LEGISLATIVE COUNCIL
Question On Notice

Thursday, 18 May 2023

1461. Hon Dr Brad Pettitt to the Parliamentary Secretary representing the Minister for Environment

I refer to the CALM Draft Prescribed Burning Manual states that: *"Conditional Burn Areas (CBAs) are areas that require specific fire regimes, to support some management or research activity. These are usually areas where fire is to be excluded, though other regimes may also be set (such as prescribing a fire regime to manage for specific species within an area). CBAs are identified in land management plans, species and community recovery plans, Science and Conservation databases and other planning instruments."* The Manual describes 8 types of Conditional burn Areas, including 'Fire Exclusion Reference Areas', which are described as: *"A FERA is an area from which fire has been deliberately excluded to provide a reference site for scientific studies of the effects of fire on the environment. Areas selected should be broadly representative of the landscape within which they are located. FERA are designated in perpetuity. A representative network of long unburnt areas (generally areas that are greater than 10 to 20 years since last fire) is desirable. These areas are fixed locations that are available for research activities, as points of reference for studies of fire-driven ecosystem change, and for education and training. Recently burnt areas (generally less than 10 years since last fire) are also important for these purposes. Unlike long unburnt areas, however, they are usually plentiful and can be readily created if needed. Once established, FERA will continue to be managed as fire exclusion areas, even if affected by bushfire. If a FERA is burnt by bushfire, an additional long unburnt area may be nominated to augment the FERA if such an area is available, meets the nomination criteria and is necessary to ongoing research."* I ask:

(a) is it current policy of Department of Biodiversity, Conservation and Attractions (DBCA) to maintain CBAs and FERAs;

(b) will the Minister table the relevant policy documents setting out how CBAs and FERAs are selected and managed:

  i. if no to (b), why not;

(c) will the Minister table the current version of the Draft Prescribed Burning Manual:

  i. if no to (c), why not;

(d) how Many FERAs are currently maintained and what are their locations, and fire ages;

(e) how many areas that have previously been managed as FERAs are no longer managed as FERAs;

(f) in each case in (e), why did the area cease to be managed as a FERA;

(g) what ecological assessments, biodiversity surveys or scientific studies have been undertaken in FERAs by DBCA during the last 10 years;

(h) will the Minister please table the relevant documents in (g):

  i. if no to (h), why not; and

(i) is information on FERA's, including location and condition available to the public:

i. if no to (i), why not?

Answer

(a) It is the intention of the Department of Biodiversity, Conservation and Attractions (DBCA) to maintain Conditional Burns Areas (CBAs) and Fire Exclusion Reference Areas (FERA).

(b) See tabled paper # Prescribed Burn Planning Manual (Appendix 11).

i. Not applicable.

(c) See tabled paper # Prescribed Burn Planning Manual.

i. Not applicable.

(d) There are currently 62 FERA. For FERA locations. See tabled paper #.

(e) Approximately 16 areas previously managed as FERA are no longer managed as FERA, others have been added.

(f) The FERA system exists to support DBCA's longitudinal research needs, The FERA system has changed following reviews at several points in time to ensure that FERA continue to meet the necessary criteria and can be effectively managed as FERA. When FERA have changed it is often because they have been impacted by bushfire and are no longer areas best representative of longer unburned vegetation in the landscape.

(g) DBCA supports the following projects which currently have sites that include FERA:

- quantifying fuel dynamics in southwest WA forests;
- fine-Scale Burn Mosaics in South West Forests;
- optimising fire regimes for fire risk and conservation outcomes in Banksia woodlands in the Perth area; and
- long-term response of jarrah forest understorey and tree health to fire regimes.

The following papers have been published from work in the past 10 years that include sites in FERA:

- Burrows ND, Ward B, Wills A, Williams M, Cranfield R (2019) Fine-scale temporal turnover of jarrah forest understory vegetation assemblages is independent of fire regime. *Fire Ecology,* 15, 10.
- Gold ZJ, Pellegrini AFA, Refsland TK, Andrioli RJ, Bowles ML, Brockway DG, Staver AC (2023) Herbaceous vegetation responses to experimental fire in savannas and forests depend on biome and climate. *Ecology Letters,* in press.
- Robinson R, McCaw L, Wills A (2023) Biodiversity monitoring informs forest management in south-west Western Australia: Ten-year findings of Forestcheck. *Forest Ecology and Management*, 529, 120659.
- Tangney R, Miller RG, Fontaine JB, Veber WP, Ruthrof KX and Miller BP. (2022) Vegetation structure and fuel dynamics in fire-prone, Mediterranean-type Banksia woodlands. *Forest Ecology and Management,* 505, 119891.

- Ward B, Wills A, Tunsell V. (2020) Silviculture and fire effects on understorey flowering in jarrah forest. *Australian Forestry*, 83, 152-160.
- Wayne AF, Maxwell MA, Ward CG, Vellios CV, Williams MR, Pollock KH (2016) The responses of a critically endangered mycophagous marsupial (*Bettongia penicillata*) to timber harvesting in a native eucalypt forest. *Forest Ecology and Management*, 363, 190-199.
- Whitford KR, McCaw LM (2019) Coarse woody debris is affected by the frequency
and intensity of historical harvesting and fire in an open eucalypt forest. Australian Forestry, 82:2, 56-69.
- Wills AJ, Farr JD (2017) Gumleaf skeletoniser Uraba lugens (Lepidoptera: Nolidae) larval outbreaks occur in high rainfall Western Australian jarrah (Eucalyptus marginata) forest after drought. Austral Entomology, 56(4), 424-432.
- Webala PW, Craig MD, Law BS, Armstrong KN, Wayne AF & Bradley JS (2011) Bat habitat use in logged jarrah eucalypt forests of south-western Australia. Journal of Applied Ecology, 48(2), 398-406.

The following papers have been published in the last 10 years from previous studies with sites located in FERA:

- Burrows N, Stephens C, Wills A, Densmore V (2021) Fire mosaics in south-west Australian forest landscapes. *International Journal of Wildland Fire,* 30, 933-945.
- Wills AJ, Cranfield RJ, Ward BG, Tunsell VL (2017) Influence of fire-age mosaics on macrolichens and bryophytes in southwestern Australia. *Journal of the Royal Society of Western Australia*, 100(2), 32-45.
- Wills AJ, Cranfield RJ, Ward BG, Tunsell VL (2018) Cryptogam Recolonization after Wildfire: Leaders and Laggards in Assemblages? *Fire Ecology*, 14(1), 65-84.
- Wills AJ, Liddelow G, Tunsell V (2020) Wildfire and fire mosaic effects on bird species richness and community composition in south-western Australia. *Fire Ecology*, 16,5.

(h) No. The large number of published papers listed in (g) are publicly available.

i. Not applicable.

(i) No. FERA location information is not directly available to the public given their primary purpose being associated with research.

i. The fire history covering FERA locations, together with all DBCA lands is publicly available at https://catalogue.data.wa.gov.au/dataset/dbca-fire-history.

Current FERA Locations

Current FERA network (red outline) – note, review is currently underway in two regions – and previous FERA (black outline). Landscape management units (colour blocks), and DBCA tenure (light transparent shading and grey outline) also indicated. Dates indicate the year of last burn for all, or largest area of each FERA; Unkn. = date of last burn not known i.e., long unburned.

The Department of Biodiversity, Conservation and Attractions

Parks and Wildlife Service

Prescribed Burn Planning Manual

2018

Version 2.7

19/01/2021

APPROVED BY

9/10/2020

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Manager Fire Management Services Branch Date

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List of acronyms

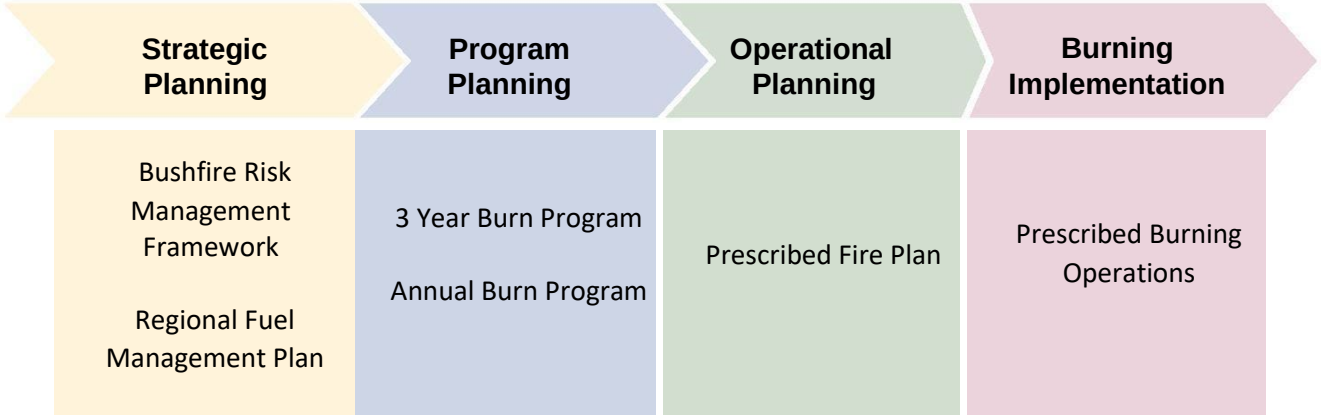
Acronym	Meaning	Acronym	Meaning
AFAC	Australasian Fire and Emergency Service Authorities Council	FPC	Forest Products Commission
ALARP	As Low As Reasonably Practicable	FMIO	Fire Management Information Officer(s)
BFAC	Bush Fire Advisory Council	GIS	Geographic Information System
BRMP	Bushfire Risk Management Plan	IBRA	Interim Bioregionalisation of Australia
CBA	Conditional Burn Area	LEMC	Local Emergency Management Committee
CBFCO	Chief Bush Fire Control Officer	LGA	Local Government Authority
CDDP	Corporate Data Distribution Program	MRWA	Main Roads Western Australia

CEO	Chief Executive Officer	NPB	No Planned Burn
CESM	Community Emergency Services Manager	OBRM	Office of Bushfire Risk Management
DBCA	Department of Biodiversity, Conservation and Attractions	OEM	Office of Emergency Management
DDO	District Duty Officer	P1, 2, 3	Priority 1, 2, 3
DEMC	District Emergency Management Committee	PBS	Prescribed Burn System
DFC	District Fire Coordinator	PBT	Prohibited Burning Time
DFES	Department of Fire and Emergency Services	PFP	Prescribed Fire Plan
DM	District Manager	PICA	Public Information and Corporate Affairs
DO	Duty Officer	RDO	Regional Duty Officer
DRF	Declared Rare Flora	RFMP	Regional Fuel Management Plan
EEDRFMS	Executive Director Regional and Fire Management Services	RLFM	Regional Leader Fire Management
FEC	Fire Exclusion Cultural	RM	Regional Manager
FEHa	Fire Exclusion Harvesting	SDI	Soil Dryness Index
FEHb	Fire Exclusion Habitat	SMR	Specified Management Regime
FERA	Fire Exclusion Reference Area	SSA	Scientific Study Area
FES	Fire Exclusion Silvicultural	TFF	Threatened Flora and Fauna
FMA	Fire Management Area	TMP	Traffic Management Plan
FMB	Forest Management Branch	WALGA	Western Australian Local Government Association
FMSB	Fire Management Services Branch		

1. Introduction

Prescribed burning: the controlled application of fire under specified environmental conditions to a predetermined area and at the time, intensity, and rate of spread required to attain planned resource management objectives (AFAC, 2012).

The Prescribed Burn Planning Manual (the manual) provides guidance to staff of the Department of Biodiversity, Conservation and Attractions' Parks and Wildlife Service in the policies and procedures used in planning prescribed burning. The manual encompasses three of the four key phases for planning and implementing prescribed burning defined by the Australasian Fire Agencies Council (AFAC) as a national risk management framework. These phases are summarised in Figure 1, in the context of departmental practice and the manual.



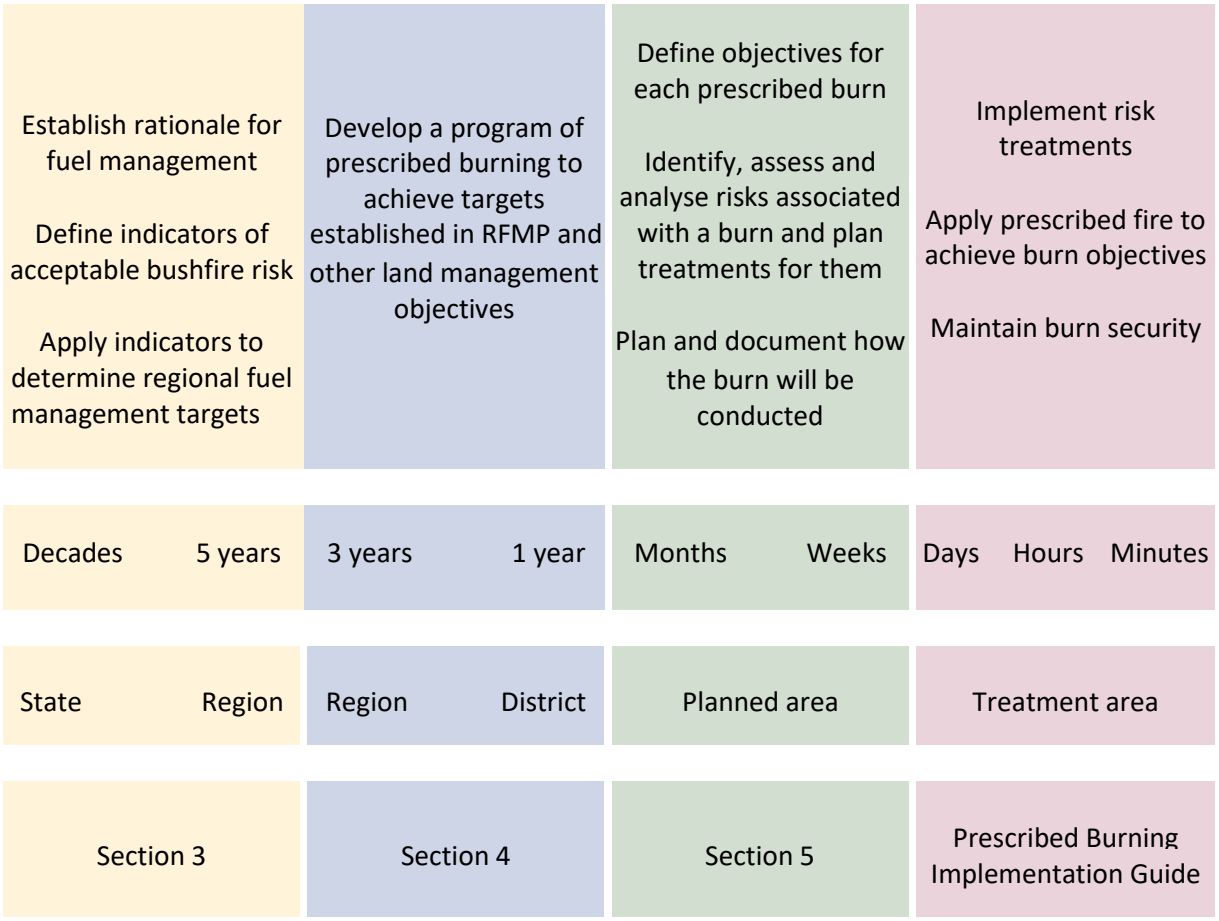


Figure 1: Key phases of prescribed burning planning and implementation (adapted from AFAC, 2016).

The manual places an emphasis on achieving the desired land management outcomes while reducing the risks associated with prescribed burning to as low as reasonably practicable. It incorporates knowledge based on many decades of research and operational experience to support practitioners' professional judgement in prescribed burn planning.

The manual does not provide instructions for the systems and software used by the department to support prescribed burn planning, as they have their own technical guides. It also does not consider the implementation phase of prescribed burning, except where there is a direct link to the planning process.

This manual should be read in conjunction with several other prices of departmental doctrine, including:

- Fire Management Strategy 2017-2021 (DPW, 2017a).
- Corporate Policy Statement No 88: Prescribed Burning (DPW, 2015a).
- Corporate Policy Statement No 19: Fire Management (2015b).
- Corporate Policy Statement No 65: Good Neighbour Policy (DEC, 2007).
- the Code of Practice for Fire Management (DEC, 2008).
- DBCA Bushfire Risk Management Framework (in prep.).
- Prescribed Burning Implementation Guide (DBCA & DFES, 2018).
- Electronic Prescribed Fire Plan (ePFP) Technical Guide (DPW, 2016).
- Daily Burn Program Technical Guide (DBCA, 2018a).

- Specifications for Standard Maps Technical Guide (DBCA, 2018b).
- Fire Management Information Notes.
- Fire Management Guidelines.
- Standard Operating Procedures.

These are available on the department's intranet and the Fire Hub.

2. Introduction to risk management

- Risk is the effect of uncertainty on objectives.
- Risk management aims to reduce uncertainty and so support better decision making.
- The risk management process involves an iterative cycle of establishing the context; identifying, analysing and assessing risks; and designing treatments for risks. Communication and consultation and monitoring and review occur at each stage.
- Risk management is integrated to all parts of the prescribed burn planning process, but the PFP context statement and risk register are critical and highly visible components.

2.1. ISO 31000 and risk management

All prescribed burning undertaken by state agencies in Western Australia must be planned and implemented in a manner that aligns with the international standard AS/NZS ISO 31000: 2009 Risk Management (ISO, 2009). The standard defines risk as 'the effect of uncertainty on objectives'. More simply, a risk is a possible event that, if it happens, will affect whether a person or organisation achieves its goals. These goals may range from the organisation's high-level strategic objectives to more immediate considerations, like maintaining personal safety.

Risk management is defined in the standard as 'coordinated activities to direct and control an organisation with regard to risk.' In practice, this means planning and doing things that will reduce the likelihood of risk events occurring or reduce their consequences if they do occur. Risk management is a systematic process that enables a person or organisation to understand the events that may impact on their objectives and make informed decisions about the actions that may need to be taken in relation to them. The risk management process is used to ensure risks are detected and understood, and that appropriate risk treatments are selected. Effective risk management means that risks are understood and are within the organisation's risk acceptance criteria.

There are many important reasons to manage risk, including:

- Reducing the negative effects of events.
- Being positioned to better exploit opportunities.
- Meeting regulatory compliance obligations.
- Protecting the organisation's people and assets.
- Protecting the organisation's reputation.

Ultimately, the goal of risk management is to make better decisions.

2.2. Risk management principles

All risk management effort must reflect the eleven principles of risk management. These are that risk management:

1. Creates value.

2. Is an integral part of organisational processes.
3. Is part of decision making.
4. Explicitly addresses uncertainty.
5. Is systematic, structured and timely.
6. Is based on the best available information.
7. Is tailored.
8. Takes human and cultural factors into account.
9. Is transparent and inclusive.
10. Is dynamic, iterative and responsive to change.
11. Facilitates continual improvement and enhancement of the organization.

2.3. Risk management framework

A risk management framework is ‘a set of components that provide the foundations and organisational arrangements for designing, implementing, monitoring, reviewing and continually improving risk management throughout the organisation’ (ISO, 2009). Elements of an effective risk management framework include:

- Senior management mandate and commitment to manage risk.
- Understanding the organisational context.
- Maintaining the training and competence required to manage risks.
- Integration of risk management with strategic and operational planning.
- Risk governance, including assigning responsibility, accountability and authority for risk management.
- Documentation of the risk management framework and associated policies and procedures.
- Monitoring, reviewing, measuring and reporting on risks and risk controls.
- Communication and relationship management.
- Resourcing risk management.

The department’s prescribed burning risk management framework includes the policies, procedures, processes and tools for planning and implementing prescribed burns, maintaining training and competency, ascribing accountability and decision-making authority and facilitating continual improvement via monitoring and lessons learned. Together these express the organisational commitment to risk management and connect the department’s strategic objectives to operational risk identification, analysis, evaluation and treatment.

2.4. Risk management process

The risk management process (Figure 2) is a cycle of establishing the context; identifying, analysing and evaluating risks and designing and implementing risk treatments. Communication and consultation and monitoring and review occur throughout the cycle and inform the core steps. The risk management process should be repeated as new information emerges or circumstances change.

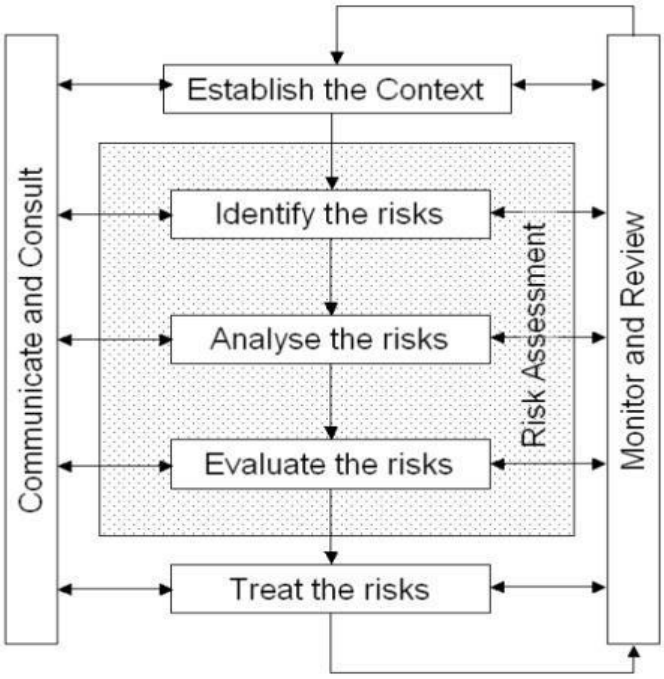


Figure 2: The risk management process (from ISO, 2009).

The risk management process is applied to all stages of planning prescribed burns, from landscape scale analysis of prescribed burning requirements, to preparation of the indicative burn program, day-of-burn ignition approval and operational decision making. It must be applied in a transparent and consistent way.

To support this, there are several places in the department's procedures where risk management information is recorded in a template or form. Where it is not, suitable records should be kept to support decisions. Minutes or notes must be kept of burn program planning meetings and meetings with stakeholders. These records may aid the preparation of prescribed fire plans (PFPs) and help to explain the prescribed burn program.

PFPs record the risk management information for a prescribed burn and are a critical component of the department's prescribed burning risk management framework. They are prepared according to a departmental template within the Prescribed Burn System (PBS), which has been designed to align with the principles of risk management. The burn objectives and context statement in the PFP are critical to the risk management process and should inform all other information in the plan.

2.4.1. Communicating and consulting

The purpose of communication and consultation is to support decision making by making different areas of expertise available at each step in the risk management process. It also assists relevant stakeholders[1] to understand risk, the basis for decisions and the reasons that actions are required. Communicating involves providing information to stakeholders. Consultation is more collaborative and affords the opportunity for stakeholders to contribute their information or views to the decision-making process.

[1] A stakeholder is any person or organisation that can affect, be affected by or perceive themselves to be affected by a decision or activity (ISO, 2009).

Stakeholders in prescribed burn planning may include internal groups such as representatives of Forest and Ecosystem Management, Parks and Visitor Services and the Science and Conservation Service; and external groups such as Local Government Authorities (LGAs), Bush Fire Brigades, Department of Fire and Emergency Services (DFES), Forest Products Commission (FPC), Water Corporation, Traditional Owners, adjacent land owners or managers and special interest groups. Appropriate consultation with key stakeholders during burn program planning and PFP development can provide information that reduces uncertainty and reliance on assumptions.

Guidance on consulting Traditional Owners and wine grape growers during prescribed burn planning is available from Fire Management Guides available on the Fire Hub.

2.4.2. Establishing the context

The purpose of establishing the context is to customise the risk management process, enabling effective risk assessment and identification of appropriate risk treatments. Context can be considered at two scales:

- Organisational context, including the amount and type of risk that is acceptable, how likelihood and consequences will be measured and how the level of risk will be defined.
- Context for an individual activity or risk, including aspects of the physical and social environments that might be sources of uncertainty, the interests of key stakeholders and any relevant human and cultural factors to be considered.

Establishing the context is a crucial step as it informs all other aspects of the risk management process.

The department's Bushfire Risk Management Framework and the manual provide much of the organisational context for the prescribed burning program. This is supplemented by contextual information in each region's RFMP.

The context for each prescribed burn is recorded in its PFP as a short narrative that explains:

- Why the burn is being undertaken and the risks associated with not undertaking it.
- Pertinent characteristics of the physical and social setting of the burn.
- Potential sources of risk associated with the burn.
- The critical stakeholders and the nature of their interest in the burn.
- Any assumptions that have been made in planning the burn or things that remain uncertain.

The context statement informs anyone reading the PFP, including the approving officer, of the burn's critical considerations. It also informs the remainder of the burn planning process as it specifies the major issues to be considered. The context statement is accompanied by a map depicting the issues described in the statement, including the fuels, tenure, things of value, and sources of risk in the surrounding area. The context statement and map should be revised throughout the planning process as new information emerges. More information on context statements is provided in Risk management context statement; example context statements are provided at Appendix 1.

2.4.3. Assessing risks

The risk assessment cycle involves identifying risks, analysing their magnitude, assessing the effectiveness of existing controls and evaluating the need for additional treatments.

Risk identification involves recognising and describing events that might affect objectives. The key questions are:

- What might happen (the risk event)?
- What would cause this event to happen?

Risk analysis involves developing an understanding of the identified events including their magnitude. The key questions are:

- What would the consequences be if the event happened?
- How likely is each consequence?
- What are we currently doing to stop the event from happening or to reduce the impact if it does happen?
- How effective is this?

Risk evaluation involves comparing the magnitude of the risk to the department's risk criteria to determine whether treatments are required. The key question is:

- Do we need to do more to prevent the event or lessen its impacts?

Assessing risks at the program planning stage involves comparing the current landscape condition to the targets set in the RFMP (see Developing the regional burn program). The results of this assessment will inform the programming of fuel management treatments. The risk assessment process for individual prescribed burns deals with more specific risks at a local scale and is contained within each PFP (see Risk register).

Risk assessment must consider the consequence of a risk event occurring and the likelihood that those consequences will occur. A matrix is often presented as the way to achieve this, but this is not required by the risk management standard and many other methods may also be used. Matrices may have significant shortcomings, particularly that they tend to oversimplify the event being considered and create an illusion of rigour. They may also not be sensitive enough to register that overall risk has been changed by altering the likelihood or consequence of an event. Critical thinking should be exercised when applying the risk assessment steps as representing complex situations, qualitative analyses and subjective interpretations on a scale or matrix may mask assumptions[2] and uncertainties.

2.4.4. Treating risks

Risks that exceed the acceptable level require a treatment to reduce either the consequences or the likelihood of them occurring. A treatment is an action that is planned to modify risk; once implemented, a risk treatment is called a control. Controls may be designed to reduce the likelihood of the risk event occurring (preventative controls), reduce the consequences should the risk event occur (corrective controls) or identify shortcomings in the control environment (detective controls). There may be many ways in which to manage any given risk and controls

[2] Assumptions are statements that we believe to be true without having evidence to support them. This can be because supporting evidence isn't available or because something is being taken for granted. Assumptions are a source of risk and should be avoided where possible by collecting information to inform and support decisions. Where a decision must be made without adequate information, it is important to record the decision-making process, including any assumptions. Assumptions should also be regularly reviewed as the operation is carried out, to check that events are occurring as was assumed.

may need to be used in combination. When selecting a risk treatment, consider its cost and benefits relative to those of other available options.

Risk treatments and controls must be reviewed regularly to ensure they remain appropriate and effective. Clearly articulating ownership of each control will assist with ensuring ongoing monitoring occurs.

Risk treatments can introduce new risks or modify the effect of known risks. As such, treatments should themselves be subject to risk assessment. For example, upgrading a track may reduce the risk of a burn escape, but could increase the frequency and impact of public use, introduce soil-borne pathogens, spread weeds or lead to erosion. These risks may need additional treatments.

Where prescribed burning is to be undertaken, the risks associated with the activity must be addressed. This is done in the PFP, with treatments described in the risk register and linked to actions in the appropriate parts of the PFP (see Risk register).

2.4.5. Monitoring and reviewing risks

The monitoring and review steps in the risk management process provide the means to detect and respond to changes in the risk environment. It is particularly important to monitor assumptions that affect important decisions or that relate to dynamic factors. Monitoring and review also facilitate ongoing learning and improvement.

Monitoring is undertaken to ensure an ongoing awareness of the state of information relevant to the context statement, risk assessment and functioning of controls. It is essential during and after treatment implementation to ensure that controls are functioning as planned and to detect the need for any further treatments. Examples of risk monitoring include:

- Analysing the achievements of the previous season's burn program before planning the next season's.
- Detecting changes in weather patterns or soil dryness before deciding when or where to burn.
- Checking that day of burn actions are carried out in the manner required.
- Confirming that water sources planned to be used in burning operations are available.

Review involves periodic re-examination of assumptions, uncertainties and decisions to ensure that they remain appropriate, effective and consistent with current best practice.

2.5. Applying risk management to operational decision making

The risk management process must be applied to decision making during prescribed burning operations. Doing so will help to determine whether the risks associated with an operation are within acceptable limits or can be treated, or whether the operation should be terminated. This may be an instinctive process, but any important factors, assumptions and decisions should be recorded in a fire diary, along with any alternatives that were considered. An example of the factors considered when applying the risk management process to operational decision making is shown in Table 1.

A more formal and rigorously documented approach should be adopted when making important or potentially contentious operational decisions. For example, good justification is required if undertaking ignitions when the forecast conditions exceed the prescribed desirable range, either because circumstances suggest a good result can be achieved or because it is required to ensure burn security; or when the customised 4-day weather forecast (accessible from Spatial Support Toolbox) suggests an increasing risk for effective management.

In such instances, the risk management process should be followed in the same manner as when planning a prescribed burn. All known issues, uncertainties and assumptions should be documented as a brief context statement and this used as the basis on which to identify, analyse and evaluate risks. This process must include a consideration of any alternative options

available to achieve the desired outcome and the risks associated with each. The justification for undertaking a burn security ignition, for example, include an analysis of the risks of taking no action compared to those of undertaking the ignition.

The risk level of the selected actions can be used to justify the level of approval that is required before embarking upon it, based on the approval requirements for the department's PFPs (see PFP endorsement and approval).

Assumptions and uncertainties must be continually reviewed throughout the operation to ensure that assumptions are holding true and uncertainties are not unduly increasing the level of risk. The effectiveness of treatments must also be monitored.

Table 1: Example of factors to consider in a dynamic operational risk management process.

Risk Management Step	***Example Questions***
Establish the Context	• What do I know about my current situation? • How complete is this knowledge, what don't I know? • What assumptions am I making, and can I support them with evidence? • What remains uncertain or unclear and what effect might this uncertainty have?
Identify Risks	• What might happen that would affect safety, burn control, resource use, the environment and the community?
Analyse Risks	• For each risk, what is the level of consequence that might be experienced? • How likely is that outcome? • What is the level of risk for each, and the overall level of risk?
Evaluate Risks	• Are the risks acceptable? • Can the risks be reduced? • If the risk is unacceptable, and cannot be treated, can the operation be suspended or terminated? • Who in the chain of command can accept this risk?
Treat Risks	• What treatment options are available?

	• What are the risks associated with each? • How will the treatment(s) reduce the level of risk? • What part of the burn or operation will need to be modified with the chosen treatment(s)?
Review and Monitor	• Is my situational awareness still sound? • Have the risks changed? • Are the controls working?

3. Strategic planning

- Strategic planning operates at the broadest scale (whole of estate or landscape).
- It encompasses government and departmental policies, procedures and standards.
- The department's bushfire risk management framework provides the criteria by which an acceptable level of bushfire risk may be defined on all department-managed lands.
- Each region must have a Regional Fuel Management Plan (RMFP) to connect government and corporate policy to burn program planning.
- RFMPs assess landscape-scale risks and define target landscape condition with associated objectives, strategies and performance indicators.
- RFMPs guide the development of annual and three-yearly burn plans.

3.1. Corporate Policy and strategies

Corporate policy and strategies provide the framework to guide the development of RFMPs, the prescribed burn program and PFPs. Key strategic planning information relevant to prescribed burning conducted by the department can be found in:

- DBCA Fire Management Strategy 2017 - 2021
- Corporate Policy Statement No 88: Prescribed Burning
- Corporate Policy Statement No 19: Fire Management
- Corporate Policy Statement No 65: Good Neighbour Policy
- The Code of Practice for Fire Management
- DBCA Bushfire Risk Management Framework
- Prescribed Burning and Fire Management and Bushfire Suppression key effectiveness and key efficiency indicators (DPW, 2016d)
- Forest Management Plan 2014-2023 (CCWA, 2013).

Other influential instruments include cooperative agreements and workforce arrangements with support agencies and collaborators.

3.2. Bushfire Risk Management Framework

The department's Bushfire Risk Management Framework provides the rationale for fuel management on public lands and the criteria by which an acceptable level of bushfire risk may be defined. These criteria are applied in each RFMP to set targets for fuel management in each region. The department's fuel management program is intended to contribute to achieving these targets.

The framework contributes to the department's strategic planning framework by defining:

- Bushfire risk and how the department assesses it.
- Principles and objectives underpinning the department's bushfire risk management.
- Rationale for the department's fuel management.
- Appropriate strategic planning units for bushfire risk management.
- A process to determine acceptable levels of bushfire risk across the State, expressed as performance indicators of the effectiveness of the fuel management program.

The scope of the framework is limited to the management of the fuel hazard to reduce the risk posed by bushfire. Other aspects of bushfire risk, such as the maintenance of bushfire detection and suppression capacity, are considered elsewhere in the department's procedures. The framework's risk criteria emphasise the preservation of human life above the protection of economic and environmental assets and other things of value. The rationale for these foci is established by the framework.

The framework provides criteria that indicate that bushfire risk is managed to an acceptable level at the scale of broad landscapes. It does not prescribe strategies by which these targets should be achieved, nor how they should be integrated with the department's statutory responsibilities to conserve Western Australia's natural environment and biodiversity. These issues are addressed via RFMPs, burn program development and PFP development.

3.3. Regional Fuel Management Plans

An RFMP provides strategic guidance to the department's fuel management program in one of its regions. It applies the department's Bushfire Risk Management Framework to set regional targets for fuel management and recommend strategies by which these may be achieved. In doing so, it guides program planning and provides standards by which the effectiveness of the region's fuel management activities may be monitored. The RFMP identifies the economic, social and environmental assets in the region and their respective risk with respect to bushfire. This process informs the identification of priority areas for prescribed burning and the definition of desired fire regimes.

3.3.1. Requirement for a Regional Fuel Management Plan

Each region must have a current RFMP in place. An RFMP has a five-year life but should be reviewed annually to ensure that it continues to represent the best available information. A comprehensive review should be undertaken after five years. The Regional Manager (RM) is the custodian of the RFMP and is responsible for ensuring its ongoing accuracy and acceptability. The plan is endorsed by the RM, Manager Fire Management Services Branch (FMSB) and Executive Director Regional and Fire Management Services (EDRFMS) but does not require their re-endorsement after annual review. It should be developed collaboratively with representatives of each of the department's services.

3.3.2. Format of the Regional Fuel Management Plan

RFMPs must be consistent with AS/NZS ISO 31000: 2009 Risk Management. To achieve this, the plan must:

- Describe the criteria used to assess and manage bushfire risk.
- Describe the context for fire and fuel management in the region, including the extent of fire management areas (FMAs).
- Identify and prioritise the risks posed by bushfire in the region.
- Provide the criteria for acceptable risk, expressed as acceptable condition of fuels within each FMA.
- Recommend treatment strategies by which an acceptable level of risk may be achieved.

A template for an RFMP and instructions in its use are available from FMSB.

3.3.3. RFMP targets

The RFMP provides targets to be achieved across a region to manage bushfire risk to an acceptable level. It does not prescribe a specific program of works to mitigate bushfire risk or achieve other land management objectives. The targets the RFMP sets should be assessed annually against the prevailing landscape condition as a basis for the development of the annual prescribed burning program (see Determining Regional Fire Management Plan burning requirements).

4. Burn program planning

- Program planning involves identifying a series of potential prescribed burns to achieve the targets set in the RFMP and other land management objectives.
- The program planning process includes consultation with stakeholders and acquiring the relevant approvals.
- Program planning typically occurs at annual and three-year time scales.
- A process for prioritising burns is used to ensure the burns that are most important to achieving targets are scheduled.
- The department uses a range of performance indicators to inform government and stakeholders on its prescribed burning program.
- Prescribed fire plans are developed for burns on the approved burn program.

4.1. Overview of burn program planning

Burn program planning is the process of translating the strategic objectives for fire management in a district or region into a series of prescribed burns that will help achieve those objectives. It results in the production of an annual burn program and, in some regions, an indicative threeyear burn program. Burn program planning is undertaken collaboratively by district and regional staff representing each of the department's services, as well as staff from FMSB and other specialists as required. External stakeholders may also be consulted. The burn program planning process includes a review of the effectiveness of the previous year's program.

Much of the burn program planning process is driven by the District Fire Coordinator (DFC) and Regional Leader Fire Management (RLFM), with support from FMSB and input from leaders from each of the department's services. This collaborative approach should extend to the development of PFPs for each burn and the implementation of the burn program. Service leaders should propose burns that will achieve outcomes for their portfolio and participate in the planning process to ensure their service's interests are represented. Broad collaboration results in a balanced and effective burn program and facilitates the identification of risks.

4.2. Summary of requirements of burn program planning

There is a degree of flexibility in the way that a region undertakes the burn program planning process. This is important as a one-size-fits-all approach is unlikely to be appropriate across the span and diversity of Parks and Wildlife Service's regions. Indicative agendas for district and regional meetings are provided at Appendices 2 and 3. There several **mandatory requirements** for burn program planning:

1. Each region must maintain an RFMP that stipulates the targets to be met by the fuel management program in the region.
2. Each region must hold a burn program planning meeting at least annually at which district or regional burn programs are formulated. Appropriate service leaders must attend these meetings and a representative from FMSB must attend each regional meeting. As part of these meetings (with appropriate preparatory work beforehand), the RLFM will:

    a) Assess and document the performance of the previous year's burn program in achieving the targets specified in each PFP and in the RFMP.

b) Analyse the targets in the RFMP and identify and document areas that should be subject to prescribed burning to meet those targets.

c) Review the incomplete burns scheduled for the previous year, reschedule them if appropriate and document the rationale for doing so.

d) Consult with district and regional service leaders to identify other burns that are required to meet service delivery requirements.

e) Incorporate the results of consultation with local stakeholders such as community groups, DFES, LGAs (including any Bushfire Risk Management Plans) and the adjoining Parks and Wildlife region(s).

f) Consolidate the outputs of points b) to e) into a proposed burn program and gain endorsement from the RM that the proposed program addresses the region's land management requirements and risk criteria, and that it is consistent with the RFMP.

g) Identify and document any contextual information for each burn that may require attention as part of the burn preparation or implementation.

3. Minutes of the burn program planning meeting must be maintained using the template provided at Appendix 4, capturing specific issues relevant to each burn and what actions are required during the preparation of its PFP. These will be provided to all district and regional service leaders, and other stakeholders as appropriate, for review. Once finalised, they will be provided to the District Manager (DM) and RM for their reference during the PFP endorsement and approval process.

4. The proposed regional burn program must be submitted to FMSB's Fire Information Management Officers (FIMOs) by May 24th. To do this, the region will:

   a) Provide to FMSB a shapefile that depicts the planned treatment area for each burn on the program and is annotated with the burn ID.

   b) Complete the minimum mandatory fields in a PFP for each burn on the program and change its 'Planning Status' to 'Seeking Corporate Approval'. The minimum mandatory fields are:

      - burn ID
      - burn name
      - planned burn financial year
      - last burnt season and year
      - region
      - district
      - location
      - priority
      - contentious
      - contentious rationale
      - remote sensing priority
      - burn purpose
      - program allocation
      - estimate of the planned area that will be treated (%)
      - planned burn area (ha)
      - perimeter / length (km)

c) Provide to FMSB the annual prescribed burning program submission template. An example of the template is shown at Appendix 5, but it should be completed in the spreadsheet available from FMSB. The information required is:

- The (approximately five) highest priority burns for the coming year.
- Any burns that will be particularly contentious, high risk or complex.
- Rationale for the selection of Priority 1 (P1) burns for the coming year.
- Any portions of non-CALM Act land included in each burn and the public value derived by including these.

5. Relevant internal and external stakeholders must be informed or consulted as appropriate prior to the finalisation of the annual indicative burn program.
6. The proposed burn program submitted by each region should include enough candidate burns to allow a reasonable degree of flexibility in the application of the program under a range of climatic and weather conditions throughout the year. As such, it will feature more burns than the region will be able to achieve but must be a realistic representation of the required flexibility.
7. No more than one third of the prescribed burns nominated on the proposed burn program may be classified as Priority 1 (see Prioritising the burn program).
8. FMSB will facilitate the development and approval of the burn program by:
   a) Collating the statewide burn program and submitting it to the EDRFMS for approval by Corporate Executive by June 15th each year.
   b) Preparing a statement that indicates the current level of bushfire risk and the level of bushfire risk that will be achieved if the entire burn program is implemented. This is tabled at a meeting of Corporate Executive with the proposed burn program.
   c) Upon corporate approval of the program, changing the 'Planning status' of all burns to 'Corporate approval given' in the PBS and publishing the approved program to the department's public website.
9. Any subsequent amendments to the approved burn program will require the RLFM to submit to FMSB a shapefile depicting the burn to be amended and a written explanation of the nature of the amendment and reason amendment is required (see Amending the approved program). FMSB will compile amendment requests and submit them to the EDRFMS for approval quarterly. Any amendments that require more urgent approval must be submitted by the RM to the Manager FMSB with a justification for the requirement. **Amendments that require Ministerial approval will be processed once per year, in February** (see Burning on non-CALM Act lands)**.**
10. No burn will be undertaken that is not on the approved burn program.
11. Regions will report their prescribed burning activity to FMSB to allow the branch to inform Corporate Executive, the Minister for Environment, the Office of Bushfire Risk Management (OBRM) and other parties. The minimum standards for reporting prescribed burning activity in a region are:
    a) Completing the 'Day of burn achievements' for each PFP daily during burning operations.
    b) Providing a shapefile of the treatment area to FMSB at the closure of the burn, when no more ignitions are expected in the current year or at the end of the financial year.
    c) The area depicted in the shapefile must match that reported in the PBS for each burn.

12. A burn evaluation will be completed by the district or region prior to each burn being closed and a post-season review completed by the region after each year's burn program.
13. FMSB will fulfil corporate reporting requirements by:
    a) Collating the regions' annual reviews and submitting them to the EDRFMS for consideration. They will also be reported to OBRM.
    b) Reporting to the Minister for Environment fortnightly throughout the bushfire and prescribed burning seasons.
    c) Providing statistics and measures of the department's prescribed burning program for inclusion in the department's annual report and year book, and its annual report to OBRM.
    d) Providing other reports, statistics and measures as required.

4.3. Developing the regional burn program

Each region submits an annual burn program to Corporate Executive for departmental approval. Forest regions also submit an indicative three-year program. The burn program shows 'planned areas'. All or any part of this area may be treated under the direction of an appropriately prepared PFP.

The burn program consists of a map showing the areas intended for prescribed burning accompanied by a brief description of the purpose of each proposed burn and any issues that need to be considered when planning and executing it.

The development of the burn program requires:

- A review of the preceding prescribed burning and fire seasons.
- A comparison between the targets in the RFMP and the current level of bushfire risk in the region.
- Consultation with representatives of each of the department's services.
- Consideration of cross-tenure burning issues.

These steps are considered in detail below - note that this assumes that a district structure is in place. Where it is not, the actions required of district officers should be undertaken by their regional equivalents.

The burn program is initially compiled by the DFC following consultation with district service leaders, external stakeholders and the DM. District programs are subsequently amalgamated into a regional program by the RLFM, in consultation with regional service leaders, the RM and key FMSB staff.

The annual program must be submitted by FMSB to Corporate Executive for approval prior to implementation. The program should include some redundancy to allow the flexibility for burning to be undertaken under a range of climatic and weather conditions throughout the year. As such, it will feature more burns than the region will be able to achieve but should be a realistic representation of the required flexibility. An indicative three-year program is developed in the forest districts to allow enough time for appropriate planning, public consultation and site preparation to be completed.

4.3.1. Review of previous year's fire program

The review of the previous year's fire program helps to establish the context for the next burn program and to facilitate continual improvement in the way the program is managed. It should consider the:

- Contribution the program made to achieving the targets for fire management in the region.
- Extent to which burns met their objectives.
- Effect that bushfire had on the region's risk profile and land management requirements.
- Need to progress any burns that were programmed and had resources invested in them but were not completed.
- Lessons that were learned during the planning and implementation of the burn program.
- Any other information that will assist the EDRFMS to brief Corporate Executive on the completed program.

The review should be instigated and chaired by the RLFM and, at a minimum, include input from the DFC, and district and regional service leaders. The outcomes of the review should be recorded and used to inform the development of the new burn program.

4.3.2. Determining Regional Fuel Management Plan burning requirements

Comparing the targets in the RFMP to the current situation is critical to determining the requirements for the burn program. A Geographic Information System (GIS) should be used to compare the current and desired distributions of fuel in the landscape and to identify where burning is required. This process may be time consuming, so the data should be prepared and considered before the burn planning meeting.

A tool to automate this process is being developed by FMSB and should be available for use in 2019. In the interim, guidance and assistance in using Arc or QGIS to complete this step is available from FMSB.

4.3.3. Draft burn program

The DFC should prepare and circulate a draft burn program prior to the burn program meeting. This draft will be based on the analysis of the RFMP burning requirements and stakeholder consultation. Circulating the draft program will allow attendees at the burn program planning meeting to be prepared to contribute to discussions about burn priorities and issues.

4.3.4. The burn program planning meeting

The burn program planning meeting brings together key staff from each of the department's services to formulate a program of burning for the next year and, where applicable, an indicative three-year program. Specifically, burn program meetings:

- Consider and prioritise candidate burns identified by the analysis of RFMP targets or suggested by stakeholders.

- Allow representatives of the department's services to propose areas to be burnt or amendments to proposed burns.
- Assess whether burns on the previous program that were not commenced should be included in the next year's program.
- Capture issues and considerations that will assist the prescribing officer to plan each burn, particularly in developing the context statement, identifying risks and identifying key stakeholders.
- Identify any issues associated with proposed burns that are sufficiently contentious to be of interest to the EDRFMS.
- Provide DMs and RMs with a strategic overview of the burn program and its risk profile.

Each district must hold a meeting to plan the district burn program and then a regional meeting is held to combine these. The attendees should include representatives of all services that have an interest in the management of fire in that jurisdiction. Attendees should be encouraged to come to the meeting prepared to contribute, by having familiarised themselves with the RFMP, considered their service's fire management requirements, identified candidate burns and identified any issues affecting burns on the draft program. Consultation with external stakeholders should be undertaken by the DFC or RLFM prior to the burn program meeting and their point of view represented as appropriate.

Creating a PFP in the PBS for each burn on the draft program before the meeting will assign a burn ID, aiding communication and records management. It also creates a place (Part D of the PFP) to file documents about the burn. Any relevant contextual or risk management information from discussions at the burn program meeting may be captured in the PFP as the meeting progresses.

4.3.4.1. Record of burn program planning meetings

Accurate records must be kept of all decisions that are made during the burn program planning meeting, including:

- The rationale for candidate burns being included on, or excluded from, the proposed program.
- Any potential issues, risk or contextual information in relation to individual burns that could contribute to the development of the PFP, including any actions that are required.

A template for the minutes of a burn program planning meeting is provided at Appendix 4. The template should be completed for each burn on the program. The meeting records must be provided to all service leaders for review. Once finalised, they are provided to the DM and RM for reference during the endorsement and approval process.

Records must also be kept of any discussions with stakeholders prior to or after the burn program planning meeting. These should capture who was present, what was discussed and any actions that were agreed.

4.3.5. Burn ID

The burn ID is allocated by the PBS when a new PFP is created. It is not editable by the user. The allocated burn ID will continue to apply throughout the life of the PFP and will not be re-used by the system.

The system allocates an alphanumeric code to each PFP, consisting of three letters and three numerals, separated by an underscore e.g. ABC_123. The three-letter code denotes the district the burn is being undertaken in, while the three numerals are a unique identifier for the burn. All numerals between 001 and 999 will be allocated in the district before the numbering system resets to 001. After resetting, numerals will not be repeated if they are allocated to an existing PFP that has not been closed. The district alpha codes are shown in Table 2.

4.3.6. Prioritising the burn program

The number of burns prepared for ignition each year exceeds both the department's resource capacity and the available burning opportunities. This is done to ensure there is enough flexibility in the burn program to allow the department to take advantage of suitable opportunities as they occur. Burns on the annual burn program are prioritised to indicate the relative importance of completing them as part of the current annual burn program. There are three levels of priority that may be assigned to a burn.

- Priority one (P1): Those burns that are the most important to complete as part of the current annual program as they make the greatest or most urgently required contribution to achieving departmental fire management objectives.
- Priority two (P2): Those burns that are the second most important to complete as part of the current annual program as they make a less significant contribution to achieving departmental fire management objectives or are less urgently required.
- Priority three (P3): Those burns that are third most important to complete as part of the current annual program.

Table 2: Alpha codes used for burn IDs in the Prescribed Burn System.

Region	District	Alpha Codes
Kimberley	**East Kimberley** **West Kimberley**	**EKM** **WKM**
Pilbara	**Exmouth** **Pilbara (remainder)**	**EXM** **PIL**
Mid-West	**Shark Bay** **Moora** **Geraldton**	**SHB** **MOR** **GER**
Swan	**Perth Hills** **Swan Coastal**	**PHS** **SWC**
South-West	**Wellington** **Blackwood**	**WEL** **BWD**
Warren	**Donnelly** **Frankland**	**DON** **FRK**
Wheatbelt	**Central Wheatbelt Great Southern**	**CWB GSN**
Goldfields		**KAL**

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South Coast	**Esperance Albany**	**ESP** **ALB**

No more than one third of the annual program should be classified as Priority1. Priority should be assigned to burns on the program based on professional judgement and local knowledge. Some of the key characteristics that may indicate a high priority burn are that it:

- Has been commenced.

  Is important to meeting corporate performance targets.
- Is required to be completed to facilitate the ignition of another strategically important burn (program building).
- Makes a strategic contribution to protecting valued assets or achieving the strategic objectives described in the RFMP.
- Has scheduling criticality or constraints which mean there is a time in which it must be completed or the opportunity to do so will be lost or reduced.
- Is important to the management of fuel age distribution in the district or region.
- Is required to meet the conditions of a statutory management plan.
- Is required to facilitate the conservation or management of species or ecosystems, such as in a threatened species recovery plan.
- Is required to re-aggregate regrowth native forest or minesite rehabilitation into the routine burn rotation.
- Is required to achieve the management requirements of ongoing silvicultural operations.
- Is required to treat a recently chained area, before the seedbank loses viability or the fuel modification loses effectiveness.
- Is required to achieve the strategic objectives for watershed management.
- Contributes to scientific research and is required to occur within a specific period.
- Has had an investment made in preparing for ignition, such as upgrading boundaries.

4.3.7. Contentious burns

A burn is contentious if it is likely to attract a large amount of attention to the department's fire management program, particularly from the media, industry groups, environmental groups or politically connected members of the public. The nomination of a burn as contentious is a professional judgement based on local knowledge. The threshold for declaring a burn to be contentious is that it involves reputational risks that the EDRFMS or Manager FMSB should be aware of.

The rationale for a burn being declared contentious should be recorded in the PFP and minutes of the burn program planning meeting. Contentious burns do not attract any additional requirement for approvals, but both FMSB and the EDRFMS may monitor their implementation more closely than that of other burns.

4.3.8. Burning on non-CALM Act lands

Any prescribed burns that include lands other than those for which the department has management authority (CALM-Act lands) are subject to additional approval requirements. This

includes prescribed burns that include both CALM-Act and other tenures and those that occur exclusively on other tenure.

Where a prescribed burn contains both CALM-Act and other lands, the Minister for Environment must make a declaration under s33(1)(f) of the CALM Act. This declaration affirms that, on the merits of each individual PFP, the inclusion of the non-CALM Act tenure portion(s) is in the public interest. The declaration must list all affected burns and each portion of non-CALM Act land must be tested against the public interest criteria.

To facilitate the s33(1)(f) declaration, the department will provide the Minister with:

1. A verbal briefing (delivered by the Deputy Director General or Director General);
2. Briefing note summarising the key elements of the prescribed burning program with generic treatment of matters related to public interest (prepared by FMSB);
3. Schedule 1 – a summary page of the tenure classes or public interest issues associated with the program and a schedule of all burns including other tenure and articulated riskbased issues associated with each burn (prepared by Districts and provided to FMSB as part of the burn program submission).

This briefing will occur on a biannual basis in July and early February each year. This will limit the ability to make amendments to the program where burns including other tenure are involved.

Where prescribed burns are planned to occur entirely on other tenure, a section 8A agreement (under the *Conservation and Land Management Act 1984* (CALM Act)) must be in place prior to the burn going ahead. This requires the approval of the Ministers for Environment and all other affected Ministerial portfolios, along with any relevant Local Government Chief Executive Officers (CEOs) and any private property owners.

4.3.9. Others burning on departmental lands

Any prescribed burning conducted on CALM-Act land must be included on the corporate approved burn program and be conducted in accordance with a departmental prescribed fire plan. This includes burns conducted by bush fire brigades, Traditional Owners or other entities.

4.4. Submitting the burn program

Corporate Executive approves the department's annual prescribed burning program, at their meeting in the 2nd or 3rd week of June. This signifies their acceptance of the program as appropriate to achieve the department's land management outcomes, including managing bushfire risk. It also affirms its ongoing support for Policy 88: Prescribed Burning which gives individual officers access to the 'policy defence' when implementing the program. The requirement for corporate approval of the burn program is stipulated in the Code of Practice for Fire Management.

Approval of the prescribed burning program is based on a briefing provided to Corporate Executive by the EDRFMS. This briefing is prepared by the manager FMSB; it contextualises the program and describes the current level of bushfire risk on department-managed land. It also describes the performance of the previous year's program and provides the outlook for activities in the year ahead, including any issues thought likely to affect the implementation of the program.

Submission and approval of the burn program involves the following steps:

- Each region provides FMSB's Fire Management Information Officers (FMIO) with:
  - a shapefile showing their proposed annual and, if appropriate, indicative threeyear burn program

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  - the completed burn program submission template.
- Each district or region completes the mandatory fields on the ‘Corporate Overview’ page of each PFP on the proposed annual program and submits the PFP for corporate approval in the PBS.
- FMSB provides the EDRFMS with maps and tables that summarise and provide a strategic overview of the proposed burn program.
- The EDRFMS briefs corporate executive on the proposed burn program.

  Corporate Executive acknowledges that the proposed program and the process used to plan it comply with the department’s risk criteria.
- FMSB’s FMIOs change the status of each PFP on the endorsed program to ‘Corporate approval given’ in the PBS and notifies the regions that the proposed program has been approved.

A more detailed description of the steps in the burn planning process, including any deadlines for completing each step is provided in Summary of roles and responsibilities in burn program planning.

Each annual burn program commences on July 1st and concludes on June 30th. Burns on the program that are not concluded during this period must be included in the next program if they are to be continued in the next year. **If the approval of the burn program is delayed, the previous year’s burn program will stay in effect until a new program is approved.**

4.4.1. Submitting a PFP for corporate approval

Each burn on the proposed program must have a PFP submitted for corporate approval. To receive corporate approval, the PFP need only contain the minimum mandatory data as described in Table 3. This information forms the burn summary.

The burn summary is combined with the map products to create a strategic overview of the statewide proposed burn program for Corporate Executive. The fields Burn ID, Region and District cannot be altered once the PFP is submitted for corporate approval.

Table 3: The minimum information required in a PFP before it can be submitted for corporate approval. The fields in bold are permanently locked after submission for corporate approval, while the others may be edited until the PFP is submitted for endorsement

Burn ID	Aircraft burn
Burn name	Burn purpose(s)
Region	Remote sensing priority
District	Treatment percentage
Year	Planned area and perimeter
Year last burnt	Location
Season last burnt	Burn priority
Contentious burn	Program
Contentious rationale	

4.4.2. Carryover burns

A carryover burn is one that is moved from the current annual burn program to a subsequent year’s program. There are three situations in which a burn may be carried over:

- a burn ID was assigned but the PFP has not been completed and approved.
- a PFP was approved but ignitions were not commenced within the annual program
- ignitions were commenced, but not completed, within the annual program

The PFP of each burn to be carried over should be reviewed to ensure that it remains accurate and complete. To allow them to be edited, the RLFM or their delegate should select the burns to be carried over and use the 'Carry over burns' function on the PBS 'Regional Overview' screen. **This will remove corporate approval and all endorsements and approvals from the PFP, returning it to draft and allowing it to be edited as required.** Once editing is complete, the burn may be submitted for corporate approval as per the process described earlier in this chapter.

A PDF of the PFP (without attachments) should be downloaded and saved to Part D of the PFP in the PBS before the burn is carried over. The PBS does not retain an archive of changes to PFPs, so for future audit, it is important to retain a version of the PFP as it was before it is edited.

If it is not desirable to remove approval from the PFP, the RLFM may request that FMSB's FMIOs carry the burn to the new program with all endorsements and approvals in place. Note that carryover will not extend the time for which the PFP is approved and carried over burns are still subject to all other requirements of the burn program submission process. **FMIOs should be contacted to assist with carrying over any burns that will be active while the burn program is being compiled and approved (mid May to end of June).**

The planned boundary of a burn may be altered when it is carried over. If changing a burn boundary, the area statement, context statement, risk register, maps and other relevant information in the PFP must be revised to reflect the new boundary. The revised burn boundary must be submitted to FMSB's FMIOs.

4.4.3. Amending the approved program

Changes to the corporately approved prescribed burn program, or to the boundaries of burns on that program, are called 'amendments to the burn program'.

4.4.3.1. Minor amendments to approved burns

Districts and regions may make minor amendments to corporately approved burn boundaries to facilitate safer or more efficient conduct of prescribed burns, satisfy stakeholders requirements or accommodate other operational requirements. Such changes are subject to the following conditions:

1. In the period between corporate approval of the annual burn program and approval of the individual PFP, the burn boundary may be altered under the authority of the DFC or RLFM, provided doing so does not:
    a. materially alter the intent of the burn
    b. significantly increase the burn area; a significant increase is defined as follows:
        i. >25% increase in the corporately approved area for burns less than 10 ha,
        ii. >10% increase in the corporately approved area for burns between 10 ha and 150ha
        iii. >5% increase in the corporately approved area for burns between greater than 150ha

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    c. incorporate new types of non-CALM Act tenure that weren't already within the burn area (this requires Ministerial approval)

    d. make the burn contentious when it was not previously so.

2. After the approval of the PFP for a burn, the burn boundary may be altered under the authority of the Regional Manager, provided doing so does not increase the risk profile of the burn to 'High' or 'Very High' or breach the criteria in point 1.

3. In all cases, all relevant information in the PFP must be updated to reflect the amended burn boundary.

4. A shapefile of the amended burn boundary must be provided to FMSB's FMIO prior to commencing ignition of the amended portion of the burn.

4.4.3.2. Major amendments requiring approval Approval

for amendments is required if:

1. A new burn is to be added to the corporate approved program.
2. The boundary of a corporate approved burn is significantly changed (see point 1 in Section 4.4.3.1 for criteria).
3. The risk associated with the burn increases to 'High'.
4. A corporate approved burn becomes contentious when it was not previously so.

The level of approval required for a burn amendment is as follows:

1. The addition of new burns to the corporate approved program must be approved by the EDRFMS.
2. Significant changes to the boundaries of corporate approved burns may be approved by the Manager FMSB.
3. The Manager FMSB will advise the EDRFMS of any burns that become contentious because of amendment.
4. Changes to boundaries of corporate approved burns that add areas of non-CALM Act land to the burn require Ministerial approval (see Chapter 3: Burning on non-CAM Act land).

Amendments to the approved program will be processed quarterly and amendment requests must be received by FMSB's FMIOs no later than the end of the 1st week of September, 1st week of December, 2nd week of February and 1st week of April. Any requests for urgent amendments to the burn program (outside of the quarterly amendment dates) must be submitted by the RM to the Manager FMSB with an explanation of the reason(s) the change is required and why it is urgent.

Amendments that require Ministerial approval will only be processed in February.

All amendment requests must consist of:

1. A list of the burns being amended with burn ID and whether they are new, boundary changed or now contentious.
2. A short statement explaining why each burn is being added or changed and the effect of any change on the risk profile.
3. If appropriate, a list of the non-CALM Act tenure included in the burn and an explanation public value of including it.
4. A shapefile of the boundaries of the amended burns.
5. The PFP of any amended burns updated and 'submitted for corporate approval' in the PBS.
5. Any currently approved burns that are being amended must have their PFP updated in the PBS before the amendment is submitted. This may require the PFP to be returned to

'draft'.

6. Any PFPs that have been significantly altered must be re-endorsed and approved by district, regional and FMSB staff as appropriate. The DM determines any requirement for re-endorsement.

4.4.4. Burn program shapefiles

A shapefile depicting each region's burn program must be submitted to FMSB's FMIOs to allow the production of maps and other spatial data products. This shapefile should show the planned area for each burn and be attributed with the burn ID and name.

The shapefiles are used to develop the map products shown in Table 4, as well as for daily public notifications during burn implementation.

Table 4: Maps produced by FMSB during the burn program endorsement process

Product	Audience
Proposed annual burn program for each region.	Corporate Executive, Conservation and Parks Commission, DFES, Parks and Wildlife public website
Combined forest regions annual burn program.	Corporate Executive, Conservation and Parks Commission, DFES, Parks and Wildlife public website
Combined forest regions annual burn program overlain on fuel age.	FMSB
Indicative three-year burn program for each forest region by proposed year.	Corporate Executive and forest regions
Combined forest regions three-year burn program by proposed year.	Corporate Executive and forest regions

4.5. Stakeholder and community engagement

Opportunities must be provided for key stakeholders to provide input or seek more information at various stages of the burn program planning process. This communication is mutually beneficial because:

- The prescribing officer may not have comprehensive information about the burn environment. Consultation will fill knowledge gaps and ensure that planning is informed by the best available information.
- Undertaking prescribed burning requires tacit community consent. The community needs to understand the reasons for, and risk inherent in, undertaking or not undertaking, the burn.
- Stakeholders may need to change their behaviour to avoid the temporary effects of prescribed burns.
- Stakeholders may have outcomes they wish to achieve from prescribed burning which can be incorporated to the burn program.

FMSB is primarily responsible for engagement with:

- Stakeholders with an interest in strategic fire management across the entire state or large portions of it such as the Conservation and Parks Commission and major utility managers.

- Fire management stakeholders that are state representative bodies, such as the Office of Emergency Management, OBRM, WA Local Government Association and the South West Aboriginal Land and Sea Council. FMSB will provide information depicting the state and regional burn programs to these organisations as required. Districts and regions may also choose to liaise with local contacts to help ensure information about the burn program is received.
- The Minister for Environment, including an annual briefing about the effect of smoke from prescribed burning on vignerons.
- The public, in relation to the department's overall approach to fuel management across the state. FMSB publish the approved burn program on the Parks and Wildlife website. The information published will be digital versions of maps of the annual burn program, and for the three forest regions, the indicative three-year burn program. A KMZ file will also be provided to allow users to view the burn program in Google Earth. Regions and Districts are primarily responsible for consultation with
- Local community stakeholders, whose interests are confined to issues associated with specific burns or the district or regional prescribed fire program such as regional DFES Offices, local government CEOs and Bush Fire Advisory Committees (BFACs).
- Local representatives of organisations managing assets that may be affected by prescribed burns.
- The public, in relation to specific burns or the program within a district or region.

Records must be maintained of communication (who was told what?) and consultation (who was asked what and what was their response?). It may also be necessary to record confirmation that information has been accurately transferred and understood. These records should be retained in Part D of the PFP.

4.5.1. Engagement by Regions and Districts

Districts and regions should employ suitable methods of communication to introduce stakeholders to the proposed burn program and gather input and concerns. The information conveyed should include the:

- Achievements of the previous prescribed fire program, such as areas burnt and objectives achieved.
- Proposed burn program for the upcoming/current year.
- Occurrence of bushfires, including any influence they have had on the form of the proposed burn program.
- Indicative burn program for the annual and (where applicable) indicative three-year program.
- Process and considerations used to schedule the annual and (where applicable) indicative three-year program.

Stakeholders that are particularly influential in shaping the burn program, such as FPC and Traditional Owner groups, should be consulted prior beginning to develop it. Others with a strong interest in the department's prescribed burning, such as wine grape growers or organisers of significant community events, should be engaged as early as possible in the burn program planning process.

Regions should engage regularly with LGAs, BFACs, and regional DFES managers to facilitate cooperative and complementary fire management programs across jurisdictional boundaries. As

the season progresses, DFES and BFBs should be kept informed of burns that are likely to be undertaken, to maximise opportunities for them to participate.

Districts and regions should engage relevant LGAs directly and via Local and District Emergency Management Committees (LEMC and DEMC). Direct engagement may be via council meetings, the Chief Bushfire Control Officer (CBFCO), Community Emergency Services Manager (CESM), brigade meetings, brigade captains or any other avenue deemed locally appropriate. Engagement should aim to facilitate the development of a cross-jurisdictional complementary burn program and to create opportunities for cooperative implementation of the program.

Engagement with Traditional Owners is an increasingly important consideration in the development of the department's burn program and the planning and execution of burns. The nature of this engagement varies across the state, depending on the status of Native Title claims and the activity of Traditional Owner groups. A Fire Management Guideline on Aboriginal Interests and Fire Management is available from the Fire Hub (https://dpaw.sharepoint.com/sites/fmsb/Pages/Fire-Management-Guidelines.aspx)

4.5.1.1. Notification to neighbours of planned prescribed burns

The *Bush Fires Act 1954* (Regulation 15B) states that during restricted or prohibited burning times, all adjoining private property landholders must be given notice of intent to burn. This notice must be provided no less than four days and no more than 28 days from the date of ignition.

The Bush Fires Act does not bind the Crown, however, the department conforms to the spirit of the Act by informing neighbouring landholders of any intention to burn adjacent to their property at least annually. Advice is provided to neighbours using the form FIRE 243 and a map of the proposed burn. Cancellation of a prescribed burn that has been previously notified should be communicated to the neighbour using form FIRE 622a.

Nearby, but non-neighbouring, landholders can be advised of a proposed burn by other means including letter drops, commercial radio announcements, electronic media and notices placed in local newspapers that reference the department's public website where the burn program is published.

4.5.1.2. Notification to apiarists of planned prescribed burns

Beekeepers who may be affected by prescribed burning must be provided written notification (including a burn program map) of the intention to burn, to ensure that they can plan their operations and protect apiary sites. In the southwest land division, this notification must be provided before August 31 for spring / summer burning and before January 31 for autumn / winter burning. Outside of the south west land division, written notification should be provided at least 6 weeks prior to likely commencement of prescribed burning. The form FIRE 622 is used to provide notification and form FIRE 622a to notify of any cancellation.

4.5.1.3. Notification to other industries and land users of planned prescribed burns

Community and commercial users of department-managed land must be forewarned of burning operations. This includes lessees, wildflower pickers, timber harvesting operators (through arrangements with the FPC), surveyors, miners, tourism operators, recreationists and others. These groups may be notified via radio announcements, electronic media and notices placed in local newspapers that reference the department's public website where the burn program is published. Public Information and Corporate Affairs (PICA) manage notifications based on the daily burn nomination process.

Direct communication is required if a lessee located on CALM Act land may be directly affected by a prescribed burn

4.5.1.4. Installation of Aerial Burn Imminent signs

‘Aerial Burn Imminent’ signs must be erected at all significant road and walk trail entry points to the burn cell at least four days prior to aerial ignition. These signs must be 600 mm x 600 mm, include the text ‘Aerial Burn Imminent’ and provide a contact number for the district or regional office undertaking the burn.

4.6. Performance indicators for prescribed burning

The department uses a range of performance indicators to inform government and stakeholders of the performance of its prescribed burning program and to facilitate ongoing improvement in its operations. The performance indicators are described in detail in the information note ‘Prescribed Burning and Bushfire Suppression Performance Indicators’ which can be found on the Fire Hub (https://dpaw.sharepoint.com/sites/fmsb/Pages/Manuals.aspx).

FMSB’s FMIOs regularly report on the status of the department’s prescribed burning including:

- Fortnightly reports to the Minister.
- Quarterly risk reports to Corporate Executive.
- Annual reports for the public and our oversight bodies.
- Other non-routine reports, such as responses to parliamentary questions.

The most frequently required indicators are the

- Number of prescribed burns commenced and completed in each of the department’s regions.
- Total area treated with prescribed fire in each region.
- Extent to which each prescribed burn on the program achieved its objectives.
- Extent to which the burn program contributes to the outcomes specified in each RFMP.
- Lessons that have been learned from the planning and implementation of the burn program.

These reports are largely based on the information in the PBS, cross-referenced with supporting spatial data (GIS shapefiles). To ensure accurate reporting, districts and regions must ensure that the information in the PBS is current and accurate and burn shapefiles are provided to FMSB in a timely manner.

4.6.1. Planned area, treatment area, actual burnt area

There are three different areas used in burn program planning and reporting: the planned area, treatment area and actual burnt area. A definition of these terms is provided below and illustrated in Figure 3.

Planned area is the area of a prescribed burn nominated on the annual burn program. Once approved, a PFP may be prepared that covers the entirety of the planned area, or any part of it.

Treatment area is the area that is exposed to ignition. It may incorporate the entirety of the planned area, or a decision may be made to only treat a portion of the planned area. All corporate reporting on prescribed burn achievements is based on treatment areas.

Actual burnt area is the area within a treatment area where the fuel is consumed by fire in a prescribed burn. Actual burnt areas may be mapped for inclusion in the corporate fuel age dataset, but they are not used in corporate reporting. This is because the precise nature of the mosaic of burnt and unburnt patches within that treatment area is immaterial for the purposes of corporate reporting but may be important for fire or land management planning.

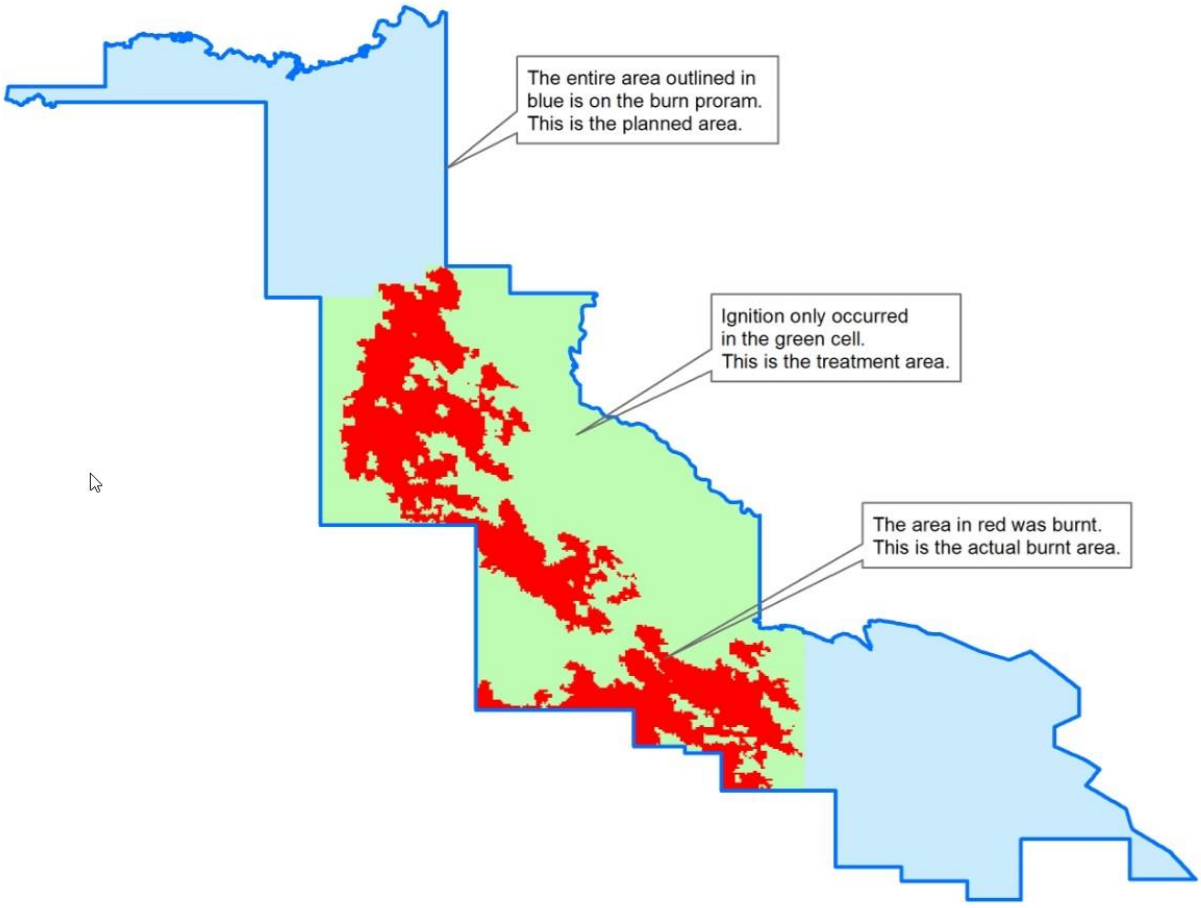


Figure 3: Illustration of the distinction between the planned area, treatment area and actual burnt area in prescribed burn planning and reporting.

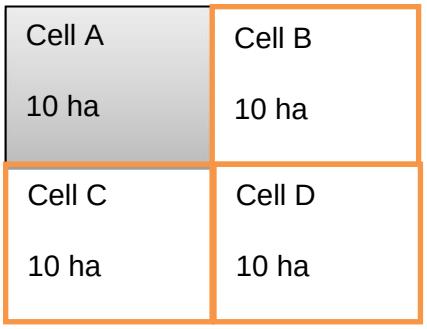
4.6.2. Reporting day of burn achievements

Day of burn achievements are reported in the PBS after each day's burning. Two figures are entered to section B11 of the PFP for each burn on which work was undertaken.

Area treated today is a log of daily activity to assist with future planning and financial accounting. In this field, the user should record the area that was exposed to ignitions on the day. If a cell is exposed to ignitions on multiple days, its area may be recorded in this field on each occasion it is lit. This provides an indication of how much effort went into conducting a burn. An estimate of the area treated is adequate for the 'area treated today' as it is not used in corporate reporting.

Area where treatment is complete is a record of the area in which burning activities have been concluded. An area may only be recorded as being completed once and should not be entered here until the DFC is satisfied that no more ignitions will be required in that area. This is the field that all corporate reporting will be based upon and should be measured and maintained as accurately as possible. The 'area where treatment is complete' is not the actual burnt area (mapped firescars) but a bounding box drawn around these burnt areas (see Figure 4). The difference between 'area treated today' and 'area where treatment is complete' is illustrated in the simple example below (Figure 4). Note that neither figure relates to the **actual burnt area**.

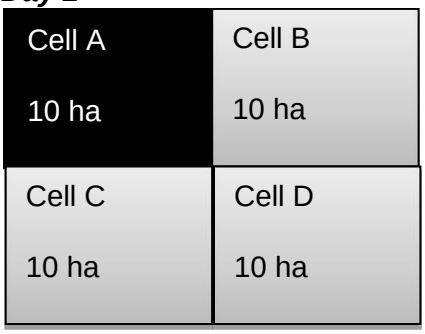
Day 1



Date	Treated today	Treatment complete
Day 1	10 ha	0
Total	**10 ha**	**0**

Cell A is lit, but the result is poor and it is thought that further ignitions will be required. 10 ha is recorded as having been treated today, but none as completed.

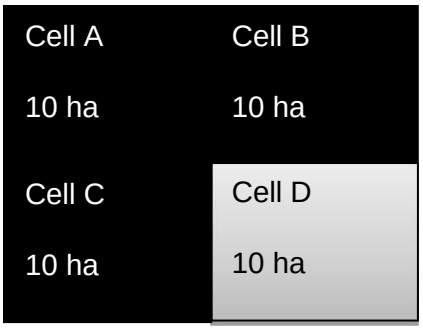
Day 2



Date	Treated today	Treatment complete
Day 1	10 ha	0
Day 2	40 ha	10 ha
Total	**50 ha**	**10 ha**

All four cells are lit. Cell A is completed, the other three cells will all require further ignitions. 40 ha is recorded as having been treated today, but only 10 ha as completed.

Day 3



Date	Treated today	Treatment complete
Day 1	10 ha	0
Day 2	40 ha	10 ha
Day 3	30 ha	20 ha
Total	**80 ha**	**30 ha**

Cells B, C and D are lit. B and C are completed, but further ignitions are required to complete cell D. 30 ha is recorded as having been treated today and 20 ha recorded as complete, for a total of 80 ha of treatment and 30 ha where treatment is complete.

Figure 4: Demonstration of the use of the fields 'area treated today' and 'area where treatment is complete' in a prescribed fire plan.

The principle demonstrated in Figure 4 also applies to situations where multiple ignitions are undertaken on an area over the course of a season. For example, Figure 5 shows a situation where the entirety of a 40,000 ha planned area is exposed to aerial ignition on four separate occasions. On the 4th, 5th and 6th of April the planned area was flown but the operations officer was not satisfied that the burn was adequately completed. On each of these days, 40,000 ha is entered at the 'Area treated today' but zero hectares as the 'Area where treatment is complete'. Finally, on the 25th of May, the whole planned area was flown one final time. As the operations officer was now satisfied with the result, 40,000 hectares was entered as being treated today and the entire 40,000 ha entered as now being complete.

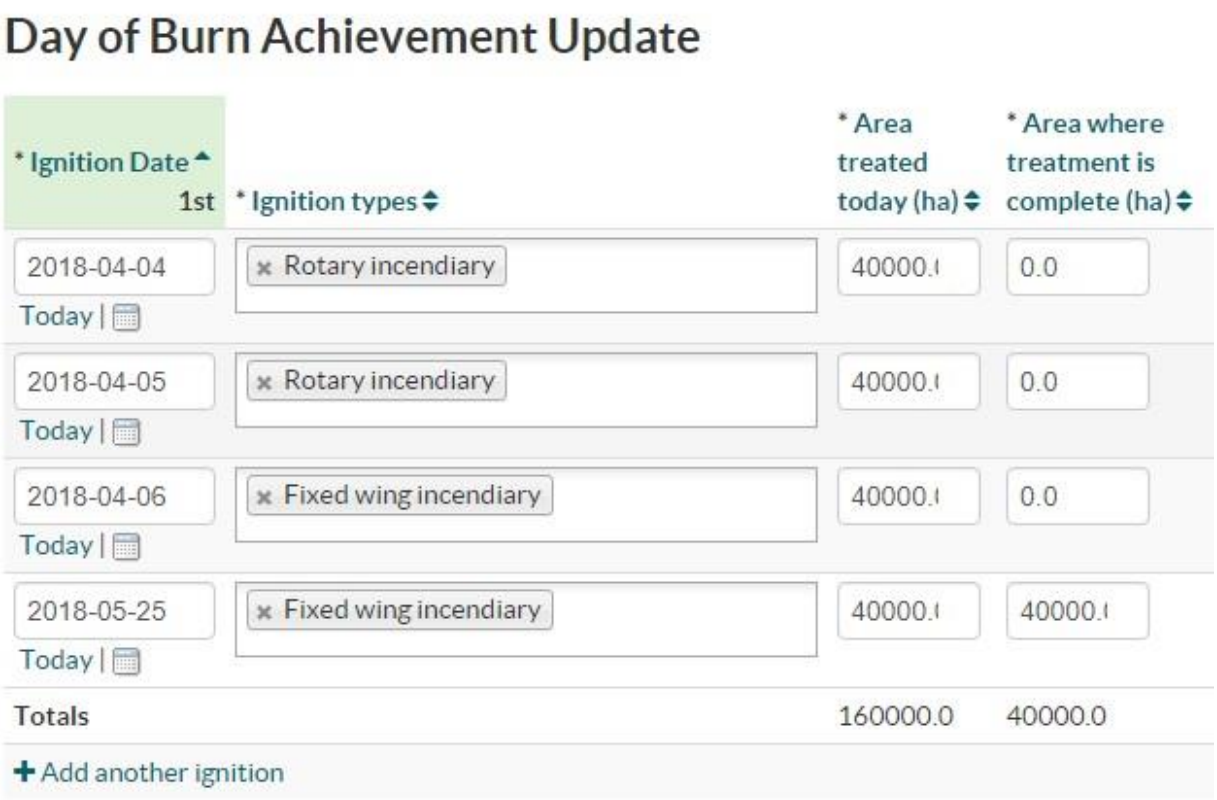


Figure 5: Example of day of burn reporting for an aircraft burn requiring multiple ignitions of the entire planned area.

4.6.3. Spatial data

A spatial dataset (GIS shapefile) of all areas where treatment is complete must be provided to FMSB when a burn is completed, at the end of a season of ignition or at the end of the financial year. Providing spatial data progressively through the year is best for both FMSB and the region, because these data are incorporated to the corporate fuel age dataset as they are provided. Keeping them up to date will help to ensure the best quality fuel age information is available for fire planners in the region. It will also assist the branch with ongoing reporting requirements and allow any errors or discrepancies to be identified sooner. If better data subsequently become available, it can be substituted into the fuel age layer to replace the obsolete information.

The shapefile provided to FMSB need only contain the burn ID and depict, as accurately as possible, the area where treatment is complete. If the burn was patchy or has large unburnt pockets in it, a shapefile showing the actual burnt area may be provided separately to FMSB for inclusion in the fuel age dataset.

4.7. Evaluation of prescribed burning

For the planning cycle to be completed, the burn program, and each individual burn on it, must be assessed against the planned outcomes to determine performance. Measurement of performance is a multidisciplinary activity and requires involvement of all service leaders. To ensure continuous improvement, adaptive management principles must underpin the burn program planning and implementation process, the review of burn programs and individual burn outcomes, and the sharing of lessons learned.

4.8. Summary of roles and responsibilities in burn program planning

	Burn Program Planning Step	Deadline	Who?
1	**Regional Fuel Management Plan** Assets identified, Fire Management Areas mapped and targets for fuel management program calculated.	As per RFMP review schedule	RM, RLFM
2	**Conditional Burn Areas (CBA)** Custodians of CBA datasets confirm to FMSB that they are current and fit for purpose or provide changes to them.	2nd week of February	DSC[3], DFEM[4], RM
3	**Amendments** to the burn program submitted to FMSB. This is the only opportunity to submit amendments requiring Ministerial approval.	2nd week of February	RLFM, DFC
4	**Corporate Fire History** Corporate fire history and CBA datasets updated and distributed via CDDP.	2nd week of March	FMSB FMIO
5	**Public consultation** Consultation and engagement with public and other agencies undertaken for burn review and planning.	Prior to each burn season.	RLFM, DFC[5]
6	**Amendments** to the approved burn program submitted to FMSB	1st week of April	RLFM, DFC
7	**Harvesting plans** FMB provide an updated indicative 3 year harvesting plan that identifies Fire Exclusion Harvesting Areas. Areas planned for harvesting and available for silvicultural burning identified.	Early May	Manager FMB, DFC
8	**Review** district's prescribed burning achievements to inform burn program planning and End of Burn Season Review Report (FIRE874)	Early May	DFC

[3] Director Science and Conservation
[4] Director Forest and Ecosystem Management
[5] District Fire Coordinator

9	**Candidate burns identified** GIS analysis to identify potential burns required to satisfy the targets set in the RFMP. Potential burns required to satisfy other land management requirements or on behalf of other land or asset managers identified. Initial program checked against the dataset of CBAs to ensure that it complies with fire management requirements. Initial program circulated for consideration by district service leaders.	Early May	DFC, district service leaders

10	**District burn program planning meeting** District review and planning meeting, service delivery coordinators review achievements of previous year and prepare next annual program. Initial district burn program compiled. PFP created and mandatory 'Summary and Approval' information completed for each.	Early May	DFC, district service leaders, representative of FMSB
11	**Final district burn program provided to RLFM.**	Mid May	DFC
12	Proposed district programs combined to form draft regional program. Regional program assessed against targets set in RFMP.	Mid May	RLFM
13	**Regional burn program planning meeting** Regional burn planning meeting for service leaders to review proposed burn program. Regional annual burn program and three-year indicative burn program (if required) finalised.	Mid May	DFC, regional service leaders , representative of FMSB
14	**Burn program approved by Regional Manager.**	Mid May	RM, RLFM
15	**Regional burn program submitted** All PFPs on proposed program submitted for corporate approval and shapefiles of regional burn programs submitted to FMSB.	24th May	RLFM
16	Proposed regional programs collated to a state program and provided to EDRFMS.	1st week June	FMSB
17	**State burn program approved** State program approved by EDRFMS and tabled at Corporate Executive meeting.	2nd or 3rd week June (according to meeting schedule)	FMSB, EDRFMS

18	**Annual reporting data submitted** Shapefiles of previous year's fire program submitted to FMSB for annual reporting, BRS and PBS complete and current.	June 15	DFC, RLFM
19	**New burn program commences**	July 1	All
20	State annual and three-year indicative burn programs published on the Parks and Wildlife public website and provided to stakeholders.	Mid July	FMSB
21	**Annual reports produced** Annual report, year book and end of season prescribed burning reports provided to EDRFMS.	July 15	FMSB
22	**Amendments** to the burn program to be submitted to FMSB.	1st week of September	RLFM, DFC
23	Requests for suspension of the prohibited burning period submitted to FMSB.	10th October	RLFM
24	**Amendments** to the burn program to be submitted to FMSB.	1st week of December	RLFM, DFC

5. Prescribed Fire Plans

- A PFP is prepared for each burn on the approved prescribed burn program.
- The department uses the PBS to prepare, authorise and manage PFPs.
- PFPs:
  - Define objectives for each prescribed burn and strategies to achieve them.
  - Assess operational risks and hazards and describe controls to manage them.
  - Provide the Operations Officer with direction as to how the burn should be implemented.
  - Record information about the conduct of the burn, to demonstrate that it was reasonable and to allow others to learn from the experience.
- The PFP must be approved before a burn can be conducted.

5.1. Prescribed Burn System

The PBS is an online application used by the department to prepare and manage PFPs. It can be accessed via the FireHub or directly at: https://pbs.dpaw.wa.gov.au/

The PBS is available to all people with a departmental login. A User Guide for the application is available from the Fire Hub (https://dpaw.sharepoint.com/sites/fmsb/Pages/TechnicalGuides.aspx).

5.2. General requirements

A PFP must be written for every prescribed burn undertaken by the department or on CALM-Act land, in accordance with the procedures below.

- PFPs must be prepared in the PBS and the master copy retained in that system.
- PFPs are written under the direction and supervision of the DFC (or RLFM in the absence of a DFC), who remains the custodian of the plan.
- Although aspects of burn planning may occur one or more years in advance of the burn being undertaken, the final PFP must correctly reflect the circumstances at the time that approval is given for ignition to proceed.
- The PFP must be approved by a person authorised to do so for the level of risk involved.
- Each PFP will identify:
    - the area to be burnt
    - the conditions under which the burn may proceed
    - relevant components of the way in which the burn is to be conducted (where this can be described in advance), including necessary preparatory work
    - controls for risks to departmental personnel, the public and things of value

- contingency arrangements for burn escape or other unintended events
- any factors that are to be the subject of ongoing monitoring or review during the burn, including triggers for contingencies.

- Each PFP will include:
  - a comprehensive context statement
  - a register of risks associated with the burn and a record of the risk assessment
  - the priority of the burn
  - an analysis of the burn complexity
  - an operations map
  - a context map that encompasses the risk environment of the burn
  - the approvals of any external agencies or persons that are either required or entitled to approve aspects of the plan
  - the signatures of persons authorised to endorse the plan on behalf of those DBCA services with a legitimate interest in the plan
  - the signature of the duly authorised person who has approved the plan -
    any other documents that are referred to as forming part of the PFP.

5.2.1. PFP endorsement

PFP endorsement signifies that the endorser has reviewed the PFP and considers that it conforms to the department's requirements for their area of responsibility. The minimum requirements for PFP endorsement are as follows:

- The DFC must endorse the PFP for low risk burns.
- The DM must endorse the PFP for medium risk burns.
- The RM endorse the PFP for high risk burns.

These endorsements confirm that the PFP adequately addresses risk and the burn is required to achieve management objectives.

PFPs do not require endorsement by district service leaders unless it has been agreed at the burn plan meeting that this is appropriate, or the DM has directed this to occur for a burn. The DM may choose to seek endorsement from regional service leaders, but this is not required except if directed by the RM. The Prescribing Officer must ensure the list of endorsees is appropriate.

PFPs should be reviewed prior to endorsement to determine their effectiveness in addressing the risks associated with the proposed burn. If risks are not adequately addressed, the plan should be modified so that it can be approved within the risk criteria set by the department.

The following show the endorsement text from a PFP for each potential endorsing role. These statements should be considered when determining endorsing roles and applying endorsement to a PFP.

Regional / District Manager
I have reviewed the assessed level of bushfire-related risk for the area concerned, the primary objectives of the burn, the risk register for the burn, the burn implementation plan and relevant supporting information and have formed the view that as prescribed, the risk is as low as reasonably practicable, and (for other than a scientific, vegetation management or silviculture

burn) the level of bushfire-related risk for the burn area concerned (or for another area to which this burn relates) is likely to increase if this burn does not proceed as planned.

Regional Fire Coordinator
I have studied the summary and implementation plan of this prescribed fire plan and endorse that it meets DPaW fire requirements including where applicable for: corporate executive approval, conditional burning areas, and fire management area objectives.

District Fire Coordinator
I have studied the summary and implementation plan of this prescribed fire plan and endorse that it meets DPaW fire requirements including where applicable for: traffic management, smoke impacts, other agencies, utilities and industry stakeholders.

Regional / District Program Leader - Nature Conservation
I have studied the summary and implementation plan of this prescribed fire plan and endorse that it meets DPaW nature conservation requirements including where applicable for: rare, threatened, or priority species or communities, pest animal and plants, spread of disease, and significant or fragile areas.

Regional / District Program Leader - Parks and Visitor Services
I have studied the summary and implementation plan of this prescribed fire plan and endorse that it meets DPaW parks and visitor services requirements including where applicable for: long distance trails and recreation infrastructure, tour operators, diversions, cultural sites, compliance with area management plans, and indigenous sites.

Regional / District Program Leader - Sustainable Forest Management
I have studied the summary and implementation plan of this prescribed fire plan and endorse that it meets DPaW sustainable forest management requirements including where applicable for: harvesting impact assessments, harvesting impact reconciliations, and disease risk areas.

Science Division Representative
I have studied the summary and implementation plan of this prescribed fire plan and endorse that it meets DPaW nature conservation requirements including where applicable for: rare, threatened, or priority species or communities, pest animal and plants, spread of disease, and significant or fragile areas.

5.2.2. PFP approval

PFP approval signifies that the content of the PFP conforms to departmental requirements and has been prepared and endorsed by properly competent and authorised staff. The level of approval required for a PFP is determined by the burn's final risk level:

- Very high risk burns may not be approved.
- High risk burns must be approved by the Manager FMSB[6].
- Medium risk burns must be approved by the RM.

[6] There are specific requirements for prescribed burns where the risk attributed to roads or traffic management is assessed as high or greater. Refer to the Prescribed Burning Traffic Management Plan on the FMSB intranet site for more information.

- Low risk burns must be approved by the DM[7].

If the required approver is not available, PFPs may be approved by a more senior officer.

PFP approval is granted for a discrete period, usually not exceeding 12 months. This ensures that the PFP is reviewed and updated in accordance with the department's risk management framework. If approval is granted for longer than 12 months, a justification of this decision should be uploaded to Part D of the PFP.

The following is the approval text from a PFP; this statement should be considered when applying approval to a PFP. Note that the term 'competent' does not refer to any specific qualification, rather it signifies that the approver considers the relevant personnel to have appropriate knowledge and experience to undertake the described tasks. Similarly, to be 'authorised' requires that, at the time the endorsement was applied, the endorser held or was acting in the described position.

District Manager / Regional Manager / Manager FMSB Approval
I confirm that the persons who have prepared this plan and have provided the above endorsements are competent and authorised to do so and I confirm that the plan has been prepared in accordance with the DPaW procedure for planning Prescribed Burns. The level of risk associated with the plan is within my authority to approve and accordingly, I approve the plan for implementation.

5.2.3. PFP extension

At the expiration of the period of approval, a PFP may be extended in fortnightly increments for an additional six weeks. After this, the PFP will require re-endorsement and re-approval. The PFP must be reviewed for currency and completeness before endorsement and approval is reapplied.

5.2.4. Amending a PFP

Much of the information in a PFP cannot be edited once the PFP is submitted for endorsement. Once 'locked' to edits the RM, DM, RLFM or DFC may make minor adjustments such as correcting spelling or typographical mistakes or updating the contact details of stakeholders. The FMSB FIMOs may also make these changes on behalf of districts and regions if required. Any changes that substantially alter the intent, conduct, or risk profile of the burn will require the PFP to be returned to draft mode for updating by the Prescribing Officer. In this case, endorsements and approval will need to be reapplied after the edits have been made. If the changes to the PFP raise the risk level to 'High' or make the burn contentious when it was not previously so, an amendment to the burn program will also be required.

5.3. Format of a prescribed fire plan

Each PFP contains four parts:

- Part A provides contextual and risk management information.
- Part B is an implementation plan.
- Part C records information about the evaluation and closure of the burn.

[7] The RM may choose to approve low risk burns.

- Part D provides a location for filing documents and information related to the burn.

5.3.1. Part A – Summary and approval

Part A of the PFP provides those planning or approving a prescribed burn with the contextual information they require to make informed judgements. This comprises the burn summary, risk management context statement, burn objectives, risk register, complexity analysis and the authorisations of departmental officers endorsing and approving the PFP.

See Submitting a PFP for Corporate Approval for the list of fields that form the burn summary.

5.3.1.1. Burn name

A locally meaningful name should be given to each burn to facilitate communication about it. The name given to a burn should not contain any reference to a previous burn ID. It may include forest block names and 'sequencing' numbers e.g. Sawyers 1, Sawyers 2 etc. A geographic descriptor is the best name to use for a burn, as it will assist provide context when discussing the burn with members of the public and people outside the region.

5.3.1.2. Description

The burn description consists of the burn ID, location, area, fuel type and year last burnt. It is automatically generated by the PBS using the information entered to the burn summary and approval page. This automation is only partially effective, however, so should be edited to ensure an accurate and sensical description.

5.3.1.3. Year / season last burnt

It is important to provide a meaningful description of the age of fuels within the burn to inform those endorsing, approving and reviewing the PFP. In instances where a range of fuel ages occur within the burn area, it is acceptable to enter 'various' to these fields. In such cases, a description of the fuel ages should be provided in the context statement and fuels ages shown on the context and operations maps.

5.3.1.4. Contentiousness

See Contentious burns in Chapter 3 for information on identifying contentious burns.

5.3.1.5. Remote sensing priority

Remote sensing priority is not used in the department's current processes and this field in the PFP may be ignored.

5.3.1.6. Burn purpose

The department undertakes prescribed burning to achieve many objectives, that can be broadly grouped into eight burn purposes:

1. Bushfire Risk Management. Prescribed burning that is undertaken to reduce the consequences or likelihood of a bushfire affecting people, communities, and associated assets.

2. Biodiversity Management. Prescribed burning that is undertaken to protect significant biodiversity, create or maintain favourable habitat for native taxa, support ecosystem processes; prevent the occurrence of bushfires of a scale, intensity or frequency that causes

environmental degradation; or protect parts of the landscape that are sensitive to the impacts of fire.

3. Aboriginal Interest. Prescribed burning that is undertaken to protect or facilitate identified Aboriginal interests in fire management including the protection of cultural and heritage values and assets, promotion of cultural land management and practices, caring for country, supporting the transfer of cultural knowledge and participation in customary activities.

4. Community Interest. Prescribed burning that is undertaken to address an interest in fire management by local communities, fulfil the obligations of the department's 'Good Neighbour Policy', or to provide training and development opportunities for bushfire brigades or others.

5. Research. Prescribed burning that is undertaken to create conditions required for a research project, protect an area required for research from bushfire, or facilitate a study of fire behaviour or effects.

6. Silviculture. Prescribed burning that is undertaken to stimulate seed release, create favourable conditions for seedling establishment, promote natural regeneration, reduce fuel loads generated from silvicultural practices and protect fire-sensitive regeneration from bushfire in forest areas utilised for commercial timber harvesting operations.

7. Vegetation Management. Prescribed burning that is undertaken to assist in the rehabilitation of areas disturbed by mining, pastoralism, or other extractive industries; manage weeds, remove exotic vegetation, manipulate the activity of native animals or manage view sheds.

8. Water Catchment Management. Prescribed burning that is undertaken to encourage rainwater runoff to dams, increase infiltration of rainfall to the groundwater and reduce groundwater usage, by reducing water use of vegetation in water catchments. A single prescribed burn can be undertaken for multiple purposes. A single prescribed burn can be undertaken for multiple purposes.

It is important to record all the purposes for which a burn is to be undertaken as this provides important contextual information for those planning, approving and implementing it. Assigning burn purpose(s) will also help to prioritise the burns on the program, develop suitable objectives, harmonise competing burn objectives and communicate the burn program to stakeholders and the public.

The department's Bushfire Risk Management Framework provides information about the management objectives of areas of department-managed land and how these relate to burn purposes.

5.3.1.7. Planned burn tenure

The tenure included in a burn is an important consideration for the approvals process and must be fully documented in the PFP. Every tenure type within the burn boundary must be identified, even if comprises a very small proportion of the burn area. All burning on non-CALM Act land requires Ministerial approval (see Burning on non-CALM Act lands in Chapter 3 for more information). Tenure boundaries should be shown on context and operations maps.

5.3.1.8. Fuel types

A description of the fuel types within the burn provides useful context for those endorsing, approving and reviewing the PFP. More information on bushfire fuels is available from the Prescribed Burning Implementation Guide.

5.3.1.9. Shires

Identifying the Local Government area(s) that a burn occurs within assists with corporate reporting on the burn program.

5.3.1.10. Forecast areas

Incident weather forecasts are now obtained from a range of sources, meaning the forecast district is less relevant than it was. The forecast area field may be removed from the PFP in the future but should be competed accurately in the interim.

5.3.1.11. Bushfire Act zone

Bushfire Act zones no longer exist in Western Australian bushfire policy as prohibited and restricted burning periods are now declared for Local Government areas. This section will soon be removed from the PFP but, in the interim, the zones defined in the Western Australian Government Gazette No. 75, Thursday, 16 September 1982 may continue to be used.

5.3.1.12. Program allocation(s)

The proportion of funding provided by each departmental program to conduct the burn is recorded here.

5.3.1.13. Regional Fire Management Plan Objectives[8]

This section lists any objectives from the RFMP that the burn will contribute to achieving. These objectives are entered on the 'Regional Overview' page under the 'Welcome' menu. Once entered there, they may be added to an individual PFP by pressing the button 'Select Regional Fire Management Plan Objectives' then highlighting tickbox alongside each relevant objective.

The objectives entered to the PBS are the management objectives for each Fire Management Area provided in the department's Bushfire Risk Management Framework. Additional, locally significant objectives may also be entered if these are identified in the RFMP.

5.3.1.14. Risk management context statement

The context statement describes the physical (built and natural) and socio-political environments within which a burn is to be undertaken and the key things need to be considered in its planning and implementation. It provides information that helps a reader to understand the burn and contributes to identifying risks and planning appropriate risk treatments. Assumptions and uncertainties are sources of risk and should be identified in the context statement.

The context statement must consider issues relevant to the planned burn area (internal context) and to the surrounding landscape (external context). The external context informs thinking about how the burn might affect the surrounding community and what might happen if the burn escapes. These are key sources of risk in prescribed burning and must be explored in the context statement to support the risk register and contingency plan. The extent of the area that may form part of a burn's external context will vary depending on the nature of the burn, the environment in which it is being conducted and the types of issues involved.

To aid prescribing officers in developing a good context statement, it is suggested that they consider six aspects of the burn – Political, Economic, Social, Technical, Legal and Environmental (commonly referred to by the acronym PESTLE). It is not necessary enter information against each of these categories for every burn or to structure the context statement using the PESTLE acronym. PESTLE provides a reminder of the factors to be considered; information need only be recorded if a pertinent issue is identified.

[8] This nomenclature will soon be adjusted to 'Regional Fuel Management Plan'.

Political: how the burn may be influenced by government policies or mandates or any issues associated with the burn that may come to the attention of local, state or federal politicians. A consideration may be the political connections of any people or groups likely to be affected by the burn.

Economic: any foreseeable economic impacts to users of the land being burnt or its surrounds. This should include effects during the implementation phase and any flow on or downstream effects. Factors that may cause economic impacts include the closure of roads, disruption to industry or events or reduction in opportunities for use or amenity of the burnt area.

Social: the attitudes of neighbours, interest groups and the broader community to the conduct of the burn and description of any side-effects they are likely to experience. Burns in more high profile locations are likely to attract greater public interest, which may be positive or negative. Community sentiment, road closures, reduced access to the burn area and smoke are factors to consider when describing social impacts.

Technical: any significant methodological constraints or risks to implementing the burn. Technical constraints tend to relate to fuels, access, terrain or timing of burn implementation, including any sequencing requirements for program building.

Legal: any legislative requirements, constraints or effects of the burn. This may include a description of the imperative for undertaking it, requirements for stakeholder inclusion and legal ramifications of any unintended effects. A description of the tenure and management arrangements is important for any burns that include portions of non-CALM Act land.

Environmental: the ecological considerations in planning and implementing the burn. This should include the identification of any significant species, communities or ecosystems with specific fire management requirements or that need to be protected during burning operations. It may also include any constraints on access, earth works or chemical use in the planned area.

The Operations Officer and endorsing, approving and reviewing officers are all important audiences for the context statement. Enough information should be provided to allow them to understand the burn context. A series of well-crafted dot points is the recommended format for the context statement to maximise clarity and conciseness. The context statement and context map should support one another with consistent and comprehensive representation of issues.

Some example context statements can be seen at Appendix 1.

5.3.1.15. Context map

The context map provides a visual representation of the risk context of the burn. It should clearly depict the area within and surrounding the burn and show fuels, land tenure, assets, major access routes and any known hazards or sources of risk that may be depicted on a map. A template for the context map is provided in the departments' Specifications for Standard Maps Technical Guide (DPW, 2016a) available from the Fire Hub (https://dpaw.sharepoint.com/sites/fmsb/Pages/Technical-Guides.aspx).

It can be difficult to maintain clarity on a context map if there are many features that need to be shown. If this is a problem, consider using multiple maps, each identifying a subset of features or grouping point features into a polygon. For example, depicting an area as 'urban', rather than showing each house as a point, may clarify the map. Remember that this map is intended to provide an overview of the context and will be supplemented by more detailed information on the operations map.

5.3.1.16. Critical stakeholders list

Any significant person or group referred to in the context statement should be included in the critical stakeholders list, along with the reason for their interest or involvement. Not every

stakeholder in the burn is ‘critical’; they should be entered to this register if there is a requirement for consultation beyond what may be considered the norm for planning a prescribed burn in the area. Although no field is provided to record contact details, it may be convenient to add these to the ‘Interest’ field.

5.3.1.17. Burn objectives

Burn objectives are the outcomes that are to be achieved by undertaking the burn. A PFP’s objectives may be localised to the outcomes of a single burn or relate to the outcomes of a broader land management regime.

The combination of the objectives and success criteria should be specific, measurable, achievable, realistic, time bound and representative of departmental policy. Some examples are provided at Appendix 6.

5.3.1.18. Success criteria

Success criteria state the conditions that must be met to achieve the objectives. They are indicators that can be measured or estimated upon completion of the burn, or soon thereafter. They may be direct or indirect measures - for example, scorch or defoliation are both indicators of fire intensity that are used because it is difficult to measure fire intensity directly. The success criteria must be assessed before the burn is closed. As such, these criteria must be measurable in a manageable timeframe. Any requirement for longer term assessment of the effects of a fire regime should be recorded in a monitoring plan for the area, rather than in the individual PFP.

5.3.1.19. Burn priority and justification

Completion of the Burn Priority Justification assists burn coordination at a local, regional and state level by indicating how important the burn is in relation to other burns on the program, in achieving the department’s objectives.

Burn priority is set at the program planning stage. For more information, see Prioritising the burn program.

5.3.1.20. Complexity analysis

The complexity analysis is a list of categorised factors that may affect the difficulty of planning or implementing the burn. The intent is to provide readers with a quick appreciation of these factors and to alert approving and implementing officers of any issues that may require close attention or greater than usual care. Appendix 7 outlines factors to consider when conducting burn complexity analysis.

5.3.1.21. Risk register

The risk register describes and quantifies the risks associated with the conduct of a prescribed burn and, where required, the treatments that will be enacted to control them. It comprises an initial risk assessment, planned risk treatments and final risk assessment for a burn. The risk register is a crucial aspect of prescribed burn planning and should be approached with a full understanding of the principles of risk management. The following information should be read in conjunction with Introduction to risk management.

Risk events should be added to the risk register throughout the preparation of the PFP. This may commence as risks are identified during stakeholder consultation or at the burn program planning meeting and will continue during the development of the context statement and when undertaking field reconnaissance of the burn area.

The risk register should be continually reviewed during the preparation of the PFP to ensure that it provides a comprehensive and accurate description of the risks associated with the burn. This includes reviewing the effectiveness of controls and revising risk assessments as required. It is

also important to understand that risk treatments may create new risks or alter the level of existing risks. It is particularly important to review the risk register following any significant changes to the plan for burn implementation, including changes to the boundary, season or ignition method.

It is not practical to describe every risk associated with prescribed burning. The risk register should describe those things that are significant, different, special or unique about the burn that could foreseeably occur.

Initial risk assessment

The initial risk assessment identifies risk events and quantifies the level of risk associated with each event. It requires the input of a consequence value and the likelihood of this outcome occurring. The PBS then calculates the risk level for that event using the Parks and Wildlife risk matrix (Figure 6).

The risk register should describe all significant risks pertinent to the burn, but treatments are only required for those risks that are not adequately addressed by the existing controls. If standard operating procedures and normal business practices adequately address the risk, it may be described as ALARP in the risk register, as no additional treatment is required.

It is acknowledged that the term As Low As Reasonably Practicable (ALARP) is not entirely aligned with the contemporary use of this function. The term used will be updated soon but, in the interim, ALARP may be considered to mean that existing organisational controls adequately address the risk or that it is within the department's thresholds of acceptable risk.

Identifying risks

To identify risks, consider each objective of the burn (both standard organisational objectives and those specific to the individual burn) and describe events that could prevent them from being achieved. This should include any uncertainties about the internal and external contexts of the burn that might affect its outcomes. Attention should be paid to how an event and its consequences might unfold and potential flow on effects. Each identified risk should be entered to the risk register.

Each risk should be described as an event with associated consequences. Each event may have a variety of consequences and it may be necessary to record an event more than once if the consequences and treatments are different. For example, "an escape from the prescribed burn resulting in bushfire damaging the neighbouring industrial area" and "an escape from the prescribed burn resulting in the loss of a nearby population of priority flora" stem from the same event but have different outcomes and may be addressed in different ways. It is important that risks be described as an event, rather than just an outcome, so that appropriate and meaningful treatments can be designed.

Analysing risks

Analysing risks means developing an understanding of each risk event so that the magnitude of the consequences and likelihood can be documented.

- Consequence is a measure of the degree to which the outcome being described will affect the ability to meet objectives (at both organisational and burn scale).
- Likelihood is a measure of the probability that the described consequences will occur, not just how likely the event itself is.

Once the likelihood and consequence are assigned, the PBS will calculate the risk level for the described event. This calculation is based on the matrix shown in Figure 6. The risk analysis

should be constantly reviewed as the plan is developed to ensure that it reflects the best available information about the burn.

Risk analysis must consider the effect of any existing controls which will make the consequences less severe or make it less likely that the consequences will occur. Any assumptions made in this process should be documented. The PBS doesn't provide a place to record assumptions, so they should be documented in a separate document and uploaded to Part D of the PFP.

Appendix 8 provides classifications and levels of severity for each category of consequence and ratings of likelihood.

Likelihood							
	Almost Certain	Medium	Medium	High	High	Very High	Very High
	Likely	Low	Medium	Medium	High	High	Very High
	Possible	Low	Low	Medium	Medium	High	High
	Unlikely	Very Low	Low	Low	Medium	Medium	High
	Rare	Very Low	Very Low	Low	Low	Medium	Medium
		1	2	3	4	5	6
		Consequence					

Figure 6: Risk analysis matrix used in Parks and Wildlife Prescribed Fire Plans.

Evaluating risks

Evaluating risks means comparing the risk level calculated for each risk event in the risk analysis to the department's risk criteria. If the level of risk is unacceptably high, a risk treatment will be required to reduce it. If existing controls reduce the risk to an acceptable level, it may be designated as ALARP (see the note above on the term 'ALARP'). Any risks not marked as ALARP will require a treatment to reduce the risk level. Risk cannot be eliminated, and a risk may be designated ALARP if it is considered it will not be practical or financially viable to apply treatments that reduce the risk level any further.

Departmental prescribed burns cannot proceed if they are assessed to be very high risk; risk treatments must be planned to reduce risk to below this level. Within this constraint, the level of risk that is acceptable for a burn is a judgement to be made by the approving officer in consultation with the prescribing officer. If risk cannot be reduced to an acceptable level the burn will not be approved.

Designing treatments

Proposed treatments are described in the risk register and then another risk assessment undertaken to determine if they will reduce risk to an acceptable level. This process is iterative, the risk analysis and evaluation steps are repeated after each risk treatment is designed, to determine whether it will have the desired effect. If it does not reduce risk to the required level, further treatments must be added.

When entering a risk treatment, a place in the PFP is identified where the corresponding action is required or will be recorded. The required treatments must be recorded in relevant part of the PFP to ensure that are undertaken, to maintain a record of the resultant actions and to maintain internal consistency within the PFP.

Final risk assessment

After all treatments have been added to the risk register, the final risk assessment is used to identify the level of approval required for the PFP. The highest risk level determined for any of the risk events will determine the overall risk level of the burn.

The PFP is not configured to allow 'positive risks' to be recorded. For example, the risk register cannot be used to record the risks of not undertaking the burn or the positive effect on risk of undertaking it. Where these concepts are important to record, they may be described in the context statement.

5.3.2. Part B – Burn implementation plan

Part B of the PFP is a plan for the implementation of the burn. It includes a list of actions required before and during the burn, ignition prescriptions for each fuel type, traffic management and signage plans, requirements for managing burn exclusions, the contingency plan and maps to guide operations. It also provides templates for the organisational structure, communication plan, briefings and other information to be recorded during burn implementation.

5.3.2.1. Operational overview

The operational overview allows the Prescribing Officer to provide operational context and strategic direction on how the burn should be implemented. This may include a description of the landforms, terrain and fuels within the burn unit and information about the potential or need to separate the burn into cells. The Operational overview shouldn't be so detailed or tactical as to unnecessarily restrict the Operations Officer's options on the day of burn and should not duplicate information from the context statement, risk register or contingency plan.

An important function of the Operations overview is to give approving and reviewing officers with an appreciation of how the burn may be implemented. The strategic direction in the Operations overview is complemented by the detailed tactical information provided in the edging plan and lighting sequence sections.

5.3.2.2. Plan actions

Plan actions are a list of specific activities that need to be undertaken before, during or after the burn to mitigate risks. Each action is transcribed to the appropriate page in the PFP when it is allocated as being required pre-burn, on the day of burn or post-burn. Actions may also be allocated to appear as part of the context statement if that is appropriate.

Actions should be marked as completed after they are undertaken, with the name of the person completing the action and the time and date at which it occurred. The Plan actions lists in the PBS don't support entries for multiple days of operations. Where ignitions occur on multiple days, the actions lists must be downloaded, completed and saved to Part D on each day of operations.

Identifying that all actions have been completed and then signing and dating the bottom of the day of burn actions list has the same legal standing as initialling each entry. Whichever is done, it must be completed by the Incident Controller and Operations Officer as appropriate for each day of burning.

Pre-burn actions: describes actions required to mitigate risks before burn ignition.

Day of Burn actions: describes actions to be undertaken on any day that ignitions occur. Actions are allocated as the responsibility of either the Incident Controller (usually the Duty Officer (DO)) or the Operations Officer. The PBS allows for day of burn actions to be added to the pre-burn briefing template.

Post-burn actions: describes actions required to be undertaken after the burn has taken place. This must be completed before the PFP can be closed.

5.3.2.3. Roads

Roads are used as operational boundaries for many prescribed burns and the interaction between prescribed burning activities and traffic is a significant risk. It is essential that appropriate pre-planning is undertaken to control this risk, including consideration of hazards posed to both burn personnel and road users.

The roads section of the PFP records how roads around or within the burn which will be managed before, during and after the burn. It requires the nomination of appropriate traffic management schemes to reduce hazards to road users and fire crews. Guidance in the application of traffic management is provided in SOP064 *Traffic management for prescribed burning* available from the Fire Hub:
https://dpaw.sharepoint.com/sites/fmsb/Pages/StandardOperating-Procedures.aspx

Public roads

The department has collaboratively developed a Traffic Management Plan (TMP) with Main Roads Department Western Australia (MRWA), which applies to planned fire operations undertaken on or near public roads. The TMP provides appropriate traffic management guidance for fire practitioners when developing burn plans and undertaking prescribed burning operations. Any departmental road that is accessible to the public must be managed as a public road.

The TMP states several legislative and policy requirements for the management of public roads, including the qualifications required for people involved in traffic management roles. It should be consulted during the development of the PFP to ensure appropriate measures are in place to manage roads during the burning operation. All assumptions about traffic and road conditions made during the development of the PFP must be checked prior to burn ignition. For example, roadworks or a traffic accident in the area could change traffic conditions at short notice and require alteration to the traffic management scheme.

The traffic control diagrams shown in the TMP can be uploaded to the PFP from the Traffic management page within the PBS. The TMP should be applied to all burning operations in cognisance of the following condition:

"MRWA recognises that situations sometimes arise where application of these requirements is not appropriate and that variation to these requirements will be necessary. When it becomes apparent that deviation is necessary from the requirements of this Code, persons arranging the works should carefully consider all possible options using common sense and judgement based on risk management in accord with Section 5.3. (of the TMP)"

The TMP provides requirements for a daily process that must be followed, not just the signage requirements. This will require that various forms and documents be completed to acknowledge that daily requirements have been met. Where required, these must be saved to Part D of the PFP.

A prescribed burn may not proceed under the auspices of the TMP where the traffic management components have a residual risk rating of 'High' or 'Very High'. Such burns require a specific agreement with the network operator.

Other roads

Roads are not required to be managed in compliance with the TMP if they are physically blocked for management purposes or within private properties which cannot be lawfully accessed by the public. Non-public roads should still be described in the PFP and managed appropriately during the implementation of the burn. Where non-public roads are required to be managed for burning

operations, records must be kept of notifications provided to relevant landholders and stakeholders. These should be uploaded to Part D of the PFP.

Where they occur on CALM Act land, non-public roads must be closed through a management planning process or via CALM Act Regulation 44, not simply taped off for the duration of a burn.

Smoke on roads

Smoke is a significant hazard for road users during and after the implementation of a prescribed burn and measures should be put in place to mitigate its effects. Specific instructions regarding smoke on roads is contained in SOP 64 Traffic Management for Prescribed Burning (DPW, 2017b) available from the Fire Hub: https://dpaw.sharepoint.com/sites/fmsb/Pages/StandardOperating-Procedures.aspx.

Sign installation and surveillance (traffic management scheme)

The management of roads, tracks and trails typically requires the use of signage to control their use and warn the public of burning operations. The use of signage for a given operation is described as a traffic management scheme and is described in the TMP. Once in place, signs must be regularly inspected to ensure they continue to conform to requirements.

The requirements for sign inspection are specified in the TMP for public roads. A record of sign inspection should be maintained on the Sign inspection and surveillance page of the PFP. This record may be made using the form provided in the PFP, a fit-for-purpose diagram or a diary entry. Whichever method is used, it must comply with the standard set out in the TMP, including ensuring that all mandatory details are recorded, and the information is accurate, complete and consistent. The completed information must be saved in Part D of the PBS.

Note that the terms ‘controlled burn’ and ‘prescribed burn’ are not approved by MRWA; signs associated with prescribed burns must use the term ‘burning off’.

Removal of signage and restoration

Relevant signs and devices are to be removed or concealed from view as soon as the activity is completed, or the hazard ceases to exist. All other advisory signs and demarcation must be removed as soon as practical after the completion of the burn, subject to inspection and approval of hazardous or hollow-butted trees by appropriately experienced personnel.

5.3.2.4. Tracks and trails

Users of tracks and trails that pass through or near prescribed burns may be inconvenienced or put at risk by burning operations. The tracks and trails section of the PFP records information about the likely effect of burning operations on tracks and trails and the steps that will be taken to manage them. Guidance in the management of tracks and trails during prescribed burns is provided in SOP101 *Protection of users of tracks and trails during prescribed burning and bushfires* available from the Fire Hub: https://dpaw.sharepoint.com/sites/fmsb/Pages/StandardOperating-Procedures.aspx. Consultation with staff from Parks and Visitors Services is crucial when managing tracks and trails.

Protection of trail infrastructure

The Prescribing Officer must ensure that tracks, trails and visitor infrastructure are included as part of the risk assessment and pre-burn checklist. Risks and protection measures should be

discussed with trail managers as part of burn planning as track and trail assets may need to be protected during the burn or rebuilt afterwards if not able to be protected.

Trail diversions

Where popular or high-profile tracks and trails will be affected by prescribed burning operations, a temporary trail diversion may be required. Diversions should be planned such that users can be found and relocated rapidly in the event of a burn escape. The diversion must be clearly marked and signposted in the field, remaining in place until the DM and RM (informed by

DFC / RLFM) declares the burn safe for trail users. Where an appropriate realignment cannot be determined, the section of the trail affected by the burn will be closed until it is safe to re-open to the public.

Should a trail diversion be required, a trail diversion map must be uploaded onto the Tracks and trails page of the PFP. A template for a trail diversion map is provided in the department's Specifications for Standard Maps Technical Guide, available from the FireHub: https://dpaw.sharepoint.com/sites/fmsb/Pages/Technical-Guides.aspx.

Any diversion of the Bibbulmun Track or Munda Biddi Trail must be planned in conjunction with the department's Recreation and Trails Unit.

5.3.2.5. Burning prescription

The burning prescription stipulates the fire behaviour that should be achieved in conducting the burn, and so, the fuel and weather conditions under which it may be undertaken. The burning prescription may be informed by the Fuel Assessment Summary (FIRE872) and Fire Behaviour Calculation (FIRE873) forms. Where these forms are not applicable, an appropriate equivalent must be included in the PFP, such as a photo, map or description of the fuels to be burnt.

The burning prescription provides the conditions that are *recommended* to achieve the desired result. It may not be possible to continue to operate within the prescribed conditions once the burn is ignited. The prescribed conditions cease to be a consideration once achieving burn security becomes the over-riding concern of operations.

It is not necessary to stipulate a wind direction in the burning prescription, but the term 'any suitable wind should not be used. A term such as 'wind direction not critical to burn outcomes' is an acceptable alternative. If recommending (rather than mandating) against or for a wind direction, any considerations to guide the decision and actions that may be required as a result should be provided. For example, "Recommend east side winds. If burning on a westerly wind, traffic management will be required on highway".

Guidance on how to set appropriate conditions for prescribed burning and undertaking the calculations required to complete the burning prescription is available from the Prescribed Burning Implementation Guide.

Appendix 9 provides a guide to Soil Dryness Index (SDI) and burn outcomes for different forest fuel types, to assist with developing the burning prescription.

Fuel assessment

A PFP must include an assessment of the fuel type, load and structure in the area to be burnt. The method used to assess and describe fuels may vary according to the characteristics of the burn and its risk profile. Instruction on the selection and use of methods is provided in the Prescribed Burning Implementation Guide. Where fuel samples are taken, the sample forms and a map showing the sampling locations must be uploaded to Part D of the PFP. Where fuel

sampling is not practical or appropriate, an alternative method of describing the fuels within the planned area must be provided.

Fire behaviour calculation

Refer to the Prescribed Burning Implementation Guide for guidance on the use of fire behaviour models to determine the ignition conditions required to achieve the desired fire behaviour.

5.3.2.6. Edging plan

Edging is used to provide a low fuel area around the perimeter of burn cells prior to undertaking ignition of the core area. It is done to enhance burn security and improve crew safety during core ignition and reduce the mop-up required after it. It may also allow the protection of legacy habitat elements, and preservation of the aesthetics of road verges and recreation sites, as it achieves a milder result than the core ignition.

An edging plan is not required for every prescribed burn. It should be completed if the edging will be undertaken under a different range of conditions or circumstances than the core ignition.

Refer to the Prescribed Burning Implementation Guide for detailed information on edging.

5.3.2.7. Lighting sequence

The lighting sequence describes the order in which ignitions will be undertaken, the strategies that will be employed for each ignition and the conditions under which they should proceed. Sequencing ignitions is particularly important in multiple fuel burns but can also be needed where igniting cells in a specific order will help to achieve burn objectives or enhance burn security. The lighting sequence page of the PFP also allows the Prescribing Officer to identify any specialist resources that may be required for each ignition.

Refer to the Prescribed Burning Implementation Guide for detailed information on ignition sequence.

5.3.2.8. Areas to be excluded

Planned burn units will often include areas that require exclusion from fire. Such areas may include Conditional Burn Areas (CBAs), fire sensitive Declared Rare Flora (DRF), cultural heritage sites, organic soils or infrastructure. Any requirement to exclude fire from a portion of the planned burn area must be described on the Areas to be excluded page of the PFP. This description should include the location, the reason for exclusion and the strategies that will be employed to achieve it. Exclusion areas must also be shown on the Operations map.

If exclusion of fire from an area is part of an ongoing management strategy, the flammability of the vegetation in the surrounding landscape must be managed to protect the exclusion area from unplanned fire. The regular introduction of low intensity fire in surrounding flammable and fire-tolerant vegetation types in the landscape is a key strategy for protecting exclusion areas from damaging bushfires.

Refer to the Prescribed Burning Implementation Guide for more information on strategies that may be used to achieve fire exclusion.

5.3.2.9. Contingency plan

The contingency plan provides pre-planned responses to events that arise from residual risks after standard controls and the treatments described in the PFP are applied. It describes risk events, the ‘triggers’ that will indicate some action is required and the actions that will be undertaken when these triggers occur. A key action is usually notifying stakeholders and their contact details are recorded in the contingency plan.

Contingency planning considers low likelihood, high consequence events, primarily an escape from the burn that threatens a nearby asset. The contingency plan should describe how, where and why a burn might escape, including the conditions that will increase the likelihood of a burn escape. The trigger to implement a contingency plan for an escape will usually specify a time to control the escape or its size. It may also be appropriate to describe weather or fuel conditions that will trigger a proactive response (such as increased monitoring) while there is still fire activity within a burn.

There is no need to repeat standard approaches to managing a bushfire in the contingency plan. It should describe circumstances and actions that are specific to the burn, such as contacting the managers of a facility or piece of infrastructure. Where an event will trigger a standard bushfire response, the text 'Manage as a bushfire' is appropriate to include in the actions.

Some things to note when writing a contingency plan:

- The main residual risks to manage are an escape from the burn and the burn being active on a day of high fire danger.
- The triggers to act should be specific, such as a threshold area, distance, location, time or weather.
- There is no need to repeat SOPs or standard approaches to managing a bushfire in the actions, just state "Manage as a bushfire".
- The actions should include anything that is specific to the burn's context, such as contacting the manager of an item of infrastructure or closing a campsite.
- One of the most important elements of a contingency plan are the contact details of stakeholders that may need to be notified. These should be comprehensive and correct.
- A map may be included to help identify triggers or important assets. This should be uploaded to Part D and a note made in the contingency plan to guide the reader to it.

Examples of contingency plans are provided at Appendix 10

5.3.2.10. Organisational structure

While a record of the organisational structure for each day of burning should be maintained, it is not mandatory to use the template provided in the PFP to do this. Whether the template is used or an entry made in the fire diary, it must be scanned and uploaded to the Organisational structure page of the PFP.

5.3.2.11. Briefing checklist

The briefing checklist template is populated with key risk information during the development of the PFP. Entries from the day of burn actions page may be transferred to the briefing template by checking the appropriate box in the PBS. The remaining information is completed by the Operations Officer on the day of the burn and used as a guide when briefing burn crews. The completed briefing checklist must be uploaded to part D of the PFP.

The information required in a briefing will change as a burn progresses and circumstances change. The briefing checklist in the PFP will not constitute a comprehensive briefing but provides a list of issues for the Operations Officer to consider when briefing crews.

5.3.2.12. Operations Officer day of burn checklist

Items on the day of burn actions list which are designated as being the responsibility of the Operations Officer will be transferred to the day of burn checklist. This checklist must be

completed by the Operations Officer on each day of burning to indicate that each action has been performed, and then uploaded to the PBS.

5.3.2.13. Fire and weather observations

Observations of the prevailing weather conditions and fire behaviour must be made during the progress of a prescribed burn. These may be made on the template form provided in Part B10 or equivalent information may be recorded in a fire diary. In either case, a copy of the records should be uploaded to the Fire and weather observations page of the PFP.

5.3.2.14. Operations map

The operations map provides those conducting the burn with much of the information they require to do so safely, efficiently and effectively. It is used to brief burn crews on risks, access to and around the burn, assets within and outside the planned area, areas to be excluded, lighting strategies and other important facts. It may also be required by burn crews for navigation throughout the operation. The Prescribing Officer must ensure that all necessary information is current and correct and is displayed legibly and accurately on the map. The required update frequency of the Operations map varies depending on the context but, at a minimum, the map must be current and accurate at the commencement of each 'season' of ignition.

Any hard copies of the Operations map that are annotated to show the progress of the burn or issues of interest must be scanned and uploaded to Part D of the PFP.

A template for the operations map is provided in the departments' Specifications for Standard Maps Technical Guide available from the FireHub: https://dpaw.sharepoint.com/sites/fmsb/Pages/Technical-Guides.aspx.

5.3.2.15. Aerial burn map

A separate map is no longer required for aerial burning as the Operations map is used by the Incendiary Operations Supervisor to navigate at the burn. Using the Operations map in aircraft ensures that all staff involved in the burn are referring to same map. The PBS requires that a map be uploaded to section B13 of the PFP for all aerial burns, however, so a second copy of the operations map should be uploaded to satisfy this requirement.

5.3.2.16. Day of burn achievements

The day of burn achievements page of the PFP records information about each ignition that is undertaken. It is important that an entry is recorded on this page every time ignitions are undertaken, even if no area is successfully treated. Four values may be recorded on this page:

Area treated today: An estimate of the area exposed to ignition on a given day. This field is not used in Corporate reporting but should be completed after each day of ignitions.

Area where treatment is complete: The area treated to a standard that negates the need for any further ignitions to be undertaken. This field may be completed once accurate mapping or remote sensing of the treatment area is available. The sum of the area where treatment is complete must not exceed the burn's planned area. A zero-hectare achievement is recorded if the day's burning did not achieve the required result.

Length of edging: An estimate of the length of edging successfully completed. This field is not used in Corporate reporting.

Depth of edging: An estimate of the depth of edging successfully completed. This field is not used in Corporate reporting.

See Reporting day of burn achievements for more information on these terms.

5.3.3. Part C – Burn closure and evaluation

Burn closure requires Part C of the PFP be completed, comprising post-burn assessment, burn closure checklist and closure declaration. All completed burns should be closed before the end of the financial year, preferably as soon as practical following the final ignition on the burn.

5.3.3.1. Post-burn actions

The post-burn actions List is auto-populated with any items identified on the actions list for attention after burning operations are complete. It should be updated as the stipulated actions are completed, by identifying who took the action and the date and time at which it occurred. If appropriate, substantiating evidence may be uploaded to Part D of the PFP.

Actions should only be included on the post-burn list if they can be completed within a reasonable period of the burn's completion. Longer term undertakings, such as monitoring vegetation recovery should not be included here as it will unnecessarily delay closure of the burn.

In the case of burns with longer duration, it may be necessary to complete the Post-burn actions list after each 'season' of ignitions. This decision will be guided by the nature of the actions and whether they are required after each phase of ignition or only at the completion of the burn. For example, a check of walk trails may be required after each ignition, whereas rehabilitation of internal cell boundaries may only be required upon completion of the burn.

5.3.3.2. Burn evaluation

The burn evaluation summary requires the burn outcomes to be assessed against the objectives and success criteria set for the burn. Success criteria are assessed as achieved, partially achieved or not achieved and a justification for that response is recorded. If appropriate, substantiating evidence should be uploaded to Part D of the PFP. Evaluation of burn outcomes is a key step in the continual improvement cycle and the risk management process.

5.3.3.3. Lessons learned

Anything significant that is learnt during the planning or implementation of the burn should be recorded on the lessons learned page of the PFP. This should include any corrective actions that were required or should be considered in the future. Information for this page may be collected during a formal After Action Review, or Post Incident Analysis, or from informal debriefs or conversations. Any identified lesson that has ramifications beyond the affected work centre should be shared with FMSB to allow wider dissemination. The lessons learned from all burns should be reviewed by district and regional fire staff after each season to encourage continual improvement.

5.3.3.4. Burn closure

The burn closure declaration is completed by the DM or DFC. The declaration states that no further work is required on the burn and all conditions of the PFP have been met to the signatory's satisfaction. This includes completion of all items in the post-burn actions list and post-burn checklist. A checklist of items is provided in Section C4.

5.3.4. Part D - Documents

Many documents and records are created during the planning, implementation and review of a prescribed burn. These are filed in Part D of the PFP, using the inbuilt categorisation and dating system. Staff should consider the department's Corporate Policy Statement No. 7: Records Management (DPW, 2016c) and the Records Management Policy Implementation Guidelines

(DPW, 2015c) when determining which records may need to be maintained in Part D of the PFP. A guiding principle is that records are required as evidence of any business activities and decisions.

The archiving function may be used to help keep the documents in Part D organised.

5.3.4.1. Notifications

Part D of the PFP is a register of communication with stakeholders in relation to the burn. This should be maintained throughout the planning and implementation phase and after burn closure if required. If appropriate, substantiating evidence or records of communications may be uploaded to Part D of the PFP.

6. Authorisation of prescribed burning

Each prescribed burn undertaken by DBCA must be approved by the RDO of the relevant region and the SDO. These approvals must be granted on each day of burning operations, prior to ignition commencing. In determining whether to grant permission for ignitions, these DOs shall take account of the factors shown in Table 5: Factors to be considered by the regional and state duty officers before granting permission for ignitions to be undertaken on a prescribed burn. Following the granting of permission for ignitions, the SDO shall email a signed schedule of the permissions they have granted to the Director of OBRM using the form FIRE 268C.

Table 5: Factors to be considered by the regional and state duty officers before granting permission for ignitions to be undertaken on a prescribed burn.

Matter	SDO	RDO
The location of the proposed burn and intended time of ignition.	Y	Y
The completed complexity analysis and risk assessment for that burn, noting in particular: • Potential fire behaviour • Exposure of things of value beyond the burn boundaries • Any measures to mitigate any factors rated as high risk (before mitigation).		Y
The current and forecast weather.	Y	Y
The state of fire activity in the district, region and state.	Y (state)	Y (district & region)
The general availability of contingent resources in the region and state.	Y (state)	Y (region)

The DO or equivalent should monitor the prevailing and forecast conditions to identify opportunities to conduct prescribed burning. A customised 4-day Weather Forecast should be sourced prior ignition on each day. Table 6 describes the process required prior to ignition when a suitable opportunity for burning arises or is expected. This table assumes that district (DDO) and regional (RDO) DOs are in place; in regions without districts, the RDO will assume the responsibilities of both positions. DOs may also be replaced by the manager's nominee.

Table 6: Steps in the process for nominating and approving a prescribed burn for ignition.

Time	Action	Detail
Four working days before first ignition	FMSB to review PFP.	RDO to identify candidate burns a minimum of four working days prior to first ignition to enable FMSB Regional Fire Services an opportunity to review the PFP.

Afternoon before ignition. **By 1600**	DDO to advise RDO of intent to ignite burn.	DDO to advise the RDO of next day's proposed burn programme by 1600.
Afternoon before ignition. **By 16:15 (on teleconference if conducted)**	RDO to advise SDO of intent to ignite burn.	RDO to advise SDO of next day's proposed burn program on the 1615 teleconference.

Morning of ignition. **By 0815**	RDO to submit FIRE268a to FMSB.	RDO to nominate burns appropriate for ignition under the forecast conditions using the FIRE 268a process in the PBS by 0815. This should consider: • burn priority and sequence • resource availability for conducting burns • availability of contingent reserve resources in the region • existing fire activity, and forecast conditions (including a customised 4-day weather forecast) . RDO to identify any burns requiring aerial ignition on a FIRE301 and email to the State Aviation Operations Officer by 0815.
Morning of ignition. **On teleconference**	SDO to confirm burn nomination.	SDO will confirm whether nominated burns are to be approved for ignition on the morning teleconference. In selecting burns for approval, the SDO will consider: • burn priority • resource availability (including State-wide contingent reserve) • existing bushfire and burn activity • forecast conditions including midlevel stability • smoke impacts • other salient factors.
Morning of ignition. **Following teleconference**	SDO to approve burns.	The SDO to approve ignition of nominated burns by approving the 268a within the PBS and acknowledging with the 268b. This will include the stipulation of any special conditions to be observed.
Morning of ignition. **Following teleconference**	FMSB to notify state stakeholders.	SDO Management Support to disseminate the FIRE268c to OBRM and other necessary stakeholders. SDO Management Support to ensure that all burns approved for ignition or active from previous ignitions are identified on the department's public website.

Morning of ignition. **Following teleconference**	RDO to inform DDO of ignition approval.	RDO to provide DDO with approved FIRE268a.
Morning of ignition. **Before ignition**	DDO to complete daily risk monitoring.	DDO to complete FIRE413 – Daily Monitoring Plan for Active Burns and Fires and any other pertinent documentation of risk management. Ensure a current customised 4-day weather forecast has been sourced.
Morning of ignition. **Before ignition**	DDO to give burn OIC permission to light.	Final permission to proceed with ignition should be provided by DDO to the officer in control of burning operations following any required field checks and validation.

6.1. FIRE268

The FIRE268 process must be completed each day that a region has active prescribed burns or fires or intends to undertake ignitions on a prescribed burn. The process is completed within the PBS, using the daily burn program tab. Information on the use of this facility can be found in the Daily Burn Program Technical Guide available from the FireHub: https://dpaw.sharepoint.com/sites/fmsb/Pages/Technical-Guides.aspx.

The 268 process includes the following forms:

FIRE268a – Region provides to SDO to nominate burns for ignition. SDO confirms whether nominated burns are to be approved for ignition on the morning teleconference and approves ignition of nominated burns by acknowledging with the 268b and approving the 268a within the PBS including any special conditions.

FIRE 268b – Region provides SDO with a summary of current active bushfires and prescribed burns.

Active: In relation to a prescribed burn or a bushfire, means:

In rangelands:
- presence of hot spots detected by satellite surveillance over two consecutive days;

In all other areas:
- it is judged that there has been less than 30mm rain (total) in 5 days since the last ignition; or
- in the prior 3 days, running fire has been observed or smoke has been reported within 100m of the burn boundary; or
- in the prior 3 days, running fire has been observed or smoke has been reported within any area of unburnt fuel greater than 5ha that is within 500m of the burn boundary.

Monitoring: In relation to a prescribed burn or a bushfire, means:

In rangelands:
- presence of no hot spots detected by satellite surveillance over two consecutive days.

In all other areas:

- in the prior 2 days, no running fire has been observed within 100m of the burn boundary; or
- in the prior 2 days, no running fire has been observed within any area of unburnt fuel greater than 5ha that is within 500m of the burn boundary.

Inactive: Any burn where the 'active' or 'monitoring' applied but are no longer active. On the first day that a burn or fire is inactive it should be indicated on the 268b as 'inactive'.

Note:

- The burning out of a pocket in a bushfire is not a planned burn and does not require entry in the 268a.
- The figure entered in the column "Area treated / burnt by bushfire yesterday" in the 268b should be area additional to last reported and not the cumulative total area.

6.1.1. Disposal of plant debris and rubbish by burning

The disposal of plant debris or rubbish by burning is not a prescribed burn and does not need to be included on the corporate burn program, have a prescribed fire plan prepared, receive daily ignition approval from the State Duty Officer or be included in the department's corporate reporting. This is provided the activity meets the following criteria:

- The activity is not conducted during the prohibited burning period for the relevant Local Government area.
- The intent of the activity is to dispose of debris, not standing vegetation.
- The activity will primarily dispose of light fuels, such as leaves and small branches or small amounts of heavier debris from construction or repair works.
- The area covered by the debris is no more than 200 square metres.
- The debris is separated from all surrounding available fuels by mineral earth, uncured grass or other non-flammable materials to a distance adequate to prevent fire spread.
- The activity poses no appreciable risk to public safety, departmental reputation or the natural environment.
- Smoke from the activity will not cause a public hazard.
- The activity can be safely concluded within the regular work hours of those involved.
- The activity must be approved by a staff member with a fulsome understanding of the risk management context, such as the District Manager or their delegate, and a diary note must be made to record the approval.

Examples of debris that may be disposed of by burning are: piles of leaves raked from around a campsite or office complex, small quantities of vegetation removed while maintaining a firebreak or track, weeds that have been removed and heaped and timber debris from construction or repair works.

6.2. FIRE413

The DDO completes the form FIRE413 (Daily Risk Monitoring Plan for Active Burns / Fires) to document the risk controls that will be enacted over the course of the 24-hour period in relation to active and monitored burns and fires. The FIRE413 should reflect the relevant contingencies for any active or monitored prescribed burns as described in the PFP contingency plan, as well as any other general risk controls. The FIRE 413 also confirms that the standing orders contained in the Bushfire Preparedness and Response Plan for detection, response and communications are being followed.

The risk monitoring arrangements described on the FIRE413 should be designed to ensure that any changes in fire activity, weather or environmental conditions that could result in undesirable fire activity, are detected in enough time to enable contingency measures to be activated. They may include:

- Giving consideration to the customised 4-day Weather Forecast
- Monitoring forecast or actual weather and assessing any changes.
- Monitoring by tower persons.
- Inclusion in the spotter pilot daily work sheet requiring alpha observation over the burn as part of the daily spotter schedule, or as an additional task to the normal schedule.
- Monitoring satellite hotspot applications for any evidence of fire activity.
- Scheduling ground inspections with notation of priority areas of the boundary to be inspected if required.

The DDO must record on the FIRE413 that monitoring arrangements are implemented as this occurs. The FIRE413 does not need to be provided to the region or FMSB unless requested but should be stored in case of future requirement.

6.3. Declaring a burn escape

Guidance on declaring an escape from a prescribed burn to be a bushfire is provided in the Bushfire Preparedness and Response Manual. It is only when fire breaches the planned boundary and requires additional resources to contain that it can be considered a bushfire and accounted for as such. The bushfire account cannot be billed for any actions related to fire inside a planned burn boundary that resulted from ignitions applied under an approved PFP. This includes investigating or patrolling any re-ignition of a prescribed burn. If a fire is caused by lightning or arson within the planned area of a prescribed burn, it may be declared to be a bushfire and activities paid for from the bushfire account.

Declaring a burn escape may trigger an OBRM audit.

6.4. Exemptions for burning in the prohibited period

The *Bush Fires Act 1954* provides for a period each year during which the lighting of fires is prohibited, except for certain specific purposes. Prohibited Burning Times (PBTs) are declared by the Minister for Emergency Services for areas and the beginning and end date published in the Government Gazette. PBTs may be suspended or varied by DFES for areas, or more generally varied for overall zones and times. Where DFES suspends a PBT and allows burning on an area of land, the owner or occupier of adjacent land may also obtain a permit to burn for fire hazard reduction. An LGA may also vary the PBTs within its area for up to two weeks, however, the variation can be overridden by the Minister for Emergency Services acting on the recommendation of DFES. Local Parks and Wildlife offices must be consulted by the LGA if a variation will affect department-managed lands.

There are provisions in the Bushfires Act that allow Parks and Wildlife to obtain a suspension of a PBT to carry out prescribed burning under specified conditions. Applications for suspension of the PBT must be prepared by the region and lodged with FMSB before October 10th. FMSB collates these applications and provides them to the FES Commissioner (or their delegate) for their approval via DFES Legal and Legislative Services. Suspension will normally only be granted to enable burns that cannot be ignited during the Restricted Burning Time due to their fuel type (such as karri and tingle forest), having already commenced and need to be completed for burn security, or for special purposes such as regeneration burns or fire behaviour studies.

The Parks and Wildlife RM is required to submit applications for suspension of the PBT to FMSB supported by the following information (some of this information may be captured in the endorsement letter from the DFES regional office):

- Reason the suspension is required.
- Period for which the suspension is required (dates).
- Area and identifier of each burn.
- Prohibited burning zone for each burn.
- Map showing the location of the burn in relation to LGA boundaries.
- LGA endorsement
- Local DFES office endorsement.
- A corporately approved PFP (stored in the PBS).
- Description of weather conditions, fuel moistures and precautions to be followed at the time of the burn
- Communication plan which ensures all relevant authorities and interested members of the public are advised of the proposed burn.
- If suspensions are requested to undertake multiple burns, the contingency measures that are in place to ensure adequate resources are available and risk of escape are minimised.

Before submitting the request, the DM or RM must obtain the endorsement of the CEO in the local government in which the burn is to be undertaken and the DFES Regional Superintendent. A copy of the written endorsement must be included in the above application. Once

departmental requirements have been satisfied, FMSB will forward the application to the FES Commissioner. A flow chart illustrating the process for obtaining a suspension of the PBT is shown in Figure 7.

The DDO / RDO must ensure that ignitions undertaken during the PBT comply with those described in the approval from DFES.

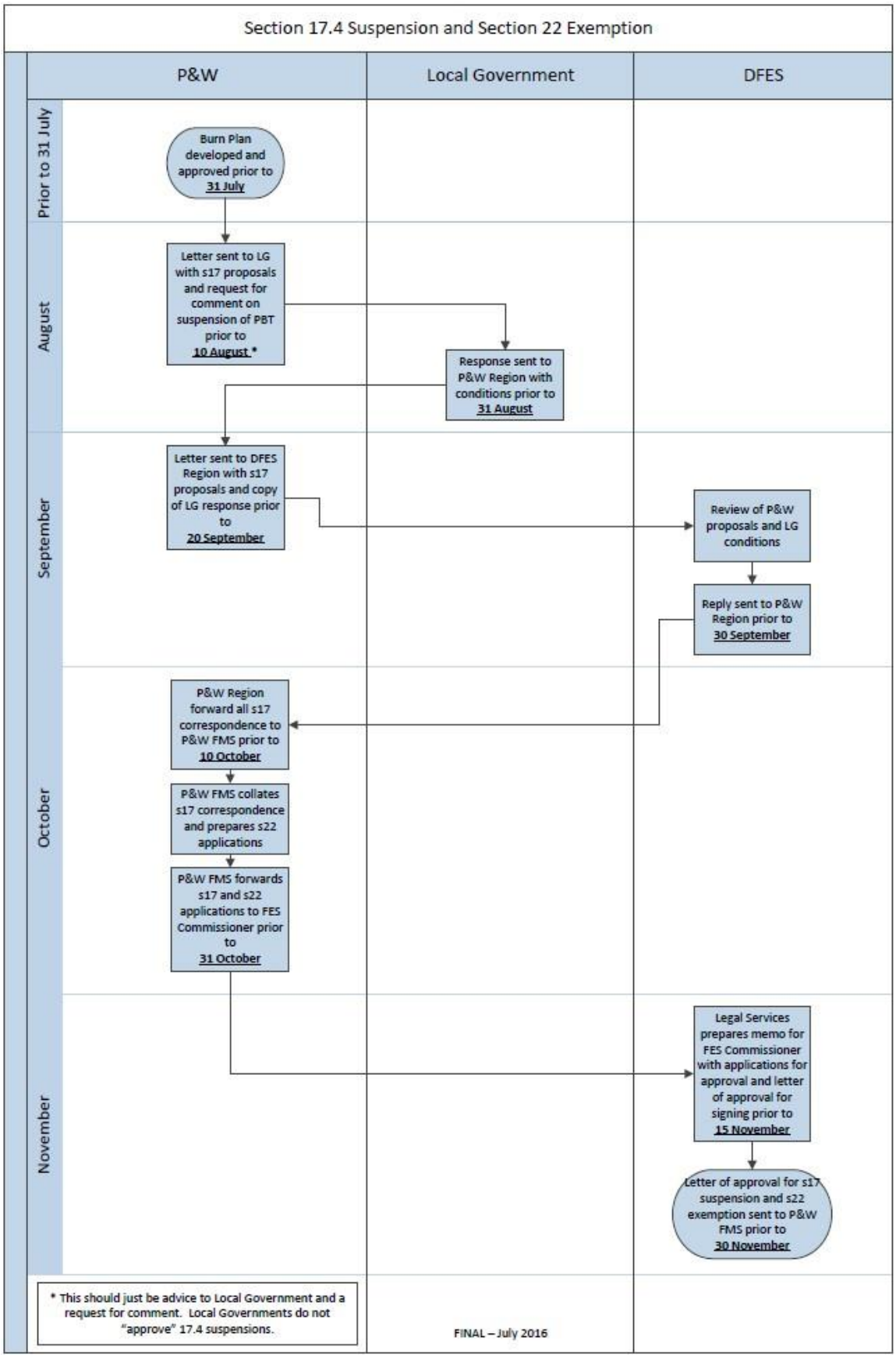


Figure 7: Flow chart showing procedure to obtain a suspension of the prohibited burning time for undertaking a Parks and Wildlife prescribed burn.

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Appendix 1. Example context statements

Statement 1

- BWD_096 is 152 ha on Caves road in the Leeuwin-Naturalist National Park (LLNP). It is located:
    - adjacent to the Commonage subdivision
    - immediately east of Yallingup
    - 5 km south west of Dunsborough
    - 7 km north of Smiths Beach.
- The Commonage comprises many semi-rural 5-10 acre lots with many houses and other assets among partially cleared remnant forest blocks.
- Yallingup, and Dunsborough are major, high profile tourist destinations with high rates of summer visitation. Yallingup has 50% occupancy of holiday homes during the winter months, increasing during summer and holiday periods.
- The treatment area contains a mixture of vegetation types including peppermint woodland, coastal heathland, jarrah marri woodland and *Melaleuca lanceolata* shrubland.
- The burn area is 9 years since last burnt and is carrying more than 8t/ha in parts. Prescribed burning is critical to reduce the fuel load and so the bushfire risk in the area.
- The burn adjoins other areas to the north and west that were last burnt 6 years ago and will provide an anchor to reburn these areas safely and effectively.
- Yallingup is an extremely high bushfire risk settlement, surrounded by coastal heath vegetation. Extensive mechanical fuel reduction has been completed within the LNNP and adjacent to Yallingup to provide defendable space. The community is very well prepared for fire, with an active brigade.
- There is a history of prescribed fire within the LNNP with the last burn being Spring 2007. The treatment area is highly visible as you enter Yallingup and significantly adds to the visual amenity of this section of coastline.
- The Leeuwin-Naturaliste Capes Area Parks and Reserves Management plan notes "the Yallingup asset protection area surrounds the town site and contains cultural and biological values which have been considered. A range of mitigation strategies have been used including prescribed burning and mechanical fuel management".
- Economic impacts or inconvenience may be experienced during the burn by tourism operators (including the department) associated with Ngilgi Cave and Yallingup.
- Several vineyards are located to the east of the burn which may be impacted by smoke. The burn will most likely be undertaken outside of the fruit growing season and a risk managed approach to the ignition plan that considers grapes will be implemented.
- Smoke accumulation is expected on Caves Road to the north and east of the burn area and single lane road closures will be required. Four-wheel drive tracks that make up part of the burn boundary are frequently used. Although track closures will be implemented on the day of the burn, people may still try to access these areas during burning operations.
- A Bridle Trail which passes through the treatment area will be closed for the duration of the burn as there is no safe alternative route to divert users to.

- Indigenous groups have a long connection to country around Yallingup, with a number of artefact, burial and mythological sites recorded nearby. Consultation with the relevant family groups will be required, particularly if additional mechanical fuel management activities are to occur to improve burn security.

- The burn contains occurrences of the Leeuwin ridge ecosystem and *Melaleuca lanceolata* priority ecological communities, *Caledenia excelsa* DRF and habitat for Western ring tail possum.

- There are areas of limestone karst adjacent to the treatment area, however the full extent of the system is not known. Any activities requiring the use of heavy machinery off the existing access network will need to be carefully considered.

- A high level of public and media interest is expected because of the proximity of the burn to towns and major roads.

- Bushfire or escape from a prescribed burn impacting Yallingup will have significant political, economic and legal implications. In the event of an escape consideration needs to be given to suppression difficulties owing to karst, flora, fauna, steep inaccessible terrain and frequent changes to fuels associated with the Commonage rural urban interface.

Statement 2

- Wolfe Creek Crater National Park is a small, remote reserve located 105 km south of Halls Creek. It is one of the few reserves representing the desert ecosystem managed by Parks and Wildlife in the East Kimberley. It is of interest due to a unique geological feature (meteorite crater).

- Visitation is encouraged with a day use site consisting of a carpark, walk trail and toilet block. There is also a small informal campsite that also has a toilet block.

- Access to the area is via the Tanami Track, an unsealed road which is the main transport corridor in the area and runs from Halls Creek to Alice Springs.

- Most of the reserve has burnt in the last two years in landscape scale fires that originated outside of the park. The recreation site and facilities were damaged in these fires. Such fires pose a risk to site visitors.

- Although campfires are prohibited in the reserve, they are often lit by campers and represent an ignition risk for bushfires.

- Recent fencing to prevent cattle grazing has led to a build-up of fuel in the reserve. There is evidence that recent bushfires have burnt more intensely than previous ones and have burnt with greater intensity in the reserve than on surrounding pastoral leases.

- Inappropriate fire regimes that lead to vegetation loss have the potential to cause erosion to the meteorite crater.

- Pastoralists adjoining the reserve have expressed concerns at how Parks and Wildlife have managed fuel loads within reserve since it was fenced. Prescribed burning will address these concerns as well as protecting park infrastructure and visitors. It will also protect biodiversity as fire will be introduced in mild weather conditions prior to grasses fully curing.

- The park will need to be closed for the duration of the burn but this is likely to have little impact with there being very low visitation at the time of year the burn will be conducted.

Statement 3

- This burn is adjacent to the Sawyers Valley and Mundaring town sites and is strategically very valuable to the protection of those localities from bush fire. It is bounded by urban areas to its north and northwest and there are also several private properties surrounded by the burn. The only access to these properties is through the burn area.
- The burn adjoins Great Eastern Highway to the north and Mundaring Weir Road to the west. The Munda Biddi Trail, a local walk trail and a bridle trail run just inside the western boundary of the burn area and there are two picnic sites in this area.
- The eastern and southern boundaries of the burn are minor roads, with recently prescribed burned (2016 and 2017) state forest beyond these. Most of the burn area was last burnt in spring 2011, with the north-western portion last burnt in 2008 and a part of the northern boundary last burnt in 2010.
- The vegetation within the burn area is mostly northern jarrah forest with small areas of sparse shrubland surrounding granite rock outcrops and dense shrubland in a creekline that runs NW-SE through the burn.
- Significant infrastructure/assets within or adjoining the burn area include:
    - Sawyers Valley water tanks, water pipeline and associated infrastructure
    - Mundaring Weir-Sawyers Valley and the Darlington-Northam high voltage power lines and a power substation, along with various distribution lines
    - A locally significant King Jarrah tree
- There are numerous community assets near this burn, including:
    - Mundaring & Sawyers Valley town sites ○ A retirement home (about 600m to the northwest) ○ Sawyers Valley primary school (about 400m to the north) ○ The Mundaring Sporting Club and recreation ground
- Most of the burn is within a disease risk area though most of the tracks within the burn have been mapped as 'high confidence - dieback infestation'.

Appendix 2. Agenda for district burn program planning meeting

_____ Date:

_____ Time:

_____

Venue:

Required Attendees: District Manager, Regional Leader Fire Management, District Fire Coordinator, District service delivery coordinators (Forest and Ecosystem Management, Science and Conservation, Parks and Visitor Services), GIS and PBS operator(s)

Other Attendees: District Fire Operations Officers, District Service Delivery Staff

Chair: District Fire Coordinator

Minutes: _____

- DFC to table district report on the performance of each burn completed against its objectives and success criteria and contribution to targets set in RFMP.
- DFC to provide strategic overview of landscape condition and fuel management requirements to meet targets set in RFMP.
- Service Delivery Coordinators to table recommendations for burns required to fulfil specific management requirements.
- Review of carry-over burns, their objectives and future scheduling.
- Confirm currency of conditional burn areas and check for interaction with proposed burns.
- Confirm draft annual and three-year burn program (where applicable).
- Discussion to populate (as far as is possible) the Context Statement, Risk Register, Key Stakeholders and Contentious Rationale for each burn on the annual burn program.
- DFC to assign a burn priority to each burn on the annual burn program.
- District Manager approval of proposed program.

Appendix 3. Agenda for regional burn program review

_____ Date:

_____ Time:

_____

Venue:

Required Attendees: FMSB Regional Fire Services Coordinator or delegate, Regional Manager, District Managers, Regional Leader Fire Management, District Fire Coordinators, Regional service delivery coordinators, GIS and PBS operator(s)

Other Attendees:

Chair: Regional Leader Fire Management

Minutes: _____

- Regional Leader Fire Management to table the regional report on the performance of last financial year's program against the objectives and success criteria for the region, as specified in the Regional Fuel Management Plan.
- Collate the district burn programs into a regional indicative burn program.
- Review and confirm the Issues List and Risk Context Statement for each burn on the burn program.
- RLFM and Service Delivery Coordinators endorsement of the proposed program.
- RM approval of the proposed program.

Appendix 4. Proforma for minutes of burn program planning meeting

MINUTES OF PRESCRIBED BURN PROGRAM PLANNING MEETING

District / Region:	Date:	Time:
Facilitator:	Minute taker:	
Attendees:		

Review of previous year's fire program:

Summary of RFMP fuel management requirements:

Summary of strategic intent of program

Other issues of note:

Burn ID:	**Burn name:**

Priority:	Rationale:

Contentious:	Rationale:

Burn purpose(s):	

Context information:

Critical stakeholder issues:

Known risks or constraints:

Burn ID:	**Burn name:**

Priority:	Rationale:

Contentious:	Rationale:

Burn purpose(s):	

Context information:

Critical stakeholder issues:

Known risks or constraints:

Appendix 5. Template for annual prescribed burning program submission

2018/19 Indicative annual burn program submission template

Region:_____

Highest priority burns that will be targeted in 2018/19

1. **2**. **3**. **4.** **5.**

Burns that may be particularly contentious, high risk or complex

Burn identifier	**Burn name**	**Issues of interest**

Any other notes of interest for the Director RFMS

2018/19 Burn Program Submission

Burn identifier	**Burn name**	**Area to be treated in 2018/19 (ha)**	**Burn priority**	**Rationale for priority (P1 only)**	**Non-CALM Act tenure included**	**Public value in burn (only complete if non-CALM Act tenure included)**	**Can the burn be completed safely without the inclusion of other tenure? Y/N** **Risk based issues if other tenure not included**

PHS_149	Waroona 2	150 ha	1	Provides strategic protection to Waroona townsite against fire run through long unburnt fuels to northwest.	UCL UMR Private Property etc	Begin addressing an area of long unburnt fuel in a high-risk area	N Inability to undertake prescribed burns safely, no hard edge or separation between tenure types. If fuel not managed, large bushfires emanating from dept. managed land near to town. OR Y

							Separation between tenures exists, will need to be improved as an edge for the burn. There will be continued risk adjacent to dept. managed lands if the fuel in other tenure is not treated - no ability by other tenure manager to treat the risk currently. Has been historically undertaken by the dept.

Endorsement

Regional Manager

Signed

Date:

Appendix 6. Example objectives and success criteria

Example 1

Objectives:

- To protect the towns of A and B from bushfire to the northeast.
- To reduce the risk of damage to the C Pine Plantation from bushfire.
- To protect the D campsite and recreation area from bushfire.
- To contribute to a mosaic of fire regimes within the burn.
- To remove senescent vegetation within quokka habitat.

Success Criteria:

- Available fuel is reduced to less than 4 t/ha over at least 70% of the treatment area.
- Available fuel is reduced to less than 2 t/ha over at least 90% of the area within 100 metres of the D campsite and recreation area.
- Severe crown scorch (i.e. complete defoliation) in dominant and co dominant trees does not exceed 60% of forested area within burn boundary.
- Complete defoliation of 70-90% of shrubs within five metres of E Brook and F swamp.

Example 2

Objectives:

- Maintain a mosaic of fuels aged 0 to 4 years within A Reserve to reduce the potential size and intensity of bushfires and provide habitat diversity.
- Engage native title holders of B in joint fire management operations.

Success criteria:

- No more than 40% of the treatment area burnt.
- An age class distribution across the reserve of: 30-50% 1-2 years, 30-50% 3-4 years, 10-30% greater than 4 years.
- Aerial burning operations are undertaken in partnership with the Aboriginal Corporation.

Example 3

Objectives:

- To create and maintain a fine scale mosaic of diverse seral states and functional habitats in the A Landsystem.
- To protect the animal enclosure fence, and habitat within the acclimatisation compound, from bushfire damage.
- To prevent fires originating within the reserve to cross onto neighbouring properties.
- To protect the homestead and associated infrastructure from damage from bushfire.

Success criteria:

- Each fire management unit to contain a spatial mosaic of at least 3 of the 5 key seral stages (see FMP).
- No unburnt patches greater than 1,000ha in size.
- All spinifex fuels within the acclimatisation compound and within 100 metres of the compound fence less than 7 years old.
- All spinifex fuels within 50 metres of the property boundary less than 10 years old.

Appendix 7. Complexity Analysis

Prescribed burn complexity analysis

FACTOR		LOW	MEDIUM	HIGH
Burn Objectives and Success Criteria	**Complexity of Objectives**	Objectives are limited to easily achieved fuel reduction or ecosystem maintenance. The necessary fire behaviour is easily created, managed, and monitored.	Objectives may include changes in two or more strata of vegetation for ecosystem restoration or maintenance. Objectives are judged to be moderately hard to achieve. Basic monitoring of fire behaviour and weather is needed to determine if prescribed fire objectives are being met.	Objectives include changes in several strata of vegetation for ecosystem restoration or hazardous fuels reduction. Objectives are judged to be hard to achieve and may require specialised monitoring of fire behaviour and weather.
	Criticality of Burn	Other opportunities to meet objectives will be available. Other management activities are not dependent on the completion of the burn. Failure to meet objectives would have few or no adverse impacts on natural resources.	Other opportunities to meet objectives are very limited. Other management activities are dependent on the completion of the burn, but other management options are available. Failure to meet objectives could have short-term adverse impacts on natural resources.	Other opportunities to meet objectives are not available every year or may not be available at all. Other management activities are dependent on the success of this burn and other management options are limited. Failure to meet objectives could have long-term adverse impacts on natural resources.
	Technical Feasibility	Measures to achieve the objectives are easy to complete and there are few or no restrictions on techniques. Limited pre-burn monitoring is needed to determine if the burn is within prescribed parameters.	Measures to achieve the objectives are either 1) easy to complete but there are restrictions on the techniques or 2) moderately difficult to complete and there are few or no restrictions on techniques. Moderately intense fire behaviour is needed to meet the resource objectives. Preburn monitoring is needed to determine when the burn is within prescribed parameters. During-burn monitoring is needed to check if the objectives are being met.	Measures to achieve the objectives are moderately difficult and there are restrictions on the techniques. High intensity fire or a combination of fire intensities are needed to meet resource objectives. Success depends on precise timing and sequence of ignition. Extensive pre-burn monitoring is required to determine when the burn is within prescribed parameters. Post-burn monitoring is required to determine if the burn prescription parameters are met.
Internal Values Requiring Special Treatment	**Presence**	Few or no special internal features are present that require special attention in planning or implementation. There are few on-site values at risk or those identified are generally considered low or minimal value.	Special features may be present within the burn that may need to be addressed in planning, strategies and briefings, and during burn implementation. Some limited areas of high value are located within the burn area.	Special features are present within the burn. Several areas of high value are located within the burn area. Strategies must address details in planning, at pre-burn briefings, and during burn implementation.
	Implementation Problems	Implementation problems will not damage special features or adversely affect on-site resource values.	Implementation problems or failures will result in moderate damage to special features and some reduction or loss of on-site resource values.	Implementation problems or failures will result in substantial damage to, or destruction of special features or on-site resource values.
	Planning and Preparation	No special skills or operating procedures are required. Resource values within the burn are easy to protect.	Protection of special features or on-site resource values requires the development of special ignition or containment plans. Some pre-burn preparation work may be required.	Protection of special features or on-site resource values requires the development of special ignition and containment plans. Special or additional equipment will be needed. Considerable preparation work is needed.
Constraints to Burning	**Access and Scheduling**	No constraints related to access, water sources, firelines, specific tactics, or equipment and aircraft use exist. There are few or no scheduling restrictions.	Some constraints exist on access to parts of the burn area, use of some water sources or the amount of water that can be taken, types of fireline, specific tactics, heavy equipment, or aircraft use. Ignition may be restricted during some portions of the potential burn window to minimise impacts to special events or seasonal activities.	Significant constraints on access to parts of the burn area, use of water sources or the amount of water that can be taken, types of fireline, specific tactics, heavy equipment, or aircraft use. Ignition will be restricted, potentially for long periods, during the potential burn window to minimise impacts to special events and seasonal activities.

	Burning Opportunities	Burn can be implemented whenever it is in prescription. Tactics and burn activities are not limited.	Some burn windows may be unavailable due to the constraints and may cause the burn to be implemented under less than optimal conditions, reducing the ability to meet natural resource objectives. Limitations on the	The constraints result in a very narrow burn window and are likely to cause the burn to be implemented under less than optimal conditions, reducing the ability to meet natural resource objectives. Limitations on the available tactics will increase the risk of unexpected or adverse events.

FACTOR		LOW	MEDIUM	HIGH
			available tactics may increase the risk of unexpected or adverse events.	
	Duration	Constraints do not increase the difficulty of completing the burn.	Constraints moderately increase the difficulty of completing the burn. The length of time to complete the burn and the size of the organisation needed may increase.	Constraints significantly increase the difficulty of completing the burn. The length of time to complete the burn and the size of the organisation will increase and burn feasibility may be in doubt.
Ignition Methods and Procedures	**Sequence and Timing**	Ignition sequence and timing is not critical to meet burn objectives.	Ignition sequence and timing are somewhat critical to meet burn objectives.	Ignition sequence and timing are critical to meet burn objectives.
	Implementation Issues	Ignition methods and procedures do not pose a safety concern to personnel, compromise burn objectives, or increase the likelihood of an unexpected or adverse event.	Ignition methods and procedures must be coordinated to provide for adequate safety, meet burn objectives, and reduce the likelihood of an unexpected or adverse event. Opportunities for remedial actions or corrections are available in the event of problems.	Ignition methods and procedures must be carefully planned and well coordinated to address safety concerns, meet burn objectives, and reduce the likelihood of an unexpected or adverse event. Opportunities for remedial actions or corrections are limited in the event of problems.
	Management Complexity	Simple hand burn, or aerial burn in the rangelands. There is no need for special ignition equipment, techniques, or patterns. Ignition procedures are simple and the ignition team is small. Use of only one type of ignition device is planned. The ignition pattern requires minimal supervision of the lighters to achieve burn objectives and manage safety concerns.	Aerial and/or hand ignition. The need for special ignition equipment, techniques, or patterns has been identified. Ignition procedures are somewhat complex in at least some portions of the burn area and the ignition team may be broken into two or more ignition crews. Use of different types of ignition devices is planned. The ignition pattern requires direct control of the lighters to achieve burn objectives and manage safety concerns.	Aerial and hand burn. The need for special ignition equipment, or different techniques, or multiple ignition patterns has been identified. Ignition procedures are complex and may be broken into multiple teams with more than one division within the management structure. Simultaneous ignitions will occur. Use of several different ignition devices (aerial and ground) is planned. Ignition patterns and techniques to manipulate fire behaviour are used and require tight control of the lighters to achieve burn objectives and manage safety concerns.
Fire Behaviour	**Specialist Resources**	Standard precautions are adequate to ensure personnel safety. The number or size of spot fires and hop-overs would not require additional suppression resources. Fire behaviour is such that suppression forces can control most or all spot fires and hop-overs using direct attack tactics. No on-site operational fire behaviour assessments or calculations are needed.	Some special provisions for safety are needed to protect personnel. At least one containment opportunity exists. Fire behaviour is such that suppression resources may need to use indirect tactics to control some spot fires and hopovers. Occasional on-site fire behaviour assessments or calculations are needed and can be performed as a collateral duty.	Fire behaviour may create unique safety problems or the need for special escape routes or other safety measures. Limited containment opportunities exist. Fire behaviour is such that additional suppression resources would be required along with indirect attack tactics. Systematic fire behaviour assessments and calculations are needed by a fire behaviour specialist.
Safety	**Hazards**	Safety issues are easily identifiable and mitigated. Potential hazards are typical and easily addressed in briefings. There is little or no potential for adverse impacts to public health and safety. Fatigue and exposure to safety risks are limited.	Significant safety issues have been identified. Detailed briefings are needed to raise safety consciousness of all involved. Most safety hazards have been mitigated, but some remain that require special caution. There could be adverse impacts to public health and safety. Fatigue and prolonged exposure to safety risks may occur.	Complex safety issues exist. Special safety briefings are required. Several safety hazards remain that require special cautions. Potential adverse impacts to public health and safety require special mitigation. Fatigue and prolonged exposure to safety risks require special mitigation or consideration.

	Accident Potential	Minimal potential for serious accidents/injuries to firefighters or the public.	Moderate potential for serious accidents/injuries to firefighters or the public.	High potential for serious and/or multiple accidents and injuries to firefighters or the public.
	Mitigation Measures	Safety concerns can be easily mitigated through attention to LACES. A standard safety briefing as part of the burn briefing should be sufficient to cover the safety concerns. Special mitigation activities to protect public health and safety are not needed.	Most safety concerns can be easily mitigated but some remain that require extra caution during burn operations. Special emphasis is needed for some elements of LACES. The burn briefing will include a safety briefing with special issues or areas of emphasis. Limited mitigation measures to protect public health and safety are needed.	Extra caution is needed during burn mitigation to manage several safety concerns. Careful attention to all elements of LACES is required. The implementation team may include a qualified Safety Officer. A special safety briefing with special issues or areas of emphasis is needed as part of the burn briefing. Special mitigation measures are required to protect public health and safety.

FACTOR		**LOW**	**MEDIUM**	**HIGH**
Public Information	**Media Interest**	The prescribed fire is in an isolated or remote area and/or is small in size. There has been little or no public or political controversy related to the burn planning and little or no news media interest.	The prescribed fire is visible to some portions of the public and/or is moderate in size. There has been some public or political concern about the burn or the burn program. There is some media interest in the burn.	The prescribed fire is highly visible to the public. Public or political interest is high for either the burn or the burn program causing high management complexity in the dayto-day preparation necessary to carry out the burn. Media are interested in the burn and may desire to be present onsite during some phases of the burn.
	Management Complexity	Requires no special fire information function. No special notifications of the public are needed.	Special public information strategies or public meetings may be warranted. May require special media releases or field trips. Some specific members of the public or political entities may need to be notified directly.	Requires significant dedicated time from PICA, DM and/or DO. Requires a Public Information Officer within the burn structure. Public information stations and door-to-door contacts may be warranted. Extensive pre-burn public meetings may be needed. Media is expected to be on site during implementation. Multiple direct notifications are needed prior to burn implementation.
Smoke Management	**Duration and Visibility**	Smoke concerns are generally few or easily mitigated. The burn will produce smoke for only a short period of time or is barely visible to the public.	Smoke concerns are moderate and some concerns require special mitigation. The burn will produce smoke visible to the public over several days.	Smoke concerns are high and require special and sometimes difficult mitigation. Smoke will be readily visible to the public and will last several days to weeks.
	Effects	Smoke exposure or amounts are not expected to cause health or safety concerns to the public. Members of the public have expressed few or no concerns about smoke during burn planning. No impacts or minor impacts to isolated residences, remote roads or other facilities are expected. Firefighter exposure to smoke is expected to be minimal and not cause health and safety concerns.	Smoke exposures or amounts may cause some health or safety concerns over a short period of time. Members of the public have expressed some concerns about smoke during burn planning. Vistas, roads, and some residences may experience short-term decreases in visibility. A few health-related complaints may occur. Minor smoke intrusions may occur into smoke sensitive areas but are below levels that trigger regulatory concern. Burn personnel may be exposed to dense smoke for short periods of time.	Smoke exposures are likely to cause some health and safety concerns that will require special mitigation. Large segments of the public were concerned about smoke during burn planning. Vistas, roads, and residences may experience longer-term decreases in visibility or significant decreases in visibility over the short-term. Major smoke intrusions may occur into smoke sensitive areas, such as metropolitan airsheds, hospitals, and or major airports, at levels that trigger regulatory concern. Burn personnel may be exposed to dense smoke for prolonged periods of time.

	Planning, Monitoring and Mitigation	No special operational procedures are required. Limitations on wind direction, season, etc. may be present in the PFP.	Some considerations are needed in the PFP. Burn window/opportunities are reduced by the required weather/dispersion conditions. Normal coordination with air quality officials is required. Some mitigation measures or additional smoke modelling may be needed to address potential concerns with smoke impacts. Specific smoke monitoring may be required to determine smoke plume heights and directions. Rotating burn personnel out of dense smoke is necessary but easy to accomplish.	Special considerations are needed in the PFP for near burn values. Special smoke management techniques will be used. Burn window/opportunities are limited by the required weather/dispersion conditions. Special coordination with air quality officials is required. Accelerated mop up may be planned to reduce smoke impacts. Some mitigation measures or additional smoke modelling are required to address potential concerns with smoke impacts. Specific smoke monitoring is required to determine smoke plume heights and directions. Rotating burn personnel out of dense smoke is necessary but may be difficult to achieve.
Burn Logistics	**Duration and Supplies**	The burn requires minimal logistical support with no specific logistic function assigned. Supplies needed to conduct the burn are readily available and no special transportation or storage needs have been identified. No special equipment or communications needs have been identified. Burn duration is 2 days or less.	The burn requires some logistical support in some areas, such as communications, ground transportation, or personnel support. Most supplies are readily available. Some special transportation or storage needs may exist for equipment. Special equipment or communications equipment requiring more intensive logistical support may be needed. Burn duration requires at least one re-supply trip to support remotely stationed personnel.	The burn requires extensive logistical support in several areas. Certain key supplies are limited in availability or require special transportation and storage. Several pieces of equipment or a communications network is needed that require intensive logistical support. Burn duration requires several re-supply trips to support remotely stationed personnel.
	Effect on Burn Security	Problems related to logistics will not increase the risk of escape, affect the completion of the burn or create a safety concern.	Problems or failures related to logistical support will increase the risk of escape or affect the completion of the burn or create a safety concern.	Problems or failures related to logistical support will substantially increase the risk of escape, affect the completion of the burn and/or cause safety concerns.
FACTOR		**LOW**	**MEDIUM**	**HIGH**
	Resourcing	No special logistical support issues. Supervisors normally handle their own support needs. Supplies and personnel are readily available and easy to obtain.	Burn implementation requires a small logistical support operation. Logistical support may be combined with other functions. Securing, transporting, or storing some supplies or equipment may require additional effort. Obtaining some personnel may require additional contacts and advanced scheduling. Additional support may be needed for out of District personnel.	Burn implementation requires a large logistical support operation. Logistical support will operate as a separate function. Securing, transporting, or storing several supplies and equipment requires additional effort. Obtaining the necessary personnel requires at least some additional contacts and does require careful scheduling. Additional support will be needed for out of District personnel.
Interagency Coordination	**Partnerships**	The burn does not involve another land management/fire agency or jurisdiction. No concerns or issues associated with interagency partners have been identified.	The burn involves another land management/fire agency or jurisdiction but burn completion is not dependent on coordinated implementation. One or more interagency partners have interest or concerns with the burn that are easily addressed and satisfied.	The burn involves other land management/fire agencies or jurisdictions and burn completion is dependent on coordinated implementation. Several interagency partners have interest or concerns with the burn that may require additional attention.
	Criticality	Burn can be completed as planned.	Interagency coordination issues may delay burn implementation or require minor modifications to the PFP.	Interagency coordination issues may cause significant delays in burn implementation, may cause burn cancellation in a burn window, or may require major modifications to the burn.
	Planning and Management	No interagency issues. No special authorisation required as burn is on DEC-managed lands. No unusual communication or coordination issues. Interagency resources are readily available with few or no restrictions on their use.	Burn requires the use of one or two standard agreements e.g. with MRWA or Water Corporation. Implementation may require special attention to certain interagency details, such as communications and standards for operations. Interagency resources are generally available but some restrictions on their use may be present.	Burn requires use of several special agreements i.e. burning private property, etc. Implementation requires special attention to certain interagency details, such as communications and standards for operations. Interagency resources are limited in availability and several restrictions on their use may be present.

Organisational Structure and Management	**Scale and Span of Control**	A small number of qualified people are required to implement the prescribed fire. A single person may fill several positions. A single level of supervision is all that is needed (i.e. Operations Officer plus Crews).	May require staffing of most of the prescribed fire positions with qualified and experienced personnel. A single person may fill more than one position. Two levels of supervision are needed (i.e. Operations Officer, Sector Commanders plus Crews).	Requires staffing of all primary prescribed fire positions by qualified and very experienced persons. Multiple divisions, sectors, or crews may be necessary to maintain an acceptable span of control. Three levels of supervision may be needed (i.e. Operations Officer, Division Commanders, Sector Commanders plus Crews) or multiple teams are needed to cover multiple shifts or a long-duration burn. Other staff and technical specialists may be needed.
	Potential Problems	Problems related to coordination, management supervision or communication is expected to be minimal.	Problems related to coordination, management supervision or communication may cause failure to meet some objectives, increase the chance of the fire escaping, or compromise safety standards.	Problems related to coordination, management, supervision or communication will cause failure to meet objectives, have a high probability of an escaped fire, or violate safety standards.
	Skills and Availability of Resources	All team members are available within the local District and are familiar with local factors affecting burn implementation. Several qualified personnel are available. No special supervision required.	At least one primary team member will need to come from outside of the District and may not be familiar with local factors. The numbers of qualified personnel available in the District are limited. Special skills or supervision required for one function.	Numerous and varied resources, multiple ignition methods, and/or a large team of specialised positions are needed. The burn has difficult assess, complicated logistics, potentially conflicting objectives, unusual fuel complexes, and is proximate to smoke sensitive areas or rural urban interface, and/or large scale/long duration. The Operations Officer and/or two or more primary team members will need to be acquired from outside the District and may not be familiar with local factors. Certain skills and qualified personnel are not available in the District. Special skills or supervision is required for more than one function.

Consequences

	SEVERITY OF CONSEQUENCES					
CONTEXT OF CONSEQUENCES	**1**	**2**	**3**	**4**	**5**	**6**
Political	Burn is not contentious. No political interest or concerns from an escape.		Burn is locally contentious. Considerable political interest and concerns from an escape. Some industry and community groups are monitoring. May affect normal P&W business at all levels		Burn is highly contentious. Strong political interest and serious concerns from an escape. Industry and community groups and media would demand inquiry. Loss of confidence or support for P&W burning.	

Economic	Few external economic values. Assets identified are considered of low value or vulnerability. No structures would be involved. Any damage can be quickly repaired. No or minimal inconvenience to essential services, public thoroughfares or economic activities.	Limited areas of high economic value located near the burn area. One critical protection area has been identified. Other agency or private lands might be involved with moderate impacts on assets. No residences involved, but other structures might be affected. Damage to assets would take some time to repair. Some disruption to essential services, public thoroughfares or economic activities.	Several areas of high economic value near the burn. Multiple critical protection areas identified. Nondepartment managed lands involved with large impacts on assets. Numerous residences may be involved. Industrial and commercial losses. Damage to assets would take a prolonged time to repair. Significant and widespread disruption to essential services, public thoroughfares and economic activities.
Social	No community concerns. Minimal impact to the public or users. The burn is planned to take place during periods of low visitor use. No restrictions on visitor use during burn implementation. No social disruption.	Some community concerns. The burn is expected to take place during periods of moderate visitor use. Visitor use may be restricted during burn implementation for a short period of time. There would be moderate impacts on the public and users of the area. Some social events could be affected. Some organised local community interest.	Major community concern in the event of hop-overs, spot fires and escapes. Significant impacts on the public with lives threatened. Burn will take place during periods of high visitor use. Visitor use will be restricted during burn implementation for an extended period. Social events will be disrupted. Well organised interest from peak community representative bodies.
Technical	Burn is straightforward, accommodated by standard procedures, and can be implemented by personnel with basic competence and few resources.	Burn is moderately complex, with higher levels of resourcing, experience and management required. Technical complexity introduces uncertainties and opportunities for loss of control and failure.	Burn is very complex, requiring significant resourcing and very high levels of experience in implementation and management. Technical complexity provides numerous opportunities for loss of control and failure.
Legal	None or minimal legal issues or litigation.	Some legal issues and litigation due to impacts on non-DEC lands and assets, as well as economic disruption. Claims for losses and damage of moderate value, as well as nuisance and negligence.	Numerous legal issues and protracted litigation. Several large claims for loss and damage to private property or other high value assets, resource damage on other agency lands, or economic disruption.
Environmental	Fire behaviour within the burn is consistent with prescription and meets burn objectives. Fire behaviour causes little or no damage to off-site environmental and natural resource values. The vegetation potentially affected generally has rapid recovery rates.	Fire behaviour within the burn exceeds prescription with undesirable environmental outcomes. Fire behaviour could result in moderate damage to vegetation, habitat, or associated natural and environmental assets in the spread zone. Burns conducted at the upper end of the preferred SDI range could lose habitat trees and logs. The vegetation potentially affected generally has moderate recovery rates.	Fire behaviour within the burn is significantly outside prescription with unacceptable and highly challenged outcomes. Fire behaviour could result in severe damage to vegetation, critical habitat, critical watersheds, or associated natural and environmental assets in the spread zone. Burns conducted above the preferred SDI range could cause significant damage and habitat loss. The vegetation potentially affected generally has slow recovery rates. Restoration work or salvage of natural resources could be required.

Likelihood of Consequences

LIKELIHOOD OF CONSEQUENCES	RARE	UNLIKELY	POSSIBLE	LIKELY	ALMOST CERTAIN

Fuels, Topography and Fire Behaviour	The probability of ignition outside the burn is low, but with some hop-overs, each comprising small areas that are readily detected, accessed, and controlled by resources present at the burn. No dangerous fuel concentrations near critical holding points. Low adjacent fuels or limited availability e.g. green paddocks. Fuels in the spread zone on the downwind side of the burn under hot dry wind conditions typical of the season of burning are low. Terrain is mostly flat or the slope and aspect are uniform leading to a relatively unvarying fire. Winds, microclimate and other fire conditions are relatively uniform. Ignition procedures do not create intense fire behaviour. Fire behaviour is highly predictable. Fire behaviour in the spread zone would be less than the fire behaviour within the burn.	The probability of ignition in fuels outside the burn boundary is moderate. Limited potential to cross burn perimeter and exceed the capability of resources present. Some fuel concentrations exist near critical holding points. Some heavy fuels may be present but are mostly well inside the burn. Fuels in the spread zone on the downwind side of the burn under hot dry wind conditions typical of the season of burning are moderate. More than one fuel model may be present on significant portions of the burn area. Burns conducted at the upper end of the preferred SDI range will require additional mop up and patrol. Variable terrain features may significantly affect fire behaviour and present moderate ignition and control problems. Local winds and burning conditions may vary enough to cause notable shifts in fire behaviour. Spotting is expected to be short-range. Potential for multiple hopovers or spot fires with moderate ROS which can be held by skilled and prompt suppression. Fire behaviour in the spread zone would be about the same as that experienced within the burn.	Probability of ignition in fuels outside the burn is high. Potential for multiple hop-overs or spot fires that exceed the capability of the resources present to detect and suppress. Concentrations of dangerous fuels exist near critical holding points that could hamper control. Fuels in the spread zone on the downwind side of the burn under hot dry wind conditions typical of the season of burning are high. Major variations in the fuel complex require the use of several fuel models to account for the fire behaviour. Burns conducted above the upper end of the preferred SDI range will require critical attention to mop up and extended patrol. Terrain encompasses a wide range in slope steepness, abrupt changes in slope, and several directional aspects that lead to widely variable and unpredictable local winds and microclimate differences. High intensity fire behaviour may be expected with high rates of spread, torching, possible crown fire runs, and possible long-range spotting. The resulting variations in fire behaviour may present major control challenges. Expected fireline intensities in the primary fuel type are known to challenge standard firelines or to produce abundant spotting. Fire behaviour in the spread zone would be significantly higher than that experienced within the burn.
Boundaries	The burn has robust edging on all sides, with uncomplicated boundaries, well prepared mineral earth breaks, or a significant moisture differential in adjoining fuels or fire scars for open edge burns.	The burn has variable edges, with convoluted boundaries, marginally prepared or narrow mineral earth breaks, or a diminishing moisture differential for open edge burns.	The burn has variable to poor edges, with very convoluted boundaries, marginally prepared or narrow mineral earth breaks, or a limited and diminishing moisture differential for open edge burns.
Duration	There is no residual fire expected beyond the day of burn.	Residual burning may last up to three days, with a moderate potential to cause escapes.	Residual burning may last for several days to several weeks with potential to flare up and escape the burn.
Resources and Local Knowledge	All key implementation personnel from local District.	Some key resources from outside local District.	Most key resources from outside local District.
Off-site Protection	Protection of the off-site values requires no special management, equipment or skills.	Protection of the off-site values requires some special management, a moderate skill level and good team coordination, particularly at the critical holding points.	Protection of the off-site values requires special management, a high skill level and a high level of team coordination, particularly at the critical holding points.
Suppression	Suppression operations, if required, would normally be supervised at the Crew Leader level. The burn and spread zone is easily accessible to the suppression resources identified in the PFP and IPRP. Weather conditions as identified in the PFP are normal for the area and season.	Suppression activities require supervision at the Sector Commander level. Several types of resources would be involved in the suppression operation. Areas of the burn and spread zone are not easily accessible to the suppression resources.	Suppression activities require supervision at or above the Division Commander level. Several areas of the burn and spread zone are not easily accessible or some areas are inaccessible to the suppression resources. Several types of suppression resources would be required.

Appendix 9. Guide to Soil Dryness Index and Burn Outcomes

SPRING	Forest fuel type				
SDI	**Jarrah regrowth**	**Jarrah mature**	**Karri mature**	**Karri regrowth unthinned**	**Karri regrowth thinned**
0-250	May be suitable for edging	May be suitable for edging			
251-600					
601-1000		Southern jarrah types	Karri 3&6 Karri 4&5	Karri 3&6 Karri 4&5	
1001-1500			Karri 4&5 Karri 1&2	Karri 4&5 Karri 1&2	
1500+			May be required for final ignition in active or monitored burns	May be required for final ignition in active or monitored burns	

AUTUMN	Forest fuel type				
SDI	**Jarrah regrowth**	**Jarrah mature**	**Karri mature**	**Karri regrowth unthinned**	**Karri regrowth thinned**
Fall by 200+ from peak	Acceptable in stands managed primarily for nature conservation				
Fall by 400+ from peak					
Fall by 500+ from peak					Possible but not recommended

[a] SDI expressed in units of 0.1 mm of rainfall [b] Applies to post-1967 even-aged

regrowth stands thinned within the previous 5 years

Success of prescribed burning can be judged according to the achievement of objectives which can relate to fuel consumption, habitat management silviculture, and other land management activities.

Success rating scale:

Ignition likely to be patchy with <50% of area burnt, and incomplete fuel consumption. Further ignition may be required to achieve objectives. Low difficulty of containment, with hop-overs and other control problems unlikely. Minimal mop-up.
Good ignition, with 65-75% area burnt and good fuel consumption. Crown scorch within limits prescribed for the stand. Low to moderate difficulty of containment, with a possibility of some trees alight and small hopovers that can be rapidly suppressed. Standard cost and effort required for mop-up and black out.
More than 90% of the area likely to be burnt out, with a high level of fuel consumption and crown scorch, particularly in fuels older than 10 years. Moderate to high difficulty of containment, with a possibility of many trees alight and multiple hopovers that divert resources from the main ignition. High cost and effort required for mop-up and blackout.

Appendix 10. Example contingency plans

Example 1:

Event	**Trigger**	**Action**	**Notifications**[9]
Burn escape threatens AAA subdivision.	Hopover on southside winds not contained by onsite resources within 30 minutes or before reaching 2 ha in size.	Manage as a bushfire.	Joe Bloggs, CBFCO Shire of BBB, ph. ### #### Jodie Smith, CCC BFB CFO, ph. ### ####

[9] Names should be included where applicable and phone numbers provided for all contacts.

Burn escape threatens DDD school.	Hopover on northside winds not contained by onsite resources within 30 minutes or before reaching 2 ha in size.	Evacuate school Manage as a bushfire	As above, plus Mike Jones, DDD School administrator, ph. ### ####
Forecast conditions increase risk of burn escape	Burn is active on a day when the forecast FDI >80	DO to consider additional spotter flights. DO to consider deploying personnel to maintain a patrol through period of elevated FDI. DO to consider proactive positioning of suppression resources on burn boundary to facilitate a rapid bushfire response.	N/A

Example 2:

Event	**Trigger**	**Action**	**Notifications**
Burn escapes threatens surrounding facilities and properties	Escape not contained within 30 minutes	Activate emergency evacuate procedure for AAA campsite. Manage as a bushfire	Ranger station, ph ### ####

	Escape not contained within 1 hour	Notify Shire of BBB Notify neighbouring leaseholders	Helen Black, CBFCO Shire of BBB, ph. ### #### Steve Brown, Lessee CCC Station, ph. ### #### Stacey Green, Lessee DDD Station, ph. ### ####
	Escape approaches to within 3 hours burning time of rail line.	Notify EEE mining company Consider deploying resources for asset protection (see Rail infrastructure map in Part D).	Jo Trainor, Emergency Coordinator, EEE Mining, ph. ### ####
Forecast conditions increase risk of burn escape	Burn is active when forecast winds are >35 km/h	DO to consider tracking unburnt pockets within 500 metres of burn boundary.	N/A

Example 3

Event	Trigger	Action	Notifications
Burn escapes into environmentally sensitive area.	Hopover reported in exclusion area marked at AB12 on Operations Map.	No vehicles or machines to be used within exclusion area. Handtool attack with water support from existing track only.	N/A

	Hopover not contained within 15 minutes	DO to despatch Nature Conservation advisor to assist Operations Officer with managing response to hopover. Establish hygiene station and protocols at appropriate location.	Mary Parker, District Nature Conservation Coordinator, ph. ### ####
	Hopover not contained within range of water support from existing track	If safe to do so, light around base of outcrop at AB1234 on upwind side with aim of removing fuels before arrival of headfire. Only attempt if time allows this to be done safely without risking a junction zone within 50 metres of outcrop. DO to consider requesting water bombers if available.	State Air Desk, ph ### ####

Appendix 11. Principles of burn program development

Principles of burn program development

The following are some general principles that should be considered when developing a burn program.

- Some area management plans specify requirements for fire management or prescribed burning.
- Several management issues must be considered in relation to the sequencing of burns in the broader landscape. These issues include:
    - reducing the total risk being carried across Parks and Wildlife-managed estate
    - the resources required to complete any individual burn
    - the duration of commitment to an individual burn
    - the cumulative cost of the burn program
    - complexity, burning opportunities and 'achievability' of individual burns.
- The sequence of burning in the forest regions will ideally progress from the SE to the NW. This provides optimal burn security during the most unpredictable pattern of wind changes (NW to SW).
- Larger burns have a greater likelihood of internal heterogeneity in fuel, topography and moisture conditions which gives rise to heterogeneity in fuel availability and fire behaviour. Biodiversity is often better supported by the resultant diversity in fire regime, than by more homogenous burn outcomes.

Bushfire risk management
The rationale and targets for fuel management to address the risk posed by bushfire to the community are described in the department's Bushfire Risk Management Framework. The targets in the framework are translated to locally meaningful measures in each region's RFMP.

Biodiversity management
While individual biota elements will vary in their response to fire, a basic tenet of fire management is that diversity in fire regime (intensities, frequencies, seasons and scales of fire) will facilitate the conservation of biodiversity. A mosaic of fire regimes creates a large interface between patches of different fire-induced vegetation structure, and so, a diverse range of habitat opportunities for taxa. A fire mosaic maintained at multiple scales will help maximise ecosystem resilience. More information on fire management to facilitate biodiversity management can be found in various Fire Management Information Notes which are available on the Fire Hub.

<u>Landscape scale</u>
There are different ways to view landscape scale biodiversity. Bioregions are sequences of landforms, supporting characteristic ecosystems, repeated in a similar form across a wide area. In the south-west, Landscape Management Units are based on amalgamations of vegetation complexes. In other regions of the State, IBRA subregions or land systems are defined by a combination of geology, soils, landform, climate and vegetation. Each unit will have ecological fire requirements that the prescribed burning program should seek to support.

Landscape-scale fire management is not achievable in fragmented landscapes where isolated remnants must be treated as islands. In these environments, planning is typically targeted at the management unit and species and community scales.

Management unit scale

The management units within a landscape may be individual reserves, forest blocks or other discrete cells. They are an area into which prescribed fire will be introduced to contribute to achieving the strategic objectives for fire management in the area.

The desired outcome of fire management for biodiversity conservation is usually a fine-grained mosaic of fire occurrence and timing within a management unit. The size and configuration of the management unit will determine whether it is feasible to establish a coarse mosaic of cells burnt at different times within the unit, or whether moisture and vegetation differentials must be used to create a mosaic within a single prescribed burn. In either case, the fire regime established within a management unit should be based on the requirements of the most fire-prone portions of the landscape. This will tend to protect the less fire-prone (most fire sensitive) areas.

Species and community scale

Within any prescribed burn, there are likely to be taxa, communities and ecosystems that have specific fire regime requirements. These often occur within niche habitats that need to be considered when planning a prescribed burn. Rare and threatened flora and fauna warrant additional attention and may have legislative requirements with respect to fire management (refer to the relevant recovery plans). When considering the fire regime requirements of native taxa, communities, and ecosystems, the response of weeds and their effect on biodiversity should also be considered.

The strategies used to provide the ecological fire requirements of sensitive habitats may be applied at different scales. Where an area requires fire exclusion, it is often necessary to introduce fire to the surrounding landscape under conditions where the target areas will not burn or in a manner that will isolate them from subsequent landscape-scale bushfire events. At a tactical scale, lighting strategies may be used of localised ignition of vegetation adjacent to fire vulnerable areas under conditions that will result in lower intensity fire, carry the fire away from the asset and take advantage of overnight extinguishment.

Ecological fire requirements do not relate solely to fire exclusion. Even fire-sensitive habitats may require periodic burning to regenerate senescing vegetation or suppress species that are becoming abnormally dominant. Furthermore, fire regimes that feature long periods of fire exclusion followed by large, intense bushfires risk homogenising habitats, leading to possible local extinction and longterm damage to ecosystems.

Species and habitats that are considered to have specific fire regime requirements should be identified spatially and described so that they can be considered during burn program planning and PFP development. Fire Management Information Notes have been prepared for many such species and habitats and are published on the FMSB intranet page.

Silvicultural management

Silvicultural burns are undertaken to achieve silvicultural objectives including site preparation, regeneration establishment, regeneration release and stand protection. A reduced fuel load may be a side-effect of silvicultural burning, rather than being the primary objective. Consultation between burn and harvest planners should occur to facilitate burn implementation, burn security and, where possible, incorporate silvicultural burns to broader burning objectives. The relatively long horizon used in harvest planning means that burn and harvest planners may need to plan as far as ten years ahead to identify potential conflicts.

In areas managed for timber production, fuel reduction should be achieved without causing damage to retained trees. Damage may be caused by high fire intensity or scorch and will result in reduced wood quality. Larger trees can usually withstand greater fire intensity than smaller ones as they have thicker bark, which provides more insulation from the heat, and greater separation between a ground fire and the crown.

Tree size and stocking level (the number of trees per hectare) will both influence fire behaviour. Areas with fewer trees per hectare (lower stocking) will have less wind impedance[10] than those with higher stocking, resulting in a faster rate of fire spread and greater flame length. In harvested areas, tree crowns and logs will increase the fuel load, extending the residence time of the fire and the potential fire intensity. These areas will also have lower wind impedance which, combined with the additional fuels, will result in more intense fire behaviour and a greater probability that prescribed fire may damage trees.

Silvicultural burns in jarrah

Silvicultural burns in jarrah should be of mild intensity, except if the objective is to stimulate seedfall (post-harvest burns in shelterwood) or the development of regeneration (post-harvest burns in gap areas). In those cases, a moderate intensity burn is appropriate. Prescribed burns in shelterwood areas will ideally occur when seed crops have reached maturity. The FPC can provide seed forecast information to assist in burn scheduling.

Further information on silvicultural burns in jarrah is available in the Jarrah Silvicultural Burning Manual (DEC, 2011) which can be found on the Forest and Ecosystem Management extranet.

Silvicultural burns in karri

There are two types of silvicultural burns in karri: stand establishment and stand protection. Stand establishment burns are usually 'heaps burns' where harvest debris is heaped and burnt to facilitate planting. High intensity prescribed burning of 'seed trees' is also a recognised method of regeneration establishment in karri. This approach has not been used recently due to operational changes including the retention of marri and mature understorey and habitat elements. Stand protection burns should reduce the fuel load without damaging retained trees.

Further information on silvicultural burns in karri is available in the Karri Silvicultural Burning Manual (DPW, 2016c) available on the Forest and Ecosystem Management extranet.

Silvicultural burns in wandoo

Silvicultural burning in wandoo may be undertaken to facilitate either stand establishment or stand protection. In either case, wandoo should be burnt under mild conditions to protect retained trees. Regeneration burns should be undertaken in autumn (ideally early autumn) and harvest debris should be heaped away from retained trees. Burning in early autumn will stimulate seed fall while the burning of heaped debris will produce an ash bed to aid germination.

Silvicultural burns in pine plantations

Silvicultural burns in pine plantations are undertaken for either stand protection or site preparation. Stand protection involves burning beneath standing pine trees to reduce the fuel load of accumulated needle beds or 'red tops' created by thinning. This is usually done in winter to ensure mild fire behaviour that will not damage standing trees. Stand protection burning is usually only undertaken in maritime pine (*Pinus pinaster*) stands, as this species has a higher tolerance to fire than *P. radiata*.

[10] The effect that vegetation has on reducing the speed of the wind, usually expressed as a ratio of the of the speed of wind at 10m above the canopy compared to the speed of wind at 1.5m above ground level.

Site preparation requires the burning of debris after a stand has been clear felled. This is generally done in autumn and aims for a relatively high intensity burn to dispose of as much harvesting residue as possible.

Conditional Burn Areas

CBAs are areas that require specific fire regimes, to support some management or research activity. These are usually areas where fire is to be excluded, though other regimes may also be set (such as prescribing a fire regime to manage for specific species within an area). CBAs are identified in land management plans, species and community recovery plans, Science and Conservation databases and other planning instruments.

The presence of CBAs must be considered when developing the burn program. There are eight types of CBAs (Table 7) with different requirements for fire exclusion or specific fire regimes. These requirements are described below.

Table 7: Datasets depicting Conditional Burn Areas and the custodian of each.

Dataset Name	Custodian
Fire Exclusion Reference Area (FERA)	Director of Science & Conservation
Scientific Study Area (SSA)	Director of Science & Conservation
No Planned Burn – Management Plan (NPB)	Regional Manager
Fire Exclusion – Harvesting (FEHa)	Manager of Forest Management Branch
Fire Exclusion – Habitat (FEHb)	Regional Manager
Fire Exclusion – Silvicultural (FES)	Manager of Forest Management Branch
Fire Exclusion – Cultural (FEC)	Regional Manager
Specified Management Regimes (SMR)	Regional Manager

A spatial dataset showing the locations of these layers is available as part of the Corporate Data Delivery Program (CDDP). It is the responsibility of the custodian (or their delegate) to monitor and review the currency and comprehensiveness of the datasets. After being appropriately endorsed, any required changes should be submitted to FMSB for inclusion in the CDDP.

Fire Exclusion Reference Area (FERA)

A FERA is an area from which fire has been deliberately excluded to provide a reference site for scientific studies of the effects of fire on the environment. Areas selected should be broadly representative of the landscape within which they are located. FERA are designated in perpetuity.

A representative network of long unburnt areas (generally areas that are greater than 10 to 20 years since last fire) is desirable. These areas are fixed locations that are available for research activities, as points of reference for studies of fire-driven ecosystem change, and for education and training. Recently burnt areas (generally less than 10 years since last fire) are also important for

these purposes. Unlike long unburnt areas, however, they are usually plentiful and can be readily created if needed.

Once established, FERA will continue to be managed as fire exclusion areas, even if affected by bushfire. If a FERA is burnt by bushfire, an additional long unburnt area may be nominated to augment the FERA if such an area is available, meets the nomination criteria and is necessary to ongoing research.

Suppression objective: Minimise area burnt.

Fire Management Objective: Protect from bushfire and do not introduce prescribed fire at any time.

Criteria for Selecting FERA:

FERA should be:

1. Representative of the landscape, including representation of the major ecosystems / habitats that typify the landscape.
2. Of sufficient size to allow for monitoring or research on most plants, fungi, invertebrates, small terrestrial vertebrates and sedentary bird species. An area of 50-500 ha is usually appropriate but larger areas are sometimes required, such as for the study of fauna with large home ranges. Large FERAs should be avoided where possible as they create opportunities for large, intense bushfires.
3. Spatially separated by at least 5-10 km to minimise the opportunity for adjacent FERAs to contribute to a high intensity bushfire run.
4. Located such that they do not present an unacceptable bushfire risk to communities, properties and other assets.
5. Able to be protected from fire, within reason. They should be bounded by existing roads or tracks, to allow a rapid effective fire suppression response.
6. Located where the surrounding landscape is available for fuel reduction burning to provide protection from bushfire.
7. Located in areas that are not available for future timber harvesting or mining activities, unless they are part of a study of such activities.
8. Located in areas that have a minimal history of disturbance.

Scientific Study Area (SSA)

A SSA is an area in which a scientific study is being undertaken that requires the area to remain unburnt, or be subjected to a specific fire regime, for the period of that study. SSAs remain in place only for the period of that study. SSAs are listed in the Science and Conservation database of scientific study sites. An annual update of this dataset will be provided by Science and Conservation for distribution via the CDDP.

Suppression Objective: Minimise area burnt, unless otherwise specified by the study.

Fire Management Objective: Protect from bushfire and exclude prescribed fire, except as required by the study, for the duration of the study.

No Planned Burn – Management Plan (NPB)

NPBs are areas specifically identified in a gazetted or draft area management plan as an area not to be burnt by prescribed fire. NPBs remain in place for the life of the management plan. The RM

(or their delegate) should monitor any changes to the management plans in their region and advise FMSB if the NPB dataset requires amendment.

Suppression Objective: Minimise area burnt

Fire Management Objective: Protect from bushfire and do not introduce prescribed fire for the life of the management plan.

Fire Exclusion – Harvesting (FEHa)

FEHa are areas where timber harvesting is planned and a period of fire exclusion is required to allow pre-harvesting operations to be completed (such as dieback, lignotuber and flora surveys). These operations cannot be effectively undertaken in areas that are recently burnt.

Forest Management Branch (FMB) produces an indicative three-year harvesting plan each January. Harvesting plans with a longer planning horizon may also be available. These plans are used to identify areas that will be subject to timber harvesting operations and cannot be burnt. FMSB obtains the harvesting plan from FMB and provides it to each region for inclusion in the burn program planning process. FEHa areas remain in place for the life of the relevant harvesting plan or until harvesting and associated post-harvesting works are completed, as confirmed by FMB.

Suppression Objective: Minimise area burnt.

Fire Management Objective: Protect from bushfire and do not introduce prescribed fire for the life of the harvest plan.

Fire Exclusion – Habitat (FEHb)

FEHb are areas identified as having special value as fauna or flora habitat due to the vegetation structure, species composition, seral stage, unique habitat attributes or location. These areas are nominated and spatially described at each burn program planning meeting by the Regional Leader Nature Conservation. The reason for the fire exclusion and an end date for the period of exclusion should also be stipulated. Final approval of a FEHb rests with the RM and FMSB should be advised of any changes to allow them to be incorporated into the corporate dataset.

Suppression Objective: Minimise area burnt

Fire Management Objective: Protect from bushfire and do not introduce prescribed fire.

Criteria for nominating FEHb:

FEHb may be created to:

1. avoid disturbance and impact on re-introduced fauna during the early stages of a reintroduction program.
2. maintain a diverse mosaic of seral states in the landscape, including long unburnt vegetation, to support taxa with specific habitat requirements.
3. protect habitats containing fire regime sensitive taxa such as rock outcrops, wetlands with organic substrates (peat swamps) and riparian zones.

Fire Exclusion – Silvicultural (FES)

FES contain areas that are regenerating from timber harvesting, mining or other site rehabilitation or stabilisation operations and require the exclusion of fire until the regeneration has matured to a ‘fire tolerant’ status. In general, these are areas of jarrah regeneration less than 10 years old, karri regeneration less than 15 years old and mine-site rehabilitation less than 10 years old. Very young

regeneration may have very low fuel loads and be burnt without causing undue damage to the stand if well managed.

FMB will maintain a dataset that identifies these areas and provide it to FMSB for distribution to regions.

Suppression Objective: Minimise area burnt.

Fire Management Objective: Protect from bushfire and do not introduce prescribed fire.

Fire Exclusion – Cultural (FEC)

An area identified as having indigenous or non-indigenous cultural assets or value that are sensitive to fire. Examples might be timber structures such as bridges, homesteads or shield trees. Most of these assets will be recorded on the Cultural Assets Register maintained by Parks and Visitor Services. Most of these assets are localised and do not require the exclusion of large areas from burning. In most instances, these assets are identified and dealt with during the preparation of PFPs for individual burns rather than during the burn program planning process.

Suppression Objective: Protect sensitive asset.

Fire Management Objective: Protect sensitive asset from bushfire and prescribed burns.

Specified Management Regimes (SMR)

SMR are areas identified in a gazetted or draft management plan that have been assigned a fire regime for a specified purpose. The RM (or their delegate) should monitor any changes to the management plans in their region and advise FMSB if the SMR dataset requires amendment. SMRs remain in place while the area management plan is in effect. They incur management constraints that require the ongoing application of managerial judgement. These constraints require review annually by the DFCs in consultation with local PVS Leaders and fire ecologists.

Suppression Objective: Minimise area burnt

Fire Management Objective: As per the management plan, or:

1. *Flexible management area* - aim to achieve ecological diversity within each of the major land units to provide a wide range of vegetation succession stages and fauna habitats. Fire regime may involve variable rotation burns, ranging from 5-20 years.
2. *Vegetation management regime* - aim to achieve ecological diversity within each of the major land units. Most of these regimes will entail longer burns of about 10-20 years.
3. *Habitat management regimes* - a carefully considered and managed prescribed burning program initiated to promote the maintenance of rare fauna or flora habitat in areas of importance for wildlife conservation. Changes may be made to the burning regimes in these areas because of new research information or management circumstances.
4. *Biological survey areas* - selected areas of major vegetation types that should not be subject to prescribed burning until a biological survey has been conducted in them.

Threatened Flora and Fauna (TFF)

TFF are species of high conservation value that need to be appropriately considered during prescribed burn planning. Some TFF require specific fire regimes and the characteristics and requirements of listed species must be considered when planning prescribed burns that may affect them. The RM (or their delegate) should maintain a register of TFF fire requirements or constraints in consultation with DFCs, Science and Conservation staff and fire ecologists. The custodian of the

Threatened and Priority Flora and Fauna (TFF) dataset is the Director of Science and Conservation.

Suppression Objective: Protect fire-sensitive species

Fire Management Objective: Manage fire sensitively according to species constraints:

1. *Seasonality* – identify species with sensitivity to fire in specific seasons and plan to burn outside critical periods.
2. *Frequency* – identify minimum inter-fire periods for sensitive species and plan to exclude fire for that period.
3. *Intensity* – identify opportunity for avoidance of sensitive habitats, or creation of refugial areas/mosaics, through management of fire intensity.

Fire Management Information Notes available on the FMSB website provide additional information to departmental staff in the decision-making process when undertaking fire management for some specific species and ecosystems.

Obtaining a Permit to Take

Ministerial permission (delegated to the Director of Science and Conservation) is required if declared rare (threatened) flora will be affected by burn preparation or implementation. This is known as a 'permit to take' rare flora. The permit application should describe any measures that will be taken to avoid rare flora and any characteristics of the rare flora that will provide resilience to the proposed burn. It should also include details of any recent monitoring information, how post-fire monitoring will occur and justification if monitoring is not proposed.

Managing weeds

Prescribed burns can increase the opportunities for weed species or increase their impact on native vegetation. Prescribed burns can also provide an opportunity to control some weed species. The landscape scale effect of fire regimes on weed species and locations where weed control may be required should be considered by Science and Conservation staff during the burn program planning process. They should also incorporate information on their management to relevant PFPs, such as preferences for ignition timing or fire intensity or post-burn treatment.

Managing introduced predators

Prescribed fire has the potential to increase predation pressure on native fauna by reducing vegetation cover. To address this, fox and cat control may be required after prescribed burns in areas of threatened fauna habitat. This requirement should be identified by Science and Conservation staff during the burn planning process. Any predator control that is required should be implemented by Science and Conservation staff in the district or region. Ecosystem Health Branch can assist with planning these activities.