



# **United Kingdom Vegetation Fire Standard**

Data Fields and Terminology for Wildfire Incidents and Prescribed  
Burning Operations within Great Britain and Northern Ireland

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<sup>1</sup> Institution of Fire Engineers (IFE)

<sup>2</sup> Royal Institute of Chartered Surveyors (RICS)

<sup>3</sup> Institute of Chartered Foresters (ICF)

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## EXECUTIVE SUMMARY

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1. United Kingdom Vegetation Fire Standard (UKVFS) project is a multi-government agency and organisation approach to delivering vegetation fire (Outdoor fires) reporting. Presently the United Kingdom has limited evidence on the impacts of, and use of, vegetation fire. Many vegetation fires are poorly, if at all, reported and the true impact of these incidents and operations is not fully understood. This has resulted in United Kingdom not being on an equal footing with European and international colleagues in assessing and reporting the scale of wildfire as a policy area. At a national level our systems are limited and uncoordinated.
2. UKVFS provides 111 of data fields covering three data themes; core, impact and improvement. These themes are form from twelve data sections listed below:

**Table 1 – UKVFS Data Sections**

<b>Core Data</b>	Incident Reference Number, Fire Dates and Times, Fire Location, Fire Size (Burnt Area in Hectares) and Cause
<b>Impact Data</b>	Environmental and Heritage, Access and Social and Economic
<b>Improvement Data</b>	Fire Behaviour, Fire Preparedness & Prevention, Fire Response and Fire Safety

3. In providing these data fields it also ensures a comprehensive and standardise terminology for vegetation fires. The information can be used by fire, governance and land management sectors across three of the emergency service processes (preparedness, prevention and response).



## INTRODUCTION

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4. Wildfires are natural hazard identified by the Department for Communities and Local Government. Fire is a natural part of our environment, able to provide benefits as well as threats to the biodiversity, society and the economy. Presently the United Kingdom has limited statistics on the impact and use of fire. The United Kingdom has had 860,263<sup>4</sup> outdoor fire incidents between 1995 to 2004, although this is considered an under estimate.
5. At a national level the information presently collected is extremely limited and does not correspond to other fire reporting system. For example we have no data on the actual numbers of ignitions (potential of wildfires) and the area burnt. The lack of evidence provides a limitation when measuring the effectiveness of our policy, strategy, tactics and operations across fire, governance or land management. This limits the measurement of systems and impacts used during emergency service.

## PURPOSE OF UKVFS

6. The aim of UKVFS is to *'provide a standard for the reporting of vegetation fires (wildfires incidents and prescribed burning operations) and in the United Kingdom'*. In providing this standard it provides two outcomes: providing a set of data fields and as a result providing standardised terminology. Practitioners can use both outcomes across the numerous sectors and during all phases of management and emergency processes. In providing UKVFS it is hoped to encourage partnership working between different organisations, sectors and professions across fire, governance and land management. Two simple questions define the scope of UKVFS; What it is? What it is not?

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<sup>4</sup> Number of outdoor fire incident are made up from 26,935 Primary and 833,328 Secondary fires. Primary Grassland and Heathland Fires (FDR1). Those involve more than four fire appliances to the incident. Includes metropolitan Fire and Rescue Services. Secondary Grassland Fires (FDR3). Those involving less than four fire appliances to the incident. Excludes metropolitan Fire and Rescue Services.

## **What is UKVFS?**

- It is a non-mandatory framework of data fields that provides a flexible approach to developing fire reporting and using standardise terminology.

## **What isn't UKVFS?**

- UKVFS is not a fire report for wildfires in the United Kingdom. Excellent practical examples already exist, from Fire Beater's Wildfire Report, Fire Operation Group's Fire Report and the Incident Reporting System.
- UKVFS scope aims to be comprehensive, but is not envisaged that all data fields will be used. The user's organisation performance measurement and indicators should help define what data fields are used.
- UKVFS is not a final cost or valuation for fire loss, although UKVFS provides data fields to help in the collection of evidence.

## **AUDIENCE**

7. The primary audience is those managing fire-reporting system across the United Kingdom. The main focus of UKVFS is helping define the data within Incident Reporting System (IRS)<sup>5</sup>. Other audiences of UKVFS can use it to provide a standardise approach to their areas of work i.e. training, research, fire investigation etc.

## **CLIMATE CHANGE**

8. With wildfires incidents expected to increase there is an urgent need to provide evidence on the impact and impact upon vegetation fires. By 2040 it is expected that we will have variable rainfall during spring and warmer summers. These will be normal conditions for the United Kingdom similar to our worst wildfire year 2003. UKVFS data fields can be used to provide information on CO<sub>2</sub> sinks and green house gas emissions.

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<sup>5</sup> A fire reporting system used by the United Kingdom's Fire and Rescue Services. It is designed and operated by the Department for Communities and Local Government, and although other systems may be used IRS forms a national standard of data fields.

## BACKGROUND

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### REQUIREMENT

9. UKVFS is a key objective with the Fire and Rescue Statistic User Groups action plan. For the Scottish Wildfire Forum's Data Gathering Working Group it is a key project and is of interest to the English Wildfire Forum. Additionally this work has been used to suggest recommendations in the Forestry Commissions internal fire data collection<sup>6</sup> and Dorset's Urban Heaths Project. This document in part fulfils the requirements of scholarships from several institution trusts<sup>7</sup>; Fire Research and Training Trust RICS Education Trust and Educational and Scientific Trust across fire, land management and governance sectors.

### RESEARCH AND DEVELOPMENT

10. This document is drawn from '*UKVFS Research and Development*' (2009). The document brings together and compares fire recording systems, considers best practice of some classifications, integrating and changing others. It takes into consideration the data requirements of the United Nations<sup>8</sup> and European Union<sup>9</sup> requirements. The document draws upon research across numerous sectors in the United Kingdom as well as New Zealand and Australia. A list of the final data fields can be found in Appendix A.

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<sup>6</sup> Forestry Commission Operational Guidance Booklet 17 'Preparing for the Unexpected' Fire Log and Fire Report.

<sup>7</sup> Institution of Fire Engineers (IFE), Royal Institute of Chartered Surveyors (RICS) and Institute of Chartered Foresters (ICF).

<sup>8</sup> The Timber Committee of the United National Economic Commission for Europe (UNECE) Trade Division along with the European Forestry Commission of the Food and Agriculture Organisation (FAO) compiles Forest Fire Statistics. Additionally the FAO's Fire Management: Voluntary Guidelines (Fire Management Working Paper FM17E) Section 4.15 details the development of strategic actions for 'Monitoring and Evaluation'.

<sup>9</sup> The Joint Research Council (JRC) within the Institute for Environment and Sustainability (IES) actions the Land Management and Natural Hazard Unit (INFOREST) to develop European Forest Fire Information System (EFFIS). The JRC provides European data to both EFFIS and Forest Fire Statistics.

## **CONSULTATION**

11. The development of UKVFS included a broad consultation during 2008 and 2009. A list of responders can be found in Appendix B, drawn across numerous sectors and organisations.

## **REVIEWING UKVFS**

12. UKVFS is designed to be reviewed to ensure that it is an evolving document and able to meet future requirements and opportunities. Numerous data fields have been added that presently have no defined use i.e. '*UKVFS Data Field – Not used*'. Future amendments may use these fields. Any submissions or queries on the data fields (including categories, types, descriptions etc.) should be made in writing to the author.

## **PERFORMANCE MANAGEMENT FRAMEWORKS**

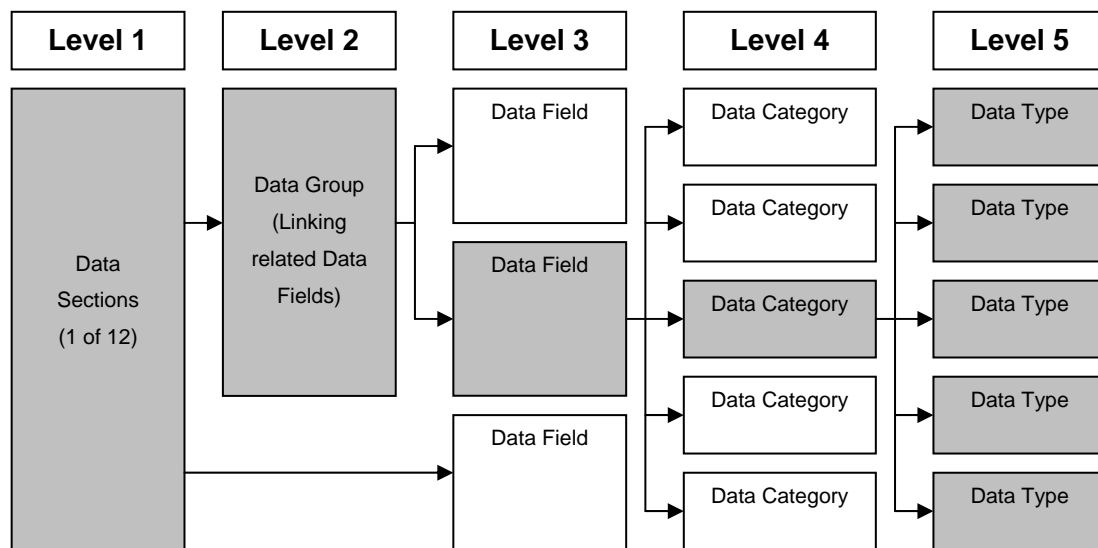
13. UKVFS is designed to help deliver measures and indicators within performance management frameworks as well as other reporting systems. These may include; Integrated Risk Management Plans, business plans, strategies, policies and research programmes etc.

## **DATA SECTIONS, GROUPS, FIELDS, CATEGORIES, TYPES AND TEMPLATES**

### **Data hierarchy**

14. UKVFS uses a simple data hierarchy or levels as shown in Figure 1 to ensure correspondence. The descending order of the hierarchy is; Section, Group, Field, Category and Type. Data sections are discussed below. Data groups are only used to organise related data fields, such as complex data sections (e.g. Fire Behaviour). Each field is broken down by a list of data categories. In some cases categories may have their own hierarchies and use data types to sub define them.

**Figure 1 – Data hierarchy or levels in UKVFS**



## Data Sections

15. UKVFS framework is made up of twelve data sections. Five of these correspond with existing national and international requirements. The data sections are grouped in three themes as shown in Table 1:

- **‘Core Data’** provides the statistics required for providing the basic picture of wildfire incidents and prescribed fire operations.
- **‘Impact Data’** provides a picture on the impact on Sustainable Development, Ecosystem Services, Communities and tackling Climate Change.
- **‘Improvement Data’** looks at the measurement of fire behaviour and the impact of preparedness, prevention, response and health & safety on users.

**Table 2 – Overview correspondence of the Data Section for United Kingdom Vegetation Fire Statistics within existing international and national systems**

Information Types	UNECE – Forest Fire Statistics	EU – European Forest Fire Information System (EFFIS)	CLG – Incident Recording System (IRS)	United Kingdom Vegetation Fire Standard (UKVFS)
Type 1 – Core Data	N / a	Section 1. Incident Reference Number ( UK, and EU)		
	N / a	Section 2. Fire Dates and Times ( UK, and EU)		
	N / a	Section 3. Fire Location ( UK, and EU)		
	Section 4. Fire Size (Burnt Area in Hectares) ( UK, EU and UN)			
	Section 5. Cause ( UK, EU and UN)			
Type 2 – Impact Data	N / a			Section 6. Environmental and Heritage Impact (UK)
	N / a			Section 7. Access and Social Impact (UK)
	N / a			Section 8. Economic Impact (UK)
Type 3 – Improvement Data	N / a			Section 9. Fire Behaviour (UK)
	N / a			Section 10. Fire Preparedness & Prevention (UK)
	N / a		Section 11. Fire Response (UK)	
	N / a		Section 12. Fire Safety (UK)	

16. The hierarchy allows for a range of needs, from simple to more complicated data collection. The aim is that a small landowner can supply information that corresponds directly with Fire and Rescue Services or government departments. Table 2 also defines what level the data is needed and its correspondence with international reporting systems.
17. Of the twelve data sections, seven of these can be found within Incident Reporting System, abet modified in this document. The other elements are additional, some new and others from other systems. Each data section is constructed from two parts, a template and the data fields that populate it. Although the templates are flexible, the data fields are not.

## **Measurement of data**

18. UKVFS measures data using two types of scales; nominal and ordinal. Both are forms of categories. Nominal data assigns each data field a category number (e.g. Land Use Class or Fire and Rescue Service). Ordinal data seeks to place categories into meaningful rank or order (e.g. height, classes or Date and Time Events). Both scales data categories and types are issued a unique reference number to aid future analysis. These measurements use fixed text to provide 'dropdown lists' such as those found in the 'UKVFS Data Field' tables. Additionally numeric measures (e.g. hectares and metres) are also used.

## **Using and editing data fields**

19. The categories and types within data fields should not be rearranged but the user can be edited out if not relevant to the user. This ensures that the reference number given to each data category and type is consistent and provides universal correspondence. This speeds up the data inputting process and analysis, but also ensures that only standardised values are used.

## **APPLICATION OF UKVFS AT INCIDENTS AND OPERATIONS**

20. UKVFS can be applied across the three sectors that own vegetation fire incidents shown in Table 3; Fire Management, Local Governance and Land Management. This document cross cuts sectors and is focused on two distinct vegetation fires; wildfire incidents and prescribed burning operations.

## **Wildfire Incidents**

21. Wildfire incident are broken down by the Emergency Service Process (PPRR – Preparedness, Prevention, Response and Recovery) in Table 3. The management of vegetation fire is owned across three sectors (fire, governance and land management) systems and processes (operations, risk management etc.). UKVFS provides data fields that can be used to provide evidence within a performance management framework to ensure measurement of efficiency and effectiveness.

**Table 3 – Breakdown of Vegetation Fires by sectors systems and processes**

Emergency Service Process	Fire Management Systems	National and Local Governance Systems	Land Management Systems
Preparedness	<ul style="list-style-type: none"> <li>Wildfire Training</li> <li>Integrated Risk Management Planning (IRMP)</li> </ul>	<ul style="list-style-type: none"> <li>Planning Policy</li> <li>Land Use Planning</li> <li>Reviewing Land Use</li> <li>Local Service Delivery</li> <li>Emergency Planning</li> <li>Local and Regional Risk Registers</li> </ul>	<ul style="list-style-type: none"> <li>Wildfire Training</li> <li>Contingency Planning</li> </ul>
Prevention	<ul style="list-style-type: none"> <li>Community Fire Safety (CFS)</li> <li>Arson Task Force</li> </ul>	<ul style="list-style-type: none"> <li>Land Use Management</li> <li>Land Use Policy</li> </ul>	<ul style="list-style-type: none"> <li>Land Management Strategies</li> <li>Land Management Policy</li> <li>Land Management Planning</li> <li>Land Management Operations</li> </ul>
Response	<ul style="list-style-type: none"> <li>Incident Command System (ICS)</li> <li>Operations</li> <li>Fire Investigation</li> <li>Fire Recording Systems</li> </ul>	Emergency Planning	Operations
Recovery		Communities	Vegetation Fire Recording Systems

### Prescribed Burning Operations

22. For prescribed burning operations UKVFS provides an opportunity to monitor and report on this unique land management tool. The framework provides standard for data fields in prescribed fire planning, operation and monitoring.

### OTHER APPLICATIONS FOR UKVFS

23. UKVFS can also be used to improve a range of management systems and process linked to wildfires and prescribed fires. Listed below are a number of examples:
- Development and measurement of prevention (risk analysis and risk management planning) and preparedness systems (fire plans and Standard Operating Procedures [SOP]),
  - Evidence Reports during wildfire incidents,
  - Situation Reports to help provide standardised information within the Fire and Rescue Service's Incident Command.



- Awareness raising,
- Development and measure of wildfire training,
- Research and monitoring,
- Improving communication and partnership working,
- Development of policy and guidance.
- Fire investigation

## DATA SECTION 1 – FIRE REFERENCE NUMBER

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24. Fire Reference Number (FRN) provides a unique reference for each incident or burning. This aids the discrimination of reports and is vital for more detailed monitoring and evaluation. FRN is made up from five Data Fields; organisation code, organisation sub-divisions, financial year, incident number and incident type.

### Data Field – Organisation Code

25. As UKVFS is designed to be used by numerous organisations, private and public. Below are definitions for government organisation across the United Kingdom. Other organisation, such as private or voluntary organisations, who wish to join the input of vegetation fire statistics. In this case they should contact the author to receive an appropriate unique code number. This Data Field can be defaulted by an organisation to reduce the amount of data inputting.

### UKVFS Data Field 1 – Organisation Codes

No.	UKVFS – UK Organisation Codes		
	Organisation	County	IRN Category
1	Forestry Commission	England	FCE
2		Scotland	FCS
3		Wales	FCW
4	Northern Ireland Forest Service		NIFS
5	Ministry Of Defence	England	MODE
6		Scotland	MODS
7		Wales	MODW
8		Northern Ireland	MODNI
9	Natural England		NE
10	Scottish Natural Heritage		SNH
11	Countryside Commission for Wales		CCW
12	Environmental and Heritage Service (Northern Ireland)		EHS
13	Fire and Rescue Service	England	FRSE
14		Scotland	FRSS
15		Wales	FRSW
16		Northern Ireland	FRSNI

## **UKVFS Data Field 2 – Organisational Sub-Division Codes**

26. Within some organisations there is a need to reflect sub-divisions, especially those operation organisations that do not follow administrative boundaries. UKVFS uses a simple three-figure numeric or text code for an organisation's sub-division. For example in the Forestry Commission, each Forest District will use its three figure cost code i.e. for South East England Forest District the '302' reference<sup>10</sup>.

## **UKVFS Data Field 3 – Calendar Year**

27. For analysis across short, medium and long-term periods there is a requirement to reflect the year, in this case it is purposed to use the calendar year. This is in order to link to each organisations business and management planning. The calendar year is shown as a two figure reference, therefore the calendar year for 2009, is identified as 09

## **UKVFS Data Field 4 – Fire number**

28. As organisations have numerous incidents each year there is a need to have an 'event number'. This is unique to each organisation and each number given is successive. The number is issued from when the incident or operation started (i.e. ignition point or origin), not from when it was reported. UKVFS uses a four-figure unique successive number ranging from 000 to 9,999.

## **UKVFS Data Field 5 – Not used**

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<sup>10</sup> Forest District codes are fully listed in Forestry Commission Survey Handbook: Table 5.6-1 – FD Numbers' (Forestry Commission, 2007).

## **Data Field – Fire type**

29. As UKVFS is part of wider requirement to collect data on Environmental Incidents and/or Natural Hazards. This document focuses on Wildfires and Prescribed Burning as shown in UKVFS Data Field 5, but this provides future scope for development.

### **UKVFS Data Field 6 – Fire Types**

No.	UKVFS Event Type	Code
1	Wildfire Incident	WF
2	Prescribed Burning Operation	PB

### **UKVFS Data Field 7 – Not used**

### **UKVFS Data Field 8 – Not used**

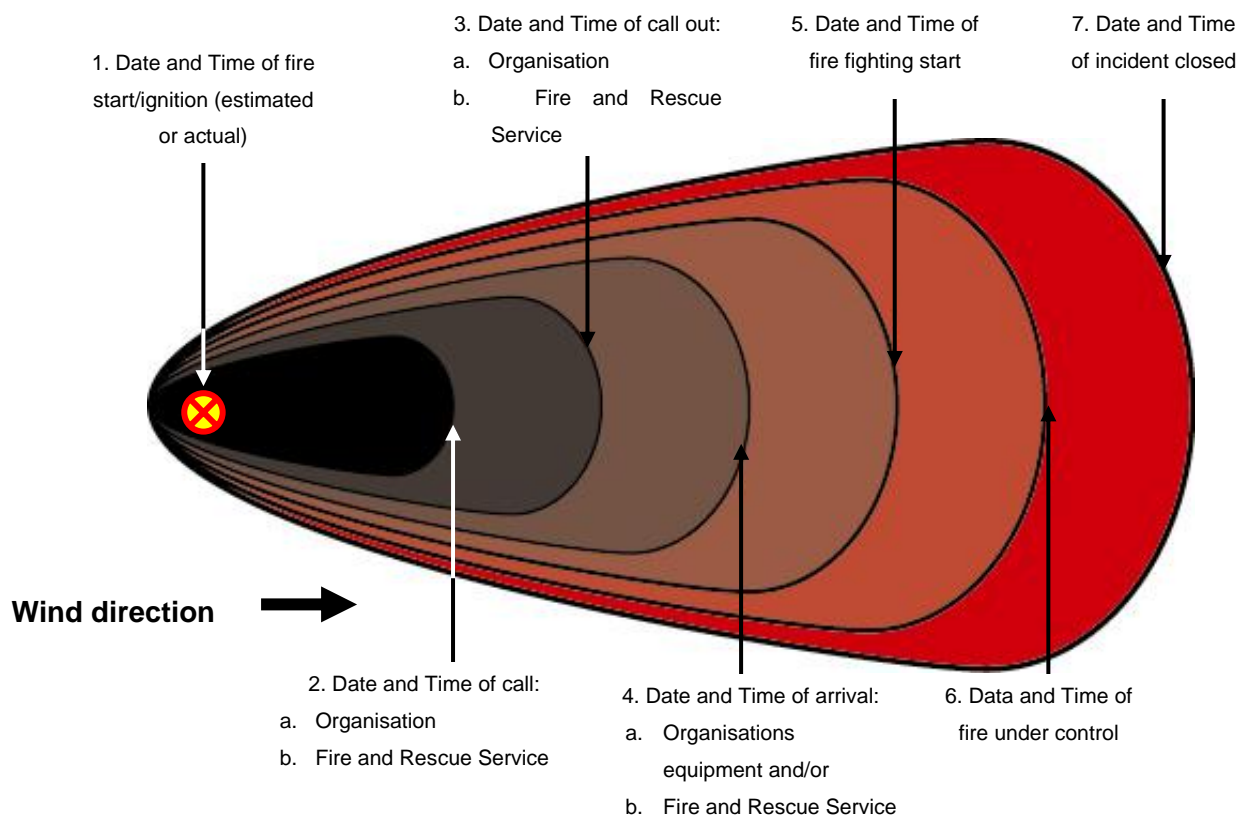
## DATA SECTION 2 – FIRE TIMES AND DATES

30. UKVFS uses up to seven data fields to measure dates and times events during either the response period of an incident or management operation. This can be used to measure the intervals between events. Common to both wildfire incidents and prescribed burning operations is the start and close of the fire. For wildfires, additional data fields are added to measure specific intervals when responding to incidents.

### DATA GROUP – DATE AND TIME EVENTS

31. Date and time events are shown spatially in Figure 2 and are defined in Table 4. The events are adapted from of IRS (2008), OGB 17 (FC 2008) and other fire recording systems.

**Figure 2 – Spatial representation of wildfire date and time event and boundaries**



**Table 4 – Date and Time Event in Vegetation Fires**

Ref.	Data and Time events	Wildfire	Prescribed Fire
<b>1</b>	Date and Time of fire start/ignition (estimated or actual)	Yes	Yes
<b>2a</b>	Date and Time of call to Organisation	Yes	No
<b>2b</b>	Date and Time of call to Fire and Rescue Service	Yes	No
<b>3a</b>	Date and Time of Organisations called out	Yes	No
<b>3b</b>	Date and Time of Fire and Rescue Service called out	Yes	No
<b>4a</b>	Date and Time of Organisations equipment arrived	Yes	No
<b>4b</b>	Date and Time of Fire and Rescue Service arrived	Yes	No
<b>5</b>	Date and Time of fire fighting start	Yes	No
<b>6</b>	Date and Time of fire under control	Yes	No
<b>7</b>	Date and Time of incident/operation closed	Yes	Yes

**Date**

32. Within the framework dates are recorded as day, month and year. This uses three groups of two numbers separated using a forward slash. E.g. 1<sup>st</sup> January 2009 is displayed as 01/01/09.

**Time**

33. Time is measured using a 24-hour clock measured in Greenwich Mean Time (GMT with daylight saving). This records hours (hh) and minutes (mm). Care should be given when comparing UKVFS Data Fields to counties outside the United Kingdom.

**UKVFS Data Field 9 – Date and Time of fire start/ignition (estimated or actual)**

Date and Time of fire start/ignition (estimated or actual) shown as (DD/MM/YY and hh/mm).
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**UKVFS Data Field 10 – Not used**

**UKVFS Data Field 11 – Date and Time of call (to Organisation or Fire and Rescue Service)**

Date and Time of call shown as (DD/MM/YY and hh/mm).

**UKVFS Data Field 12 – Date and Time of called out (of Organisation or Fire and Rescue Service)**

Date and Time of Fire and Rescue Service called out shown as (DD/MM/YY and hh/mm).

**UKVFS Data Field 13 – Date and Time of Organisations equipment arrived**

Date and Time of Organisations equipment arrived shown as (DD/MM/YY and hh/mm).

**UKVFS Data Field 14 – Date and Time of Fire and Rescue Service arrived**

Date and Time of Fire and Rescue Service arrived shown as (DD/MM/YY and hh/mm).

**UKVFS Data Field 15 – Date and Time of fire fighting start**

Date and Time of fire fighting start shown as (DD/MM/YY and hh/mm).

**UKVFS Data Field 16 – Not used**

**UKVFS Data Field 17 – Data and Time of fire under control**

Data and Time of fire under control shown as (DD/MM/YY and hh/mm).

**UKVFS Data Field 18 – Date and Time of incident closed**

Date and Time of incident closed shown as (DD/MM/YY and hh/mm).

## **UKVFS Data Field 19 – Not used**

### **Data Field – Duration**

34. Duration is the number of days and hours that a wildfire incident or prescribed fire operation has lasted. The duration is measures from the date and time of fire start/ignition until the incident is closed.

## **UKVFS Data Field 20 – Duration of incident/operation**

Number of days and/or hours the wildfire incident or prescribed fire operation has lasted shown as (DD/hh).
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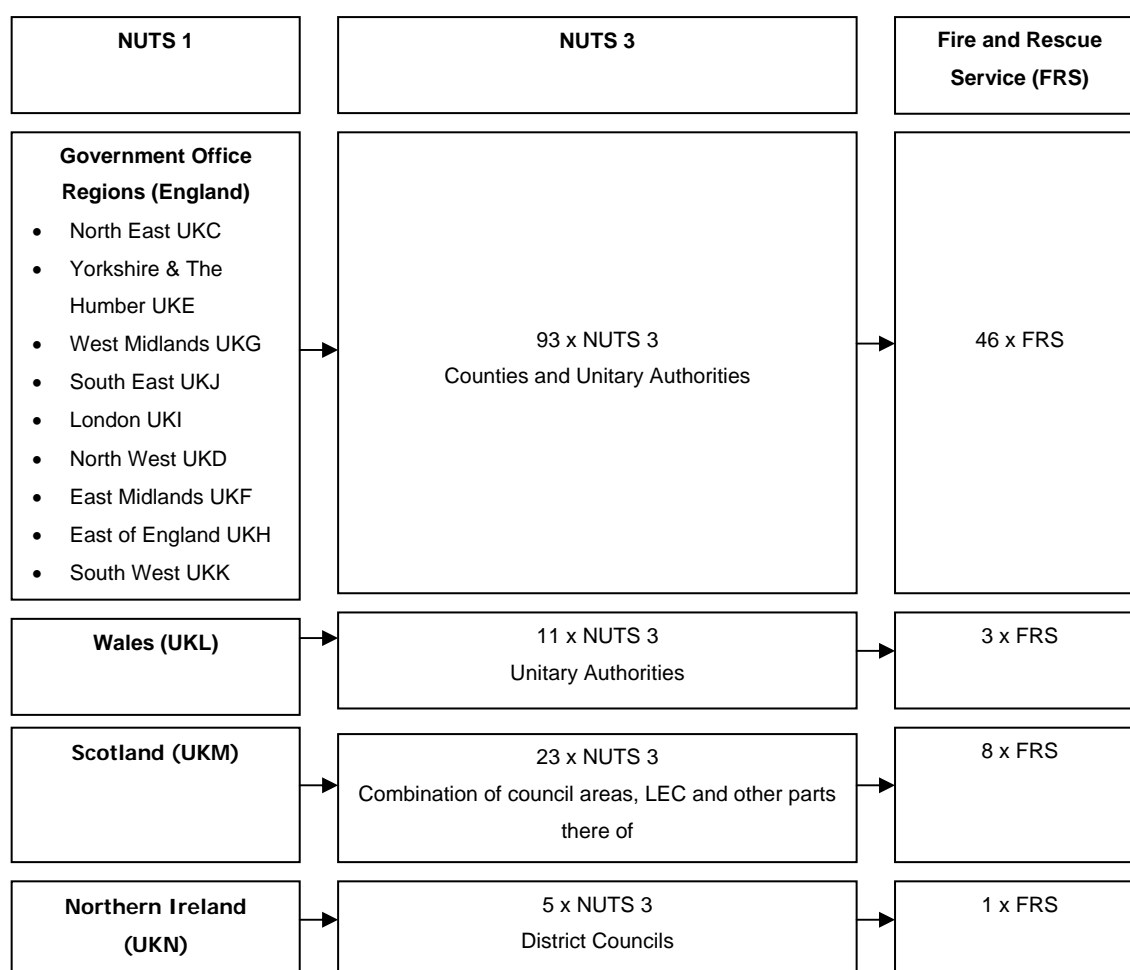
## **UKVFS Data Field 21 – Not used**



## DATA SECTION 3 – FIRE LOCATION

35. Fire Location is used within UKVFS to record the administrative and geographical location of the fire. UKVFS using three levels of data. The first two use the European Union and United Kingdom system of Nomenclature of Units for Territorial Statistics (NUTS<sup>11</sup>). As shown in Figure 3 two levels of NUTS classifications have been selected giving the national/regional level and county/unitary authority/LEC level. These are linked to the relevant Fire and Rescue Services. This ensures that the data fields can be across various levels in administration.

**Figure 3 – Fire Location using NUTS, Fire and Rescue Services and Local Governance**



<sup>11</sup> Commission Regulation (EC) No 105/2007 of 1 February 2007

36. The third data field provides more specific geographic information at the site level, using the established twelve-figure national grid reference. The grid reference can record three geographic locations of the fire; ignition point, centre point and end point. This information can be used to identify 'below Local Administrative Units' (by the Office of National Statistics), vital for working with social and economic data fields (i.e. census data for population key statistics) etc. Grid references can be converted to provide longitude and latitude if required.

### **DATA GROUP – NUTS1**

37. NUTS 1 are illustrated in UKVFS Data Field 22 and reflect the English Regions. Wales, Scotland and Northern Ireland are given as separate counties in UKVFS Data Field 9, 10 and 11.

### **UKVFS Data Field 22 – NUTS 1**

No.	UKVFS – NUTS 1	
	NUTS 1 Category	Definition
1	North East UKC	
2	North West UKD	
3	Yorkshire & The Humber UKE	
4	East Midlands UKF	
5	West Midlands UKG	
6	East of England UKH	
7	London UKI	
8	South East UKJ	
9	South West UKK	
10	Wales (UKL)	
11	Scotland (UKM)	
12	Northern Ireland (UKN)	

### **UKVFS Data Field 23 – Not used**

### **Data Group – NUTS3**

38. NUTS 3 is used to distinguish Counties (England), Unitary Authorities (Wales) and LEC (Scotland) levels as shown in below in their respective columns.

### UKVFS Data Field 24 – English NUTS 3

No.	UKVFS – NUTS Class (England)			Fire and Rescue Service and IRS Code
	NUTS 1 GOR Region and Code	NUTS 3 Code	County or Unitary Authority NUTS 3	
1	North East UKC	UKC11	Hartlepool and Stockton-on-Tees	Cleveland FRS AC
2		UKC12	South Teesside	
3		UKC13	Darlington	Durham and Darlington FRS AD
4		UKC14	Durham CC	
5		UKC21	Northumberland	Northumberland FRS AN
6		UKC22	Tyneside	Tyne and Wear FRS AT
7		UKC23	Sunderland	
8	Yorkshire & The Humber UKE	UKE11	Kingston Upon Hull, City of	Humberside FRS
9		UKE12	East Riding of Yorkshire	
10		UKE13	North and North East Lincolnshire	
11		UKE21	York	North Yorkshire FRS DN
12		UKE22	North Yorkshire CC	
13		UKE31	Barnsley, Doncaster and Rotherham	South Yorkshire DS
14		UKE32	Sheffield	
15		UKE41	Bradford	West Yorkshire DW
16		UKE42	Leeds	
17		UKE43	Calderdale, Kirklees and Wakefield	
18	West Midlands UKG	UKG11	Herefordshire, County of	Hereford and Worcester FRS FE
19		UKG12	Worcestershire	
20		UKG13	Warwickshire	Warwickshire FRS FS
21		UKG21	Telford and Wrekin	Shropshire FRS FH
22		UKG22	Shropshire CC	
23		UKG23	Stoke-on-Trent	Staffordshire FRS FT
24		UKG24	Staffordshire CC	
25		UKG31	Birmingham	West Midlands FRS FM
26		UKG32	Solihull	
27		UKG33	Coventry	
28		UKG34	Dudley and Sandwell	
29		UKG35	Walsall and Wolverhampton	

30	South East UKJ	UKJ11	Berkshire	Royal Berkshire FRS JY
31		UKJ12	Milton Keynes	Buckinghamshire FRS JC
32		UKJ13	Buckinghamshire CC	
33		UKJ14	Oxfordshire	Oxfordshire FRS JX
34		UKJ21	Brighton and Hove	East Sussex FRS JE
35		UKJ22	East Sussex CC	
36		UKJ23	Surrey	Surrey FRS JS
37		UKJ24	West Sussex	West Sussex FRS JW
38		UKJ31	Portsmouth	Hampshire FRS JH
39		UKJ32	Southampton	
40		UKJ33	Hampshire CC	
41		UKJ34	Isle of Wight	
42		UKJ41	Medway	Kent FRS JK
43		UKJ42	Kent CC	
44	London UKI	UKI11	Inner London - West	E HE?
45		UKI12	Inner London - East	F HF?
46		UKI21	Outer London - East and North East	G HG?
47		UKI22	Outer London - South	
48		UKI23	Outer London - West and North West	
49	North West UKD	UKD11	West Cumbria	Cumbria FRS BC
50		UKD12	East Cumbria	
51		UKD21	Halton and Warrington	Cheshire FRS BE
52		UKD22	Cheshire CC	
53		UKD31	Greater Manchester South	Greater Manchester FRS BG
54		UKD32	Greater Manchester North	
55		UKD41	Blackburn With Darwen	Lancashire FRS BL
56		UKD42	Blackpool	
57		UKD43	Lancashire CC	Merseyside FRS BM
58		UKD51	East Merseyside	
59		UKD52	Liverpool	
60		UKD53	Sefton	
61		UKD54	Wirral	
62	East Midlands UKF	UKF11	Derby	Derbyshire FRS ED
63		UKF12	East Derbyshire	
64		UKF13	South and West Derbyshire	
65		UKF14	Nottingham	Nottinghamshire FRS ET
66		UKF15	North Nottinghamshire	
67		UKF16	South Nottinghamshire	
68		UKF21	Leicester	Leicestershire FRS ES
69		UKF22	Leicestershire CC and Rutland	
70		UKF23	Northamptonshire	Northamptonshire FRS EM
71		UKF30	Lincolnshire	Lincolnshire FRS EC

72	East of England UKH	UKH11	Peterborough	Cambridgeshire FRS GC
73		UKH12	Cambridgeshire CC	
74		UKH13	Norfolk	Norfolk FRS GN
75		UKH14	Suffolk	Suffolk FRS GS
76		UKH21	Luton	Bedfordshire FRS GB
77		UKH22	Bedfordshire CC	
78		UKH23	Hertfordshire	Hertfordshire FRS GH
79		UKH31	Southend-on-Sea	Essex County FRS GN
80		UKH32	Thurrock	
81		UKH33	Essex CC	
82		South West UKK	UKK11	Bristol, City of
83	UKK13		Gloucestershire	Gloucestershire FRS KG
84	UKK12		North and North East Somerset, South Gloucestershire	
85				Somerset FRS KS
86	UKK23		Somerset	Wiltshire FRS KW
87	UKK14		Swindon	
88	UKK15		Wiltshire CC	
89	UKK21		Bournemouth and Poole	Dorset FRS KT
90	UKK22		Dorset CC	
91	UKK30		Cornwall and Isles of Scilly	Cornwall FRS KC
92				Isle of Scilly FRS KL
93	UKK41		Plymouth	Devon FRS KV
94	UKK42		Torbay	
95	UKK43		Devon CC	

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### UKVFS Data Field 25 – Welsh NUTS 3

No.	NUTS 1 Wales (UKL)		Welsh FRS regions and IRS Code	Unitary Authority's
	NUTS 3 Code	NUTS 3		
1	UKL11	Isle of Anglesey	North Wales Fire and Rescue Authority WC	Isle of Anglesey
2	UKL12	Gwynedd		Gwynedd
3	UKL13	Conwy and Denbighshire		Conwy
4				Denbighshire
5	UKL23	Flintshire and Wrexham		Flintshire
6				Wrexham
7	UKL24	Powys	Mid and West Wales Fire & Rescue Service WD	Powys
8	UKL14	South West Wales		Ceredigion
9				Pembrokeshire
10				Carmarthenshire
11	UKL18	Swansea		Swansea
12	UKL17	Bridgend and Neath Port Talbot		Neath Port Talbot
13				Bridgend
14	UKL22	Cardiff and Vale of Glamorgan	South Wales Fire and Rescue Service WT	The Vale of Glamorgan
15				Cardiff
16	UKL15	Central Valleys		Rhondda, Cynon, Taff
17				Merthyr Tydfil
18	UKL16	Gwent Valleys		Caerphilly
19				Blaenau Gwent
20				Torfaen
21	UKL21	Monmouthshire and Newport		Monmouthshire
22				Newport

### UKVFS Data Field 26 – Scottish NUTS 3

No.	NUTS 1 Scotland UKM		Scottish FRS regions and IRS Code	Combination of council areas, LEC and other parts there of
	NUTS 3 Code	NUTS 3		
1	UKM10	Aberdeen City, Aberdeenshire and North East Moray	Grampian Fire and Rescue Service SG	Aberdeen City
2				Aberdeenshire
3				Moray
4	UKM21	Angus and Dundee City	Tayside Fire and Rescue ST	Angus
5				Dundee City
6				Perth & Kinross and Stirling
7	UKM43	Lochaber, Skye & Lochalsh and Argyll and the Islands	Strathclyde Fire and Rescue SY	Argyll and Bute
8	UKM35	Inverclyde, East Renfrewshire and Renfrewshire		Inverclyde
9				Renfrewshire
10				East Renfrewshire
11	UKM34	Glasgow City		Glasgow City
12	UKM33	East Ayrshire and North Ayrshire Mainland		East Ayrshire
13				North Ayrshire
14	UKM36	North Lanarkshire		North Lanarkshire
15	UKM37	South Ayrshire		South Ayrshire
16	UKM38	South Lanarkshire		South Lanarkshire
17	UKM31	East Dunbartonshire, West Dunbartonshire and Helensburgh & Lomond		East Dunbartonshire
18				West Dunbartonshire
19	UKM32	Dumfries & Galloway		Dumfries & Galloway Fire and Rescue Service SD



20	UKM25	Edinburgh, City of	Lothian and Borders Fire and Rescue Service SL	Edinburgh, City of
22	UKM23	East Lothian and Midlothian		East Lothian
23				Midlothian
24	UKM24	Scottish Borders		Scottish Borders
25	UKM28	West Lothian		West Lothian
26	UKM26	Falkirk	Central Scotland Fire and Rescue Service SC	Falkirk
27	UKM27	Perth & Kinross and Stirling		Stirling
28	UKM22	Clackmannanshire and Fife		Clackmannanshire
29			Fife Fire and Rescue Service SE	Fife
30	UKM41	Caithness & Sutherland and Ross & Cromarty	Highland and Islands Fire and Rescue Service SH	Highland
31	UKM44	Eilean Siar (Western Isles)		Western Isles / Eilean Siar
32	UKM45	Orkney Islands		Orkney Islands
33	UKM46	Shetland Islands		Shetland Islands

### UKVFS Data Field 27 – Northern Ireland NUTS 3

No.	NUTS 1 Northern Ireland (UKN)		District Council (Northern Ireland)
	NUTS 3 Code	NUTS 3	
1	UKN04	North of Northern Ireland	Derry City
2			Limavady
3			Coleraine
4			Ballymoney
5			Moyle
6			Strabane
7	UKN05	West and South of Northern Ireland	Magherafelt
8			Cookstown
9			Omagh
10			Dungannon
11			Fermanagh
12			Armagh
13			Newry and Mourne
14	UKN03	East of Northern Ireland	Craigavon
15			Ballymena
16			Larne
17			Antrim
18			Banbridge
19			Down
20			Ards
21	UKN02	Outer Belfast	Newtownabbey
22			Lisburn
23			North Down
24			Carrickfergus
25			Castlereagh
26	UKN01	Belfast	Belfast

UKVFS Data Field 28 – Not used

UKVFS Data Field 29 – Not used

UKVFS Data Field 30 – Not used

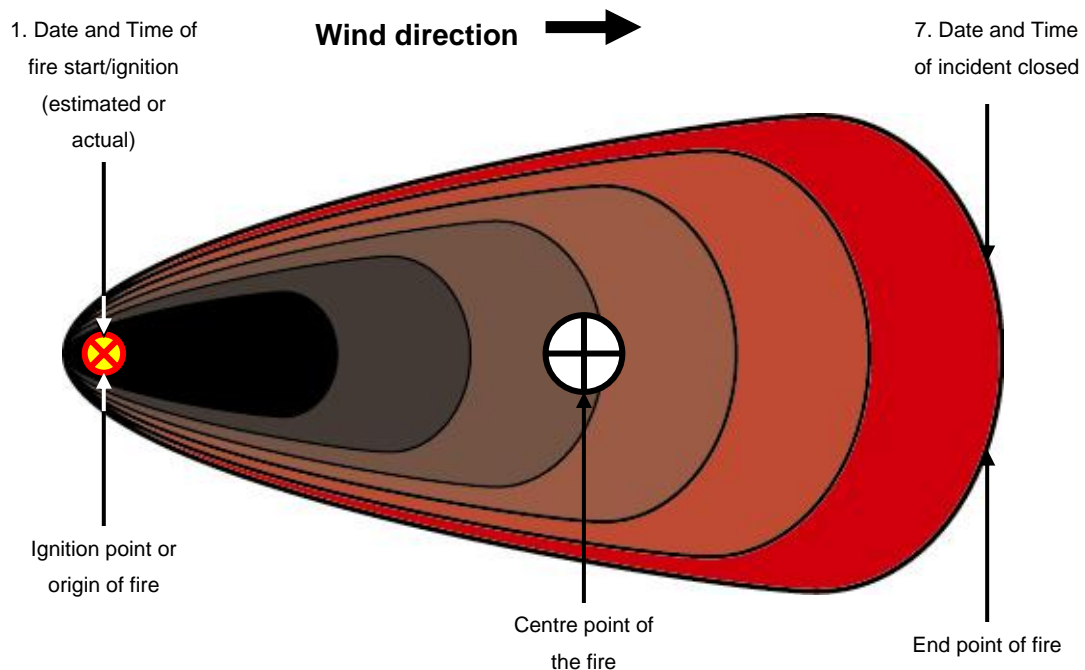
## Data Field - Location Points

39. Three location points are defined in UKVFS; ignition point, centre point of area burnt and end point of fire. Two location points are linked spatially to Date and Time Events as shown in Table 5 and Figure 4. UKVFS uses the Ordnance Survey established eight-figure grid reference and national grid. In England and Wales this helps define the two different land use types; Rural and Urban areas. Where these two land types meet establishes the administrative 'Rural / Urban Interface'.

**Table 5 – Correspondence between Location Points and Date and Time Events**

Location Point	Date and Time Events
Ignition point or origin of fire	Date and Time of fire start/ignition
End point of fire	Date and Time of incident closed

**Figure 4 - Spatial correspondence between Data and Time Events boundaries and Location Points of a wildfire**



**UKVFS Data Field 31 – Ignition point or origin of fire**

National Grid Reference and eight figure grid reference (four easting and four northing) of the Ignition point or origin of fire.

**UKVFS Data Field 32 – Centre point of area burnt**

National Grid Reference and eight figure grid reference (four easting and four northing) of the centre point of area burnt.

**UKVFS Data Field 33 – End point of fire**

National Grid Reference and eight figure grid reference (four easting and four northing) of the end point of the fire.

**UKVFS Data Field 34 – Not used****UKVFS Data Field 35 – Not used**

## DATA SECTION 4 – FIRE SIZE (AREA BURNT)

40. Within UKVFS Fire Size measures the area burnt. Although there is only one measurement two different types of classifications must be considered; land use and habitat as shown in Table 6. Land Use is defined as being descriptive of the purpose or function of the land and habitat of groups of definable vegetation.

**Table 6 – Classification systems considered within UKVFS**

Type of Classification	Classification System
Land-use Classification	Forest Fire Statistics: B. Area burned by type of land – UNECE
	European Forest Fire Information System (EFFIS) – Area burned
	EU – CORINE Land Classification (CLC) 2000
	Incident Recording System (IRS) ('Property Types' Building and Outdoor Fire) – Communities and Local Government (CLG)
	Generalised Land Use Database (GLUD) – Communities and Local Government (CLG)
	OGB 17 'Planning for the Unexpected' – Forestry Commission
	Survey Handbook (Sub-Compartment Data Base): Description / Land Use Code – Forestry Commission
Habitat Classification	European Union Nature Identification System (EUNIS)
	National Vegetation Classification (NVC)
	BAP – Broad Habitat Classification
	Centre for Ecology and Hydrology – Land Cover Map 2007 (LCM 2007) Target Level 1 Phase One Habitats Survey
	Forestry Commission – National Inventory for Woodlands and Trees (NITW)

### Data Field – Land Use Classification

41. Of the land use classifications found in Table 6, UKVFS classes are developed from; LCM 2000, Forest Fire Statistics, EFFIS and IRS. This provides broad correspondence that can be found in *UKVFS Research and Development* (2009). The data field is adapted from CORINE Land Classification 2000, Land Class Map 2000 (Fuller *et. al.* 2002) as well as other classification system.

## UKVFS Data Field 36 – Land Use Classification

No.	UKVFS – Land Use Classification		
	Land Use Category	Land Use Type	Linkage to Infrastructure Data Fields
1	Property	a. Urban	Property Infrastructure – See UKVFS Data Field 68
		b. Sub-urban	
		c. Rural	
2	Infrastructure	a. Transport	Transport Infrastructure – See UKVFS Data Field 71
		b. Utilities	Utilities Infrastructure – See UKVFS Data Field 70
3	Agriculture	a. Arable cereals	
		b. Arable horticulture	
		c. Nurseries and market gardens	
		d. Grassland, pasture, grazing	
4	Forestry	a. Broadleaved and Mixed woodland	
		b. Other Trees	
		c. Conifer Woodland	
5	Recreation	Recreation	Recreation Infrastructure – See UKVFS Data Field 69
6	Leisure & Tourism		
7	Heritage		
8	Game shooting		
9	Nature Conservation		
10	Military	Military	Military Infrastructure – See UKVFS Data Field 68 (See Military Infrastructure category)
11	Landscape		
12	Coastal	Beach	
13	Mines and quarries		
14	Land fill		
15	Other		
16	Not Known		

## **Data Field – Habitat Classification**

42. UKVFS corresponds five selected habitat classifications at a very broad level. A more detailed correspondence is more complex in part due to the unique technical manner in which different systems measure and classify habitat/vegetation types. Habitats classification has been selected over species based systems for two practical reasons. Firstly species in comparison to habitats are less identifiable after a fire. Secondly non-ecological professionals can correctly identify habitats easier than species. Defined by Fuller *et al* (2002) Broad Habitat Classifications from Bio-diversity Action Plans (BAP) have been selected due to there simple but effective classification. This classification was also used within IRS (2008) to define property types.





## UKVFS Data Field 37 – Broad Habitat Classifications

No.	UKVFS – Broad Habitat Classification			
	Category	Types (with BHC reference numbers)	Definition <sup>12</sup>	
1	Coniferous woodland	2. Coniferous woodland,	Conifers, felled, new plantation.	Woodland is defined as land over 0.25 hectares (50 metres by 50 metres) with a canopy cover of trees at least 20% of area
2	Broadleaves, mixed and yew woodland	1. Broadleaves, mixed and yew woodland	Deciduous, mixed, open birch, scrub, shelterbelts etc.	
3	Other tree/s		Individual or groups of burnt trees	
4	Boundary vegetation and linear features	3. Boundary and linear features	Hedgerows, etc.	
5	Heath and moorland	9. Bracken	Bracken	
		10. Dwarf shrub heath	Dense ericaceous, gorse open ericaceous	
		11. Fen, marsh and swamp	Swamp, fen/marsh, fen willow	
		12. Bogs	Bog: shrub, grass/shrub, undifferentiated (all on deep peat)	
6	Mountainous	15. Montane habitats	Vegetation above 600m above sea level	
7	Grassland	5. Improved grassland,	Intensive, grass (hay/ silage cut), grazing marsh grass set a side	
		6. Neutral grassland,	Rough grass (unmanaged), grass (neutral / unimproved)	
		7. Calcareous grassland,	Calcareous (managed), calcareous (rough)	
		8. Acid grassland	Acid, acid (rough), acid with Juncus, acid with <i>Nardus/Festuca/Molinia</i>	
8	Arable and horticulture	4. Arable and horticulture	Cereals – barley, maize, oats, wheat, cereal (spring), cereal (winter), arable bare ground, carrots, field beans,	
			Horticulture – linseed, potatoes, peas, oilseed rape, sugar beet, mustard, non-cereal(spring),	
			Non rotational – orchard, arable grass (ley), set-aside (bare), set-aside (undifferentiated)	
9	Built up areas and gardens	17. Built up areas and gardens	Amenity Parks	
			Domestic garden (vegetation not equipment)	
10	Rives, steam, open water and canals	13. Standing open water and canals		
		14. Rivers and streams		
11	Coastal vegetation	19. Supra-littoral sediment	Shingle, shingle (vegetated), dune, dune shrubs	
12	Other	Other	Roadside and railway trackside vegetation	
13	Not Known	Not Known		

<sup>12</sup> Table 1. Broad Habitats and their relation to LCM2000 Target classes, Subclasses and Variants

### **Data Field – Area Burnt and Total Area Burnt**

43. All areas in UKVFS are measured in hectares, made up of 10,000 metres<sup>2</sup> or 100m by 100m. In IRS wildfires over 10,000m<sup>2</sup> are also measured in hectare, as metres<sup>2</sup> becomes too complex and unwieldy. The data fields record from 0.0001 hectares (1 metre x 1 metre defined as a Small Fire) up to 9999 hectares (a Landscape Scale vegetation fire). Area Burnt is the single Land Use or Broad Habitat Classes within that row and Total Area Burnt is the sum of all of these.

#### **UKVFS Data Field 38 – Area Burnt (Ha)**

Area burnt in hectares from 0.0001 to 9999 hectares
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#### **UKVFS Data Field 39 – Total Area Burnt (Ha)**

Total area burnt in hectares from 0.0001 to 9999 hectares
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### **Data Field – Species burnt**

44. This data field provides evidence of the major species that were burnt during the course of the fire. This is one of several fields vital in the collection of Climate Change data.

### UKVFS Data Field 40 – Species burnt

No.	UKVFS – Species burnt	
	Categories	Types
1	Trees	a. Pine
		b. Spruce
		c. Fir
		d. Larch
		e. Other conifer
		f. Birch
		g. Oak
		h. Other broadleaved
2	Other vegetation	a. Heather
		b. Grass
		c. Gorse
		d. Purple moorgrass
		e. Crops
		f. Straw, stubble or hay
		g. Ground vegetation litter
		h. Billberry
		i. Bracken
		j. Broom
		k. Other
		l. Unknown
3	Soil	a. Peat
4	Other	a. Other

### UKVFS Data Field 41 – Not used

### UKVFS Data Field 42 – Not used

### Data Field – Compartment and Planting Year

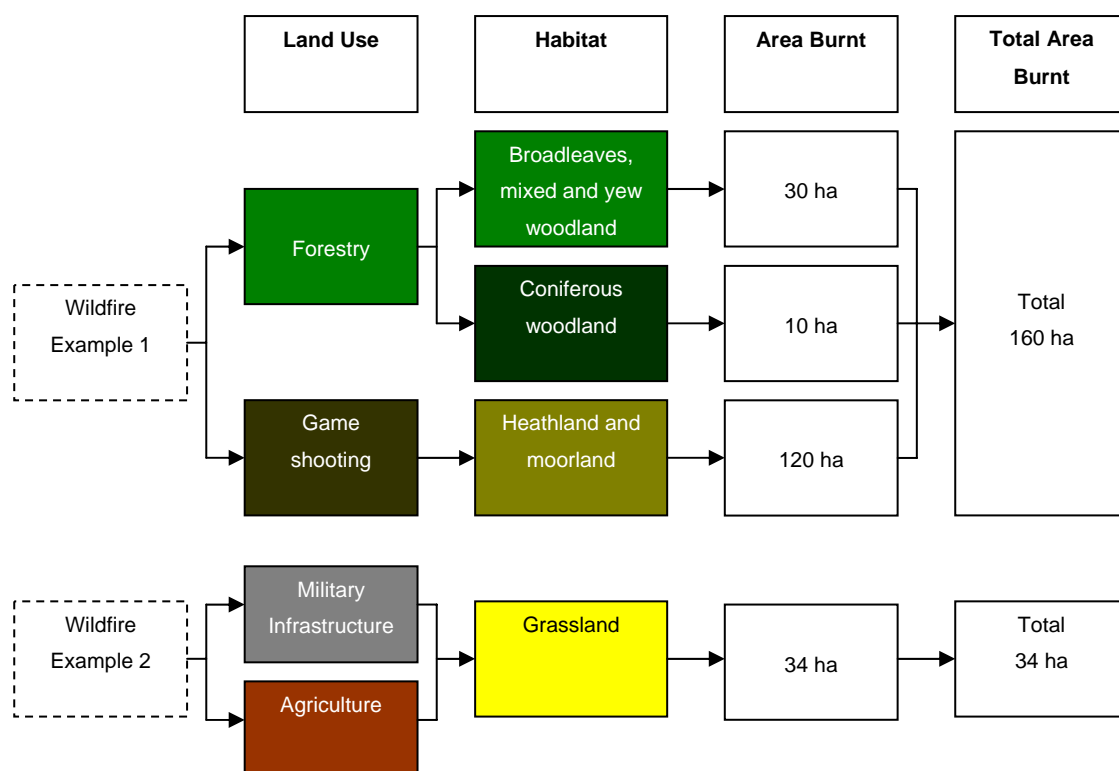
45. Three other Data Fields can be included in UKVFS and are covered in ‘Data Section 8 – Economic Impact’. For land managers these provide vital identification and descriptions of the asset that has been affected.

### UKVFS Data Field 43 – Not used

## FIRE SIZE (HECTARES BURNED)

46. A problem occurs when dealing with inputting both Land Use and Habitat Classification on a single report, which should come first? To resolve this UKVFS uses the same methodology as the Forestry Commission's Sub Compartment Data Base<sup>13</sup>. Illustrated in Figure 5 a single Land Use class may be formed from a single or multiple number of Habitat classes (Wildfire Example 1). Additionally a fire may impact on a single or multiple number of Land Use class/es with a single Habitat (Wildfire Example 2). For managers the use of compartment or sub-compartment reference details<sup>14</sup> that can be added to record further details (i.e. planting year or yield class etc.). This system allows for multiple land uses as well as multiple habitats to be recorded.

**Figure 5 – Examples of Recording Land Use and Habitat Classes**



<sup>13</sup> Forestry Commission (2007). Survey Handbook, Sub-Compartment Data Base. Operational Support Unit, Forestry Commission.

## DATA SECTION 5 – FIRE CAUSE

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47. Fire cause is an important factor in understanding the different vectors for incidents and addressing the cause of the problem. UKVFS use five types of Data Fields to define Fire Cause being; 'Fire Cause', 'Cause by or action', 'Contributing Factors', 'Place where fire started' and 'Item first ignited'.

### **Data Field – Fire Cause**

48. Taken from IRS (2008) UKVFS uses three categories of fire cause; deliberate, accidental and unknown as shown in UKVFS Data Field 42. Fire Cause is defined by motive category (deliberate, accidental and not known) and sub-defined by cause type. Where a prescribed burning or suppression fire goes 'out of control' a deliberate, accidental or unknown category can be recorded.

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<sup>14</sup> This will aid cross-referencing with the organisations internal recording systems such as the Forestry Commission Sub Compartment Data Base (SCDB).

## UKVFS Data Field 44 – Fire Cause

No.	UKVFS – Fire Cause			
	Motive Category	Cause Type	Fire type relevance	
			Wildfire incidents	Prescribed Fire Operations
1	Deliberate	a. Incendiary device	3	
		b. Prescribed burning operation	3	3
		c. Prescribed burning operation out of control	3	3
		d. Suppression fire out of control	3	
		e. Heat sources and combustibles brought together deliberately	3	
		h. Later found as arson/wilful fire raising	3	
		i. Restart from previous fire	3	
		j. Other	3	
2	Accidental	a. Faulty leads to equipment or appliance	3	
		b. Fault in equipment or appliance	3	
		c. Prescribed burning out of control	3	3
		d. Suppression fire out of control	3	
		f. Burning out of control (i.e. Bonfire)	3	
		g. Careless handling	3	
		h. Combustible articles too close to heat source	3	
		i. Person too close to heat source (or fire)	3	
		j. Vehicle crash or collision	3	
		k. Playing with fire (or heat source)	3	
		l. Accumulation of flammable material	3	
		m. Military training	3	
		n. Natural Occurrences	3	
		o. Restart for previous fire	3	
		p. Overheating, unknown cause	3	
		q. Other	3	
3	Not Known	a. Faulty leads to equipment or appliance	3	
		b. Fault in equipment or appliance	3	
		c. Prescribed burning out of control	3	3
		d. Suppression fire out of control	3	
		f. Burning out of control (i.e. Bonfire)	3	
		g. Careless handling	3	
		h. Combustible articles too close to heat source	3	
		i. Person too close to heat source (or fire)	3	
		j. Vehicle crash or collision	3	
		k. Playing with fire (or heat source)	3	
		l. Accumulation of flammable material	3	
		m. Military training	3	
		n. Natural Occurrences	3	
		o. Restart for previous fire	3	

	p. Overheating, unknown cause	3	
	q. Other	3	

### Data Field – Cause by or action

49. Taken from IRS (2008) this is one of two social data fields recording whom caused the incident, as shown in UKVFS Data Field 45. This data field is closely linked to ‘Contributing Factors’.

### UKVFS Data Field 45 – Caused by

No.	UKVFS – Caused by or action
	Categories
1	Child (0 - 9)
2	Youth (10 - 17)
3	Adult (18 - 64)
4	Elderly (65 plus)
5	Person, age not known
6	Animal
7	Other
8	Not known

### Data Field – Contributing Factors

50. The second of two social data fields recording the contributing activity or number of the individuals involved as shown. This Data Field is closely linked to ‘Cause by’ and forms the basis of social vector of Wildfire incidents.

## UKVFS Data Field 46 – Contributing Factors

No.	UKVFS – Contributing Factors	
	Categories	Description
1	Linked to use of drugs	
2	Linked to use of alcohol	
3	Linked to another illegal activity	Stolen car burnt out
4	Linked to work activity	Forestry, agricultural or other operations
5	Mental health issues	
6	Physical health issues	
7	Started by more than one person	
8	Started by individual	
9	Smoking	
10	Matches, lighter etc.	
11	Illegal fly tipping	
12	Road Traffic Collision	
13	Powerlines	Arching causing ignition
14	Vehicles	Train or car exhausts etc.
15	Later found as arson	
16	Male	
17	Female	
18	Vandalism	
19	Retaliation	
20	Accelerant/petrol	
21	None	

## UKVFS Data Field 47 – Not used

### Data Field – Place Where Fire Started

51. 'Place where fire started' is linked to 'Data Section 7 – Access and Social Impact' and represent the place where the fire was ignited.

## UKVFS Data Field 48 – Place Where Fire Started

No.	UKVFS – Place Where Fire Started	
	Categories	Description
1	On or near tracks or paths	National Trails / Paths, Foot paths, Bridle ways, Forest rides
2	In open area next to housing	Housing estates or rural settlement
3	Access land (England only)	Defined in the CRow Act 2000 (England) as; mountain, moor, heaths, down and registered common land.
4	Near amenity or recreation structure	Play area, shelter, bird hide
5	Military live firing range	MoD land using live firing



6	Military training area	MoD land using dry training
7	Railway Infrastructure	Permanent Way, Line side buildings and equipment.
8	Other	
9	Not known	

## UKVFS Data Field 49 – Not used

### Data Field – Item First Ignited

52. Adapted from IRS (2008) this field identifies the ignition source. This can provide important information during risk identification and management planning. The data field is formed from the possible vegetation ignition sources found across the United Kingdom.

### UKVFS Data Field 50 – Item First Ignited

No.	UKVFS – Item First Ignited	
	Categories	Types
1	Trees	a. Pine
		b. Spruce
		c. Fir
		d. Larch
		e. Other conifer
		f. Birch
		g. Oak
		h. Other broadleaved
2	Other vegetation	a. Heather
		b. Grass
		c. Gorse
		d. Purple moorgrass
		e. Crops
		f. Straw, stubble or hay
		g. Ground vegetation litter
		h. Billberry
		i. Bracken
		j. Broom
		k. Other
		l. Unknown
3	Soil	a. Peat
4	Rubbish / Bonfire	a. Bonfire
		b. Domestic
		c. Commercial
5	Other	a. Other

## DATA SECTION 6 – ENVIRONMENTAL AND HERITAGE IMPACT

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53. In order to provide data on the impacts of fire three factors are measured; environment & heritage, access & social and economics. The aim is not to provide a valuation, rather the data fields that can be used later for analysis.

### **Data Field – Environmental Designations**

54. Many locations for wildfire incidents and prescribed burning may happen upon environmental sites with international, European and United Kingdom statutory designations. These have been listed below in UKVFS Data Field 51 along with other designations to ensure that a value can be determined.

### ***Multiple Designations***

55. Ayliffe and Hill (2003) highlight that many areas of wildlife interest in the UK have multiple site designations. The relationship between them in terms of site boundaries and interest features is often complex. For example, all but a handful of candidate Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) in the UK are underpinned by Sites of Special Scientific Interest (SSSI) or Areas of Special Scientific Interest (ASSI) designation. Candidate SAC may be made up of a number of component SSSI/ASSIs. In addition, the SSSI/ASSIs may have been notified for a different suite of habitats and species. Almost all Ramsar sites are also Natura 2000 sites, but all features are necessarily not identical. Ayliffe and Hill (2003) stress that from monitoring perspective, an important principle is that data must be collected in such a way as to allow a separate assessment of each individual interest feature. The data field therefore provides a range of categories to reflect this situation.

## UKVFS Data Field 51 – Environmental Designations

No.	UKVFS – Environmental Designation	
	Categories	Description
1	Site of Special Scientific Interest (SSSI) or Area of Special Scientific Interest (ASSI)	
2	Special Protection Area (SPA)	
3	Special Area of Conservation (SAC)	Natura 2000
4	Candidate Special Protection Area (cSPA)	
5	Proposed Special Area of Conservation (pSAC)	Natura 2000
6	Ramsar	Natura 2000
7	National Nature Reserve (NNR)	
8	Local Nature Reserve (LNR)	
9	Environmentally Sensitive Area (ESA)	
10	County Wildlife Site	I.e. Site of Important Nature Conservation (SINC)
11	Ancient Woodland (AW) or Ancient Semi Natural Woodland (ASNW)	
12	Veteran Tree/s	
13	Other	
14	Not Known	
15	None	

## UKVFS Data Field 52 – Not used

## UKVFS Data Field 53 – Not used

## UKVFS Data Field 54 – Not used

## Data Field – Heritage Designation

56. The recording of the built environment's heritage assets is recorded during structural fires. In order to value the natural environment's assets in the below data field includes those statutory designations.

### UKVFS Data Field 55 – Heritage Designations

No.	UKVFS – Heritage Designation	
	Categories	
1	Scheduled Monument (SM)	
2	Unscheduled Ancient Monument (UAM)	
3	World Heritage Site (WHS)	
4	Battlefields sites	
5	County register of historic parks and gardens (England and Wales only)	
6	None	

### UKVFS Data Field 56 – Impact on Environment/Heritage

No.	UKVFS – Impact on Environment/Heritage	
	Categories	Definition
1	Destroyed	Site interest is lost
2	Damaged	Site interest requires repair to make good damage
3	Closure	Site is closed for the day
4	Disruption	Site is disturbed for more than 6 hours but is not closed
5	Minimal impact	Minimal disruption caused (less than 6 hours)
6	No impact	
7	Other impact	
8	None	

**UKVFS Data Field 57 – Not used**

**UKVFS Data Field 58 – Not used**

**UKVFS Data Field 59 – Not used**

**UKVFS Data Field 60 – Not used**

**UKVFS Data Field 61 – Not used**

## DATA SECTION 7 – ACCESS AND SOCIAL IMPACT

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57. UKVFS allows for the identification of access and social impacts using three text data fields. These include Countryside and Rights of Way (CRoW) access land type (for England and Wales only), type of path or trail and large landscape designations.

### Data Field – CRoW Access Land (England and Wales only)

58. UKVFS Data Field 62 illustrates the six Access land types under Part 1 of the Countryside and Rights of Way (CRoW) Act 2004, and is only relevant to England and Wales. Section 25 of the Act allows for a relevant authority to exclude or restrict the public from the CRoW access land types where there is a particular risk of fire. Please note, such restrictions do not affect Public Rights of Way.

### UKVFS Data Field 62 – CRoW Access Land type

No.	UKVFS – CRoW Access	
	Categories	Description
1	CRoW Access land – Registered common	
2	Recently dedicated CRoW access land	Within 6 months
3	CRoW Access land – open country	
4	Other Open Access land not subject to CRoW rights	Section 15 land
5	CRoW public access is excluded	
6	CRoW public access is restricted but not excluded	
6	Not known	
7	None	

### Data Field – Path or Trail

59. In many cases the wildfires occur next too access routes. The data field below provides a list of access designations. It should be noted that these designation are not common across the United Kingdom and some terms are applicable to some nations.

## UKVFS Data Field 63 – Access Designations

No.	UKVFS – Access Designations		
	Categories	Types	Definition
1	Public Rights of Way (PRoW)	a. Public Footpath	Over which the right of way is on foot only
		b. Bridleway	For pedestrians, horse riders and bicyclists (who must give way to people on foot or on horseback)
		c. Byway Open to All Traffic	Carriageways over which the right of way is on foot, on horseback and for all vehicular traffic (including mechanically propelled vehicles, but which are used mainly for the purposes for which footpaths and bridleways are used (i.e. by walkers and horse riders).
		d. Restricted byways	Carriageways over which the right of way is for all types of traffic except mechanically propelled vehicles.
2	National Trail		England and Wales only
3	Long Distance routes		Scotland only
4	National cycle routes		Part of the national cycle network
5	Other		
6	Not known		
7	None		

## Data Field – National Park

60. Due to its legal definition and high recreation use National Parks are included into vegetation fire statistics.

## UKVFS Data Field 64 – National Parks

No.	UKVFS – National Parks	
	Categories	
1	Brecon Beacons	
2	Broads	
3	Cairngorms	
4	Dartmoor	
5	Exmoor	
6	Lake District	
7	Loch Lomond	
8	New Forest	
9	Northumberland	
10	North York Moors	
11	Peak District	
12	Pembrokeshire Coast	
13	Snowdonia	
14	Yorkshire Dales	

15	South Downs
16	None

**UKVFS Data Field 65 – Not used**

**UKVFS Data Field 66 – Not used**

**UKVFS Data Field 67 – Not used**

## DATA SECTION 8 – ECONOMIC IMPACT

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61. *Data Section 4 – Land Use (Area Burnt)* established the use of the area burnt. In some cases several activities can be undertaken on a single land use classification, thus increasing the possible loss. Data Section 8 defines the primary and multiple Land Use (as defined in Section 4) undertaken on the same land (if any) and the losses incurred to both levels. The impact of vegetation fires can also impact upon our infrastructure providing considerable in-direct costs to the economy. Consideration of this presents a truer picture of the impact of Wildfire incidents.

### Data Field – Impact on Land Use

62. The impact on both primary and multi-purpose Land Use can be recorded. As shown below the categories estimate the destruction, degree of damage or lesser impacts. This is important to develop the scale of economic impact.

### UKVFS Data Field 68 – Impact on Land Use

No.	UKVFS Impact on Land Use	
	Categories	Definition
1	Destroyed	Land Use interest is lost
2	Damage	Land Use interest has suffered a percentage of damage and requires repair to make good (see UKVFS Data Field 69 for percentage of area damaged).
3	Minimal impact	Land Use interest is disturbed but received little impact
4	Impact unknown	
5	Beneficial impact	
6	Other impact	
7	Not Known	

### UKVFS Data Field 69 – Percentage of Damage

Damage to land use is measured as a percentage (%) of the area.
---



## **DATA GROUP – INFRASTRUCTURE (PROPERTY, RECREATION, TRANSPORT AND UTILITY)**

63. This data group defines infrastructure into four classes; property, recreation utilities and transport.

### **Data Field – Property and Recreation Infrastructure**

64. Property and Recreation infrastructure affected by wildfire incidents can be considerable, especially when the impacts are in-direct.

## UKVFS Data Field 70 – Property Infrastructure

No.	UKVFS – Community Infrastructure		
	Property Infrastructure Category	Property Infrastructure Type	Definition
1	Dwelling / Residential	a. Dwelling	Private and residential homes
		b. Other Residential (institutional)	Hostels, B&Bs, nursing homes, student halls of residence etc.
		c. Residential Infrastructure	Lighting, signage etc.
2	Community Infrastructure	a. Community buildings	Public buildings, religious buildings etc.
		b. Public realm facilities	Lighting, signs, bins etc.
		c. Public buildings	Hospitals, Police station etc.
3	Commercial Infrastructure	a. Commercial building/s	Offices, shops, restaurants, cinemas etc.
		b. Commercial infrastructure	Yards, outdoor storage areas etc.
4	Industrial Infrastructure	a. Industrial Buildings	Factories, warehouses etc.
		b. Industrial Infrastructure	
5	Agricultural buildings	a. Agricultural buildings	Silos, barns, sheds etc.
6	Mine, dump and construction sites	a. Mineral extraction sites	
		b. Dump sites	
		c. Construction sites	
7	Military Infrastructure	a. Military Training Area	Dry Training Areas and associated infrastructure (bridges, troop shelters etc).
		b. Live Firing Area	Live firing ranges and associated infrastructure (Range mantels, firing butts, troop shelters etc).
		c. Airfields	Tarmac and glass etc.
		d. FIBUA/OBUA	
		e. Military buildings	Barracks, sheds, stores etc.
		f. Military domestic	Military family dwellings
		g. Ammunition compound	
		h. Military communications	Satellite, radio etc.
		i. Military other	
8	Vehicles	a. Road Vehicle	Public and FRS vehicles
		b. Rail Vehicle	
		c. Aircraft	
		d. Boat	
9	Other		
10	Not Known		

## UKVFS Data Field 71 – Recreation Infrastructure

No.	UKVFS – Access Designations	
	Recreation Category	Definition
1	Sports and leisure facilities	Leisure complexes, urban and rural sports area, football pitches etc.
2	Playground	Urban and rural playground etc.
3	Outdoor Venue	Outdoor concerts, outdoor event sites etc.
4	Outdoor	Assessable green space ranging from paths to fields
5	Country Park	Designated as a Country Park under the Countryside Act 1968
6	Other countryside site	E.g. Forest and Woodland Parks (Forestry Commission), reserves (Trusts) etc.
7	Nature Reserve	Designated Local and National Nature Reserves (LNR and NNR)
8	Other	
9	Not Known	

## Data Field – Utilities Infrastructure

65. As many of our local, regional and national utilities infrastructure uses rural areas to connect or generate our services. The data field provides a list of categories and types likely to be effected by vegetation fires.

## UKVFS Data Field 72 – Utilities Infrastructure

No.	UKVFS –Utilities Infrastructure		
	Utilities Categories	Utilities type	Definition
1	Electricity	a. Power lines	
		b. Wind Turbine/s	
		c. Hydro electrical	
		d. Power generators	
		e. Electricity sub-station	
		f. Power station	
		g. Other electricity	
2	Water	a. Water pipeline (overground)	
		b. Water pipeline (underground)	
		c. Water pump station	
		d. Water treatment station	
		e. Extraction area	
		f. Reservoir	
		g. Other water	
3	Sewage	a. Sewage pipeline (overground)	
		b. Sewage pipeline (underground)	
		c. Sewage treatment station	
		d. Other Sewage	
4	Fuel	a. Fuel pipeline (overground)	
		b. Fuel pipeline (underground)	
		c. Fuel tank	
		d. Other fuel	
5	Gas	a. Gas pipeline (overground)	
		b. Gas pipeline (underground)	
		c. Gas tank	
		d. Other gas	

## Data Field – Transport Infrastructure

66. The development of local, regional and national transport networks uses rural areas to connect or pass through.

## UKVFS Data Field 73 – Transport Infrastructure

No.	UKVFS – Transport Infrastructure		
	Categories	Type	Definition
1	Road	a. Motorway	
		b. A road	
		c. B road	
		d. Other roads	I.e. private tracks
		e. Road services	
		f. Road signs	
		g. Vehicle bridges	
2	Rail	a. Train line	
		b. Signalling equipment	
		c. Station	
		d. Depot	
		e. Operational buildings	Signal boxes, control centres and equipment cabinets
		f. Other rail	
3	Airport	a. Runway	
		b. Taxi routes	
		c. Control tower	
		d. Hanger	
		e. Associated airport services	
		f. Other airport	
4	Water	a. River	
		b. Open water	
		c. Lake	
		d. Canal	
		e. Marina	
		f. Association water services	
		h. Other water	
5	Paths, routes and sustainable transport networks	a. Public Right of Way (PRoW)	Public Footpath, Bridleway, Byway Open to All Traffic etc.
		b. Permission access route	Route open for access
		c. Path or trail	Non Public Right of Way
		d. National Trail	England and Wales only
		e. Long Distance Routes	Scotland only
		f. National cycle Network	Part of the national cycle network
		g. Access type not known	
		h. Footbridges	
		i. Other	

## UKVFS Data Field 74 – Not used

## UKVFS Data Field 75 – Not used

## UKVFS Data Field 76 – Not used

### Data Field – Impact on Infrastructure

67. In order to reflect the economic losses caused by vegetation fire on both Utilities and Transport infrastructure, categories can be used to determine the impact. Additionally if 'Closure' or 'Disruption' categories have been chosen then the number of hours is also inputted. This is recorded as 'number of hours closed or disrupted' in UKVFS Data Field 78. Short incidents are rounded up to an hour.

### UKVFS Data Field 77 – Impact on Infrastructure

No.	UKVFS – Impact on Infrastructure	
	Categories	Definition
1	Destroyed	Utility requires replacement
2	Damaged	Utility will not function without repair
3	Closure	Number of days/hours utility have been closed
4	Disruption	Number of days/hours utility have not been working normal
5	Minimal impact	Minimal disruption caused (less than 1 day)
6	Impact unknown	
7	Other impact	
8	None	

### UKVFS Data Field 78 – Number hours closed or disrupted

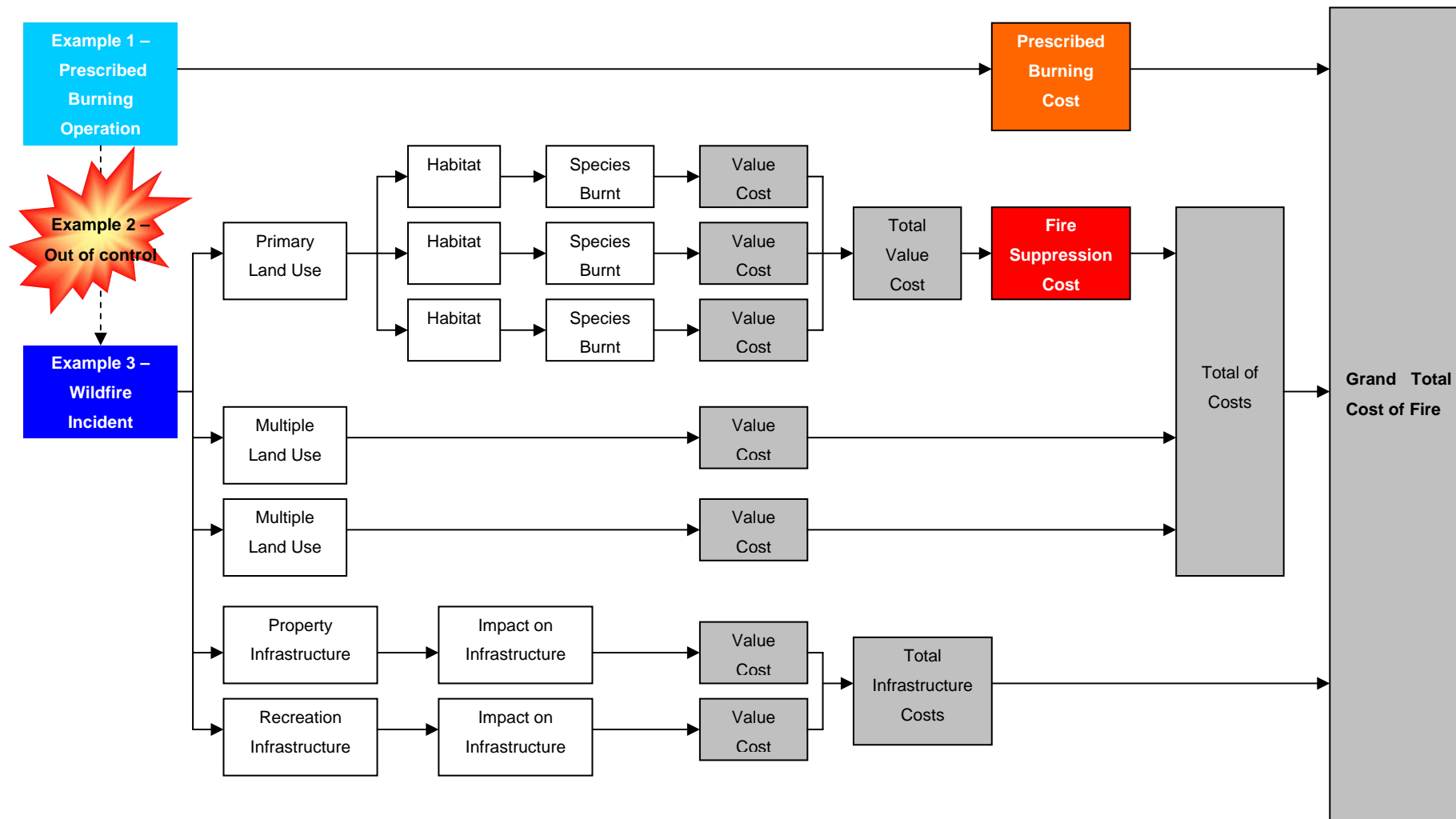
Number of hours infrastructure (transport or utilities) has been closed or disrupted i.e. (hours)

## UKVFS Data Field 79 – Not used

### DATA GROUP – ECONOMIC COST OF VEGETATION FIRE

The economic cost of vegetation fires is the sum of several data fields. Figure 6 shows two examples of a prescribed burning operation (1) and one that has gone out of control (2, and into a wildfire) as well as a wildfire incident (3).

**Figure 6 – Example of calculating the cost of losses for vegetation fires in UKVFS**



68. In example 2 the cost of the operation (prescribed burning) is added to the loss of the primary land use (in this case multiple habitats lost) as well as the multi-purpose land uses and infrastructures losses.

#### **Data Fields – Cost of Benefits/Losses**

69. All data fields within this section are measured in pounds Sterling and are rounded up to the nearest hundred i.e. £100.

#### **UKVFS Data Field 80 – Value Cost (£)**

Used to record the value benefit/lost from Species Burnt, Multiple Land Use and Impact on Infrastructure data fields measured in £.
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#### **UKVFS Data Field 81 – Not used**

#### **UKVFS Data Field 82 – Not used**

#### **UKVFS Data Field 83 – Not used**

#### **UKVFS Data Field 84 – Not used**

#### **UKVFS Data Field 85 – Not used**

#### **UKVFS Data Field 86 – Not used**

#### **UKVFS Data Field 87 – Fire Suppression Cost (£)**

Used to record the total cost of fire suppression (Total of land owners and Fire and Rescue Service costs and losses) measured in £.
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### UKVFS Data Field 88 – Prescribed Burning Cost (£)

Used to record the total cost of prescribed burning operations measured in £.

### UKVFS Data Field 89 – Total Infrastructure Costs (£)

Used to record the total of Value Cost from impact of infrastructure measured in £.

### UKVFS Data Field 90 – Grand Total Cost (£)

Used to record the grand total of all costs (benefits and losses) resulting from the operation or incident.

### UKVFS Data Field 91 – Not used

## DATA GROUP – ANIMALS

Defined by the Animal Health Office<sup>15</sup> the below data fields can be used for wildfire incidents as well as animal rescue and flooding.

### UKVFS Data Field 92 – Animals

No.	UKVFS – Animals		
	Categories	Type	Description
1	Live stock	a. Horse	If used for farming purposes
		b. Cow	All Bovidae animals (including buffalo and bison)
		c. Sheep	
		d. Goat	All goats are included here
		e. Pig	
		f. Poultry	
		g. Fish	Farmed fish including salmon, trout etc.
		g. Exotic	Llama, Ostrich etc.
		i. Other	Farmed deer of any species

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<sup>15</sup> Pilar Romero, Veterinary Officer in South East England.

2	Wild	a. Horse	i.e. Dartmoor pony etc.
		b. Deer	Non-farmed deer; Red, Fallow, Roe, Muntjack, Sitka
		c. Wildfowl	
		d. Game	
		e. Aquatic	Includes fish and marine-based mammals including whales, seal lions and seals etc.
		f. Exotic	
		g. Herpetological	Lizards, amphibians, snakes etc.
		h. Other	
3	Domestic	a. Dog	
		b. Cat	
		c. Rodents	
		d. Other	Horses not kept for farming activities
4	Other		
5	Not known		

### UKVFS Data Field 93 – Extent of Animal Harm

No.	UKVFS – Extent of Animal Harm	
	Categories	Definition
1	Killed	Fatality without rescue
2	Fatality	Fatality after rescue
3	Injured	Rescue with injury
4	Rescued	Rescue without injury
5	Not known	
6	Other	

### UKVFS Data Field 94 – Number of Animals Harmed

Number of animals harmed

### UKVFS Data Field 95 – Cost of Animals Harmed

Cost of animals harmed (£)

### UKVFS Data Field 96 – Total cost of Animals Harmed

Total cost of animals harmed (£)

### Data Field – Humans

70. The costs of human injuries and fatalities can be found in Chapter 12.

**UKVFS Data Field 97 – Not used**

**UKVFS Data Field 98 – Not used**

**UKVFS Data Field 99 – Not used**

## DATA SECTION 9 – FIRE BEHAVIOUR

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71. Although the measurement of fire behaviour can be technical, it is essential in the understanding of the fire. It provides terms for understanding and measuring this hazard, thus aiding communication. Matt Davis of University of Edinburgh has kindly supplied many of the terms used within the element from his research within the Fire Beaters Project.

### DATA GROUP – FIRE BEHAVIOUR

#### Date Field – Forces of Alignment

72. Used within the Wildfire Prediction System (WPS) numerous factors are used to determine fire behaviour. The three most common forces are slope, aspect and wind direction. These are recorded as being in or out of alignment.

#### UKVFS Data Field 100 – Forces of Alignment

No.	UKVFS – Forces of Alignment	
	Categories	Description
1	F1	any one of the three forces (Slope, Aspect or Wind Direction)
2	F2	any combination of two of the three (E.g. Slope + Aspect = F2)
3	F3	all the forces in alignment

#### UKVFS Data Field 101 – Not used

#### Data Field – Fire Measurement

73. The area the fire burns is an important indicator of the nature of the event but if possible it would be valuable to also record:
- Fire Width – Maximum width of the fire, as fire front size determines fire behaviour
  - Distance from ignition point – the furthest point of spread, will indicate how rapidly the fire was brought under control and how quickly it was likely to have spread.

74. Both of these can be recorded using GPS, visually estimated, estimated from maps or paced out where the fire is not too large. Both Fire Width and Distance from ignition point are linked to Location Point and Date and Time Event

#### **UKVFS Data Field 102 – Fire Width**

Fire width is the furthest point between flank to flank measured in metres.

#### **UKVFS Data Field 103 – Distance from Ignition Point (or Origin)**

The distance between the furthest point of the head fire to the ignition point or origin measured in metres.

#### **UKVFS Data Field 104 – Not used**

#### **Data Field – Fire Type**

75. The majority of fires in the UK are surface fires (burning shrubs, grass and litter) but it is important to note fires that occur in the crowns of forests and woodlands and under the ground in peat. Recording the nature of fires attended will provide researchers with the data forecast when and where they are likely to occur. These types are defined as; ground fuels, surface fuels and crown fuels

#### **UKVFS Data Field 105 – Fire Type**

No.	UKVFS – Fire Type
	Categories
1	Crown Fire
2	Surface Fire
3	Ground Fire

#### **UKVFS Data Field 106 – Not used**

## **Data Field – Flame Length**

76. Flame length is directly related to fire intensity with a strong relationship that allows one to be calculated from the other. It is a measure of heat output that relates to safe time/distance at a fire front. A record of flame length allows researchers to develop forecasts not just of when wildfires are likely to occur but also how they are likely to behave when they do. Fire intensity is also relevant to understanding the ecological impact of a fire. It should be noted that flame length is not the same as flame height the latter being affected by the angle of the flames which is in turn influenced by wind speed. Rough estimates of height to the nearest quarter of a metre are useful though more exact measurements can be made using photographs and features of a known height that are close to the flame front.

## **UKVFS Data Field 107 – Flame Length**

Flame Length is the average length measure from the ground to the tip of the flame in metres.
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## **UKVFS Data Field 108 – Not used**

## **Data Field – Multiple Seats of Fire**

77. Taken from IRS (2008) 'multi-seated' fire means a fire that has more than one location or origin of fire.

## **UKVFS Data Field 109 – Multiple Seats of Fire**

Number of seats detected or 'Yes' & 'No' question
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## **UKVFS Data Field 110 – Not used**

## **Data Fields – Rate of Spread & Direction of Spread**

78. The rate of spread and the direction is a crucial factor in determining the fire's impact and controllability. Fast moving fires are more difficult to control and tend to be more intense and damaging. Making an estimate of rate of spread allows researchers, Fire and Rescue Service operation and incident planners to understand not just when fires occur but when different types of fire occur and the condition that leads to destructive, damaging, dangerous wildfires.
79. Rough estimates of 'rate of spread' can be made by recording the time it takes a fire to spread between two or more landmarks. Other methods include throwing or placing markers such as small metal plates or spikes at the front of the fire and recording the time when they were placed and the distance between them. It is important to remember to record the units in which rate of spread is recorded (e.g. metres per minute etc.).

### **UKVFS Data Field 111 – Rate of Spread**

Spread measured by metres per minute
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### **UKVFS Data Field 112 – Direction of Spread**

Direction measured by degrees from magnetic north
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### **UKVFS Data Field 113 – Not used**

## **Data Field – Fire Spotting**

80. Spotting is the process by which small fires are ignited by 'fire brands' and embers outside the main fire perimeters. It normally only occurs alongside extreme fire behaviour and is an important indicator that the fire was likely to be of high intensity, dangerous and potentially ecologically damaging. Recording if spotting is observed will ensure that dangerous and intense fires are noted, and allow us to better forecast the conditions when such burns occur.

## UKVFS Data Field 114 – Fire Spotting

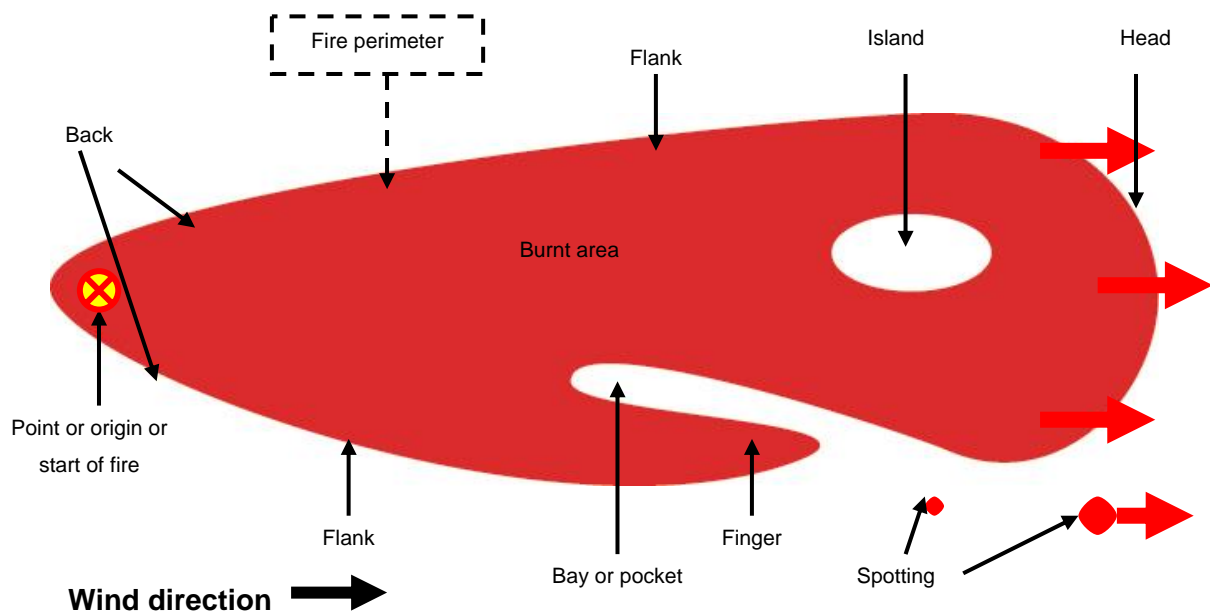
Number of spots detected or 'Yes' & 'No' question

## UKVFS Data Field 115 – Not used

### Data Field – Fire Characteristics

81. Fire Characteristics are a breakdown of the parts of a vegetation fire. This may be inside, outside or in the fire perimeter as shown in Figure 7. UKVFS Data Field 114 lists the categories considered.

**Figure 7 – Fire Characteristics**





## UKVFS Data Field 116 – Fire Characteristics

No.	UKVFS – Fire Characteristics	
	Category	Description
1	Head	Front of fire perimeter
2	Flank	Sides of the fire perimeter
3	Back	Rear of the fire perimeter
4	Bay or pocket	Outside the fire perimeter
5	Finger	
6	Island	Inside the fire perimeter
7	Point of origin	
8	Spot	Out side the fire perimeter

## UKVFS Data Field 117 – Not used

## UKVFS Data Field 118 – Not used

## DATA GROUP – WEATHER

### Data Field – Wind Direction

82. The interaction between wind direction, slope and fuels will govern direction of fire spread and eventual fire area. If wildfires occur and researchers or fire investigators visit the scene afterwards knowing what general direction the wind was blowing in allows them to more easily piece together how the fire behaved and how the eventual pattern of burnt and unburnt was created.
83. Wind direction can be adequately estimated to the nearest 22.5 degrees (As shown in UKVFS Data Field 117) or 45 degrees using local land-marks and by observing the direction in which smoke drifts. If no smoke is visible a handful of vegetation thrown into the air can provide a useful substitute.

## UKVFS Data Field 119 – Wind Direction

No.	UKVFS – Wind Direction	
	Category	Description
1	N	North
2	NNE	North North East
3	NE	North East
4	NEE	North East East
5	E	East
6	SEE	South East East
7	SE	South East
8	SSE	South South East
9	S	South
10	SSW	South South West
11	SW	South West
12	SWW	South West West
13	W	West
14	NWW	North West West
15	NW	North West
16	NNW	North North West

## UKVFS Data Field 120 – Not used

### Data Field – Wind Speed (Miles Per Hour)

84. Wind speed is one of the most critical factors in determining fire behaviour governing both its rate of spread and how likely it is to establish from both intentional and accidental ignitions. Observations of wind speed allow observed fire behaviour/occurrence to be linked to on-site weather conditions during the fire, existing fire behaviour models to be tested and more robust models of fire risk to be developed.
85. Wind speed can be measured using portable weather stations or hand-held anemometers but where these are not available it can be estimated using the Beaufort scale (see Table 7) or an adjusted version developed for use in moorland or treeless areas (see Table 8). The speed of the wind is recorded in Data Field 121.

**Table 7 – The Beaufort Scale for estimating wind speed in mph**

UKVFS – Beaufort scale			
Force	Speed MPH	Name	Description
0	0-1	Calm	Calm; smoke rises vertically
1	1-3	Light air	Direction of wind shown by smoke drift, but not by wind vanes.
2	4-7	Light Breeze	Wind felt on face; leaves rustle; ordinary vanes moved by wind.
3	8-12	Gentle Breeze	Leaves and small twigs in constant motion; wind extends flag.
4	13-18	Moderate Breeze	Raises dust and loose paper; small branches are moved.
5	19-25	Fresh Breeze	Small trees in leaf begin to sway; crested wavelets form on inland waters.
6	25-31	Strong Breeze	Large branches in motion; whistling heard in telegraph wires; umbrellas used with difficulty.
7	32-38	Near Gale	Whole trees in motion; inconvenience felt when walking against the wind.
8	39-46	Gale	Breaks twigs off trees; generally impedes progress.
9	47-54	Severe Gale	Slight structural damage occurs (chimney-pots and slates removed).

**Table 8 – Modified Beaufort scale for use on moors and heaths.**

UKVFS – Modified Beaufort scale			
Force	Speed MPH	Name	Description
0	0-1	No wind	Smoke rises vertically
1	1-3	Light air	Smoke drifts
2	4-7	Light breeze	Leaves rustle, wind felt on face
3	8-12	Gentle breeze	Heather and small twigs in constant motion
4	13-18	Moderate wind	Ash kicked up heather sways and tree branches move
5	19-25	Fresh wind	Heather sways vigorously and continuously, trees sway
6	25-31	Strong wind	Shrubs thrash violently, large braches move
7	32-38	Very strong wind	Flames completely flat, trees sway, difficulty to walk
8	39-46	Gale	Hard to keep balance and stand up

#### **UKVFS Data Field 121 – Wind Speed (Miles Per Hour)**

Wind speed of the fire in miles per hour (mph).

#### **UKVFS Data Field 122 – Not used**

#### **UKVFS Data Field 123 – Not used**

### Data Field – Fire Severity Index

86. Meteorological Office Fire Severity Index (MOFSI) is the measurement tool used under Part 1 of the Countryside and Rights of Way Act (2000) (CRoW) and is applicable to England and Wales only. A relevant authority can restrict the public from CRoW access land by a fire prevention direction or when MOFSI registers an exceptional score.

### UKVFS Data Field 124 – Fire Severity Index

No.	UKVFS – Fire Severity Index	
	Category	Description
1	1	Very Low
2	2	Low
3	3	Medium
4	4	High
5	5	Exception

### Data Field – Relative Humidity

87. Temperature and humidity are thought to play a role in determining flammability and play an important role in determining moisture content being particularly relevant to the status of this in dead fuels.

### UKVFS Data Field 125 – Relative Humidity

Relative Humidity is measured as a percentage of the water-vapour in the atmosphere.

### UKVFS Data Field 126 – Not used

## DATA GROUP – VEGETATION

### Data Field – Fuel Burnt

88. Understanding what actual fuels were burnt in a fire is important as different fuels display differing fuel moisture relationships and fire behaviour characteristics. Wildfire fuels can be broadly separated into three categories already shown in Fire Type; ground, surface and crown fuels, and an indication of all fuels that are involved in the fire would be extremely useful.

### UKVFS Data Field 127 – Fire Type and Vegetation Burnt

No.	UKVFS – Fire Type and Vegetation Burnt	
	Fire Type	Vegetation Burnt
1	Crown Fuels	a. Conifer Trees
		b. Broadleaved Trees
		c. Mixed Conifer and Broadleaved Trees
		d. Other trees
2	Surface Fuels	a. Litter
		b. Moss
		c. Purple Moorglass
		d. Crops
		e. Straw, stubble or hay
		f. Bracken
		g. Billberry
		h. Other Grasses
		i. Heather
		j. Gorse
		k. Scrub
		l. Conifer Trees
		m. Broadleaved Trees
		n. Mixed Trees
		o. Mixed vegetation
		p. Other
3	Ground Fuels	a. Peat
		b. Other

### UKVFS Data Field 128 – Not used

### Data Field – Fuel Moisture Content

89. Fuel Moisture Content (FMC) is the critical factor determining whether conditions are suitable for fire to establish and it plays an important role in determining fire behaviour once they have (though other factors like wind speed and fuel structure then become more important). Knowledge of the moisture contents of fuels allows researchers to understand how fire started

and how intense it's likely to be. Relating fuel moisture to weather conditions and fire occurrence is the central plank of any fire forecasting system.

### UKVFS Data Field 129 – Fuel Moisture

Moisture deficit in vegetation should be measures in MORSEC (mm).

### UKVFS Data Field 130 – Not used

### Data Fields – Fine Fuel Components

90. Fine fuel components play an important role in determining fire behaviour, which form the majority of the fuel bed (Davies, 2008). Examples of fuels that could be sampled for four commonly burnt fuel types are given.

### UKVFS Data Field 131 – Fine Fuel Components

No.	UKVFS – Fine Fuel Components		
	Categories	Type	Description
1	<b>Heather</b> ( <i>Calluna vulgaris</i> , <i>Erica species</i> )	a. Live canopy	Live green foliage and shoots at the top of the plant. Play important role in fire behaviour.
		b. Lower canopy	The bottom half of the canopy where there are greater amounts of grey, dead fuel. Plays an important role in ignition potential and fire behaviour
		c. Dead fine fuel	Entirely dead shoots and twigs less than 2 mm in diameter. Provide an insight into the FMC of all dead fuels which are otherwise difficult to sample. These play an important role in fire behaviour.
		d. Moss and litter	The top 2 cm of the layer of moss and litter beneath heather plants. When dry can considerably increase the fuel load. Closely related to the ecological impact of the fire.
2	<b>Purple moor grass</b> ( <i>Molinia caerulea</i> )	a. Aerial dead	Strands of grass caught or suspended in the canopy of bushes. Often dry and extremely flammable but not forming a high proportion of the total fuel load.
		b. Upper litter	The top 2 cm of the layer of dead grass on the ground. Normally dry and flammable.
		c. Lower litter	The lower layers of dead grass on the ground. Often in contact with bog surface, wet and frequently does not burn

3	<b>Gorse</b> ( <i>Ulex species</i> )	a. Live shoots	Live green foliage and shoots at the top of the plant. In marginal conditions these may not actually burn but they can play an important role in fire behaviour.
		b. Dead shoots	Entirely dead shoots and twigs less than 2 mm in diameter. Often found below the layer of live green shoots at the top of a bush. These play a critical role in fire behaviour.
		c. Litter	The top 2 cm of the layer of litter beneath bushes. When dry can burn but often only crowns of gorse bushes are alight. Can considerably increase the fuel load. Closely related to the ecological impact of the fire.
4	<b>Coniferous woodland</b>	a. Live needles	Live needles in the crown of trees. Appropriate in crown fire situations
		b. Dead needles	Dead needles in the crown of trees. Appropriate in crown fire situations
		c. Litter	The top 2 cm of dead needles and small twigs on the forest floor. Appropriate for surface fires
		d. Moss	The top 2 cm of moss on the forest floor. Appropriate for surface fires.
		e. Shrubs	Shrubs such as <i>Calluna</i> on the forest floor. Appropriate for surface fires. <i>NB such fuels can themselves be divided as for Calluna above</i>
		f. Grass	Grasses growing on the forest floor. Appropriate for surface fires. <i>NB such fuels can themselves be divided as for Molinia above.</i>

## UKVFS Data Field 132 – Not used

### Data Field – Maturity of Vegetation

91. Maturity of vegetation defines the fuel loading and structure playing an important role in fire behaviour. The amount of fuel available to burn will determine the fires heat output, its rate of spread and its intensity. For simplicity fuel loading is recorded using three vegetation types; tree age class, heather age class and peat depth.
92. UKVFS uses two types of data field, three individuals (UKVFS Data Fields 131, 133 and 137) and combined (UKVFS Data Field 139). These fields are some of those vital in the collection of Climate Change data. UKVFS Data Field used the definitions defined by Alonso<sup>16</sup> (2002).

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<sup>16</sup> Paragraph 10.7 page 8.

### UKVFS Data Field 133 – Age Classes (Trees)

No.	UKVFS – Age Class (Trees)	
	Age Class (Trees) Category	Description
1	Regeneration or recently planted (<0.5m)	
2	Thicket (0.5 to 5m)	
3	Young (6m to 10m)	
4	Mature (>10m)	
5	Dead tree	
6	Unknown	

### UKVFS Data Field 134 – Not used

### UKVFS Data Field 135 – Age Class (Heather)

No.	UKVFS – Age Class (Heather)	
	Category	Description
1	Pioneering (up to 15 cm)	<3 years – This is the establishment phase in which heather develops from seed into small pyramid shaped plants. The height is usually less than 10-15 cm. Short (mown, burnt or grazed) swards can be included as ‘pseudo-pioneer’.
2	Building (up to 40 cm)	4-6 years – In this phase the heather forms a closed canopy. It grows up to 40 cm.
3	Mature (up to 60-100 cm)	7-12 years – In this phase heather plants become woody, with thick stems and fewer green shoots. The heather canopy begins to open up and other plant species, especially mosses, begin to increase in cover. Taller vegetation (60-100 cm) provides some shelter and cover for animal species, but too much can indicate a long-term decline in habitat quality.
4	Degenerating (up to 100 cm)	Over 13 years – In the degenerate phase the central branches of heather plants tend to die off, creating gaps in the centre of the bush in which heather seedlings may sometimes establish.
5	Dead heather	Areas of dead heather are commonly found on lowland heaths and have an ecological role in providing gaps for new colonisation. However, large areas of dead heather are not particularly valuable for nature conservation.
6	Unknown	

### UKVFS Data Field 136 – Not used

### UKVFS Data Field 137 – Not used

### UKVFS Data Field 138 – Not used



### UKVFS Data Field 139 – Soil Depth (Peat)<sup>17</sup>

No.	UKVFS – Soil Depth (Peat)	
	Soil Depth (Peat) Category	Description
1	Soil depth – 0 to -0.1m	Ground level
2	Soil depth – -0.1m to -0.5m	
3	Soil depth – -0.6 to -0.9m	
4	Soil depth – >-1m	
5	Unknown	

### UKVFS Data Field 140 – Not used

### UKVFS Data Field 141 – Maturity of Vegetation

No.	UKVFS – Maturity of Vegetation		
	Category	Types	Description
1	Trees	a. Regeneration or recently planted (<0.5m)	
		b. Thicket (0.5 to 5m)	
		c. Young (6m to 10m)	
		d. Mature (>10m)	
		e. Dead tree	
2	Heather	a. Pioneering (up to 15 cm)	
		b. Building (up to 40 cm)	
		c. Mature (up to 60-100 cm)	
		d. Degenerating (up to 100 cm)	
		e. Dead heather	
3	Peat	Soil depth – 0 to -0.1m	
		Soil depth – -0.1m to -0.5m	
		Soil depth – -0.6 to -0.9m	
		Soil depth – >-1m	
4	Unknown		

### UKVFS Data Field 142 – Not used

<sup>17</sup> Thomson (2008), Centre for Ecology and Hydrology (CEH) amendment

## DATA GROUP – TERRAIN

93. Identification of the topography of the site can aid in understanding fire spread. Hibberd (1991) defines terrain as the following; ground conditions, ground roughness and slope (as shown below). Fires tend to preferably burn up-hill as increased slope reduced the angle between the fuel/vegetation and the flames in a way analogous to wind, as used in the Wildfire Prediction System (WPS). Noting whether the fire was primarily burning up or down hill and how much variation there was in site topography allows a better understanding of the fires potential behaviour. Ground conditions and ground roughness can help researchers, wildfire responders and planners to understand the practical difficulties of fire suppression.

### UKVFS Data Field 143 – Ground Conditions

UKVFS – Ground Conditions					
Terrain Class	Class				
	1	2	3	4	5
<b>Ground Conditions:</b>	<b>Very Good</b>	<b>Good</b>	<b>Average</b>	<b>Poor</b>	<b>Very Poor</b>
Description	Dry sands and gravel	Firm mineral soils	Soft mineral or iron pans soils in drier areas	Peaty gleys in drier areas; soft mineral soils in wetter areas	Peaty gleys in wetter areas; deep peats

### UKVFS Data Field 144 – Ground roughness

UKVFS – Ground Roughness					
Terrain Class	Class				
	1	2	3	4	5
<b>Ground roughness:</b>	<b>Very Even</b>	<b>Slightly Uneven</b>	<b>Uneven</b>	<b>Rough</b>	<b>Very Rough</b>
Description	Obstacles small or widely spaced out	Intermediate	Obstacles of 40 cm at 1.5 - 5m spacing	Intermediate	Obstacles of 60 cm or more at 1.5 - 5 m

### UKVFS Data Field 145 – Slope

UKVFS – Slope					
Terrain Class	Class				
	1	2	3	4	5
Slope:	Level	Gentle	Moderate	Steep	Very Sleep
Description	0-10%	10-20%	20-33%	33-50%	50%+
	0-6°	6-11°	11-18°	18-27°	27°+

94. For example, from above data fields, a site can be described by the class number i.e. 3.2.1 that means; Average ground conditions, Slightly uneven ground roughness, Level slope.

**UKVFS Data Field 146 – Not used**

**UKVFS Data Field 147 – Not used**

**UKVFS Data Field 148 – Not used**

**UKVFS Data Field 149 – Not used**

**UKVFS Data Field 150 – Not used**

**UKVFS Data Field 151 – Not used**

## **DATA SECTION 10 – FIRE PREPAREDNESS AND PREVENTION**

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95. Fire preparedness and prevention are the actions taken to limit the adverse environmental, social, political, and economical effects of wildfire. Below are listed a limited number of preparedness and prevention methods, but when linked to incidents and operations can be used to review the effectiveness of methods and approaches. These span many aspects of preparedness and prevention work, from small Wildfire Groups to strategies and land management operations.

### **DATA GROUP – FIRE PREPAREDNESS**

96. Fire preparedness delivered by Fire and Rescue Services in partnership with numerous organisations. Listed below are numerous preparedness methods. They can be evaluated by using Effectiveness of Fire Preparedness (outcomes & systems).

#### **Wildfire Groups**

97. Wildfire Groups offer a strategic and operational framework for partnership working across organisations and can improve the fire management stages. From their actions plans they can evolve a variety of preparedness methods. It is therefore important to record wildfire incidents and prescribed burning that occurs within their area of influence.

#### ***Standard Operating Procedures (SOP) and Standardised Fire Maps and Plans***

98. Two outcomes of Wildfire groups are Standard Operating Procedures (SOP) and Fire Maps and Plans. SOP's are vital for organisations to work together effectively during incidents. To improve communication they use standardised terminology and protocols to identify hazards and form control measures and actions. Like SOPs, Fire Maps and Plans use standardised terms to ensure that all organisations spatially identify issues and provide contingency planning

in the event of a fire. These issues could effect the success of suppression strategies, such as initial attack.

### **Integrated Risk Management Plan (IRMP)**

99. Fire and Rescue Authorities use risk management planning to strategically identify the most effective preparedness, prevention and response approaches. Integrated risk management has shifted the focus in planning to put people first, looking at the risks arising from all fires and other emergency incidents, and at the options for reducing and managing them. In brief IRMPs;

- identify existing and potential risks to the community within the authority area
- evaluate the effectiveness of current preventative and response arrangements
- identify opportunities for improvement and determine policies and standards for prevention and intervention
- determine resource requirements to meet these policies and standards

### **Local Governance**

100. Our local authorities provide a wide range of services, like emptying rubbish bins, maintaining highways, running education, social services, parks and gardens and planning. These activities may increase the likelihood or be vulnerable to wildfires. They are therefore an important partner for reparedness.

### **Community Fire Safety (CFS)**

101. Research clearly shows that those most likely to be at risk from fire, and also likely to be the most adversely affected, are those in the lower socio-economic groups. In promoting fire safety, fire and rescue services seek many opportunities to work with their local communities, particularly in deprived areas (those that are most at risk) and will frequently provide facilities for groups to use and activities for local youths.

## Community Engagement

102. Considerable work has been undertaken in Australia to consult with communities vulnerable to wildfires. Taken from the Department for Sustainability and Environment<sup>18</sup> (2007) UKVFS use the following engagement categories shown in UKVFS Data Field 150 across the fire management stages (preparedness, prevention, response and recovery).

## Wildfire Training

103. Within the United Kingdom wildfire training exists for land management and Fire and Rescue Services. The development of effective training across several fields can have an important effect on the impact of vegetation fires.

## UKVFS Data Field 152 – Fire Preparedness used

No.	UKVFS – Fire Preparedness		
	Fire Preparedness Categories	Fire Preparedness Type	Description
1	Wildfire Group	a. Standard Operating Procedures	
		b. Standardised Fire Plans	
		c. Strategy	
		d. Action Plan	
		e. Measures and Indicators	
		f. Reporting	
2	Integrated Risk Management Plan (IRMP)	a. Strategy	
		b. Action Plan	
		c. Measures and Indicators	
		d. Reporting	
3	Community Fire Safety (CFS)		
4	Local Governance	a. Local Services	
		b. Local Planning	
		c. Local Policy's	
		d. Emergency Planning	
		e. Land Management	
		f. Risk Registers	
5	Wildfire Training		
6	Community Engagement	See UKVFS Data Field 169	

<sup>18</sup> Pages 14 to 15. Overall engagement objectives for different fire management activities on public land.

7	Users organisation	a. Policy	
		b. Standard Operating Procedures	
		c. Standardised Fire Maps and Plans	
		d. Strategy	
		e. Action Plan	
		f. Measures and Indicators	
		g. Reporting	
8	Other		
9	Not Known		

### UKVFS Data Field 153 – Level of Community Engagement

No.	UKVFS – Level of Community Engagement	
	Level of Communities Engagement Categories	Description
1	Informed	To provide the public with balanced and objective information to assist them understanding vegetation fires
2	Consulted	To obtain public feedback on projects, alternatives and/or decisions.
3	Involved	To work directly with the public throughout projects to ensure public issues and concerns are consistently understood and considered
4	Collaborative	To partner with the public in projects or in each aspect of making a decision
5	Empowered	To place part or all of a project in the hands of the public or enable them to make decisions that we will implement together
6	Other	
7	Not Known	An incident that could have caused an injury or death
8	None	

### UKVFS Data Field 154 – Not used

### UKVFS Data Field 155 – Not used

### Fire Plan Legends

104. Defined from the Northumberland and Cumbria Wildfire Groups, Scottish Wildfire Forum and South East England Wildfire Group the data fields below define the categories and types required.

## UKVFS Data Field 156 – Map Legends

No.	Fire Plan Legend				
	Category	Type	Operational Fire Plan	Land Management Fire Map	Description
1	Access	a. Open	Yes		
		b. Locked			Padlocked, security barrier, height restriction barrier etc.
2	Access road	a. 4 x 4	Yes		Accessible by 4 x 4 vehicles only
		b. All vehicles			
		c. +38 tonnes			For use of High Volume Pump transports etc.
3	Rendezvous Point (RVP)		Yes		
4	Permanent Water	a. Pond	Yes		Minimum 20,000l
		b. Stream			
		c. River			
5	View Point	a. Fire Tower	Yes		
		b. Look out point			
6	Hazard	a. Area	Yes		Danger Area (Live firing areas), Out of Bounds (Unexploded Ordnance), bog etc.
		b. Linear			Powerlines, pipelines etc.
		c. Point			Electricity sub-station etc.
7	Dead end		Yes		Restricted route that ends, has limited turning and could trap vehicles
8	Turning point		Yes		Hard standing for all vehicles to turn around
9	Property	a. Dwelling	Yes		
		b. Dwelling (Thatch)			House with thatch roof
10	Bridge	a. Weight/width indicated	Yes		Weight/width has been confirmed by engineers report
		b. Unknown			
11	Fuel break			Yes	
12	Fire break			Yes	
13	Waymarkers		Yes		Marked on map and site
14	Landmarkers		Yes		Local or national names marked on map and site
15	Grid reference		Yes		OS Grid reference or other system
16	Map scale		Yes	Yes	
17	Fuel types			Yes	
18	Fuel loading			Yes	
19	Fire Hydrants		Yes		



20	Major infrastructure	a. Property	Yes		See UKVFS Data Field 67
		b. Recreation			See UKVFS Data Field 68
		c. Utilities			See UKVFS Data Field 69
		d. Transport			See UKVFS Data Field 70
21	Priority area	a. Life		Yes	Risk to life (i.e. Residential homes, schools, dwellings, events etc)
		b. Property			Major infrastructure, property designated as for priority for the landowner (buildings, commercial etc.)
		c. Environment			Crops (agricultural, forestry), area designated for species and/or habitats that are a priority for the landowner etc.
23	Land owners contact details	a. Postal contact details	Yes		
		b. Telephone contact details			
		c. Mobile contact details			
24	Site location name		Yes		Unique reference name for fire map within owner series.
25	Site reference number		Yes		Unique reference number for fire map within owner series.
26	Spot heights		Yes		
27	Contour lines		Yes		
28	Northing		Yes		
29	Other			Yes	

## UKVFS Data Field 157 – Not used

## UKVFS Data Field 158 – Effectiveness of Fire Preparedness (outcomes)

No.	UKVFS – Effectiveness of Fire Preparedness	
	Effectiveness Categories	Description
1	Excellent	Delivered all outcomes
2	Good	Delivered up to 75% of outcomes
3	Fair	Delivered up to 50% of outcomes
4	Poor	Delivered up to 25% of outcomes
5	Weak	Fail to deliver any outcomes
6	Other	
7	Not Known	

### UKVFS Data Field 159 – Effectiveness of Fire Preparedness (systems)

No.	UKVFS – Impact of Fire Preparedness
	Categories
1	Extinguished fire
2	Contained fire
3	Did not contain fire
4	Made incident worse
5	Other
6	Not Known
7	None

### UKVFS Data Field 160 – Not used

## DATA GROUP – FIRE PREVENTION

### Data Field – Arson Prevention

105. Fire prevention can be conducted in many different ways. Arson Task Forces are a partnership of organisations that aim to reduce deliberate fires within their area of interest. These partnerships typically include; Fire and Rescue Services, Police force, local authorities and other organisations with interest, such as wildfires.

### UKVFS Data Field 161 – Arson Prevention

No.	UKVFS – Arson Prevention		
	Categories	Fire Preparedness Type	Description
1	Arson Task Force (ATF)	a. Strategy	
		b. Action Plan	
		c. Measures and Indicators	
		d. Reporting	

## UKVFS Data Field 162 – Effectiveness of Fire Prevention

No.	UKVFS – Effectiveness of Fire Preparedness and Protection	
	Categories	Description
1	Excellent	Delivered all outcomes
2	Good	Delivered up to 75% of outcomes
3	Fair	Delivered up to 50% of outcomes
4	Poor	Delivered up to 25% of outcomes
5	Weak	Fail to deliver any outcomes
6	Other	
7	Not Known	

## Data Field – Prevention Operations

106. Taken directly for the AFAC's<sup>19</sup> (1997) AIRS Standard, Land Management Prevention Operations covers four categories. This allow assessment on their effectiveness. The data field below provides both the categories and types used. In order to assess the effectiveness of the protection system UKVFS Data Field 166 is used to define its impact.

## UKVFS Data Field 163 – Prevention Operations

No.	UKVFS – Land Management Fire Prevention	
	Fire Prevention Categories	Fire Prevention type
1	Fire Prevention Effective	a. Firebreak, mechanical ( ploughed, graded)
		b. Firebreak, chemical (poisoned)
		c. Firebreak, cut, slashed, mown
		d. Firebreak - natural (bare earth, rock)
		e. Fuel reduced area, previous prescribed fire
		f. Fuel reduced area, previous wild fire
		g. Fuel reduced area, cut slashed, mown
2	Fire Prevention Not Effective	a. Firebreak, mechanical (ploughed, graded)
		b. Firebreak, chemical (poisoned)
		c. Firebreak, cut, slashed, mown
		d. Firebreak - natural (bare earth, rock)
		e. Fuel reduced area, previous prescribed fire
		f. Fuel reduced area, previous wild fire
		g. Fuel reduced area, cut slashed, mown
3	Other Fire Prevention	a. Other fire prevention not classified above
		b. Other fire prevention; insufficient information to classify further

<sup>19</sup> BLOCK G Wildfires (Including grass, bush and forest) – G11 Fire Prevention

No.	UKVFS – Land Management Fire Prevention	
	Fire Prevention Categories	Fire Prevention type
4	Fire Prevention	a. Fire prevention not applicable
	Undetermined Or Not	b. Fire prevention undetermined
	Reported	c. Fire prevention not reported

**UKVFS Data Field 164 – Not used**

**UKVFS Data Field 165 – Not used**

**UKVFS Data Field 166 – Impact of Fire Prevention**

No.	UKVFS – Impact of Manual Systems
1	Extinguished fire
2	Contained fire
3	Did not contain fire
4	Made incident worse
5	Improved fire fighting access
6	Hampered fire fighting access
7	Other
8	Not Known
9	None

**UKVFS Data Field 167 – Not used**

**UKVFS Data Field 168 – Not used**

## DATA SECTION 11 – FIRE RESPONSE

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107. Fire suppression provides details on the effectiveness of strategies, equipment and resources used in vegetation fires. This information is vital in the monitoring and evaluation of what systems are working against the different vegetation fire types. Listed below are the data fields selected to reflect fire suppression.

### **Data Field – FRS Called and in Attendance?**

108. This data field asks were the Fire and Rescue Service were called out and were they in attendance. If FRS are called and attend wildfires then incidents will be recorded in their Incident Reporting System. It is vital that this data field is included into fire reports as it alerts data analysts to ensure that no double accounting is made when they compile statistics.

### **UKVFS Data Field 169 – FRS in Attendance?**

Was the Fire and Rescue Services called and in attendance at the wildfire and how many appliances?

### **Data Field – Suppression Strategy**

109. UKVFS Data Field 168 defines the suppression strategies, either defensive or offensive employed during an incident. In some cases vegetation fires may require single or combinations of different strategies / attacks, especially those incidents and operations spanning a number of days. There are many Offensive Attacks types; initial, direct, parallel, flank, in-direct, hot-spotting, cold trailing and mopping up/damping down.

## UKVFS Data Field 170 – Suppression Strategy

No.	UKVFS – Suppression Strategy		
	Category	Attack Type	Description
1	Defensive Strategy	Defensive	Either a lack of resources and the protection of various assets such as lives, dwellings and other assets (including social, economic and environmental).
2	Offensive Strategy	Initial Attack	A direct attack method – an aggressive attack made by the first resource to the incident.
3		Direct Attack	A method whereby the fire is attacked immediately adjacent to the burning fuel.
4		Parallel Attack	A direct attack method - A method whereby a fireguard is constructed as close to the fire as heat and flame permit, and burning out the fuel between the fire and the fireguard.
5		Flank Attack	A direct attack method - An attack that attempts to achieve the joining of the flanks at the head by successive and/or simultaneous working.
6		In-direct Attack	A method whereby the control line is strategically located to take advantage of favourable terrain and natural breaks in advance of the fire perimeter and the intervening strip is usually burned out or backfired.
7		Hot Spotting	A method to check the spread and intensity of a fire at those points that exhibit the most rapid spread or that otherwise pose some special threat to control of the situation. This is in contrast to systematically working all parts of the fire at the same time, or progressively, in a step-by-step manner.
8		Cold Trailing	A method of determining whether or not a fire is still burning, involving careful inspection and feeling with the hand, or by use of a hand-held infrared scanner, to detect any heat source.
9		Mopping-Up / Damping Down	The act of extinguishing a fire after it has been brought under control.
10		Combination of Offensive Attacks	
11	Defensive and Offensive	Combination of Defensive and Offensive Strategies	
12	None	None	No tactics used
13	Unknown	Unknown	Tactic not reported
14	Other	Other	

### Data Field – Ease of Control

110. The defined tactics used above can be evaluated using the data field below.  
This is adapted from IRS (2008).

### UKVFS Data Field 171 – Ease of Control

No.	UKVFS – Ease of Control	
	Category	Description
1	No control	No control necessary as fire self extinguishes
2	Easy	Control easy with beaters alone, fire extinguished using beaters
3	Moderate	Control possible with beaters, sprayer held in back-up, backing fire spreads
4	Difficult	Control difficult but just maintained, firebreaks/sprayers play major role
5	Very difficult	Fire very difficult to control firebreaks and helicopter important

### Data Field – Main Actions

111. Adapted from IRS (2008), 'Main Actions' provide two levels of activities defined from the tactic employed in vegetation fires. UKVFS Data Field 170 illustrates the two levels used. These consists of five categories; None, Small means, Portable extinguisher, Other sources and Not Known. Each of these is further detailed in Main Action type.

## UKVFS Data Field 172 – Main Actions

No.	UKVFS – Main Actions		
	Category	Type	Description
1	None	a. No firefighting	
		b. Burned out (Allowed to burn under control)	Relevant to fire suppression methods and prescribed fire operations
2	Small means	a. Cutting back vegetation	Using chainsaw etc.
		b. Beating, manual stamping	Using boots to suppress the fire
		c. Smothering – use of sand, earth, snow etc	
		d. Smothering – use of fire beaters	
		e. Smothering – use of other method	
		f. Water – from bucket/containers	
3	Portable extinguishers	a. Water extinguisher	mobile unit
		b. Other vaporising liquid	BCF, CTC, CBM, HALON
		c. Foam – other than AFFF (Aqueous Film Forming Foam)	
		d. Knapsack sprayers	
		e. Combination of knapsack sprayers and fire beaters	Back mounted chemical sprayers
		f. Extinguisher – other	type unspecified
		g. Not used	
4	Other sources	a. Hosereel (low pressure) (HR) tank supply only	Including from portable or small vehicle mounted pump
		b. Hosereel (low pressure) (HR) augmented supply	Including from portable or small vehicle mounted pump
		c. Hosereel (high pressure) tank supply only – Pump	From pumping appliance
		d. Hosereel (high pressure) augmented supply – Pump	From pumping appliance
		e. Main branch/Jet (low pressure) tank supply only – Pump	From pumping appliance
		f. Main branch/jet (low pressure) augmented supply – Pump	From pumping appliance
		h. Main branch/Jet (low pressure) – tank supply only – Portable/Small	From portable or small vehicle mounted pump
		i. Main branch/jet (low pressure) – augmented supply – Portable/Small	From portable or small vehicle mounted pump
		j. High pressure fogging unit	Vehicle mounted
		k. Low pressure fogging unit	Vehicle mounted



5	Other	a. Use of existing firebreaks	Existing roads, tracks, streams, walls and wetland areas
		b. Suppression Fire firebreaks	Use of suppression fires to form fire breaks
		c. Fire lighter	Prescribed Burning and Suppression Fire tool for starting fires on the ground
		d. Airborne Fire lighting	Prescribed Burning and Suppression Fire tool for starting fires from the air.
		e. Emergency firebreaks	Use of excavator, mulcher/flails, plough and bulldozer/front loader to construct fire breaks during the fire
		f. Foam firebreaks	A foam firebreak laid during the fire.
		g. Aerial fire suppression	Helicopter and fixed wing air craft
		h. Other methods	
6	Other		
7	Not known	a. Not known	

## Data Field – Resources

112. The data field below is adapted from IRS (2008) and provides the resources commonly employed in vegetation fires. In many cases single or multiple resources might be selected for the delivery of Main Actions. Resources are a collection of personnel and machinery used to suppress the fire.

## UKVFS Data Field 173 – Resources

No.	UKVFS – Resource	
	Category	Description
1	Pumping	Fire Service or equivalent Heavy Duty Pump without 4 x 4
2	Pumping 4 x 4	4 x 4 or other off road or specialist vehicle (L4T, Unimog, Supacat etc.)
3	Pumping Quad	Quad cycle with or without trailer
4	Water management	Water carrier / tanker/ bowser supplying Pumps
5	Helicopter	Helicopter with 'Bambi' or 'Big Dipper' style bucket
6	Fixed wing	'Water bomber' fixed wing aircraft
7	Harvester or forwarder	Forestry machinery used to remove vegetation
8	Excavator	360° excavator with various bucket attachments
9	Bulldozer/Front loader	
10	Mulcher/Flail	Tractor or purpose built mulcher/flail
11	Plough	Agricultural or commercial
12	Strategic water tanks	Fixed location
13	Potable water tanks	Temporary located
14	Transport	4 x 4 vehicle
15	Other	

## Data Field – Extinguishing Medium

113. Taken from AIRS (1997) Standard<sup>20</sup>, the data field below defines what extinguishing medium was used.

### UKVFS Data Field 174 – Extinguishing Medium

No.	UKVFS – Extinguishing Medium	
	Category	Type
1	Water	Water only
2		Water with wetting agent
3		Water with retardant
4		Water with A class foam
5		Water with additive not classified above
6		Water; insufficient information available to classify further
7	Foam	Low expansion foam-protein
8		Low expansion foam-AFFF
9		Low expansion- alcohol resistant (ATC)
10		Medium expansion foam
11		High expansion foam
12		Non aspirated foam
13		Foam not classified above
14		Foam; insufficient information available to classify further
15		Compress Air Foam System (CAFS)
16	Solid	Sand
17		Soil
18		Solids not classified above
19		Solids, insufficient information available to classify further

### UKVFS Data Field 175 – Not used

### UKVFS Data Field 176 – Not used

## Data Field – Personnel

114. As shown in UKVFS Data Field 175 the personnel used in a fire are recorded. The categories shown covers; Fire and Rescue Services, land management staff, wildfire specialists<sup>21</sup>, other professionals and the general public.

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<sup>20</sup> Block F Fire Fighting: Table F6 Extinguishing Medium Codes.

<sup>21</sup> Operational, Tactical or Strategic staff specially training in Wildfire incidents

## UKVFS Data Field 177 – Personnel

No.	UKVFS – Personnel		
	Categories	Types	Description
1	Land Management	a. Land Manager	Management Staff employed by the owner
		b. Workforce	Operational Staff employed by the owner
		c. Wildfire Specialist	Accredited employee
		d. Contract workforce	Operational staff contracted by the land owner
		e. Contracted Wildfire Specialist	Contract staff contracted by the land owner
		f. Other staff	Strategic Staff - Planners, administrators and logisticians
2	Volunteer	a. Volunteer Wildfire Specialist	Accredited volunteer
		b. Other Volunteer	
		c. Prescribed Fire Specialist	
3	Fire and Rescue Service	a. Firefighter	
		b. Wildfire Specialist	Accredited firefighter
		c. Sector Commander	
		d. Command Support	
		e. Operational Support	
		f. Incident Commander	
		g. Other competent professional	Professional approved to work with FRS
		h. Other non-competent professional	Professional not approved to work with FRS
4	Other	a. General Public	
		b. Other	
5	Not known		

## Data Field – Manual Equipment

115. As with the above Data Field single or multiple manual equipment may be employed at a vegetation fire. The data field below is adapted from IRS to provide commonly employed manual equipment categories.

## UKVFS Data Field 178 – Manual Equipment

No.	UKVFS – Manual Equipment
	Categories
1	Fire beaters
2	Rakes, shovels, mattocks
3	Knapsacks
4	Fogging pumps
5	Hand portable water pumps (conventional)
6	Fire lighters (For prescribed burning and suppression fires)

## Data Field – Impact of Manual Systems

116. The Impact of the Manual Equipment employed above is evaluated in below.  
This has been taken directly from IRS (2008).

## UKVFS Data Field 179 – Impact of Manual Systems

No.	UKVFS – Impact of Manual Systems
1	Extinguished fire
2	Contained fire
3	Did not contain fire
4	Made incident worse
5	Other
6	Not Known
7	None

## UKVFS Data Field 180 – Not used

## Data Field – Fire Status

117. Adapted from County Fire Service<sup>22</sup> (2006) and Department of Sustainability and Environment<sup>23</sup> (2006), UKVFS Data Field 162 provides details on the status of the fire. This is important for fire situation reports during an incident.

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<sup>22</sup> 19. Status of Incidents.

<sup>23</sup> Chapter 4: Incident Management, Table 4.2 Fire Status

## UKVFS Data Field 181 – Fire Status

No.	UKVFS – Fire Status	
	Categories	Description
1	Going	Interim Status – A fire is expanding in certain directions
2	Not Found	Interim Status – The fire has not been located
3	Contained	Interim Status – The spread of the fire is halted
4	Under Control	Interim Status – The complete perimeter of the fire is secured, and no breakaway is expected
5	Under Control – Patrol only	Interim Status – The complete perimeter of the fire is secured, and no breakaway is expected. Control line quality or depth is such that only patrol is required.
6	Safe	Final Status – No further suppression action or patrol is necessary
7	Safe – Not found	Final Status – The fire has not been located, however it is expected that no further action or patrol will be required
8	Safe – False Alarm	Final Status – Mistaken or hoax reports
9	Incident closed	All resources have returned to home base

## Data Field – Incident Level

118. UKVFS uses two types of incident levels, Primary and Secondary. This are taken from the old FDR1 and FDR3 reports and new IRS (2008). In addition incidents that involve a significant number (over twenty) of fire appliances are given their own category.

## UKVFS Data Field 182 – Incident Level

No.	UKVFS – Incident Level	
	Incident Level Categories	Description
1	Primary Fire – Major Incident	Includes any wildfire involving casualties, rescues or attended by more than twenty fire engines in attendance
2	Primary Fire	Includes any wildfire involving casualties, rescues or attended by five or more appliances.
3	Secondary Fire	<p>Including all wildfires that were attended by four or fewer appliances</p> <p>These are reportable fires that:</p> <ul style="list-style-type: none"> <li>• Did not involve casualties, rescues or escape and,</li> <li>• Were attended by four or fewer appliances (an appliance is counted if either the appliance, equipment from it or personnel riding on it, were used to fight the fire).</li> </ul>
4	Not Known	
5	None	

## Data Field – Fire in the Open – Size

119. Adapted from IRS (2008) '*Fire in the Open – Size*' this data field defines the size of wildfires in the United Kingdom. The correspondence between IRS and UKVFS is defined in Table 9.

**Table 9 – Correspondence in Fire in the Open – Size between IRS and UKVFS**

IRS Fire in the Open – Size	UKVFS Fire Size
Large (greater than 1 hectare)	Landscape scale (greater than 1,000 hectares)
	Very large (between 100 to 999 hectares)
	Large (between 50 to 99 hectares)
	Medium (between 1 hectare to 49 hectares)
Small (less than 1 hectare)	Small (less than 1 hectare)
	Spot fire (less than 0.0001 hectare)

## UKVFS Data Field 183 – Vegetation Fire Size

No.	UKVFS – Vegetation Fire Size		
	Fire Size Categories	Description	
1	Landscape scale	A fire over 1,000 hectares	A vegetation fire with an area burnt that involves large quantities of combustible vegetation materials. Such as open areas, standing crops, forests, woodlands, game shooting heath/moor, Military Training Area (live firing and troop training), recreation sites, parks, parkland and nature reserves.  Examples: <i>Standing crops, corn fields, forest fires, heath, moor, moorland, moors, peatland, urban park, formal parkland, plantation, wood, woods or a combination of the above.</i>
2	Very large	A fire between 100 to 999 hectares	
3	Large	A fire between 50 to 99 hectares	
4	Medium	A fire between 1 hectare (>10,000 square metres) to 49 hectares	
5	Small	A fire between 0.0001 hectare and 1 hectare (<10,000 square metres)	A vegetation fire with an area burnt that involves a small area or small quantities of combustible vegetation materials. Single tree/s, Bushes, Scrub, Grass, Amenity area. Examples: <i>Hay stack, bales of hay / straw, Bush, single tree, hedge, allotment, back yard, grass, garden fire, gorse, bonfire, common, copse, embankment, field, grass, manure, park, shrubs, straw, stubble, waste, wasteland.</i>
6	Spot Fire	A fire no greater than 0.0001 hectare (1 metres by 1 metres)	
7	Ignition point	The ignition point of a fire that has no definable area	
8	Not Known		
9	None		

## UKVFS Data Field 184 – Not used

## **In Attendance**

120. In attendance is a record of the number of personnel from each organisation that attended. This covers the following organisations; Fire and Rescue Services, the Organisations own staff, Police, Military and Wildfire Partners. The numbers recorded are the total numbers for duration of the incident. For incidents that span over a number of days the total number, including re-visiting personnel are recorded. This reflects the true personnel resources incurred during vegetation fires.

### **UKVFS Data Field 185 – In Attendance**

Number of persons involved for the whole duration of the incident.
--

### **UKVFS Data Field 186 – Total In Attendance**

Total number of persons involved for the whole duration of the incident.
--

## DATA SECTION 12 – FIRE SAFETY

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121. The most important factor in vegetation fires is the protection of life. Fire Safety records instances where vegetation fires have had a negative impact on life, whether this is a fatality or injury. This information is vital for monitoring the safety of operations, tactics and strategies used.

### Data Field – Health and Safety Accident Type

122. The data field below provides categories for possible accident types. This includes 'near misses'.

### UKVFS Data Field 187 – Health and Safety Accident Type

No.	UKVFS – Health and Safety Accident Type	
	Category	Description
1	Death	
2	Injury	
3	Near miss	An incident that could have caused an injury or death
4	Other	
5	None	

### Data Field – Person effected

123. In order to determine the casualty involved in a health and safety related incident the data field below provides categories of those involved in a vegetation fire.



## UKVFS Data Field 188 – Casualty

No.	UKVFS – Casualty		
	Categories	Types	Description
1	Land Management	a. Land Manager	Management Staff employed by the owner
		b. Workforce	Operational Staff employed by the owner
		c. Wildfire Specialist	Accredited employee
		d. Contract workforce	Operational staff contracted by the land owner
		e. Contracted Wildfire Specialist	Contract staff contracted by the land owner
		f. Other staff	Strategic Staff - Planners, administrators and logisticians
2	Volunteer	a. Volunteer Wildfire Specialist	Accredited volunteer
		b. Other Volunteer	
		c. Prescribed Fire Specialist	
3	Fire and Rescue Service	a. Firefighter	
		b. Wildfire Specialist	Accredited firefighter
		c. Sector Commander	
		d. Command Support	
		e. Operational Support	
		f. Incident Commander	
		g. Other competent professional	Professional approved to work with FRS
		h. Other non-competent professional	Professional not approved to work with FRS
4	Other	a. General Public	
		b. Other	
5	Not known		

## Data Field – Cause of death or injury

124. Taken directly from IRS (2008), UKVFS Data Field 165 defines the cause of death within a range of categories. For injuries this data field should be used in combination with 'severity of injury' below.

### UKVFS Data Field 189 – Cause of death or injury

No.	UKVFS – Cause of death
	Categories
1	Overcome by gas, smoke or toxic fumes; asphyxiation
2	Burns - severe
3	Combination of burns and overcome by gas/smoke
4	Shock / anaphylactic shock
5	Other medical condition
6	Fracture
7	Other physical injury
8	Cuts/lacerations
9	Impalement
10	Drowning
11	Hypothermia
12	Dehydration
13	Heat related injury
14	Back / neck injury (spinal)
15	Head injury
16	Chest / abdominal injury
17	Chest pain / Heart condition / Cardiac arrest
18	Other
19	Not known
20	None

### Data Field – Contributing factors to death or injury

125. the cause of injury defined Northumberland Fire Group (2008) must be evaluated by contributor factors to provide further evidence.

### UKVFS Data Field 190 – Contributing factors to death or injury

No.	UKVFS – Cause of death or injury
	Categories
1	High temperatures
2	High humidity
3	Physical exertion
4	Restrictive clothing
5	Dehydration
6	Poor physical condition
7	Not Known
8	Other
9	None

### Data Field – Severity of injury

126. Taken directly from IRS (2008), the data field below defines the severity of injury sustained within a range of categories. This Data Field should be used in combination with 'Nature of Injury' above.

### UKVFS Data Field 191 – Severity of injury

No.	UKVFS – Severity of injury
	Categories
1	Victim went to hospital, injuries appear to be serious
2	Victim went to hospital, injuries appear to be slight
3	First aid given at scene
4	Precautionary check recommended
5	Not known
6	Other
7	None

### Data Field – Personal Protection (Clothing and Equipment)

127. Defined by the Northumberland Fire Group (2008) this data field identifies the category of personal protective equipment used by fire fighters and wildfire specialists.

### UKVFS Data Field 192 – Personal Protection (Clothing and Equipment)

No.	UKVFS – Personal Protection (Clothing and Equipment)	
	Categories	Definition
1	Helmet	
2	Smoke mask/respirator	
3	Goggles/face shield	
4	Overalls or long sleeve shirt & trousers	
5	Full structural fire kit	
6	Full wildfire kit	Lightweight fire retardant materials used for outdoor operations in warm conditions.
7	Boots	
8	Gloves	
9	Other	
10	None	

### Data Field – Vegetation Fire Training

128. This data field is used to define Personnel or Casualty in training. Lantra is the Sector Skills Council for the environmental and land-based sector. Working with partners they provide industry with accredited standards. Some wildfire courses may not be accredited, such as in-house training.

### UKVFS Data Field 193 – Vegetation Fire Training

No.	UKVFS – Vegetation Fire Training	
	Category	Description
1	Advanced wildfire training	To a Lantra accredited standard or FRS equivalent.
2	Basic wildfire training	To a Lantra accredited standard or FRS equivalent.
3	Advanced wildfire training	Non accredited course
4	Basic wildfire training	Non accredited course
5	In house wildfire training	Non accredited course
6	Untrained	
7	Other	
8	Not Known	

### Data Field – Escape Route

129. Taken from the Northumberland Fire Group (2008) hand book this data field identifies the category escape route possible or used.

### UKVFS Data Field 194 – Escape Routes

No.	UKVFS – Escape Routes	
	Categories	
1	On foot	
2	In a building	
3	In a vehicle	
4	Other	
5	None	

### UKVFS Data Field 195 – Not used

### UKVFS Data Field 196 – Not used

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## **APPENDIX B – CONSULTATION RESPONSE’S**

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