Lions of West Africa : ecology of lion (Panthera leo Linnaeus 1975) populations and human-lion conflicts in Pendjari Biosphere Reserve, North Benin

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Summary

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Ecology of lion (*Panthera leo* Linnaeus 1975) populations and human-lion conflicts in Pendjari Biosphere Reserve, North Benin

Keywords

lion *Panthera leo*; human-wildlife conflicts; social structure; feeding ecology; habitat use; West Africa;

Earth's biodiversity is disappearing at an alarming rate in the last decades. Many species, including carnivores, are becoming endangered. The lion was one of the most widely distributed terrestrial mammals and is today restricted to Gir ecosystem in India and to more or less fragmented populations in sub-saharan Africa. The species is considered as Vulnerable on IUCN Red List. In West Africa, due to its small and fragmented populations, the species is listed as Regionally Endangered. While the species is widely studied in other parts of Africa, it is poorly known in West Africa. The threats to lions, their ecology and their behaviour have not been assessed in the context of this region. In order to fill this gap, this research aims at investigating the ecology of the lion population and conflicts with humans in a West African protected area: Pendjari Biosphere Reserve, Benin. Pendjari Biosphere Reserve is one of the best-managed protected areas in West Africa and is part of the two most promising Lion Conservation Units in the region. It covers about 5,000 km² and is composed of the Pendjari National Park, and the Pendjari and Konkombri hunting zones.

Local populations surrounding the Pendjari Biosphere Reserve suffer from livestock depredation mainly by hyena (53.6% of attacks), baboon (24.8% of attacks) and lion (18% of attacks). Most attacks occur during the rainy season when wild prey are scattered and more difficult to hunt. The depredation level is relatively low compared to many other regions in Africa. However the losses are significant, as local populations live below the poverty line. Fortunately, despite these losses and the fear of carnivores, people tolerated conflicts. No retaliatory killing of predators was reported. This could be partly attributed to the social and cultural importance of carnivores. The low level of conflicts in Pendjari is confirmed by the absence of livestock in the diet of lions. In the relatively well protected Sudanian savannah area that Pendjari represents, buffalo is the most consumed species (50% of the prey biomass consumed). However, like in other areas of West and Central Africa, the lion diet is dominated by medium prey (61.7%) while large prey composed 38.2% of the diet. Similarly to what is observed across Africa, smaller prey

such as oribi and duiker were avoided and relatively large prey such as waterbuck and hartebeest were preferred. The predominance of small prey in the diet is then due to the relative abundance of these prey and not to the small size of lion groups in the region. There are about 1.6 lions/100 km² in the Pendjari Biosphere Reserve. The mean lion group size is of 2.6 lions with a significantly higher group size in the park compared to that in hunting zones. The adult sex ratio of 1 male : 1.04 female is skewed towards males. The small group size could be linked to the low prey and lion densities in the area. The lion population is particularly vulnerable to trophy hunting both in hunting zones of Pendjari and hunting zones of Burkina Faso, as the park's lion population plays the role of source population while the hunting zone lions represent the sink populations. The mean home range of lionesses (95% MCP: 200 ± 141 km²) is consistent with findings across Africa. Riparian forests, woodlands and dry forests were the preferred lion habitats during the dry season while grasslands and swamps were used according to their availability. The few available results showed that during the rainy season, when most of the reserve is flooded, lions preferred woodlands on hills and avoid grasslands and swamps. The study of the home range and the social structure of lions in Pendjari highlighted the need for a concerted management of Benin and Burkina Faso lion populations for better efficiency. In summary, when protected areas are safe enough, lion population ecology and behaviour are similar across Africa. The Pendjari lion population was increasing and did not represent a great threat to livestock and humans surrounding the reserve. The lion population remained vulnerable, however, mainly because of legal and illegal hunting and human encroachment from neighbouring reserves. The impact of hunting and human activities on the social structure need to be better investigated. To save the lion in the region of West Africa, efforts should be made to safeguard only protected areas but also their surrounding areas. Studies on other issues such as the impact of lion trophy hunting and the relationship between the different large predators will contribute to improve the status of lions and other predators in West Africa.