RURAL FIRE RESEARCH Update

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National fire use survey reveals rural opinions

Fire is considered a useful tool for rural land managers according to a recent Scion study. But the practice is not without risk. Scion conducted a national survey of rural land managers, rural populace and fire personnel to learn more about how fire is used as a land management tool.

We found:

- Most burns are small and are for removing vegetative debris (piles and stubble). Land clearance burns (for the removal of tussock, scrub, etc.) are larger in area, but occur less frequently.
- Land managers support the use of fire more than the rural populace, mostly due to the cost and efficiencies of fire as a tool.
- Those who don't support fire are more likely to be female, manage smaller properties, and are from sectors that have not had a long history of land clearance burning (i.e. horticulture and lifestylers).
- There were two major concerns around burn-offs: smoke impacts – particularly air pollution – and the risk of fire escaping.

The findings give a better understanding of the differences in fire use practices and concerns. The data can be used to help develop targeted messages that aim to reduce the adverse effects of fire, particularly effects on human safety and ecological damage, as well as help to inform the general public as to why burning is taking place.

Land clearing burns to establish forestry in North Otago, April 2018.

Introduction

Fire use has great benefit to rural land managers, but it also carries risk. Over the last 25 years, New Zealand has seen the number of wildfires increase from around 3000 to nearly 5000 per year. In the last five years, around 25% of wildfires were attributed to campfires, bonfires and rubbish fires getting out of control whereas 18% were due to the escape of land clearing burns. Half of these occurred in periods when there was an open fire season. Public complaints about smoke from burn-offs is also putting pressure on farmers to improve burning practices. To learn more about how fire is used as a land management tool, Scion conducted a national survey of rural land managers, residents and fire personnel.

Background

The risks and benefits of using fire as a land management tool are not well understood or quantified. With no system for reporting, it's not clear how much controlled burning is actually happening in New Zealand. In addition, there are no consistent guidelines or protocols to advise best practice for landowners.

About the study

We gathered 695 responses from an online survey of rural New Zealanders from three core audiences:

1. Landowners/managers who are active in rural land management operations (361)
2. Rural Populace (people living in rural communities or urban fringe areas who are affected by fire activities (245))
3. Rural fire personnel responsible for policy and administration (89)

Most land manager responses came from the sheep and beef sector, and the majority of responses from the Canterbury region. However, other sectors and regions were well represented.

The survey questions were designed to determine:

- When, where and how fire is used by rural sectors
- How the different audiences view the risks of these practices
- The perceptions and values of the different audiences concerning these practices

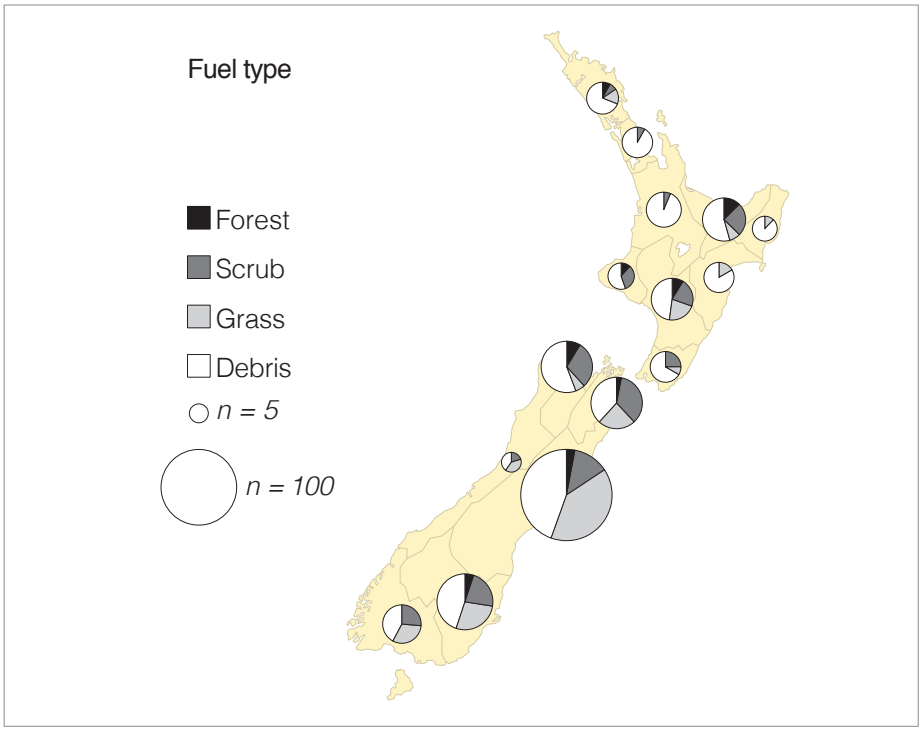

Figure 1. *The number of responses in each location by different vegetation types burnt.*

What did we learn?

Fire is considered a useful tool

The study confirmed that fire is considered a useful tool in rural New Zealand, with 54% of the respondents indicating that fire is part of their land management practice and 77% supporting the use of fire.

The biggest reasons for burning are for the removal of organic rubbish, invasive weed clearance, land preparation, grass growth regeneration and stock access improvement.

The majority of fires are lit for removing vegetative debris (pile burns, cereal crop stubble, and orchard prunings, etc.) rather than for clearing land of grass and tussock (Fig 1).

Grass burn offs were more frequent in the South Island.

The size/scale of areas burnt varied from less than 1 ha to more than 100 ha, but the majority of recently burned areas were less than 1 ha. Many of these were pile burns of more than 10m^3 in volume.

Supportive of fire as a tool	Not supportive of fire as a tool
Benefits of fire use	Smoke impacts
• Men • People currently using fire • Land managers • Sheep, cattle and arable sectors • Managing larger areas of land	• Women • People not currently using fire • Not a land managers • Specialist and lifestyle sectors • Managing smaller areas of land
Tradition of fire as a tool	Risks from knowledge loss and changing land use
• Men • People currently using fire • Rural fire officers • South Island residents • Arable sector • Managing more than 800 ha of land	• Women • People not currently using fire

Table 1. *Reasons for supporting or not supporting the use of fire as a land management tool.*

Land managers are in greater agreement with the statement that 'fire is a good land management tool' (46%) compared to only 29% of the rural populace.

Sheep and cattle farmers, and particularly farmers in the arable sector, are very confident in their ability to use fire in managing their land. People in sectors that undertake mainly pile burns (horticulture and lifestyle blocks, etc.) show only limited confidence in using fire.

Perceptions differed based on the audience

Perceptions around the benefits and risks of fire use are varied, between:

- Rural populace and land managers.
- Rural personnel and land managers.
- Different land management sectors, between regional locations, and according to the size of the land being managed.

Land managers perceive a lower level of risk from burning compared to rural fire officers. There were no significant differences in beliefs for the different age groups, but more males agree on the benefits of fire use than females. Females were more concerned about the impacts of smoke and the loss of knowledge on fire practices (Table 1).

Those who are not currently using fire as a land management tool are more likely to express the view that smoke is a nuisance and also perceive that there has been a loss of knowledge about fire practices.

The more that respondents agreed that smoke impacts were negative, the less likely they were to believe that fire is a good option for managing land.

Some perceptions are held strongly, but by only a few people; while others are held by many people, but not so strongly (Fig 2).

Burn off for forestry establishment, Marlborough, May 2015.

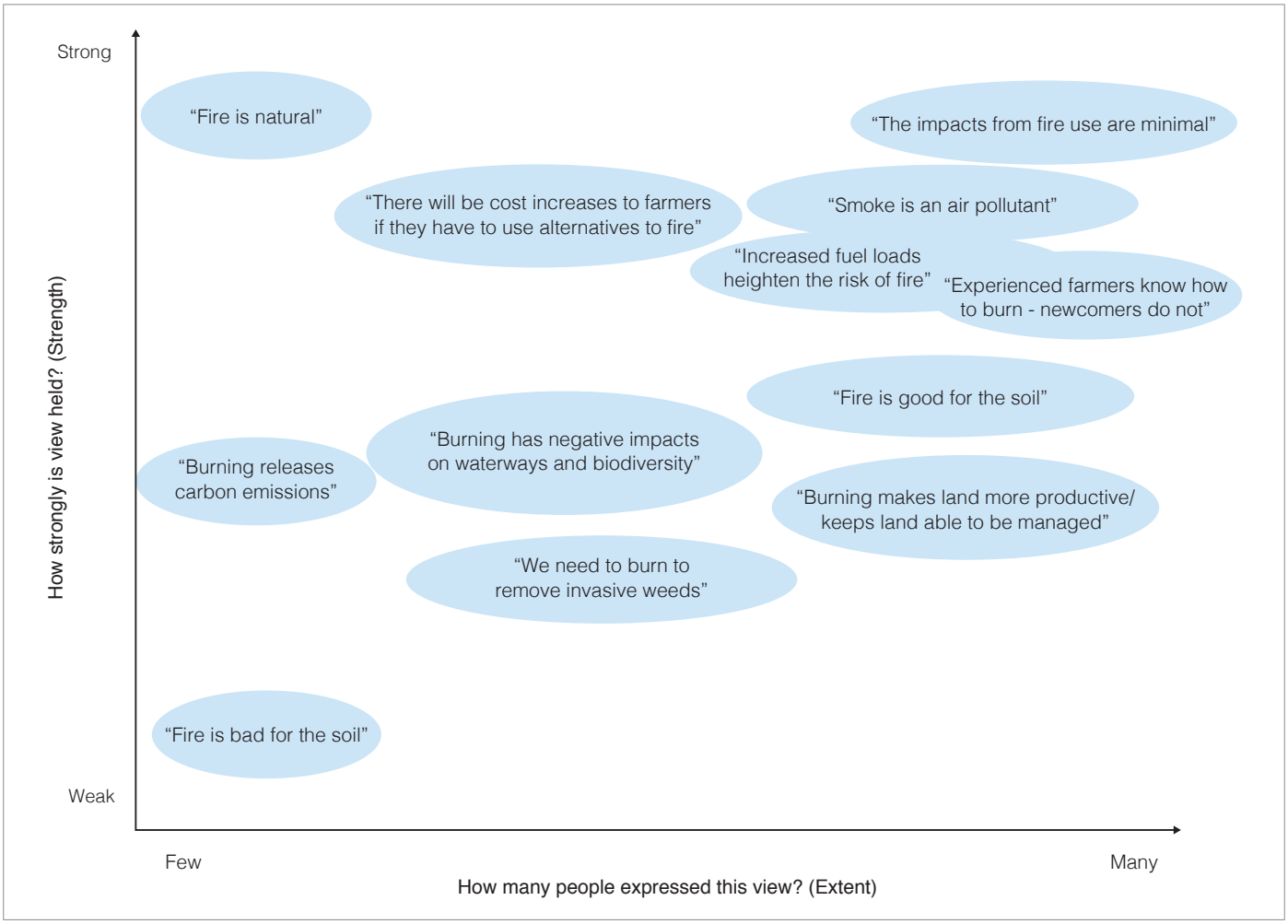

Figure 2. *Strength and extent of perceptions.*

Conclusion and future activities

The research findings show diversity in types of vegetation being burned, and a change away from large-scale land clearance burns towards more frequent but smaller area burns, and pile burning. To maintain social licence for the use of fire as a land management tool, it is clear that the negative impacts of smoke need to be addressed. For example, given the perception of smoke nuisance by non-burners. We suggest that real-time tools can be modified to run 'what-if smoke scenarios' for assisting farmers/landowners with burn planning so as to avoid smoke nuisance as much as possible, while achieving land management objectives. Scion is working with international collaborators to implement these for wildfire (e.g. the BlueSky Smoke Modelling Framework).

The perceptions and preconceptions identified from this research have been further investigated and compared to known research findings to determine if they are valid. This "myth-busting" will now help to guide the messaging process used in training courses that support landowners or managers to use fire safely and effectively for different land management objectives (e.g. piles, stubble burning and land clearance burn-offs).

Scion is currently working with Fire and Emergency New Zealand, international research groups and fire agencies in the development of training courses, tools and best practice burning guidelines that meet land management objectives while taking into consideration smoke nuisance and possible ecological impacts.

Further information

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Crop stubble burn off, Canterbury, March 2018.

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