NPWS ENHANCED BUSHFIRE MANAGEMENT PROGRAM 2017–22

NSW NATIONAL PARKS AND WILDLIFE SERVICE

FINAL REPORT

26 APRIL 2022

EXECUTIVE SUMMARY

BACKGROUND

Australia has a long and complex history with fire. As the frequency and severity of extreme weather events continues to rise, it is becoming increasingly important for governments to be sufficiently prepared to respond to the resulting crises.

In Australia, bushfires represent a significant risk in terms of extreme weather events.[1] In New South Wales (NSW), the National Parks and Wildlife Service (NPWS) is one of the principal agencies tasked with preparing for and responding to bushfires. The primary means by which the NPWS prepares for and rapidly responds to bushfires is through the implementation of the Enhanced Bushfire Management Program (EBMP), which was established in 2012.

The purpose of this evaluation is to examine how the NPWS has progressed in implementing the EBMP over the period July 2017 to June 2021. In conducting the evaluation, we examined administrative data containing information on key performance indicators and the volume of activities undertaken by the NPWS (e.g., hazard reduction, Rapid Aerial Response Team deployments, measures of ecosystem resilience); reviewed a wealth of internal documents provided by the NPWS; interviewed dozens of staff; and surveyed 101 individuals directly involved in the program. We have used this information to prepare this evaluation report for the NPWS.

The remainder of this executive summary provides answers to the six Key Evaluation Questions (KEQs) that constitute the bulk of this report. These KEQs are listed in Table 1. The answer to KEQ6 is described in a separate report, provided to the NPWS by Inform Economics.

TABLE 1.   KEY EVALUATION QUESTIONS

Key Evaluation Questions
KEQ1: To what extent have actions from the Enhanced Bushfire Management Program Strategic Delivery Plan 2017–2022 been completed?
KEQ2: NPWS service received funding from the 2019–20 NSW Bushfire Inquiry. To what extent has this funding allowed the associated commitments to be implemented?
KEQ3: To what extent have targets from the EBMP been achieved?
KEQ4: How has the NPWS prioritised its hazard reduction program to meet its obligations to protect life, property, environmental and cultural values?
KEQ5: To what extent has the NPWS hazard reduction program reduced the risk of bushfire in treated areas while supporting ecosystem resilience?

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[1] *State of the Climate 2020. Australian Bureau of Meteorology. Available from: http://www.bom.gov.au/state-of-the-climate/australias-changing-climate.shtml*

KEQ6: To what extent has the NPWS Bushfire Management program been cost-effective in delivering its results?
A) Does the program represent value for money? Has the program used cost-effective delivery mechanisms or approaches?
B) To what extent do bushfire management activities reduce the cost of risk across the landscape?

KEQ7: What lessons have been learnt from the EBMP?

Note: All information relating to KEQ6 is provided in a separate document to this report.

HOW MUCH HAS BEEN DONE?

KEQ 1: *TO WHAT EXTENT HAVE ACTIONS FROM THE ENHANCED BUSHFIRE MANAGEMENT PROGRAM STRATEGIC DELIVERY PLAN 2017–2022 BEEN COMPLETED?*

The NPWS is nearing completion across five out of seven action areas.

The EBMP is the central means by which the NPWS implements its bushfire management program. Implementation of the EBMP was guided by the *EBMP Strategic Delivery Plan 2017–2022,* hereafter referred to as 'the Plan'. As such, our evaluation began with examining how the NPWS has progressed in terms of implementing the (53) actions that the Plan characterised as important for delivering the program (i.e., providing an answer to KEQ1).

As described in Section 3 of this document, we developed a rubric with specific criteria for rating the level of progress that the NPWS has made in relation to each action. For each action, the rubric assesses evidence provided by the NPWS to generate one of the following ratings: completed; nearing completion; in progress; not yet commenced; and no longer relevant.

While each of the 53 actions received its own rating (outlined in Section 3 of this document), we also aggregated these ratings by 'action areas'. The Plan sets out seven action areas: Hazard Reduction; Rapid Aerial Response Team (RART); People; Communication; Funding; Systems; and Research and Knowledge. The aggregate rating for each action is described in Table 2 below. From Table 2 we can see that five out of seven action areas are nearing completion and two are in progress. There is a significant degree of variation in the proportion of actions (within an action area) that have been rated as completed. No actions in action areas of People and Systems were rated as completed. Details around the ratings for individual actions (within an action area) are provided in Section 3 of this report.

TABLE 2.   SUMMARY RATINGS FOR EACH ACTION AREA

Action area	Summary rating	% of actions rated as '*Nearing completion*' or '*Completed*'
1. Hazard Reduction	Nearing completion	**62%** (31% rated as 'Completed')
2. RART	Nearing completion	**100%** (56% rated as 'Completed')

3. People	**In progress**	**60%** (0% rated as 'Completed')
4. Communication	**Nearing completion**	**100%** (40% rated as 'Completed')
5. Funding	**Nearing completion**	**86%** (43% rated as 'Completed')
6. Systems	**Nearing completion**	**57%** (29% rated as 'Completed')
7. Research and Knowledge	**In progress**	**83%** (0% rated as 'Completed')

KEQ 2: THE NPWS SERVICE RECEIVED FUNDING FROM THE 2019–20 NSW BUSHFIRE INQUIRY. TO WHAT EXTENT HAS THIS FUNDING ALLOWED THE ASSOCIATED COMMITMENTS TO BE IMPLEMENTED?

The NPWS has made progress on all 10 and completed five of the commitments made against the 2019-20 bushfire inquiry recommendations.

As a result of the 2019–20 NSW Bushfire Inquiry, the NPWS received a considerable increase in (temporary, supplementary) funding to implement its bushfire management program. In exchange for the additional funding, the NPWS committed to the implementation of several initiatives. In this evaluation, we examined the extent to which the NPWS has progressed in terms of implementing such initiatives. We found that of the ten recommendations NPWS committed to, half have been completed and they have made good progress towards completing the others.

WHAT HAS BEEN ACHIEVED?

KEQ 3: TO WHAT EXTENT HAVE TARGETS FROM THE EBMP BEEN ACHIEVED?

The NPWS has achieved or almost achieved all targets where data is available.

After examining the progress that the NPWS has made in relation to implementing the bushfire management program, we turned our attention to what had been achieved through the program. This analysis began with an examination of the targets that the NPWS set out for itself in the Plan. The purpose of the targets is to serve as a benchmarking tool for the NPWS's operational branches in relation to conducting hazard reduction and RART activities. These targets, and the degree to which the NPWS has achieved each target, is summarised in Table 3 below.

From Table 3 we can see that, conditional upon data availability, the NPWS has either achieved or almost achieved all targets defined in the Plan. In terms of bushfire risk and suppression, there is very little practical difference between a rating of achieved vs. almost achieved. This is because a rating of almost achieved indicates that the NPWS was extremely close to achieving the target. For example, among fires that started on NPWS land, one of the RART targets that is currently under development is to contain 90 per cent of such fires on NPWS land. The NPWS achieved this in 89 per cent of cases. Although the target was

technically not achieved, there is likely to be little-to-no difference between 89 and 90 per cent in terms of bushfire risk.

**TABLE 3.   HAZARD REDUCTION AND RART KPI SUMMARY**

NPWS target	Target status	Target rating
Hazard Reduction (HR) targets		
Complete more than 800 hazard reduction activities per year (measured on a five-year rolling average)	Existing KPI	Target achieved.
Treat more than 135,000 hectares each year (measured on a five-year rolling average)	Existing KPI	Target almost achieved.
Plan and approve 150% of each year's hazard reduction target (measured on a five-year rolling average)	Existing KPI	Data not available.
Meet APZ objectives in more than 90% of cases	Existing KPI	Target almost achieved.
Meet SFAZ objectives in more than 70% of cases	Existing KPI	Target almost achieved.
At least 50% of LMZs are within vegetation threshold values	Existing KPI	Target achieved.
Percentage of hazard reduction burns meet their fuel management objective (based on Overall Fuel Hazard, and/or severity mapping under development with RFS)	KPI under development	Target achieved.
Percentage of residual bushfire risk relative to target threshold	KPI under development	Data not available.
Consideration will be given to a range of indicators including: • Cost per % of risk reduction • Cost per hectare of prescribed burn by size, complexity and risk of burn • Expenditure on prescribed burning per year • Expenditure on suppression per year • Value of assets damaged or destroyed from bushfires starting on park	KPI under development	This target is discussed in a separate document, Economic Evaluation prepared by Inform Economics.
RART targets		

More than 90% of fires responded to in less than 30 minutes	Existing KPI	Target achieved.
More than 80% of fires kept to a size smaller than 10 hectares	Existing KPI	Target almost achieved.
90% of fires departed for within 30 minutes of detection (based on time of fire report to time of RART aircraft take-off)	KPI under development	Data not available.
>90% of fires starting on park are contained within the park boundary	KPI under development	Target almost achieved.
Consideration will be given to a range of indicators including: • Expenditure on suppression per year • Value of assets damaged or destroyed from bushfires starting on park (comparison between where RART resources were used compared to those fires where RART was not used)	KPI under development	This target is discussed in a separate document, Economic Evaluation prepared by Inform Economics.

KEQ 4: HOW HAS THE NPWS PRIORITISED ITS HAZARD REDUCTION PROGRAM TO MEET ITS OBLIGATIONS TO PROTECT LIFE, PROPERTY, ENVIRONMENTAL AND CULTURAL VALUES?

The NPWS has a slight over focus on the protection of life and property, at the expense of environmental and cultural values.

The general consensus among interviewed and surveyed NPWS staff is that the NPWS's HR program prioritises the protection of life and property over environmental and cultural values. Given community expectations and the NPWS's explicit focus on the protection of life and property, this should be an uncontroversial finding. The interesting question is whether there is *too* much focus on the protection of life and property versus environmental and cultural value. We put this question to NPWS staff involved in the delivery of the program. The results to this question are summarised in Figure 1 below. From Figure 1, we can see that the Team Leader Fire (TLF) from each branch and operational staff felt that the program had a slight overemphasis on the protection of life and property.

FIGURE 1.   **RESPONDENTS' (N=101) RATINGS OF THE EBMP'S PRIORITIES**
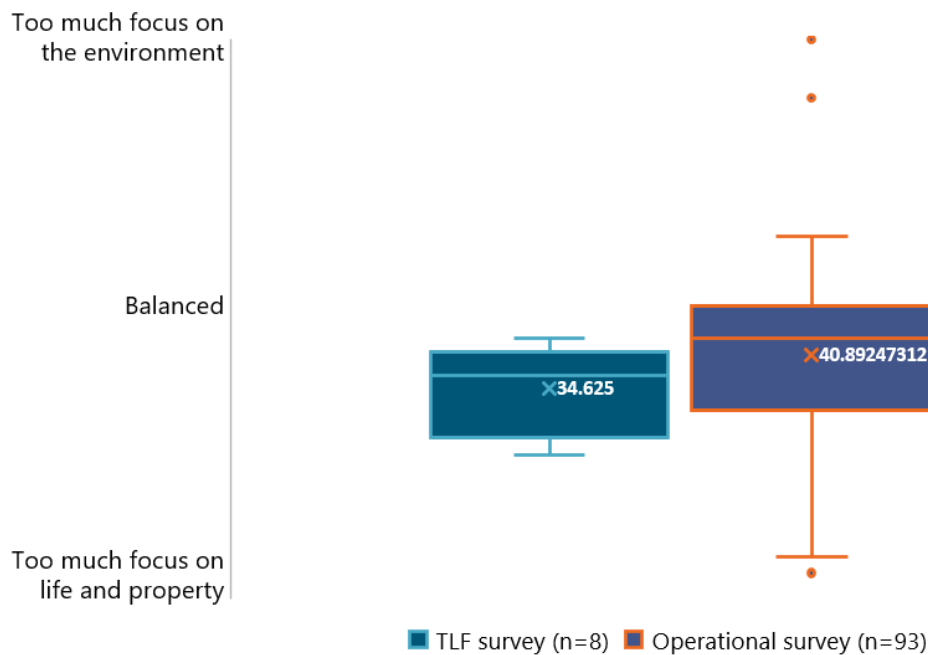
Source: EBMP Operational Survey 2021 and EBMP TLF Survey 2021.

KEQ 5: TO WHAT EXTENT HAS THE NPWS HAZARD REDUCTION PROGRAM REDUCED THE RISK OF BUSHFIRE IN TREATED AREAS WHILE SUPPORTING ECOSYSTEM RESILIENCE?

The NPWS's bushfire management program is likely reducing the probability and severity of bushfires and supporting ecosystem resilience.

To assess whether the results of these activities was associated with a reduction in risk, we examined administrative data relating to the overall fuel hazard score before and after a prescribed burn. We found a sizable reduction in these scores following a prescribed burn. That said, the extent to which these scores serve as an accurate proxy for bushfire risk is questionable. As such, we also sought the views of NPWS staff involved in the HR program, examined the count of assets protected, and reviewed relevant literature from Australia and elsewhere. These sources of evidence point to the same conclusion; hazard reduction activities are associated with a reduction in bushfire risk. We are not, however, able to identify or measure the size of the reduction using available data.

While the NPWS's bushfire management program is focused on reducing risk to life and property, the program also takes ecological considerations into account. To examine the relationship between the NPWS's bushfire management program and ecosystem resilience, we analysed tolerable fire interval data. These data provide information relating to the proportion of land (that the NPWS is responsible for managing) that resides within various fire intervals (e.g., too recently burnt, too long since last exposure to fire, within a desirable interval) for a dozen vegetation types.

This analysis revealed that NPWS areas can be broadly divided into three groups. The first group relates to vegetation types that have been too frequently burnt. Our analysis suggests that this is likely the result of the 2019–20 bushfires impacting particularly sensitive vegetation types (e.g., semi-arid woodlands). The second group relates to vegetation types that are not burnt enough. Our analysis suggests that such areas recovery quickly from exposure to fire and are of little strategic value to the NPWS in terms of hazard reduction (e.g., grasslands). The third group refers to areas where we observed an increase in the fraction of land that is within a desirable fire interval following the introduction of the EBMP.

WHAT WAS THE VALUE?

KEQ 6: TO WHAT EXTENT HAS THE NPWS BUSHFIRE MANAGEMENT PROGRAM BEEN COST-EFFECTIVE IN DELIVERING ITS RESULTS?

Inform Economics have prepared an economic evaluation of the program to determine whether the benefits of the program have been greater than the costs. This evaluation is provided in a separate report.

HOW CAN WE IMPROVE?

KEQ 7: WHAT LESSONS HAVE BEEN LEARNT FROM THE EBMP?

Interviews revealed a variety of areas that could be improved in the next iteration of the NPWS's bushfire management program.

A crucial element to all programs is continuous improvement. To determine how the next iteration of the EBMP can build off the successes and challenges of the current iteration of the program, we sought the views of those with the deepest knowledge of the program's operation, the NPWS staff tasked with delivering the program. The most common suggestion from NPWS staff was the replacement of hectare-based targets with risk-based targets. This was predominately because the staff felt that hectare-based targets create an unintended, perverse trade-off between reducing risk and achieving the target. Other commonly reported suggestions included additional funding for dedicated administrative staff, synchronising the award between EBMP and area staff, and an increased emphasis on two-way communication between operational staff and senior management.

Based on these findings, and the findings from the evaluation more generally, we have put together a list of five priority recommendations for the NPWS to consider when developing the next bushfire management program. These recommendations are listed in Panel A of **Error! Reference source not found.** below. We have also collated a variety of suggested e nhancements to the program made by NPWS staff during the evaluation. These suggested enhancements are listed in Panel B of Table 4.

TABLE 4.   RECOMMENDATIONS AND SUGGESTED ENHANCEMENTS TO THE PROGRAM

Panel A. Recommendations for the next bushfire management program		
#	**Recommendation**	**Rationale**
1	Develop a framework, strategy and implementation plan for the transition to risk-based targets that support eco-system resilience.	The central objective of the NPWS's bushfire management program is to reduce risk. Hectare-based targets are a poor proxy for risk that have the potential to generate adverse incentives for operational staff. Replacing hectare-based targets with risk-based targets should be a top priority for the NPWS.
2	Review the resourcing requirements of operational staff	A common theme from the interviews with Branch Program Managers and TFLs was that administrative duties (e.g., maintaining staff competencies) confound the capacity for fire teams to implement the hazard reduction program. Reviewing the resourcing requirements of operational staff would support on-going improvements to the efficiency of the program.
3	Enhance the capabilities of the systems used to support the bushfire management program	Operational branches are asked to provide a wealth of data for reporting purposes. The degree to which this data is complete varies considerably between branches. One reason for this is that the current system used to record information (i.e., ELEMENTS) is difficult for operational staff to use in circumstances where the activity undertaken doesn't align with the existing system's interface. Improving this system would likely improve the frequency and consistency of recording information.
4	Develop a strategy to support on-going engagement with Aboriginal communities	Building relationships with local Aboriginal communities is the key step in improving the integration of traditional fire practices and the NPWS's fire management program. This should involve the forming of a relationship of trust that comes from consistent interactions between the same people.
5	Improve the system and processes used to record and evaluate program costs	Operational branches are not consistent in the way that they record their spending. This makes it difficult to determine the cost of the program. Developing an easy to use, mandatory and standardised approach to recording this information would support on-going monitoring and evaluation of the program.

Panel B. Suggested enhancements to the program from operational staff

#	**Suggested enhancement**	**Rationale**
1	Improve clarity around governance arrangements	There is a considerable degree of variation in how the bushfire program is planned and implemented between and within branches. This is largely due to variation in how the areas conduct HR. Clearer governance in terms of who is responsible for what under the program would improve consistency between and within branches.
2	Synchronise the award that EBMP and area staff work under	Staff retention and turnover was an issue raised by many branch program managers and TLFs. One major driver for high turnover rates was EBMP staff moving to work for the areas due to more favourable working conditions. Synchronising the award that both types of staff work under would mitigate this issue.
3	Improved integration of ecological information in ELEMENTS (or a similar system)	In addition to bushfire management, land management is also a key responsibility of the NPWS. As such, integration of data used by the Saving Our Species team (e.g., GIS layers for ecological risk pertaining to certain species) would enable NPWS staff to better consider ecological risks during the burn planning stage.
4	Provide operational branches with collated data	The recording of data varies considerably between branches. One way to improve the frequency and consistency of reporting is to provide this information back to branches (e.g., in the form of a dashboard).

5	Develop a program management/coordination team within FIOB	If the next phase of the NPWS's bushfire management program involves a large number of actions (i.e., deviations from the current process), then a program management team could support the implementation, coordination, monitoring and evaluation of these actions.
7	Consider the inclusion of wildfires in hectares burnt	From a risk reduction standpoint, prescribed burns and wildfires both result in the depletion of fuel. It may, therefore, be prudent to count land burnt through a wildfire toward a given branch's HR target. The benefit is that it prevents the branch from treating areas of little risk, thereby increasing the efficiency of the program. The potential problem is that it creates an incentive for operational staff to allow a wildfire to continue to burn in an effort to support meeting their branch's target. This problem generates two risks: first, that the wildfire will escalate to the point at which it cannot be contained; and second, that could result in adverse ecological consequences. In any event, further consideration/ research is warranted around this question.
8	Consider the use of dynamically adjusted targets for each branch	Different areas of NSW experience different weather conditions over time. Adjusting a given branch's targets for seasons (or years) in which weather conditions impact the risk of a given area and the branch's capacity to implement HR would be more consistent with what is possible and necessary.
9	Increased emphasis on assets protected	The central aim of the NPWS's bushfire management program is to reduce risk to key NPWS values. Shifting the focus from hectares burnt to assets protected is consistent with this objective. This data is also already recorded.
10	Continue to improve communication with the general public around the NPWS's bushfire management efforts	The interviews revealed that the NPWS is responsible for roughly 10% of the land in NSW and more than 70% of HR burns. Providing the communications team with a dedicated budget would allow them to make further progress in promoting the NPWS's bushfire management outcomes.
11	Develop a research strategy with clearer expectations on how to incorporate research findings	Research is critical to the effective implementation and evaluation of the NPWS's bushfire management program. One finding from the evaluation was that most TFLs and branch program managers were unaware of the research outputs from the Bushfire Research Hub. A research strategy with clear governance for how research findings will impact fire management practices will enable the NPWS to better adapt to a growing research area.

WHAT'S NEXT?

The current iteration of the EBMP is due to expire in June 2022. ARTD Consultants will work with the NPWS to communicate the findings from this evaluation so they may inform the development of an approach for the next iteration of the EBMP. We will also work with the NPWS to develop a Monitoring, Evaluation, Reporting and Improvement framework for the next iteration of the program.

HOW TO READ THIS REPORT

This evaluation centres around answering seven Key Evaluation Questions (KEQs). The KEQs, which are provided in both Table 1 and Table 5 below for convenience, are designed to enable the evaluation to examine the core features of the NPWS's bushfire management program.

TABLE 5.   KEY EVALUATION QUESTIONS

Key Evaluation Question
KEQ1: To what extent have actions from the Enhanced Bushfire Management Program Strategic Delivery Plan 2017–2022 been completed?
KEQ2: NPWS service received funding from the 2019–20 NSW Bushfire Inquiry. To what extent has this funding allowed the associated commitments to be implemented?
KEQ3: To what extent have targets from the EBMP been achieved?
KEQ4: How has the NPWS prioritised its hazard reduction program to meet its obligations to protect life, property, environmental and cultural values?
KEQ5: To what extent has the NPWS hazard reduction program reduced the risk of bushfire in treated areas while supporting ecosystem resilience?
KEQ6: To what extent has the NPWS Bushfire Management program been cost-effective in delivering its results? *A) Does the program represent value for money? Has the program used cost-effective delivery mechanisms or approaches?* *B) To what extent do bushfire management activities reduce the cost of risk across the landscape?*
KEQ7: What lessons have been learnt from the EBMP?

Note: All information relating to KEQ6 is provided in a separate document to this report.

Before examining each KEQ in detail, an explanation of how the NPWS's bushfire management program operates is warranted. This explanation is provided in Section 1. Section 2 describes the data used to answer each of the KEQs outlined in Table 5. Sections 4 through 9 then examine each KEQ from Table 5.

Finally, there are two items worth mentioning. First, all information relating to KEQ6 is provided in a separate document to this report. Second, Sections 4–9 are self-contained. That is, these sections can be read independently, and in any order, after reading Section 1.