Lion densities in Selous Game Reserve, Tanzania

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INTRODUCTION

The monitoring of wildlife abundance and trends is critical to the management of protected areas. It helps to assess the success or failure of management and conservation practices. This is particularly true in regions where these protected areas, and their emblematic species, have large ecological influence or socio-economic values (Gordon, Hester & Festa-Bianchet, 2004; Lindsey, Balme, Booth & Midlane, 2012).

African lion Panthera leo numbers have been declining for the past decades because of anthropogenic threats, such as habitat loss, prey base depletion, illegal killing, or poorly regulated sport hunting (Bauer et al., 2015). However, the magnitude of this decline at local or regional scales is still debated (Riggio et al., 2016). This absence of consensus originates from the lack of consistent, spatially and temporally repeated lion population surveys across much of the species range (Bauer et al., 2015).

Tanzania is believed to hold a large portion of remaining wild lion range and numbers. However, only few large-scale surveys have been repeatedly conducted in Tanzania, mainly in national parks (Bauer et al., 2015). Bauer et al. (2016a) suggested that lion numbers declined by 66% between 1993 and 2014 in Tanzania. However, their sample accounted for less than 2% of the lion permanent range in the country, i.e. 9329 km² of c. 530 000 km² (Riggio, 2011). Therefore, the size and trends of lion populations remain unknown across most Tanzanian ecosystems. This jeopardizes the implementation of timely and informed conservation actions that could reverse negative lion population trends.

The Selous Game Reserve (hereafter the Reserve), c. 47 000 km², has been identified as a key conservation unit for African lion (IUCN SSC Cat Specialist Group, 2006). It hosts the largest population of wild lions managed through trophy hunting. The sustainability of lion trophy hunting in the Reserve has been questioned in the recent years (Packer et al., 2011; Brink et al., 2016). However, estimates of lion densities are only available for relatively small sections of the Reserve, covering between 90 km² and 1900 km² (Rodgers, 1974; Creel & Creel, 1997; Spong, 2002; Brink, Smith & Skinner, 2013).

These areas only represent between 0.2 and 4% of the Reserve, and differed from one study to the other. This is not sufficient to assess lion numbers or trends for the entire Reserve. Indeed, lion densities may drastically change across the Reserve (Brink et al., 2013). For instance, lions tend to prefer riverine habitats, for shade, water, presence of prey, and ambush opportunities (Spong, 2002). Therefore, their densities may be higher close to water sources (Bouché et al., 2016).

In this study, with the first large-scale lion survey in the Reserve, we aimed to provide important baseline information for the effective monitoring and the management of this key lion population in Tanzania.

MATERIALS AND METHODS

The Reserve is the core of the Selous-Mikumi

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