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Assessing the link between rural food security and rangeland woody biomass in Limpopo

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1 December 2017

Dear Professor Francesca Parrini

RE: Response to examiner comments on remark of Masters Dissertation – Veronique Evans (351296)

This document details my response to the examiners comments on the second submission of my Masters Dissertation. I found all the comments valid and appropriate. I have, where possible, made the suggested changes to the final version of my dissertation. I have also included responses to the examiners comments where possible below.

I have responded to each comment made on the PDF document I received from the examiner.

I am very grateful and deeply appreciative of the time, effort and invaluable guidance given to me by the examiner on the second review of my dissertation. The advice and insight from the examiner has helped me improve the quality of this dissertation.

Please find my responses below in pages 1 – 12.

Yours sincerely,



Veronique Evans

1. Page 33 full stop in the middle of the following sentence: “Although people realise the negative effects that resource harvesting has on the natural resource base (Shackleton *et al.* 2007), the direct value that resources contributed to a household is significant. as no other option exists for households in rural communities.”

Sentence has been rectified and change to “Although people realise the negative effects that resource harvesting has on the natural resource base (Shackleton *et al.* 2007), the direct value that resources contributed to a household is significant, as no other option exists for households in rural communities.”

2. Page 33, incorrect use of comma in the following sentence: “Natural resource use, acts as a buffer against poverty (Twine *et al.* 2003b).”

Sentence has been changed to “Natural resource use acts as a buffer against poverty (Twine *et al.* 2003b).”

3. Page 34, incorrect use of comma in the following sentence: “Natural resource use in savannas, changes the vegetation structure and functioning of the woody vegetation (Freitag-Ronaldson and Foxcroft, 2003). the relationship between humans and savannas is complex.”

Sentence has been changed to “Natural resource use in savannas changes the vegetation structure and functioning of the woody vegetation (Freitag-Ronaldson and Foxcroft, 2003). the relationship between humans and savannas is complex.”

4. Page 34, comma placed after a full stop in the following sentence: “Not only has the distance from settlement increased for fuelwood collection, so has the time taken to collect fuelwood, which has increased from 239 minutes per trip in 1992 to 268 minutes per trip in 2002 (Madubansi and Shackleton, 2007).,”

This has been corrected and changed to “Not only has the distance from settlement increased for fuelwood collection, so has the time taken to collect fuelwood, which has increased from 239 minutes per trip in 1992 to 268 minutes per trip in 2002 (Madubansi and Shackleton, 2007).”

5. Page 34, third sentence of paragraph 2, incorrect spelling of resources in the following sentence: “By examining the patterns of resource extraction in communal rangelands further insight into the factors driving the use and extraction of recourses can be understood, while also identifying the heavily utilised areas.”

Spelling has been corrected, the sentence now reads as follows: “By examining the patterns of resource extraction in communal rangelands further insight into the factors driving the use and extraction of resources can be understood, while also identifying the heavily utilised areas.”

6. Spelling mistake in the following sentence: “Thee growing human population and expansion of rural settlements and the over use of natural resources is having a contaminant effect on the surrounding natural environment.”

The sentence has been correct and now reads as follows "The growing human population and expansion of rural settlements and the over use of natural resources is having a contaminant effect on the surrounding natural environment."

7. Incorrect reference in the following sentence "This impact is seen radiating outwards from a village and is evident by small 'hotspots' of biomass change through the communal rangelands (Coetzer *et al*. 2010)."

Correct reference has been added.

8. Page 35, incorrect use of comma in the following sentence: "Access to natural resources, is a central criterion to assuring sustainable rural livelihoods (Lee e*t al.* 2009)."

The sentence has been corrected and now reads as follows "Access to natural resources is a central criterion to assuring sustainable rural livelihoods (Lee e*t al.* 2009)."

9. Page 35, full stop put in the wrong place in the middle of the following sentence: "For example, a larger asset base may mean that households are less constrained by choices between livelihood strategies, this means that they can easily substitute one form of capital for another (Lee *et al.* 2009). this helps reduce their level of vulnerability."

The sentence has been corrected and now reads as follows "For example, a larger asset base may mean that households are less constrained by choices between livelihood strategies, this means that they can easily substitute one form of capital for another (Lee *et al.* 2009) which helps reduce their level of vulnerability."

10. Page 37, second sentence of second paragraph, requested reference for the following sentence: "This suggests that disturbance to a landscape by human utilisation, increases with increasing distance from human activities."

Reference has been added

11. Page 38, incorrect use of commas in the following sentence "Shackleton *et al*. (1994) suggests that the mechanism for the pattern of resource use is, based on the fact, that people use resources that are closer to the village and more easily accessible."

This has been corrected and the sentence now read as "Shackleton *et al*. (1994) suggests that the mechanism for the pattern of resource use is because people use resources that are closer to the village and more easily accessible.

12. Page 38, incorrect use of commas and full sops in the following sentence "If it is assumed, that resource collection is a function of the distance travelled to collect it, (MacDonald *et al.* 2001; Hegan *et al.* 2004). then by assessing the cost of choosing the most cost-effective path, it is possible to predict the likelihood of a resource being chosen over other alternatives."

This has been corrected. The sentence now reads as follows: "If it is assumed that resource collection is a function of the distance travelled to collect it (MacDonald *et al.* 2001; Hegan *et*

al. 2004), then by assessing the cost of choosing the most cost-effective path, it is possible to predict the likelihood of a resource being chosen over other alternatives."

13. Page 38, end of second paragraph, sentence did not make sense "Exploring the cost associated with collecting a given resource. This may be a more effective way to describe patterns of resource use, than the "Central Place Theory" and the Piosphere Theory, as cost can be determined through several combined limiting factors.

The sentence has been augmented and changes. The sentence now reads as follows "Exploring the cost associated with collecting a given resource may be a more effective way to describe patterns of resource use than the "Central Place Theory" and the Piosphere Theory, as cost can be determined through several combined limiting factors."

14. First three sentence of section 2.1.4, incorrect use of commas and full stops and missing capital letters "Larger single standing trees, are of importance to savannas systems, as they play a key role in maintaining the functioning and the structural diversity of these ecosystems (Manning *et al.* 2006; Treydte *et al.* 2009). Trees protect the soil surface in two main ways: namely the litter layer and the leaf canopy (Sanchez *et al*. 1997). large trees also provide shade, reduce evapo-transpiration of the below-canopy herbaceous layer, and increase local nutrients which are accumulated close to root systems (Belsky *et al.* 1993; Belsky, 1994; Manning *et al*. 2006)."

These sentences have been changed. They now read as follows "Larger single standing trees are of importance to savannas systems, as they play a key role in maintaining the functioning and the structural diversity of these ecosystems (Manning *et al.* 2006; Treydte *et al.* 2009). Trees protect the soil surface in two main ways: namely the litter layer and the leaf canopy (Sanchez *et al*. 1997). Large trees also provide shade, reduce evapo-transpiration of the below-canopy herbaceous layer, and increase local nutrients which are accumulated close to root systems (Belsky *et al.* 1993; Belsky, 1994; Manning *et al*. 2006)."

15. Top of page 39, incorrect use of comma and missing linking words in the following sentence: "These factors, highlight the important role that trees play in maintaining structural integrity, diversity, ecosystem functioning in savannas.

The sentence has been changed and now reads as follows "These factors highlight the important role that trees play in maintaining structural integrity, diversity and ecosystem functioning in savannas.

16. First sentence of the first paragraph on page 38 is missing a capital letter at the start of the sentence.

This has been fixed and the sentence now reads as follows: "Large trees are also socio-economically important as, they provide fruit which can be harvested for direct use and sold for additional income (Shackleton *et al.* 2003; Luoga *et al.* 2005; Kirkland *et al*. 2007)."

17. Section last sentence of the second paragraph on page 38, missing a space after the comma.

The sentence has been fixed and now reads as follows “Any changes to the number and/or height of these fruiting trees might be an indicator of fuelwood scarcity, as people are prepared to violate local taboos and harvest live wood.”

18. Last two sentences of page 39, paragraph two. Missing a full stop in the last sentence.

This has been fixed and the sentence has been further refined and now reads as follows” Intensive harvesting of natural resources that change the structure of savannas, threatens to alter communal rangelands into homogenous landscapes (Mograbi *et al.* 2015). It is essential to conserve large trees, to maintain and ensure the sustainability of savannas.”

19. Page 40, end of first paragraph, grammatical errors through the sentence.

This has been corrected the sentence now reads as follows “Bush thickening can be exacerbated by continued wood harvesting and coppicing shoots in communal rangelands. Desertification, the opposite of bush thickening, is also detrimental for ecosystem functioning (Mograbi, 2014), as bare patches of land increase surface-water run-off, decreased infiltration, an overall loss of soil nutrients and soil erosion (Rietkerk and van de Koppel, 1997).”

20. First two sentences of paragraph 2 on page 40, incorrect spacing between words and full stop in the wrong place.

The spacing has been corrected as well as the grammatical errors, the sentence now read as follows “The impact of humans on the landscape is evident in post-Apartheid South Africa, where traditional authorities’ control over natural resource use within communal rangelands has deteriorated (Kaschula *et al.* 2005; Twine 2005). This is exacerbated by the fact that households are often, disinclined to limit their personal consumption when, due to diminished resource control, other households have unrestricted access the natural resources in their rangelands (Scholes, 2009).”

21. Second sentence of paragraph 2 on page 40, spelling mistake and reference not in brackets.

This sentence has been corrected and changed to the following: “A communal rangeland study conducted by Fisher *et al*. (2012) found that areas where high wood harvesting occurred, that the structural diversity of the area was reduced, through changing height class distributions.”

22. Page 41, second sentence under section 2.1.5, no capital letter at the beginning of the sentence.

This has been correct the sentence now reads as follows “It is imperative that the degree of woody biomass utilisation is known to ensure the sustainability of resource harvesting and the resilience of the ecosystem (Mograbi, 2014).”

23. Page 42, first sentence of the first paragraph, requested deletion of the word “application”.

This has been removed the sentence now reads as follows “The use of Light Detection and Ranging (LiDAR) in biomass studies has increased in recent years as it aided in improving the accuracy of landscape-scale biomass estimation methods (Colgan *et al.* 2013).”

24. Page 42, second sentence of first paragraph, requested deletion of the word “As”.

This has been corrected the sentence now reads as follows “LiDAR extends spatial analysis into the third dimension, by providing an opportunity to analyse the structure of an ecosystem (Lefsky *et al*. 2002). LiDAR sensors directly measure the 3-D distribution of plant canopies as well as canopy topography.”

25. Page 42, middle of first paragraph. Incorrect use of commas and the sentence does not flow.

This has been corrected, the sentence has also been split into two sentences to make it flow better. The sentences now read as follows “LiDAR datasets are often large and simplified into summary statistics, often including canopy cover (Lefsky *et al.* 2002a; Anderson *et al.* 2006; Meyer *et al.* 2013). These summary statistic’s do not express savanna heterogeneity in an ecologically meaningful context (Fisher *et al.* 2011; Wessels *et al.* 2011; Fisher *et al.* 2014).”

26. Page 42 end of the first paragraph, grammatical errors and incorrect spacing between number and unit of measurement.

This has been corrected. The sentence now reads as follows “Often LiDAR application in savannas makes use of voxels (volumetric pixels) which are a 2-D summary of the 3-D point cloud by binning LiDAR laser returns into aggregated 1 m height classes (Weishampel *et al*. 2000).”

27. Page 42, middle of second paragraph, incorrect use of comma.

The comma has been removed. The sentence now reads as follows “The use of LiDAR is a valuable tool which allows for repeat estimations and monitoring of biomass, in conjunction with providing subcanopy information on large scale geographic areas coupled with fine-scale detail (Goatley and Bellwood, 2011; Mograbi, 2015).”

28. Page 43, bottom of the page, last sentence is not a complete sentence. Additionally, unit of measurement spacing is incorrect.

This has been rectified and now reads as follows “The features of the RIEGL LMS-Q560 in the LiteMapper-560 LiDAR were ideal for application to this study as it allowed for vegetation parameters to be derived such as tree/vegetation height, vertical canopy expanse and density, which aids in the facilitation of more accurate biomass and other vegetation descriptors (Hug *et al*. 2004). The LiDAR sensor used was flown over the study sites at approximately 650 m above ground level.”

29. Page 45, commented that end of July could arguably be considered Winter not the end of summer.

This is valid, as such I have changed the sentence to now read as “To ensure that local variations in leaf and branch characteristics did not affect the LiDAR data, all the LiDAR data, for all sites, was collected during the same month in winter, 2014.”

30. Page 46, second sentence of first paragraph, incorrect use of comma.

This has been corrected, the sentence now read as "The exclusion of data below 1.5 m was done to account for the possibility of ground or grass being misclassified as above ground woody vegetation (Colgan *et al.* 2012) and that woody cover can be underestimated below 1.5 m (Wessels *et al.* 2011)."

31. Middle of the paragraph under section 2.2.3, spelling mistake.

Sentence has been rectified and changed to "The rasterization process relies on a manual estimate of the pixel size, using point spacing information, which in this case was 25 x 25 m, because of variable point spacing, not all pixels received a CHM value."

32. Page 54, first sentence of paragraph two, incorrect spacing between number and unit of measurement.

This has been corrected and the sentence now reads as "For this study, biomass was calculated using the LiDAR-derived metric of H x CC (Colgan *et al.* 2012; Mograbi *et al.* 2015), where H is mean top-of-canopy height where the mean pixel height for values greater than 1.5 m and CC is the proportion of canopy cover per grid where the proportion of pixels greater than 1.5 m in height (Colgan *et al*. 2013; Mograbi *et al.* 2015)."

33. Third last sentence in the first paragraph under section 2.2.5 on page 54 incorrect spacing between sentences.

This has been corrected the sentence now read as follows "The impact of fire on fuel load was excluded from this study as low fuel loads from intensive grazing maintain low grass fuel loads and, less intense fires (Archibald *et al.* 2009). Distances walked to collect natural resources have increased over the years, which has resulted in the development of gradients of wood resource availability around settlements (Twine, 2005; Giannecchini *et al*. 2007; Wessels *et al*. 2013)."

34. Section 2.2.5, requested what statistics were performed on the extracted data.

The following sentence were added to the end of section 2.2.5 "In order to assess the relationship between above ground woody cover and average biomass ANOVA tests were performed on the average communal rangeland biomass in comparison to village settlement areas. Regression analyses were used to assess the relationship between above ground woody biomass gradients and distance to the nearest village settlement and road."

35. End of page 55, repeat of the word Chapter 3 in the last sentence.

The duplicated word has been removed.

36. Middle of the first paragraph under section 2.3.1, incorrect spacing between number and units.

This has been corrected and the sentence now reads as follows "While Mafarana had the lowest average rangeland canopy cover. Vyeboom and Ka-Ndengeza had a similar average rangeland canopy cover with 52.12% and 56.24% respectively."

37. Page 58, graphs needed axis title and legend to be fixed.

This has been corrected in the thesis.

38. Page 59 first sentence has an apostrophe at the end of the sentence.

This has been removed the sentence now reads as follows "The average rangeland biomass for the four villages was then compared with two villages from Bushbuckridge in a study conducted by Mograbi *et al*. (2015), looking at human-mediated bush encroachment in communal rangelands."

39. Page 59, section 2.3.2 title, requested that the abbreviation be written out in full.

This has been changed and the title now reads as "Communal rangeland above ground woody biomass gradients"

40. Page 59, section 2.3.2, incorrect spacing between distance bands.

The sentence where this occurred have been fixed. The two sentences where this occurred now read as follows:

"Overall, there is a gradual increase in biomass between 0-2200 m from the village, where after it starts to decrease quite rapidly."

"In Ka-Ndengeza, there was a steep increase in average biomass between 0-1200 m from the village settlement (Figure 2.9c)."

41. Page 60, last sentence, incorrect spacing between the wort "at" and the number.

This has been corrected the sentence now reads as follows "There was no significant relationship between biomass as increasing distance from the nearest settlement or the nearest road (R2=0.00545, p=0.79). Mafarana had the highest within village biomass in comparison to the other villages at 9.77 Mg/ha."

42. Page 61, road key missing from graphs

This has been corrected and the road key added to the graphs.

43. Page 62, under section 2.3.3, requested the deletion of the word "consistence"

This has been removed and the sentence now reads as follows "In Ka-Ndengeza and Ga-Selwana there was a gradual increase in sub-canopy structures with increasing distance from the village settlements (Figure 2.10c and Figure 2.10d)."

44. Page 62, bracket located in the middle of the sentence needed to be removed.

This has been done the sentence now reads as follows "In Ga-Selwana there was only a significant relationship between the percent canopy cover of shrubs (R2=0.54938, p<0.01), and low trees (R2=0.53000, p<0.01) and distance from settlements in comparison to the percent canopy cover of trees (R2=0.16949, p=0.12) and tall trees (R2=0.10008, p=0.25) (p>0.05)."

45. Page 64, incorrect spacing between distance bands as well as incorrect spacing between number and units of measurement.

The sentence where this occurred have been fixed. The two sentences where this occurred now read as follows:

"In Vyeboom, between 0-1200m from the nearest road there were a large proportion of small shrubs (bushes) in comparison to the other sub-canopy structures (Figure 2.11b). Between 1200 - 2000 m from the nearest road the proportion of small shrubs (bushes) and shrubs is similar and plateaus, where after 2200 m low trees have the highest canopy cover and gradually increases while the canopy cover of small shrubs (bushes) decreases (Figure 2.10b)."

"In Ka-Ndengeza, the canopy cover of small shrubs (bushes) is almost double that of the shrubs between 0-400 m from the nearest road (Figure 2.11c)."

46. Section 2.3.4, middle of paragraph, "trees" needs to be changed to "tree".

This has been corrected and the sentence now reads as follows "As a remedial measure, a cost path map was generated using 12 separate randomly selected trees (which met the criteria, 6–10 m, detailed in section 2.2.6) each in a separate distance band (1 tree from each of the 200 m distance bands).

47. Page 64, requested clarification of why there are 14 pathways when only 12 trees were selected from the 12 distance bands.

The reason for this is because there are 14 different pathways to access the 12 selected trees based on the slope and the shrub cover of the rangeland. The 14 pathways also show that in the beginning a pathway to one tree is followed and then an individual can deviate off the first path to access another tree which is why there are more pathways than selected trees.

48. Page 70, third last sentence in the paragraph above section 2.4.1, bracket located in the at the sentence needed to be removed.

This has been corrected and the sentence now reads as follows "The intensity of wood extractive pressure also appears to influence the biomass of the rangeland, seen in Table 2.3."

49. Page 70, last two sentences in the paragraph above section 2.4.1 comma added after a full stop.

This has been corrected the sentence now read as follows "Although there is a more noticeable difference in biomass and intensity of use in the Bushbuckridge villages in comparison to the villages in Limpopo. A more comparative analysis needs to be explored on data from each area, collected at the same time of year for a more accurate comparison of the biomass between the two areas."

50. First sentence in second paragraph on page 71, bracket was not closed and was missing a full stop.

The sentence now reads as follows "High levels of anthropogenic disturbance were evident in Mafarana's rangeland, where the biomass gradient was bimodal, it had two maximum points, and human disturbance was evident at increased distance from the settlement and the nearest road seen in Figure 2.9."

51. Second last sentence in second paragraph on page 71, missing capital letter at the beginning of the sentence.

This has been corrected and the sentence now reads as "Village residents in Mafarana verbally mentioned, that the communal rangelands of the adjacent villages do not overlap, but this does not mean that the collection base of adjacent communal lands are clearly defined."

52. Middle of the last paragraph on page 72, incorrect use of comma.

This has been fixed and the sentence now reads as follows "Some resource collection activities are deemed illegal by the traditional authorities, such as the cutting down of live trees or the theft of wood harvested by others (Kirkland et al. 2007)."

53. Page 73, second paragraphs first sentence duplicated "Ka".

The duplicated word has been removed.

54. Last sentence on page 73 "savannas" should be "savanna".

This has been corrected and the sentence now reads as follows "As a complex system, savanna ecosystems are capable of reorganising after disturbances (Mograbi, 2014).

55. Middle of first paragraph on page 74, incorrect date given for (Fisher *et al*. 2011).

This has been corrected and the sentence now reads as "Under extreme circumstances, disturbance gradients decline in highly utilised areas and this is a warning of severe woodland degradation (Fisher *et al*. 2012)."

56. Second last sentence on page 74, incorrect use of comma.

This has been corrected and the sentence now reads as follows "The long-term impact of this utilisation in these villages rangelands requires further research."

57. Page 75, last two sentences in the paragraph above section 2.4.3 comma added after a full stop.

This has been corrected the sentence now read as follows "Based on the vegetation trends seen in this study, as well as the household interview data, the households in Limpopo's first response to fuelwood shortages is to switch from their preferred species, many village residents also hire trucks so that they can collect more wood per trip and can also travel further."

58. Last sentence on page 74, incorrect date given for (Fisher *et al*. 2011).

This has been corrected and the sentence now reads as follows "As previously mentioned, the impacts that humans have on their surrounding landscape has been well documented (Twine 2005; Giannecchini *et al.* 2007; Coetzer *et al.* 2010; Fisher *et al.* 2012 Coetzer *et al.* 2013; Coetzer *et al.* 2014; Mograbi *et al.* 2015)."

59. Page 76, middle as well as the end of the first paragraph, comma added after a full stop.

The sentence where this occurred have been fixed. The two sentences where this occurred now read as follows:

"The data explored in this thesis found that patterns of disturbance gradients do exist around the village settlements in Limpopo. Considering that much research has been applied to disturbance gradients around villages elsewhere in South Africa (Shackleton *et al.* 1999, Shackleton and Shackleton, 2000; Shackleton *et al.* 2002; Twine, 2005; Fisher *et al.* 2011; Matsika *et al*. 2012; Mograbi *et al.* 2015), the findings in this thesis are not novel."

"When examined on a smaller scale the cost associated with a given pathway is easy to explain based on the landscape features and vegetation. Although the least cost pathway is a possible extension of the "Central Place Theory", it is hard to apply to such large areas."

60. Page 76, middle of the first paragraph the following sentence needs to be moved to conclusion section "Based on the results it can then be concluded that there are numerous pathways to a given resource depending on where in the landscape an individual is starting from and ending., there were too many trees that met the criteria (fruiting trees) which resulted in the cost maps being hard to interpret over a large scale such as a village rangeland."

The sentence above has been moved the conclusion which now reads as follows: "This research has highlighted the impact that human utilisation can have on woody resources and vegetation structure in communal rangelands. This has been explored in other research (Louga *et al.* 2002; Wessels *et al*. 2010; Fisher *et al*. 2012; Wessels *et al*. 2013; Mograbi *et al*. 2015). This research has also demonstrated the impact that village location and access to roads can have on resource harvesting, and the associated impacts on vegetation structure. Based on the results it can then be concluded that there are numerous pathways to a given resource depending on where in the landscape an individual is starting from and ending., there were too many trees that met the criteria (fruiting trees) which resulted in the cost maps being hard to interpret over a large scale such as a village rangeland. As the distance from the nearest roads and the distance from settlements to a given resources affects how people make complex trade-offs in their decision-making (Giannecchini *et al.* 2007)."

61. Page 77, capital letter missing in the following references

"Asner, G.P. and Levick, S.R. (2012). Landscape-scale effects of herbivores on treefall in African savannas. *Ecology letters,* 15:1211-1217."

"Coetzer, K.L., Erasmus, B.F.N., Witkowski, E.T.F. and Reyers, B., (2013). The Race for Space: Tracking Land-Cover Transformation in a Socio-ecological Landscape, South Africa. *Environmental management,* 52(3):595–611."

This has been corrected and they now read as follows:

"Asner, G.P. and Levick, S.R. (2012). Landscape-scale effects of herbivores on treefall in African savannas. *Ecology Letters,* 15:1211-1217."

Coetzer, K.L., Erasmus, B.F.N., Witkowski, E.T.F. and Reyers, B., (2013). The Race for Space: Tracking Land-Cover Transformation in a Socio-ecological Landscape, South Africa. *Environmental Management,* 52(3):595–611."

62. Page 79, need to italicise the journal title in the following reference "Dovie, D.B.K., Witkowski, E.T.F and Shackleton, C.M. (2005). Monetary valuation of livelihoods for understanding the composition and complexity of rural households. *Agriculture and* Human Values, 22:87–103."

This has been corrected and now reads as follows "Dovie, D.B.K., Witkowski, E.T.F and Shackleton, C.M. (2005). Monetary valuation of livelihoods for understanding the composition and complexity of rural households. *Agriculture and Human Values*, 22:87–103."

63. Page 79, missing colon in the following reference "Fisher, J.T., Erasmus, B.F.N., Witkowski, E.T.F., van Aardt, J., Wessels, K.J. and Asner, G.P. (2014). Savanna woody vegetation classification – now in 3D. *Applied Vegetation Science,* 17(1)172-184."

This has been corrected and now reads as follows "Fisher, J.T., Erasmus, B.F.N., Witkowski, E.T.F., van Aardt, J., Wessels, K.J. and Asner, G.P. (2014). Savanna woody vegetation classification – now in 3D. *Applied Vegetation Science,* 17(1):172-184."

64. Page 80, the "&" in the following reference must be written out in full "Giannecchini, M., Twine, W. & Vogel, C. (2007) Land-cover change and human-environment interactions in a rural cultural landscape in South Africa. *The Geographical Journal* 173: 26–42."

This has been corrected and now reads as follows "Giannecchini, M., Twine, W. and Vogel, C. (2007) Land-cover change and human-environment interactions in a rural cultural landscape in South Africa. *The Geographical Journal* 173: 26–42."

65. Page 80, incorrect us of semi-colon in the follows reference "Goatley, C.H.R. and Bellwood, D.R. (2011). The Roles of Dimensionality, Canopies and Complexity in Ecosystem Monitoring. *PLoS One*. 2011; 6:1–8."

This has been corrected and now reads as follows "Goatley, C.H.R. and Bellwood, D.R. (2011). The Roles of Dimensionality, Canopies and Complexity in Ecosystem Monitoring. *PLoS One*. 6:1–8."