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Fire danger warning communication in New Zealand: Summary of a study of Rural Fire Authority communications in Northland

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Introduction

Effective communication of fire danger information to the general public and visitors to New Zealand is essential to prevent and reduce the consequences of rural fires. This *Fire Technology Transfer Note* is a summary of research investigating Northland Rural Fire Authority (RFA) managers' expectations of communication of fire danger warnings in their region.

The research is part of a broader study of RFAs and the general public's understanding of fire danger communication in two regions of New Zealand. The study was undertaken by Scion's Rural Fire and Human Factors Research Groups and is a further part of ongoing work investigating fire danger warning communication in New Zealand. Previous research by Scion reviewed overseas literature and conducted a pilot study of RFA managers in Canterbury, a similarly high fire risk region. This research will deliver valuable findings to determine whether the views expressed in the Canterbury study are more widespread and signal whether the effectiveness of fire danger communication in New Zealand needs to be re-evaluated further. The research is supported by the Foundation for Research, Science and Technology (FRST) and various rural fire sector organisations.

The main mechanisms to communicate fire danger warnings to the general public in New Zealand include the use of fire danger warning signs (i.e. 'half grapefruit' signs showing low to extreme fire danger) alongside roads in rural and other high-risk areas (see Figure 1); a national rural fire prevention publicity campaign with the cartoon character named 'Bernie' (see Figure 2); and other regional mechanisms such as notification of fire restrictions and local publicity campaigns.



Figure 1: Standard 'half grapefruit' fire danger warning sign used by RFAs in New Zealand.

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While the aim of this segment of the research was to determine the messages that RFAs intend to convey to the general public through fire danger communications in Northland, the findings will also input into a broader programme of research being undertaken by Scion to:

- determine the general public's understanding of fire danger warning communications in two regions of the country (Canterbury and Northland);
- compare fire managers' expectations and the public's understanding of fire danger warning communications in these same regions; and
- determine whether the effectiveness of communication of fire danger in New Zealand needs to be investigated further.



Figure 2: The current national fire prevention publicity campaign's 'Bernie' character.

Background

A literature review of existing methods to communicate fire danger warnings in New Zealand and overseas was conducted in 2007 (Bones, Pearce & Langer, 2007). Key findings included:

- Most Western countries use similar methods (fire danger warning signs and media campaigns) to communicate fire risk and the appropriate behaviour required;
- These methods can be confusing to the public and their effectiveness in changing people's behaviour has often not been evaluated;
- Rural fire danger messages need to be matched to behavioural changes that the fire authorities are trying to encourage; and
- In New Zealand, more attention needs to be paid to evaluate how effective the rural fire messages are at achieving the aims of the RFAs.

A pilot study on what messages RFAs seek to convey in their region through fire danger warning signs and other forms of fire danger communication was undertaken in Canterbury in 2007 (Langer & Chamberlain, 2007). The results from the 2007 study should be considered in conjunction with those from the 2009 Northland study reported here. Northland and Canterbury were the two regions targeted because of the higher incidence of wildfires in these regions, with access for researchers a further consideration. Other regions may be involved in future research, resources permitting.

Research Approach

In May-June 2009, interviews were conducted with twelve fire and land managers involved in rural fire safety from all three districts of the Northland region (Kaipara, Whangarei and the Far North). These managers represented Rural Fire Authorities, District Councils, New Zealand Fire Service, Department of Conservation, Federated Farmers of New Zealand and forestry companies. The sample group was selected from a list of Northland RFA personnel with the aim of being representative. The same qualitative interview structure that was used in the 2007 pilot study was repeated, with 29 open questions put to each fire manager that concerned: fire danger warning signs, fire restrictions and permits, the national 'Bernie' publicity campaign and general questions on rural fire safety. Interviews ranged from 40-90 minutes in length, with responses summarised under these same four headings.

Summary of Northland Study Findings

Interviews with the twelve Northland rural fire managers revealed a wide range of responses. The most common comments and issues have been summarised in the following points:

Fire Danger Warning Signs

Many respondents stated that:

- Fire danger warning signs provide the public (locals and visitors) with a general indication of the current fire risk and potential flammability of vegetation in rural areas.
- Timely changes to the fire danger signs to reflect changing conditions (between low and extreme) is important to inform regular observers of the signs whether fire risk is increasing or decreasing.
- The colour-coding of fire danger classes used on the fire danger signs is effective in informing the public of the fire danger conditions, as there is international understanding of both the colours used and the design of the indicator dial.
- Differences in local conditions (e.g. prevailing weather conditions, vegetation type, visitor numbers, and needing to be pre-emptive with changes) between regions (or areas within a region) lead to a public perception that the signs are inaccurate or irrelevant, as messages are inconsistent.
- Fire danger warning signs do not convey any information to the public of the behaviours expected of them, and the implications of each rating are unclear.
- Interpretation of sign information depends on an individual's understanding of fire safety and their experiences of fire.
- The lack of recommended action on the signs leaves the assumption that observers know how they should modify their behaviour (e.g. requesting advice when the ratings get high and checking fire permit status).
- A range of views were expressed on whether one approach is appropriate for all, as signs could prompt different behaviours between groups of people (e.g. landowners who use fire as a land management tool may have a better understanding of local rules and risks, whereas urban dwellers or visitors may not know these rules or risks). Others considered that the expected behaviours should be the same for everyone.
- The effectiveness of the signs in informing people of fire danger levels is thought to be limited by their location, accuracy and the fire danger knowledge of the observer.
- Signs are one part of the toolkit of publicity initiatives, and investment in related publicity campaigns on fire safety all help convey the necessary information. However, the link between these tools and the signs is not always clear.

Some respondents stated that:

- Signs provide a clear indicator of fire risk for locals and English-speaking visitors.
- The location of signs is improving over time as they are erected in appropriate areas with a high rural fire risk.
- Suggested changes are to increase the number of signs particularly on roads most commonly used by locals and summer visitors, to include information on the sign

about current fire status and the instruction to dial 111, and to explore novel methods in sign designs (e.g. plastic arrows attached by velcro to reduce vandalism of the sign, and the use of electronic technology to remotely and regularly update signs).

- Although signs link with other publicity initiatives on fire safety, there can be confusion when signs contradict other rules that are in place (e.g. low fire danger indicated on signs with a year-round restricted fire season in place, such as occurs in the Aupouri/Karikari Rural Fire District).
- Community buy-in to fire safety initiatives helps to keep the signs relevant and the rating appropriate to community risks.



Figure 3: Roadside 'half grapefruit' sign displaying fire danger, Dargaville (left) and Dunedin (right).

Fire Restrictions and Permits

Many respondents stated that:

- Radio is an effective medium to provide information on fire restrictions, along with seasonal notices in specialist magazines (e.g. boating, fishing) and local newspapers to reach the influx of visitors to the region over the summer.
- Radio notices timed around weather reports, local newspapers, pamphlets delivered to mail boxes and community notice boards are most effective for a rural audience.
- Website communication is increasing, partly in response to public requests and also because it enables a consistent and constant message to be provided.
- Weaknesses exist in each type of communication. For example, variations in fire season status between the three RFAs in Northland can make radio notices difficult to follow, some people are without radio or TV reception or do not subscribe to newspapers and therefore do not access statutory notices.

Some respondents stated that:

- Initiatives such as school campaigns, links with the New Zealand Fire Service's Firewise programme (a fire safety education course for children) or mass texting are being considered to target teenagers.
- Variations in rules and regulations between councils and the lack of a central place to obtain this information make the difficult task of getting explanations across to the public even harder (e.g. different rules on either side of the road, or in driving a short distance between two beaches).
- The procedures for issuing fire permits could be improved to increase consistency in rules and the process followed across the region.
- Catchment areas could be considered in determining fire season status and issuing fire permits.

National 'Bernie' Publicity Campaign

Many respondents stated that:

- The New Zealand rural fire sector 'Bernie' publicity campaign is recognised by sections of the public, but there are questions about whether he is still relevant to children, teenagers and others outside the 'Bernie' demographic (considered to be rural, white, middle-aged).
- Delivery of fire safety information from one 'fire authority' is seen as important in order to provide a consistent message to the public, whether they are rural or urban dwellers. Fire managers consider that most people do not appreciate the subtleties between the messages of the 'Bernie' and Firewise campaigns. This is particularly true of many urban-dwelling summer visitors holidaying in rural areas who are unfamiliar with local rules.
- The effectiveness of the 'Bernie' campaign needs to be accurately measured to determine what it is saying, and who hears it.
- The message to 'dial 111 if you see a wildfire' is seen as appropriate, with a strong public response when fires do occur. However, the additional workload for the New Zealand Fire Service, particularly volunteer brigades, through false alarms and hoax calls needs to be considered. The emphasis could be on fire prevention first, with the 'dial 111' message second.

Some respondents stated that:

- The New Zealand Fire Service's urban Firewise 'Flint and Amber' characters may have more appeal for a young audience.
- 'Bernie' compares poorly with the Firewise campaign, which is probably better known and better understood by younger people and urban populations.
- Extension of the Firewise campaign to include rural fire safety and an updated 'Bernie' should be explored.
- Along with the fire danger warning sign, 'Bernie' raises awareness of vegetation fires at a basic level, but he needs to make the public aware of all the fire prevention aims of RFAs as well as localised initiatives.

General Comments

Many respondents stated that:

- The success of the various forms of communication to the public about fire safety is dependent on each medium being matched to a specific audience.
- Influx of large numbers of visitors to the region in the summer exacerbates the difficulty of fire danger communication.
- A region-wide rural fire district is seen as allowing an improvement in fire safety and reducing confusion among the public. However, many barriers to improvements were also raised.

Some respondents stated that:

- Given the limited resources available for public communication on fire prevention, it is necessary to ask all sectors of the public what works best for them to choose a range of media to match the targeted population.
- Support exists to create a region-wide threshold for introducing a prohibited fire season, as occurs in some other regions (e.g. Canterbury). Implementing this practice would remove variations between districts and RFAs, and promote a more consistent message to the public.
- Community-level or 'grassroots' initiatives are commonly given as successful examples of how to engage with a population, transfer knowledge and create local ownership of fire prevention measures.

Northland Study Conclusions

There is confusion in the behavioural changes fire managers expect of the public through communication of fire danger warnings. It is likely that there is also public confusion with the fire danger messages being conveyed by RFAs. This matches the findings from the Canterbury pilot study.

Significant issues from the Northland study findings conclude:

- More direct links are required between the fire danger warning sign and the desired actions/behaviours;
- Associations between the New Zealand Fire Service Firewise campaign and RFA fire danger communication strategies need to be established and maintained;
- The 'Bernie' figure needs to be updated; and
- Region-wide policies on fire safety need to be developed to provide consistent information to the public.

Broader Research Project

The general public's understanding of fire danger warning communications is currently being assessed using a questionnaire approach in the same two regions (Canterbury and Northland). The findings of the Northland fire managers' study will be coupled to those of the earlier Canterbury study and a comparison will be made between fire managers' expectations and the public's understanding of fire danger warning communications in the same two regions. This will provide an insight into the understanding and effectiveness of fire danger communication in New Zealand, and guide the need for further research in this area.

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