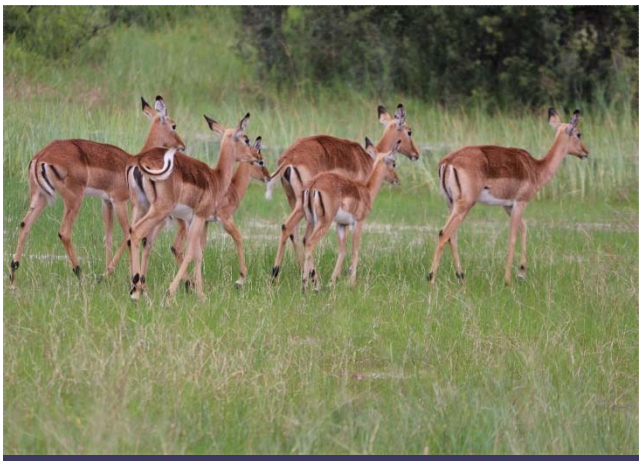
Resource protection

Cognisant of the fact that no single method is effective, DNPW uses a combination of different measures to reduce poaching in all of Zambia's protected areas. These include environmental education to raise the importance of conservation, co-management of natural resources in GMAs, and law-enforcement. According to the Zambia Wildlife Act No.12 of 1998, GMAs were established for the sustainable utilisation of wildlife. They provide for multiple use in the form of agriculture, forestry, grazing, wildlife conservation, hunting and fisheries management. By virtue of sharing common boundaries with national parks, however, they also act as buffer zones (Lewis et al., 1990; Lewis & Alpert, 1997). As such, they play an ecological role in that they cushion the negative impact of human activities on the national parks.

Out of the three approaches used to combat illegal activity, the authors opted to assess resource-protection by measuring patrol effectiveness because there is a quantifiable and direct relationship between the level of illegal activity and effort to reduce poaching. Such a direct relationship can be difficult to establish if assessing the effectiveness of environmental education and community-based natural resources management in reducing poaching. This contention does not intend to diminish the roles played by the other two approaches in natural resource conservation. Rather, it is the establishment of numerical evidence of their direct impact in combating poaching that is problematic. For example, in assessments of law-enforcement effectiveness, evidence such as indices of catch of illegal activity per effort is the more reliable method (Bell, 1984; Jachmann, 1998). We are not aware of similar approaches being used to assess the effectiveness of environmental education or co-management in combating poaching.

Besides the problem of deriving empirical evidence, community-based natural resources management, in its present form, takes place only in the GMAs under the Parks and Wildlife Act Nos. 12 and 14 of 1998 and 2015 respectively, although the involvement of communities in the management of wildlife and protected areas was initiated over three decades ago, in the mid-1980s in Zambia (Lewis et al., 1990). Within the GMAs, there is sharing of revenue from professional hunting between DNPW and communities. Additionally, on behalf of communities, community resource boards fund development projects, employ local residents in wildlife protection and management, and undertake any other activity that benefit the conservation of natural resources using revenue generated from hunting. Under the Acts, communities are expected to form community resource boards along geographic boundaries contiguous to a chiefdom in a GMA or an open area (not a protected area, but one with wildlife) to spearhead their participation in wildlife management. Although some authors, for example, Musumali et al. (2007) observed a general incongruence between community perceptions and expectations with regards to stewardship over community-based natural resources management, and Aurélie et al. (2009) have questioned its achievement in Africa, others extol the virtues of involving communities in wildlife and protected areas management (e.g. Infield, 1988; Child, 1996; Lewis et al., 1990; Hutton et al., 2005).

In terms of law enforcement, there are seven patrol types in KNP, long (≥21 days), short (≤5 days), day (8 hours or less), night, ambush, river and lake. Long and short patrols are deployed from the base to a patrol



Impala © Olga Laiza Kupika

camp using a vehicle, and return by the same means after 21 or 5 days respectively. From the patrol camps a standard 6-person patrol is conducted. During patrols, the number of illegal activities encountered and their locations are recorded on standardised patrol forms. The other data collected includes the number of staff on patrol, duration of patrol, areas covered, and the number of large mammals encountered by species and location. The duration of long patrols was, however, arbitrarily reduced to 10 effective patrol days after a study by Siamudaala et al. (2009) revealed that encounters with illegal activity, poachers and arrests declined after 5, 6 and 7 days respectively. Effective patrol staff-days do not include time spent on placement (moving between base and the patrol camp) and preparations (Jachmann, 1998, 2008a, b).

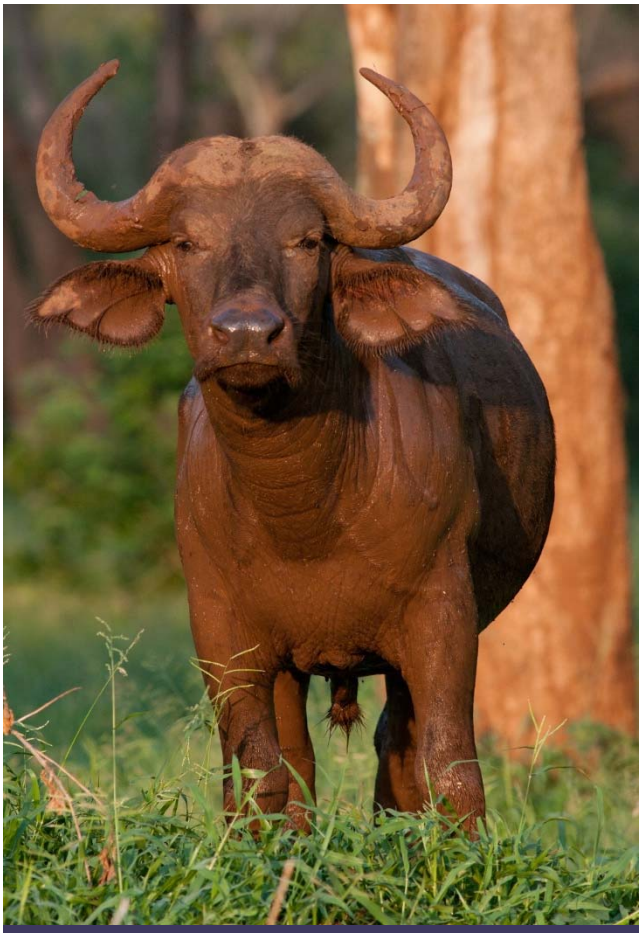
Various approaches to assessing law-enforcement effectiveness are given by Bell (1984) and Jachmann (1998), with Catch-per-Effort (C/E) method regarded as the most reliable. For this reason, we used this method to analyse the trend of law-enforcement effectiveness (C/E indices) from 2005 to 2015. The indices were calculated using the following formula by Bell (1984):

C/E = KI, where:
C = the "catch", i.e. the number of encounters with illegal activity per unit area per unit time;
E = the "effort", i.e. the index of patrolling effort per unit area per unit time;
K = the "capture constant" which defines the relationship between catch per effort and the amount of illegal activity per unit area per unit time; and
I = the amount of illegal activity per unit area per unit time.

To determine C/E indices, effective patrol staff days (effort) were calculated for the period 2005 to 2015. Effective patrol time was multiplied by the number of staff in the patrol group to give effective patrol staff-days per year. From the patrol forms, the study determined the number of serious offences (catch) per year, that is, those which directly relate to the illegal killing of wildlife, namely, poachers arrested, poachers observed, firearms/cartridges/ivory/skins confiscated, gunshots heard, poachers' camps found, animals killed, wire snares collected, and cartridges seen (Bell, 1984; Jachmann, 1998, 2008a, b). Data for 2015 was also obtained from the Game Rangers International-Kafue Conservation Project (GRI-KCP), a Zambian conservation-focused organisation working closely with the DNPW and other key stakeholders to protect Zambia's rich wildlife estate (Game Rangers International, 2017). The GRI-KCP project focuses on law enforcement within KNP and the adjacent GMAs.

Jachmann (2008a) arbitrarily set the acceptable amount of illegal activity value of 0.02 encounters with serious offences/effective patrol staff-day/ month, which in fact translates to the same index per year. The same value can be used as an annual index. As such, it was adopted to determine whether or not illegal activity was within an acceptable annual limit.

As part of the examination of law-enforcement effectiveness, operational budgets were also examined because they have a negative effect on poaching (Jachmann, 2008a). In Ghana, poaching declined with increasing camp visit frequencies and financial resources in protected areas. Expenditures (in US dollars) on law enforcement were extracted from annual budgets. Only recurrent costs, for example, consumables such as patrol rations, fuel for deployment and uniforms were considered. Capital costs such as equipment (GPS, handcuffs) and vehicles were excluded because they do not vary annually. Following the methods of Jachmann (2008b), expenditures were converted to amount/km2/ year.



Buffalo © Daniel Polakow

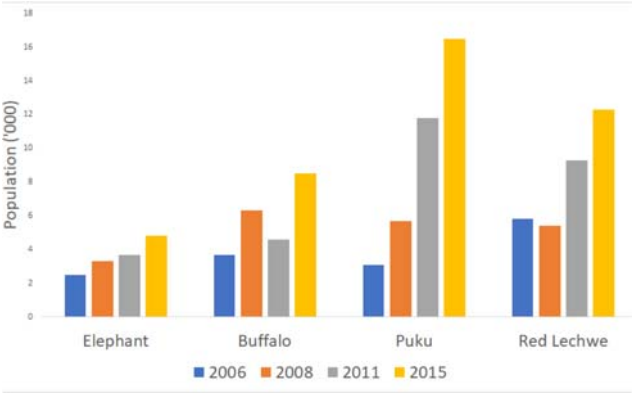


Figure 2. Population trends of 'key' wildlife species in the Kafue National Park, project period (2006–2011) and post project (2015)

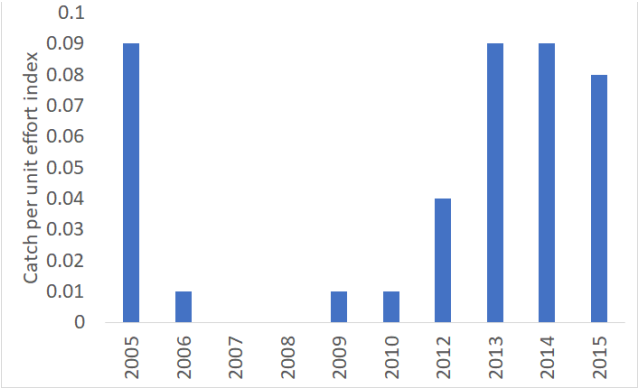


Figure 3. Trend of catch per effort 2005–2015, Kafue National Park, Zambia

Expenditures for 2015 include figures from the GRI-KCP. In 2014 a new project funded by the United Nations Development Programme (UNDP)/GEF covering KNP, West Lunga National Park, GMAs and Forest Reserves was implemented by ZAWA and the Department of Forestry to strengthen management effectiveness and generate multiple environmental benefits within and around protected areas. While there is an allocation for resource protection, actual amounts spent for this purpose in KNP were not easy to obtain. A total figure of US$3.0 million was purportedly spent on law enforcement. An attempt to obtain the data from the Chunga and Ngoma offices (see Figure 1) revealed that no money was remitted to the park by the UNDP/GEF project. In terms of recurrent costs, only rations, fuel and per diems are covered by the project, but the costs were not available. Given this challenge, the analysis excluded funding from the project. As will be seen later, exclusion of such data did not affect the results negatively.

Tourism

Tourism was assessed in terms of the number of tourists to the park and revenue generated. Tourists to the park fall into three categories, international, established residents and locals. International tourists pay in foreign currency, while established residents and locals pay in Zambia Kwacha, the local currency. Regarding revenue, the main sources are fixed and variable fees. The former relate to rental charges based on the size of the tourism facility, number of tourist beds, and length of the tourism season, while the latter cover visitors' sold bed-nights, bed levies, and park entry fees.

Data on tourists and revenue receipts (fixed and variable fees) were obtained from Chunga, Ngoma, and DNPW headquarters in Lusaka. Revenue collected in local currency was converted to US dollars using the prevailing exchange rate. While tourist numbers were available for all the years, data for variable fees was missing for 2010. As such, the number of tourists and the associated revenue for that year was excluded from the analysis. The missing data, however, does not negatively affect the trends in the number of tourists and amount of revenue.

RESULTS AND DISCUSSION

The resource

All populations of the 'key' wildlife species increased between 2005 and 2015 (Figure 2). It is evident that the momentum gathered in reducing illegal activity (Figure 3) during the KNP Programme led to the increases in populations of the species examined even four years after the project. That the populations increased after the programme suggests that in terms of the wildlife resource, the concern that the park would revert to its previous state may have been misplaced. Future data will tell whether or not the trend will change.

Resource protection

As expected, there was a high encounter rate of illegal activity as evidenced by the C/E index upon commencement of the project (Figure 3). However, it declined drastically during implementation of the programme, particularly between 2007 and 2008. The annual average C/E index during the programme was 0.02, the acceptable amount of illegal activity (Jachmann, 2008a) or a low illegal-hunting challenge (PMTC-Zambia Limited, 2008). After the programme, however, there was an increase in C/E indices, the annual average being 0.08 (Figure 3), a situation of moderate to high illegal-hunting challenge. This change from low to moderate or high illegal-hunting challenge vindicates those stakeholders who were concerned that the park would revert to its previous state.

Considering that the 'key' species continued to grow while the C/E indices increased, it may be inferred that the illegal activity may have mostly involved killing animals other than the 'key' wildlife species. This inference is supported by an examination of the carcass ratio of elephants, an indication of population trends (Douglas-Hamilton & Hillman, 1981). A carcass ratio is defined as the number of estimated elephant carcasses divided by the sum of all carcasses and the estimated elephant population. It is converted to a percentage by multiplying by 100. When the ratio is under 5 per cent, most of the carcasses are produced by natural mortality in stable or expanding populations. However, if over 8 per cent, the losses may be unsustainable and the populations are decreasing. Although there has been an increase in the carcass ratio, from 0.8 in 2006 to 5.5 per cent in 2015, it is attributed to the fact that the majority (242 of the 279 or 86 per cent) of the carcasses sighted in the most recent aerial survey were of individuals more than 10 years old.

The increase in poaching is undoubtedly a result of low operational budgets (Figure 4). PMTC-Zambia Limited (2008) stated that for a protected area with a low illegal -hunting challenge, which was the case during the programme, the minimum expenditure should be US$40.00/km², which is slightly lower than the average annual expenditure of US$44.00/km² on resource protection operations between 2005 and 2011. In contrast, the average annual expenditure after the programme was US$14.00/km². With the increased illegal activity after the programme, as evidenced by the high C/E indices, the operational budget is 11 times lower than suggested by PMTC-Zambia Limited(2008), which recommended an expenditure of up to US$160/ km² for a moderate to severe illegal-hunting challenge.

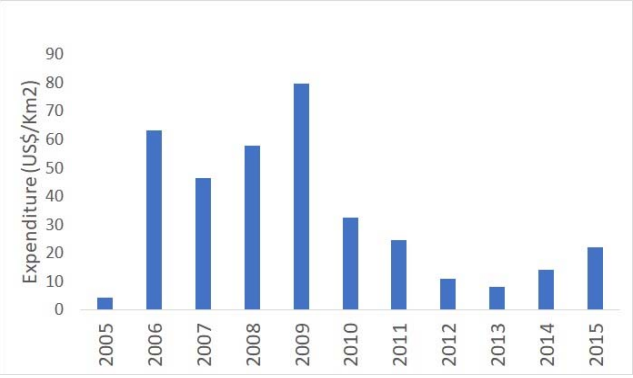


Figure 4. Trend of annual budget for law enforcement in Kafue National Park, 2005–2015

During the Kafue Programme, sufficient funding for resource protection helped to reduce illegal activity. This has not been the case after the programme. The additional funding from the two projects by GRI and UNDP/GEF is having very little impact on law-enforcement effectiveness. This inference is by no means intended to denigrate the two projects. It simply illustrates that more financial resources than are presently available are needed to once again fund law enforcement adequately. Further evidence of the need for adequate finances for law enforcement is given by Munthali (2017), who observed that this decline in funding has led to lack of capacity to procure items such as transport, fuel, rations, uniforms and field equipment (e.g. handcuffs, GPS sets, camping gear). Currently, the park is using old vehicles procured more than six years ago during the programme. These vehicles have become very expensive to maintain. With the reduction in the budget for resource protection, this situation is likely to worsen. The current situation also supports the views of those stakeholders who were concerned by the withdrawal of funding to the business centre, and its subsequent closure.

Considering the correlation between operational budget and law-enforcement effectiveness, it is logical to surmise that it is only a matter of time for the populations to decline again due to the increase in poaching. To avoid such a situation, it would be advisable to increase funding for resource protection.
The increase in illegal activity is evidence enough that the current co-management in the adjacent GMAs is not having the intended effect of cushioning the negative impact of human activities on the park. A full examination of the weaknesses of the co-management in GMAs and how this might be improved in KNP by strengthening the institutions and governance is a subject for future study. A study of two GMAs adjacent to the park, Namwala, which is disturbed by human settlements and cultivation, and Nkala, which is relatively pristine, concluded that institutions and governance were a factor in determining the ecological status of the two areas (Mkanda et al., 2014). Other authors have also noted that governance and institutions in co-management of wildlife and protected areas can be challenging (Musumali et al., 2007; Simasiku et al., 2008; Aurélie et al., 2009).

Tourism

There has been an overall increase in tourist numbers and revenue earned since 2005 (Figure 5a and b). Comparatively, there were more tourists to the park after than during the Kafue Programme. The annual average number of tourists during the implementation

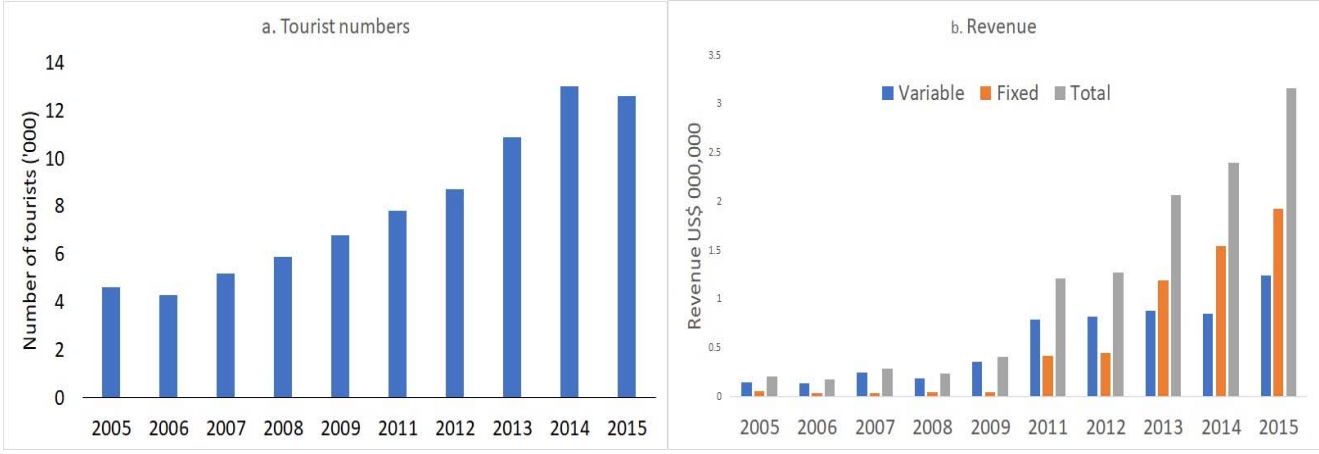


Figure 5. (a) Number of tourists, Kafue National Park, 2006–2016 (b) Revenue, Kafue National Park, 2006-2016

of the KNP programme was around 7,666 but increased by about 55 per cent to 11,250 in the four years from 2012 to 2015. Although there is a drop in the numbers of tourists after 2015 (Figure 5a), the figures are still higher than during the programme. Given the relationship between poaching and tourism (Jachmann et al., 2011), the slight decline in tourist numbers in 2015 could be the beginning of a downward trend.
In terms of revenue, it increased threefold after expiry of the programme, from US$1.2 million in 2012 to US$3.2 million in 2015 (Figure 5b). That more revenue is being collected than during the programme underpins the need to invest in resource protection, and ensure the sustainability of funds before the resource is further degraded.

Several reasons have led to the increase in tourist numbers and revenue. First, there was an increase in the number of tourist lodges and camps from seven with 120 beds in 2010 to 22 with 288 beds in 2015. The most remarkable achievement was the arrival of Wilderness Safaris in 2006, which established luxury tourist lodges at Lufupa and the Busanga Plains (see Figure 1). The increase in investment in tourism facilities is an indication of the attractiveness of the park not only for business by lodge owners, but also as a tourist destination. Tourists are motivated to visit national parks because of the attractions that they have to offer (Kruger & Saayman, 2010).

There were also significant infrastructural improvements, for example, three existing airfields were rehabilitated, and two were newly constructed. These works shortened the time of travel from Lusaka, the nearest city with an international airport. Shortening the travel time is an incentive for tourists to visit the park because short distances attract high numbers of visitors (Jachmann et al., 2011). Even access by road was improved; for example, the M9 single-lane highway that traverses the park was upgraded. While this road is of economic importance in that it provides the main access to western Zambia and the bordering countries of Angola and Namibia, it also shortened the distance between Lusaka and KNP. Besides the M9, bridges and internal access roads to lodges, as well as those for game viewing were also improved. New roads to provide access for game-viewing, specifically during the rainy season, were constructed around Lufupa Lodge. The new all-weather game-viewing roads inevitably extended the tourist season in the area around the lodge. Previously game viewing had been restricted to the dry season of June to November, as in the rest of the park.

The increase in the number of tourists to the park and the revenue generated supports the view of those stakeholders who contended that the achievements of the programme were a solid foundation to propel the park to greater success. These results reveal the futility of trying to predict the performance of a protected area after project funding is withdrawn. Those who were most concerned by the ending of the Kafue Programme may have been unaware or ignored the fact that project impacts are felt well beyond a project's life. Outcomes are documented through evaluative actions taken some time following project completion. This study serves as a proxy for such an evaluation.

However, it should also be stated that ecological impacts are seldom obvious in the short term; while they tend to have significant effects in the long term. Four years after the project is, therefore, not a long enough period for DNPW to be complacent about the population status of the key species and increased tourism. After all, the

increase in poaching such species not considered 'key' may be the manifestation of a more serious problem that will eventually include the poaching of 'key' ones. It is just a matter of time until the cumulative impacts of these illegal activities will slowly, but surely, erode the ecological integrity of the park unless they are addressed now. Measures are therefore necessary to curb the poaching of all species.

CONCLUSION

This paper sought to assess whether the park has indeed reverted to a state of neglect after the phasing out of the Kafue Programme and closure of the nascent business centre, as postulated by some stakeholders. While there is evidence that resource-protection operations are underfunded and illegal activity is on the increase, there is, however, no decline yet in the populations of the wildlife species we examined or tourism activity. However, considering the increase in illegal activity, a situation that will most likely erode the ecological integrity of the park unless the trend is reversed, we conclude that the giant is in the initial stages of a deep slumber and the full potential of the park is yet to be realised. It would, therefore, be appropriate, for DNPW to take measures to control illegal activity in the park.

ACKNOWLEDGEMENTS

The authors are grateful to Richard Mwamba and Nyambe Namushanawa, Principal Business Development Officer and Principal Accountant respectively in the Department of National Parks and Wildlife, Zambia for providing data on revenue and tourists. We also wish to thank Simbotwe Mwiya, Project Manager, UNDP/GEF V Project within and around Kafue and West Lunga National Parks for the information on funding for law enforcement.

AUTHOR BIOGRAPHIES

Francis Mkanda is a natural resources management specialist with experience in protected area and wildlife conservation in Southern Africa for over three decades. He was the park manager during the implementation of the Kafue Programme; currently a freelance consultant.

Simon Munthali is an ecologist with 36 years working experience in the nature conservation. Currently freelance consultant in the sector.

James Milanzi is a wildlife ecologist and a protected-area specialist with wide experience in managing donor funded projects that combine the management of such areas with local communities in remote areas. His research interest is in the development of a financially sustainable park management model.

Clive Chifunte is a wildlife ecologist working with the Department of National Parks and Wildlife, Zambia. He also has a background in wildlife law enforcement. His research interest revolves around investigating fire ecology, vegetation studies and monitoring of wildlife populations.

Neal Muswema is a tourism management specialist with the Department of National Parks and Wildlife in Zambia. He is experienced in the sustainable commercialisation of protected areas. Research interests include sustainable tourism development.

Anety Milimo is a research technician in the Department of National Parks and Wildlife in Zambia with 13 years' experience in data collection on fauna and flora.

Chaka Kaumba is a mapping specialist in the Department of National Parks and Wildlife in Zambia. He has over 20 years of experience in Geographic Information System (GIS) and Remote Sensing Applications. He has spent the last 12 years specialising in Conservation GIS. His research interests include establishing the amount of space utilisation by man and beast through habitat mapping and monitoring.

Austin Mwakifwamba is a protected-area socio-economist with experience in community-based natural resources management in the Department of National Parks and Wildlife in Zambia.

REFERENCES

Aurélie, B., Blomley, T., Coad, L., Nelson, F., Roe, D. and Sandbrook, C. (2009). What has CBNRM Achieved in Africa? The '3Es' – Empowerment, Economics, Environment. In D. Roe, F. Nelson, and C. Sandbrook (eds) *Community Management of Natural Resources in Africa: Impacts, Experiences and Future Directions*. Natural Resources No. 18, pp. 55–81, London: IIED.

Bell, R.H.V. (1984). Monitoring of Illegal Activity and Law Enforcement in African Conservation Areas. In R.H.V. Bell and E. McShane-Caluzi (eds) *Conservation and Wildlife Management in Africa*. pp. 317–352. Washington, DC: United States Peace Corps.

Child, B. (1996). The Practice and Principles of Community-Based Wildlife Management in Zimbabwe: the CAMPFIRE Programme. *Biodiversity and Conservation*, 5: 369–398. doi.org/10.1007/BF00051780

Conservation Ecology Research Unit (undated). Elephants, Facts and Fables (online), http://www.ceru.up.ac.za/elephant/faqs.php. Accessed June 2017.

Department of National Parks and Wildlife (2016a). *Report on the 2015 Aerial Census of Elephants and Other Large Mammals in*

Zambia: Volume II Population Estimates for Other Large Mammals and Birds. Lusaka, Zambia: Department of National Parks and Wildlife.

Department of National Parks and Wildlife (2016b). *The 2015 Aerial Survey in Zambia. Population Estimates of African Elephants (Loxodonta africana) in Zambia. Vol.1*. Lusaka, Zambia: Department of National Parks and Wildlife.

Dlamini, C.S. and Masuku, M. (2012). Towards Sustainable Financing of Protected Areas: A Case Study of the Swaziland National Trust Commission (SNTC). J*ournal of Geography and Regional Planning*, 5(11): 298–313. doi.org/10.5897/JGRP12.004.

Dlamini, C.S. and Masuku, M. (2013). Towards Sustainable Financing of Protected Areas: A Brief Overview of Pertinent Issues. *International Journal of Biodiversity and Conservation*, 5(8): 436–445. doi.org/10.5897/IJBC11.238

Douglas-Hamilton, I. and Hillman, A. (1981). *Using Elephant Carcasses and Skeletons as Indicators of Population Trends in Low-Level Aerial Survey Techniques*. ILCA Monograph.

Emerton, L., Bishop, J. and Thomas, L. (2006). *Sustainable Financing of Protected Areas: A Global Review of Challenges and Options*. Gland, Switzerland and Cambridge, UK. doi.org/10.2305/iucn.ch.2005.pag.13.en

Frederick, H. (2009). *Aerial Survey of Kafue Ecosystem 2008*. Lusaka, Zambia: Zambia Wildlife Authority.

Frederick, H. (2011). *Aerial Survey: Kafue Ecosystem 2011*. Lusaka, Zambia: Zambia Wildlife Authority.

Game Rangers International (2017). *GRI – Kafue Conservation Project Quarterly Report January – March 2017*. Lusaka, Zambia.

Hutton, J., Adams, W.A. and Murombedzi, J.C. (2005). Back to the Barriers? Changing Narratives in Biodiversity Conservation. *Forum for Development*, 2: 341–369. doi.org/10.1080/08039410.2005.9666319

Infield, M. (1988). Attitudes of a Rural Community towards Conservation and a Local Conservation Area in Natal, South Africa. *Biological Conservation*, 45: 21–46. doi.org/10.1016/0006-3207(88)90050-X

Jachmann, H. and Billiouw, M. (1997). Elephant Poaching and Law Enforcement in the Central Luangwa Valley, Zambia. J*ournal of Applied Ecology*, 34: 233–244. doi.org/ 10.2307/2404861

Jachmann, H. (1998). *Monitoring Illegal Wildlife Use and Law Enforcement in African Savanna Rangelands. Lusaka, Zambia*. Wildlife Resource Monitoring Unit, Environmental Council of Zambia.

Jachmann, H. (2008a). Illegal Wildlife Use and Protected Area Management in Ghana. *Biological Conservation*, 141: 1906–1918. doi.org/10.1016/j.biocon.2008.05.009

Jachmann, H. (2008b). Monitoring Law-enforcement Performance in Nine Protected Areas in Ghana. *Biological Conservation*, 141: 89–99. doi.org/10.1016/j.biocon.2007.09.012

Jachmann, H., Blanc, J., Nateg, C., Balangtaa, C., Debrah, E., Damma, F., Atta-Kusi, E. and Kipo, A. (2011). Protected Area Performance and Tourism in Ghana. *South African Journal of Wildlife Research*, 41(1): 95–109. doi.org/10.3957/056.041.0112.

Jolles, A. (2007). Population Biology of African Buffalo Syncerus caffer at Hluhluwe-iMfolozi Park, South Africa. *African Journal of Ecology* 43(3): 398–406. Doi.org/ 10.1111/j.1365-2028.2006.00726.x

Kruger, M. and Saayman, M. (2010).Travel Motivation of Tourists to Kruger and Tsitsikamma National Parks: A Comparative Study. *South African Journal of Wildlife Research*, 40(1): 93–102. doi/abs/10.3957/056.040.0106.

Lapeyre, R. and Laurans, Y. (2017). Contractual Arrangements for Financing and Managing African Protected Areas: Insights from Three Case Studies. *Parks* 23 (1): 75–88. doi:/10.2305/IUCN.CH.2017.PARKS-23-1RL.en.

Leader-Williams, N., Albon, S.D. and Berry, P.M.S. (1990). Illegal Exploitation of Black Rhinoceros and Elephant Populations: Patterns of Decline, Law-Enforcement and Patrol Effort in the Luangwa Valley, Zambia. *Journal of Applied Ecology*, 27: 1055–1087. doi.org/ 10.2307/2404395

Lewis D., Kaweche, G.B. and Mwenya, A. (1990). Wildlife Conservation outside Protected Areas: Lessons from an Experiment in Zambia. *Conservation Biology*, 4 (2): 171–180. doi.org/ 10.1111/j.1523-1739.1990.tb00106.x

Lewis, D. and Alpert, P. (1997). Trophy hunting and wildlife conservation in Zambia. *Conservation Biology*, 11 (1): 59–68. doi.org/ 10.1046/j.1523-1739.1997.94389.x

Lindsey, P.A., Nyirenda, V.R., Barnes, J.I., Becker, M.S. and McRobb, R. (2014). Underperformance of African Protected Area Networks and the Case for New Conservation Models: Insights from Zambia. *PLoS ONE*, 9(5): 1–14. doi.org/10.1371/journal.pone.0094109.

Mkanda, F.X., Mwakifwamba, A. and Simpamba, T. (2014). Traditional Stewardship and Conservation in Game Management Areas: The Case of Nkala and Namwala, Zambia. *Oryx*, 48: 1–8. doi:10.1017/S003060531000574

Moss, P.F.N. (1976). *Kafue National Park: A Management Plan.* Lusaka, Zambia: National Parks and Wildlife Service and Zambia Wildlife Authority.

Moss, P.F.N. (2007). *The Feasibility of Establishing Block Tourism Concessions (Non-consumptive) in Kafue National Park. A Consultancy Report*. Lusaka, Zambia: Zambia Wildlife Authority.

Munthali, S.M. (2017). *A Review of the Law Enforcement Systems in The Kafue and West Lunga Ecosystems*. Consultancy Report Submitted to the United Nations Development Programme (UNDP)–Zambia, Lusaka: Zambia.

Musumali, M.M., Larsen, T.S. and Kaltenborn, B.J. (2007). An Impasse in Community-Based Natural Resource Management

Implementation: The Case of Zambia and Botswana. *Oryx*, 41 (3): 306-313. doi.10.1017/S00306530700518

Mwima, H.K. (2001). A Brief History of Kafue National Park, Zambia. *Koedoe,* 44 (1): 57–72. doi.org/ 10.4102/koedoe.v44i1.186

National Parks and Wildlife Service and Japan International Cooperation Agency(1999). K*afue National Park Management Plan*. Lusaka, Zambia: National Parks and Wildlife Service.

PMTC-Zambia Limited (2008). *Final Tourism-based Business Plan for Kafue National Park*. Consultancy Report. Lusaka, Zambia: Zambia Wildlife Authority.

Siamudaala, V.M., Nyirenda, V.R. and Saiwana, L. (2009). *Effectiveness of Law Enforcement on Wildlife Crimes in the Kafue Ecosystem, Zambia*. Lusaka, Zambia: Zambia Wildlife Authority.

Simasiku, P., Simwanza, H.I., Tembo, G., Bandyopadhyay, S.and Pavy, J-M. (2008). The Impact of Wildlife Management Policies on Communities and Conservation in Game Management Areas in Zambia: Message to Policy Makers. Lusaka, Zambia: National Resources Consultative Forum.

Stolton, S., Hockings, M., Dudley, N., MacKinnon, K. and Whitten, T. (2003). *Reporting Progress in Protected Areas: A Site-Level Management Effectiveness Tracking Tool*. World Bank/WWF Alliance for Forest Conservation and Sustainable Use.

World Bank (2012). *Implementation Completion and Results Report (ICR) on The Programme for the Development of Kafue National Park as a Model of Sustainable Economic Use and Biodiversity Conservation in a Management Extensive Environment – 2005 to 2009; Extended to 2011*. Lusaka, Zambia: World Bank.

Zambia Wildlife Authority (2004). *Programme of the Development of Kafue National Park as a Model of Sustainable Economic Use and Biodiversity Conservation in Management Extensive Environment – 2005 to 2009*. Project Document, Lusaka, Zambia: Zambia Wildlife Authority.

Zambia Wildlife Authority (2006). *Aerial Survey of Large Mammals in Kafue National Park and Surrounding GMAs*. Lusaka, Zambia: Zambia Wildlife Authority.

Zambia Wildlife Authority (2013). *Report on the 2013 Dry Season Survey of Large Herbivores for Kafue and Luangwa Ecosystems*. Lusaka, Zambia: Zambia Wildlife Authority.

RESUMEN

La retirada progresiva del Programa Kafue, que tenía como objetivo proteger especies y hábitats críticos en el Parque Nacional Kafue y las áreas adyacentes de manejo de la caza, fue recibida con reacciones mixtas. Algunos grupos interesados, en particular los operadores turísticos, estaban desalentados; afirmaron que el parque volvería a su estado anterior de abandono. Sin embargo, otros opinaron que el programa había logrado su propósito. Por otra parte, tal desaliento podría simplemente influir negativamente en posibles inversores en turismo, la principal fuente de ingresos para el parque. Este estudio pretende constatar si el desaliento estaba justificado. Por consiguiente, examina los recursos, la eficacia en torno a la protección de los recursos y el turismo durante y después del programa. Los resultados son variados. Mientras que las poblaciones de especies silvestres clave siguieron creciendo y el número de turistas y los ingresos asociados aumentaron cuatro años después del programa, la actividad ilegal también aumentó a los niveles anteriores al programa. Por lo tanto, ciertamente había cierto grado de justificación en la preocupación, el "gigante" duerme de nuevo y su potencial sigue sin aprovecharse. Es indispensable que el Departamento de Parques Nacionales y Vida Silvestre tome medidas para frenar la caza furtiva de todas las especies afectadas.

RÉSUMÉ

Le retrait progressif du programme Kafue visant à protéger les habitats et les espèces prioritaires dans le parc national de Kafue et dans les zones adjacentes de gestion des gibiers, a été accueillie avec des réactions mitigées. Certains intervenants, en particulier les voyagistes, se sont montrés découragés : craignant que le parc revienne à l'état de désuétude passé. D'autres intervenants ont toutefois soutenu que le programme avait atteint son objectif. De plus, une telle attitude risquerait tout simplement de décourager les investisseurs potentiels dans le tourisme, principale source de revenus du parc. Cette étude tente de vérifier si le découragement est justifié. Dans ce but, il examine l'état du parc, l'efficacité de la protection de ses ressources et la qualité du tourisme pendant et après le programme. Les résultats sont mitigés. Alors que les populations d'espèces fauniques clés ont continué de croître et que le nombre de touristes et les revenus associés ont augmenté quatre ans après le programme, les activités illégales ont également crû pour revenir au niveau précédant le programme. Ceci confirme que dans une certaine mesure, l'inquiétude est bien justifiée, car le potentiel du parc reste largement inexploité. Il est essentiel que le Département des Parcs Nationaux et de la Faune prenne des mesures pour lutter contre le braconnage de toutes les espèces affectées.