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Interactive comment on “Vegetation structure and fire weather influence variation in burn severity and fuel consumption during peatland wildfires” **by G. M. Davies et al.**

Anonymous Referee #2

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Title: Vegetation structure and fire weather influence variation in burn severity and fuel consumption during peatland wildfires

General comments

This paper is a welcome addition to the sparse literature on the effects of wildfire in British moorlands and peatland ecosystems. The authors utilise a series of severe wildfires that hit the UK in 2011 and 2012 to understand the burn severity and fuel consumption of moorland fires. This is of particular interest due to the paucity of wildfire studies in the UK, but also the fact that much of the existing knowledge on fire behaviour

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stems from prescribed burning for management objectives and which are conducted often under very different meteorological conditions to spring/summer wildfires.

The paper is well written and poses a number of interesting points (e.g. Page 15750, lines 3-4) that will be of interest to the wider academic literature, as well as stakeholders such as land managers and conservation agencies. The pCBI protocol development is a welcome addition for researchers in these systems.

I have suggested a series of relatively minor revisions along with some technical corrections.

Specific comments

Page 15740, line 3: Can you give any specific examples of ‘other significant environmental and human impacts’?

Page 15740, lines 9-13: Probably also worth noting that British peatlands have also been impacted by other drivers of changes such as pollution, N deposition, etc.

Page 15740, line 20: You refer to ‘managed burning’ here, but elsewhere the term ‘prescribed burning’ is also used. If defined differently, give definitions; otherwise, stick to one term.

Page 15741, lines 5 – 14: Given the confusion in the wider media with the term ‘peatland fires’ i.e. whether it refers to fires that consume peat, or surface fires that consume peatland vegetation, it might be worth expanding a little here to carefully explain the differences.

Page 15743, lines 14-15: The rationale for using extinguished areas is only really clarified in the Supplementary Files (e.g. self-extinguish across fuel changes). Suggest an additional sentence here, or refer the reader to the protocol.

Page 15745, lines 16-17: It might be useful to report equation 4 from Davies et al. (2008).

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Page 15746, line 26: It is implied that Appendix II details the various transformations used for the fuel consumption data, but instead Appendix presents two figures of fuel load. Please clarify.

Page 15747, line 24: DMC and DC are not defined in the main body of the text.

Page 15748, lines 4 – 8: Mention that sample type is a fixed effect. All other effects in this sentence are noted as fixed or random.

Page 15748, lines 13 – 23: Include a brief discussion on surface fuel combustion completeness. All other panels of Figure 4 are discussed.

Page 15748, lines 19 – 20: Does this sentence only concern itself with ground fuel combustion completeness? If so update beginning of the sentence to “Ground fuel combustion completeness appeared. . .”

Page 15748, line 24: BUI not defined in the main body of the text.

Page 15751, lines 4 – 5: Might be worth making the distinction that it is components of the FWI that are useful not necessarily the full FWI.

Table 1: Could you add the duration of the fire or the date range?

Figure 4: Add a) – d) to each of the panels in the figure to aid cross referencing with the text on page 15748, lines 13 – 20.

Figure 4: Caption refers to colours and shapes of points ‘follows Fig 4’ – I assume you mean Figure 2?

Appendix II: When printed in black and white the points on Figures A2.1 and A2.2 are indistinguishable from each other. Suggest changing the symbols.

Technical corrections

Page 15740, line 9: Remove comma after ‘British’.

Page 15741, lines 16 – 19: Rather long sentence. Suggest splitting.

Page 15741, line 27: Consider numbering the objectives to aid clarity of text.

Page 15742, line 16: Repetition of 'locations' within the same sentence.

Page 15750, line 23: wildfires rather than just 'wild'.

Page 15751, line 26: Worrall not Worrall

Appendix I, line 4: '...the average burn condition on a plot' – should this be 'of'?

Appendix I, Table S1 caption: Add 'pCBI' at the end of the caption.

Appendix I, end of page 1: '...different research team' – plural.

Appendix I, Plot design: '...located in the interior or larger burns' – change to 'of'.

Appendix I, Filling the form: change 'stata' to 'strata'

Appendix I, Photographs: '...from North to a South' - Remove 'a'

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