

# Wildfires in Wales

## Interim Report

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# Interim Report

## Information on this document

This report forms part of the Forest Research (FR) and Forestry Commission Wales (FCW) project 'Wildfires in Wales'.

This report, along with other project can be found at [www.forestresearch.gov.uk/wildfiresinwales](http://www.forestresearch.gov.uk/wildfiresinwales)

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## Abbreviations Used

FCW - Forestry Commission Wales

FDR1 - Fire Damage Report 1 (Primary Fire)

FDR3 - Fire Damage Report 3 (Secondary Fire)

FR- Forest Research

FRS- Fire and Rescue Service

LSOA- Lower Super Output Area

MAWWFRS- Mid and West Wales Fire and Rescue Service

PACT- Partnership and Communities Together (Police/Community initiative)

PONT - Pori Natur a Threftadaeth

RCT - Rhondda Cynon Taff

SWFRS - South Wales Fire and Rescue Service

WIMD- Welsh Index of Multiple Deprivation

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## Introduction to the Interim Report

The report is in two parts; the first covers the findings and progression of the first 10 months of the project. The second offers suggestions for the future shape of the project over the coming year.

Part one is structured around the research questions that were raised by the scoping report for this project, these being:

- Who are stakeholders blaming for starting wildfires in South Wales?
- Why do people think that those who are blamed are starting these fires?
- Does the socioeconomic make up of an area correspond to incidents of wildfire in that area?
- What perceptions of wildfires do stakeholders hold?
- Are the current mitigation measures working to decrease incidents of wildfire?

Each section of this report corresponds directly with one of these research questions.

Part two will use the findings demonstrated in part one, to critically assess the level of success of each research question and use current data to suggest new research questions and new methods for answering them.

## Overview of the Project

### Scoping Phase

The scoping phase of this project surveyed the available literature on the subject of deliberately started wildfires. This literature review demonstrated a dearth of information and studies both in this subject area, and in the geographical location. This clearly demonstrated a research need that had already been identified by FCW.

The literature review, while largely focusing on psychological literature, allowed for the synthesis of a typology of motivations for firesetting in South Wales. This typology has since been tested through qualitative research and holds as being fairly robust. This theoretical induction proved to be extremely valuable.

A stakeholder analysis of wildfires in South Wales demonstrated both a variety of stakeholders and suggested that there exists a disconnection between different ways of perceiving and understanding the wildfire issue in South Wales. It was recognised that the differing stakeholder positions that had been seen were needed to be investigated in greater detail.

### Case Studies

#### Case Study Communities

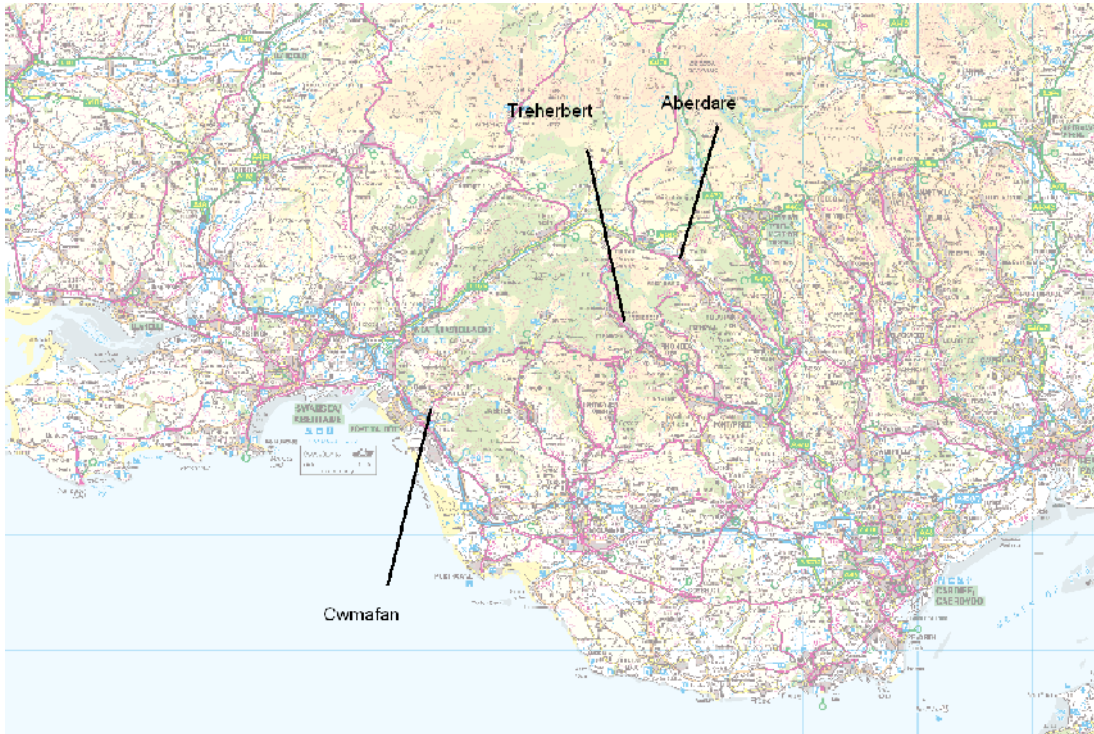
In the scoping report a number of case studies were selected, these were seen as being provisional and reliant on further analysis. The areas under study have not substantially changed, although improvements have been made to the areas.

The scoping phase led to the selection of three case study areas:

- Treherbert
- The area around Baglan Mountain
- Aberdare

GIS analysis of available fire data confirmed that fire service call outs to outdoor 'FDR3' grass or gorse fires are frequent in these areas, and that they are broadly representative of the socioeconomic areas that are most likely to see occurrences of grass and wildfires.

However there was a decision to widen the scope of one of the areas in order to gain a better understanding of the problem, and to utilise the existence of a proactive and well organised 'Communities First' funded group. As such 'The area around Baglan Mountain' now also includes the town of Cwmafan and the Lower Afan valley in which it is situated.



Map 1: Case Study Locations

The above map indicates the locations of the three case study locations.

### Case Study Interventions

The scoping report also demonstrated a need to examine organisations working to mitigate the fire risk. A number of case study organisations were selected. These have remained the same as the proposed original groups, although certain organisations have proved to be more positive in creating a viable research environment by encouraging researcher participation in day to day activities. As such the selected interventions are:

- Cwmafan Communities First and affiliated youth groups
- Chequers Youth Facility in Aberdare
- The Penyreglyn Project in Treherbert

Additionally Forestry Commission Wales and the two Fire and Rescue Services are being used as case studies. This helps to understand the institutional perspectives on firesetting, and the researcher's position as an FCW employee and colleague of FRS personnel produces an interesting and useful insight into the working practices of these key organisations.

While the selected community groups do not explicitly have wildfire prevention as primary objectives, FCW and the Fire and Rescue Services both run and fund intervention programmes that work explicitly to tackle wildfires. These interventions, including Forest Schools, 'Pain in the Grass' and 'Crucial Crew' events have been engaged with in addition to the observations and discussions with Community based interventions.

## Methods

This interim report is based on data from a number of sources. Grouping them in to four substantive areas these include:

- Interviews and Structured Discussions, including:
  - Interviews with 20 individuals from local communities, stakeholder groups and other organisations. (see scoping report for interview guides);
  - Informal discussions with institutional and community stakeholders;
  - Group conversations with community members at 3 PACT (Partnership And Communities Together) meetings;
  - A number of informal and 3 formal group discussions with children and young people local to case study areas.
- Participant observation:
  - Observations at meetings and during day to day work and at around 9 events.
- Reflexive Analysis:
  - My own research reflections.
- Spatial and Quantitative analysis:
  - Weather data provided by the Met Office;
  - Fire incidence data provided by MAWWFRS and SWFRS with additional information from FCW;
  - Welsh Index of Multiple Deprivation (WIMD) data.

## Summary

This report covers information gained from the scoping and phase one of research for the FCW project 'Wildfires in Wales'.

The findings presented below are the result of the following research activities:

- Interviews with 20 individuals from local communities, stakeholder groups and other organisations. (see scoping report for interview guides);
- Informal discussions with institutional and community stakeholders;
- Group conversations with community members at 3 PACT meetings;
- A number of informal and 3 formal group discussions with children and young people local to case study areas;
- Observations at meetings and during day to day work and at around 9 events;
- My own research reflections;
- Weather data provided by the Met Office;
- Fire incidence data provided by MAWWFRS and SWFRS with additional information from FCW;
- Welsh Index of Multiple Deprivation (WIMD) data.

A summary of the main findings is provided here, structured around the research questions of the project.

### **Who are stakeholders blaming for starting wildfires in South Wales?**

The research shows that research respondents, while often referring to 'kids' being the main firesetters in South Wales actually understand the problem as being far more complex than this. A number of potential groups of firesetters have been suggested, both in the literature, and by respondents. The following list should not be seen as exhaustive:

- Young people
- Farmers
- Residents local to the forests

- Firefighters

Most respondents appear to believe that young people, including children and teenagers start the majority of fires. This is a perception that is common to both community and institutional stakeholders interviewed as part of this project.

### **Why do people think that those who are blamed are starting these fires?**

There are no firm answers covering why people may engage in firesetting. However almost all the motivations set out in the literature gain some degree of support from local stakeholders. These include:

- Wildfires lit to create excitement or relieve boredom;
- Wildfires as 'harmless fun';
- Wildfires lit as a form of malicious vandalism;
- Wildfires lit for psychological reasons;
- Wildfires arising from uncontrolled 'controlled burns';
- Wildfires with an unclear motive;
- Wildfires set in response to socioeconomic situation.

To this list we can add, although not strictly a 'motivation',

- Wildfires set by children;

Meaning by this fires set without due knowledge of consequences and without malicious intent. Additionally we could add, although they could be considered more contentious inclusions;

- Wildfires set for financial gain, and
- Wildfires as protest against land management techniques.

These motivations should not be taken in isolation, with deliberately set fires likely to be the result of an interplay between two or more of any of the proposed motivations.

The majority of respondents express the opinion that 'boredom' is likely to be the primary motivation for firesetting, although this blanket response can be seen to hide more nuanced ideas about the motivations and drivers behind firesetting.

### **Does the socioeconomic make up of an area correspond to incidents of wildfire in that area?**

It has been found that the majority of incidences of wildfires happen in areas of South Wales that are more deprived, as measured by the Welsh Index of Multiple Deprivation (WIMD). In Coed y Cymoedd the majority of fires occur in the most socioeconomically

deprived areas. Utilising WIMD scores of overall deprivation in Wales the research divided the LSOAs that fall inside Coed y Cymoedd into five groups that were ranked by measured level of overall deprivation. Each of these 20% groupings contains around 242 LSOAs. Analysis demonstrates that a mean of 35.7% of grass, gorse and forest fires over the last nine years have occurred in the 20% most deprived areas as opposed to a mean of 6% of these fires occurring in the 20% least deprived areas.

### **What perceptions of wildfires do community members hold?**

The research has uncovered a complex range of perceptions of wildfires, from total ambivalence to acute concern. These appear to be affected by level of contact with wildfires either defined physically (relative to location of large fires) or psychologically (through employment, volunteering or other contact with groups that have a stake in the wildfire problem). The perceptions of wildfires in South Wales have been investigated in some detail by a telephone survey commissioned as part of this project.

### **Are the current mitigation measures an effective tool in tackling the problem of wildfires?**

It is difficult to judge the effectiveness of mitigation strategies. A successful mitigation strategy should result in a decrease in the number of wildfires, or a measurable change in perceptions of wildfires amongst community and institutional stakeholders. Both these outcomes are difficult to measure, not least because the main mitigating factor appears to be weather, and while it would seem that there has been a slight statistical decrease in fires since 2000 the reason for this could be weather patterns, rather than wildfire mitigation strategies.

There is a largely enthusiastic response to educational based measures, both from an institutional, and a consumer (children and young people) perspective.

Opinions relating to mitigation measures are less settled in the minds of local stakeholders, and there are a number of unresolved debates regarding the most useful methods of mitigation. One of the more controversial methods is target hardening – through increased surveillance, increased obvious land usage and creating barriers to access or fire spread.

It is also noted that there are differing perceptions of the problem, and the perceived relevance of the problem for different organisations impacts on the level to which wildfire prevention is seen as a priority.

## Part 1

### Introduction

#### The Problem

Between 2000 and 2008 there were over 50,000 FDR3 (secondary) and FDR1 (primary) outdoor fires in the South Wales Forestry Commission Wales (FCW) district Coed y Cymoedd<sup>1</sup>. Of these the majority occurred on grassland, with around 0.6% becoming FDR1 forestry or large grass fires. This still means that there were over 300 large forest and grass fires in nine years. Data from Mid and West Wales Fire and Rescue Service (MAWWFRS) over this time suggests that only 3.4% of large forestry fires and 8.6% of gorse or grass fires result from 'accidental' ignition. In this sense 'accidental' ignition means any fire judged by fire crews and investigators to have started without deliberate intent on the part of the person who set it. This can include campfires spreading out of control and other such occurrences.

The average call-out cost for each fire is said by the fire services to be around £1000. In South Wales there are on average over 5000 call-outs per year to grass and forest fires, meaning that for the nine years for which we have data around £45,000,000 has been spent on tackling grass fires. Last year (2009) South Wales Fire and Rescue Service (SWFRS) claim that the cost of fires in Rhondda Cynon Taff cost over £7 million. This suggests that deliberately started wildfires have had a significant economic, environmental and social impact in South Wales.

This project emerged from a research need identified by FCW and supported by MAWWFRS and SWFRS. Funding for a project to work towards identifying motivations for firesetting and to research the current mitigation strategies was proposed as deliberate fires in Coed y Cymoedd have been a persistent problem for decades.

#### The Report

This report takes each of the research questions posed by the scoping report and provides working answers, drawing on the interviews, observations and other research activities carried out in the first year of the project.

This report uses in part qualitative interviews with stakeholders in South Wales. Some opinions and information that have been collected and analysed include controversial ideas and some information was given 'off the record'. While all effort has been made to correctly attribute quotes and opinions, in some cases it has been decided to protect the identities of certain respondents. If quotes are not attributed to a specific person or

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<sup>1</sup> FDR1 and FDR3 Codes – FDR stands for 'Fire Damage Report' and relates to the sort of form that is filled in after a fire incident. FDR1 fires are primary fires which involve structures or property loss, although a forest or grass fire can be elevated to an FDR1 if more than 5 appliances attend the fire. An FDR3 fire is an outdoors and non-structural fire, including grass, refuse, non-inhabited structures and other outdoor fires.

organisation this will be made clear, and if a statement is the result of the reflections of the researcher this will also be noted.

## Who do stakeholders blame for starting wildfires in South Wales?

### Introduction

While it may be problematic to research the identities of firesetters, due to the legally sensitive nature of the activity of firesetting, it is possible to discover who stakeholders<sup>2</sup> in South Wales think is responsible for the wildfire problem.

Among institutional stakeholders it is assumed that people deliberately start the majority of wildfires in South Wales. Community stakeholders however, are more likely to be uncertain of the ignition source of fires. Some community stakeholders feel that many fires are the result of accidental ignition rather than being deliberate acts. The difference in opinion between these broad stakeholder groups is explored in greater detail in the 'Perceptions of Wildfires' section.

The suggestion of accidents (including broken glass, campfires and discarded cigarettes) being the primary cause of wildfires contrasts with the information that is currently communicated to communities, and many of the assumptions held by FCW, the Fire services, police and other institutional groups.

The dominant discourse suggests that the majority of wildfire setters are 'kids' or young people. However a diverse range of stakeholders believe that there are other perpetrators of firesetting in South Wales. The question of who lights fires in South Wales elicits a much more diverse range of responses than may be expected. These will be discussed in greater detail below.

This section is divided into subheadings covering the main stakeholder groups. Under each heading we discuss the types of people that stakeholder groups blame for firesetting in South Wales. Internal conflicts within the groups are also explored. There is an additional subheading dealing specifically with the most often blamed group – 'kids'. There is an emphasis placed on young people as the main perpetrators of firesetting and other antisocial behaviour, warranting a full exploration of the perceptions of stakeholders in relation to this. A diagram is used with the aim of demonstrating the different perspectives of stakeholders.

### Fire and Rescue Service

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<sup>2</sup> In this report the term 'Stakeholder' is used to refer to any individual or body which has an interest in the wildfire problem, either in terms of impacts, management or both. At some points only certain groups of stakeholders will be referred to, in these cases the terms 'community stakeholder(s)' or 'institutional stakeholder(s)' will be used to distinguish between community and institutional perspectives.

In addition to children and young people being the assumed primary firesetters farmers, men in their twenties and young girls (one senior FRS employee explained that there are more fires in girl's rather than boy's toilets in secondary schools) have all been suggested as possible firesetters by members of the Fire and Rescue Service. FRS employees working on 'Firesetter Intervention Programmes' have expressed views of firesetting that also take in to account psychological and familial stress, although the majority of their clients are young people, both male and female.

Some (three) interviewees from both services have raised the issue of firesetting by firefighters. The question of firesetting by firefighters is one that is extremely controversial, and is always referred to in the past tense as an historical problem. Senior SWFRS staff suggest that this problem has been removed by the changing of pay structures for retained fire fighters.

Two FRS staff have suggested that farmers are often responsible for firesetting, and a two have challenged the assumption that 'kids' are largely to blame for firesetting. Evidence that they have given for this includes the location of fires – being too far away from areas where kids go, and also fires being too calculated:

"They light it at the bottom there, when the wind's in the right direction, and they know it'll burn all the way up"

Operational Firefighter, near Treherbert and Tonypany area

Some FRS employees believe that the times at which fires start do not fully correspond with school times. This, they assume, means that it is not just young people responsible for firesetting in South Wales, although this does not take in to account truancy. 'Kids', firefighters have suggested, are probably responsible for smaller fires closer to houses and paths of daily activity, while those further away from areas of human habitation are more calculated fires set by older individuals.

Video evidence collected by SWFRS has shown at least four young people this year lighting fires on hillsides in the Rhondda. This evidence adds weight to the idea of fires being set by young people.

Both SWFRS and MAWWFRS run firesetter intervention programmes, and employees working on these programmes have a better understanding of the nuances of firesetting than perhaps other employees do. Their work largely focuses on structural firesetters and they do work largely with younger people. Employees on intervention programmes have suggested that while young people are responsible for much firesetting it is as a result of psychological or social stresses, and those who have been interviewed consider firesetting to be a less clear-cut issue than other stakeholders do.

## Forestry Commission Wales

There are a number of different perspectives on the identities of firesetters demonstrated in FCW. The overwhelming emphasis, as with fire service employees is on young people and 'kids'. However this is not a universally held opinion.

Discussions with a variety of FCW staff have revealed a diverse range of possible perpetrators. In casual conversation 'kids' may be a 'shorthand' for the people who cause almost any problem in the forest. But FCW staff have suggested that in addition to young people other firesetters include farmers, residents local to the forests, and even (historically) FCW staff and FRS staff.

An opinion that has also been echoed by FRS employees is that there farmers may be responsible for a number of wildfires. In an historical context this is considered to be a result of farmers being denied access to forestry land and a previous practice by the Forestry Commission of impounding stray animals at the cost of the farmer.

Today some FCW employees believe that farmers light fires in a (misguided) attempt to encourage new growth of grasses in upland areas, and these can easily get out of control. This practice of controlled burning has been observed first hand by the researcher.

The social history of the Forestry Commission is interesting. The manner in which land was acquired for planting was not always sympathetic to the feelings or desires of local communities. As a result, some FCW staff believe that lingering resentment of the Forestry Commission may drive some older residents to light fires in the woods. One employee told me that a resident living close to an area which was first planted in the 1960s had threatened that "as long as I'm alive no trees will grow here". This belief that firesetting is an act of protest against them as land is occasionally forwarded as an historical motivation that may still be relevant today. This is discussed further in the 'motivations' section.

FCW employees also recognise that there has been an issue with firefighters lighting fires in order to gain overtime payments. Previously, district staff were responsible for fire fighting on the forest estate, and as a result often gained overtime payments for fighting fires. Recent changes in Coed y Cymoedd mean that firefighting in the forests is now entirely the responsibility of the local FRS. As such FCW employees are no longer thought to be responsible for any incidents of firesetting.

## Community Group Leaders

Interviews with community group leaders have revealed that they also feel that young people are responsible for firesetting. Three community group leaders did point out the range of problems faced by many young people in Wales, and specifically in the Valleys. There was an understanding that firesetting is a problem with historical roots. One individual assumed that parents were unwilling to tackle firesetting behaviour in their children, as long as it was foliage that was being burnt. This, she assumed, was because the parents had themselves engaged in firesetting as youths and “don’t see it as a problem”.

## Local Residents

As previously mentioned the majority of respondents’ first assumption is that any deliberate fires are likely to be set by young people.

“It’s those kids over there in [local housing estate] that do it”

Elderly Resident at Partnership And Communities Together (‘PACT’) meeting,  
Blaenrhondda

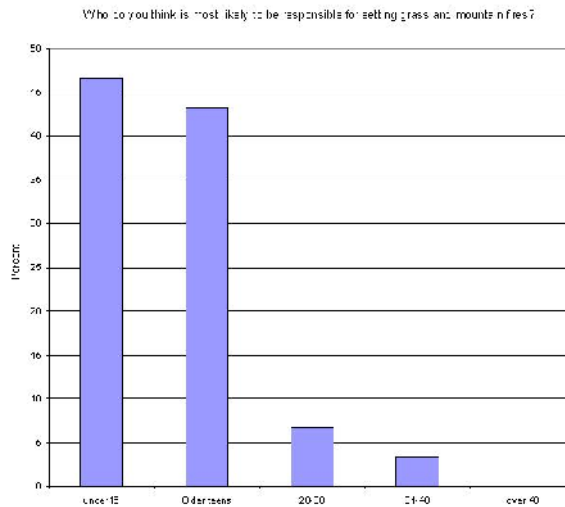
The perceptions of local residents in the study areas may be somewhat biased by the selection of PACT meetings as a way of gaining information on community perceptions. These are generally attended by older residents, and their first concerns (except for during a meeting in Port Talbot immediately after the Baglan Mountain fire) rarely focus on wildfires.

Despite these caveats, young people are once again often assumed to be the main firesetting group. This may be the result of young people being seen by many residents to be responsible for the majority of other antisocial behaviour in their neighbourhoods. The blame placed on young people for firesetting by this stakeholder group could be considered to be an extrapolation from other experiences.

Further research with this group is needed to draw out the more finely textured views relating to young people.

## Local Young People

Research conducted with children and young people, the group most frequently blamed for firesetting, sheds some light on their perceptions of wildfires. In agreement with many older community members, young people themselves suggest that teenagers and young people set the majority of wildfires.



Graph 1: Young people's perceptions of ages of firesetters

A small scale survey of young people local to two of the case study areas (ages 11-19) has shown that the majority of them feel that teenagers and those under 16 are largely responsible for deliberately started fires. The responses (n. 31) suggest that local children believe that their peers are responsible for firesetting, see graph 1, above. However discussions with local young people show that they, like other community members feel that many fires that occur are either natural or accidental in origin.

Working with a trusted community worker, interviews with a small sample of young people about their own firesetting behaviour showed that none admitted to setting fires on the mountain or in the forests near to their local area. However, with further discussion all admitted to having campfires in the woods. While this is technically an illegitimate use of FCW land these young people felt that this was something that they were entitled to do, and felt that they were out of the way and not causing trouble for other people.

"Did you ever light a fire on the mountain?"

"No, I never did that"

"Are you sure? Be honest – he won't report you, he's [the researcher] not a policeman or anything"

"Well yeah, but it was only campfires and that"

-Exchange between youth worker and young person, Aberdare

Although young people feel that their peers are to blame for any deliberately set fire they do not appear to know who these people actually are. Many of the young people who have been interviewed are happy to admit to other behaviour which could be

construed as antisocial (for example drinking and fighting), this suggests that if they were involved in firesetting they would be willing to tell someone who they trusted. The lack of concrete knowledge about the identity of firesetters could be a result of different groups of young people than those who would set fires visiting youth groups that this research has visited.

## **Police**

Although police would be seen as primary stakeholders in the wildfire issue there is little evidence that wildfires rank highly in their priorities. This is likely to be the result of the difficulty in 'proving' that a crime has occurred in the case of firesetting, and, connected to this the difficulty in collecting evidence from an outdoor fire.

The few police who have been spoken to as part of this research have either been engaged with running PACT meetings, or have been specifically running anti-wildfire initiatives.

Along with other stakeholder groups it is common for police officers to assume that young people are largely responsible, although, in line with some opinions expressed by members of the FRS the sophistication of certain fires to them demonstrates that older people are likely to be involved in some fires.

In the coming phase of research more contact should be made with police services in the case study communities to better understand their perspectives on the wildfire issue in South Wales.

## **Why are 'young people' blamed for firesetting?**

The most commonly suggested group of firesetters is 'kids'. This is partly due to an idea, which is not universally agreed with, that firesetting is something individuals do at a young age, as a 'rite of passage' (an idea expressed by people in all stakeholder groups) before growing out of it. As with other low-level antisocial behaviour there is a perception that it is the young who are mostly responsible. It is interesting to note that among many (older) stakeholders, from community members to FCW and FRS employees 'kids' are used as a scapegoat for nearly all low level antisocial behaviour in communities and forested areas.

Residents groups which have been interviewed as part of this research have suggested that 'kids' are responsible for much of the low level crime in their given areas. In casual conversation Forestry Commission employees often summon up the image of 'kids' to explain much vandalism in and around forested areas, including off-road biking, littering and other problematic behaviours.

## Conclusions

It must be remembered that the number of people who are involved in firesetting is likely to be only a small minority of the population. With a mean of around 5000 grass, gorse and forestry fires reported per year in Coed y Cymoedd (mean taken from fires over the last ten years, 2000-08), this means that only a small number of individuals at any point are engaged in firesetting. The population of Coed y Cymoedd is around 1.6 million people meaning that there are 0.004 fires per head of population on average each year (a range of 0.0025 to 0.007 over the last ten years).

Who is being blamed for firesetting in South Wales?

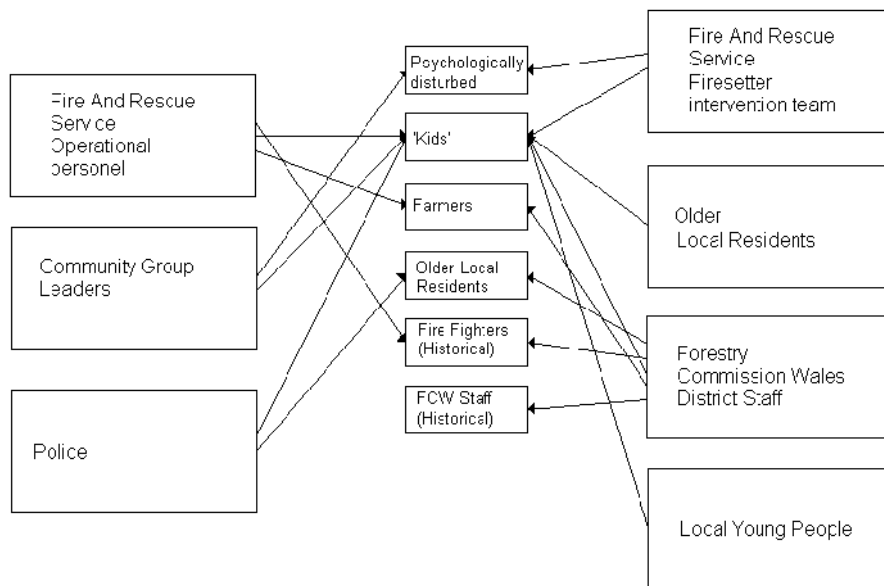


Figure 1: Who are stakeholders blaming for firesetting?

Figure 1 demonstrates the diverse nature of perceptions of responsibility for firesetting in South Wales. While the majority of mitigation measures are focused on young people this suggests that a more holistic and balanced approach should be taken to firesetting. While local residents and other agencies suggest that young men are largely the perpetrators of firesetting this perception is balanced by a more general view of firesetting from institutional stakeholders. This wider and more nuanced view of the issue should perhaps be more effectively communicated to local communities in order to encourage better understanding of the issue of wildfires.

## Motivations for firesetting

A review of relevant literature has revealed a number of different potential motivations for firesetting both for wildfires and urban structural fires. From the wide variety of motivations that have been put forward in the largely psychological literature on firesetting, a few potential motivations were selected for research as being the most likely in the context of South Wales:

- Wildfires lit to create excitement or relieve boredom
  - This category includes 'competitive' firesetting and group activity. Also includes fires set in order to encourage a fire engine or helicopter to respond.
- Wildfires as 'harmless fun'
  - Fires set by those who would not normally engage in antisocial behaviour, including those who are curious.
- Wildfires lit as a form of malicious vandalism
  - Maliciously set fires by those who may also engage in antisocial behaviour, higher level of planning, perhaps using vehicles for access and accelerants (eg. Petrol, lighter fluid, constructed incendiary devices, etc.).
- Wildfires lit for psychological reasons
  - Including as a 'cry for help', the result of psychological disorders or as a response to social or familial stresses
- Wildfires arising from uncontrolled 'controlled burns'
  - Fires set by farmers or landowners that are carelessly managed and get out of control.
- Wildfires with an unclear motive

Throughout the intervening months two additional motivations were added to flesh out our understanding of firesetting. These were:

- Wildfires set by those who do not fully understand the consequences of their actions, and those set out of curiosity.
  - This includes fires set by children
- Wildfires set in response to socioeconomic situation
  - Fires set in areas of socioeconomic deprivation, perhaps out of a sense of anomie, protest or desperation.

All these potential motivations, it is assumed, should not be taken in isolation from one another. Rather, the literature review and qualitative research has suggested that a mixture of motivations is likely to be at play in any one incident of firesetting.

The first phase of research has demonstrated that not all stakeholders agree with all the proposed motivations for firesetting. However, each of the proposed motivations have been identified by stakeholders. Many stakeholders are keen to suggest, in line with the literature, that it is unlikely that only one motivating factor or driver contributes to firesetting behaviour.

The research has so far shown that 'boredom' or the creation excitement is the primary motivation for firesetting identified by the majority of interviewees. There is a high level of agreement on this motivation (among local young people the majority - 46.3% (responses n. 41) felt that boredom was the primary motive for firesetting). It could be persuasively argued that boredom is likely to be rooted in other issues, such as lack of resources, employment opportunities and effective service provision. In areas of social deprivation there is the potential for less social cohesion and a lack of activities provided for groups and individuals, as well as a lack of economic capital available for individuals and groups to mitigate against 'boredom' for themselves. This, coupled with an apparently historical 'normalisation' of firesetting could be a major driver for firesetting in South Wales.

Other important motivations for firesetting identified include intoxication (something that is not mentioned in the proposed typology), vandalism (itself, perhaps, a method for individuals to mitigate against boredom), the 'traditional' nature of firesetting in the area and (misguided) land management.

In addition to this, the socioeconomic situation of many people living in Valleys communities should be taken into consideration. Local residents have warned me not to over romanticise or over emphasise ideas that firesetting is in someway a conscious act of protest against a seemingly difficult socioeconomic situation which individuals do not have the power to change. The connection between socioeconomic context and firesetting will be discussed in greater detail below.

A number of older respondents have expressed the opinion that local children no longer play on the 'mountains' and in the forested areas but in someway seek to destroy them. This perception may be the result of nostalgia clouding memories of older residents in the Valleys. The majority of young people that have been interviewed in the case study communities claim to be both enthusiastic and frequent users of their natural surroundings – albeit not necessarily in 'legitimate' ways.

'Playing for these kids is a *playstation*, we used to be up on the hills all day, you just don't get that anymore'

- Senior operational firefighter, Rhondda.

Research findings will be used to revisit and discuss motivations proposed in the literature on firesetting. It should be noted that only a minority of individuals in any community will be likely to engage in firesetting. The ideas expressed in this report are not meant to generalise to entire communities or groups, but aim to help understand firesetting motivations for those who do engage in such behaviour.

### **Wildfires lit to create excitement or relieve boredom**

This is perhaps the motivation that is most often raised by stakeholders. However the concept of 'boredom' could in itself cover a variety of different emotions and contributing factors, both internal (psychological) and external (social). Further reflection on this point, and specifically the assessment of what individuals understand and mean by 'boredom' could prove both interesting theoretically, and useful on a practical level. An exploration of 'boredom' and what is meant by it will pose an interesting research question in the second phase of the research.

It is observable that in the majority of towns in the Valleys there is a lack of organised and popular activities for young people. This lack of services (real or perceived) could be seen to contribute to this issue of boredom, feeding the associated antisocial behaviour and firesetting in a given area.

### **Wildfires as 'harmless fun'**

There is a perception held by some community members, as well as by FRS employees, that wildfires are not a serious problem. One FRS employee has suggested that some of his colleagues consider wildfires to be "just something that kids do" and not something that should be worried about.

For some people there is a feeling that firesetting on the mountains is an integral part of a Valleys childhood, with stakeholders suggesting that people tend to think that:

"My dad did it, his dad did it, I did it, so why shouldn't my kids do it? ... I think that if it was a shed, or a house or something that they were burning then they'd have something to say about it. I think most people don't think grassfires are that important"

Communities first employee, Treherbert

This statement is from an employee from 'Communities First' who was trying to explain why some people may not see firesetting in forests and on grassland in the Valleys. However, this research has not directly interviewed anyone holding this opinion.

Stakeholders, when questioned about firesetting in their local area (either where they live, or where their work covers) feel that those who set fires might believe that their actions are unimportant or harmless. However, it is also recognised that some wildfires are far from harmless. As one man, who openly admitted to setting fires in his local wood as a child said:

“It was just a bit of fun, but its terrible now I think about it ... It was fun though!”

### **Wildfires lit as a form of malicious vandalism**

Whether or not vandalism is the result of malicious intent is debatable. Local young people are seemingly unconvinced that fires are the result of deliberate and malicious vandalism. As previously mentioned, not only children, but also adults feel that ‘boredom’ is the primary motivation.

FCW employees are more likely than community stakeholders to suggest that vandalism is a driver for firesetting, not only on FCW managed land, but also on land surrounding communities. There are related forms of vandalism and antisocial behaviour in forested areas, especially involving damage to barriers, signage and other managed areas. Whether or not this is ‘malicious’ FCW, as landowners, are likely to be more attuned to the idea of firesetting as vandalism than other stakeholder organisations.

### **Wildfires lit for psychological reasons**

people who work for FRS-run firesetters intervention programmes engaging and working with people showing an unhealthy interest in fire have been interviewed. These people, who have sustained contact with firesetters (mostly their firesetting has occurred in urban and structural environments) state that many of their clients are suffering from a variety of psychological problems that may not be directly linked to their firesetting, but may well contribute to such behaviour. That is not to say, they stress, that all people with psychological issues are prone to firesetting behaviour, and neither do all firesetters suffer from mental ill health.

An interview with a community worker who had had contact with a young man who was known to be a firesetter told me that he was

“caught setting mountain fires, but he died of a drugs overdose before he could go to court. You could see he wasn’t right from the look in his eyes”

Communities First Employee, Treherbert

This idea that firesetters are ‘not right’ is echoed occasionally by other stakeholders who have been in contact with young firesetters.

### **Wildfires arising from uncontrolled 'controlled burns'**

One suggestion from a number of sources is that wildfires are the unintended result of farmers engaging in controlled burning as a method of encouraging new growth of grass. There is a season in which this is permissible and farmers are obliged to inform the FRS of controlled burns. However this is not always adhered to and firefighters have described a number of upland blazes each year that are the result of farmers burning grass, without prior notification, and without proper precautions. The researcher has also observed this sort of upland blaze.

Some interviewees within the FRS and FCW have proposed that fires started by farmers act as a beacon that encourages other locals to light fires. FRS employees report attending blazes where it is 'obvious' that the perpetrator is a local farmer, although they feel that they are largely unable to prove this.

The second reported type of wildfires arising from controlled burns are those which 'escape' from campfires or barbecues. These fires can spread from carelessly disposed or extinguished fires, or reportedly burn down into root systems before re-emerging elsewhere. While some stakeholders, specifically community members, hold that this is a major cause of wildfires in South Wales, it is a cause of wildfires that FCW and FRS staff do not consider to be as likely as deliberate fires. According to one FCW employee

"People say that you can have fires from barbecues, but I don't think that is the case. There was a fire up on the Forest Drive, but the people who started it noticed and called us to put it out. If it's an accident people notice."

Local Area Forester

### **Wildfires with an unclear motive**

This 'motivation' could well be seen as the main one. There is, it would appear, in most people's mind few rational reasons for wanting to set light to wild areas.

### **Wildfires set by those who do not fully understand the consequences of their actions, and those set out of curiosity.**

This motivation includes fires set by children, and is something that is often included in the literature in typologies of motivations as a separate 'motivation'. By this it is meant that children perhaps have less understanding of the consequences of their actions.

While the assumption is that young people set the majority of wildfires this 'motivation' is meant to cover incidences of firesetting largely arising from curiosity about the fire.

'everyone goes through a phase of lighting fires, don't they? But some people, there's only a few, they take it too far. I used to go to do it on the beach, light a fire and chill out'

'A camp fire?'

'Yeah, more like a campfire, we wouldn't let it get out of control'

- Conversation with 19 year old Cwmafan resident.

This is something that is echoed elsewhere in Coed y Cymoedd. Local young people will tell you that they 'don't light fires' although they do have campfires in their local woods. Many of them appear confident that they know well enough how to control a fire, and they do not misuse it. These campfires apparently are often combined with having a drink, and staying out with friends. The attraction of this appears to be that the woods provide shelter both from prying eyes and the elements.

This controlled firesetting, although illegal on FCW land, is largely harmless. Some FCW staff are more permissive in their attitude to these young people using FCW land for camping and campfires, while others are more guarded about accepting such behaviour. Others feel that it is entirely unacceptable. This suggests that there could be a benefit in standardising FCW responses to camping and campfires on FCW land, although this has the potential to cause issues around public liability and the need to control such behaviour.

### **Wildfires set in response to socioeconomic situation**

Previous research has demonstrated that there is an increase in incidences of fires in areas that are ranked as being relatively socioeconomically deprived. This research supports these findings. We do not mean to suggest that 'poor people commit arson' but rather that increased incidents of firesetting come about as a result of societal, rather than individual failings.

Socioeconomic deprivation is a motivating or driving factor for firesetting that has been discussed relatively fully in the literature, and will be addressed more fully in the next section that specifically addresses the question of firesetting and socioeconomic context in Coed y Cymoedd.

### **Additional Motivations**

FCW employees have expressed the opinion that fires may be set as a form of protest against land managers and management techniques. It is thought that some residents

dislike certain practices including unthinned (non-native) woodlands, trees backing on to houses and a lack of managed access to forests, and this may encourage firesetting. Some FCW staff are adamant that this could be a motivation for firesetters and can even be seen in part of a Forest Design Plan, where the author has written:

“Fires have actually opened up the continuous forest canopy itself, reducing tree density and introducing a mosaic of open space! In areas where access for woodland management has to date been problematic one can argue that at least the aftermath of this unwelcome activity has ultimately improved the crop’s appearance.”

Blaenrhondda Forest Design Plan 12/4/2002

However a number of community stakeholders swiftly and entirely dismissed the idea of wildfires lit as an act of protest. They do recognise, and this is something that I, as an FCW employee have noticed, that there is a degree of animosity in some quarters towards FCW, but as one woman put it

‘I doubt that they know they’re setting fire to Forestry Commission land, I don’t think they care where it is, or who owns it.’

Furthermore one motivation for firesetting that was synthesised from the literature review – firesetting for profit, has not really emerged as a motivation, except when connected to firesetting by firefighters or Forestry Commission Wales employees who may wish to gain overtime payments. Employees of stakeholder organisations setting fires is something that is only ever referred to in the past tense, and is considered to be a problem that has been tackled. It may be interesting to further explore this issue, but is an avenue of research that may prove difficult to take, given the institutional positioning of this research project.

One research question arising from this section which should be explored in the next phase of research is to ask

- What do people mean by boredom – and how does this contribute to firesetting?

## Does the socioeconomic ranking of an area correlate to incidents of wildfire?

Analysis of spatial data provided by SWFRS and MAWWFRS allowed for fire incidents to be correlated with the socioeconomic make-up of the location in which they occur. This stage of the analysis utilised arcGIS software to create fire location maps. These maps were then overlaid with data from the Welsh Index of Multiple Deprivation (WIMD).

The fire service data provided included information on outdoor 'FDR3' fires and also on forestry fires that came under the category of 'FDR1' Fires. The excel files were converted into database files which were then spatially referenced using the eastings and northings provided in the data. The analysed data covers the years 2000 to 2008.

The WIMD allows analysis of a number of different indicators of deprivation, these include education levels, health and environmental indicators among others. All the indicators are statistically linked allowing for an 'overall' level of deprivation. The overall level of deprivation data was used in the first instance. This was chosen as a good summary of different levels of deprivation. The most fine grain level that the WIMD is available at is that of the Lower Super Output Area (LSOA)<sup>3</sup>.

Fire location data were laid over a map of the Coed y Cymoedd district and only fires that occurred in the boundaries of the forest district were selected. Data from SWFRS and MAWWFRS were recorded slightly differently, but advice from data specialists from the organisations allowed for the selection of comparable fire incidents.

The analysis began by dividing the WIMD overall deprivation score for all LSOAs in Wales into five equal groupings of 20% (equalling 379 cases each for four sets and 380 cases for one set). This demonstrated that 330 of the 380 most deprived LSOAs, as indicated by the WIMD fall within the boundaries of Coed y Cymoedd. See figure 2

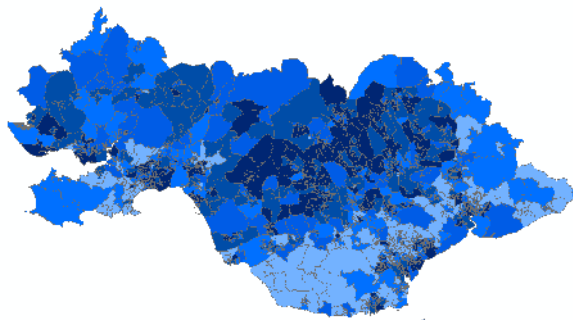


Figure 2

<sup>3</sup> LSOAs are statistical geographies used by the Office for National Statistics (ONS), The LSOA is stable over time and contains around 1,500 people, being constructed from 4-6 Output areas.

This analysis indicated that the majority (around 45%) of fires occurred within the most deprived areas of Coed y Cymoedd. However this analysis failed to take in to account that Coed y Cymoedd contains the majority of most socioeconomically deprived LSOAs in Wales.

To address this bias of a greater number of deprived LSOAs being in Coed y Cymoedd, and hence a bias towards the number of fires recorded in more deprived areas being artificially inflated the ranking of the LSOAs in Coed y Cymoedd by relative deprivation was recoded.

This recoding resulted in the map looking slightly different, see Figure 3, and improved the analysis of recorded fires by relative level of overall deprivation inside the Coed y Cymoedd forest District.

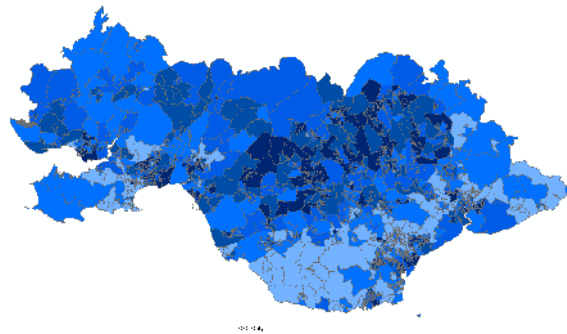
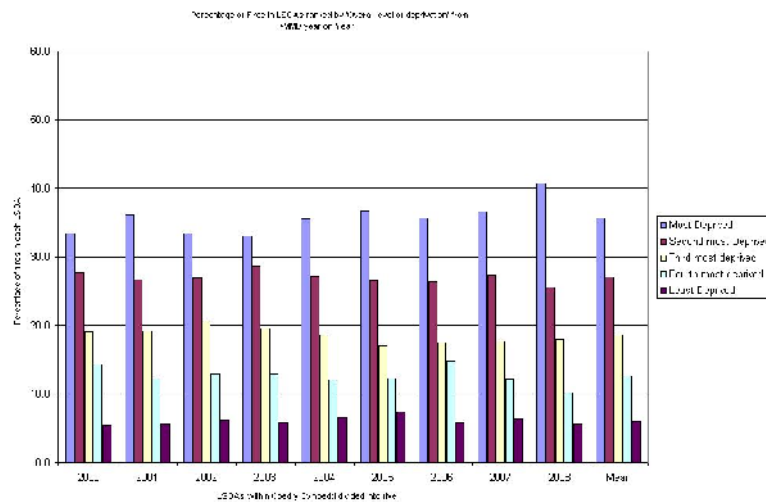


Figure 3

The resulting output still demonstrates a propensity for fires to occur in more deprived areas, although this is slightly less pronounced than in the previous analysis. Percentages of recorded outdoor grass, heath and forest fires in each area demonstrates that over the last nine years there has been a similar percentage of recorded fires in each 20% division of LSOAs in Coed y Cymoedd (with small fluctuations from the mean). This can be seen in Graph 1.

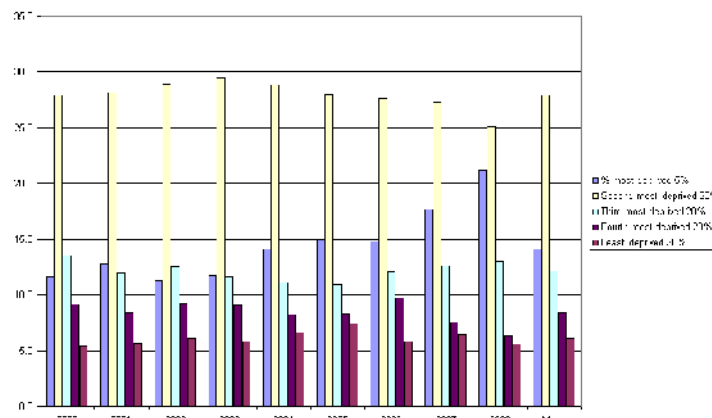


Graph 1: Percentage of fires in LSOAs by relative deprivation

Previous research has demonstrated a link between indicators of socioeconomic deprivation of an area and incidences of fires, although this research has been largely based on urban structural fires and arson (Jennings, 1999; Eccles, 2001 and Corcoran et al., 2007). This is the first analysis of its kind to focus specifically on outdoor fires.

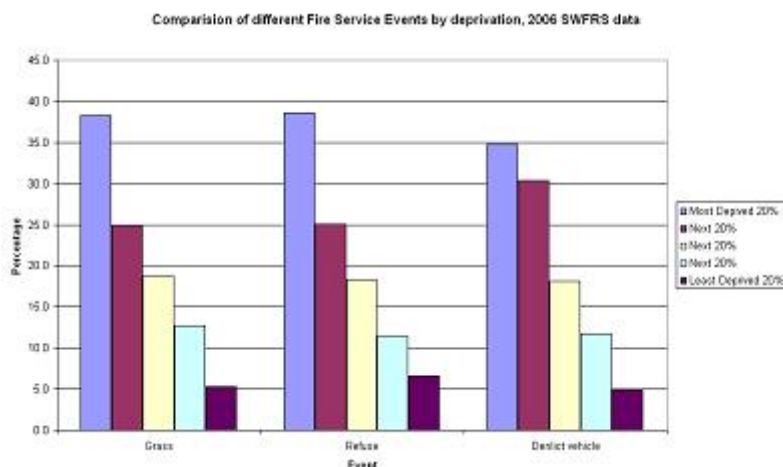
Our research supports these previous findings. Over the nine years for which spatial information is available the percentage of fires as ranked by location demonstrates that a mean of 35.7% of fires occur in the 20% most deprived LSOAs in Coed y Cymoedd.

Similarly if just those recorded fires in the 5% most deprived LSOAs are taken in to consideration there is a significant increase over time of the amount of fires being recorded in these areas (seen in light blue on the graph below). For example, the recorded percentages for 2008 demonstrate that of the 40.7% of fires that occurred in the 20% most deprived LSOAs in Coed y Cymoedd, 21.2% occurred in the 5% most deprived LSOAs. This means that over half of all the fires in the most deprived 20% of LSOAs occurred in the 5% most deprived LSOAs.



Graph 2: Percentage of fires in LSOAs by relative deprivation. Including most deprived 5%

While these findings are interesting, the analysis should be treated with caution. The majority of deprived areas in Coed y Cymoedd are areas closest to areas of forestry and grassland, which means that issues of access could be at play here. Furthermore this should not be seen as a specifically causal relationship – the fires that occur in each LSOA are not necessarily set by people living in that LSOA. People are unlikely to know the boundaries of statistical geographies in which their daily activities take place. However, simple analysis of other fires (refuse and car fires) demonstrates a similar, with minor differences seen in car fires, pattern of locations within LSOAs.



Graph 3: Grass fires compared with other FDR3 fires by relative deprivation, 2006 SWFRS data only

While this section gives a brief overview of the findings it is hoped that a more in-depth analysis of how the socioeconomic indicators of an area impact on incidences of fires in that area will form a future output of this project.

This analysis suggests that there are potential future research questions for this project to approach. These future questions aim to address gaps in the analysis conducted to date.

- Do other low level crimes and antisocial behaviour have similar relationships to relative deprivation?
- Does opportunity to light fires (availability of areas of grassland and forestry) have a relationship with relative deprivation levels?

## Perceptions of wildfire

Perceptions regarding who sets fires, and why they do it, have been discussed above. This section, however seeks to draw out wider perceptions, most notably the relative standing of wildfires as a problem in relation to antisocial behaviour and other social problems in a given local area.

Research to date demonstrates the potentially unhelpful nature of the description of wildfires as 'wildfires', It is also suggested that there is an issue of low levels of lasting significance attached to the problem of wildfires by residents in South Wales. It would appear that unless an individual thinks about wildfires frequently (out of necessity of employment, volunteering or proximity to an area that is regularly burnt) then it is easy, for some, to forget wildfires.

Fires occur regularly in Coed y Cymoedd and stakeholders are, largely, aware of this. However, even amongst those who live in areas affected by wildfires there is a surprising amount of ambivalence demonstrated, especially by community stakeholders. It could be suggested that unless people have been personally affected by an incident of wildfire they do not view it as a specific problem.

Individuals who live in South Wales but who do not work for an agency directly or indirectly working to mitigate against firesetting, or who do not live in direct contact with an area of land where fires have occurred have expressed surprise that wildfires pose a problem in South Wales. This ignorance of the problem is more frequently seen in areas of Coed y Cymoedd that are more urban.

Additionally many people express the view that wildfires are something that happens to other people. Specifically 'wildfires' are seen as an Australian or American problem, and are not equated with the mountain, grass and forestry fires seen in South Wales. This may be a result of the use of the word 'wildfire'. There is an ongoing debate, especially amongst FRS employees as to the validity of using the term 'wildfire' to describe the 'wildfires' in South Wales. Often the term Grass- or Mountain-fire is used to describe the same phenomena, and one suggestion, provided by a fire and rescue service from outside South Wales is the use of the term 'environmental arson'.

Demonstrating the potential need for a more locally relevant term in place of 'wildfire' is an exchange with a group of young people local to Cwmafan. The question whether or not they had seen wildfires in their local area was raised. Initially one boy denied ever having seen a wildfire, despite a large one burning for more than a day close to his hometown earlier in the year. Once another child described the Baglan mountain fire to him as a 'wildfire' he appeared surprised that that was what we were talking about:

Researcher "Have you ever seen a wildfire?"

Respondent 1 "No, they happen in America don't they?"

Respondent 2 "Yeah you have, you saw Baglan mountain"

Respondent 1 "oh, that - yeah I seen that before, you mean that do you?"

- Conversation at 'Disco Inferno', Cwmafan.

This may merely prove ignorance on the part of the individual, but is symptomatic of a wider perception of wildfires as either not occurring locally or a level of confusion over their naming as 'wildfires' rather than something more descriptive of the (relatively) small area which is burnt. A young girl (14) in Cwmafan, when asked about wildfires dismissed them entirely: "I don't want to talk about that, it's boring".

Noise, theft, violence, drug use and dog dirt are all ranked more highly as issues for individuals from a small scale survey of local community members, and discussions at PACT meetings. The location of fires in this context is important. People who have seen a fire at a distance (even a very short distance) are more relaxed about fires. Even people who live in close proximity to areas that are routinely burnt express an almost grudging acceptance that that is just what happens, or perhaps locals are desensitised to fires due to their frequent occurrence in certain areas of South Wales.

The lack of concern regarding wildfires may also relate to a lack of knowledge on the part of some stakeholders. This lack of knowledge about wildfires has been seen to manifest itself in two ways, either total ignorance of the problem, or a denial that the problem is one which is caused by people.

Some research participants outside the main study areas have expressed surprise that there is a wildfire problem in South Wales. Furthermore people who have expressed surprise about the wildfire issue do not necessarily live far away from the 'hot-spot' of the valleys.

The diagram below demonstrates the main factors influencing an individual's attitude towards wildfires in South Wales that are apparent from discussions with research respondents. Engagement with wildfires as an issue is based on location and relevance of fires to you, either socially, or as relates to employment.

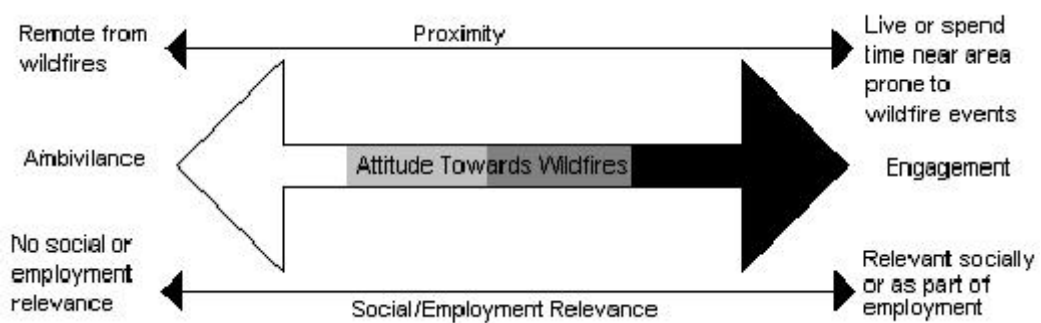


Figure 4. Influences on perceptions of wildfires.

Similarly, some people believe that wildfires are a natural occurrence, rather than being deliberately caused by people. Some respondents have expressed the opinion that "that was started by sunlight through a bottle or something, I don't think someone meant to do that" (Man in early 20s, Aberdare), or that "they're mostly natural, right?" (Similar opinions expressed by two men in Neath Valley). This demonstrable lack of understanding or interest in wildfires is perhaps significant because it suggests that better information delivered to stakeholders in South Wales, and perhaps a more

relevant term, could aid the tackling of the wildfire problem by raising awareness of the issue.

An interview with a long serving fire and rescue service employee revealed an interesting perception of wildfires. He explained that FRS operational staff really dislike tackling wildfires.

“We’re trained for house fires, road traffic collisions, that sort of thing. That’s what we live for. I’m not saying that I want people to crash their cars or get in a fire, but that’s what we’re trained to do. Fighting grassfires is just boring, trudging up a hill, getting hot, that’s not what we train for. It’s not fun”

Opinions regarding wildfires as expressed by those who have more direct experience of wildfires is varied, and some people express contradictory views. E.g. coupled with the blasé acceptance of wildfires exhibited by some residents local to areas which are prone to burning there is anger that not enough is done to work towards a cessation of wildfire incidents. Land managers and specifically Forestry Commission employees bear the brunt of blame for these perceived failings in managing potential wildfire risk.

“The council have been great, but the Forestry [Commission], I’ve rung them up every year, and they’ve not done anything. This time [during the last big fire] it was right up to our garden... It’s only a matter of time”

Resident of Baglan Mountain, 54, whose house was threatened by wildfire

The variety of opinions demonstrated by community stakeholders is also demonstrated in institutional stakeholders. The personalities of individual employees have as much to do with attitudes towards wildfires as the organisation to which they belong.

A telephone survey looking at perceptions of wildfires in the area of Coed y Cymoedd has been commissioned and will report in mid December 2009 to January 2010. This will be written up in an accompanying report. This will be the first survey of its kind and will increase understanding of the ways in which residents of South Wales think about fires in their local areas. The spatial location of these results, alongside socioeconomic indicators will allow for analysis of the perceptions of wildfires that residents from different areas and backgrounds hold in relation to these variables.

### Future Research Questions

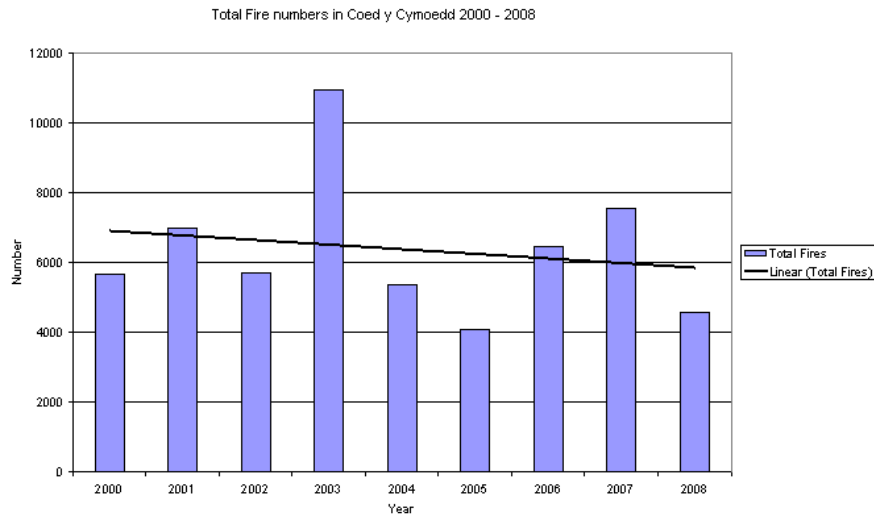
- Do community stakeholders feel that the information that they receive about wildfires is accurate and useful?
- How well do institutional stakeholders feel they provide wildfire information?

## Are the currently employed mitigation measures an effective tool for tackling the problem of wildfires

### Introduction

Over the last nine years fire service data has demonstrated that there were between 4068 (in 2005) and 10951 (in 2003) FRD3 grass or gorse fires and FDR1 forestry fires inside the boundaries of Coed y Cymoedd (mean over nine years 6368). The number of fires is largely mitigated by weather; an issue that is covered more thoroughly in the section 'Additional findings'. In 2003, the driest year for the nine years that we have both fire and weather data there was a significant spile in recorded incidences of outdoor fires.

It is extremely difficult to assess the effectiveness of mitigation strategies in tackling wildfires. There are many potential variables that could encourage or discourage firesetting. These range from environmental factors (weather, availability of flammable flora) to social factors (presence of diversionary activities, relative deprivation levels) and also psychological factors (relating to the mental health of both perpetrators and their surrounding peer-, social-, family- and other groups). As such it is hard to develop a base rate from which to measure increases or decreases in recorded wildfire incidents and to see how interventions have impacted on this. A linear trendline added to a graph of fire occurrences year on year since 2000, suggests that there is a small statistical decrease in wildfires in South Wales. Whether this is the result of successful mitigation strategies or merely wetter weather over the previous few years, is debatable. The number and timing of various mitigation strategies make it difficult to plot against incidents of firesetting. This, however, may form an interesting research question for the second phase of the project.



Graph 4: Fires in Coed y Cymoedd 2000 –2008 with linear trend line.

This section discusses the various observed direct and indirect mitigation measures employed in South Wales

There are a number of potential methods for mitigating the wildfire problem in South Wales. Different agencies take slightly different approaches to the problem. Some delivered in partnership, others working independently from other measures. However, there is also a degree of disagreement within and between agencies as to the effectiveness of certain mitigation strategies.

The literature review allowed the synthesis of a typology of mitigation measures. These can broadly be grouped under the following headings:

- Diversionary Tactics
- Education
- Interventions with firesetters
- 'Target hardening'

Each of these research categories is discussed below. The discussion includes institutional and community stakeholder perspectives on each measure, observed examples of effectiveness and statistical analysis of changes in the number of incidences of firesetting. The section finishes with a discussion of research findings relating to disagreements concerning the effectiveness of some mitigation strategies.

## Diversionsary Tactics

One way of preventing antisocial behaviours is by creating alternative activities that are preferable to, convenient for, and appealing to the target audience. There are projects run in all of the communities under study that could be considered to be 'diversionary'. However, unless instigated by the FRS these 'diversionary' activities are unlikely to have the prevention of wildfires as a primary outcome.

Although reduction of wildfires is not a stated aim of most community groups in South Wales it is something that has reportedly been an almost 'accidental' outcome of at least one community group's activities. The possibility of funding for anti-arson events has encouraged a certain amount of work by Communities First groups in the Valleys area. This is especially demonstrated in Cwmafan and the Afan valley, who have run bushcraft days and youth discos with the help of anti-arson funding from MAWWFRS.

The claim by leaders at the Penyrenghlyn project that their ownership of a small area of woodland resulted in a decrease in fires and other antisocial behaviour in the vicinity of their centre was countered by perceptions expressed at a local PACT meeting. Other local residents assumed that firesetting in their local area, as well as other antisocial behaviour, such as vandalism, graffiti, nuisance noise, was caused by children and young people from the estate served by Penyrenghlyn. This ingrained perception of young people as trouble makers could be a product of the generational divide between one group and the other, rather than a true reflection of fact.

Arguably the provision of welcoming, convenient, open and affordable indoor recreation spaces for children and young people can reduce antisocial behaviour and associated behaviours, not least firesetting, even if it is not a formal objective of the intervention.

Other attempts at diversionary activities, such as outdoor pursuits for potential firesetters during likely spate conditions have been made. However the one example of this that was scheduled this year was cancelled. SWFRS, with backing from FCW proposed an overnight camping and bush survival night for young people at risk of committing crimes. Due to apparent time and financial constraints this was called off at the last minute.

'Disco Inferno' an anti wildfire arson disco, which received money from MAWWFRS was a success in terms of numbers of attendees, however a representative from MAWWFRS did not attend as planned. As such, this attempt at spreading an anti wildfire message in a fun and informal setting, and at a time when young people could potentially be engaged in antisocial behaviour was, arguably, not as successful as it might have been.

The lack of real impact for these two events may merely be the product of underfunding and understaffing, however this may also indicate a slight level of ambivalence, or perhaps the lower priority of wildfire prevention – even among organisations working towards tackling the phenomenon.

These projects are only run sporadically, and while there are youth groups available in all the study areas there is a lack of specific anti-wildfire information made available to these groups. A more obvious and intensive programme of anti-wildfire awareness raising could prove useful in working towards tackling wildfires.

## Education

Education initiatives are used as a tool to address the problem of firesetting, both in formal school settings and in the less formal woodland school settings. A number of observations of such initiatives, and discussions with those who have taken part in education events, have revealed some interesting opinions about the effectiveness of these measures.

The flagship education program for tackling firesetting is the joint initiative 'Crucial Crew'.<sup>4</sup> While it is only FCW who present on the dangers of wildfires, the number of different agencies that are represented at the event demonstrates a positive commitment to encouraging children and young people to be safe and sensible.

Crucial Crew is aimed at children in their final year of Primary education and involves a half-day visit to a location where a number of agencies give talks and information on personal safety. Most of the young people who I have spent time with remember going to Crucial Crew, although not all children do. Some, like a 14 year old girl from Aberdare missed out on attending a Crucial Crew event due to personal issues, while others appear to have merely forgotten about the event and friends will vouch that they did, in fact, attend an event. When asked what they most remember most mention the damage that wildfires cause to animals.

In addition to this the FRS have teams whose job focus is on education. They do not focus specifically on firesetting; their education programmes focus on road safety, home fire safety and other areas.

From a small survey of young people carried out as part of this research many young people (87% n. 31) agree that Crucial Crew, and other similar initiatives are a positive

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<sup>4</sup> Crucial crew is a partnership programme bringing together a diverse range public organisations including Forestry Commission Wales, the local Fire and Rescue Service, the Police and National Rail among others. Crucial Crew events are delivered to students in year 6, the final year of primary education, in an out of school setting, either in a public hall or in a dedicated building at the foot of the Rhondda Valley. The FRS gives a home fire safety message and the Forestry Commission focus on safety in the forest and firesetting.

way of decreasing wildfires. From this small survey about 30% of young people said they found Crucial Crew an interesting experience, while around 20% of respondents felt that Crucial Crew was 'boring'.

### **Interventions with firesetters**

Both MAWWFRS and SWFRS run 'Firesetter Intervention' programmes. These programmes work with those who have exhibited an 'unhealthy interest in fire' or those who have been caught engaging in firesetting and who have been referred, either by a family member or professional. However the majority of individuals that go through this programme are referred for firesetting in urban and dwelling settings.

One member of an intervention team talked about the case history of one young boy who was a prolific firesetter, often setting fires on grassland. This respondent explained that the boy was fascinated by fire, and really wanted to be a fireman. After consultation the boy was allowed to join the 'young firefighters' on the understanding that he would desist from firesetting. It was explained that after this point the boy had only relapsed once, and had admitted his guilt – pleading that he not be banned from the organisation.

While these interventions are potentially extremely rich in data it has only been, possible to talk to people who run these interventions and not those who benefit from them for ethical and legal reasons. Staff engaged in these interventions who have been interviewed believe that their interventions are largely successful in tackling firesetting behaviour once it has started.

### **'Target hardening'**

Making areas susceptible to fires more difficult to attack is a method that is often used in protecting buildings and structures. However it is a method that some stakeholders feel can be used to prevent wildfires. This does not mean creation of barriers and sealing off areas susceptible to fires.

Certain organisations in Wales, including PONT ('Pori Natur a Threftadaeth' – a grazing rights organisation) and Rhondda Cynon Taff (RCT) county borough council have proposed the use of grazing to reduce wildfire incidences. This was not expressly the primary aim of their attempts at encouraging grazing in areas, rather there was an ecological imperative. The motivation behind using grazing as a method of fire prevention is primarily a financial one:

"You can't get money for ecological initiatives, you have to have something else aswell. It does, we think, stop fires, at least it has the potential to, so that's how we justify the costs"

Council Employee, RCT

The presence of grazing animals has two by-products that employees from these organisations promote as being beneficial for stopping fires. Firstly the land looks cared-for and used which, it is suggested, may discourage some firesetters. Secondly, the constant grazing and trampling of the land decreases the amount of fuel that can be burnt by suppressing vegetation growth.

An employee from FCW suggested that there is an additional third benefit of this target hardening method. This employee suggested that allowing grazing on Forestry Commission Wales or council land may prevent firesetting by farmers, something that he believes is a real problem. The FCW employee felt that farmers who may have previously resented the refusal of grazing rights, may be motivated to burn the land, either carelessly or maliciously. This behaviour might cease if it was known that they were allowed onto land to graze their livestock.

Another example of 'target hardening' is the multi agency event 'Operation Phoenix'. This involved members of SWFRS, FCW, the police and Police Community Support Officers. The aims of these days were to increase surveillance of forested and fringe areas in order to stop a wide variety of antisocial behaviour occurring. The day resulted in a number of stops of individuals, and the seizure of a number of off-road motorcycles. However, no fires were detected during the course of the day. This was perhaps as a result of the timing of the operation; the majority of recorded outdoor fires are between 1500–1600 hours and 2000 hours each day, and the operation phoenix event that was attended in the course of the research to date finished at 1700 hours. However, the visible presence of a number of uniformed personnel from different organisations in the area may have added to this.

A further attempt at target hardening carried out almost entirely by one policeman from Merthyr Tydfil involves the use of the probation service, and individuals on 'community payback' orders to cut firebreaks in fire prone areas. This project, known as Operation Base is run outside the remit of the officer's main work and in his words "does not count towards me hitting my targets". Some of the information provided by this policeman, although interesting, was given off the record so cannot be provided here. Other organisations have expressed similar sentiments and they have been included elsewhere. The firebreaks have been demonstrated to work, however the restrictions on the time that they are able to be cut has caused some questioning of the method by members of other stakeholder organisations, including the fire and rescue services and FCW.

SWFRS have also developed a 'fire crime unit' with special vehicles. Part of their job is high profile patrols of areas, which are prone to fire-related crimes, including deliberately started wildfires. This form of target hardening essentially involves increased

surveillance, and increased visibility of enforcement agencies. This could prove to be an effective, albeit resource-intensive method of target hardening.

### **Differing Fire and Rescue Service Responses to Wildfires**

Two Fire and Rescue Services cover Coed y Cymoedd. These are Mid and West Wales and South Wales Fire and Rescue Services. They each cover roughly half of Coed y Cymoedd, although SWFRS cover the area of Coed y Cymoedd with a more pronounced wildfire problem (statistics show that SWFRS deal with about twice as many outdoor fires a year, within the district boundaries of Coed y Cymoedd than MAWWFRS).

There is a perception held by some FCW staff, especially those with close dealings with the fire services, that the two services have noticeably different approaches to their management of the wildfire problem. This could be explained by the difference in numbers of wildfires per year in the areas covered by each service, but could also be a reflection of priorities and the manner in which each service views (and projects views of) itself and the issue of wildfires.

Some research respondents have expressed the view that SWFRS believe that their problem with wildfires is more pronounced and more intense and that they need a more combative approach to wildfire. This can be seen in the dominant discourse among senior SWFRS employees. Research with this group of stakeholders has demonstrated a belief that SWFRS have a degree of pride about the challenges of wildfires that are faced in South Wales.

It could be seen that SWFRS “want to approach wildfires almost as if they were ‘fire-police’, as opposed to a more ‘good guys’ approach favoured by MAWWFRS”, as one senior FCW district employee put it. The same FCW employee expressed the opinion that while partnership working is important in both areas he believed that SWFRS are more keen to align themselves with the police force, while MAWWFRS prefer to keep a degree of distance between the two agencies. There is, however, a need for different priorities in both the affected fire and rescue services, depending on the different natures of problems in each fire service area.

### **Differing Responses to Wildfires across agencies**

While wildfires are recognised by stakeholders as a real problem consensus on mitigation strategies appears to be difficult to reach. This, the researcher would posit, is a result of the different relationships that stakeholders have to the wildfire issue. Changes in the way in which FCW approach wildfires has served to position the organisation less as an enforcer – responding to wildfires once they are burning through firefighting, and more as a ‘victim’ whose property is under threat.

The FRS have the mandate to firstly prevent, and to extinguish fires which positions them slightly differently to FCW as they now take an active role in prevention and suppression, with officers whose job is entirely one of education or responding to 'fire crime'

The police appear to be less engaged with the wildfire problem. One police initiative in Merthyr Tydfil has focused on firesetting, although, as mentioned in the 'target hardening' section is not a priority work area. However, other organisations have expressed the opinion that the police are not always as proactive as they perhaps could be in following up leads on firesetters. The opinion has been expressed off the record that this ambivalence on the part of the police is not helpful in targeting wildfires.

Future research questions arising from this section:

- Do mitigation measures encourage a fall in fires in the surrounding area during and after the time that they are being enacted?

## Additional findings

### Roads

Using GIS software it is possible to spatially reference the locations of fires. This data needs to be treated with caution as the spatial reference points result from the location of the appliance called to the fire incident. Theoretically the spatial reference should be altered to reflect the actual location of the fire, although anecdotally this is not always the case. Initial analysis of fire locations suggests that the majority (98.7%) of fires happen within 500 metres of either an A, B or minor road. This finding demonstrates that human impacts are likely causes of these fires and, furthermore, that fires are likely to occur in convenient locations close to routes taken as part of day-to-day activities, rather than in areas that are remote or difficult to access.

### Timing of fires

Analysing the timing of recorded fire incidents proves interesting. There are observable spikes in incidences of fires at certain times of the day. In addition to this the peaking of fire incidences (from around 3pm to midnight) relatively uniform across weekdays, weekends and school holidays. The graph below demonstrates hour by hour fire incidences plotted against times when schools were in and out of session, in addition to rainfall for around eight weeks of March and April 2003. This is widely acknowledged as being one of the most intensive and destructive periods of wildfires in recent time in Coed y Cymoedd in terms of both numbers of fires and hectares of grass and forestry lost to fire.

Observing the below graph there are a number of points to note. The areas shaded in light yellow are times when school is out of session (1600-0800 plus weekends and approximate school holidays for Easter) while grey areas indicate school is in session. This is relevant because if it is mostly children who are lighting wildfires you would expect fires to peak outside school hours, which they apparently do. However the same patterns occur at weekends, which suggests that while fires are likely to occur after 1600 hours, this is not necessarily because of the influence of school opening hours. The large grey band on the right hand side indicates the twenty-four hours of Easter day – April 20<sup>th</sup>. The weekend over Easter 2003 resulted in massive losses for the forestry commission in terms of hectares of trees, but as can be seen there were not nearly as many fires recorded in this period as in previous weekends.

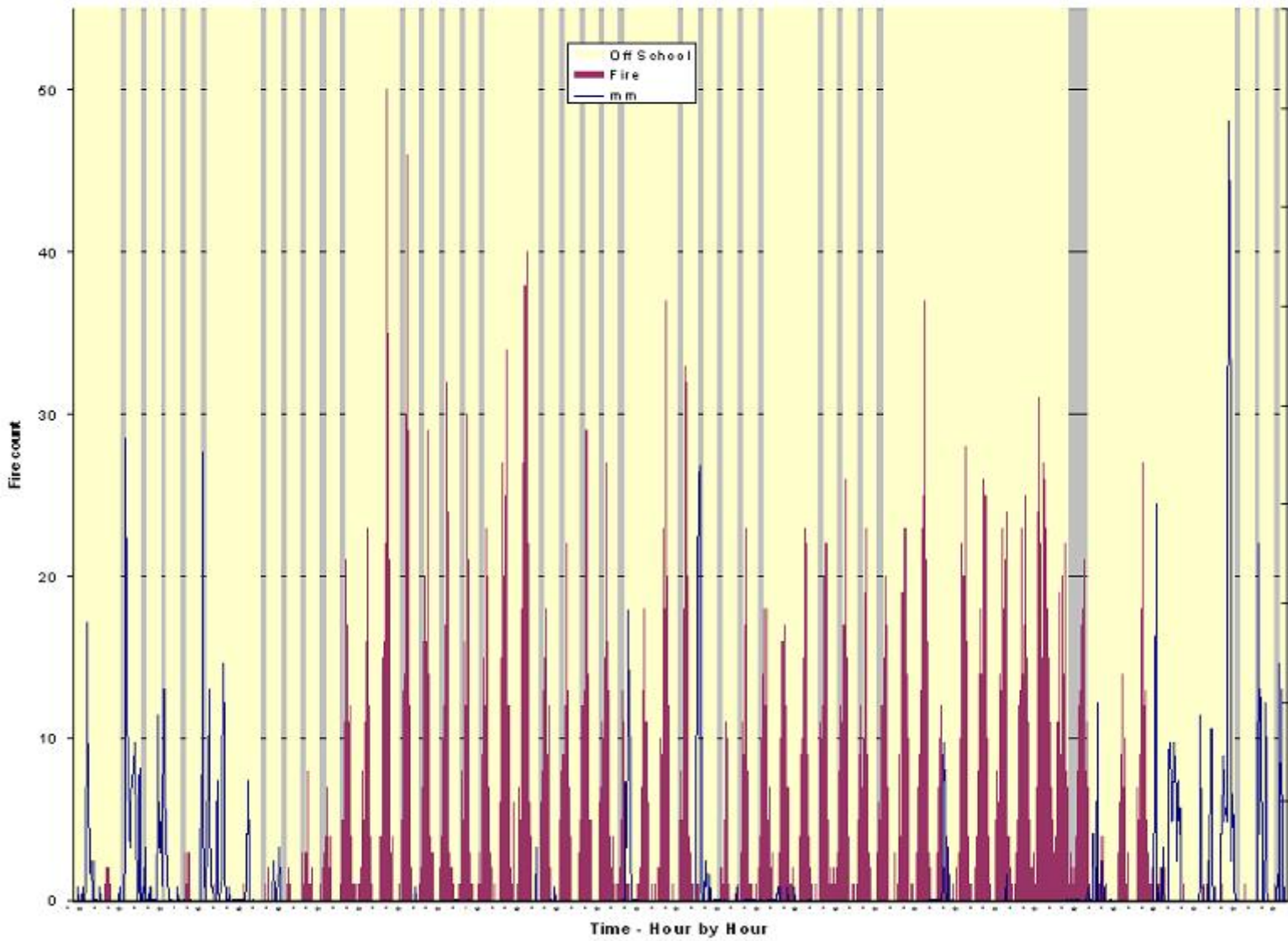
The blue line included on the graph shows the hourly rainfall in millimetres over this period, synthesised from averages of three weather stations in South Wales – Pembray,

St. Athan and Mumbles Head. As can be seen while it was raining fires did drop off, although the peak average hourly rainfall during this time was only 4mm

### **Weather**

FRS data demonstrates that on an hour by hour basis there is an inverse relationship between recorded fires and rainfall. This is perhaps not surprising. The large data sets provided by the FRS and the Met office demonstrate that on a yearly basis the main factor that appears to predict total number of recorded fires in a year is the total number of hours of rainfall in March and April. For every year that we have data these are the peak months for recorded fires. While this is not a groundbreaking finding it is necessary to note it.

Fires March and April 2003 against Weather and School Day



Graph 5: Fires in March and April 2003, Coed y Cymoedd. With school and rainfall data

## Conclusions

This short section brings together the threads covered in the above sections and demonstrates the complex nature of the wildfire problem in South Wales.

There is apparently no static or universal perception of firesetting in the study area. While some stakeholders, especially in communities that are not directly affected by wildfires, are almost ignorant of the issue, others are extremely aware of the potential for damage and the costs that could be incurred as a result of firesetting. This could be in part a result of blockages in information flows surrounding wildfires, specifically information held by institutional stakeholders, which is not getting through to community stakeholders.

Data from the first year of research demonstrates that wildfires are almost certainly a human caused phenomenon. This is corroborated by the analysis of proximity to roads of the majority of fires, the times at which they occur – largely afternoons and evenings, and the evidence of stakeholders who have insider knowledge of the problem.

Current mitigation strategies could be resulting in a decrease in firesetting. However, the research results to date suggest that the weather over the last few years could be part of the cause of a decrease in fires. This weakness in access to longitudinal data is something that has to be worked with, FRS employees involved in the collection and maintenance of data felt that older data was much less reliable, both in terms of numbers, access, and locations.

There is positive feedback from the majority of people who have engaged in anti-firesetting educational programmes, suggesting that they have a positive role to play in the fight against wildfire. It is perhaps surprising that despite a wide variety of potential firesetters and motivations for firesetting, the majority of attempts at stopping firesetting in South Wales have focused on younger people. In the coming year it is hoped that the research can critically engage with the assumptions that lie behind this focus.

Attempts to draw together all elements of the wildfire problem into a concise diagram have proved to be extremely difficult. Each potential group of perpetrators, each motivation and each mitigation measure has such a propensity to overlap in terms of saliency and impact that such a task becomes confusing. This demonstrates that firesetting is a multidimensional problem with more than one motivation, more than one

driver, more than one sort of perpetrator and a multitude of ways in which it can be tackled.

The following twelve months of research should aim to bring a mixture of stakeholders into direct contact with one another in order to discuss and develop new ways of thinking about and methods for wildfire prevention. This will hopefully prove useful in demonstrating the benefits of partnership working to involved stakeholders. Bringing stakeholder groups together to discuss the wildfire problem will also provide rich data for analysis and help to understand the gaps in communication between groups and uncover areas of conflict and consensus. This brings in to play the 'action research' element of the project.

## Part 2

### Future Research Questions

From the conclusions that have emerged from the first ten months of research, both desk based and 'on the ground' with community and institutional stakeholders it is clear that there are a number of questions still to be addressed.

One of the major problems with the research so far, and one that was envisaged at the outset, is the lack of contact with offenders who may be able to shed light on areas of motivations for firesetting. This is something that we have so far only been able to infer from discussions with (knowledgeable) local stakeholders. This is a method that research into social causes of wildfires in Europe that has successfully utilised. It is hoped that this research will, in the following year be able to dig more deeply into this issue through direct contact with firesetters, something that has only been touched on in the first year.

It is suggested that future research focus on the application of 'action research' principles. This will involve the bringing together of a number of groups who may not usually be in contact with each other, and involving them in the collaborative design of new interventions.

The gaps that have emerged from the first section of this research project demonstrate that there are still questions that need satisfactory answers. Along with building on the current research questions it is suggested that a number of other questions be approached in the coming research phase. These research questions have emerged throughout this report and are summarised below:

- How can stakeholder groups improve their wildfire mitigation strategies?
- Can the connection between socioeconomics and wildfire occurrences be better explained?
- What do people mean by boredom – and how does this contribute to firesetting?

- Why is there such confusion about the source of wildfires?
- Do community stakeholders feel that the information that they receive about wildfires is accurate and useful?
- How well do institutional stakeholders feel they provide wildfire information?
- Do mitigation measures encourage a fall in fires in the surrounding area during and after the time that they are being enacted?

The research will continue working on the questions of community perceptions of wildfires, and hopefully, will gain contact with firesetters over the coming year.

It is also hoped that by working to increase contact between fire service personnel, police and the FCW staff research in this area can be improved, and furthermore could work towards developing a concise and consistent message across all agencies. It is unlikely that this could be achieved in a single year, and from the perspective of a research project, however the documentation of attempts at this may prove to produce rich and interesting data.

Over the following year the research will focus on developing a better understanding of mitigation strategies, and also on better understanding the community perceptions of wildfires. This will be partly addressed by the forthcoming telephone survey, however the qualitative element of the research will also benefit this understanding.

The selected case study areas will be engaged with to address the future research questions. Access to community groups, fire service personnel, and other connections made in the scoping and first phase of research will allow for indepth interviews, focus groups and meetings to be set up in order to understand the complex interplay of ideas surrounding wildfire. Observations at forthcoming events run by stakeholder groups, and a documentation of their development will prove to be interesting in understanding the institutional response to wildfires more fully.

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