Vegetation fires: adding value to Greater Manchester Fire and Rescue Service (GMFRS) Incident data

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Vegetation Fires

The instigation of the Incident Recording System (IRS) in April 2009 has raised the level of data collection for vegetation fires, but what can it tell us about their geography?

The poster reports on work in progress to analyse the 'where, when, and what of vegetation fires attended by Greater Manchester FRS (GMFRS)

Aims

The project aims to show how value can be added to existing data-sets on vegetation fires, highlight limitations and make recommendations for improving data collection

Data

Management Information System (MIS) data is used to highlight relative distribution of reported vegetation fires prior to IRS

The first financial year 2009/10 of Incident Recording System (IRS) data will be used for fires within the GMFRS area

This will be compared against fires attended by GMFRS in neighbouring FRS areas, using data from GMFRS's Management Information System (MIS).

CORINE Land Cover Classes data is compared to the recorded Property_3 Land Cover Classes recorded within IRS in 2009/10

Method/Results

Using Management Information System (MIS) data for FDR3 for spring (figure1) and summer (figure 2), the fire incidents were mapped for spatial distribution and incident sub-type land cover for the reported land cover burnt

Overall spatially the reported fires are in the north and east of Greater Manchester; the majority are reported to have occurred in the peri-urban areas of Bolton, Bury, Rochdale and Tameside; as well as roads leading from these areas to rural areas

The results reflect the nearest postal address to the incident or where appliances were parked than the location of the incident; no formal record of the size of the burnt area was recorded.

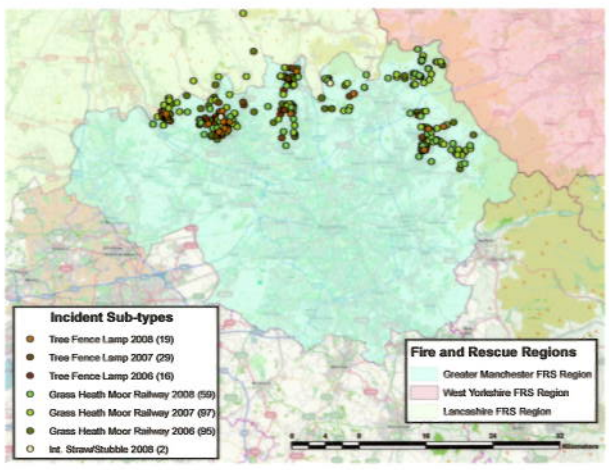

Figure 1- Incident Sub-Type classes for spring 2006 to 2008 attended by GMFRS using FDR3 data

MIS reported on only three incident sub-types; for both seasons over the three years an average of 77% were classed as grass fires

On average the number of spring fires is higher; however over the three years it was summer 2006 when most incidents were recorded

Start and stop times were recorded and how many appliances attended, giving some indication of the severity of an incident; details were recorded if appliances were called over the border into another FRS region.

Over the three year period records show GMFRS attended 16 over the border incidents, 11 were attended in 2006 with 8 of these in the summer

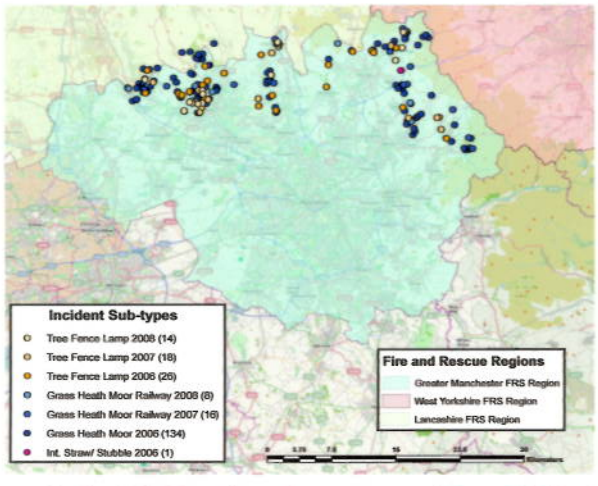

Figure 2- Incident Sub-Type classes for summer 2006 to 2008 attended by GMFRS using FDR3 data

Spring and summer fires were mapped with land cover classes to study the relative distribution of fire incidents (figure 3a); a chart was produced to analyse the land cover affected (figure 3b)

Intra-annually from the MIS data, grass and tree vegetation fires occurred in similar areas in the north and eastern peri-urban areas; in 2006 when summer grass fires were highest in numbers, the majority were still in the same vicinity as earlier spring fires.

Some summer grass fires were distinct, such as those occurring in the east of Manchester which occured in the Saddleworth Moor area where no spring fires are recorded
The incidents attended outside the GMFRS area are all grass fires in the Lancashire region; there are 8 spring incidents spread over 3 years and 8 all in summer 2006

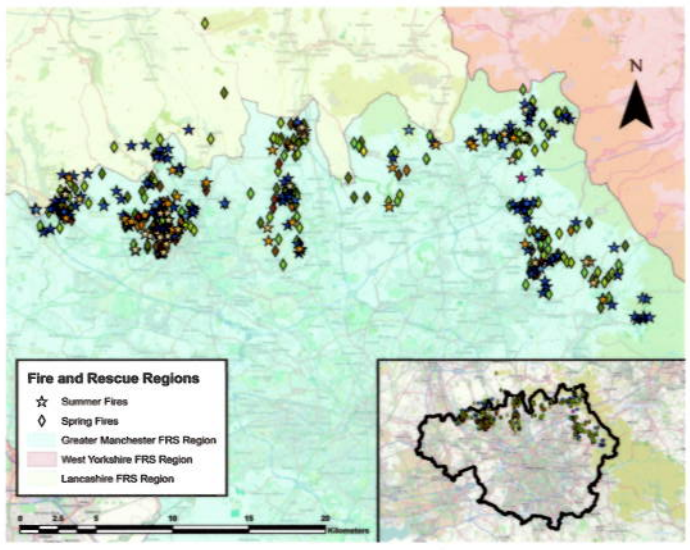

Figure 3a – Secondary Fires (FDR3) attended by GMFRS by season over 2006-2008

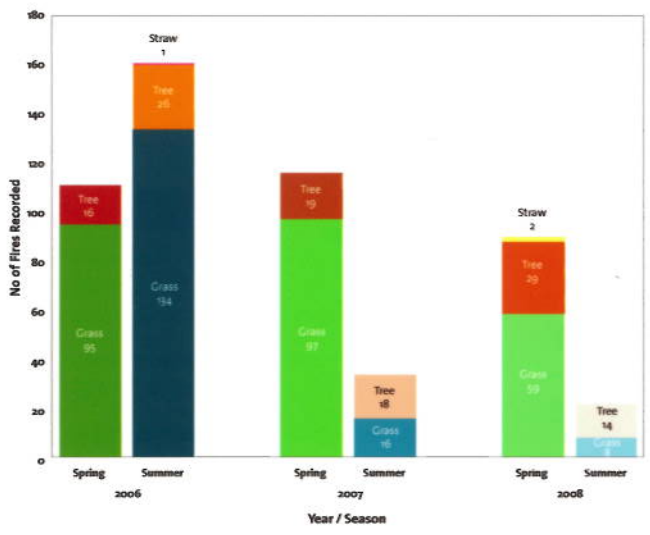

Figure 3b – Chart comparison of the number of secondary fires (FDR3) in the two fire seasons by land cover class

Across the two seasons the most vegetation fires were in 2006, it was the summer fire season not the spring when most fires occurred; over the other two summers the number of incidents was considerably lower

Spring has a more consistent frequency of fire incidents, but there is no evidence that a high number of fires in spring is an indicator of the fire levels in summer

Land Cover comparison

Using IRS data on vegetation fires, the CORINE land cover classes were overlaid on the FRS regions (figure 4)

Symbols were created which represented the land classes which were reported on IRS system.

Each fire point has a buffer of 3km generated around it to reflect the land cover that was burnt and the surrounding land cover classes which could have been at risk or have been burnt

The overlay of the property classes reported in IRS compared to CORINE highlighting thematically the vegetation that has been burnt

Discrepancies between classes shows the extent of spatial inaccuracies with regard to the coordinates of the fire incidents

The size of the 'significant' fires is included in IRS, showing how one year's larger Primary and Secondary fires could be displayed

Only 13 significant fires displayed, showing if a definition is restricted, then the geography alters considerably in comparison to the earlier MIS data, with secondary fires

IRS has a different spatial distribution to MIS with incidents in the east and south

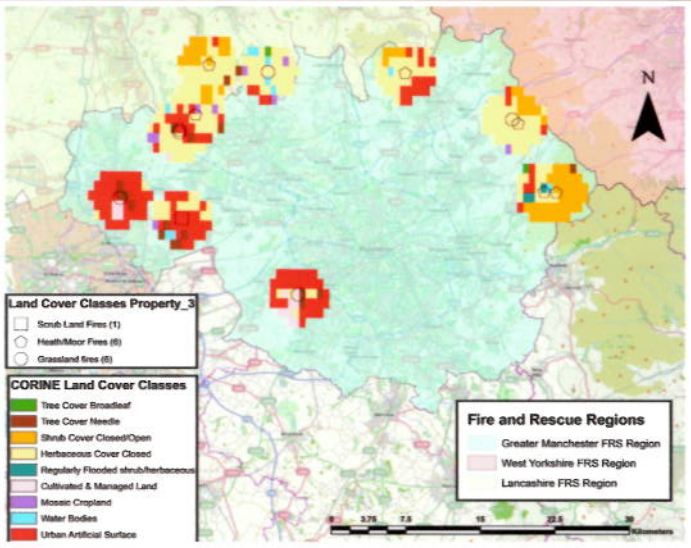

Figure 4- Land Cover for fires attended by GMFRS financial year 2009/10 using IRS data and CORINE Land Cover classes with a 3km buffer

Buffering provides both potential land classes that may have been affected by the fire dependent on its direction

Approximate size of burnt area is provided in IRS; unable to provide the true extent or represent the shape of the area and the vegetation burnt in total

The IRS data initially was for the first year only, but does display how the IRS definition can provide differing results

Added Value

It's recognised that climate change will lead to increase in vegetation fires, the DCLG stated that as average number of fires increases there are major implications for FRS resources (DCLG, 2006)

We need to find value in vegetation fires data, evidence for identifying potential risk and aiding future decision making (Gazzard, 2009)

An agreement on the definition or definitions of vegetation fire/ wildfire is key; any criteria will be based on multiple criteria to present picture of wildfire which can be used predict present and future risk (Gazzard, 2009)

Further Research

Using the first three years IRS data allied to climate and land cover data, the intention is to test scenarios using GIS to map the numerous potential geographies of vegetation fire.

Could threat of ignition can be dealt with and should a warning system be introduced based on revised wildfire strategy and policy

Analysis of the lapsed time and appliances for an incident could be used to produce a cost per incident, highlighting savings through prevention and shorter termination of incidents.

A focus on cross border incidents and whether further resource, equipment and specialised vehicles may be required in the future

Fire and Rescue Services must be continuously consulted on what they want from an incident reporting; consultation and cooperation between stakeholders is a crucial step to having a higher level of preparedness and risk awareness

Acknowledgements

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References

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Gazzard, R.J ; Forestry Commission *(2009)- UK Vegetation Fire Standard (UKVFS) (2009) - Data Fields and Terminology for Wildfire Incidents and Prescribed Burning Operations within Great Britain and Northern Ireland Forestry Commission; http://forestportal.efi.int/view.php?id=2238&c=UK Accessed 26th April 2013*

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