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Recommendations

John C. Z. Woinarski, Sarah M. Legge and Libby Rumpff

Introduction

Heroic efforts helped to control the Australian wildfires of 2019–20. Extraordinary responses were also made during and after these fires to rescue wildlife and support the recovery of fire-affected biodiversity. Much of this highly collaborative effort was successful and will result in long-term benefits. However, the scale of these fires severely tested existing capabilities, planning, practices and policy. Such stress revealed some critical shortcomings, and those inadequacies contributed to the magnitude of the impacts of these fires on biodiversity and may constrain or compromise recovery. In a future likely to be characterised by an increasing frequency of comparable severe and extensive wildfires, these shortcomings need to be remedied – for otherwise there will be little long-term recovery of the biodiversity affected by the 2019–20 wildfires, and future fires will replay and magnify the losses of species and environments.

The official inquiries into the 2019–20 wildfires made many recommendations to address some of these shortcomings (Chapter 30). Less formally, Chapter 29 reports on some of the experiences of individuals closely involved in the management of the 2019–20 wildfires and the attempts to protect wildlife during them, highlighting their assessments of what worked and what didn't work before and during the fires. Most other chapters in this book also include recommendations that reflect a range of different perspectives and foci, all aiming to enhance preparedness for the future and to better secure recovery after these wildfires. In this chapter, we distil and coalesce these recommendations. Our focus is particularly on factors that affect biodiversity, and we do not presume here to venture into many of the other components of fire management and disaster response that were the subject of most recommendations in the official inquiries.

We structure the recommendations below to reflect the needs to make improvements before, during and after wildfires (with sets of recommendations broadly in that order), and to enhance legislation, policy, planning, knowledge, practice and management. The challenge is immense, and limited and piecemeal refinements will not suffice: many of the recommendations are interrelated (Fig. 35.1) and major broad-scale changes are needed.

Although these recommendations are targeted explicitly to wildfire in Australia, most are also applicable to comparable environmental catastrophes across the globe, and we would hope that lessons learnt in the 2019–20 wildfires will help decrease the risk of such catastrophes, constrain their impacts, and aid recovery after them.

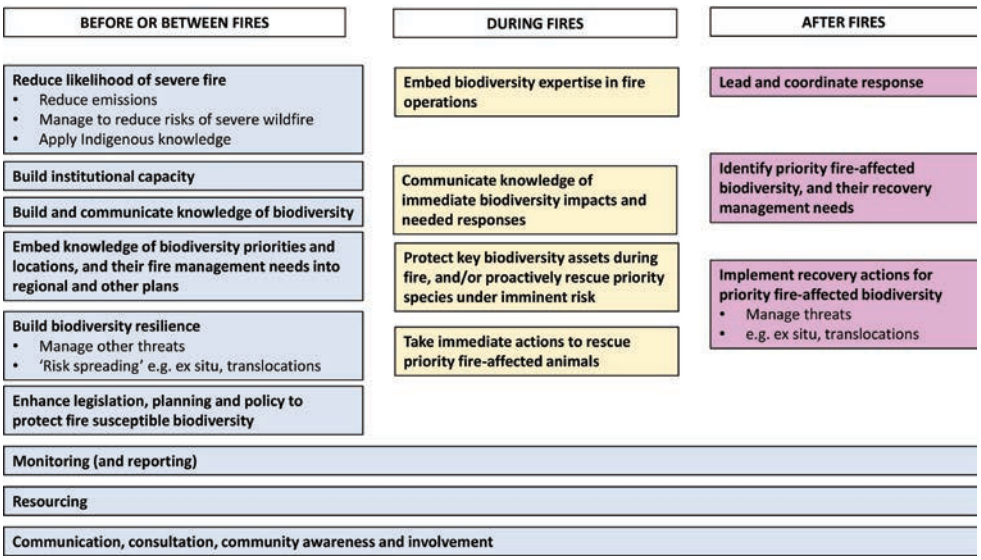

Fig. 35.1. Summary schematic diagram of main recommendations.

List of recommendations

Mitigate climate change

The magnitude of the 2019–20 wildfires, and consequent losses of biodiversity, was driven by climate change; and climate change will lead to a future marked by an increasing frequency of comparable catastrophes. To constrain and reduce such risks and compounding impacts on biodiversity, there is a foundational requirement to mitigate climate change.

- *Immediately implement stronger commitments to urgent reductions in greenhouse gas emissions.*

Support Indigenous land management

The 2019–20 wildfires showed that the management currently implemented in Australia may be inadequate to pre-empt and control the fires that are likely to characterise our future. As a community, we will need to also recognise and apply other fire knowledge systems and practices, in particular the long-honed and intricate knowledge held by First Nations people to care for Country. Limiting the spread of wildfire in the catastrophic fire weather conditions that will become increasingly common may remain a management challenge, but there is much to be gained from following Indigenous leadership to reset our relationship with fire, and its application for looking after and connecting with our country.

- *Enable the broader application of Indigenous-led wildfire planning and recovery, and Indigenous rights and authority to care for Country through fire and other management practices. This will require more support for increased capacity for planning, on-ground*

management and learning. It will also require the removal of barriers that currently impede such uptake, including current decision making frameworks and processes, insufficient resourcing, current regulatory and legal frameworks, disconnection with and lack of access to Country, conflicting views around fire and burning regimes, fragmented partnerships, and a lack of information about Indigenous wildfire management.

Enhance capability to evaluate and mitigate severe fire risks and to suppress wildfire

Government inquiries examined in detail many operational matters relating to fire control and these are not revisited here. However, we note three recommendations that may reduce risks of future conflagration, thereby benefiting biodiversity:

- *Enhance modelling capability to evaluate risks to biodiversity from severe wildfire and fire regimes in different landscape contexts, and include such risk assessments in fire plans and operations.*
- *Improve capability and resourcing for early detection of wildfires such that there is more chance of suppression in conditions conducive to uncontrollable fire.*
- *Cease timber-harvesting in native forests, given the supporting evidence that logged landscapes increase fire risks, and the practice is detrimental for biodiversity as a whole.*

Build resilience

The period between fires is critical to build resilience in natural environments. Biodiversity is likely to fare better in future fires if – in the period before fire – ongoing targeted conservation management can increase the population size and number of locations of fire-susceptible species (especially threatened species) and can improve the condition of ecological communities. Furthermore, for the conservation of biodiversity, most other threats can be controlled more tractably than fire, so there is practical advantage in reducing the overall threat burden by controlling the more manageable threats.

- *Supported by increased long-term investment, implement more enduring and effective programs to control threats that are currently affecting biodiversity and likely to compound fire impacts.*
- *More specifically, identify and better manage areas of current and potential future critical habitat, including fire and climate change refuges.*
- *Develop and implement a risk-informed program of translocations for highly imperilled species that are likely to be especially susceptible to future wildfires, in order to establish these species across multiple locations, and thus reduce risks of extinction in single events.*

Risk of species' loss in future fires will be reduced, and capability to respond after fires will be increased, if strategic and prioritised *ex situ* programs are implemented, especially for threatened species whose fate may be most precarious in future fires.

- *Implement a program of priority* ex situ *measures for species whose existence is likely to be jeopardised by future fires. Such actions should build from the existing* ex situ *(e.g. seed) collections, enhance knowledge about germination and restoration, enhance knowledge of husbandry for at risk animals, develop appropriate holding facilities for any emergency collections of fire-affected species and, where appropriate, develop maintenance of insurance populations. Note that this recommendation links also to capability for translocations, as highlighted above.*

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Enhance the evidence base

Biodiversity is more likely to be effectively managed, protected during fire and recovered successfully following fire if there is more knowledge about the distribution, baseline condition (including abundance), ecology (including traits associated with fire-susceptibility and potential for recovery), threats, responses to fires and fire regimes (including consideration of mortality rates during and in the aftermath of fires) and management requirements of species and ecological communities; spatial information on the age composition of vegetation types or plant populations relative to thresholds of potential concern (or 'immaturity risk'); and the effectiveness of threat management. Such information provides guidance on where management is critical, what actions are required, and when. The knowledge base is currently biased, being particularly poorly developed for some groups, notably invertebrates and fungi, for which there is also a need for much taxonomic resolution. Likewise, knowledge of suitable fire regimes (and responses to fire regimes generally) is generally better for plants and ecological communities than for most animals. The utility of such knowledge also depends on its accessibility, interpretability, currency and capability to provide information from local to national scales.

- *Implement a strategic research program to build the evidence base for the responses of biodiversity to fire regimes, and especially to fires of the intensity likely to characterise the future (noting that the research response to the 2019–20 wildfires will provide a major contribution to this goal). Such a research program should focus especially on understanding which species, communities and places of significance for biodiversity are highly susceptible to fire impacts, with poor opportunities for recovery. Filling major knowledge gaps that currently impede effective management is a priority, with much greater focus on relatively poorly known species and environments.*
- *Consolidate and enhance data and modelling for biodiversity (including distributions, baseline condition), particularly to help circumscribe and help prioritise sites of biodiversity significance, and for short-range endemic species that may be particularly susceptible to loss of entire populations during fire.*
- *Undertake research to build the evidence base for the responses to fire of other threat factors (e.g. introduced predators), their distribution in the landscape, compounding impacts with fire, and the effectiveness of management to control them in different landscape contexts (noting that the research response to the 2019–20 wildfires will provide a major contribution to this goal).*
- *Implement a program of taxonomic research to fill major knowledge gaps (e.g. for some invertebrate groups and fungi).*
- *Ensure that the resulting knowledge of biodiversity responses to fire is readily accessible and informs prioritisation to support management actions before, during and following wildfire events.*
- *Increase public awareness of fire impacts on biodiversity, and how fire affects ecological health and function, and hence our society as a whole.*

Enhance and implement long-term biodiversity monitoring programs

Monitoring provides a mechanism for enhancing the evidence base, particularly with respect to capability to assess impacts of wildfire (i.e. through before/after sampling), setting targets for and measuring the rate and success of recovery, and assessing and refining the effectiveness of threat management before and after fire.

- *Implement a comprehensive and enduring monitoring program for threatened and fire-susceptible species and ecological communities, sites of biodiversity significance, threats and ecological processes, and ensure that results from such monitoring are regularly reported and publicly accessible in a coordinated, regularly updated database. Ensure such monitoring data can and are used to assess and help continually refine management (i.e. adaptive management), and can measure progress towards post-fire recovery.*

Identify and protect significant sites for biodiversity

Some parts of the landscape are more critical for biodiversity conservation than others: such places include centres of endemism and genetic diversity, wetlands of international significance, World Heritage sites, sole locations and critical current and future habitat for threatened species, climate change refuges, longer unburnt patches and old-growth forests, and places of Indigenous cultural significance. Damage to such irreplaceable sites may be irreversible. Such sites are more likely to be afforded protection during fire if, beforehand, their value is explicitly recognised and accorded priority in policy and planning and fire management, their locations explicitly delineated, their responsiveness or susceptibility to fire and fire management (e.g. vulnerability to use of retardants) appropriately documented, and such information is routinely and rapidly available during fire control operations.

- *Appropriately delineate all sites of biodiversity significance with their importance and prioritisation documented, and with such information explicitly described in fire management plans and appropriately recognised in relevant policy and law.*
- *Appropriately manage all such sites of biodiversity significance to reduce fire risk (e.g. by prescription fire around their perimeter) and target for prioritised protection during fire control operations.*
- *Appropriately fund management of all such sites of biodiversity significance to reduce compounding threats.*
- *Amend environmental legislation to provide more explicit recognition of the need to protect sites of biodiversity significance (i.e. legislative compulsion), to clarify responsibility for such protection, and to provide greater accountability when such sites are not adequately protected.*
- *Evaluate and prioritise the significance of, and risks to, these sites in a manner that is fungible with respect to the value and risks to infrastructure and human life, such that the asset protection hierarchy in fire control operations is not inevitably ordered infrastructure > nature.*

Enhance fire management and planning for fire-susceptible and threatened species and ecological communities

Many threatened and fire-susceptible species and ecological communities have particular requirements for fire management, and particular management needs following wildfire. These management requirements should be clearly articulated and promulgated in relevant planning documents, and implemented.

- *Develop or update management plans (including recovery plans and conservation advices, where relevant) to include more specific information on responses to fire, preferred fire regime, need for protection from fire (e.g. through prescriptive burns around the periphery of important locations), constraints during fire operations (e.g. detrimental impacts of retardants) and post-fire management needs for all threatened species and ecological communities.*
- *Ensure such information informs regional fire management plans and is readily available during fire operations. Ensure that these plans provide explicit wildfire advice (including*

clarification of roles and responsibilities, priority locations and actions under different wildfire scenarios, and resources required) such that they can be implemented readily (i.e. plans and their actions are 'shovel ready').
- *Develop state/territory and regional biodiversity emergency response plans that chart priorities and provide the mechanism, and trigger the funding, required to implement post-fire urgent responses. Such plans should have explicit legislative support.*
- *Ensure currency of a Key Threatening Process under national legislation for 'fire regimes that cause biodiversity decline' and develop, resource and implement a threat abatement plan that provides a strategic, proactive and prioritised basis for regional and national management of fire to benefit biodiversity.*
- *Undertake scenario modelling and contingency planning to stress test existing planning and policy, to ensure readiness for future fires, and to ensure that planning and policy settings are optimally honed for the recovery of biodiversity after fire.*

Build and coordinate skill sets and capability for individuals and groups that have important roles in the protection of biodiversity during and after wildfire

The likelihood of success of actions taken to protect and recover wildlife during and after wildfire is much influenced by the capability, knowledge and coordination of respondents.

- *In preparedness for future wildfire, enhance the expertise and capacity for individuals and groups that have responsibilities or interests in wildlife care and biodiversity conservation during and after fires, and formalise communication pathways among such respondents.*
- *Provide appropriate training or knowledge about biodiversity to fire operations staff (at command centre and on-ground).*
- *Undertake scenario training for wildlife respondents to ensure adequate capability and preparation for future emergencies.*
- *Undertake scenario modelling and contingency planning to stress test capability and to ensure readiness of respondent groups for future fires.*
- *Help build governance and other capacity for conservation non-government organisations (NGOs) and other bodies to manage large donations flowing rapidly in response to catastrophic wildfire, including appropriate collaboration across groups to best harness skills, clarification of the distribution of donations, and a process for clear specification about the use of funds.*

Embed biodiversity expertise and responsibilities in disaster planning and fire control operations

In some jurisdictions, biodiversity agency representatives were embedded in the emergency management structure (e.g. in incident management teams). Experience in the 2019–20 wildfires demonstrated that this allowed for ready access and dissemination of biodiversity data, guided prioritisation of natural assets, and facilitated connections to a broader network of biodiversity respondents, and that this helped to provide protection of important biodiversity assets during the fires (Chapter 29).

- *Ensure legislation, planning and policy provide for representatives of conservation agencies to be embedded in the emergency management structure, with due authority. Such representation and liaison should be enacted at the central control level, but also at local on-ground operational level.*

Develop, maintain and resource capability for rapid response for biodiversity protection, during and immediately after fires and other catastrophes

Biodiversity may be at most risk during and immediately after wildfires, and the opportunity to prevent extinction and initiate recovery may then be contingent on rapid responses. Accordingly, there is a need to facilitate ready access to necessary resources in the aftermath of wildfire.

- *Where irreplaceable loss for high priority biodiversity assets is likely during fires or fire operations, implement emergency rescue, supported by 'shovel ready' plans.*
- *Ensure financial systems can readily provide emergency funding (e.g. pre-established disaster recovery fund) for wildlife response during and after catastrophic wildfire.*
- *Ensure regulatory provisions (e.g. permits for emergency collection of wildlife) are in place before fires, to allow for emergency response.*

Establish a permanent body to provide oversight of or advice on preparedness for fire, prioritisation of actions during fire, and recovery post-fire for biodiversity

The Australian Government established an expert panel to help prioritise responses for the recovery of biodiversity in the aftermath of the 2019–20 wildfires, but this panel was disbanded after 9 months. If made permanent, such a panel would help ensure better and more collaborative planning and management before fires, and rapid response during and after future fires. Note that the Royal Commission into National Natural Disaster Arrangements (see Chapter 30) recommended a suite of such permanent collaborative entities, including a national disaster advisory body, a 'resilience and recovery entity' and a 'national preparedness and response entity'. One option may be to fit a biodiversity component into these broader groups.

- *Establish a permanent collaborative national body focused on planning, policy and management for biodiversity in relation to fire (and other environmental catastrophes).*

Prioritise species, places and actions to support the recovery of biodiversity after fire

The responses made to the 2019–20 wildfires provided a sound building block for planning and implementing the suite of actions that will need to be taken to support recovery from future fires. Key lessons are listed as recommendations here:

- *Ensure that there is coordination and a clear demarcation of response roles amongst government agencies, conservation NGOs, animal welfare groups, Indigenous groups and other stakeholders, and national leadership that helps foster such collaboration.*
- *Coordinate responses and actions from national to local scales.*
- *Involve and empower local communities in the response to heal country and manage recovery.*
- *Use spatial analysis, on-ground sampling and expert opinion where required to assess the extent of species' overlap with fire and the likely proportional short- and long-term population loss (accounting for the likelihood of future recovery) for all components of biodiversity – including taxonomic groups that are generally poorly known and uncharismatic.*
- *Provide appropriate legislative protection (listing as threatened) for those species and ecological communities that have been most fire-affected.*

- *Undertake surveys to locate important surviving populations and key refuge areas following fire, for subsequent protection.*
- *Map and protect unburnt patches that may be essential sources for persistence in largely burnt landscapes, and recruitment to burnt areas.*
- *Rapidly undertake actions to control other threats that may compound the impacts of fire and/or would otherwise compromise recovery.*
- *Don't exacerbate the impacts of wildfire by undertaking post-fire actions that will further reduce resources or disturb affected areas (such as salvage logging).*
- *Communicate impacts, responses and results – including through collaborative regional workshops and accessible databases – to all communities and affected interests to ensure public awareness of and involvement in the recovery process.*

Recognise that recovery is a long-term proposition and requires long-term resourcing commitments

The impacts of catastrophic wildfire on biodiversity are likely to be long-lasting (Fig. 35.2), but funding for biodiversity recovery following fire tends to be short-term, targeting immediate post-fire needs. Also, it is likely to be more cost-effective to provide ongoing funding to effective fire management (including to build resilience) than to be required to episodically spend extraordinary funds in the aftermath of successive wildfires.

- *Ensure adequate enduring funding is available to support the long-term recovery of fire-affected biodiversity.*
- *Provide adequate funding in the intervals between fires to build resilience and establish appropriate fire plans, policies and management.*

Fig. 35.2. Nature returns after wildfire, but much investment, management, planning and action need to be done to support the recovery. (Photo: Alex Pike/Saving our Species/DPE)