Risk of sustained ignition mapping for the Peak District National Park

Introduction

The Peak District FOG group currently use the ignition risk map produced by McMorrow and Lindley (2006) to guide their work. Since its publication, a more complete and up to date wildfire database has been collated by the Moors For the Future Partnership (MFFP). Furthermore, significant changes in land cover have occurred following MFFP's restoration work. Therefore, it is timely to update the ignition risk map. It should be noted the risk map only shows 'risk of reported ignition', i.e. that a wildfire has started, been reported and either the Fire Rescue Services or National Park rangers have attended. It does not represent wildfire size, danger, speed nor severity and results should be interpreted with this in mind.

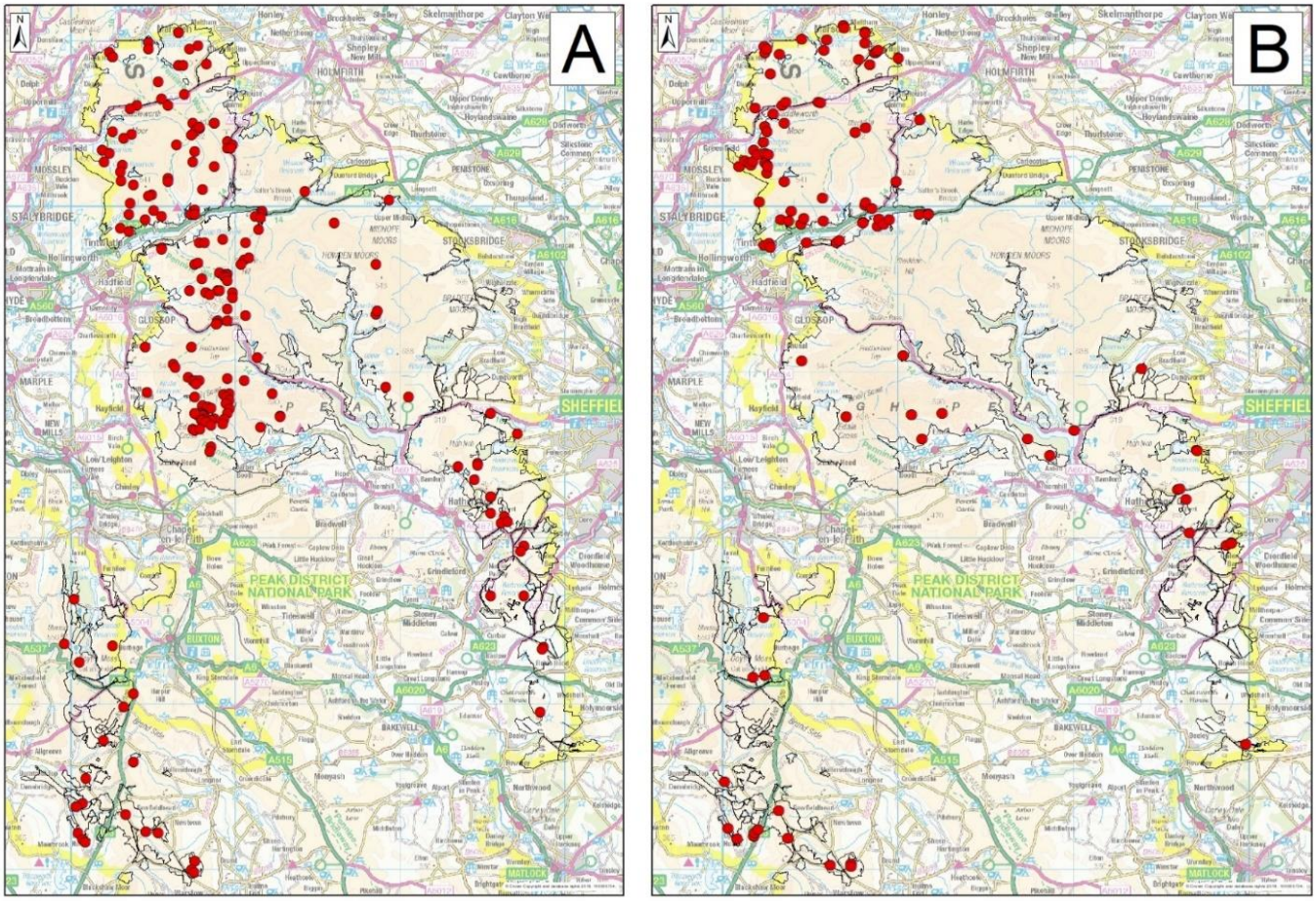

Figure 1: Wildfire locations during the years 1976-2003 (A) and 2009-2018 (B). Data from MFFP's wildfire database (Titterton and Crouch, 2018).

Methodologies

Two methodologies were utilised, Multi-Criteria Evaluation and Logistic Regression. For brevity, only the results of the logistic regression approach are shown here. Inputs into the model were the Index of Multiple Deprivation (deciles 1-3), distance to minor roads and distance to waylines. Detailed methodologies are available in the full report.

Results

The spatial distribution of wildfires has changed through time (Figure 1). During the period 1976-2003 many fires occurred on high moorland areas such as Kinder and Bleaklow, particularly in areas surrounding the Pennine Way. Since 2009, the majority of fires have occurred in the north west of the study area, particularly on the moorland fringe. The resultant ignition risk map (Figure 2) clearly shows this change, with higher risk areas tending to be located in accessible regions on the fringe of the study area.

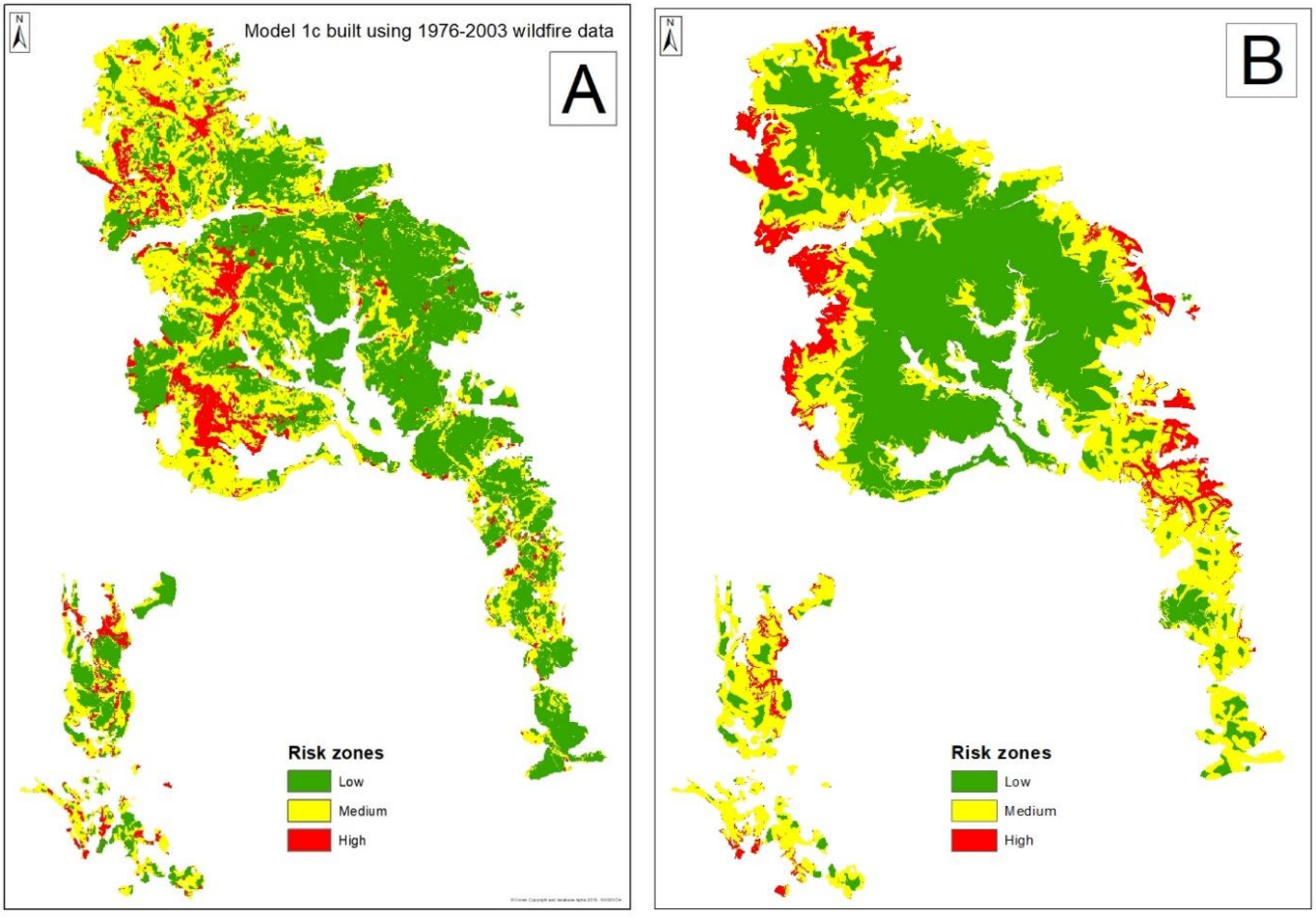

Figure 2: Previous ignition risk map from McMorrow and Lindley (2003) on the left (A) compared with risk map produced using logistic regression model using fires during the period 2009-2018 on the right (B)

Conclusions

- Wildfire distribution has changed through time. Distribution of wildfires from 2009 onwards show clear differences to wildfires from 1976-2008 (Figure 1).
- Both Multi Criteria Evaluation and logistic regression derived maps show different ignition risk distribution across the study area compared with the best performing models from McMorrow and Lindley (2006) (Figure 2).
- Higher risk areas are located around the moorland fringe, particularly in easily accessible areas close to population centres.