

CALL FOR EXPRESSION OF INTEREST FOR ERP 12 – EFFECTIVENESS OF RESOURCES TO SUPPRESS BUSHFIRE

Proposals due **27 July 2018** to office@bnhrc.com.au

INTRODUCTION

The Bushfire and Natural Hazards CRC in conjunction with our clients, the Department of Environment Land Water and Planning (DELWP) representing the State of Victoria on behalf of Country Fire Authority (CFA), is seeking expressions of interest for the following project.

Effectiveness of resources to suppress bushfire: aerial and ground based

PROJECT AIMS AND OBJECTIVES

1. This project will explore resource use and effectiveness on both small and large fires throughout the duration of fire incidents to identify and highlight any evidence of potential inefficiencies, and make recommendations on practices to improve efficiencies
2. This project will focus on the development and pilot of a robust methodology to address:
 - a. Incident level productive capacity of all resources relative to length of fire perimeter;
 - b. Resource abundance during the active growth and control phase as delineated by actual fire cessation;
 - c. The types of resources used during different phases of fire management; and
 - d. The relationship between the daily observed percentage of final fire perimeter contained and the reported percentage containment during an incident

BACKGROUND

Safer Together

1. In November 2015, the Victorian Government released the Safer Together policy platform, setting out the future direction for bushfire management in Victoria. Safer Together is part of broader government reform to Victoria's emergency management sector and sees land and fire management agencies working together, in partnership with local communities to combine fire expertise with local knowledge.
2. A key pillar to Safer Together is science data and technology. The policy specifically states "we use the latest science, data and technology to make sure our actions are

targeted at reducing bushfire risk and protecting those things we care about. It also notes under “what we do:” “Commission bushfire science research” (p. 9), “What we will do: continue to invest in new science to address knowledge gaps and reduce uncertainties in our bushfire modelling.” (p. 17) and “Risk is dynamic and constantly shifting, so we need to keep building on our evidence base. We will continue our investment in science, and in partnership with research institutions, to build knowledge of the relationship between fire and the environment and to better manage risk.” (p. 18)

3. In May 2017 \$23m was announced to fund a two-year Safer Together program. In part these funds were allocated to ensuring that Victoria’s significant investment in bushfire preparedness and response is supported by a systematic and ongoing investment in developing scientific evidence.
4. The implementation of Safer Together is being improved by applying a systematic approach to understanding what some of the key sector knowledge gaps are, the resulting risks they may pose to the achievement of Safer Together objectives, and determining how these risks can be mitigated by specific pieces of research.
5. Through being able to clearly articulate what existing research delivers, and where the priority knowledge gaps occur, the sector will be able to respond quickly and consistently in answering questions about resource requirements, in accessing external, collaborative or partnership opportunities, or in leveraging off existing programs.
6. This project is one of nine intended for delivery through the Safer Together program.

CONTEXT

1. Fire management agencies currently have limited understanding in how effective they are at their core business: Suppressing fire to protect lives and property.
2. Underpinning firefighting are different strategies and tactics used when deploying resources, such as different combinations of aircraft, tankers, dozers and hand crews.
3. There have been many studies on productivity rates on hand crews, dozers and aircraft, which have demonstrated high variability in the line production rates. Very little research has been conducted into the production rate of ground-based tankers. There is an opportunity for some innovative work to determine resource use and productivity at real incidents and experimental fires, with the availability of tracking devices on both ground-based and aerial resources. From this data, realistic probability models could be developed for the resource types and could also analyse tactics and tasks undertaken – such as diverting resources from the fire for asset protection.
4. Understanding fire suppression efforts is complex- it is not only the number of resources deployed, but how these resources are used in combination to combat various elements of fire suppression. For example, sending the maximum number of

tankers to a fire may not result in the most effective fire suppression effort. If the difficulty of suppression is the distance to a water source, tankers are off the fire line for a substantial time travelling to the nearest fill point. It may be more effective to deploy fewer tankers and a quick fill or bulk water carrier to maximise suppression efforts on the fire.

5. This complexity is increased by cost-effective considerations. For instance, aircraft are very expensive resources, yet they are a very efficient way to knock down a head fire.
6. This research will provide an evidence base for economic justifications relating to firefighting fleet and resources.
7. This project is clearly linked to the *Safer Together* criteria of improving our effectiveness at reducing the risk of bushfires.

SCOPE

INCLUSIONS

1. Undertake a literature review and provide a reference paper that describes the classes of resources used in fire suppression activities, and for each class of resource, provide an overview (with references) of the attributes, limitations and range of activities each resource can be applied to fire suppression activities across a range of fire intensities and fire dimensions. Also include a review of what fireline construction/suppression effectiveness methods currently exist and their fitness for purpose in Victoria. This information should be used as a foundation to support the subsequent elements of this project.
2. Develop a methodology to collect data on resource allocation and efficiency of suppression resources. There are multiple scales to this including:
 - a. Tactical level: what are the best techniques for effective suppression a fire line? E.g. tanker relays along flanks with two hoses to knock down and extinguish fire edge. These tactical decisions can ultimately influence the growth and subsequent suppression efforts. E.g. if the tanker relay is ineffective at suppressing all the fire edge, there will be breakouts which will require additional suppression efforts
 - b. Incident-level: what resource combinations are required to improve initial attack on the fireground? E.g. aircraft to knock down head fire, tankers to extinguish flanks, bulk water carriers to reduce distance to fill, ultralights and hand crews on the black to knock out hot spots and identify hazardous trees
 - c. State/strategic level: where should resources be allocated/prepositioned to improve strategic suppression effectiveness?
2. Refine and pilot test methodologies for application at the incident level
3. Complete undertaking of methodology to determine suppression efficiency of resources over the course of a fire season

EXCLUSIONS

1. Incorporating suppression effectiveness findings into current and future fire behaviour models and risk tools – this will require a separate project and funding

PROJECT SPECIFICATIONS

Key Steps

Key Steps	Lead	Due Date
1. Project commencement		September 2018
2. Consultation with end-users on available data for study		September 2018
3. Develop a draft methodology for data collection and analysis of effectiveness		November 2018
4. Refine and pilot test methodology		Fire season 2018/19
5. Literature review and reference paper		June 2019
6. Further development and refinement of method		November 2019
7. Utilisation of method to determine suppression efficiency of resources over the whole fire season		Fire season 2019/20
8. Produce project report including defined methodology and recommendations for future work, and peer reviewed publications from study findings.		May 2020
9. Project completion		Jun 2020

Expected Outputs

Refer to Scope.

Quality Control

Final report and other project outputs

It is the expectation of the Bushfire and Natural Hazards CRC and our clients DELWP and CFA, that the material delivered as part of this project will meet the highest scientific standards and will be suitable for internal and external distribution.

It is a requirement of this project that the final report (and any supporting material) is 'submitted to the States' satisfaction'. To ensure the final report meets this expectation it will be subject to up to two rounds of review (with a minimum of two weeks for each review) by DELWP and CFA. Research organisations are required to ensure an internal peer review process is undertaken prior to the draft final report being submitted for consideration.

Before the final report is submitted to the State's representative for approval it must also have been

- Through an independent peer reviewer approved by the Bushfire and Natural Hazards CRC Project Manager
- Professional proof read and copy edited

These steps must be arranged by the research organisation costed as part of project budget and completed within the project timeframe.

Reports that have not been independently peer reviewed and professionally proof read and copy edited will not be considered final. A copy of the independent peer review and the researcher response to any comments must be provided to the CRC.

Communication

To further assist with the quality assurance, it is expected that:

- The project team will utilise a consultative approach when developing the overall framework and data management processes/criteria, and will demonstrate this by documenting engagement activities within the relevant reports. This will involve seeking input from DELWP and CFA subject matter experts to ensure development of a framework and processes that are fit for purpose.
- The research team leader will give periodic presentations) to the project reference group to gain critical feedback on project milestones.

Any further quality control processes that are required for this piece of work, as well as key success measures, will be agreed with the Policy Lead as part of the planning process.

PROJECT MANAGEMENT AND PROCESSES

Contractual Arrangements

This project is being delivered under an Agreement in place between the Bushfire and Natural Hazards Cooperative Research Centre and the DELWP in the State of Victoria. Under this Agreement the CRC is responsible for the delivery of a number of bushfire related research projects. The contract put in place between the CRC and the research organisation selected to undertake this work will reflect the terms of the Agreement between DELWP and the CRC.

A copy of the draft contract the CRC will provide to the successful research organisation is provided with this document. This contract should be reviewed as part of the EOI process. This is a standard agreement, and any changes will be at the sole discretion of the CRC. If you would like to request amendments to any of the terms and conditions set out in the proposed contract, details of the proposed changes and the reason the changes are requested must be included with the submitted response. In considering, this contract and proposing changes please note we have been advised by DELWP that (i) changes to provisions relating to the ownership of Intellectual Property will only be varied to take account of substantial in-kind contribution from the successful research organisation/s and (ii) no changes can be made to the publications approvals processes.

Project Governance

Each project is carried out under the supervision of a Project Control Board (PCB) and in accordance with the governance arrangements agreed between CRC and DELWP.

While the contractual relationship for the delivery of this project will be between the research organisation and the Bushfire and Natural Hazards CRC there will also be a strong relationship between the research team and DELWP and CFA staff. Communication is an important element of the success of this project and Researchers will be required to maintain strong links with both the Policy Lead and the CRC Project Manager throughout the project.

A governance plan has been prepared which shows the roles and responsibilities of each of the participants. The successful research team will be required to comply with the processes and expectations as set out in that document.

Project Planning

The project overview included in this document describes the way the DELWP and CFA subject matter experts believe the project can most successfully be undertaken. Alternative approaches can be considered. Any alternative approaches must ensure the delivery of the required outputs including any intermediate outputs identified in this document.

Following acceptance of a project proposal the successful research organisation must prepare a detailed project plan and risk treatment plan **using the DELWP template**. This plan must be approved by the Policy Lead and will become an attachment to the contract. The project plan must be approved within 3 months of the notification of the acceptance of the project proposal.

Reporting

The successful research organisation will be required to make at least one presentation (and possibly two) to the Project Control Board or other nominated group during the life of the project.

Research organisations will also be required

- to provide a poster for the annual AFAC/BNHCRC conferences;
- detailed progress reports on a quarterly basis; and
- and contribute to the Project Evaluation Report

Dates for submitting Quarterly Progress Reports

Period covered	Report required
1 July to 30 September	24 October
1 October to 31 December	24 January following calendar year
1 January to 31 March	24 April
1 April to 30 June	24 July

SUBMISSION OF EXPRESSION OF INTEREST

Submission Requirements

Research teams responding to this Call for Expression of Interest are required to submit their response, including:

- A draft project proposal (4-6 pages) clearly addressing the requirements of the specifications set out in this document. Proposals must include achievable timelines, which will be used to monitor progress. A statement of capability demonstrating the ability of the proposed project team to undertake the work. This statement of capability should include the names and experience of key team members and their proposed contribution to the project. (The capability statement should not exceed 4 pages)
- Project budget including details of any in kind contribution from the research organisation. A statement of acceptance of the terms and conditions of the proposed

contractual arrangements. If such arrangements are not acceptable details of any changes must be included with the submitted response.

Additional information

- Research bids from a consortium of research organisations with expertise in the relevant fields are specifically encouraged.
- Attached is a draft contract which we ask your organisation to review. In your response to the EOI you should identify any items in this contract that will require attention /amendment should your organisation be selected to undertake this piece of work. This contract is based on the Head Agreement between DELWP and the Bushfire and Natural Hazards CRC and as such there is very limited scope to make changes to the draft contract.

The total maximum budget for this project is \$340,000 (excl GST) and all work must be completed by 30 June 2020.

Any research proposal once submitted will be treated as commercial in confidence.

Applications must be submitted to: office@bnhrc.com.au by 27 July 2018.

Evaluation Criteria

After the closing date the Bushfire and Natural Hazards CRC along with the Policy Lead will review proposals against the evaluation criteria below and make a recommendation to the State's representative on the most appropriate organisation to undertake this work. The evaluation criteria provide an indication of those matters that should be included in the project proposal and associated documentation. Details are provided below.

Successful applicants will be advised by 20 August 2018 and it is expected work on the project will commence no later than 10 September 2018.

The decision of the BNHCRC and our clients DELWP and CFA will be final. The BNHCRC reserves the right not to offer the work, or only allocate a proportion of the available funding, if a proposal does not meet the client's needs. The Project Control Board reserves the right to invite any other specific researchers as it sees fit to submit proposals before or after the closing date.

Evaluation Criterion	% weighting
Research Capability The capacity and capability to deliver an excellent applied research project in a Victorian environment.	15

<p>Project Proposal A clear demonstration that the research team has an understanding of the project scope through the proposed research approach</p> <p>The proposal must also include an indicative timetable of work and interim milestones/project outputs as described in this document</p> <p>Quality Control Clear documentation of quality control processes including proposed internal and external reviewers. Identification of copy editors and proof readers.</p>	50
<p>Industry Engagement Strong Track record of industry engagement with the ability to support and influence bushfire management in Victoria through interaction with land and fire agency personnel</p> <p>Victorian Focus Ability to undertake research in Victorian environments individually and/or in cooperation with land and fire managers</p>	15
<p>Value for Money Delivery of required outcome within available budget along with the ability to leverage the funds provided with in-kind contributions or supplementary opportunities.</p> <p>The evaluation team will consider the membership of the project team and the proposed roles and time commitment.</p>	20

Attachments

1. Draft Contract
2. Bushfire and Natural Hazards CRC /DELWP Governance Arrangement
3. DELWP Project Plan Template (to be provided)
4. Project Evaluation Report Template
5. Quarterly Reporting Template