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Notes and records

Historical distribution and threats to Grevy's zebra (*Equus grevyi)* in Samburu – an indigenous people perspective

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Introduction

Over the last 30–40 years, Grevy's zebra has experienced dramatic reductions in range and numbers and are now found only in northern Kenya and in small pockets in Ethiopia. The Kenyan population has declined from about 14,000 in the 1970s to about 2500 in 2008 (Klingel, 1980; Low *et al.*, 2009a) while the Ethiopian population has declined from about 2000 in the 1970s to about 100 in 2003 (Williams, Nelson & Kebede, 2003). Due to their low numbers, Grevy's zebra are now classified as endangered by IUCN (Williams, 2002; Moehlman, Rubenstein & Kebede, 2008) and have been in CITES Appendix I since 1979. The Kenya Wildlife Service has been working with stakeholders to implement a national conservation and management strategy launched in 2008 (KWS, 2008; Muoria *et al.*, 2009). If fully implemented, this strategy will help reverse the decline in Grevy's zebra numbers in the country. The major challenge facing conservationists is to identify and mitigate the causes of the decline in Grevy's zebra population. This study investigated the historical distribution and causes of the population decline in areas historically inhabited by pastoralists in Ngutuk Ongiron Group Ranch, Ngaroni and Barsalinga community areas of Southern Samburu.

As information relating to the past distribution and threats to these animals is lacking, it was expected that information collected from this study could explain the decline in the population of Grevy's zebra in their natural range hence inform the current conservation efforts and thus provide a basis to curb its extinction.

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Materials and methods

Study area

The study area was in north of Samburu National Reserve and west of Mathew ranges in Samburu District, Rift Valley Province, Kenya (Fig. 1). The area is about 841 km^2 and is specifically located at about 37°–38° East and 0°–1° North. It is characterized by flat to undulating plains with altitude ranging from 1000 to 1350 m above the sea level. Rainfall is erratic, bimodal in distribution with peaks in April/May and November/December. Mean annual rainfall is 375 mm and the mean minimum and maximum temperatures are 24 and 33°C, respectively. Further description of the study area is available in Muoria *et al.* (2007) and Low *et al.* (2009a).

Data collection

Forty five male respondents from the nomadic Samburu ethnic group were interviewed using a questionnaire. These respondents were distributed in three community areas: (i) Ngaroni (ii) Barsalinga (iii) Ngutuk Ongiron Group Ranch. The age of the respondents ranged between 51 and 90 years. Ninety-seven percent of the respondents had no formal education. They were asked simple questions about where they lived in the past, whether Grevy's zebra population was increasing or decreasing in those areas and whether there were any animals' disease outbreaks, and droughts that could have had negative impacts on numbers and distribution of Grevy's zebra. A list of major events in Samburu (Lelenguyah, 2007) was used to determine the age of the respondents; the duration they lived in a particular area and also the years that disease outbreaks, droughts and hunting of Grevy's zebras occurred. Percentage frequencies were used to compute the results and to report the findings.

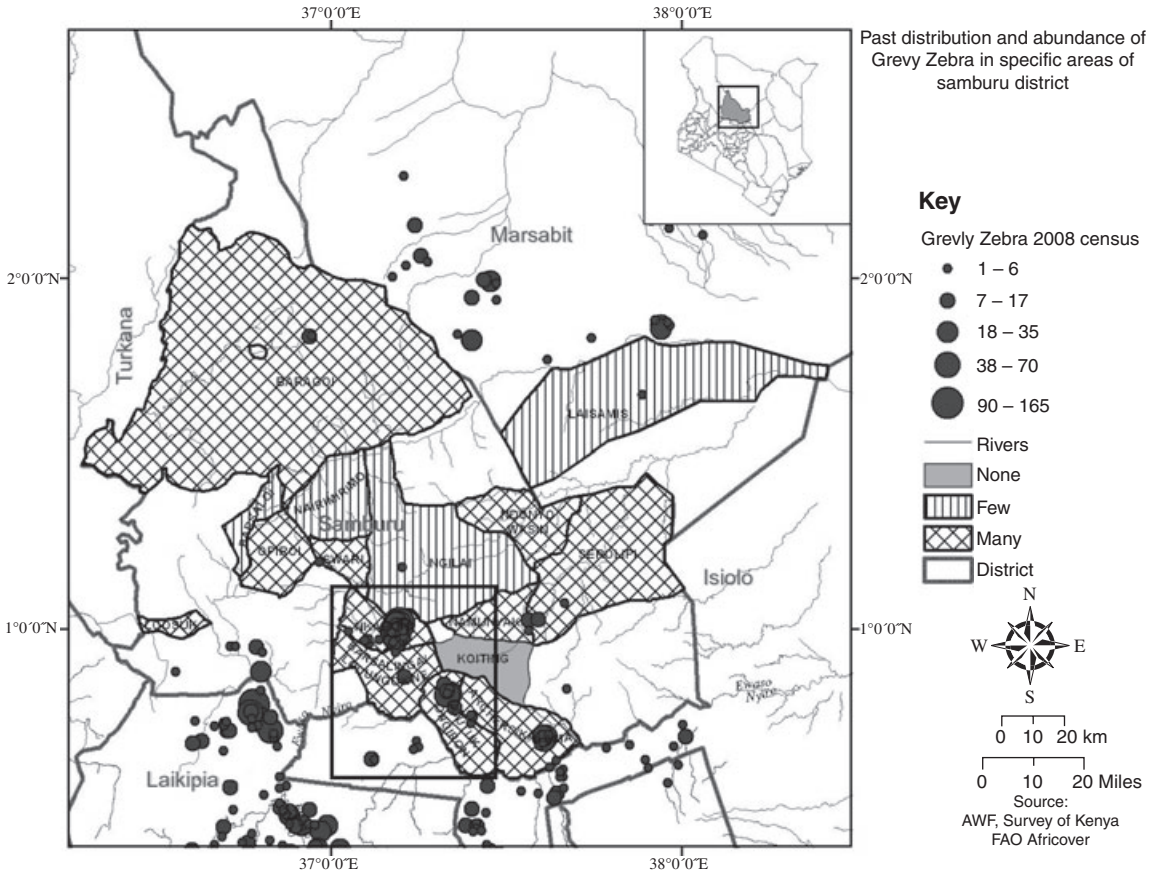

Fig 1 Study area map showing past distribution and abundance of Grevy's zebra in specific areas of Samburu according to respondents interviewed in Ngaroni, Ngutuk Ongiron Group Ranch and Barsalinga areas (in highlighted rectangle) in March 2007 and the distribution of Grevy's zebra during the aerial survey of 2008 (Low *et al.*, 2009b)

Results and discussion

Range decrease

Grevy's zebras were present in 98% of the areas that the respondents had lived in the past. Seventy-three percent of the areas that the respondents had lived in had many Grevy's zebras in the past (Fig. 1). An aerial survey of Grevy's zebra conducted in 2008 (Low *et al.*, 2009b) indicated that many Grevy's zebra were still using parts of southern Samburu including West Gate Conservancy (Ngutuk Ongiron Group Ranch), Meibae Conservancy (Ngaroni and Barsalinga in Fig. 1), Kalama conservancy and Kirimon to the south west. In contrast, areas to the north and north east (including Baragoi and Laisamis) had many Grevy's zebra in the past, but only a few Grevy's zebra were counted in the 2008 survey (Fig. 1).

The perceived threats

The respondents reported decline in Grevy's zebra population in 1965, 1980, 1984, 1992, 1996, 2000 and 2006. Disease outbreaks, predation, drought, vegetation changes, poaching and water scarcity were perceived by 93%, 86%, 81%, 72%, 17% and 6% of the respondents respectively as causes of Grevy's zebra decline. Anthrax and anaplasmosis were the diseases perceived to have negatively affected Grevy's zebra by 64% and 13% of the respondents respectively. The approximate years when anthrax outbreaks occurred were 1949, 1952, 1957, 1963 and 1973. The spores of the bacteria that cause anthrax can survive for many years in the environment (Dragon & Rennie, 1995); these outbreaks could have been the source of anthrax spores, which led to an outbreak of 2005 and 2006 in which at least 53 Grevy's zebra died

(Muoria *et al.* (2007)). Lack of documentation on diseases that affect Grevy's zebra in the region makes it impossible to assess whether the other diseases reported to affect Grevy's zebra are still relevant. We therefore recommend that studies on this aspect be carried out.

Eighty-six percent (86%) of the respondents mentioned predation as a major cause of the decline in Grevy's zebra population particularly during droughts when resource availability is limited. During such periods, these animals are forced to seek resources in areas with pasture and at times where rate of predation is high (Williams, 1998).

The declines in 1965 and 1996 were attributed to armed conflicts in the area, for example, poaching for meat by combatants during the 'shifta' War of 1963–1968 (Whittaker, 2008). Poaching was also perceived to have been a problem by the people who had lived in areas inhabited by the Turkana (mainly Baragoi area), Borana and Somali ethnic groups. The three ethnic groups have been known to kill Grevy's zebras for food and medicinal purposes (KWS, 2008). All the other declines were attributed to drought, an explanation supported by the fact that Kenya was experiencing drought during those years (Omambia, Shemsanga & Li, 2009).

Seventy-two percent of the respondents mentioned that vegetation changes have occurred in the study area. These changes included increased woody cover and decreased grass cover. The respondents attributed these changes to drought, overgrazing and termites activity. Barsalinga area for instance has been invaded by *Sansevieria volkensii* Guerke and *Acacia lahai* Steud & Hochst.

This study suggests that past disease outbreaks, predation, drought and vegetation changes could have led to the decline in Grevy's zebra numbers in the Samburu landscape. The study demonstrates that indigenous knowledge can be useful in understanding undocumented historical causes of decline in an endangered species.

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