Ex-situ Conservation: Primate Protection in the Limbe Wildlife Centre

Author: Ayonghe Akonwi Nebasifu

Abstract

This study aims to describe efforts by the Limbe Wildlife Centre to protect primates in Cameroon. Specifically, we aim to identify what species of primates are currently under ex-situ conservation, the approach of conservation adopted, problems with keeping animals in the zoo, and to suggest recommendations towards improving activities of the zoo. Using ethnographic methodology combining with mixed method approaches of field notes, photographic recordings, and interview, findings show that the Chimpanzee, Gorilla, and Mandrill make up the main species of primates in the zoo, rescued and brought by means of donations. In addition, observations reveal that illegal animal trade forms the major threat to survival of these primates. I conclude with a general call for both organizations and individuals to fight against extinction of primates by active participation in awareness creation, and to develop self-attitudes of tracking and reporting any suspicious activity of illegal animal trade where necessary.

Keywords: Ex-situ conservation, Primate protection, Wildlife

1. Introduction

“A primate is any member of the biological order Primates, the group that contains all the species commonly related to the lemurs, monkeys, and apes, with the latter category including humans. Primates are found all over the world. Non-human primates occur mostly in Central and South America, Africa, and southern Asia. A few species exist as far north in the Americas as southern Mexico, and as far north in Asia as northern Japan. The Primates order is divided informally into three main groupings: prosimians, monkeys of the New World, and monkeys and apes of the Old World. All primates have five fingers (pentadactyly), a generalized dental pattern, and a primitive (unspecialized) body plan. Another distinguishing feature of primates is fingernails” (ScienceDaily, 2015 [10]). In this study, we focus on Chimpanzees, gorillas, and Mandrills as typical examples of primates currently under protection by the Cameroon government and the Pandrillus foundation.

1.1. Problem statement

Considering several studies that have attempted to analyze the role played by zoos towards the fight against extinction of primates, one will definitely agree that zoos are of crucial help through ex-situ conservation of wildlife species. Yet, these occur with problems.
In this study, I adopt a case study of the Limbe Wildlife Centre (LWC) in the South West region of Cameroon. My objectives are;

- To identify the type of primates currently under protection in the LWC through photographic recording
- Identify causes to threats of extinction in primate population
- To describe the conservation approach applied in the LWC
- To determine problems and difficulties associated with conservation of these primates in the LWC

Propose recommendation to improve conservation activities in the LWC.

1.2. Theoretical background

1.2.1. Ex-situ Conservation

According to UNEP and WCMC World Conservation Monitoring Centre (2014), “ex-situ conservation refers to a set of conservation techniques involving the transfer of a target species away from its native habitat”. Examples include; captive breeding, DNA storage, and seed storage. Two main examples may include zoological and botanic gardens. Skroppa (2005) regards ex-situ conservation as when population, individuals, or reproductive material are maintained outside their original growth environment. Reasons for the practice of ex-situ conservation occur based on different contexts. For instance regarding plants, Skroppa argues that through breeding activities and the supply of genetically improved reproductive material, it allows commercial improvement of species; it supports populations that are in danger of genetic deterioration; where in-situ protection remains impossible, ex-situ helps to safeguard plant populations that are vulnerable to physical destruction; and that it helps to secure and ensure continues supply of reproductive material though storage or creation of a production source.

1.3. Related studies for consideration

Several studies have been carried out with respect to technical guidelines on management and protection of ex-situ population; associated legal requirements for ex-situ conservation; and in particular problems related to the application of ex-situ conservation techniques. According to article 9 of the Convention on Biological Diversity (CBD), ex-situ conservation should always be implemented as a complementary approach to in-situ conservation and not as an alternative. Furthermore, ex-situ techniques should be preferably implemented in the country of species origin. According to IUCN- International Union for the Conservation of Nature (2002) technical guidelines on the Management of ex-situ populations for conservation, the goal of conservation remains to maintain existing genetic diversity and populations in the wild so as to maintain ecological processes, biological interactions, and function.

Moreover, the decisions to adopt ex-situ strategies must depend on species’ circumstances and conservation needs. Thus only in exceptional cases should ex-situ be considered as an alternative to in-situ and where in both approaches could be integrated where possible. A range of ex-situ objectives may be short to medium and long term maintenance of ex-situ populations including use of techniques like applied research, reproduction propagation, re-introduction into the wild or in controlled environments (IUCN, 2002 [7]).

Prior to implementing any ex-situ conservation plan, IUCN calls on clearly stated objectives to be agreed upon by participating organizations, and relevant stakeholders like landowners when implement any ex-situ program. Guideline defined by the CBD, Center for Plant Conservation and the World Zoo Conservation strategy, and the International Agenda for Botanic Gardens in Conservation must be respected by all parties.

When one looks at studies about zoos (Dalia A.C, Nate F, Owen R.J, and Alexander S, 2011 [4]; European Union, 2011[6]; Lauren M, 2012 [8], and Dan H, 2012 [8]), reports reveal that zoos play a vital role in saving the extinction of animal species due to their ability to employ staff of well experienced backgrounds in applying captive-breeding techniques. For instance where there are threatened species that require captive breeding, the zoo is being used including keeping an account of number of species at risk being represented in the zoos.

Dalia A.C, Nate F, Owen R.J, and Alexander S, 2011[4] used data from ISIS (International Species Information System) and IUCN Red List of threatened species to analyze conservation status and population size of terrestrial vertebrates in ISIS member institutions. Their results highlight some 15% of species noted as threatened was represented in ISIS zoos especially mammals, meanwhile the threatened bird population sizes appeared to be lower. Furthermore, their findings show that with one-quarter of world’s described bird species represented in ISIS zoos, the representation of reptiles and amphibians remains low with 12% and 4%. When one merely focus on threatened species, mammals appear to have highest representation of 24%
vulnerable, 23% endangered, and 19% critically endangered as classified.

In Dan’s (2012) study on zoos Victoria’s programme to fight against extinction of Leadbeater’s Possum population, zoo Victoria developed a criteria towards initiating captive-breeding programmes for native threatened species based on extinction risk. Some 20 threatened species were identified as priority for ex-situ conservation including genetically-distinct lowland population of Leadbeater’s Possum. The Leadbeater’s Possum refers to the only specie of native mammal that is restricted in distribution in the whole of Victoria, a small arboreal marsupial regarded to be extinct prior to its rediscovery near Marysville in 1961, currently confined to an area of 70 by 80km on montane habitats in the Victorian Central Highlands.

Remnants of the population are found in lowland habitats at Yellingbo Nature Conservation reserve genetically distinct from populations at montane habitats (Dan, 2012). Thus, zoo Victoria adopts an approach of establishing captive populations and subsequent release to the wild for recovery with the aim to reduce loss of genetic diversity in captive populations. This approach includes periodic transfer of individuals from every population meanwhile recognizing the quality of individuals bred in captivity. Greater integration of in-situ and ex-situ strategies are used.

Lauren (2012) in an attempt to evaluate conservation in zoos argues that zoos perform three main roles of conservation, entertainment, and education. By evaluating 32 zoos involved in conserving indigenous species in New Zealand, 30 semi-structured interviews were conducted with conservation practitioners from the department of Conservation, some 10 zoo practitioners from Auckland zoo, Willowbank, Wildlife Reserve, and Orana Wildlife Park regarding their perspective on conservation. Their findings show that conservation and zoo practitioners regarded conservation advocacy as a crucial role to zoos. In addition, the following recommendations were suggested; advocacy through education should be a focus point for conservation especially where zoos have little or less contributive efforts. This can be done by informal speaking by staff about their conservation experiences to the public; also the study recommends that conservation projects should not be limited to inside the zoo but must extend to outside the zoo so as to enhance collaboration with other organizations as was reveals from the interviews.

1.3.1. Vision and goals of the CBD towards Ex-situ conservation
The CBD has the vision of maintaining biodiversity levels where necessary, ex-situ translocation and methodologies. Thus the following goals have been outlined by the IUCN (2002) to ensure anyone in charge of managing ex-situ flora and fauna populations must make use of available resources to maximize conservation of populations including targeting the following aspects among others:
- Increasing public and political awareness and understanding important conservation issues and significance of extinction
- Need to re-introduce and support wild populations
- To restore and manage habitat
- Professional capacity building and Institutional strengthening
- Appropriate benefit sharing
- Enhance research on ecological and biological questions relating to in situ conservation
- Introduce fundraising that can support the above goals outlined

In addition to the above goals, IUCN emphasizes that conservation institutions must follow national and international obligations regarding access and benefit sharing as proposed in the CBD to ensure full collaboration among stakeholders, with priority given to populations of great economic, cultural, and ecological value being threatened.

1.3.2. Techniques for Ex-situ Conservation
According to UNEP and WCMC (2014), the techniques of ex-situ conservation are applied to both flora and fauna which equally depends on the characteristics of the species under consideration. Techniques include; embryo and DNA storage, and captive breeding such as livestock. Captive breeding may be criticized for its high cost of maintenance, poor success of re-introduction attempts, and the negative effects of genetic domestication on reproduction. While some species may be less susceptible to captive breeding programs, some are less susceptible. Amphibian species like the frogs in captive population and high fecundity with rapid buildup and as such low maintenance requirement. It’s also argued ex-situ conservation helps to prevent extinction through creation of safety nets or assurance colonies for endangered and critically endangered.

1.3.3. The institutional role and related problems in ex-situ conservation
Institutions like botanic gardens and zoological centres take the role of genetic reservoirs against extinction and by captive breeding them for future re-introductory

According to Skroppa (2005) [11], some of the problems facing ex-situ conservation among others include:
- Ex-situ conservation may be prohibited by increasing pressure on land
- Changes in land use and the emergence of economic constrains
- Ex-situ conservation populations are mostly expensive to create and maintain. And as such mostly species of high economic value are being conserved.

2.0. Methodology
Using an ethnographic methodology combined with mixed approaches of field notes, photographic recordings, and an interview with a staff, data was being gathered during a one day visit at the site on 16th December 2015.

3.0. Case study: Limbe Wildlife Centre
Covering an area of 1.76 Hectares, “LWC was founded in 1993. The LWC is home to 15 species of primates and several other wild animals, all native to Cameroon. Most of them are endangered because of the illegal bush meat trade. All primates in the LWC are orphans whose families were killed for bush meat. They have been illegally taken out of their natural forest homes. The animals have been donated by their previous owners, or confiscated by government wildlife officials. The LWC never buys or sell animals. They are funded through donations and without this assistance, it would be impossible to do work. The LWC is a collaborative effort between the Government of Cameroon and the Pandrillus Foundation with mission to help secure the long-term survival of endangered species, the LWC is focusing on conservation education by promoting awareness and appreciation for Cameroon’s unique wildlife” (Ayonghe, 2012 [1]).

At the zoo, the primates are conserved in enclosed land surfaces fenced with steel-like nets with outlets within which the animals are provided periodic food supplies and checks by staffs which ease a close follow up on their behavioral changes before being returned to the wild. The conservation approach is basically that donation of primates for captive-breeding and subsequent release to the wild for recovery with the aim to reduce loss of genetic diversity in captive populations.

![Fig 1: Entrance to LWC](Source: Field data (Ayonghe, 2015))

3.1. Chimpanzee
The Chimpanzees inhabit the Primary and Secondary Dry Woodland Savanna, grassland, and Tropical rainforest with all year round rich food supply from lowland to montane up to 3000m. Its argued they are the closest living relative to humans and sharing some 98% of our genes making them the most intelligent of apes with their ability to make tools for searching food. They communicate using facial expressions, vocalizations, body gestures, and drumming on trees. At first, they inhabited some 25 countries, and now said to inhabit only 4 countries with Cameroon being one of the few countries in the world where these apes still inhabit.
Based on my field notes and observations of informative signs regarding the Chimpanzee population in the zoo, it showed that this group of primates is currently on a decline and hence an endangered species. Indirect causes include fragmentation, deforestation, and unsustainable development that include road creation to forested areas to ease hunting, and human habitation which both destroy animal homes. Direct causes involve the practice of pet trade, illegal bush meat trade and use of animal parts like skulls and hands for black magic. Equally, infants are very vulnerable to human capturing which are then used as pets. The primates are equally susceptible to human diseases following the increasing encroachment of human settlements near forested areas where primates inhabit. Both the presence of disease carrying livestock such as cows and presence of disease infected humans near forested areas can transmit disease to primates as well as from primates to humans and livestock.

My observations show that most of the primates brought to the zoo were based on donations from people. This is evident in the information being displayed on the sign boards which provides a story line about every Chimpanzee in the zoo. Below are two image examples.

*Koto*, a Chimpanzee born in 2005 whose mother was killed in a trap, was rescued by a cocoa farmer in 2005 in Koto-Mbonge Meme. After being kept for some 9 days in a cupboard, Koto was confiscated by the then Provincial Chief of Wildlife for the South West. His condition at the time was quite stressing due to his dehydrating state and with a rope on his waist. He later on survived at the zoo following close follow up with
quarantine procedures and his habitation with new friends in the zoo.

Another example is Achidi who was born in 1994 and donated to the zoo in 2004 but arrived in 2006. Achidi was rescued at the age of 2 months from a hunter in the North part of the country following great efforts by Sam Achuo, son of Achidi Simon Achuo. She was then kept in Ntairkon Bamenda for a while in a wooden cage. It was due to the death of Mr Sam, that the Chimpanzee then moved under the care of Achidi Simon Achuo in Santa till 2004 when she was then donated to LWC.

![Achidi Arrived LWC in 2006](Fig4)

**Source:** Field data (Ayonghe, 2015)

### 3.2. Drills (Mandrillus leucophaeus)

The Mandrills are known to be endangered. They are one of Africa’s most endangered primates with only 3000 estimated to remain in the wild. They are now protected by law but their future remains uncertain. They can be found in South East Nigeria, the South West of Cameroon as far as to the Sanaga River. Some 80% of the drill natural range is in South West Cameroon and particularly the Mount Cameroon area. Habitat is essentially semi-terrestrial, the climb trees, sleep at night, and feed mainly on ground picking fruits, leaves, and other vertebrates. Regarding community life, the drills are noted to live in large groups with several adult males and females, led by a dominant male. They have a life span of up to 30 years.

![Mandrills, LWC](Fig5)

**Source:** Field data (Ayonghe, 2015)
Mandrills are said to have great ecological role to the environment. For instance they help to sparse seeds, clean overgrowth of plants underneath the canopy of trees, and help to control the outbreak of invertebrates like termites.

3.3. Gorilla
Two subspecies of gorillas exist in Cameroon. The Cross river Gorilla and Western Lowland Gorilla. Critically endangered currently, their habitat is the dense primary and secondary forest, lowland swamp, and montane forest up to 3000m from Eastern Nigeria to the Democratic Republic of Congo. The gorilla is referred to as the largest body sized primate with up 225kg in weight. They live in groups of 5-12 with adult males, several females, and their young ones, under the domination of one male gorilla. They feed essentially on plants and may singly walk up to 2km/day. However when in a group, they can cover up to 40 square km/day. They communicate by vocalization of up to 20 different sounds and by beating their chest when excited and when faced by threats. They have a lifespan of up to 50 years. The gorillas sleep in nests on the ground which they construct using leaves.

Field observations show that most of the gorillas at the zoo arrived by donations. They all have some kind of a story of being rescued by some individual following threats to survival. For example, the following photographs from information boxes highlight this observation.
Adjibolo is a female gorilla born in 2007 and arrived at the zoo in 2007 through donation. She is noted to be the youngest gorilla in the LWC brought to the zoo at half year old by age having being rescued by Mr. Adjibolo, a senior civil servant in the Ministry of agriculture in Batouri, who seized the little gorilla from a hunter who tried to sell her.

Jumbo on the other hand is a female born in 1996 and arrived at the LWC in 1996 by a donation by Ms Lena Perazzi who owns a garden where Jumbo was abandoned by someone trying to illegally sell the infant gorilla. Jumbo is well known for her gesture in entertaining the visitors with a dance of shaking her arms about and playing on the water fountain when the visitors gaze at her.

3.4. Interview with a staff
I attempted to interview a staff whom I have known to be working at the zoo for the past 4 years now. Mr Glen is now an Educational officer for the LWC. I sought to find out from him: how is the rescue and conservation being done; what problems or difficulties they face in keeping the animals in the zoo; and what he recommends for the suitable maintenance of the zoo and its activities. He explains that most of the animals that arrive at the zoo and brought by means of donations either from individuals or from organizations.
When the animals arrive at the zoo, they undergo quarantine measures aimed at healing the wounds and all other infections the animals have. Furthermore, the quarantine approach aims at preparing every primate to get use to the new environment by introducing them to socialize with new friends in the zoo. Glen explains that the zoo is greatly involved in external activities mostly in the form of educational programs. For instance, at the moment the zoo has worked with some 1,434 student this year most of which are primary school kids of class 4 and secondary school kids of forms 1-2 in the South West Region.

The educational programme remains continues such that there is an establish Nature Club that allows students to join every Saturdays from 2-4pm of the clock where they get to discuss and share ideas about topics of wildlife conservation which stimulates the kids. Membership remains free of any charges. Schools are being grouped together to participate in holiday workshops that run mostly within the month of June for two days.

Related problems in zoo have been the need for land expansion or space so as to be able to accommodate more rescued animals in the zoo; the fact that the zoo completely depends on financing through donations, without these source of finances the zoo cannot operate. As such there is need for some new sources of income to be able to improve on work staff, medical and work-related equipments, as well as fund external activities such as the ongoing educational programme. Some recommendations proposed include: a call for everyone to report or inform Wildlife authorities upon seeing any illegal wildlife activity such a illegal trade and hunting; and a call for everyone to help raise awareness on the need to protect primates by every suitable means necessary.

<table>
<thead>
<tr>
<th>Primate type</th>
<th>Gorilla</th>
<th>Mandrill</th>
<th>Chimpanzee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ex-situ conservation approach</td>
<td>Captive-breeding &amp; subsequent release</td>
<td>Captive-breeding &amp; subsequent release</td>
<td>Captive-breeding &amp; subsequent release</td>
</tr>
<tr>
<td>Means of arrival to zoo</td>
<td>Donations</td>
<td>Donations</td>
<td>Donations</td>
</tr>
<tr>
<td>Threats to survival</td>
<td>Disease infection, poaching, illegal pet trade</td>
<td>Disease infection, poaching, illegal pet trade</td>
<td>Disease infection, poaching, illegal pet trade</td>
</tr>
</tbody>
</table>

4. Conclusion
This study has examined and illustrated the role of the LWC towards the protection of primates by means of ex-situ conservation. Past studies have highlighted that it’s important for zoos to be active as well in activities outside the zoo, and that accountability for population of animals under conservation is crucial to fighting extinction. In addition to such findings, our study reveals that the major threat to survival of primates has been illegal trading of wildlife. We further propose in addition to a list of recommendations by the LWC which can be adopted both at organizational and community levels such as; adopting a self-attitude towards avoidance of buying wild animals in Cameroon, raise awareness about the need to protect primates of all kinds by informing wildlife authorities where necessary upon discovering illegally kept and illegally sold animals. One interesting finding was how the zoo operates an on-going educational programme about wildlife conservation for kids of both primary and secondary sectors of education which helps to spread awareness to fight against the extinction of primates in Cameroon.

5. References
5. Dan H. The application of Zoos Victoria’s ‘Fighting Extinction’ commitment to the conservation of Leadbeater’s Possum Gymnobelideus Leadbeateri. Wildlife Conservation and Science Department. Zoos


