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Can the potential for tick infestation influence patterns of resource use by Eland (Taurotragus oryx)?

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Examiner Research Report Response: Doug McCulloch, January 2016

Examiner 1

1. Specific errors: spelling of *Hyperthelia dissoluta* – corrected throughout the document

2. Included additional comment on the difficulty in including a reliable control in field studies of this nature, if only to reinforce my concurrence with the examiners observations.

Examiner 2

Section 6

1. Comment: *The figures in Section 6 could be better presented*.
    - I am happy with the existing GIS maps in section 6. They are neat, and clearly convey the intended information.
    - I have adjusted the photographs in Table 1, aiming for a more uniform size and a neater fit.
    - I have smoothed out the drawing in Figure 4, resulting in a neater figure. Other than that, I think it adequately conveys my experimental design.
    - I have added a photograph (Plate 1) of an eland cow with a GPS collar.

2. Comment: *Concerning my approach to artificial tall grasslands*. Page 21, para 2: Clarified my interpretation of artificial or modified tall grassland areas, and their inclusion in the structure type. The structure of the vegetation was the over-arching consideration.

3. Comment: *The examiner queried my approach the start of the rainy season, with the wet season commencing with the first rainfall event*. Para 21, last para: I explained the significance of the two sampling periods by relating rainfall interval to potential tick mortality rather than vegetation phenology.

Section 7

- The comment regarding the standard error of the mean tick numbers per drag during the February sampling period (in Figure 8) was checked.
- The comment on checking the discussion statements relating to the results is noted.

Section 8

1. The comment regarding native bulk grazers- I have said all I want to say on this subject in the discussion. I intended to include the points regarding buffalo and cattle to suggest possible applications of my research to the reader. I concur that the point needs to be further investigated, and I have mentioned it in the section concerning avenues of future research.

2. Comment: *Include a statement on the forage quality of the respective structure types.* I have broadly described the structure types as sourveld, sweetveld or mixed veld, sufficient to introduce forage quality as a prominent factor influencing eland movement. I am reluctant to describe the forage quality of each structure type in detail simply because I don't know. I haven't analysed forage samples in a lab. I am surmising based on the field characteristics evident in each of the types. The eland are concentrating in areas of lower adult tick loads. They may be concentrating in areas of lower forage quality, but this would only be conclusively determined by analysing the quality of the forage they are actually using at this time of the year.

3. Comment: *The herbivore community is also a factor determining tick abundance*. I have indicated that the associated herbivore community also influences tick occurrence.

4. Comment: *A query about zebra being important tick hosts*. There are zebra in the reserve, but I only ever saw them down in the woodland areas of the central valley. They could well host ticks in the TUG, there is no reason that they shouldn't occur there, but I never saw them in this structure type during the course of my fieldwork. I doubt zebra will utilise the SUG areas, I think the terrain is too rocky for them to move comfortably.

5. I agree that keeping saplings within the fire trap may be negative as well as positive.

6. Comment: *A query regarding "chain-sawing".* I have improved on the description of bush control.

7. Comment: *Query about whether eland will actually change their movement patterns in response to tick abundance*. Given the catholic nature of the eland diet, there is as yet no clear empirical evidence to show that the quality of the forage in the uplands at this time is markedly better than that of the forage in the valley lowlands. In the valley the eland have the choice of grasses that will arguably be as nutritious as the upland grasses (if not more so). In addition they have easier access to a range of

broadleaved and microphyllous browse species to maximise the quality of their diet. It is hence unlikely to be forage quality that draws the eland up into the highlands. What would be the other drawcards? Possibly thermoregulation, they are moving to an area exposed to cooling breezes. There is sufficient evidence to suggest that it is perfectly plausible for animals to alter their movement patterns in response to adult tick challenge, particularly when their calves are young. I contend that the coinciding improvement in forage quality in the uplands allows them to do this.

Section 9

The examiner raises an interesting point on whether the eland response to adult tick abundance during the peak calving period is evolutionary in nature, and this would certainly be an interesting study. I consider it beyond the scope of this document, but would certainly hope that my research would contribute to any further investigations into this.

Section 10

- The examiner's suggestion that future work be included as an ongoing monitoring programme to track tick and host response to varying climatic conditions, holds merit. I do think that this would, however, have to be implemented and funded by an interested research institution as I don't see it becoming a priority for the conservation authority.

- I have included a statement on the possible management implications of my findings.

Comments in the Table.

I have worked through the specific comments and corrected in the text where appropriate.