Fire Technology Transfer Note

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What is the general public's perception of rural fire danger communications?

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Introduction

The effectiveness of communicating rural fire danger warnings has been investigated by Scion's Rural Fire Research Group during a six year research programme. A literature review was undertaken at the outset to document international knowledge (Bones et al., 2007) and findings from this questioned (i) the value of fire danger warnings in influencing positive behaviour amongst the public, and (ii) the ability of the media campaign to identify and encourage the behaviour changes that fire authorities are seeking. These concerns were subsequently explored through interviews with Rural Fire Authority (RFA) managers in both the Canterbury (Langer & Chamberlain, 2007) and Northland (Langer et al., 2009) regions. These interviews revealed that RFA managers also had reservations about these issues, and raised a number of other concerns that warranted exploration through public survey.

The material documented in this Fire Technology Transfer Note (FTTN) summarises findings of a public survey used to explore the general public's perception of rural fire danger communication (Hide et al., 2010). The main mechanisms used to communicate danger of rural fire to the public are:

- Fire danger 'half-grapefruit' warning signs which indicate 'low' through to 'extreme' risk depending on conditions. The sign may also be supplemented with fire season details and permit requirements;
- 'Bernie', a cartoon character used in a national fire prevention publicity campaign to educate people about rural fire risk; and
- Radio advertisements, pamphlets, and website information provided by RFAs.

Figure 1: The fire danger rating is displayed on roadside signs. Scientists and fire managers have become skilled at interpreting complex information to arrive at fire danger ratings. Although these signs are well recognised by the public, people are often confused about what the rating actually means and how they should behave as the fire danger level changes/increases.

This FTTN documents research results which suggest that most people are aware of fire danger warning signs, but they frequently do not understand what the ratings mean or what behaviour is expected of them. A number of recommendations for clarifying key messages and improving fire risk communication that have arisen from this study are outlined.

Methods

The concerns raised during interviews with RFA managers in both Canterbury and Northland were collated and used as a foundation from which to generate questions for the public survey.

Members of the public were interviewed in the same two regions about their understanding of fire danger communication. A pilot study, including 12 people, was undertaken at the Whangarei Agricultural and Pastoral (A&P) show in December 2009.

Following a few modifications, a further 106 adults (53 Canterbury and 53 Northland) were interviewed at five different locations in both regions in January 2010 to target people living locally (either as rural or urban residents), New Zealanders (from both urban and rural areas) visiting on holiday, and international visitors.

This research explored public perspectives on issues relating to three themes:

1. The fire danger sign - its location; perceived meaning, accuracy and relevance; and ease of understanding.
2. Knowledge of fire danger, and behaviour expected under different levels of fire danger.
3. Knowledge and perception of publicity initiatives.

Figure 2: Examples of the interviewing set-up at Bottle Lake Forest information centre (top image) and Kaiapoi Farmers Market (bottom image).

Main findings

The general public's perception of rural fire danger communications from both Canterbury and Northland revealed both positive aspects and a variety of shortcomings. Positive aspects included a high awareness of the fire danger warning sign and its alerting function to the risk or danger of fire. For those that suggested a behavioural response to the fire danger warning, 'raised awareness' and 'taking more care' were amongst the most cited changes. Nevertheless the data also identified a range of concerns:

Figure 3: Example of the National Rural Fire Authority's campaign. Source: http://www.nrfa.org.nz

The sign itself

- Many were unsure whether the sign information was current – for some vandalism and the lack of a date indicating last attention reduced credibility;
- Concerns were raised about possible interpretation difficulties, perhaps arising from visual problems, insufficient English language skills or poor literacy; and
- Some felt that the signs were directed at specific groups (e.g. campers, smokers) or reckless people (such as those throwing cigarette butts out of car windows), rather than to themselves.

Figure 4: Examples of fire danger signs not kept up-to-date (left image) or vandalised (right image).

Understanding of fire ratings

- Most commonly the rating was seen as a signal to identify hazard, risk or danger, but others saw the rating as an indicator of prevailing weather conditions or that it inferred some form of acceptable or unacceptable behaviour;
- It wasn't clear that the public 'see' each rating stage with any distinction. Many were more conscious either of (i) general left to right arrow movement on the sign, or (ii) attributed most meaning to arrow position at the ratings 'low' and 'extreme' (and to a lesser extent 'high'); and
- Although greater numbers of people saw meaning in a 'high' fire danger rating than for 'moderate' or 'very high', numbers were still comparatively low and interpretation quite varied.

Translating fire danger ratings into behaviour change

- There was uncertainty about appropriate behaviour change for each rating. When describing how they would change their behaviour for each rating many guessed or were unable to provide an answer;
- Although many acknowledged that the sign identified fire danger or risk level, only a third reported that this also alerted them to change their behaviour; and
- Descriptions of expected behaviour for the central three ratings on the fire danger warning sign were quite varied (e.g. fire was considered to be both 'acceptable' and 'unacceptable' at a 'high' rating by different interviewees).

Knowledge of fire risk and behaviour change

- When asked about behaviour change according to each rating, or as the fire danger rating increased, responses varied. When not tied to a specific rating, the variety of examples provided was greater as was, in some cases, the number of people reporting activity avoidance;
- A reasonable number of people stated that they undertook no high risk activities that might cause a fire; and
- When describing how they would actually change their behaviour with increased fire danger or risk, there were isolated statements about reducing use (sometimes in specific locations) of machinery or equipment that generate heat or sparks. The limited number of such responses raises concerns that the range of fire risk factors (i.e. that can cause fires) may not widely understood.

Figure 5: Example of other public information - fire permit sign.

Fire season information

- An 'open' fire season was generally well understood, but there were mixed responses for understanding the meaning of 'restricted' and 'prohibited' fire seasons;
- Relatively few followed publicity (radio / newspaper) alerting the public to the need to have a fire permit; many felt that the need for a fire permit related more to the intended fire activity types (e.g. burning off vegetation on private land or bonfire at a public function) and specific locations (e.g. a public place, private property, near Department of Conservation boundary) than to any fire use within restricted or prohibited fire periods; and
- Only a minority saw any association between the fire danger warning sign and fire season information.


The Southland Times

Restricted fire season starts in south

Figure 6: Regional newspaper article alerting the public of a restricted fire season.

Publicity initiatives

- Although a small number of people were aware of fire communication slogans used on the TV, almost half of the participants were unaware of the message of the cartoon character 'Bernie';
- Many of these identified that the 'Bernie' message was to alert them to identify fire danger, risk level or to 'keep it green'; fewer reported that the message alerted them to a need to change their behaviour;
- Fire danger communications by TV and / or radio were the alternative (non-fire danger warning sign) methods reported to be most useful. However, only about half of respondents reported awareness of such publicity;
- 'Newspapers' were also ranked quite highly as useful; however, awareness of receiving information through this medium was relatively low; and
- There was poor awareness of rural fire danger communication amongst international visitors.

Figure 7: Example of Bernie's message from the National fire prevention publicity campaign. Source: http://www.nrfa.org.nz

Conclusion and Recommendations

Results from this public survey suggested that most people are aware of fire danger warning signs, but they frequently don't understand what the ratings mean or what behaviour is expected of them as the fire danger level changes.

Findings indicated that there were varied areas of concern and these are highlighted as recommendations to clarify key messages and improve fire risk communication for further intervention and research:

1. Greater clarity is required in communicating the range of risk factors for fire, as these did not appear to be widely known by the public.
2. Guidance is needed on expected behaviour - what the public can or should not do as fire danger increases, as there was widespread lack of awareness on appropriate behaviour change for each fire danger rating on the 'half grapefruit' signs.
3. Efforts to clarify and simplify information relating to fire danger should be initiated, concurrently with the guidance of recommended behavioural change, as the rating 'message' on signs was not clear to the public.
4. The 'fire danger warning sign' and 'fire season' systems operate in parallel, yet there are problems with understanding both the fire danger 'message' and fire permit requirements. Nevertheless, the fire season system is a form of behavioural guidance and the possibility of developing and integrating the two separate methods into a single sign 'graphic' should be explored. Any sign redesign should consider incorporating supplementary symbols to identify acceptable or 'prohibited' activities.
5. Further consideration should be given to the sign location, condition and 'up-to-dateness' to make signs more relevant and visible.
6. TV and radio were the most preferred and memorable publicity initiatives, but the 'Bernie' campaign appeared to have only moderate impact, with limited numbers perceiving guidance on behaviour change. The media campaign should be developed to more clearly target specific groups and include guidance on behaviour modification.

An overarching feature of these recommendations is that the overall fire prevention objective would benefit from clarification of the links and distinctions between fire danger communications and fire season status, national campaigns and the varied publicity methods.

Implementation of the recommended interventions may also have implications for national rural fire sector risk management policy, legislation and practice. Accordingly, further educational work to facilitate understanding may be appropriate, as well as further research on risk communication methods. In the long term, interventions affecting both fire prevention objectives and risk management processes will require a robust communications strategy accommodating all affected agencies.

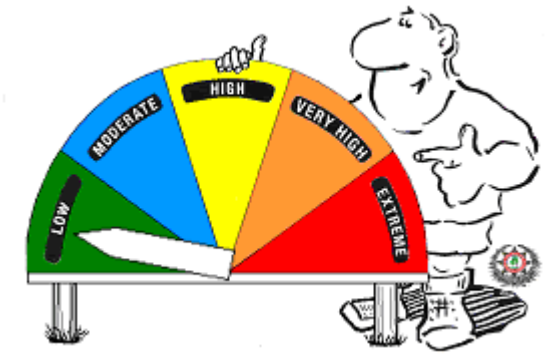

Figure 8: Bernie used on regional website to help explain fire season information. Source: http://www.wanganui.govt.nz/CDEM/RuralFire/index.asp

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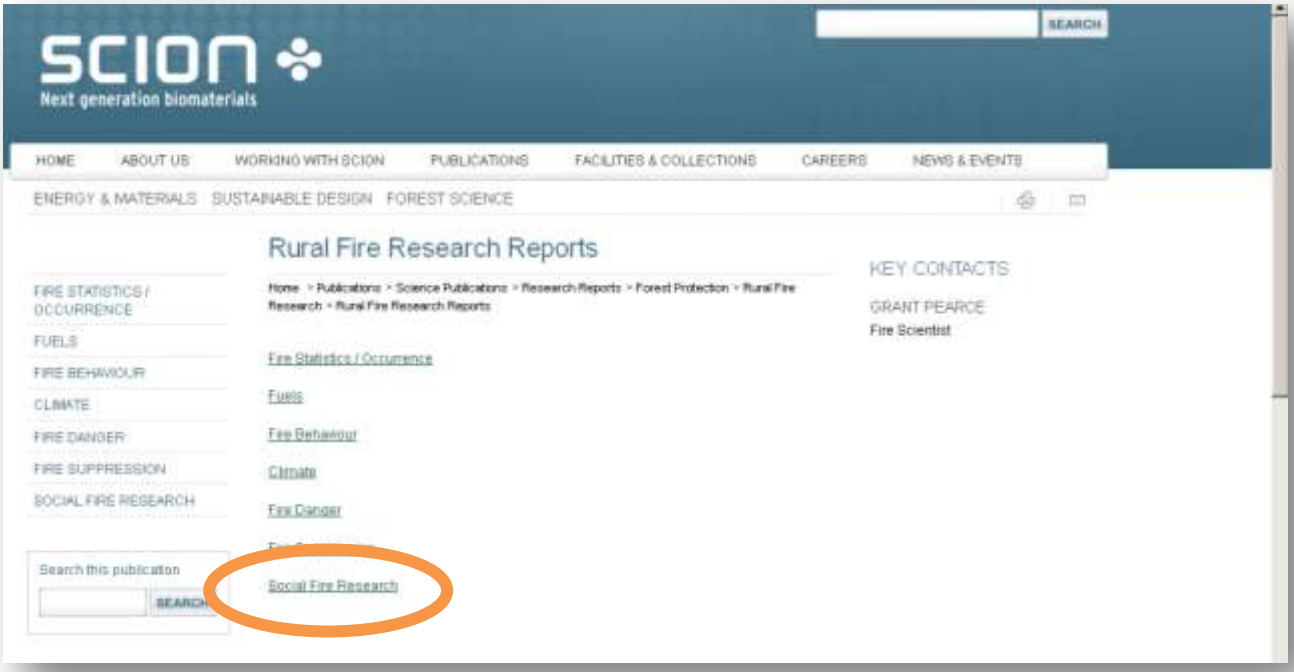
Further information

For more information, refer to the full report *Assessment of the general public's perception of rural fire danger communications* (Hide, Tappin, Langer & Anderson, 2010) which is available from the Scion rural fire research website (www.scionresearch.com/fire).



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