Testing the Collective Action Model to Lifestyle Block Owners Fire Reduction Activities

Science for Communities

Testing the Collective Action Model to Lifestyle Block Owners Fire Reduction Activities

February 2021

Authors:

Maria Hepi

Graeme Nicholas

PREPARED FOR: Fire Emergency New Zealand

CLIENT REPORT No: CSC21002

REVIEWED BY: Matthew Ashworth and Mathew Walton

Science for Communities

Fire and Emergency New Zealand Research Report Number 192
ISBN Number 978-1-92-728757-6
ISSN Number 2703-1705

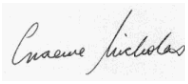
Hepi, Maria and Nicholas, Graeme (2021). Testing the Collective Action Model to Lifestyle Block Owners Fire Reduction Activities. Report prepared by Institute of Environmental Science and Research for Fire and Emergency New Zealand.

This research was commissioned by Fire and Emergency New Zealand and undertaken by independent researchers. Publication does not indicate Fire and Emergency New Zealand's endorsement of the findings or recommendations.

ACKNOWLEDGEMENTS

The authors wish to acknowledge support for this project from Fire and Emergency New Zealand (FENZ). The authors thank all those who contributed insights to the research. In particular they wish to thank Darrin Woods, Integrated Risk Manager, Christchurch; Bruce Janes, Principal Rural Fire Officer, North Canterbury; Rob Goldring, National Advisor Fire Risk Management, NHQ, Wellington; Sally Chesterfield, Region Community Education Advisory, Invercargill; Isaia Piho, Principal Advisor Fire Risk Management, Dunedin; Mike Grant, Regional Manager, Dunedin; and community participants from the Selwyn and Waimakariri districts.

The authors also thank Matt Ashworth and Mat Walton for their important review comments.

Manager	Peer reviewers		Authors	
				
Rob Lake	Matt Ashworth	Mathew Walton	Maria Hepi	Graeme Nicholas
Group Manager Risk Assessment and Social Systems	Senior Scientist Health and Environment	Technical Lead Social Systems Risk Assess-ment and Social Systems	Senior Scientist Risk and Assess-ment and Social Systems	Ti Kouka Consulting

CONTENTS

LIST OF FIGURES

1. EXECUTIVE SUMMARY

PURPOSE AND SCOPE

This report documents the steps taken to further develop and test the prototype Collective Action Model (CAM) developed in 2016, in preparation for the tool being deployed more widely. The research reported here was commissioned by Fire and Emergency New Zealand (FENZ) as a follow-up to the research conducted by ESR (Institute of Environmental Science and Research Limited) in 2016 that developed the prototype tool. That research sought to better understand barriers preventing lifestyle block owners (LBOs) from accepting wildfire risk and making changes to reduce that risk. This prototype tool was designed to support a collective action approach to reducing wildfire risk among LBOs.

THE PROTOYPE MODEL AND ITS DEVELOPMENT

The 2016 project enabled us to develop a provisional customised model for constructive engagement with LBOs.

The approach taken

- Treated wildfire risk as a collective problem that can be made worse by individual decisions. International evidence on decision-making in regard to a shared or common risk suggests there is considerable value in treating behaviour as social (a function of relationships).
- Used empirical research to develop a rich picture of the attitudes, practices and constraints influencing LBOs in regard to wildfire risk.
- Applied insights from the extensive empirical work of Ostrom and others on how to improve outcomes in such social dilemmas.

The idea behind the CAM is for it to act as an enabler of neighbourhood response to mitigating wildfire risk. The tool identifies important considerations in assessing how well a property and its owners are contributing to neighbourhood wildfire risk mitigation as well as supporting their understanding and appreciation of the risk. The CAM was designed to encourage informed dialogue within and between households, with a view to increasing general awareness of wildfire risk and enhancing knowledge of how to mitigate identified wildfire risk, as well as giving as appreciation of the responsibility for acting on that awareness.

METHODOLOGY

The first phase of the research was a technical review of the prototype CAM tool with key FENZ staff within a workshop.

Phase two of the project involved designing instruments and methods for introducing and implementing the prototype CAM tool in test communities and was in partnership with key FENZ subject matter experts. A website was developed for the prototype CAM tool. The website introduced the prototype CAM tool to prospective users and said that it was being offered for trial and research purposes.

Phase three of the project included testing the prototype CAM for understandability and usability by:

1. introducing it to two neighbourhood clusters of LBOs;
2. encouraging participants to trial the CAM online;

3. interviewing participants about their experience and seeking suggestions to improve the design and presentation of the model.

FINDINGS

There were no considerable differences in the findings from the two LBO clusters. All participants could see the usefulness of the tool and its potential to stimulate thought and discussion amongst neighbours. They noted a shift in their thinking from risk located with their individual property to that of the neighbourhood.

All participants, except one, found the CAM tool easy to use.

The tool involved grading each property against certain criteria. Two of the participants thought that the grading was quite harsh and a bit judgemental. Especially when it concerned aspects, they had no control over, such as their neighbour's property.

Insights participants reported after using the tool included that communication with neighbours was key, and that it was also important to have a community emergency plan.

For those who used the tool with their neighbours, they said it was a useful mechanism for discussing fire risk, and it was not something they had done before.

Most participants thought an organisation such as FENZ needs to take ownership of the tool. Other organisations that were suggested to take ownership, besides FENZ, were Civil Defence, under the Get Ready umbrella, or the local council.

Suggestions on how to promote it to communities were: giving community talks/training sessions, as well as advertising on media platforms and local print media. Also, a link to the tool should be on other websites such as Civil Defence, rural insurance companies and local councils, as well as within relevant FENZ publications and public awareness collateral.

One participant suggested the tool could also be used to gather intelligence for FENZ. FENZ could use the information to produce targeted campaigns and inform future research.

DISCUSSION AND RECOMMENDATIONS

The findings indicate that the prototype CAM tool is a useful mechanism to shift shared norms amongst neighbours from that of individual risk to a collective neighbourhood risk. Through using the CAM tool, the participants found a shift in their thinking from risk laying with their individual property to that of the neighbourhood and the tool was useful to encourage neighbourhood socialising of wildfire risk by stimulating thought and discussion amongst neighbours.

We recommend the following:

- FENZ to develop the tool into an app or website using a professional app or web developer.
- A facilitators guide to be developed so that FENZ can socialise and disseminate it along with information about the tool when they are doing community outreach, such as at local A&P shows.
- FENZ liaises with other organisations such as Civil Defence, local councils and rural insurers to advertise the CAM tool on their websites so as to distribute it widely.
- FENZ should consider using the CAM tool for data collection for strategic intelligence for fire management purposes. This would provide data for future FENZ planning or future fire research.

- FENZ to undertake ongoing development and implementation of the CAM tool by developing a Developmental Evaluation approach around the CAM tool.

2. INTRODUCTION

2.1 PURPOSE AND SCOPE

This report documents the steps taken to further develop and test the prototype Collective Action Model (CAM) developed in 2016, in preparation for the tool being deployed more widely. The research reported here was commissioned by Fire and Emergency New Zealand (FENZ) as a follow-up to the research conducted by ESR (Institute of Environmental Science and Research Limited) in 2016 which developed the prototype tool (Nicholas & Hepi, 2017). That research sought to better understand barriers preventing lifestyle block owners (LBOs) from accepting wildfire risk[1] and making changes to reduce that risk. It informed the development of a prototype tool designed to support a collective action approach to reducing wildfire risk among LBOs.

Unlike other research reports, this report is not the major output of this research. Instead, the primary output is the development and refinement of a useful tool (the CAM). This report simply reports how the CAM tool has been developed, refined, and tested. Firstly, the report introduces the prototype CAM produced in the earlier project, along with the theoretical approach that underpins it. We then detail the methods used to refine and test the model before offering an improved version of the CAM and making recommendations on next steps.

The overall objective of the research is a safer New Zealand through supporting communities to manage their risk.

2.2 THE PROTOTYPE MODEL AND ITS DEVELOPMENT

The 2016 project enabled us to develop a provisional customised model for constructive engagement with LBOs.

The approach taken

- Treated wildfire risk as a collective problem that can be made worse by individual decisions. International evidence on decision-making in regard to a shared or common risk suggests there is considerable value in treating behaviour as social, a function of relationships (Jakes, Kruger, Monroe, Nelson, & Sturtevant, 2007; Jamieson & Briggs, 2009; McFarlane, McGee, & Faulkner, 2011; Paveglio, Jakes, Carroll, & Williams, 2009).
- Used empirical research to develop a rich picture of the attitudes, practices and constraints influencing LBOs in regard to wildfire risk.
- Applied insights from the extensive empirical work of Ostrom and others on how to improve outcomes in such social dilemmas (Ostrom, 2009).

[1] Wildfire risk is defined as the likelihood of a wildfire occurring and its associated consequence. Context determines the risk – e.g. the probability of fire that will damage 1ha is different to the probability of a fire that will damage 1000ha. Likewise, this is different to the risk of severe fire weather occurring (Huggins, T. J., Langer, E. R., J. McLennan, J., Johnston, D. M., Yang, L. (2020). The many-headed beast of wildfire risks to Aotearoa-New Zealand. Australian Journal of Emergency Management. Volume 35 (3). July 2020. pp 48-53).

The prototype CAM (Figure 1) comprised a matrix of three rows and three columns, with each box highlighting an aspect of social practice relevant to reducing neighbourhood wildfire risk.

The work of Shove et al (2012) provided a basic framework to specify social practices. According to that framework social practices consist of configurations of materiality (stuff), capabilities (skills), and meaning (sense). We adopted this framework for the rows of our model. The columns of the model were a way to capture the idea of stages of activity in relation to wildfire risk mitigation: preparedness, prevention practices, and participation and connectedness. Preparedness includes activities that anticipate a wildfire event and ensure that preparations are in place to reduce the impact and spread of the fire. Prevention practices include actions that will make wildfire less likely to happen in the first place. Participation and connectedness are seen as social infrastructure that will maintain both a sense of collective responsibility and capacity for more effective response to situations of wildfire threat.

The underlying methodology informing the CAM development is discussed more fully in our earlier report (Nicholas & Hepi, 2017).

The idea behind the CAM is for it to act as an enabler of neighbourhood response to mitigating wildfire risk. The nine boxes identify important considerations in assessing how well a property and its owners are contributing to neighbourhood wildfire risk mitigation. The model came with a schedule of how to score each box. The CAM was designed to encourage informed dialogue within and between households, with a view to encouraging both awareness of wildfire risk and how to mitigate wildfire risk, and responsibility for acting on the awareness.

Rather than being a basis for social marketing, or a tool for enforcement or compliance, the CAM was developed firstly as a tool for self-assessment by LBOs; and then to be used as a vehicle for conversation between neighbours and/or as a basis for a neighbour to undertake a peer assessment. While we did foresee a role for FENZ in refining and promoting the CAM, the model was designed for community use independent of FENZ.

FIGURE 1: Prototype Collective Action Model (2017)

	Preparedness to be prepared for wildfire event	Prevention practices to maintain property and conduct safe fires	Participation and connectedness to establish and sustain links and relationships
Stuff (infrastructure)	Access to the property for firefighting equipment Water – volume, accessibility Information on good fire practice and advice Fire extinguishers strategically placed Landscaping to defend houses and key	Landscape design and management – to reduce fuel and avoid ignition Machinery precautions – to avoid accidental ignition Location and management of flammable items and substances	Neighbourhood communications plan – up to date Neighbourhood resources plan – up to date Neighbourhood fire safety plan – up to date Neighbourhood regular mutual audit

	infrastructure Communication options readily available Awareness package – what to notice, what to do Fire safety plan	Management of open fires	
Skills (competencies)	Understanding of behaviour and nature of fires Awareness of response options and when to deploy them Physical and psychological capability to respond to a fire event Familiarity with neighbours' properties and protocols	Land and crop management to minimise risk Situational awareness – including issues of proximity, weather, seasonality Awareness of information sources and regulations Awareness of behaviour and nature of fires	Household plan and awareness (including children) Information sharing with neighbours
Sense (way of seeing the world)	Collective responsibility "We are in this together as a neighbourhood" "We understand there are times we will need specialist advice or help to be prepared" "We are realistic about our vulnerability to out-of-control fire"	"We are realistic about our vulnerability to out-of-control fire" "We see fire risk as a problem we can do something about" "We are in this together as a neighbourhood" Openness to expert and regulatory influence	New neighbours are actively engaged in neighbourhood fire awareness Fire prevention and management is a shared and neighbourhood responsibility

3. METHODOLOGY

This section provides detail of the approach used to refine and test the CAM tool. There were three phases of activity:

- Phase One - Technical review
- Phase Two - Resource and tool development
- Phase Three - Testing and refining the tool

3.1 PHASE ONE – TECHNICAL REVIEW

The technical review of the prototype CAM tool was undertaken with six key FENZ staff. This involved inviting selected senior FENZ staff to a workshop to introduce the tool and our programme logic (Appendix A) that a collective action model will support reduction in LBOs fire risk. A programme logic displays understanding of the current issue being addressed, what actions the project will include, outputs of the project and the expected outcomes. Links between activities, outputs and outcomes show the programme theory of change. In this case, that collective action between neighbours through use of the CAM tool will support collective ownership of wildfire risk and actions to reduce wildfire risk across LBO neighbours.

The participants were given a handout that included the prototype collective action model tool, the proposed grading, and a worked example of the tool (Appendix B). They were then invited to use the tool themselves, by working with a scenario (Appendix C). The workshop participants then gave feedback on: strengths and weaknesses of the CAM tool; anything missing, not needed or not clear enough; and what existing material (such as websites or links to brochures or online resources) they could identify that could populate the CAM tool. This information was then used by the researchers to further develop the prototype CAM tool.

3.2 PHASE TWO – RESOURCE AND TOOL DEVELOPMENT

Phase Two of the project involved designing instruments and methods for introducing and implementing the CAM in test communities and was done in partnership with key FENZ subject matter experts. An interim website (Appendix D) was developed for the prototype CAM tool. The website introduced and presented the prototype CAM tool to prospective users and reiterated that it was being offered for trial and research purposes.

3.3 PHASE THREE – TESTING AND REFINING THE CAM TOOL

Phase three of the project included testing the prototype CAM for understandability and usability by introducing it to two neighbourhood clusters of LBOs, encouraging participants to trial the CAM using the web version, and then interviewing participants about their experience and seeking suggestions to improve the design and presentation of the model. This approach was informed by human-centred design thinking. The motivation behind design thinking has been described as: “the need to create ideas and find solutions (products, services, systems), which are as viable as possible for certain groups of users” (Lindberg, Wagner, & Meinel, 2011). In our case, the prototype CAM was a product of empathic engagement with ‘target’ communities, technical advice on wildfire risk factors and a generic framework to provide a systemic understanding of social practice (Shove et al,

2012). Testing involved working with potential end-users of such a model to involve them in improving its usefulness to them.

LBO participants were recruited through FENZ staff networks who put the ESR researchers in contact with two people who had good networks into the two selected case study sites in Canterbury, one being the Selwyn district and the other the Waimakariri district. In the Selwyn case study, the person was from Civil Defence and in the Waimakariri case study the person was a community board member from the Waimakariri District Council. They were able to identify neighbours who they thought might be interested in participating in the research that the ESR researchers could contact.

Initial briefing and introduction of the model was done with each cluster as a group meeting in their own district. In the case of the Selwyn district, a group of four individuals (one couple from one household and two individuals from two other households) convened in a community hall (another person from another household who was unable to attend still participated in the research in the interview phase); in the case of Waimakariri, a group of six individuals (three couples from three individual households) convened in the home of one of the participants. In both cases the participants knew one another as neighbours and had existing social relationships. These introductory events included the researchers describing the background to the research and the purpose of the current phase. Participants were introduced to the online resources for the model and given a paper-based exercise to practice using the model (Appendix E). Participants discussed their experience of the model and made some observations about usability. These observations were noted by the researchers. Questions of clarification were answered. Participants were invited to try the website version in their own time and to apply it to their own properties before working with at least one neighbour to discuss each other's properties. Research information sheets (Appendix F) and consent forms (Appendix G) were provided for participants, and participants were informed about the plan for follow-up phone interviews to be conducted by one of the researchers. Each of the community meetings took about 60-90 minutes.

Follow-up interviews were semi-structured using an interview guide (Appendix H) but were open enough to encourage free-flowing responses and clarifications. A total of six interviews were undertaken with six separate households, three in both the Selwyn and Waimakariri case studies. We had hoped to get four to seven households per case study site, however this proved difficult amid disruption from COVID-19 and the associated lockdown period. In our first case study we did have four households involved but one household pulled out when we restarted the research after the lockdown ended. We did not start to recruit people for the second case study site till after the lockdown and again it proved difficult to get four to seven households willing to participate in the research. We therefore decided to proceed with fewer numbers in order to be able to undertake the research. It also impacted on this case study's participants willingness to apply the tool with their neighbours. Therefore, for the Selwyn case study we were only able to interview the participants on their views of using the tool in relation to their own property. This was unfortunate but one of the realities of carrying out research during a global pandemic. Some insights on working with neighbours, however, were gained from the Waimakariri study as all of the participants in this cluster used the tool with their neighbours.

The Selwyn interviews were conducted in August and September 2020 and the Waimakariri interviews were conducted in November and December 2020. Interviews were recorded for later analysis. Interview responses were then collated and reviewed for insights that could improve the understandability and/or usability of the CAM.

We had planned on having debrief focus groups with each case study site after the initial interviews (as noted in Appendix F). However, as indicated above, during the introductory community meetings, the participants gave us feedback on the usability of the CAM tool. This was more than we had expected as we had thought we would only be introducing the tool and how it worked. Therefore, it was decided that a debrief workshop after the interviews for each case study site was not warranted. We did not feel we would garner more feedback, as the participants had already given us two rounds of feedback via the introductory meetings and then during the interviews.

On the basis of insights from the above process the structure and wording of the online CAM was edited, and recommendations formulated for future implementation and dissemination of the model.

3.4 LIMITATIONS OF THE RESEARCH

The current research project was limited in scale and findings cannot be generalised to all LBOs. The purpose of the research was to further develop and refine the CAM prototype developed in 2016 in preparation for the tool being deployed more widely. If implemented more widely, ongoing evaluation and refinement of the CAM will be needed.

4. FINDINGS

4.1 TECHNICAL REVIEW OF THE CAM PROTOTYPE TOOL

The significant finding from the technical review of the CAM with key staff from FENZ was that the order of the columns and rows of the model needed to be completely turned on its head. For example, the column, 'Participation and connectedness' needed to come first not last. This was because the FENZ staff thought that everything begins with 'Participation and connectedness', with 'Prevention' following, then 'Preparedness', as this reflected and aligned with the FENZ strategy. In regard to the rows, it was thought that 'Sense' needed to be moved to the top followed by 'Skills' then 'Stuff', again aligning with the FENZ strategy.

Other general feedback from the technical review were:

- You cannot be reliant on a community champion to lead this in the community because if they move out of the community then it creates a vacuum and the tool will not be used. Therefore, you have to check there is sustainability behind implementing the tool. It was thought the best way to ensure this was to make sure the community had a strong collective ownership of both the risk and associated actions for reducing fire risk.
- The CAM tool should be seen as a work in progress and adjusted, even after it had been implemented.
- When the FENZ staff did their scenario in the workshop, they found it scored a D, however they thought the scenario had a lot of potential. Therefore, it was suggested that the CAM tool could be more strengths-based so that householders do not get too disillusioned and can instead see where they are doing well.
- LBOs need to know they are the first responders when an out of control fire is first detected and in the initial stages of response. They also need to understand they live in a hazard scape and they need to have a shared community understanding and appreciation on fire risk.
- FENZ needs to recognise what communities' value and therefore where the risk mitigation is best placed.
- The CAM tool is about imparting knowledge so that households are empowered, and they are talking to their neighbours about fire risk.

The rest of the feedback was around editing and identifying things that were missing such as what to do with pets and livestock if you are not at home, and including information on egress i.e. multiple points of getting in and out of your property.

After addressing the feedback from the FENZ staff, the CAM prototype tool's columns and rows were rearranged. Below is the tool we took out to the two case study communities.

Figure 2: Prototype Collective Action Model (2020)

	Staying connected	Practices to prevent wildfire	Preparation for wildfire
How we think (way of seeing the world)	How you think about working with your neighbours to manage shared risk.	How you think about the risk of wildfire in your area and how to prevent it.	How you think about being ready for a fire and responding to it as a neighbourhood.
Skills and knowledge that matters (competencies)	Who needs to know what in your household and community to help prevent and respond to wildfires.	The skills and knowledge needed to reduce wildfire risk at or near your place.	The skills and knowledge needed to respond to wildfire at or near your place.
Equipment and infrastructure	What you need to have in place in your community to support a neighbourhood approach to reducing wildfire risk.	What you need to have in place on your property to reduce wildfire risk.	What you need to have in place on your property in case there is an out-of-control fire.

Working with staff from FENZ we were able to populate each quadrant with information and links to different web pages and an interim website was developed for the CAM tool for community participants to use and test (see Appendix D).

4.2 FIELD TRIAL OF THE CAM PROTYPE TOOL

The following are the main themes that emerged from participants who trialled the tool on their own and their neighbour's properties.

4.2.1 Usefulness of the CAM tool

All participants could see the usefulness of the tool and could see its potential to stimulate thought and discussion amongst neighbours. They could see it created awareness and considered it a useful tool to encourage neighbourhood socialising of risk.

> *It opened up discussion around fires [with our neighbours] which we hadn't really talked about before.*
>
> (Interviewee A)

> *The biggest gain…is probably socialising the whole thing and getting a sort of group of neighbours to think about it that's the most beneficial thing I can think of really.*

Because if there was a fire that is the biggest gain… it certainly made us think collectively about it as a neighbourhood.

(Interviewee B)

Even if they were familiar with fire risk, they found the tool was useful to remind people of all the risks as some found they became complacent over time.

I think it just made you a bit more aware because we take it for granted and we perhaps a bit silly if you have not had experience of fire at your place it is good to bring awareness.

(Interviewee C)

Through using the tool, they found a shift in their thinking from risk residing within their individual property to that of the neighbourhood.

…the aim of the tool is to get you thinking from a neighbourhood perspective as well as own property, so this is probably good.

(Interviewee B)

One participant noted that they thought the whole concept of putting in place a tool that guided you to all the useful information out there on prevention and mitigation of fire risk was a good one.

There is a mass of useful information out there if you know where to look and the tool takes us to it. The tool was helpful in highlighting some fire safety issues and the links were helpful in taking us to the right website.

(Interviewee B)

However, some participants thought it might be hard to get people to use it as people were time poor and they also had to be trained to use it.

…it could be difficult to get the whole community to buy in due to the busy lives that everyone leads nowadays.

(Interviewee A)

Nearly all participants, except one, found the CAM tool easy to use. The one participant who did not find it easy to use said it was because they were not technology minded and therefore found it complicated. One of the barriers to ease of use was using it on their phone which made the screen too small and hard to see when both themselves and their neighbour were assessing each other's properties. Therefore, they suggested having an app that was phone friendly.

4.2.2 Grading with the CAM tool

In relation to the grading aspect of the tool a couple of the participants thought that the grading was quite harsh and a bit judgemental.

I don't particularly like a grading system, it felt like a score with a pass or fail, sort of judgmental.

(Interviewee A)

However, the point of the grading aspect of the tool is to provoke an emotional response. In the previous research we found that LBOs inclined to over-estimate their own preparedness for preventing and managing wildfire. Therefore, by gaining a grade that was lower than expected it is hoped they will do further wildfire risk mitigation on their property.

Another participant thought it was harsh when it concerned aspects, they had no control over, such as their neighbour's property.

> *But I found that the scoring was quite harsh and it's not necessarily something I can alter because it's not necessarily something that is my property it's perhaps my neighbours.*
>
> (Interviewee D)

However, this participant had not undertaken the grading with their neighbour. If they had of then they would have been able to have that discussion with their neighbour about the aspects that concerned them or find out what their neighbour did to mitigate fire risk on their property.

Additionally, the grading part needed to be interactive so you could fill it out online and not require it to be printed out, as not everyone has a printer. One participant also suggested that it would be useful to have examples of what is good practice in the paragraphs.

> *[grading could be improved] by what is good practice and that might be in paragraphs that you have got some equipment stored where everyone knows it is… just a bit more bulky around that.*
>
> (Interviewee B)

For those participants that used the tool with their neighbour one said they did feel uncomfortable about grading their neighbour's property. Another participant said their neighbour didn't like the word 'grade' as they associated it with degrading and thought the word grade could be replaced with either the word 'score' or 'rating'.

4.2.3 Insights from using the CAM tool

After using the CAM tool, participants identified the importance of communication with neighbours, having up to date contact information and a community emergency plan developed with neighbours in case of fire.

> *Well I guess the communication thing is important to know who your neighbours and how quick you can get a hold of them.*
>
> (Interviewee C)

Those participants who used the tool together with their neighbours said it was good to discuss fire risk together and find out their knowledge and actions to mitigate fire risk on their properties. This is something they had not done before with their neighbours.

> *Lots of dialogue, lots of discussion and we had pizza at their house first for lunch and then we did it together and it was really good doing it with your neighbour because you chatted about different scenarios and it is quite interesting seeing another person's perspective.*
>
> (Interviewee B)

Most of the participants said that after using the CAM tool they were planning on doing something different on their property to reduce fire risk. Examples include: addressing their issue with a lack water; tidy up their safe zone; reducing fuel load; develop and communicate an emergency plan; update neighbours contact information; finding out all the equipment neighbours have got; putting more water on their lawn during summer; making sure every household member knows how to use the irrigators; having water available for helicopters; getting a trailer with a water tank on it; and taking more care with their mowing.

4.2.4 Ownership and presentation of the CAM tool

Most thought an organisation such as FENZ needs to take ownership of the tool, keeping it up to date and coordinating roll-out across organisations. Suggestions on how to promote it to communities was giving community talks/training sessions and this could be done through schools or community groups. One suggestion was that the tool, if developed as an app or interactive web tool, should have the ability to book a group session.

> *The fully developed tool needs an organisation (Fire & Emergency) to take ownership and get the message out to community groups and individuals. Fire Service can give community talks/training sessions. [You] could have the ability to book a group session through the tool.*
>
> (Interviewee B)

Television and radio were considered good platforms to advertise the tool, as well as Facebook and other social media platforms, community newspapers and flyers in letterboxes. Also, a link to the tool could be on other organisation websites such as Civil Defence, insurance companies and local councils.

Participants thought the tool should be a free online, interactive, user friendly, web-based tool or app with the ability to record your scores on your device. It was also suggested that it would also be good to have it as a laminated chart for those who do not have access to the internet or do not know how to use a digital device. At the Waimakariri case study training meeting all the participants suggested getting the tool out there sooner rather than waiting till it is perfect.

Other organisations that were suggested to take ownership besides FENZ were Civil Defence, under the Get Ready umbrella.

> *I reckon you should do it through something that already exists even something like Selwyn gets ready or those Gets ready situations and I am a community response team member for that that would be great for us to have something. We could talk about that type of thing to individuals who are signing up.*
>
> (Interviewee D)

Another suggestion was the local council could take ownership, as they would know of new people moving into the area and they would need to be educated about fire risk.

> *The key thing is, is that someone has to be the driver for it someone has to take responsibility and that person has to have authority to both monitor and audit it…and present it to new people as an option for new people shifting into the area and Im probably thinking of a council type person here, who can take responsibility for it. They know when new people are coming into the area.*
>
> (Interviewee E)

One participant suggested the tool could also be used to gather intelligence. After people had used the tool the anonymous data could be useful for identifying the overall weaknesses in fire risk awareness and mitigation, either in a geographical area or as a general risk, and then FENZ could have a targeted campaign, either in that geographical area or nationally. For this to happen, the tool would need to have a location category implemented into the tool that the participant would need to fill out.

5. RECOMMENDATIONS

Following technical review and tool development, results from limited testing with LBOs suggest the prototype CAM tool can support a shift in shared norms amongst neighbours. According to the participants, the tool helped to create awareness of wildfire risk amongst themselves and their neighbours. Through using the tool, they found a shift in their thinking from risk laying with their individual property to that of the neighbourhood. Furthermore, the participants said the tool was useful to encourage neighbourhood socialising of wildfire risk by stimulating thought and discussion amongst neighbours. Due to the positive feedback we got from the participants on the usefulness of the CAM tool to raise awareness and reduce fire risk, we recommend the following:

- FENZ to **develop the tool into an app and/or website** by a professional app or web developer that can make it graphically appealing and easy to use by participants.
- A **facilitators guide to be developed** so that FENZ can socialise and disseminate it along with information about the tool when they are doing community outreach, such as local AMP shows. This facilitators guide could also be disseminated to local rural community groups through community boards and civil defence groups within local councils. This would enable FENZ to disseminate the tool widely and also allow community groups to self-organise and facilitate the initial training of using the tool. Such a strategy would reduce the workload for FENZ staff organising community meetings and facilitating the training themselves. As noted in the methodology section, the pandemic impacted on people's willingness to participate. The findings section identified that some participants thought that the people's busy lives may create a reluctance to use the tool. However, by FENZ disseminating the CAM tool to community groups for them to use and train their neighbours, it may provide better buy-in from community members.
- FENZ **liaise with other organisations** such as Civil Defence, local councils and rural insurance providers to advertise the CAM tool on their websites so as to distribute it widely.
- FENZ **consider using the CAM tool for data collection** for strategic intelligence for fire management purposes. This would not necessarily be just about identifying weaknesses in awareness and identification of fire risk, but also an opportunity to identify strengths that could be leveraged for use in other communities. In order to do this, the tool would need to include user informed consent for their anonymous data to be used. It would also be important to be clear, for the sake of uptake, that information would not be used for compliance enforcement. The tool would also be used to collect information on user location so that FENZ could target certain districts. This would provide data for future FENZ planning or future fire research.
- FENZ to undertake **ongoing development and implementation** of the CAM tool **by developing a Developmental Evaluation approach** around the CAM tool. This would be achieved by regularly collecting and considering information on where and how the tool is being used, and improvements that can be made.

In conclusion, following our, albeit limited study testing the CAM tool with two case study sites, we conclude that the CAM tool has potential to enable individual LBOs and their neighbours to shift their thinking of wildfire risk from that of the individual household to that of the neighbourhood and promote changed practice. This was demonstrated in how the participants responded with using the CAM tool. As noted in our first report (Nicholas & Hepi,

2017), by encouraging a sense of neighbourhood in relation to risk management it will be possible to stimulate change in social practice regarding wildfire risk. What will support this change is mutual accountability along with mutual trust, which in turn will enhance social cohesion within the neighbourhood, as well as some mechanisms to compare reducing wildfire risk practices within a neighbourhood. We have demonstrated the potential for the CAM tool to enable this.

6. ACRONYMS

CAM	Collective action model
ESR	Institute of Environmental Research Limited
FENZ	Fire and Emergency New Zealand
LBO	Lifestyle block owner

7. REFERENCES

Huggins, T. J., Langer, E. R., J. McLennan, J., Johnston, D. M., Yang, L. (2020). The many-headed beast of wildfire risks to Aotearoa-New Zealand. Australian Journal of Emergency Management. Volume 35 (3). July 2020. pp 48-53.

Jakes, P. J., Kruger, L., Monroe, M., Nelson, K., & Sturtevant, V. (2007). Improving Wildfire Preparedness: Lessons from Communities across the U.S. Human Ecology Review, 14(2), 188-197.

Jamieson, I. A., & Briggs, D. J. (2009). Towards effective risk discourse: The role of stakeholder partnerships. International Journal of Risk Assessment and Management, 13(3-4), 276-293.

Lindberg, T., Wagner, R., & Meinel, C. (2011). Design Thinking: A Fruitful Concept for IT Development? In C. Meinel, L. Leifer, & H. Plattner (Eds.), Design Thinking: Understand – Improve – Apply, Understanding Innovation (pp. 3–18). Berlin, Heidelberg: Springer. Retrieved January 22, 2021, from https://doi.org/10.1007/978-3-642-13757-0_1

McFarlane, B. L., McGee, T. K., & Faulkner, H. (2011). Complexity of homeowner wildfire risk mitigation: an integration of hazard theories. International Journal of Wildland Fire, 20(8), 921-931.

Nicholas, G., & Hepi, M. (2017). Engaging owners of life-style blocks in understanding and mitigating wildfire risk (Client Report for NZ Fire Service Commission No. CSC 17005). Christchurch: Institute of Environmental Science and Research.

Ostrom, E. (2009). A General Framework for Analyzing Sustainability of Social-Ecological Systems. Science, 325, 419-422.

Paveglio, T. B., Jakes, P. J., Carroll, M. S., & Williams, D. R. (2009). Understanding Social Complexity Within the Wildland–Urban Interface: A New Species of Human Habitation? Environmental Management, 43(6), 1085-1095.

Shove, E., Pantzar, M., & Watson, M. (2012). The dynamics of social practice: Everyday life and how it changes: Sage publications.

8. APPENDICES

APPENDIX A - FENZ WORKSHOP HANDOUT

Appendix A - prototype Collective Action Model (CAM)

The CAM prototype (Figure 1) is firstly a tool for self-assessment by LBOs; it can then be used as a vehicle for conversation with neighbours and/or as a basis for a neighbour to undertake a peer assessment. While we see a role for FENZ in refining and promoting the CAM, the model is designed by community use independently of FENZ.

	Preparedness to be prepared for wildfire event	Prevention practices to maintain property and conduct safe fires	Participation and connectedness to establish and sustain links and relationships
Stuff (infrastructure)	Access to the property for firefighting equipment Water – volume, accessibility Information on good fire practice and advice Fire extinguishers strategically placed Landscaping to defend houses and key infrastructure Communication options readily available Awareness package – what to notice, what to do Fire safety plan	Landscape design and management – to reduce fuel and avoid ignition Machinery precautions – to avoid accidental ignition Location and management of flammable items and substances Management of open fires	Neighbourhood communications plan – up to date Neighbourhood resources plan – up to date Neighbourhood fire safety plan – up to date Neighbourhood regular mutual audit
Skills (competencies)	Understanding of behaviour and nature of fires Awareness of response options and when to deploy them Physical and psychological capability to respond to a fire event Familiarity with neighbours' properties and protocols	Land and crop management to minimise risk Situational awareness – including issues of proximity, weather, seasonality Awareness of information sources and regulations Awareness of behaviour and nature of fires	Household plan and awareness (including children) Information sharing with neighbours

Sense (way of seeing the world)	Collective responsibility "We are in this together as a neighbourhood" "We understand there are times we will need specialist advice or help to be prepared" "We are realistic about our vulnerability to out-of-control fire"	"We are realistic about our vulnerability to out-of-control fire" "We see fire risk as a problem we can do something about" "We are in this together as a neighbourhood" Openness to expert and regulatory influence	New neighbours are actively engaged in neighbourhood fire awareness Fire prevention and management is a shared and neighbourhood responsibility

Figure 1: A Collective Action Model to reduce wildfire risk

We envisage the model being supported by explanatory and educative material linked to specific boxes and items. However, exact interpretations are less important than the awareness and dialogue that the model promotes.

Using the CAM

Each box in the model is used to produce a grade for how well a property demonstrates the desirable elements: grades A – D (Table 1). That process results in three grades per row (stuff, skills and sense).

For each row in the model the property is then given the lowest grade in that row.

The overall rating of the property is determined by the lowest of the row grades and interpreted by Table 2.

A worked example of the CAM is provided in Appendix A.

Table 1: Grading scale for particular elements

Grade	Interpretation
A	"This property has got all the elements in this box fully covered."
B	"This property has the elements in this box adequately covered. Some areas could be improved, but these areas are unlikely to increase the neighbourhood risk of wildfire."
C	"This property needs to make changes to one or more elements in this box to lower the risk to the neighbourhood of wildfire."
D	"This property is an immediate risk to the neighbourhood because important elements in this box are not in place."

Table 2: Grading scale for a property

Grade	Interpretation
A	"This property is an exemplar of good practice in reducing the risk of wildfire. Very little improvement in practices on this property are likely

	to make a positive difference to wildfire risk."
B	"This property is well prepared to prevent and to deal with wildfires. Only minor improvements are suggested."
C	"This property lacks some important elements of good practice in reducing the risk of wildfire."
D	"This property is poorly prepared to prevent and deal with wildfires. Significant improvements of practice are needed."

The idea behind this model is that it promotes social action simultaneously with promoting good individual practice. The grading system is intended to provide a simple heuristic to show when improvement is needed and the focus of that improvement. Grading gives an easy shared language between neighbours and can stimulate an element of competition to drive social change. The interpretation statements in Tables 1 and 2 are intended to communicate in plain language and stimulate relevant sense of achievement or social obligation.

The CAM is envisaged as a resource to be disseminated for voluntary use by LBOs. It is not intended, or suitable, as a regulatory or formal audit device. The aim is to stimulate responsible social practices, not a compliance mentality. The mechanism for change is the combination of awareness raising and social accountability among neighbours.

A Worked Example

The following is a hypothetical example of applying the CAM. It is based on field observations of a cluster of properties in the Selwyn District.

1. *Each box in the model is used to produce a grade for how well a property demonstrates the desirable elements: grades A – D (Table 1). That process results in three grades per row (stuff, skills and sense).*

Stuff:

The property in question had most of the infrastructure in place but lacked a documented fire safety plan (preparedness) and there is no neighbourhood regular audit (participation and connectedness).

This means that two of the three boxes in the 'Stuff' row had to be graded 'C'.

Skills:

The property occupants lacked some important skills: they had no familiarity with neighbours' properties and protocols (preparedness), little awareness of where to find information and regulations about fires (prevention practices), land and crop management did not take account of fire risk (prevention practices), there is no information sharing with neighbours (participation and connectedness). The land and crop management were considered sufficiently serious that it was graded 'D'. The other boxes in the row were graded 'C'.

Sense:

Fire prevention and management was not fully seen as a shared and neighbourhood responsibility (participation and connectedness), but there was some awareness. Therefore, one box in the Sense row was graded ‘B’.

2. *For each row in the model, the property is then given the lowest grade in that row.*

As the lowest grade for the boxes in the ‘Stuff’ row is C, the grade for the whole row is C.

> “This property needs to make changes to one or more elements in this row to lower the risk to the neighbourhood of wildfire.”

The lowest grade for the boxes in the ‘Skills’ row is D, so the grade of the whole row is D.

> “This property is an immediate risk to the neighbourhood because important elements in this row are not in place.”

The lowest grade for boxes in the ‘Sense’ row is B, so the grade of the whole row is B.

> “This property has the elements in this row adequately covered. Some areas could be improved, but these areas are unlikely to increase the neighbourhood risk of wildfire.”

3. *The overall rating of the property is determined by the lowest of the row grades and interpreted by Table 2.*

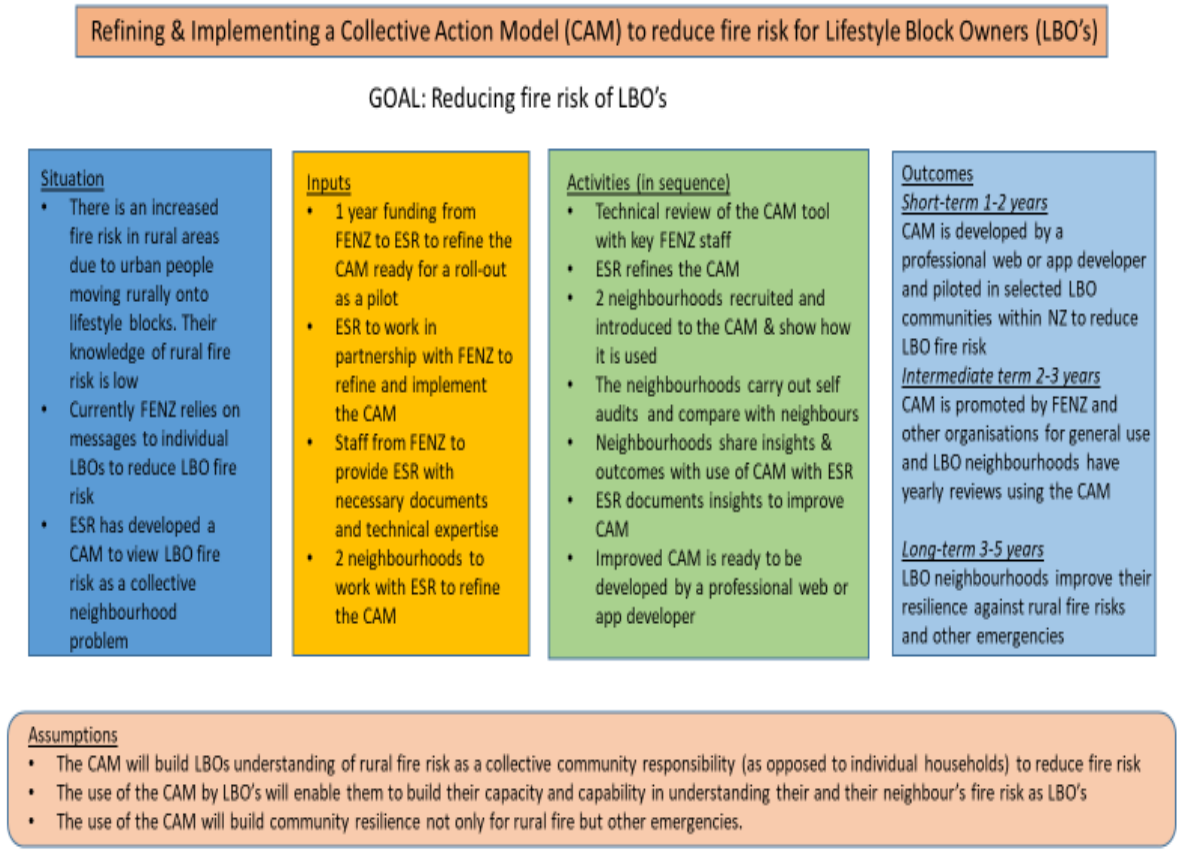
The lowest of the row grades is the D for Skills. Therefore, the property as a whole received a D grade:

> “This property is poorly prepared to prevent and deal with wildfires. Significant improvements of practice are needed.”

From the above worked example it becomes clear where immediate improvements can be made: land and crop management can be improved to take account of fire risk. This would lift the overall rating of the property to C [“This property lacks some important elements of good practice in reducing the risk of wildfire”].

Further improvements could then focus on the Stuff row: documenting a fire safety plan and participating in a regular neighbourhood audit. With those issues addressed the property could be graded B [“This property is well prepared to prevent and to deal with wildfires. Only minor improvements are suggested”].

Programme logic



APPENDIX B - SCENARIO

Scenario

A family from urban Christchurch has bought a 10-acre lifestyle block out in Selwyn, they have moved because they want their kids to grow up in the country and have more space. They have never lived rurally before but do have friends who also live on life-style blocks and have talked to them about fire risk and how to reduce it. Their friends have also told them about the FENZ website and told them there is lots of information on there for them to reduce their fire risk. However, they haven't got around to reading it yet but do plan on doing so. They have purchased a pony for the kids and also some sheep as they have been told by their friends that livestock are an easy way to keep the grass down. They have also bought a ride on mower to cut the grass that surrounds the house and where the livestock cannot reach. They are keen to make the property more 'pretty' by planting more trees and shrubs around the house and down their long driveway, and also to put in a pool for the kids to swim in. Their water is not reticulated, and they have a rainwater tank to supply the house with water. They have purchased some fire extinguishers and also an industrial hose to help with any possible fire outbreaks on their property. They do not know any of their neighbours yet and are unsure on how to introduce themselves to get to know them better. As both parents work full-time and in Christchurch the added extra maintenance on their lifestyle block, they do not have a lot of time to do this anyway. They aren't too worried about fire risk to their property as New Zealand doesn't get many out of control fires unlike Australia, and they are sure the fire brigade would be onto any spot fires pretty quickly.

APPENDIX C - INTERIM WEBSITE

Link to interim website: http://firesafeneighbour.nz/

APPENDIX D - HOW TO USE THE COLLECTIVE ACTION MODEL (CAM) TOOL

This was handed out to the participants at the community workshops.

How to use the Collective Action Model (CAM) tool

Below is a summary of the nine boxes within the Collective Action Model (CAM) tool to use for self-assessment of your property. The full tool is available on the website: http://firesafeneighbour.nz/ . The tool has three rows: 'How we think'; 'Skills and knowledge that matter'; and 'Equipment and infrastructure'. Each row has three columns: 'Staying connected'; 'Practices to prevent wildfire'; and 'Preparation for wildfire'.

Here is the summary of what the nine boxes represent:

	Staying connected	Practices to prevent wildfire	Preparation for wildfire
How we think (way of seeing the world)	How you think about working with your neighbours to manage shared risk.	How you think about the risk of wildfire in your area and how to prevent it.	How you think about being ready for a fire and responding to it as a neighbourhood.
Skills and knowledge that matters (competencies)	Who needs to know what in your household and community to help prevent and respond to wildfires.	The skills and knowledge needed to reduce wildfire risk at or near your place.	The skills and knowledge needed to respond to wildfire at or near your place.
Equipment and infrastructure	What you need to have in place in your community to support a neighbourhood approach to reducing wildfire risk.	What you need to have in place on your property to reduce wildfire risk.	What you need to have in place on your property in case there is an out-of-control fire.

In the online version you can click on a link in each box, you will then see a series of statements relating to the theme of that box. In some cases, there will also be links for further information that give more information on the themes in that box. You are invited to give each box a grade (A-D) based on how well your property fulfils the ideals in the statements. Use the template provided to record your self-assessment of your property. You can determine the appropriate grade by what is written next to the A, B, C, D on the right-hand side of the statements. Your assessment for each box is based on taking into account

all the statements in the box. If any one aspect lets your property down, then that will lower your assessment for that whole box.

Below is an example of the ‘How we think’ (row) and ‘Staying connected’ (column) box and its possible grades.

	Staying connected	What grade would you give your property? ['A' is the highest, 'D' is the lowest.]	
I: How we think (way of seeing the world)	"I/We see fire prevention and management as a shared and neighbourhood responsibility" "Our neighbours are actively engaged in your neighbourhood's fire awareness" "New neighbours are actively included into a neighbourhood fire awareness?" Find out more	A	“This property has got all the elements in this box fully covered.”
		B	“This property has the elements in this box adequately covered. Some areas could be improved, but these areas are unlikely to increase the neighbourhood risk of wildfire.”
		C	“This property needs to make changes to one or more elements in this box to lower the risk to the neighbourhood of wildfire.”
		D	“This property is an immediate risk to the neighbourhood because important elements in this box are not in place.”

When you have finished all 3 boxes in a row, you then give the row as a whole the ‘lowest’ grade of the three boxes. This is because the tool is designed to identify where the weaknesses are in your property regarding fire risk, so you can then remedy them. The online version will then link to the next row in the model.

Below is a copy of the template to record the grade you give to each box, each row and, finally, each property.

	Staying	Practices to prevent	Preparation for	Line Grade

	connected	wildfire	wildfire	(A, B, C or D): The lowest grade for each line
How we think	I:	II:	III:	
Skills and knowledge	IV:	V:	VI:	
Equipment and infrastructure that matters	VII:	VIII:	IX:	
				Property grade: (lowest grade in the column)

A "This property is an exemplar of good practice in reducing the risk of wildfire. Very little improvement in practices on this property are likely to make a positive difference to wildfire risk."

B "This property is well prepared to prevent and to deal with wildfires. Only minor improvements are suggested."

C "This property lacks some important elements of good practice in reducing the risk of wildfire."

D	“This property is poorly prepared to prevent and deal with wildfires. Significant improvements of practice are needed.”

After you have graded each row you, give the property as a whole the lowest grade of the 3 rows. This is because the property is only as strong as its weakest link. So, each property will have an A, B, C or D for its current state. Here is how to interpret that overall grade for the property:

You are then invited to identify the two main things that lowered the current grade for this property, that you think you could remedy for the current or coming fire season.

The aim of the tool is to identify weaknesses and lessen your fire risk. It is very doubtful any property would score an ‘A’ first off. Although, hopefully over time with using the tool and with implementing improvements, your property will move towards an ‘A’ grade.

Once you have used the tool on your own property, could you then team up with another neighbour that is in the research trial and together do and discuss an assessment of each other’s property. The rationale behind this is that we see the tool as promoting social neighbourhood action simultaneously with promoting good individual practice. In other words, the aim of the tool is to facilitate neighbourhood thinking and action on reducing wildfire risk.

Because this is a trial of the tool and we want to improve it, when you are using it please note down any frustrations with its design or presentation, or improvements you think could be made. This will help you when we do our interview with you on the usability and usefulness of the tool.

Thank you very much for taking the time to trial this important tool and helping to reduce the risk of wildfires and their consequences in your neighbourhood.

Maria Hepi, research project leader

ESR. Phone: 027 3807809

APPENDIX E - INFORMATION SHEET

Science for Communities

Information Sheet: Trial of a Collective Action Model to reduce fire risk in Small Block Owners

March 2020

In 2016-17 ESR was commissioned by the then New Zealand Fire Service Commission to better understand barriers preventing small block owners from accepting wildfire risk and from making changes to reduce that risk. The aim was that such understanding would enable authorities to modify social marketing and other practices in ways that improve behaviours of small block owners in relation to wildfire risk. It was a small-scale qualitative study carried out in two districts in Canterbury.

The project produced a prototype model for constructive engagement with small block owners.

We have called the prototype model the Collective Action Model (CAM) to support small block owner's fire risk reduction. ESR has now been commissioned by Fire and Emergency New Zealand to further develop and test the CAM. The research will evaluate the CAM ease of use, acceptability and effectiveness at encouraging wildfire prevention and risk reduction with small block owners. A link to the CAM can be found here: http://firesafeneighbour.nz/

The study is being conducted in the two districts of Selwyn and the Waimakariri. We would like you to be part of this project. We all have something to gain by reducing the risk of wildfire in our districts.

What would it involve from you?

Attend a one-hour gathering with neighbours in your area to learn about the CAM and how to use it. We are aiming for 4-7 property owners per trial.

Use the CAM to undertake a fire risk assessment of your own property.

In dialogue with a neighbour, discuss fire risk assessments of both your own and your neighbour's property using the CAM.

Participate in an interview with one of the research team to give feedback on the usefulness and usability of the CAM. The interview will be in person, at a time and place that is convenient to both parties. An interview will take 45 – 60 minutes.

Attend a debrief focus group with the other participants in your district to share insights on the usefulness and usability of the CAM. The focus group will be no longer than 2 hours.

Any comments by participants will not be attributed to identifiable persons. You are, of course, free to decline to participate or to withdraw from the study at any time.

If you would like to read the 2017 report on engaging owners of life-style blocks in understanding and mitigating wildfire risk that produced the CAM, you can access it here: https://fireandemergency.nz/assets/Documents/Files/Report-157-Lifestyle-block-owners-report-Dec-2017.pdf

For further information:

Maria Hepi

ESR

027 380 7809

Email: maria.hepi@esr.cri.nz

Graeme Nicholas

Ti Kouka Consulting

0272087314

Email: graeme@tikouka.co.nz

APPENDIX F- CONSENT FORM

Science for Communities

Trial of a Collective Action Model to reduce fire risk of Small Block Owners

Consent form

October 2020

I have read and understood the information sheet dated _____ for taking part in the study on reviewing the Collective Action Model to reduce fire risk of Small Block Owners.

I am satisfied with the answers I have been given. I understand that taking part in this study is voluntary and that I may withdraw from the study at any time.

I understand that in written reports, comments will not be attributed to identifiable individuals.

I have had time to consider whether to take part in the study, and I know who to contact if I have any questions.

I _____ (full name) consent to take part in this study.

Date: _____

Signature: _____

APPENDIX G- INTERVIEW GUIDE

Interview guide for Small Block Owners on usability and usefulness of the CAM to reduce fire risk

1. What was your experience of using the CAM when you assessed your own property for fire risk?
   a) Was it easy use?
   b) What worked well?
   c) What got in the way?
   d) What would you change?
   e) What did you think of the grading aspects of the CAM?
      i. Could the grading aspect be improved? If so, how?
   f) What insights did you gain on fire risk by using the CAM?

2. What was your experience of using the CAM in dialogue with your neighbour when you assessed your own property and their property for fire risk?
   a) Was it easy use together?
   b) What worked well using it together?
   c) What got in the way when using it together?
   d) What would you change?
   e) What did you think of the grading aspects of the CAM when undertaking an assessment with your neighbour?
      i. Could the grading aspect be improved? If so, how?
   f) What insights did you gain on fire risk by using the CAM with your neighbour?
   g) Do you think a tool like the CAM is useful for developing your thinking of fire risk as a collective community problem not an individual property problem?

3. Would you like to see this tool being used by other owners of small blocks?
   a) What would you suggest as a good way of presenting the CAM tool so it gets used?
4. Did you do, or plan to do, anything different because of the CAM?

Science for Communities

INSTITUTE OF ENVIRONMENTAL SCIENCE AND RESEARCH LIMITED

Kenepuru Science Centre
34 Kenepuru Drive, Kenepuru, Porirua 5022
PO Box 50348, Porirua 5240
New Zealand
T: +64 4 914 0700 **F:** +64 4 914 0770

Mt Albert Science Centre
120 Mt Albert Road, Sandringham, Auckland 1025
Private Bag 92021, Auckland 1142
New Zealand
T: +64 9 815 3670 **F:** +64 9 849 6046

NCBID – Wallaceville
66 Ward Street, Wallaceville, Upper Hutt 5018
PO Box 40158, Upper Hutt 5140
New Zealand
T: +64 4 529 0600 **F:** +64 4 529 0601

Christchurch Science Centre
27 Creyke Road, Ilam, Christchurch 8041
PO Box 29181, Christchurch 8540
New Zealand
T: +64 3 351 6019 **F:** +64 3 351 0010

www.esr.cri.nz