

https://dspace.org/

Human-wildlife conflict in subsistence and commercial farmers in north-eastern South Africa

Seoraj-Pillai, Nimmi

2016

http://hdl.handle.net/10539/21697

Seoraj-Pillai, Nimmi (2016) Human-wildlife conflict in subsistence and commercial farmers in north-eastern South Africa, University of Witwatersrand, Johannesburg, <http://wiredspace.wits.ac.za/handle/10539/21697>

Downloaded from a DSpace repository. https://dspace.org/

Commentary sheet- Nimmi Seoraj-Pillai, PhD thesis examination

Human-wildlife conflict in subsistence and commercial farmers in north-eastern South Africa

**asterisks denote candidate's response to examiner comments

EXAMINER 1 COMMENTS

Chapter 8

While I found this chapter interesting, it did seem like somewhat an add-on with not terribly much association with the preceding chapters, especially since wild dogs were not actually cited as being the most influential predator in conflict situations amongst the respondents. Nevertheless, I think it can be retained but would need quite a bit more work (and increased sample sizes) if you are thinking of publishing it.

****The African wild dog is one of the most threatened and endangered canids in Africa, and due to agricultural expansion, disease and farmer persecution (Woodroffe, 2011) this species continues to decline. Since the wild dog occurs within all study sites within north-eastern South Africa, and my previous chapters demonstrated that wild dogs were among the top three ranking carnivores implicated in the highest number of reported depredation incidences, this species was an ideal case study to include in the thesis. A more focused investigation with more packs, if possible, will be considered for publication later.**

Comments in text:

Page 26, Minor change: Define Mega-fauna. ****Page 26, line 721: Added mega-fauna (large-bodied mammals)**

Page 27, Minor change: Scientific name of wheat. ****Page 2, line 741: Added wheat *Triticum* spp.**

Page 28, Minor change: fill in spp. ****Page 3, line 758: Corrected *Taurus* spp.**

Page 28, Minor change: fill in spp. ****Page 3, line 761: Corrected *Capra* spp.**

Page 31, Minor change: Delete species name for Cape porcupine. ****Page 6, line 865: Deleted *Hystrix africaeaustralis*, examiner picked up that I had mentioned it on Line 837 prior to this**

Page 31, Minor change: Scientific name for potato. ****Page 6, line 866: Added *Solanum tuberosum***

Page 31, Minor change: Delete repeated species name. ****Page 6, line 885: Deleted *Lycaon pictus* examiner picked up that I had mentioned it on Line 823 prior to this**

Page 31, Minor change: Delete repeated species name. ****Page 6, line 885: Deleted *Panthera leo* examiner picked up that I had mentioned it on Line 815 prior to this**

Page 31, Minor change: Delete repeated species name. ****Page 6, line 885: Deleted *Acinonyx jubatus* examiner picked up that I had mentioned it on Line 813 prior to this**

Page 33, Minor change: check for consistency in the spelling of "sub". Earlier on the chapter I noted it capitalized. ****Corrected on Page 8, line 958 and throughout the thesis to Sub-Saharan Africa as noted in many ISI-indexed journals.**

Page 38, General comment: I really like the broad approach taken in this chapter and the attention to important details pertinent to the study. This chapter sets the scene well and is well written and informative. Well done! ****Thank you**

Page 46, Minor change: I know that these chapters are stand-alone, likely with several authors, but in a thesis, I would have preferred the use of I throughout. ****Noted, but 'we' was used as this paper is co-authored and submitted for publication.**

Page 47, Minor change: Surely "group" would be more appropriate. ****Page 8, line 1369: Corrected**

Page 48, Minor change: Hyphenate Mega herbivore and define. ****Corrected here on Page 23, line 1407 to mega-herbivore and defined very briefly and changed throughout thesis**

Page 48, Minor change: Canis spp. not sp.****Page 23, line 1410: Corrected**

Page 50, Minor change: Add Scientific name for pine trees. ****Page 25, line 1490: Added *Pinus* spp.**

Page 50, Minor change: Delete spp. ****Page 25, line 1496: Done (deleted *Papio* spp.)**

Page 50, Minor change: Delete species name. ****Page 25, line 1497: Done (deleted *Panthera leo*)**

Page 51, Minor change: Hyphenate Mega herbivore. ****Page 26, line 1515: Done here and throughout**

Page 51, Minor change: Hyphenate Mega herbivore. ****Page 26, line 1527: Done here and throughout**

Page 53, Minor change: Insert full stop. ****Page 29, line 1611: Inserted full stop and new sentence starts with "Examples of LSC..."**

Page 54, Minor change: Surely this conflict with your definition of a HSC? Brown hyenas are not normally attackers of people. I would recommend deleting this example. ****Page 29, line 1620: Removed**

Page 56, Minor change: hyphenate throughout Mega herbivore. ****Page 32, line 1720: Done here and throughout**

Page 60, Minor change: you are not being consistent with your use of scientific names and this needs rectification. ****Page 35, line 1788: Corrected all repetitions in this paragraph**

Page 63, Minor change: why species.? ****See Page 39, Table 5, Corrected to *Mellivora* spp.; my initial approach was to refer to species in singular form.**

Page 63, Minor change: why species.? ****See Page 39, Table 5, Corrected to *Phacochoerus* spp.; my initial approach was to refer to species in singular form.**

Page 64, Minor change: why species.? ****See Page 40, Table 5, Corrected to *Pongo* spp.; my initial approach was to refer to species in singular form. Also changed in text Line 1807 and deleted repetitions within the chapter.**

Page 69, Minor change: There is more recent (2016) meta-analysis published on this point.
****Inserted reference in text (page 45- 46-lines 1960 and 1972) and in the ref. list (page 54, lines 2156-2158): Di Minin, E., Slotow, R., Hunter, L.T.B, Pouzols, F.M., Toivonen, T., Verburg, P.H., Leader-Williams, N., Petracca, L. & Moilanen, A. 2016. Global priorities for national carnivore conservation under land use change. *Scientific Reports*, 6: 23814.**

Page 69, Minor change: Why species.? ****Page 45, line 1963, Changed to spp. my initial approach was to refer to species in singular form.**

Page 72, General comment: Another nice chapter which sets up the rest of the data chapters really well.
****Thank you**

Page 86, Minor change: Mega-herbivore spelt without a hyphen, but in your text you hyphenate (sometimes).
****Corrected both figures and captions S4-S5 page 63 (Line 2349) and S5 (Line 2354)**

Page 114, Minor change: Wouldn't "location" be more appropriate? ****now Page 94, line 3178: Changed**

Page 116, Minor change: Insert scientific name. ****now Page 96, line 3250 inserted *Bos taurus***

Page 142, General comment: I enjoyed reading this chapter and believe that the results are worthy of publication. The GLMM's were pretty tough going in the results though. They seem largely appropriate but you might want to consider re-analysing your data when it comes to publication using a model building approach, rather then assuming linear relationships. This is not a required change for your thesis though.
****Thank you for the valuable comments and recommendations which will be considered for future publications**

Page 187, Minor change: you are missing a more recent reference: Parker et al. (2015) in Human Dimensions of wildlife.
****I could not find Parker et al., (2015) but (2014) with the following reference which I have inserted in text, Page 169, line 4908, 4909 and 4923 and in the reference list (Page 191, line 5438-5441):**
Parker, D.M., Whittington-Jones, B.M., Bernard, R.T.F. & Davies-Mostert, H.T. 2014. Attitudes of Rural Communities Toward Dispersing African Wild Dogs in South Africa, *Human Dimensions of Wildlife*, 19:512-522.

Page 188, Minor change: you need to be very careful with making statements like "this study compares commercial and subsistence farmers" (essentially the basis for your rationale in the introduction for this chapter).
****I have added to the thesis that future studies should collect, adequate and relatively equal samples of subsistence and commercial farmers. Se page 267, lines 7108-7111.**

Page 188, General comment: In fact, looking at your map below, I would recommend that if you want to actually compare commercial and subsistence farmers' attitudes for a publication, that you remove all of the KZN data and the outlying data from Limpopo and focus on the data immediately adjacent to the Kruger National Park. This is not required for your thesis corrections but I believe will make a paper much stronger.
39Thank you for the suggestion and recommendation which I will consider applying to future publications**

Page 192, For publication: you should calculate the Cronbach's alpha values for your indices.
****Thank you for the valuable suggestion and recommendation which I will consider applying to future publications**

Page 193, Minor change: This paragraph is repetition of information described earlier.
****This served as a reminder to the reader that for this chapter, I examined differences between farmer type and their responses (but here I did not consider location differences for these investigations), while the GIS attitude index provides a geographic distribution of farmer attitudes, page 176, lines 5076-5078.**

Page 198, Minor change: Scientific name. ****Page 180, line 5120: Inserted *Equus* spp.**

Page 198, Minor change: Scientific name. ****Page 180, line 5125: Inserted *Giraffa camelopardalis***

Page 198, Minor change: Scientific name. ****Page 180, line 5126: Inserted *Loxodonta africana***

Page 204, Minor change: But see how this contrasts with Parker et al. (2015). ****Inserted the contrasts in studies in Page 187, line 5287-5292 for Parker et al., (2014).**

Page 220, For publication: My Cronbach's alpha comment in the previous chapter also refers here. ****Thank you for the valuable suggestion which I will consider applying to future publications.**

Page 223, Minor change: Correct spelling of "showed". ****Page 208, line 5805: Rectified spelling error "showd" to "showed".**

Page 235, General comment: This chapter has the potential to be seminal for conservation biology in RSA and beyond. As such, I strongly encourage you to publish the results. However, your sample sizes are very low. Therefore, if possible, I would recommend that you try and expand your sampling to include as many practitioners across the country as possible, comparing SANPARKS, provincial parks etc.
****Thank you for the valuable suggestion which I will definitely consider applying to future research/ publications.**

Page 249, Minor change: space. ****Page 235, line 6264: Corrected space between "≥ eight"**

Page 249, Minor change: there are published references for this which would be better that citing Kelly personally. ****Thank you for the valuable suggestion but I feel that quoting a very knowledgeable South African wild dog researcher is valid.**

Page 256, Minor change: Company name and address ArcMap. ****Page 242, line 6457: Inserted and corrected name of programme and inserted reference in list for this chapter (Page 251, line 6637).**

Page 264, Minor change: Insert scientific name. ****Page 249, line 6589: Inserted *Panthera leo*.**

Page 281, Minor change: Insert scientific names. ****Page 267, line 7118: Inserted *Saccharum* spp.**

EXAMINER 2 COMMENTS

All analysis seemed to be based on generalised mixed models with a Poisson link, whether such models were appropriate for the questions and the data or not.
****I justified my use of the statistical analysis, throughout. A GLMM is appropriate to assess the impact of HWC on the two farming groups, because it is an extension to the generalized linear model, containing random effects (e.g. farm location) in addition to the typical fixed effects (e.g. subsistence and commercial farmers). All GLMMs performed in this thesis were fitted via maximum likelihood, equivalent to the Akaike information criterion (AIC). The GLMM allows the specification of models whose response variable follows non-normal/error distribution (e.g. counts of participants' responses (Poisson) from the questionnaire, which can have many zeros or no responses), or binary distributions (yes/no responses). In addition, the GLMM allowed me to examine differences between and within farms. See page 30, lines 1655-1664.**

A Poisson error structure with a log link function was used throughout the GLMM analyses, except for binary data, in which case binomial distribution was used with the log link function. See page 30, lines 1667-1668, and page 74 lines 2667-2687.

I have concerns overall about the validity of comparing primarily commercial animal farmers in the Waterberg (some of whom are close to a few small PAs) with mainly subsistence farmers of mixed ag products (more plant crops), most of whom are much closer to a very large and nearly natural PAs (Kruger NP) or within mosaics containing rural land and a network of PAs (KZN). Proximity to a large, naturally intact source of diverse and abundant wildlife is bound to affect the level of HWC independently of whether a farm is commercial or subsistence. I see this as a critical confounding factor to the entire project.

****All the farmers interviewed in the Waterberg were located within the Waterberg Biosphere Reserve (-23,16 to 24,66 S; 27,5 to 28,66 E), Limpopo Province, South Africa. The Waterberg is a designated biosphere reserve (a 650 000 ha area set aside to reconcile the conservation of biodiversity and sustainable natural resource use by the United Nations Educational, Scientific and Cultural Organization (UNESCO)) (Swanepoel et al., 2015; De Klerk, 2003). The Waterberg Biosphere Reserve supports a host of native antelope, giraffe, white rhinoceros and warthog, in addition to free-ranging carnivores, such as leopard and wild dog (Swanepoel et al., 2015; De Klerk, 2003). Notably, the Waterberg Biosphere Reserve, comprises a network of subsistence livestock and crop farms (De Klerk, 2003) commercial crop (De Klerk, 2003) and game-livestock farms (Thorn et al., 2013) within the biosphere reserve, where conflict between carnivores and livestock/game farmers are common (Thorn et al., 2013). In addition, previous studies show that a mixture of subsistence pastoralists (Gusset et al., 2008) and crop farmers (Elliott and Steele, 1994) are in conflict with wildlife in KwaZulu-Natal Province, South Africa. In addition, both commercial and subsistence livestock farmers in KwaZulu-Natal have expressed concerns over damages caused by livestock depredators (Whittington-Jones 2012). All study sites were contiguous with protected areas with abundant biodiversity and were therefore suitable to assess human-wildlife conflict and the argument above will be reiterated in the appropriate methods, pages 64-65, lines 2375-2392. Significant differences between study localities emerged after analysis and the characteristics and distance of PAs from farms sampled will be recommended as a future study, Chapter 9, page 267, lines 7124-7128.**

The relevant references have also been inserted in appropriate chapter of thesis.

- **De Klerk, A. 2003. Waterberg biosphere: a land use model for eco tourism development. — MSc thesis, Univ. of Pretoria.**
- **Elliott, W. & Steele, N. 1994. Community management of natural resources in wildland areas: The KwaZulu experience. *In* Hendee, JC & Martin, VG (Eds.), International wilderness allocation and research: International Wilderness Leadership foundation, Los Angeles.**
- **Gusset, M., Maddock, A.H., Gunther, G.J., Szykman, S., Slotow, R., Walters, M. & Somers, M.J. 2008. Conflicting human interests over the re-introduction of endangered wild dogs in South Africa. *Biodiversity Conservation*, 17:83-101.**

- **Swanepoel, L.H., Somers, M.J., & Dalerum, F. 2015. Density of leopards *Panthera pardus* on protected and non-protected land in the Waterberg Biosphere, South Africa. *Wildlife Biology*, 21:263-268.**
- **Whittington-Jones, B.M. 2012. The dispersal of African wild dogs *Lycaon pictus* from protected areas in the northern KwaZulu-Natal province, South Africa. M.Sc. thesis, Rhodes University, Grahamstown.**

For all figures:
It is not clear whether the candidate present raw frequencies in the bar graphs or estimates from the GLM(M)s.
****Absolute values were plotted. The suggestion be considered for future publications.**

For all tables:
Rather report means, differences between levels in a category, slope-estimates and associated 95% CIs. Mean differences have biological meaning, P-values do not.
****In a paper or thesis report, the coefficients of the GLMM output is sufficient to mention the sample size (or degree of freedom), the z value and the p-value. The recommendations of the examiner will be considered for publication.**

Nowhere do I see any assessment of how well the data fit the model.
****Typically model validation and diagnostics are performed for regression models (standard GLMs and applied regression analysis) and not appropriate for mixed models.**

Basic things like deviance and R^2 would help the reader assess how well the data are summarised by a model, and therefore, how reliable the findings and conclusions are. Goodness-of-fit tests would be particularly nice.
****I state that a GLMM was an appropriate choice for the analysis of data. In a paper or thesis report, the coefficients of the GLMM output is sufficient to mention the sample size (or degree of freedom), the z value and the p-value. The recommendations of the examiner will be considered during future research.**

I think the term 'covariate' is being misused. In linear models, there are explanatory (X) and response (Y) variables.
****A covariate is a variable that is possibly predictive of the outcome under investigation, and may be of direct interest or a confounding factor, and a predictor, in an analysis (Gujarati and Porter, 2009). I considered the following covariates in the different chapters:**

- **number of respondents experiencing HWC**
- **household size, household income**
- **the number of farms affected by crop raiders or livestock depredators,**
- **environmental challenges,**
- **presence or absence of irrigation**
- **presence or absence of electrified fencing.**

Gujarati, D. N., Porter, D. C. 2009. Terminology and Notation. Basic Econometrics (5th International Ed.). New York: McGraw-Hill. p. 21.

In several analyses, there appears to be a goal of comparing between localities. In this case, locality must be treated as a fixed effect.
****Since I obtained different types of data from farmers in different locations, it was better to include locality as a random factor.**

Examiner 2 Comments in text.
680-698 (now lines 694-702) This is not relevant or important to the subject of the thesis, and it's far too broad. Rather begin directly with the problem that motivated the research.
****This broad but brief introductory paragraph outlining the historical development of HWC is noteworthy. I think that it is important to show that although HWC can be traced back to the Neolithic (in one paragraph at the onset of the thesis), relatively little information on this topic was published until recently.**

989-991 (now lines 994-996) This is an interesting problem, but it needs to come up earlier in the introduction.
****I introduced the problem statement here as a build up towards the motivation of the study. I could not focus on this comparison in the background because so little was known about how subsistence and commercial farmers were affected by, and reacted to, problem animals at the onset of my study.**

1000-1012 I argue that it is insufficient in a PhD thesis to set goals or objectives only.
****The aims and objectives are testable statements and predictions and the overall aim of the study is included in each data chapter, page 10, line numbers 1005-1024.**

1028-1031 Most of the commercial sample units are in one region (Waterberg) and most of the subsistence is in another (next to Kruger and KZN parks). Is this a valid comparison?
****Although many commercial farmers were sampled in the Waterberg, commercial farmers were also sampled in Komatipoort, Ndumo and Giyani. Different farmers were sampled in different areas because this was what was available. To compensate for unbalanced sampling, proportions were used and therefore it is a valid comparison.**

1033 Add 'conservation practitioner'. It's not clear whether this includes university-trained biologists, technikon-trained managers or game guides, maintenance people who work in PAs, etc.
****Added to glossary in alphabetical order (page: 12. lines 1053-1056) and also reiterated in the methods (page: 72, lines 2608-2614): "Conservation practitioner. Individual employed at protected areas (game reserves, lodges, national parks), involved in the management of ecological resources, such as university or technikon trained individuals in the fields of Zoology, Botany, Nature Conservation or Ecotourism Management, and excludes maintenance workers) (Driver et al., 2012)."**

Chapter 1 general: It would be good to indicate that CH2 is to establish that a comparison between subsistence and commercial farms is an adequate proxy for developed/developing ag comparisons, that in turn is used later in the thesis.

****Added to page 10, lines 1009-1013 and revised this paragraph: "I commenced my investigation with a meta-analysis of the occurrence of published scientific reports of human-wildlife conflict globally and specifically in South Africa (Chapter 2), to verify whether subsistence and commercial farmers were pertinent representatives for developed and developing agriculture economy comparisons, and these findings were used to shape data chapters for the remainder of the thesis."**

1330 (now 1359) Not clear what a 'conflict profile' is. Maybe add to glossary.

****Added to glossary in alphabetical order (page 48, lines 2064-2067) and also reiterated in the discussion chapter (page 257 lines 6772-6776): "Conflict profile. A measure of the vulnerability of people and farming commodities to human-wildlife conflict based on the number of HWC cases reported in the published literature for such groups of people, in combination with the number of low-, moderate- or high-scale conflict species that commonly affect such groups of people."**

1351-1371 This introductory material is far too broad. Rather start directly with HWC and how it pertains to agriculture.

****The Introduction was structured to highlight the main issues and each driver of HWC is interrogated into context in subsequent chapters.**

1426-1444 (Information in this paragraph forms the basis of the problem that this chapter is about. It should lead off the Introduction so that the 'context/importance/so what?' is clear.

****I agree that this information forms the basis of the problem, and hence it was placed in a paragraph that leads into the motivation of the study, now page 24, lines 1453-1469.**

1476-1500 (now 1503-1528) As the arguments develop, just note that developed countries tend to protect scenery (mountains and glaciers...what remains of them) that are generally poor wildlife habitat. African PAs are usually more explicitly for the protection of wildlife and wildlife habitat.

****I agree that this important point needs to be stated with relevant literature, and I have added it as a prelude to the paragraph, now lines 1502-1509, page 25: "There have been several international efforts to conserve cultural and natural amenities in developed countries, to increase the popularity of a destination through scenery and outdoor recreation (Thorsell and Sigaty, 2001). Wildlife densities in such developed countries, however, remain low due to historical extirpations and several land-use changes (mining, farming, industrialisation; Hansen and Rotella, 2001). In contrast, developing countries on the African continent contain 25% of the global mammal species, including about 80 species of antelope and > 2000 bird species. In addition, Africa is home to 24% of the 34 global biodiversity hotspots (World Resource Institute, 2016). South Africa, in particular, houses the third highest level of biodiversity globally (DeGeorges and Reilly, 2008) and presents a unique scenario to investigate HWC due to the prevalence of commercial farmers and local subsisting communities competing with PAs for critical natural resources."**

1538-1553 Given that this is a global analysis what were the sources of data for regions outside of Africa.
****All data were sourced from published scientific literature from 1994 to 2015 indexed through the Institute for Scientific Information (ISI).**

1584 'Weight' suggests a number that is multiplied by other numbers in an analysis to increase or decrease their importance. Maybe 'category' or 'classification'?
****changed weighted to categorised, here and throughout, now in lines 1600, 1610, 1626, 2025, 2323**

1600 Maybe 'taxon'?
****since not all taxa were reported, retaining "types of mammals and birds" is more appropriate and retained, now page 30, line 1640**

Methods in general: Please provide more detail. What constitutes a sample unit? Is it one paper, one incident?
****This was already mentioned on page 27, lines 1561 -1563. "Each publication that investigated a single DCA species/type (depending on detail), was recorded as a single incident per site. If the publication investigated more than one species of DCA, we considered each species a separate incident per site. Hence, each DCA represented one data point...."**

It isn't clear how the models were set up. What are the explanatory 'X' and response 'Y' variables?
****In the thesis, I specified the fixed, random, covariates and dependent variables, see pages 74-75, lines 2677-2680, and lines 2696-2702.**

What is a 'relevel' function?
****"Relevel functions re-order factors of interest so that the level specified by reference is first and the others are moved down. This technique is useful for contrasts which take the first level as the reference. For example, first level factors included differences between countries, and second level factors examined and reordered factors to reveal countries experiencing greatest to lowest number of HWC incidences". page 31, lines 1682-1686.**

What sort of data are being used? Counts of incidence? These things affect what sort of model and link functions are appropriate.
****Count data (number of publications, species, locations, etc.) and hence poisson family which is stated in all data chapters: "A Poisson error structure with a log link function was used for count data throughout the GLMM analyses, except for binary data, in which case binomial distribution was used with the log link function, because continuous responses could be exaggerated."**

Why a GLM(M) (note that if this is a stand-alone paper, as indicated by the footnote on page 21, all the necessary detail should be included here?

****The necessary detail has been added to page 30, lines 1655-1664: "A GLMM was most appropriate to assess the impact of HWC on groups of people (local communities, subsistence and commercial farmers), because it is an extension to the generalized linear model, containing random effects (e.g. location) in addition to the typical fixed effects (e.g. subsistence and commercial farmers). All GLMMs were fitted via maximum likelihood, equivalent to the Akaike information criterion (AIC). In addition, the GLMM is ideal as it also allows the specification of models whose response variable follows non-normal/error distribution (e.g. counts of literature studies (Poisson), or binary distributions (yes/no or absent/present). Although several methods to analyse meta-data exist, we have used the GLMM as it allowed us to examine differences between and within regions."**

Why a Poisson link for all the analysis?

****Count data (number of publications, species, locations, etc.), page 30, lines 1667-1668.**

Why a mixed model, what is the random effect and why is it specified as such?

****Since I obtained different types of data from farmers in different locations, it was better to include locality as a random factor. In the thesis, I specified the fixed and random factors see pages 74-75, lines 2677-2680.**

1627-1631 I think better labels are in order. Labels 1, 2 and 3 are all herbivores.

****Labels 1-3 refer to categories of feeding types. All three feeding types do not fit into the single category of 'herbivore'. 1) refers to an herbivore. 2) refers to a bulk grazer and 3) refers to a bulk feeder, all with definitions. I categorised all three feeding types separately because their diet differs in forage quality and quantity (Owen-Smith, 2005). The distinction between categories 1-3 was reiterated in the data chapter, page 31 lines 1702-1703.**

Owen-Smith, N. 2005. Functional heterogeneity in resources within landscapes and herbivore population dynamics. *Landscape Ecology*, 20:317-317. Page 54, lines 2236 -2237.

Was this analysis also conducted with a GLM(M)? ****Yes**

Did the original papers use reporting data, or were incidents observes/reported directly by the authors? **(**both)**. If the former, note that there could be 4 links in the chain between the original incident and the conclusions of the meta-analysis (incident → reporting by farmer → synthesis by original authors → synthesis across papers by PhD candidate), with potential for error to creep in at each link. How does the candidate deal with this uncertainty in the data?

****These methodological limitations are restated in the conclusion section of Chapter 2, page: 28, lines 1570-1578. "We acknowledge that the data set may be prone to biased reporting and relate to specific cases that have been reported in the literature using particular terminology. It is possible that some countries may use terms, keywords and phrases that are atypical and hence limit the findings of the meta-analysis. We thus limit conclusions based on the applicability of our data set. In addition, we acknowledge**

that the meta-analysis contains data derived from articles that provide original observations as well as those articles with synthesised data derived from secondary sources and hence it is possible that the data set could be prone to some degree of misinterpretation."

1700-1713 Do I understand correctly that the response variable was calculated by the number of HWC incidents by the number of DCAs? ****Yes** How did all the numbers end up as integers? What is the justification for calculating incidents per species? These numbers should no longer be counts (integers) but rather continuous values (Poisson no longer appropriate). Non normality should be addressed with transformations.
****These were count data because I counted the number of HWC cases for each DCA, in each region from the database.**

There are very large differences in sample size between regions, and thus very large differences in estimates of variation between regions. This is likely to drive the outcomes seen in the statistical analysis.
****Differences between regions were not a result of sampling bias but emerged as a result of the meta-analysis of what studies were published in ISI-indexed journals.**

1722-1723 There are only five cases on the map. Difficult to conclude an increase.
****Many of the GPS data points were stacked/lying on top of each other. For example, if author A has conducted 8 studies in the same area- this will still look like as a single point. This has been corrected for all meta-analysis maps so that the points do not overlap, from pages 37-63.**

1762 In Africa and Asia, most reporting appears to be in English-speaking countries. Could it cause bias if, say, all of west/central/North Africa is overlooked?
****These methodological limitations have been restated in the conclusion section of Chapter 2, page: 28, lines 1570-1578. See my previous response to a similar comment.**

1799 The main conclusions, in the first few lines should be softened 'proving' versus 'lending support', or 'were most vulnerable' versus 'reported the most incidents'.
****Revised: "Local communities (i.e. people that might or might not farm) were affected by 49 different species of wildlife globally, lending support that such communities are potentially the most common target for a wide range of damage-causing wildlife." page 42, line 1856 and 1858.**

There might be some confounding influence if HWC damage is higher in local communities because there are many people available to report it, rather than because they actually experience more damage. How is this addressed?
****I agree that this important argument needs to be made. Inserted in the discussion section: "However, these findings could be attributed to a greater research focus of HWC in literature devoted to commercial farming industries. It is also possible that these findings were driven by a confounding factor where HWC damage was reportedly higher in local communities because there were many people available to report it, rather than because they actually experience more damage." Chapter 2, page 43, lines 1871-1875.**

1840 What is the source of this?

****Reference added "(DeGeorges and Reilly, 2008)" to (now) page 43, lines 1898-1899.**

Chapter 3 general: I'm not sure I understand why there is an entire chapter just on methods. Presumably there is an interest in publishing the subsequent chapters, and the methods will need to be repeated for each paper?

****The general chapter of my study provides an overview of the general methods used for the thesis, whilst specific methodology or analytical techniques are presented for specific data chapters.**

2306 There is a very strong imbalance in the number of farmers in each category within regions. There aren't many commercial farmers near the large PAs in general. **(**see my earlier response regarding the Waterberg, pages 64-65, lines 2375-2392)**, but I wonder if a matched or paired design might be more effective at making conclusions about commercial versus subsistence farming in a more rigorous way. For example, a subsistence farm could be paired with a commercial farm in a way that they were as similar as possible (size, crops, location, proximity to PA), the pair or farms would be treated as one unit of observation, and it would help with controlling for confounding factors.

****A paired design was my initial approach. However, this was not always possible because farms were scattered and did not allow for a paired analysis. In addition, farm types were not balanced by locality. To account for these issues, I included locality as a random factor. In addition, it will be very difficult, for example, to find a subsistence and commercial farm of similar size and with identical crop or livestock yields.**

2550-2551 Poisson link is used for count data (integers) whereas the identity link (normal distribution) is used for continuous data.

****Poisson was appropriate as I dealt with count data (e.g. counting the number of HWC cases per DCA in the database). This is stated on page 30, lines 1661-1662.**

3151-3155 The basis of this study is the contention that rural/subsistence farmers have fewer resources to deal with HWC, and therefore, they suffer more because of it. Proximity to PAs confounds assessment of this contention.

****All study sites were contiguous with protected areas with abundant biodiversity and were therefore suitable to assess human-wildlife conflict, see pages 64-65, lines 2375-2392. Significant differences between study localities emerged after analysis and the characteristics and distance of PAs from farms sampled will be recommended as a future study, page 267, lines 7135-7136.**

3165-3168 There is mention of removing Mkuze and the Waterberg from analysis. Given that the goal (broadly in the thesis and specifically in this chapter) is to compare commercial and subsistence farms, those data should be left entirely out of this chapter.

****The Waterberg data were not included in this analysis as suggested in the graph caption, but nevertheless an illustrative comparison of how much livestock was lost to depredation in this area was included. Furthermore, I think that it is still important to report that the rural people of Mkuze**

reportedly suffered high numbers of crop species lost, even in comparison to other rural communities. I also state that Mkuze was removed from the statistical analysis because no comparative data for that area was obtained, now pages 99, lines 3326-3329, page 134, lines 4099-4102, and page 149, lines 4391-4393.

All of the analysis section: again there is not enough detail to know exactly what the candidate did. Not sure what the explanatory and response variables are.
****In the thesis, I specified the fixed, random, covariates and dependent variables, see pages 74-75, lines 2677-2680, and lines 2696-2702.**

3228-3286 I don't see how this is relevant.
****I adopted the same protocol used by Dickman (2008) to report biographical and demographical descriptive data. Potential relationships between culture/demography and HWC emerged later on. Dickman addressed the original aims and objectives, while other relationships that may have emerged, were investigated in future studies.**
Dickman, A.J. 2008. Key determinants of conflict between people and wildlife, particularly large carnivores, around Ruaha National Park, Tanzania. PhD thesis. University College London (UCL) and Institute of Zoology, Zoological Society of London.

3315 Response variable seemed to change. I see 'proportion' (should be 0-1). If the response variable was a proportion, GLM(M) with Poisson link is not appropriate. Rather transform with log-odds and use normal GLM(M).
****GLMMs satisfy the assumptions for non-normal data without the need for log or inverse transformations (Lo and Andrews, 2015).**
Lo, S. & Andrews, S. 2015. To transform or not to transform: using generalized linear mixed models to analyse reaction time data. *Frontiers in Psychology*. 6:1171. doi: 10.3389/fpsyg.2015.01171.

3335-3470 Response variable (livestock depredation: Y/N) is binary. Analysis should be with logistic regression.
****I agree that the response variable 'type of response', was a binary response indicating whether farmers experienced HWC or not, which was a binary Y/N category of farmers (Farmer type is a fixed effect). Hence, because the response variable here was binary, we still used a GLMM with a binomial distribution I specified the script family=binomial. I now include this in the main methods, page 74, line 2692-2693. In addition, in the main methods chapter I include the following: a Poisson distribution (with a log link function) was used throughout the analysis, except for binary data, in which case binomial distribution was used with the log link function, page 74, lines 2685-2688.**

3355 I'm not sure I understand the purpose of this analysis? I think that 'covariate' is used incorrectly here.
****A covariate is a variable that is possibly predictive of the outcome under investigation, and may be of direct interest or a confounding factor, and a predictor, in an analysis (Gujarati and Porter, 2009).**

Is the response a count? For this analysis the response is binary (yes/no) and logistic regression should be used.
****See my responses two comments above regarding binary data, and page 74, line 2692-2693 of the thesis.**

3367 More confusion between 'covariate' and 'response variable'.
****A covariate is a variable that is possibly predictive of the outcome under investigation, and may be of direct interest or a confounding factor, and a predictor, in an analysis (Gujarati and Porter, 2009).**

3383 Not clear what is being compared here or why? Is this number of respondents in different income brackets? What is the relevance in HWC?
****To assess differences between the proportion of respondents who claimed to earn in the poorest income group (<R500/month) and other income ranges (R500–R10 000/ month). In addition, I also assessed which was the most common household income per month, which is now been made clearer in the analysis section: "Income brackets were compared to assess differences between the proportion of respondents (subsistence and commercial) who claimed to earn in the poorest income group (<R500/month) and other income ranges (R500–R10 000/ month). In addition, I also assessed which was the most common household income per month.", page 99, lines 3343-3346.**

3387 Not clear what is being compared here or why.
****To assess whether farmer type predicted household income. This is made clearer in the analysis section, page 99, lines 3343-3346- See insertion above.**

3398 Is this a fair comparison? The number of subsistence respondents is vastly more number of commercial respondents. What if these were proportions?
****This bar graph reports the number of responses per abiotic/environmental factor and not per farm.**

3418-3428 Response variable (HWC: Y/N) is binary. Analysis should be with logistic regression.
****I agree that the response variable 'type of response', was a binary response indicating whether or not farmers experienced HWC (Farmer type is a fixed effect). Hence, I used a GLMM with a binomial distribution I specified the script family=binomial, and page 74, lines 2692-2693 of the thesis. Furthermore, a logistic regression follows normal distribution of data, while the GLMM allows the specification of models whose response variable follows non-normal distribution/binary or error distributions and are therefore more appropriate (Lo and Andrews, 2015).**
Lo, S. & Andrews, S. 2015. To transform or not to transform: using generalized linear mixed models to analyse reaction time data. Frontiers in Psychology. 6:1171. doi: 10.3389/fpsyg.2015.01171.

Results in general: there is a lot of overlap between tables and figures. Rather choose the method to better get the message across (usually graphs).
****There is no overlap between tables and figures. Tables report important statistical coefficients that bar plots cannot and are therefore appropriate.**

3456-3460 Response variable (HWC: Y/N) is binary. Analysis should be with logistic regression.
****See my earlier responses and on page 74, lines 2692-2693 of the thesis.**

3464 (caption of Table 11, now lines 3623-3625) Presence of fencing is a factor of interest. It cannot be a random effect.
****Corrected: "Table 11. Output of a generalised linear mixed model by maximum likelihood, comparing how subsistence and commercial farmers (fixed factors) were affected by incidences of human-wildlife conflict in the presence or absence of wildlife-proof fencing (covariate)."**

3473 Response variable (HWC: Y/N) is binary. Analysis should be with logistic regression.
****See my earlier responses and on page 74, lines 2692-2693 of the thesis.**

3495 (now 3651) The candidate cannot conclude this because the finding (from Fig. 6) is driven by differing numbers of respondents.
****Fig. 6 showed differing number of responses for each abiotic factor. This deduction has been revised to: "Although subsistence farmers reported a large number of environmentally-related challenges that could potentially affect crop and livestock production, this finding was driven by differing number of responses per abiotic factor which a future study with a paired sampling design of commercial and subsistence farms can elucidate." See page 118, lines 3650-3654.**

3521 (now 3690) Care with wording: the candidate did not detect a difference. Not the same as there was no difference.
****revised to 'no differences were detected' now page 119, line 3679.**

3540-3549 (now 3703-3713) What is there is no cause-and-effect relationship, but rather both things are driven by a third factor? For example, overall education level could influence both attitudes towards wildlife and attitudes toward family planning.
****I agree that the possibility of a third driving factor should be made, see discussion section: "It also plausible that no cause-and-effect relationship exists, but that a third factor, such as overall education level or cultural/religious beliefs could influence both attitudes towards wildlife and attitudes toward family planning." page 120, lines 3707-3709.**

3876-3878 (now 4046-4050) Double-check this. No population can sustain 95% removal.
****Rephrased: "A striking example occurred with the kit fox *Vulpes macrotis* and swift fox *Vulpes velox* in which >95% of the total number of individuals killed since 2000 were unintentionally killed by snares set for coyote *Canis latrans* by the Wildlife Services agency, U.S. Department of Agriculture (Bergstrom et al., 2014)." now page 133, lines 4046-4050.**

3900-3911 (now 4082-4101) There seems to be a lot of repetition between this and the previous paragraph. Could condense.

****The first paragraph deals with the aims of the chapter and the second paragraph deals with predictions and support for each prediction, page 134, lines 4070-4089.**

3912 (now 4416-4418) How is the diversity of loss related to diversity available? What if subsistence farmers loose a wider range of crop or animal species simply because they farm with more species, but the overall magnitude of impact is similar between subsistence and commercial farmers?
****I agree that this important but brief argument needs to be included. Hence, I acknowledge that: "subsistence farmers could be vulnerable to wider range of crop species loss to depredation because they farm with more heterogeneous crop species. Hence, although there might be a preference for maize by raiders, it is also possible that depredation could be opportunistic or related to availability of crops or proximity of crops from PA boundary which a more focused study can assess." See discussion section, of this chapter, page 151, lines 4404-4409.**

Is there a test of the effect of crop diversity per se on likelihood of experiencing HWC?
****No. I presented findings for the number of subsistence and commercial crop species depredated at each location. A test of the effect of crop diversity on likelihood of experiencing HWC warrants further investigation.**

4021 (now 4194) This comparison is not very informative without an idea of crops available to be raided, and how that differs between farmer types.
****I disagree as the comparisons in my study revealed that important staple food, namely maize produced by both subsistence and commercial farmers was the most frequently raided crop. This makes the comparison very informative.**

4060 (now 4244) Rather leave the Waterberg data out of this chapter altogether. No valid comparison can be made by including them.
****The Waterberg data were not included in this analysis as indicated in the graph (Fig 4, page 141, but nevertheless was included as an illustrative comparison of how much livestock was lost to depredation in this area was included.**

4080 (now 4254) Same as two comments ago. Try proportions.
****Here, mean number of incidents per livestock species/game type/poultry were investigated, and not per farm. See legend of figure 5, page 142.**

4132 What is the response here? Is it ZAR or number of incidents?
****ZAR, see legend of Table 7a page 145.**

4148 (now 4316) Same as two comments ago.
****Here, average number of incidents per retaliatory practice was investigated, and not per farm, Fig 7 page 146.**

4199 Response variable (non-lethal control: Y/N) is binary. Analysis should be with logistic regression.
****See my earlier response and page 74, line 2692-2693 of the thesis.**

4208-4211 (now page 150) Given the problems with the analysis, there is no support for this statement.
****I maintain that my approach to the analysis was appropriate and that support for these predictions are plausible: "The findings of this study support the predictions that subsistence farmers lost a greater number of crop species to DCA depredation compared to commercial farmers, and commercial farmers reported implementing a higher number of lethal control practices compared to subsistence farmers." Now page 150, lines 4383 – 4386.**

4214-4218 (now 4409-4102) Same as for the Waterberg data. Mkuze data should be excluded entirely from this chapter because there is no way to make a valid comparison between subsistence and commercial farmers in that locality.
****I think that it is still important to show that the rural people of Mkuze reported high numbers of crop species lost, even in comparison to other rural communities. I also state that Mkuze was removed from the statistical analysis because no comparative data for that area was obtained, now pages 99, lines 3326-3329, page 134, lines 4099-4102, and page 149, lines 4391-4393.**

4227-4670 (now from 4400) This chapter should be organised around testing this hypothesis. Very interesting idea.
****Noted. This important finding ("Notably, maize produced by both subsistence and commercial farmers was the most frequently raided crop.") emerged after analysis and will therefore be investigated in detail in future studies. Page 150-151, lines 4400-4402**

4674-4705 (now 4882-4894) All of this background is too broad and does not set the specific context of this chapter. Rather focus explicitly on attitudes about HWC and what shapes them.
****I believe that the historical exclusion of black rural people into land-degraded areas is worthy of brief mention here as it influenced present day perceptions of wildlife and the environment by indigenous South Africans (Khan, 1994), most of home still dwell around overpopulated communities contiguous with PAs today (pages 169-170, lines 4882-4894).**

4732-4735 (now 4944-4948) These are essentially yes/no questions, which aren't very interesting (or appropriate) for a PhD study. Rather focus on testing Madden (2004) as a basis for this chapter.
****Investigating whether farmers adopt negative attitudes towards wildlife is fundamental towards Madden's philosophy of 'Creating coexistence between humans and wildlife' and hence very appropriate.**

4745-4747 (now 4958-4960) Another comment about the sample size differences.
****All analyses in the thesis were conducted as proportion of responses.**

4797-4811 (now 5013-5016) There is well-established literature and methodology for conducting and analysing attitude surveys using a 'Lickert Scale'. Why was that approach deemed inappropriate for this attitude survey?
****I agree that the Likert scale developed in 1932 is well-recognised. I however adopted more recent protocol's implemented by Page et al. (2015) and Anthony (2007) who specifically used index scores to evaluate attitudes and opinions of rural communities towards wildlife in South Africa specifically, and these authorities have published their studies in ISI-indexed journals. This has been made clearer, page 174-175, lines 5013-5016.**

As I understand it, 'zero' is used to represent 'I do know but have no strong opinion either way', 'I don't know but cannot form an opinion', and no response (missing data). These are three very different outcomes, and lumping them probably invalidates this whole approach.
****"I don't know/no response" was weighted as a neutral response or neutral attitude.**

Question 13 - Rather the question could be, 'There are wild animals that you would like to see on your village/farm.' This way the scale used for the other questions also applies to this question/statement.
****Thank you for the valuable comments and recommendations which will be considered for future studies, since the study has already been conducted.**

Data analysis general:
The data are categorical, and therefore should be analysed as counts using contingency tables and log-linear models (or logistic regression if the response is binary). Alternatively, one could use standard GLMs, but proportions need to be transformed (e.g. log-odds).
****For this segment of the study, the participants had to provide agree, disagree and unsure/neutral responses and not yes/no (i.e. binary) responses. The assessment of positive, negative and neutral attitudes is a significant component to the assessment of HWC and therefore all three responses had to be included in the analysis.**
In all cases, I asked two different questions, and hence using one single model (GLM) is not suitable. The two questions are: 1. Do the farmers' responses differ from each other according to farmer type?
2. If so, how do they differ? The first question examines differences between the farms and with the second question examines differences within the farms. In addition, GLMMs account for non-normal data assumptions without the need for log or inverse transformations (Lo and Andrews, 2015).

4878 (now Fig. 2, page 177, now lines 5093) Not sure how this is analysed. It looks like the proportions of 'yes', 'no', and 'unsure' are included as data. Those three proportions are not independent of each other and cannot be used in the same analysis.
****In response to these questions, the participants had to say whether they agreed, disagreed with the statement or were unsure/neutral and not yes or no. The assessment of neutral attitudes is a significant component to the assessment of HWC and therefore had to be included in the analysis.**

4885 (now Table 6a, page 180, now lines 5102) Not sure what the response variable is. Is one response value yes, no, unsure? How does the candidate get to an analysis based on proportions?
****Again, the participants had to say whether they agreed, disagreed with the statement or were unsure/neutral and not yes or no. See my response above.**

4928-939 (now Fig 4-Table 8a) 'No response' is not data. It should be coded as NA in R (missing data). Analyse the rest with logistic regression or odds ratios.
****The no response was also included to assess the full spectrum of responses of subsistence and commercial farmer so as to foster trust during feedback interviews, as suggested by other scholars (Dickman, 2008). The inclusion of no responses/neutral responses is now made clear in the methods, page 69, lines 2508-2511 earlier on.**

Chapter 7: I might argue that it does not fit well with the rest of the thesis and should be removed. The candidate might choose to treat it as a separate paper for the purpose of publishing.
****Although the attitudes of local people have been studied previously (Anthony, 2006), there is limited research available on how conservation practitioners perceive and interact with local communities and farmers (subsistence and commercial) neighbouring protected areas (Dr Robert Hitchcock, Pers. Comm. University of New Mexico, Albuquerque). In addition, such interactions between conservation practitioners and local people and farmers are suggested to be important drivers of HWC. For example, retaliatory killing of carnivores increased when communication between local communities and park authorities deteriorated (Jackson and Wangchuck, 2001). Hence, the assessment of the attitudes, as well as the opinions and interactions, of conservation practitioners towards wildlife and local human communities contiguous with protected areas is fundamental to the assessment of HWC mitigation. See inclusion in page 201, lines 5568-5574.**

Chapter 8: Overall there is no way to conduct the subsistence-commercial comparison. Remove the chapter and treat it as a separate paper.
****It is challenging to predict the exact movement of a wide-ranging species and therefore difficult to find respondents that dwell on farms with identical overlap with the paths of the wild dog home range, see page 250-251, lines 6626-6631. A more focused approach can now be taken to interview more farmers that fell within the home-range of the Waterberg pack during future studies.**

EXAMINER 3 COMMENTS

Corrections:
The overall abstract needs rewriting in a standard abstract format with background, aims, methods, results and implications/applications. Currently, it does not follow a standard format.
****The abstract has all the components that the examiner mentions, which follows the recommendation of the University of the Witwatersrand. Moreover, Examiners 1 and 2 were satisfied with the abstract**

Glossary- one glossary at the start would be sufficient and not repeated throughout chapters. Check and reference definitions.

****Chapter 2 is a stand alone paper and the glossary for this chapter was developed specifically to define the categories of vulnerability to HWC. In addition, all the terms in both glossaries are defined terms and references have been allocated to each term where appropriate, Chapter 1 page 12-13, lines 1061- 1107; Chapter 2 page 48-50, lines 2072-2124.**

I would recommend some restructuring and integrating general methods into appropriate sections with questionnaires in appendix at the end.

****General methods are described in Chapter 3, while specific methods appear in the data chapters.**

The inclusion of the wild dog study seems to be bolted on at end this needs better linkage and justification.

****The African wild dog is one of the most threatened and endangered canids in Africa, and due to agricultural expansion, disease and farmer persecution (Woodroffe, 2011), this species continues to decline. Since the wild dog occurs within all study sites within north-eastern South Africa, and my previous chapters demonstrated that wild dogs were among the top three ranking carnivores implicated in the highest number of reported depredation incidences, this species was an ideal case study to include in the thesis. A more focused investigation with more packs, if possible, will be considered for publication later.**

Overall language there are shifts from first to third person and passed and present tenses. Check this throughout thesis.

****The use of first and third person in scientific writing has been shown to be acceptable (Schultz, 2009). Schultz, D.M. 2009. Eloquent Science: A practical guide to becoming a better writer, speaker and atmospheric scientists. American Meteorological Society. University of Chicago Press, Chicago, 440 pp.**

Clarify aims and state hypothesis at the start and within chapter introductions.

****The main aims and objectives are testable statements and predictions are included in each data chapter, page 10, lines 1017-1037.**

There needs to be more literature review rather than a meta-analysis of a single area that does not give sufficient background for the study. I would recommend expanding the introduction with a more robust literature review.

****The meta-analysis is the literature review with a global assessment of HWC and South African perspectives. In addition, a broad literature review is also presented in Chapter 1.**

Methods - There is no validation in the methods development process evident. This needs to be considered if it was done, or if not, validated in some way and critically reviewed in the discussion if not part of the method process.

****General methods are described in Chapter 3, while specific methods appear in the data chapters. In addition, details regarding the capturing and coding of questionnaire data has been added, page 68 – 69,**

lines 2499-2520. Furthermore, the framework of the questionnaire was developed at the outset of this study, in consultation with several conservation authorities from the Endangered Wildlife Trust who provided advice on several elements of HWC, see page 69, lines 2533-2538, and who have previously piloted questionnaire surveys to assess farmer attitudes to carnivores and published this data.

Data analysis - It needs to be reviewed throughout and more appropriate analysis applied where required.
****This issue is addressed at length in previous responses. See page 30, lines 1655-1664.**

Results - Each figure and table needs to be checked to ensure all information is present so it can be understood.
****All figures and tables are stand alone with detailed captions.**

Discussion - Expand each discussion with a more critical element of the methods and data and further integration with literature.
****While addressing comments in the examiner reports certain aspects of the discussion have been extended to include more critical elements, within all data chapters. See chapter 2, lines 1870-1872 page 42, 1885-1889 page 43, 2033-2035 pages 47-48. Chapter 4, lines 3665-3668 pages 118-119, 3721-3723 page 120, 3717-3719 page 120, 3757-3764 page 122. Chapter 5, lines 4404-4408 page 151, 4537-4543 page 155, 4573-4581 page 156. Chapter 6, lines 5257-5265 page 187, 5296-5301 page 188, 5317-5319 page 188. Chapter 7, lines 6057-6064 page 220. Chapter 8, lines 6626-6631 pages 255-256. Chapter 9, lines 7117-7143 page 268.**

Chapter 1
I would have expected this to be a broader literature review that brings the focus of the thesis into context
****My approach was broad and generalised at the onset of the study as little was known about which drivers were affecting HWC- this will lead to future studies where a more focused study can be achieved.**

697 Should be flora not fauna?
****Corrected to flora, now line 701, page 1.**

Chapter 2
The introduction does not give sufficient background to fully justify the approach. To address this, you need to broaden the starting point then focus into what you are addressing
****My approach was broad and generalised at the onset of the study as little was known about which drivers were affecting HWC- this will lead to future studies where a more focused study can be achieved.**

It needs to have clearer aims that will address the gaps in knowledge so the introduction needs to clearly highlight gaps which currently it doesn't do
****The main aims and objectives are testable statements and predictions are included on page 26, lines 1513-1516.**

The analysis approach and what it is trying to find out is not clear. It seems to have thrown what it has in an analysis without giving it context and direction.
****The approach to the data analysis issue has been addressed at length in response to previous examiner comments.**

You need to clarify the limitations and biases in your approach early on.
****These methodological limitations are restated in the conclusion section of Chapter 2, page: 28, lines 1570-1578. "We acknowledge that the data set may be prone to biased reporting and relate to specific cases that have been reported in the literature using particular terminology. It is possible that some countries may use terms, keywords and phrases that are atypical and hence limit the findings of the meta-analysis. We thus limit conclusions based on the applicability of our data set. In addition, we acknowledge that the meta-analysis contains data derived from articles that provide original observations as well as those articles with synthesised data derived from secondary sources and hence it is possible that the data set could be prone to misinterpretation."**

You cannot make claims that this is a global assessment of HWC as it only relates to a specific type of farming and only that has been reported in the literature using certain terms.
****I agree with the examiner that these limitations need to be stated and I have included the following, page 28, lines 1570-1578- also see above for details.**

Page 22 you give examples of species from Europe (but exclude an obvious species red foxes) but then give examples of developing countries not in Europe i.e. Australia, hence there are some glaring errors and obvious exclusions which stand out as not a comprehensive understanding of the topic.
****Red foxes were not included because I discussed conflict between large-mammalian carnivore and commercial farmers in developed countries in this section. In addition, according to the World Bank, Australia is a developed country. Hence, this paragraph provides examples of large mammalian carnivores (page 22, lines 1395) and large-livestock commercial farmers in developed countries.**

'Motivation for the study' is not a standard subheading in a publication, remove and integrate relevant aspects into introduction.
****Done, see page 24, lines 1453-1455**

I am unsure why you have moved some Carnivora out of carnivores and put it in other mammals.
****These species (dhole, civet, genet, honey badger and mongoose) were divided based on the wide descriptions of their diet in the literature and their feeding behaviour. I have revised the 'other mammal category to include omnivorous species, Table S2, top row, first column, page 59.**

It is not appropriate to use the same conflict scale that has been applied for cats to all other mammals and birds due to the description and nature of the categories, especially with one key criteria being attacking people which is difficult to apply to feral house mouse for example!!

****Very few meta-analyses regarding conflict of wildlife with humans have been published. The meta-analysis by Inskip and Zimmermann (2009) provided the first and only description for categorising species (felids) for vulnerability and conflict status. Although this protocol was based on felids it was able to 1) assess species vulnerability to conflict and 2) gauge the predisposition or susceptibility of species for depredation which was appropriate. In addition, my description of the category in which the feral house mouse fell includes the following: moderate-scale conflict- Wild animal rarely attacks people, or may frequently depredate livestock or crops, experiences frequent retaliatory killings See Table S1, Page 57.**

Results – Make sure you link it to aims and hypothesis.
****All the results were presented to answer the list of aims and objectives (page 26, lines 1513–1534) of the data chapter.**

Figure 1 needs presenting differently. High, med low should be in order. Each letter should be in legend so figures are stand alone. There is no reference to what the letters mean.
****Description of conflict scales is now in order and consistent with the legend of the bar plot and the caption of the figure, see page 33, Fig. 1. In addition, the detailed description is included for letters "in the legend of Fig. 1.**

It is unclear what you are actually trying to test in your analysis and the tables seem obvious without need for z values to test it.
****In a paper or thesis report, the coefficients of the GLMM output is sufficient to mention the sample size (or degree of freedom), the z value and the p-value. The recommendations of the examiner will be considered for publication.**

Discussion –Bias elements and how you controlled for it should be in the methods (**discussed earlier, 28, lines 1570-1578). Seems to be justification for the rest of the thesis focus not a wider discussion of the findings of this chapter and it's implications. This needs changing.
****Parts of the discussion have been revised, pages 42-43 lines 1870-1872 or extended, lines 1885-1889.**

The conclusion is not a conclusion and biased towards the rest of the thesis and your own idea rather and a comprehensive view of the data set and what it is showing from multiple perspectives.
****The conclusion has been extended to include the limitations of the dataset, page 47, lines 2033-2035.**

HWC is not just with vertebrates so what is the justification of why you have focused on them? Local communities and subsistence farmers are not mutually exclusive so how did you split the two. What about community based subsistence farming around villages? Which don't fit into either category.
****The output of the meta-analysis using the keywords and search criteria did not yield results for invertebrates, although this is an important category that must be considered in further studies. In the glossary I separate and provide distinct definitions for local communities, see page 49, lines 2093-2094; and subsistence farmer, page 50, lines 2106-2108.**

Table S2 is wrong it has feral house mouse etc. in Mega Herbivores and also see my previous not on carnivores versus Carnivora.

****Corrected, see page 59, Table S2, third row, first column.**

Maps- there is no way there is no human carnivore conflict anywhere other than these dots. Again you are suggesting no human-primate conflict in South America?

****Multiple GPS points were initially stacked and this was corrected, from pages 37-63. In addition, the output of the meta-analysis using the keywords and search criteria did not yield results for South America between 1994-2000.**

Water buffalo conflict in Africa – are you sure it is water buffalo?? A Cape buffalo is a different species to a water buffalo.

****Yes. According to the FAO (2015), this refers to commercially ranched water buffalo for human consumption worldwide. This is explicit on page3, lines 758-760**

Chapter 3:

You need to have a clear justification of why you selected sites and transparency in the method of how you selected sites.

****All study sites were contiguous with protected areas with abundant biodiversity and were therefore suitable to assess human-wildlife conflict and the argument above will be reiterated in the appropriate methods, pages 64-65, lines 2375-2392.**

The number of interviews done should be in results not methods (Table 1, page 66 and Table 2, page 72.

****I have retained this Table here and changed number of interviews to sample size. Page 66, Table 1 and page 72 Table 2.**

2340 seems to start with sampling design after a section on justification of questionnaires. It seems to jump back and forth between different elements and is not comprehensive in its structure and development.

****2340 is now line 2428, page 66 falls within the section "data collection and sampling procedure" and does not follow directly from justification of questionnaires.**

Why are these methods not integrated into the chapters?

****General methods are described in Chapter 3, while specific methods appear in the data chapters.**

You refer to chapters and chapter aims and other aspects throughout which means this is all over the place and seems to be a section to throw in everything you didn't want to put elsewhere??

****The main aims and objectives of the thesis are outlined in Chapter 1, lines 1004-1022, while detailed aims are included within each data chapter. I made references to the chapters in the methods to show how the questionnaire data was utilised. In addition, the outline of the questionnaire was developed at the outset of the study. Since little was known about which drivers were affecting HWC, the questionnaire**

took a broad and generalised framework – in future studies, a more focused study can be achieved. A review of methodological approaches and limitations of the study is now included in Chapter 9, page 268, lines 7117-7143.

Would have liked to see the background research which has informed what question/data you are asking and how that fits to answering specific questions. I would recommend a table of your questions what data you are collecting and what question it will link to.
****The outline of the questionnaire was developed at the outset of the study. Since little was known about which drivers were affecting HWC, the questionnaire took a broad and generalised framework – in future studies, a more focused study can be achieved. The framework of the questionnaire was developed in consultation with several conservation authorities, such as the Endangered Wildlife Trust (lines 2519-2524, page 69), the Ndumo Community Project, the National Research Foundation and Human Ethics Research Committee (HREC), University of the Witwatersrand. The recommendations of the examiner will be considered for future studies. In addition, such linked tables are provided in Chapter 6, on pages 172-173, Tables 3 and 4.**

Where questionnaires piloted to refine them?
****Yes. the questionnaire was developed on a piloted study by Dr Michelle Thorn a collaborator of my PhD project, see Chapter 3, page 69, lines 2519-2524 and Chapter 7, page 202 lines 5637-5641.**

There are multiple scientific words or words without definitions used. How do you know farmers could understand it?
****All terminology used in the questionnaire was explained in detail using layman's terms during interviews. See page 70, lines 2551-2553.**

Seems strange as some animals have higher conflict records in your chapter 1 but not put in here. i.e. caracal?? But you have included honey badger? How did you select these?
****Many species, such as caracal, only emerged as a high-conflict species after analysis.**

How are you going to use them to assess attitudes when attitude and opinion is derived from multiple different factors? I can't see the rationale for each of the different question are elements or any suggestions of methods that were used in the development and checking and trailing the questionnaire.
****See my previous comments regarding this issue where the rationale behind the development of the questionnaire is explained, pages 67, lines 2519-2524.**

Statistical analysis repeats some of what was stated in the first chapter and then says it will address each in subsequent chapter so really is not needed. The GIS section is the same as it was stated earlier.
****Chapter 2 was submitted for publication as a stand alone paper and therefore statistical analysis and GIS methods are repeated.**

I am concerned about your choice of animal pictures. Why where they chosen?
****Motivation of their selection was provided, see page 70, lines 2540-2547.**

Was there a point of choosing these positions?
****I adopted a technique used by Dickman (2005 & 2008), who incorporated endemic and exotic species to verify the identification of local wildlife, see page 70, lines 2550-2552. The recommendations of the examiner will be considered for future studies.**

2992 – inset is in the wrong place in map.
****Corrected, see page 90-91, now maps under lines 3148 and 3151.**

Chapter 4:
Your introduction doesn't really cover how demographics such as religion, language, ethnicity would be a predictor of conflict but you cover it in the analysis.
****The thesis addressed the original aims and objectives of the study. Other relationships that may have emerged will be investigated in future studies.**

The fundamental idea of differences between subsistence and commercial in terms of the occurrence and more importantly the impact of subsistence farmers in terms of losses and consequences is sound but several other aspects seem to be confusing your focus and you need to be clear what is directly relevant in your analytical approach to answer this.
****The approach was broad and generalised at the time as the exact drivers affecting HWC were unknown- this will lead to future studies where a more focused study can be achieved.**

Is there a way in analysis you could assess magnitude i.e. proportion loss to income?
****Magnitude was not possible to measure in my study. This would require measurement of economic and caloric losses due to crop and livestock depredation and could not be assessed accurately due to limitations of the questionnaire survey. This recommendation will be considered for future studies.**

You talk about proximity to PA but you don't analyse this. You don't mention religion in introduction but then you go on to analyse this, although the spread of data doesn't lend itself to analysis and I am unsure how this would answer the question you are posing.
****Significant differences between study localities emerged after analysis and the characteristics and distance of PAs from farms sampled will be recommended as a future study, page 267, lines 7135-7136. In addition, I adopted the same protocol used by Dickman (2008) to report biographical and demographical descriptive data. Potential relationships between culture/demography and HWC emerged later on.**

Farm type and type of game or livestock will have a great effect but you don't mention this much in the introduction or bring this out in the analysis.

****I briefly introduce the implications of expensive game depredation in the introduction of Chapter 4, page 96, lines 3253-3257. Depredation of expensive game only emerged after analysis and I provide discussion on the implications of expensive game and livestock loss due to predation in Chapter 5 page 153, lines 4500-4502.**

You need sample size etc. in this section. GIS – you have plotted but no analysis – strange since you were interested in distance from PA?

****Sample sizes are reported (Chapter 3, page 66, Table 1 and page 72 Table 2). The heading GIS Analysis is not used but "GIS mapping" is used. Regarding the issue about distance from PA, this relationship emerged later on in the study.**

I want to know what you did with the questionnaire data to get it ready for analysis. How did you check the data? How did you convert it if needed? How did you convert your section on damage etc. and problem animals etc. into quantitative data for the analysis in this chapter?

****Details regarding the capturing and coding of questionnaire data has been added, page 68 – 69, lines 2499-2520.**

How did you quantify depredation for fig. 4? Was it just yes or no to any depredation?

****I verified the presence or absence of crop raiding (fig. 3)/livestock depredation (fig. 4) by eliciting Yes/No responses from respondents and did not quantify raiding. The analysis is based on binary responses because continuous responses could be exaggerated.**

I am not sure you need all the descriptive analysis on language, religion or ethnicity? You could just put this in a table.

****I adopted the same protocol used by Dickman (2008) to report biographical and demographical descriptive data. Potential relationships between culture/demography and HWC emerged later on. Tables S1 and S2 with descriptive data are also provided in the supplementary material for this chapter, pages 128-129.**

Your figures and legends need to be stand alone so some of table data needs to be included on figures.

****All figures and tables are stand alone with detailed captions.**

Household size- why not just use subsistence for this question? I can't see in your table 3 (now pages 108-109) the stats value for the significant differences for just subsistence? I can't see your N values or the variation in the data (SE) that has gone into the analysis so I can't see how significant this is or what the data actually looks like.

****The main aim of my study was to compare how subsistence and commercial farmers dealt with HWC and differences in socioeconomic circumstances are one of the important reasons for this comparison.**

The Z and P values are displayed together with the std error and degrees of freedom or N=131 in Table 3a, page 108, lines 3525-3528.

Your table 3 (now pages 108-109) just shows data for overall pooled not individual farmers. Where is this analysis? Each * needs a P value.
****I am unsure if the examiner is referring to Table 3a or Table 3b here, pages 108-109. All actual P values are provided in the last column of both tables. In all the figures it states that * across or above bars represent two levels of interpretation, i.e. significant differences between farmer type and occurrence of human-wildlife conflict. Statistics are provided in Table 3a (or the relevant table for other figs).**

No P values for each type fig 6- some of these don't look significant. Can you not use your different areas as sub samples so you have repeated measures and not just a single overall proportional value which has no replication?
****the P value ($P < 0.001$) for this figure is linked to Table 7 and is stated so in the legend, page 111.**

Type of farmer maybe less important than type of farm itself – if so mention it.
****The examiner highlights an important point. This has been included in the conclusion of Chapter 4, page 122, lines 3791-3795: "Notably, it is also likely that the type of farmer, i.e. subsistence versus commercial may be less important that the type of commodity farmed (i.e. monoculture and multi-crop farms or livestock small stock versus cattle farms). More focused studies can examine the type of crops/livestock types depredated in relation to the availability of crops/livestock types as well as the proximity of such farms from PA boundaries."**

Table 3b) If you do multiple comparisons then you should consider correcting your P level such as a Boneferroni correction.
****Data analysis issues are addressed at length in response to previous examiner comments. There is no need for corrections since I used post hoc tests.**

You seem to have solely used models for pair wise comparisons and hence this is not an analytical approach that can really show which of these variables are the most significant at predicting what is affecting conflict.
****This is not correct. I used a GLMM and reported the pairwise comparisons, which were part of the output of the R statistics.**

For each analysis you need to state what you are asking and then comment in text what it shows you. i.e. not sure what you are trying to show with table 5 and what is the point?
****I investigated whether significant differences between the proportion of respondents who claimed to earn in the poorest income group (<R500/month) and other income ranges (R500–R10 000/ month) occurred (Table 5), page 109, lines 3336-3338.**

Theft is not an environmental challenge. Can you group them into sections that could be reduced with investment in prevention or mitigation? Is it due to location etc.?
****Theft is an unusual category, while it may be a biotic element, this factor doesn't neatly fall into a specific category and therefore placed it as a general environmental category.**

Table 8. You could change this figure so they are in magnitude order.
****Here I provide a pair-wise comparison of the leading environmental challenges reported with other factors, page 110, lines: 3555-3559. In addition, 'magnitude' was difficult to measure. Magnitude would require measurement of economic and caloric losses due to crop and livestock depredation and could not be assessed accurately due to limitations of the questionnaire survey. This recommendation will be considered for future studies.**

Irrigation – surely this would depend on how they supplied water? If it was to provide drinking water for livestock that would be a different appeal to wildlife compared to crop watering. Could you not break it down into different types?
****The depth of such an analysis is beyond the scope of this study. The recommendations of the examiner will be considered for future studies.**

I feel your discussions are quite superficial. Please expand the discussions to develop depth of understanding.
****Further interrogation and expansion of discussion points have been added from Chapter 4, lines 3665-3668 pages 118-119, 3721-3723 page 120, 3717-3719 page 120, 3757-3764 page 122.**

Also the type of animal causing conflict and the effectiveness of the electric fence. Again this seems more valuable information that could have been analysed to understand the complexity and causes of the issue than some of the analysis that you have done.
****Elephant, chacma baboon, and leopard transgressed electrified fencing of commercial farmers according to reports in my questionnaire survey (page 121-122, line 3754-3757). Additional discussion points on the type of animal causing conflict and the effectiveness of the electric fence have been inserted, page 122, lines 3717-3719.**

Are commercial farms actually supporting large family groups? You state in discussion subsistence farms tend to be communities or multiple households/communal gardens but this is the first time you mention this.
****It is possible that commercial farmers may not actually be housing large family groups, but the household numbers reported could include the households of resident workers, page 120, lines 3728-3730. In addition, the findings that household size was an important predictor of farmers' vulnerability or susceptibility to HWC only emerged after analysis.**

Your conclusion over estimates what you have done and your data. You have not shown HWC affects subsistence substantially more than commercial.

****Revised in conclusion (page 122, lines 3775-3777) and abstract (page 94, lines 3189-3190): "My study indicated that subsistence and commercial farmers were affected by HWC in different ways, determined by the type of farming commodity, i.e. crops, livestock or poultry, in addition to several significant predictors of incidences of wildlife conflict."**

Chapter 5:

Aims - You state aims is to determine most frequent crop/livestock, common damage-causing animals. However then in methods you add in investigating frequency between farm types and then control practices. In results of abstract you talk about Region – but you don't mention this was one of your aims. However, it gets bit better in the middle.

****The abstract contains the main aims only. This chapter contains multiple aims (3) and objectives (5), see page 134, lines 4070-4089. The 5th objective states "to examine the lethal and non-lethal control practices implemented by subsistence and commercial farmers to deter depredators". Region/location is included at the start in the third aim ..... "subsistence and commercial farmers in selected localities of north-eastern South Africa".**

I would remove predictably from line 3787 – you haven't stated predictions in abstract and why is this predicted?

****Done- removed "predictably" (see abstract Chapter 5, now line 3958).**

At the end you conclude that persecution is a result of socio-economic and ecological issue BUT this was not in the aims to assess this or presented in the abstract results so why then do you conclude with it.

****This was an unexpected but nevertheless noteworthy finding that emerged post analysis, see page 130, line 3962-3965. Main findings are presented in the abstract results.**

Introduction - I would like to see another few lines in each point to show you know the depth and breathe of research and show how it links to your aims.

****My approach was broad and generalised as little was known about which drivers were affecting depredation- this will lead to future studies where a more focused study can be achieved.**

E.g. 3857 (now 4039) - expand on this. What is the direction in relation to age/sex, ethnicity etc. and how does this fit with your predictions later?

****I agree that this is important but beyond the scope of the study and will be dealt with in future studies**

Line 3884 (now page 132, lines 4063-4066- has been restructured)- needs to come later on here. Doesn't flow in development.

****Moved to now page 132, lines 4063-4066.**

Just put your overall aims in a way that is numbered and clear. You should give some justification for your aims and predictions.

****Numbered aims are found on page 134, lines 4070-4081. All predictions have support, for example, lines 4082-4089: "1) Subsistence farmers would lose a greater diversity of crop and livestock species to DCA depredation compared with commercial farmers. In Chapter 4, I established that subsistence farmers experienced significantly more incidences of crop depredation than commercial farmers. It is probable that the type and variety of crops cultivated and livestock farmed increased opportunities for HWC."**

Methods: Better explanation of data analysis than previous chapters.

****Thank you, although I followed a similar reporting pattern there too.**

In your question you state lethal as kill and non-lethal as 'not harmful'. I would question if this was clear this was non lethal control. As non-lethal could be seen as harmful but not lethal.

****As previously stated, all terminology was explained in layman's terms to respondents. See page 70, lines 2551-2553.**

Results: Data analysis approaches, presentation and appropriateness to answer question needs to be reviewed.

****Data analysis issues has been addressed at length in response to previous examiner comments.**

Again no P values or stats results for the * to show significance.

****All actual P values are provided in the last column of all tables.**

The number of crop species taken should be related to the number of crop species available. You can't say more if commercially they only grow one crop. Figure 2 how did you control for the fact that subsistence is more likely to grow maize?

****These findings emerged after analysis. I have added an argument in discussion: "subsistence farmers could be vulnerable to wider range of crop species loss to depredation because they farm with more heterogeneous crop species. Hence, although there might be a preference for maize by raiders, it is also possible that depredation could be opportunistic or related to availability of crops or proximity of crops from PA boundary which a more focused study can assess" page 151, lines 4404 -4408.**

4195- farm type as in commercial or subsistence or livestock or crop?? Did you test if different types and different farmers varied?

****farmer type refers to subsistence and commercial, see page 74 lines 2689-91. I tested whether subsistence versus commercial differed.**

Discussion:

In your conclusions you say you have identified hot spots but that wasn't the point and I didn't see any spatial analysis with GIS to address hot spots – which could have been done with data.

****hot spots have been changed to "areas of greater than average livestock depredation" on page 155, lines 4557-4558. Species of conservation concern hot spot analysis will be conducted in future studies, with more detailed focused analysis looking at the complexities and causes, page 156, lines 4573-4581.**

The maps would be more useful if they showed what species were killed where, i.e. some spatial analysis of conflict.
****I agree that this is an important map which has now been inserted into Chapter 5, Figure 9, page 148, under lines 4348 and in the List of Figures as well. A brief discussion of the distribution of the species killed are included including the limitations of the map, page 155, lines 4537-4543.**

Chapter 6:
Abstract doesn't fully reflect findings of the analysis.
****This chapter yielded several findings. However, the abstract could not include every finding, and hence only the main aims and overall findings are presented.**

Introduction: I would like to see a clear definition of how opinion and attitude is different in terms of definition and a literature review section of how's this has previous been approached by researchers in terms of methods.
****I provide clear definitions to distinguish between attitude and opinion (page 171 lines 4942-4945). I also insert a cautionary note: "Notably, factors affecting people's attitudes and opinions towards wildlife are complex, and some variables are more difficult to quantify and investigate than others (Kellert, 1993)." See page 171, lines 4939-4942. I further discuss the protocols followed on pages 174-175 lines 5013-5016, by implementing those of Page et al. (2015) and Anthony (2007) who successfully evaluated attitudes and opinions of rural communities towards wildlife in South Africa specifically, and these authorities have published their studies in ISI-indexed journals.**

In 4717 (now lines 4926) you state what you are doing but up until now in the introduction these communities have not been introduced or how the literature might suggest that they would differ in opinion.
****But, these issues are discussed on page 168, lines 4847-4856.**

Your aims of this chapter is not specified and your questions which I assume you have put in instead of aims are quite vague.
****The major aim of this study is found on page 171, lines 4936-4948 with key questions.**

One thing you overlook in your points about wildlife outside protected areas is that most protected areas globally are not large enough to support viable populations of wildlife especially larger more widely roaming animals. Your writing seems to have a narrow view of the issues with PAs and surrounding communities.
****Note that habitat fragmentation especially of PAs are discussed at length in Chapter 7 where I deal with PA management, page 201, lines 5585-5590 and in Chapter 8, where I examine the movements of wide ranging wild dogs (pages 236-237, lines 6279-6293). Nevertheless, I added some points here, page 169, lines 4859-4865: "Fragmentation of PAs by impinging local communities have had particularly adverse effects on wide-ranging wildlife which require large ranges (where all the resources the animal**

requires to survive and reproduce is contained) (Woodroffe and Ginsberg, 1998), by reducing home-range size and PA effectiveness (Mills et al., 1998; Woodroffe and Ginsberg, 1998)."

Methods

How much reading did you do to assess attitudes with questionnaires before developing your methods? Does it follow previously published methods?

****See my response regarding protocol design in earlier comments, and also see pages 174-175 lines 5013-5016.**

How does this compare to samples from other studies? Did you start with typologies and then develop questions to address each to give a combined view of attitude? Did you follow a previous method protocol for developing questions?

****The attitude and perception segment of this questionnaire was developed in consultation with Dr Michelle Thorn, a researcher from the Endangered Wildlife Trust who previously piloted a questionnaire survey investigating farmer-carnivore conflict (Thorn, 2012). Together we modified her original questions regarding the assessment of respondent attitudes to meet the aims and objectives of my study, see Chapter 3, page 69, lines 2519-2524 and Chapter 7, page 202 lines 5637-5641. Hence the questions were first developed and fitted the typologies thereafter.**

Did you derive your analysis approach from reading how other studies have dealt with analysis of opinion questionnaires?

****Yes. See my response above**

You seem to have picked out response to just a few of the questions when focusing in your results. Why?

****Findings indicated a few dominant typologies which were discussed in detail. See Chapter 6, pages 186-187, lines 5245-5257.**

Discussion:

The financial compensation debate is huge and very open to corruption. You only just mention this.

****But the drawbacks of compensation schemes were discussed at length in my introductory chapter. The main focus on this chapter was not the issue of compensation. I have however added to the argument on page 187, lines 5257-5265.**

Many of the points in your discussion could be expanded. How else could you have undertaken your methods, analysis. What were the limits with your data? What would you improve etc.?

****Several sections in the discussion of this chapter have been extended, see Chapter 6, lines 5257-5265 page 187, 5296-5301 page 188, 5317-5319 page 188.**

5082 (now 5317, page 188) – you state your data affirms Kellert's 1993 - but you didn't explore individual's experiences or culture/religion in your analysis. So you can't say that.

****revised to: "It would be interesting to investigated whether these varying attitudes of people from the same area depend on an individual's experiences, or cultural and religious beliefs as hypothesised by Kellert (1993)." Page 188, lines 5317-5319.**

You seem to have a section on cultural beliefs in your conclusions. Maybe this should be in your actual discussion. However, you need to link it to your data and why you didn't explore it if you think it was important.

****I agree that cultural and religious values were important. As indicated in response to a previous comment, the PhD thesis addressed the original aims and objectives, while other relationships that may have emerged later, will be investigated in future studies.**

Chapter 7:

Aims are not clear.

****The aims and objectives are testable statements and predictions and included: 5593-5602, page 201.**

Line 5239 (now 5599) - what do you mean by 'establish the types of values held'?

****changed to "classified conservation practitioner responses into discrete typologies" now line 5599.**

Would like to see extension of this to cover broader aspects of the topic including previous literature on how this has been approached in other studies.

****There is limited studies where the attitudes of conservation practitioners to local communities were assessed, and therefore scant literature available (Dr Robert Hitchcock, Pers. Comm. University of New Mexico, Albuquerque).**

Methods: How the questionnaires were designed and developed is not in chapter 3 but relevant here and should be included mentioning the process of question development. How did you decide on your sample number? Where they all from different parks? How independent were they?

****The framework of the questionnaire was developed at the outset of this study, in consultation with several conservation authorities from the Endangered Wildlife Trust who provided advice regarding several elements of community conservation, lines 2620-2622, page 72. Conservation practitioners employed at PAs within the study area were sent electronic invitations to participate in this study through professional societies, see lines 2612-2615, page 72. I could not control how many individuals volunteered to participate in the study but my postgraduate committee agreed that at least 40 individuals should participate. There are many private parks and concessions within greater National Parks, from which conservation practitioners participated. In addition, if respondents worked at a National Park I invited a variety of departments to participate, for e.g. Veterinary services, conservation services. The identity and origination of employment of such individuals however have to be kept completely anonymous as per ethics approval.**

The map looks like you have people from the same park. Surely this would give you pseudo replication if you are asking about park practices? Only one per park?

****No pseudo replication. There are many private parks and concessions within greater National Parks, from which conservation practitioners participated. If respondents worked at a National Park, I invited a variety of departments to participate, for e.g. Veterinary services, conservation services. The identity and origination of employment of such individuals however have to be kept completely anonymous as per ethics approval.**

Why 8 questions, why these, why difference in number of typologies investigated? Strange use of some of these questions to test opinions along the lines you state you want to in your aims.

****The attitude and perception segment of this questionnaire was developed in consultation with Dr Michelle Thorn, a researcher from the Endangered Wildlife Trust who previously piloted a questionnaire survey investigating farmer-carnivore conflict in the Waterberg (Thorn, 2012). Together we modified her original questions regarding the assessment of respondent attitudes to suite the aims and objectives of my study, see Chapter 3, page 69, lines 2519-2524 and Chapter 7, page 202 lines 5637-5641.**

Poverty is not my problem- what are you trying to get out of this?

****See Table 1, page 202. For this particular question, for example, I investigated whether conservation practitioners were disinterested and indifferent towards the socio-economic needs of local human communities. Each question is linked to a typology: see Tables 1 and 2 on pages 202 and 203.**

Please be accurate and careful what the data is actually saying rather than fitting it to something you want it to say (page 195-now page 205).

****I believe that my questionnaire was fit for purpose. See my cautionary note (page 203, lines 5641-5644) that factors affecting conservation practitioner attitudes towards wildlife and local human communities are complex, and some variables are more difficult to quantify and investigate than others. I however based my typologies on those of Kellert's (1993) and the GIS index on the protocol implemented by Page et al. (2015) and Anthony (2007) who successfully evaluated attitudes and opinions of rural communities towards wildlife in South Africa specifically, and these authorities have published their studies in ISI-indexed journals, pages 174-175 lines 5013-5016.**

Again I think the methods just same look at chapter 3 is insufficient and these need to be developed and inserted here as they differ for each chapter.

****Specific methods for this Chapter are provided in pages 202-207. General methods are included in Chapter 3.**

Results:

I find the question 'agriculture wastes natural habitats' as they are all human and all have to eat and rely on food from agricultural practices, so this doesn't seem to be a straight forward question on attitude towards wildlife.

****Some individuals have been shown to hold ecocentric values and detachment from anthropogenic needs (Kellert, 1993). Each question is linked to a typology: see Tables 1 and 2, pages 203 and 204.**

In your tables you put post hoc letters a,b,c etc. but you don't actually say what the significance levels of each of these figures denote in the text or legend.

****The legend of all these tables in Chapter 7 state: Post-hoc letters represent the P-values of the linear mixed model generated in Supplementary material: Tables S5–6, pages 229 (with actual P-values).**

You give some quotes from free text but do you know how you would go about analysing free text to assess attitudes?

****I state in the general methods that "open-ended questions permitted respondents to express their opinions, beliefs and concerns in their own words, the results of which were reported as illustrated quotes". This has been employed in previous studies (Lindsey et al., 2005), page 69, lines 2511-2512. I again state in Chapter 6 that "open ended questions provided opportunities for non-prescriptive responses" page 172, lines 4978-4979.**

Maps - could you have looked at a correlation between attitudes to wildlife and attitudes to people? What about surrounding population pressures, index of conflict- which you could derive from proximity and DCA attitude etc.

****Correlation between attitudes to wildlife and attitudes to people will be considered for future studies.**

Again quite superficial and limited discussions which in this case seems to reflect the extent of exploratory analysis undertaken. This should be expanded.

****I have extended some discussion points as indicated in the comments above as well as a brief critique of the research limitations for this chapter, page 220, lines 6051-6054.**

Chapter 8:

I would have expected to see more detailed robust exploration of the questionnaire data chapters than limited analysis of each and more chapters.

****It is challenging to predict the exact movement of a wide-ranging species and therefore difficult to find respondents that dwell on farms with identical overlap with the paths of the wild dog home range, and this limitation is now stated under the methodological limitations of the study, page 251-252, lines 6626-6631. A more focused approach can be taken, following my study, to interview more farmers that fell within the home-range of the Waterberg pack during future studies.**

You state a spatial model but it was not really a model to predict you just overlapped lethal control points with ranges. I would recommend you are clear on what your aims are and what you did.

****Spatial model has been changed to "maps of conflict", page 235, lines 6232 and page 238, lines 6350-6351.**

Later in abstract you mention avoidance and habitat use by one of the packs but this wasn't part of the aims and not statistically tested so unsure what it is in there unless done thoroughly or consistently for all packs.
****Risk and avoidance behaviour became apparent only after analysis.**

Conflict hot spots could have more landscape criteria like proximity to PAs, land use types etc. the objectives seem quite descriptive and could have done more with the data. I would recommend you add in what you could and can do with this data at least in future studies and review approaches to this in the introduction.
******I have extended some discussion points as a brief critique of the research limitations for this chapter, page 220, lines 6051-6054.**

You seem to have presented the same data on multiple different maps. Could you not reduce this to a few with key elements overlapped, i.e. ranges, conflict and attitude?
****This will be considered for future publications.**

Your lethal control is just a point but surely this may be actually a larger area on the map, would it make a difference to the map if you plotted the area or do you not have the data?
****I could not represent farm properties as polygons as this would require me to assess the total surface area of the premises, information which I was not privy to on large farms.**

You mention corridors, habitats etc. that might affect ranges, behaviour, conflict, risk etc. Did you have access to these layers for each range so you could map it and give more idea of the risk in these areas.
****The causative effects of overlap will be considered for future publications.**
Merge some of the maps and not repeat the same data. I would recommend the colours on the maps are easier to distinguish.
****This will be considered for future publications.**

Chapter 9:
I recommend the discussion is expanded to bring in elements across the chapters and in the broader context. More critical review of the limits of your data and analysis to inform recommendations for future studies section.
****These limitations of the study have been included in the original thesis but have been clarified with elaboration and have now been developed leading to future studies, lines 7117-7143 page 268.**