Frankston City Council Natural Reserves

Bushfire Management Strategy

Report commissioned by Frankston City Council

Terramatrix

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Frankston City Council Natural Reserves – Bushfire Management Strategy
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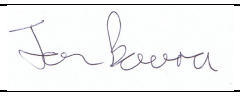
Approval for release	Jon Boura	

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Bushfire Strategy – Executive summary

Frankston City Council (FCC) commissioned Terramatrix to develop a Bushfire Management Strategy (the Strategy) for 52 of their bushland reserves. The Strategy is set out with the following sections.

Section 1: Introduction - provides the basis for the Strategy and details the reserves being considered in the assessment.

Section 2: Reserve management priorities – outlines the schema used to classify the reserves into levels of management priority and the treatment options for each priority level.

Section 3: Context – sets the bushfire management objectives for the Strategy, outlines the legislative and policy basis for bushfire management in FCC, and describes the physical environment of the study area from a bushfire perspective.

Section 4: Methodology – details the approach taken in developing the Strategy, in particular it documents and explains the analysis criteria on which the bushfire management classification schema is based.

Section 5: Treatment toolbox – explores the considerations for treatment selection and provides a description, including the implications and limitations of each treatment.

Section 6: Monitoring and review

Section 7: Communication and consultation

Section 8: Reserve analysis – provides the output of the high level assessment for each of the 52 reserves.

Section 9: References

Appendices

The main output of the Strategy is the classification of the 52 reserves based on an assessment of bushfire risk. This classification gives a management priority for FCC to administer fire management works in their natural reserves based on a consistent assessment process. To achieve this, a system to classify the reserves into Low, Moderate or

High based on bushfire risk and management priority was developed. A summary of the how each reserve was classified is shown in Table 0.1 (note: reserves located close to each other were amalgamated for the purpose of the assessment).

Table 0.1 – Summary table of reserve management priority

Low Priority	
Armstrong Link	Jubilee Park
Banjo Rise Reserve	Little Whistlestop
Baxter Trail	Lloyd Park
Carrum Woods Nature Reserve	Mulgra Reserve
Clifton Reserve	Oakwood Reserve
Cotoneaster Reserve	Outlook Reserve
Culcairn Reserve	Overport Park
Derinya Reserve	Pobblebonk Wetland Reserve
Franciscan Reserve	Raphael Reserve
Gumnut Reserve	Shaxton Circle
Illawong Reserve	Wilton Reserve
Pines Flora and Fauna Reserve (FraCC)	
Moderate priority	
18R Marcus Cres	Frankston Foreshore
Austin Reserve	Rinella Reserve
Baxter Park	Robinsons Park
Belvedere Bushland Reserve	Seaford Foreshore
Casuarina Reserve	Tangenong Creek Reserve
Escarpment Reserve	Wallace Reserve
Flame Robin Reserve	
High Priority	
Bunarong Park	Seaford Wetlands
Kananook Creek Reserve	Stevens/Lexton/Little Boggy Creek
Monique/ Southgateway/ Park Valley Bushland Reserve	Studio Park
North Reserve/Stringybark	Sweetwater Creek Lower
Paratea Flora and Fauna Reserve	Sweetwater Creek Upper

In addition to the prioritisation of the reserves and associated management actions, the Strategy makes a number of recommendations to implement the Strategy across FCC. A summary of the recommendations are listed in the table below, with a more detailed list of actions and timelines given in Appendix 1.

Table 0.2 – Recommendations for bushfire management of natural reserves in FCC

Bushfire management recommendations
General
Seek endorsement of the Strategy from the Municipal Fire Management Planning Committee and Frankston Council.
Establish a bushfire management working group to coordinate and oversee implementation of the Strategy.
Undertake a periodic review (every 5-10 years) of the Strategy and all reserve management plans.
Establish a monitoring program to inform the evaluation of treatments.
Engage a qualified community engagement officer to develop and implement bushfire safety programs where required.
Develop a community engagement strategy for delivering bushfire safety information, in particular for residents living close to bushland reserves.
Provide residents with bushfire information tailored for FCC, such as local planting guides for bushfire protection.
Undertake a stocktake of future development to assess the scale and impact of the BPA and BMO across the municipality.
Build relationships with other organisations with similar bushfire management responsibilities (such as other councils) to share information, establish best practice and work towards developing consistent approaches.
Reserve specific
Develop brief fire management statements for each reserve classified as Low or Medium priority detailing the treatment mix and standard of works to be maintained.
Develop fire management plans for each reserve classified as High priority.
Maintain annual works plans and records of work undertaken for each reserve.
Establish good record keeping protocols for all reserves, to ensure any events or changes in management regime are documented, and the rationale can be traced.

Section 1 – Introduction

1.1 The task

Terramatrix were commissioned by Frankston City Council (FCC) to develop a Bushfire Management Strategy (the Strategy) for their bushland reserves. The Strategy aims to develop a consistent approach to the management of bushfire in FCC reserves to meet public safety, environmental care, community and organisational expectations.

The Strategy sets a management priority of Low, Moderate or High for 52 of the natural reserves managed by FCC. Each priority level has a consistent set of minimum management actions, commensurate to the priority level. The reserves considered by the Strategy are listed in Table 1.1 and shown in Map 1.1.

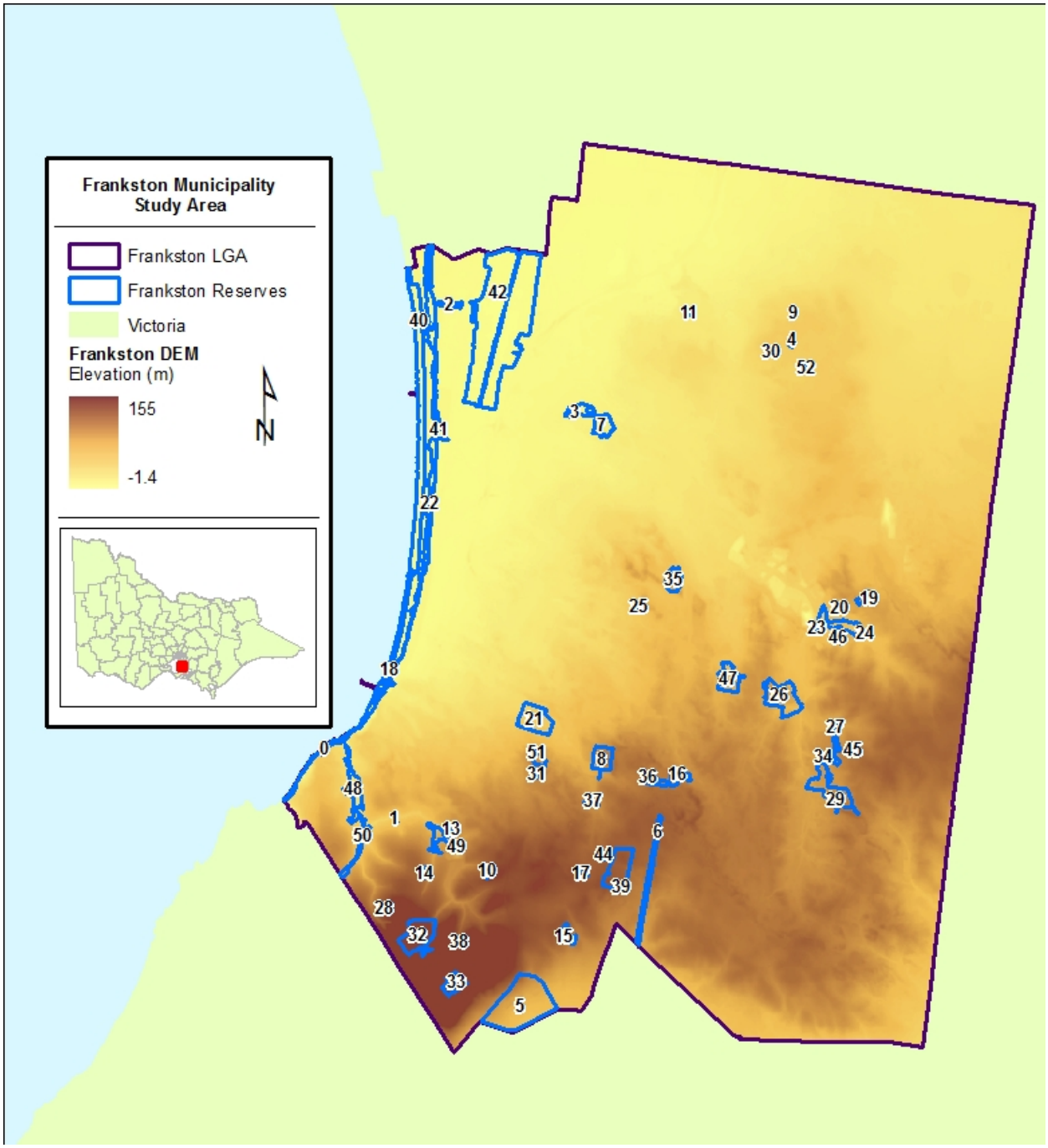
Table 1.1 - Frankston City Council natural reserves

No.	Reserve name	Melways reference	Address
1	18R Marcus Crescent	100 A5	Marcus Crescent, Frankston South
2	Armstrong Link	97 E11	Railway Parade, Seaford
3	Austin Reserve	99 K4	Austin Road, Seaford
4	Banjo Rise Reserve	100 K1	Banjo Boulevard, Carrum Downs
5	Baxter Park	106 H4	Moorooduc Road, Frankston South
6	Baxter Trail	103 D9	McLelland Drive, Langwarrin
7	Belvedere Bushland Reserve	100 A4	Ti-Tree Crescent, Seaford
8	Bunarong Park	103 B6	Wattle Tree Lane, Frankston
9	Carrum Woods Nature Reserve	98 K12	Carrum Woods Drive, Carrum Downs
10	Casuarina Reserve	102 F11	Heritage Avenue, Frankston South
11	Clifton Reserve	98 E12	Clifton Grove, Carrum Downs
12	Cotoneaster Reserve	132 A12	Cotoneaster way, Langwarrin
13	Culcairn Reserve	102 E9	Culcairn Drive, Frankston South
14	Derinya Reserve	102 C9	Derinya Reserve, Frankston South
15	Escarpment Reserve	106 J1	Escarpment Drive, Frankston South
16	Flame Robin Reserve	103 D7	McClelland Drive, Langwarrin
17	Franciscan Reserve	102 K10	Franciscan Avenue, Frankston

No.	Reserve name	Melways reference	Address
18	Frankston Foreshore Reserve	102 B3	Nepean Highway, Frankston
19	Gumnut Reserve	132 B12	Potts Road, Langwarrin
20	Illawong Reserve	132 A12	Cotoneaster way, Langwarrin
21	Jubilee Park	102 H4	Hillcrest Road, Frankston
22	Kananook Creek Reserve	99 E4	Nepean Highway, Seaford
23	Lexton Reserve	132 A12	Lexton Drive, Langwarrin
24	Little Boggy Creek Reserve	136 B1	Granite Drive, Langwarrin
25	Little Whistlestop	100 C12	Dalpura Circuit, Frankston
26	Lloyd Park	103 H3	Cranbourne/Frankston Road, Langwarrin
27	Monique Bushland Reserve	136 B6	Monique Drive, Langwarrin
28	Mulgra Reserve	102 B12	Mulgra Street, Frankston South
29	North Reserve/Stringybark	136 A8	North Rd, Langwarrin
30	Oakwood Reserve	100 J2	Oakwood Drive, Carrum Downs
31	Outlook Reserve	102 J6	Outlook Road, Frankston
32	Overport Park	102 C12	Overport Road, Frankston South
33	Paratea Flora and Fauna Reserve	106 E2	Rosedale Grove, Frankston South
34	Park Valley Reserve	136 A6	Park Valley Crescent, Langwarrin
35	Pines Flora and Fauna Reserve	100 D10	McLelland Drive, Langwarrin
36	Pobblebonk Wetland Reserve	103 C7	Willow Road, Frankston
37	Raphael Reserve	103 A8	Franciscan Avenue, Frankston
38	Rinella Reserve	106 E1	Rinella Court, Frankston
39	Robinsons Park	103 B9	Robinsons Road, Frankston
40	Seaford Foreshore	99 D9	Nepean Highway, Seaford
41	Seaford Reserve	99 E5	Seaford Road, Seaford
42	Seaford Wetlands	99 G2	Austin Road, Seaford
43	Serenity Reserve	136 B6	Monique Drive, Langwarrin
44	Shaxton Circle	103 A10	Shaxton Circle, Frankston
45	Southgateway Reserve	136 A5	Southgateway, Langwarrin
46	Stevens Reserve	136 A1	Huntly Court, Langwarrin
47	Studio Park	103 G3	Poplar Grove, Langwarrin
48	Sweetwater Creek Lower	102 A6	Fenton Crescent, Frankston South
49	Sweetwater Creek Upper	102 D9	Caladenia Circuit, Frankston South
50	Tangenong Creek Reserve	100 A9	Baden Powell Drive, Frankston South
51	Wallace Reserve	102 J6	Wallace Avenue, Frankston
52	Wilton Reserve	99 K12	Ashleigh Avenue, Frankston North

The purpose of the Strategy is to provide a consistent approach to fire management in reserves across the municipality. It should act as a resource to inform and assist FCC in making high quality decisions about fire management in natural reserves. The information provided in the Strategy is intended to help FCC make decisions about reserve management, from a bushfire safety perspective. It should be recognised that there may be considerations, other than bushfire, to take into account when making reserve management decisions. The Strategy does not constitute a fire management plan for each of the reserves, nor is it a works plan. These documents need to be developed separately, but should be underpinned and guided by the assessment and information in this Strategy.

Map 1.1 - Location of Frankston City Council natural reserves



1.2 Project objectives

The objective of the Strategy is to use a consistent risk based methodology to develop a best practice approach to fire management in bushland reserves. This is achieved by conducting a high level assessment of the risk to the community from a bushfire within each bushland reserve managed by FCC. Based on this high level assessment, each reserve is then assigned a management priority level of Low, Moderate or High. Each management priority level then has a suite of appropriate treatments or treatment options commensurate to the risk.

1.3 Bushfire management objectives

FCC have defined a set of fire management objectives in the *Frankston Municipal Fire Management Plan* (FMFMPC) (FMFMPC, 2012). For consistency, the relevant objectives have been adopted verbatim for the Bushfire Management Strategy. The objectives are to:

- Protect life and property without unnecessary impact on biodiversity values;
- Collectively identify and treat fire risks;
- Increase the capacity of communities within Frankston to prevent occurrences of fire; and
- Monitor, review and evaluate all activities across this fire plan.

1.4 Project scope

The Strategy considers risks from a bushfire within a FCC managed reserve to the local community and considers the possible impacts on people, buildings, infrastructure and environmental values. The Strategy considers locally ignited bushfires that start within a reserve; landscape scale bushfire that may burn into the reserve; and the potential for bushfires to burn from the reserve into the wider landscape.

Bushfire events are to be considered occurring under a forest fire danger index (FFDI) of 100. This FFDI is consistent with the fire weather assumptions used for assessing building construction levels for dwellings in Victoria's designated Bushfire Prone Areas (BPAs).

1.5 Project stakeholders

Consultation with FFC and other key stakeholders was identified as critical to ensuring the Strategy reflected the needs and objectives of council and addressed any ongoing issues around fire management. A communication plan was developed early in the process, to ensure input from all relevant stakeholders. The plan is shown in Appendix 2.

The Strategy was developed in close collaboration with FCC, in particular representatives from the Compliance and Safety unit and the Reserves and Parks team. A number of consultation meetings were also held with the Planning and Building department.

Stakeholders outside FCC consulted on the Strategy include other agencies or government departments involved in land management (Department of Environment and Primary Industries (DEPI), Parks Victoria, and Melbourne Water); fire management (Country Fire Authority (CFA), the Frankston Municipal and Southern Metropolitan Regional Fire Management Planning Committees (FMFMPC, SMRFMPC), which includes representatives from Victoria Police and VicRoads); and planning (Department of Planning and Community Development (DPCD)).

Terramatrix recommend FCC have the Strategy endorsed by the Frankston Municipal Fire Management Planning Committee prior to being officially adopted..

Other stakeholders who, although not involved in the Strategy may be impacted by it, include service providers (electricity and gas); adjacent and nearby landholders; reserve users; sporting groups; reserve friend's groups (or other interest groups); and the wider Frankston community. Due to constraints of resourcing and timelines, these stakeholder groups were not involved in the development of the Strategy. It is recommended, however, that FCC consider involving them in reserve fire management, in particular when undertaking the development of individual reserve management plans.

Section 2 – Management Priorities

2.1 *Reserve management priorities*

The following provides a summary of the criteria by which reserves were classified; the reserves in each class are listed; and a summary is provided of the minimum treatment actions required to mitigate the assessed risk. More detail on the methodology is in Section 3, on treatment selection in Section 5 and the analysis for each reserve is in Section 8.

2.1.1 Low Management Priority

Reserves classified as having a Low management priority are those that that fit the following criteria:

- Vegetation that can be classified as 'low threat' according to the criteria set out in *AS-3959*: *Construction of buildings in bushfire prone areas* (Standards Australia, 2009).
- Vegetation patches less than 4ha
- Vegetation in the reserve isolated by at least 150m
- No adjacent homes/assets
- Linear reserves of less than 50m in width

To be classified as Low, the reserve doesn't need to me*et all* of the listed criteria. Instead the the criteria act as a guide to assist the filtering out of those reserves that possess inherently low bushfire risk or where the works currently in place are considered adequate.

A large proportion of the assessed reserves fit into the Low category, in total 23. They are listed in table 2.1 below.

Table 2.1 - Reserves of Low management priority

Armstong Link	Jubilee Park
Banjo Rise Reserve	Little Whistlestop
Baxter Trail	Lloyd Park
Carrum Woods Nature Reserve	Mulgra Reserve
Clifton Reserve	Oakwood Reserve
Cotoneaster Reserve	Outlook Reserve
Culcairn Reserve	Overport Park
Derinya Reserve	Pobblebonk Wetland Reserve
Franciscan Reserve	Raphael Reserve
Gumnut Reserve	Shaxton Circle
Illawong Reserve	Wilton Reserve
Pines Flora and Fauna Reserve (FraCC)	

Reserves that fit into the Low category are, by nature, already managed to meet bushfire management objectives. Thus the minimum recommended treatment is to continue with the level of works currently being undertaken. Any current fire management works should be maintained, weed management conducted where needed and generic community education provided. 'Generic' community education for the Low priority reserves can be regarded as 'general awareness', such as pre-fire season information that is available through avenues such as the council's website or community based newspapers such as the 'Frankston Leader'. To ensure good record keeping, it is also suggested a generic bushfire management statement for this subset of reserves is developed. Recommended treatments are:

- Maintain current works;
- Weed management;
- Ongoing community education; and
- Develop a generic bushfire management statement for the reserves.

2.1.2 Moderate management priority

Reserves classified as having a Moderate management priority are those that that fit the following criteria:

- Reserve size between 4ha and 7ha
- Exposure of 1 – 10 homes
- Reserve orientation conducive for fire run under severe conditions (i.e. has a NW – SE orientation).
- Slopes less than 5°
- Run lengths less than 700m
- Significant asset exposure

Again, the criteria act as a guide to assist filtering into the Moderate category, rather than providing a definitive set of characteristics. Reserves in the Moderate category are those that could support a reasonable sized fire under severe fire weather conditions, but the extent of potential fire run is not considered adequate to generate a high intensity fire, and is certainly unlikely to reach quasi steady state.

Reserves categorised as being of a 'Moderate' management priority are listed in table 2.2.

Table 2.2 - Reserves of Moderate management priority

18R Marcus Cres	Frankston Foreshore
Austin Reserve	Rinella Reserve
Baxter Park	Robinsons Park
Belvedere Bushland Reserve	Seaford Foreshore
Casuarina Reserve	Tangenong Creek Reserve
Escarpment Reserve	Wallace Reserve
Flame Robin Reserve	

A generic set of treatments has been developed for the Moderate category reserves. These treatments are considered to provide a balance of preserving the biodiversity values of the reserve without compromising the protection provided to people, houses and other assets. To remain as a Moderate priority reserve, it is critical that current works are maintained, including community engagement initiatives. 'Generic' community education for the Moderate priority reserves is the same as for Low priority reserves, and aim to maintain a

general bushfire awareness using programs such as pre-fire season information that is available through avenues such as the council's website or community based newspapers such as the 'Frankston Leader'. In addition, the installation of a six metre asset protection zone (APZ) where houses are located close to the reserve will reduce the likelihood of flame or radiant heat exposure to the house. In addition, the APZ may facilitate fire vehicle access, and allow access by management vehicles to undertake a variety of tasks. To ensure good record keeping, it is suggested that a generic bushfire management statement for this subset of reserves is developed.

Recommended treatments are:

- Maintain current works;
- Ongoing community education;
- Weed management;
- Asset Protection Zone (APZ) to 6 metres (which might facilitate emergency vehicle access), where appropriate (see Section 5.3.1); and
- Develop a 'moderate threat fire management statement' that covers all reserves in this category.

It is recognised, that in some situations, the installation of additional APZs may not be feasible (due to site constraints such as slope or high value vegetation), nor preferable (due to issues such as cost, maintenance and community angst). In this situation, the following options are provided for consideration:

- Ensure access to the reserve is adequate for fire suppression and asset protection purposes (in consultation with the CFA);
- Consider strategies to reduce the likelihood of ignitions (such as signage, patrols of reserves on high fire danger days, low fuel areas beside paths) and/or
- Undertake more targeted community education.

2.1.3 High management priority

Reserves classified as having a High management priority are those that that fit within the following criteria:

- Reserve size greater that 7ha;
- Slope greater than 5°;
- Significant home exposure (greater than 10 homes);
- Significant asset exposure (e.g. electricity sub-station);
- High value vegetation present;
- Other FFG or EPBC considerations present;
- Run lengths greater than 700m; and
- Reserve orientation conducive for long run under severe fire weather conditions.

Reserves in this category are considered to possess a combination of factors that make them conducive to potentially significant fire behaviour. The characteristics that define a High priority reserve are those that directly relate to the potential for a fire to develop to a quasi steady-state, such as reserve size, run length, slope and reserve orientation.

The criteria 'home exposure' or 'asset exposure' identify that, if a fire occurs, there is potential for the fire to impact dwellings or assets. Significant assets were defined as 'critical infrastructure' (such as an electricity sub-station or water pumping station) and a significant number of homes were defined as exposure greater than 10 homes.

The inclusion of threatened species (flora or fauna) as criteria is in anticipation that there may be times when certain works cannot be completed due to the presence of a protected species or ecological community, adding to the complexity of management. The presence of steep slopes is also included, as it can render intensive vegetation management unfeasible.

Reserves categorised as of a 'High' management priority are listed in table 2.3.

Table 2.3 - Reserves of High management priority

Bunarong Park
Kananook Creek Reserve
Monique/ Southgateway/ Park Valley Bushland Reserve
North Reserve/Stringybark
Paratea Flora and Fauna Reserve
Seaford Wetlands
Stevens/Lexton/Little Boggy Creek
Studio Park
Sweetwater Creek Lower
Sweetwater Creek Upper

Due to the complexity of these reserves, a standard set of generic treatments has not been given. Rather, the fire management of these reserves should be underpinned by a detailed analysis and the development of reserve fire management plans that are responsive to the individual characteristics of the site. The development of the bushfire management plans should consider, in greater depth, the potential credible fire behaviour; and the potential exposure of people and assets. This information would then feed into the selection of an appropriate suite of treatments responsive to the site-specific conditions. The Treatment Toolbox in Section 5 provides a sound basis from which to identify appropriate treatments.

The suite of treatments should include (but are not limited to) to High Priority Reserves are:

- Fuel management zones (including APZs where appropriate, see Section 5.3.1);
- Targeted community engagement program, in particular with residents living adjacent to and within 100 metre of the reserve;
- Suitable emergency vehicle access (consult with the CFA);
- Adequate water supply (consult with the CFA);
- Fire restrictions, reserve closure, reserve patrols and associated signage;
- Appropriate egress routes and signage for reserve users;
- Arson prevention programs; and

- Targeted hazard inspections for properties adjacent to the reserve.

Fire Management Zone (FMZ) reports have been developed by Terramatrix for Bunarong Park, Kananook Creek Reserve, Monique Bushland Reserve, Paratea Flora and Fauna Reserve, Stevens/Lexton/Little Boggy Creek, Studio Park, Lower Sweetwater Creek and Upper Sweetwater Creek. These reports are considered valid, and should simply be incorporated into a more holistic bushfire management plan. At the time of review, these FMZ reports should be reconsidered to take into account the full suite of treatments in place.

The remaining reserves require FMZ reports, and this should be done in conjunction with the development of an holistic fire management plan.

Section 3 – Context

This section provides a summary of Victorian legislation that may be relevant to bushfire management. A brief outline of each Act is provided, however it should not be used as a replacement for your Council's own legal advice. As legislation is constantly being updated it is best to check each Act at the Parliament of Victoria's website Victorian Law Today, www.legislation.vic.gov.au.

Emergency management arrangements in Victoria are currently being reformed to a more integrated all-hazard approach. The *Victorian Emergency Management Reform: White paper* (Victorian Government, 2012) (the White Paper) outlines these changes. The reform will include a number of legislative changes, including a review of all legislation that allocates emergency management responsibilities to local government. These changes are likely to alter FCC's fire management obligations and it is advised that FCC monitor the implementation of the reform.

3.1 Legislative context (Bushfire)

Legislation that may apply to FCC when undertaking fire management activities includes:

- Country Fire Authority Act 1958
- Emergency Management Act 1986
- Summary Offences Act 1966

3.1.1 Country Fire Authority Act 1958

The Country Fire Authority Act and Regulations are the principal fire prevention legislation applying to the Country Area of Victoria. Section 43 of the Act requires municipal councils and public authorities to "*take all practicable steps to prevent the occurrence of fires on, and minimise the danger of the spread of fires on or from any land vested in it or under its control or management*".

It is CFA's role to superintend and enforce fire prevention (*CFA Act, s.20*) and to report any failure by a public authority or municipal council to properly carry out their duties (*CFA Act, s.46*). The CFA may also appoint a Municipal Fire Prevention Committee (MFPC, now MFMPC) (*CFA Act, s.54*) to undertake a range of functions including advising Council on the existence and management of hazards and making recommendations in the preparation of the Municipal Fire Prevention Plan (*CFA Act, s.55*). The Municipal Fire Prevention Plan must:

- Identify areas, buildings and land use in the municipal district which are at particular risk of fire;
- Specify how each risk is to be treated; and
- Specify who is responsible for treating those risks (*CFA Act, s.55A*).

The CFA Act also requires Council to appoint a Municipal Fire Prevention Officer (MFPO) (*CFA Act, s.96A*) and provides Council and the MFPO with certain legal protections when acting in good faith (*CFA Act, s.94*).

Section 41 states that the MFPO can serve a fire prevention notice (FPN) on the owner or occupier of land within the municipal district of the Council. This excludes public authorities (a municipal council is not considered a public authority under the Act). An FPN may be served if the MFPO forms the opinion that:

- It is necessary, or may become necessary, to do so to protect life or property from the threat of fire; and
- There is no procedure under any other Act or regulation made under any Act that is more appropriate in the circumstances to address that threat (*CFA Act, s41*)

There are also requirements under the Act to limit works or activities with a potential to cause ignition during the declared Fire Danger Period and on days of Total Fire Ban. The legislation sets a number of fixed conditions and permit processes to regulate potential ignition sources.

Section 38 of the CFA Act requires all authorities to obtain a permit before conducting controlled burning operations during any declared Fire Danger Period. This applies for both fuel reduction and environmental management burns. The MFPO of the municipal council can issue the permit to burn. The Chief Officer of CFA or his delegates can also issue a permit.

3.1.2 Emergency Management Act 1986

The Emergency Management Act 1986 defines most of Victoria's emergency management structure, assigns significant roles and responsibilities, and provides for special needs concerned with the management of emergencies. The Act describes its objective as being: 'to ensure that [prevention, response and recovery] are organised within a structure which facilitates planning, preparedness, operational co-ordination and community participation'(s.4A).

The Emergency Management Act 1986 gives rise to the Emergency Management Manual Victoria (EMMV). The EMMV is the primary resource for Victoria's emergency management arrangements.

3.1.3 Summary Offences Act 1966

Section 11 of the *Summary Offences Act* 1966 regulates the lighting of fires in the open air at times other than during the declared Fire Danger Period or Total Fire Ban days.

3.2 Legislative context (environment)

Fire managers should strive to limit detrimental environmental impacts by applying the principles of *Victoria's Native Vegetation Management: a framework for action* (DSE, 2002) (currently under review) of avoid, minimise, offset. When planning fire prevention

activities, avoid damage wherever possible. If damage cannot be avoided, then the effects should be minimised through appropriate planning and management of the fire prevention activity. Some effects, such as weed invasion, may need separate management arrangements to be made, for example ongoing weed control.

The role of council in planning and undertaking fire management activities may be impacted upon by environmental legislation. These Acts include:

- Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
- Planning and Environment Act 1987
- Flora and Fauna Guarantee Act 1988
- Wildlife Act 1975
- Catchment and Land Protection Act 1994
- Environment Protection Act 1970

3.2.1 Planning and Environment Act 1987

The town-planning regime in Victoria provides a number of controls relevant to bushfire planning and prevention. Some controls play a part in enabling bushfire planning and prevention while others are designed to protect native vegetation or mitigate other environmental hazards. The requirements of these controls may conflict with each other and the role of land use planning is to manage these conflicts to provide the best community outcomes. The controls are set out in the Victorian Planning Provisions (VPPs) and applied in Planning Schemes made under the *Planning and Environment Act 1987.*

Each Council in metropolitan or rural Victoria has its own Planning Scheme, which consists of some State-wide provisions drawn from the VPPs and some local provisions drawn from local policies.

There are two key levels of decision-making in the town-planning regime:

- the State level; and
- the local level.

At the State level, the Minister for Planning, the DPCD and Advisory Committees are the key decision-makers although the Governor in Council, other Ministers, other departments and State-level public authorities may also play a role.

At the local level, Councils, the Minister for Planning and local public authorities are the key decision-makers. Under the *Planning and Environment Act*, the Minister may amend the VPPs and therefore amend the State-standard provisions. In this way, the Minister has the power to determine metropolitan or regional planning policy and implement those policies in Planning Schemes.

Particular provisions of the VPP contain requirements for particular use and development proposals. They are uniform across the State. The particular provisions with some relevance to fire management include:

- Native Vegetation Precinct Plan (clause 52.16).
- Native Vegetation (clause 52.17) the purpose of which is to protect and conserve native vegetation to reduce the impact of land and water degradation and provide habitat for plants and animals. Relevant exemptions are set out below.
- Fire Exemption for Roadsides (clause 52.17-6) that simplifies the process for road managers to manage native vegetation on roadsides for bushfire risk mitigation.
- Bushfire Recovery 2009 (clause 52.38), the purpose of which is to support recovery operations following the 2009 Bushfires.
- Timber Production (clause 52.18), requires compliance with the Code of Practice for Timber Production 2007.
- Bushfire Protection (clause 52.48), establishes exemptions to allow the destruction or lopping of vegetation for the purpose of bushfire protection. An overview is provided below.

Whilst the planning provisions provide circumstances under which native vegetation can be removed without a permit, , it is recommended that FCC continue to assess the need for vegetation removal using a risk based approach to avoid unnecessary impact on biodiversity values. There are also circumstances where a permit may still be required, such as for removing vegetation protected under State or Federal legislation. FCC should always seek advice from the relevant authority to ensure compliance.

The following is a summary of exemptions in clause 52.17 and 52.48 for the removal of vegetation for emergency works and fire protection.

Clause 52.17- exemptions

Clause 52.17 sets out that a permit is not required to destroy or lop vegetation to the minimum extent necessary for emergency works and fire protection, as follows:

Emergency works	• The native vegetation presents an immediate risk of personal injury or damage to property and only that part of vegetation which presents the immediate risk is removed, destroyed or lopped. • The native vegetation is to be removed, destroyed or lopped by a public authority or municipal council to create an emergency access or to enable emergency works.
Fire protection	• The native vegetation is to be removed, destroyed or lopped for fire fighting measures, fuel reduction burning, or the making of a fuel break or fire fighting access track up to 6 metres wide. • The native vegetation is to be removed, destroyed or lopped for the making of a fuelbreak by or on behalf of a public authority in accordance with a strategic fuelbreak plan approved by the Secretary to the Department of Sustainability and Environment (as constituted under Part 2 of the Conservation, Forest and Lands Act 1987). The maximum width of a fuelbreak must not exceed 40 metres. • The native vegetation is a tree overhanging the roof of a building used for Accommodation. This exemption only allows the removal, destruction or lopping of that part of the tree which is overhanging the building and which is necessary for fire protection. • The native vegetation is to be removed, destroyed or lopped in accordance with a fire prevention notice under:

Section 65 of the Forests Act 1958.
Section 41 of the Country Fire Authority Act 1958.
Section 8 of the Local Government Act 1989.

- The native vegetation is to be removed, destroyed or lopped to keep the whole or any part of any native vegetation clear of an electric line in accordance with a code of practice prepared under Part 8 of the Electricity Safety Act 1998. The native vegetation is to be removed, destroyed or lopped in accordance with any code of practice prepared in accordance with Part 8 of the Electricity Safety Act 1998 in order to minimise the risk of bushfire ignition in the proximity of electricity lines.
- The vegetation is to be removed, destroyed or lopped to reduce fuel loads on roadsides to minimise the risk to life and property from bushfire of an existing public road managed by the relevant responsible road authority (as defined by the Road Management Act 2004) in accordance with the written agreement of the Secretary to the Department of Sustainability and Environment (as constituted under Part 2 of the Conservation, Forest and Lands Act 1987).

Clause 52.48 Bushfire protection exemptions

Clause 52.48 sets out that a permit is not required in the following circumstances:

- The removal, destruction or lopping of vegetation within 10 metres of an existing building used for accommodation that was:
  - Constructed before 10 September 2009; or
  - Approved by a permit issued under this scheme before 10 September 2009; or
  - Approved by a building permit issued under the Building Act 1993 before 10 September 2009.
- The removal, destruction or lopping of any vegetation, except trees, within 30 metres of an existing building used for accommodation that was:
  - Constructed before 10 September 2009; or
  - Approved by a permit issued under this scheme before 10 September 2009; or
  - Approved by a building permit issued under the Building Act 1993 before 10 September 2009.
- The removal, destruction or lopping of any vegetation, except trees, within 50 metres of an existing building used for accommodation where land is within the Bushfire Management Overlay and where the existing building was:

  - Constructed before 10 September 2009 or lawfully erected before 18 November 2011 without the need for a planning permit; or
  - Approved by a permit issued under this scheme before 10 September 2009 and erected before 18 November 2011; or
  - Approved by a building permit issued under the Building Act 1993 before 10 September 2009 and erected before 18 November 2011
- The removal, destruction or lopping of any vegetation for a combined maximum width of 4 metres either side of an existing fence on a boundary between properties in different ownership that was constructed before 10 September 2009.

These exemptions do not apply to vegetation protected by legal agreement or covenant, such as those established under section 173 of the *Planning and Environment Act* 1987, section 69 of the *Conservation, Forests and Lands Act* 1987 or a covenant applied under section 3A of the *Victorian Conservation Trust Act* 1972. Even if the exemption applies to the proposed works, a permit or approval may be required under other legislation (for example the *Flora and Fauna Guarantee Act 1988* and the *Environmental Protection and Biodiversity Act 1987*).

Municipalities have an agreement with DEPI in the form of the *Memorandum of Understanding on the Operation of the Public Roads Exemption*, that provides an exemption to be used for the safe and efficient function of roads, streamlining administrative processes whilst having regard for the objectives of the Government's vegetation management policy.

3.2.2 Environment Protection and Biodiversity Conservation Act 1999

Under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), actions that have, or are likely to have, a significant impact on a matter of national environmental significance trigger an assessment and permit process.

Such matters may include world heritage properties, nationally threatened species and communities, and internationally protected migratory species.

Routine or ongoing maintenance works on established bushland reserves may be subject to this Act, however there are some exemptions.

The Department of Sustainability, Environment, Water, Population and Communities is responsible for administering the Act. Section 18 of the Act imposes severe penalties on corporate bodies found to have had a significant impact on listed threatened species, this can include fines of up to $5.5 million dollars or imprisonment for a term of not more than seven years.

3.2.3 Flora and Fauna Guarantee Act 1988

The Flora and Fauna Guarantee Act is the principal Victorian statute protecting flora, fauna and ecological communities. It provides for the listing of species and communities of flora and fauna that are threatened.

Through the protected flora permit system, this Act also controls activities that might disturb, injure or kill protected native plants. Any action that leads to the taking of protected native flora requires a permit under this Act.

3.2.4 Wildlife Act 1975

The Wildlife Act provides for the protection of all native Victorian fauna, including snakes, lizards, common species such as possums, and invertebrates listed under the Flora and Fauna Guarantee Act. All fauna are protected on all land tenures. Authorisation is required to take or keep wildlife, whether alive or dead and including skin, feathers, fur, bones,

organs, blood, eggs or any part of eggs. Furthermore, a person must not damage, disturb or destroy any wildlife habitat.

3.2.5 Catchment and Land Protection Act 1994

Administered by the Department of Primary Industries, the Catchment and Land Protection Act provides the basis for the development and direction of catchment management plans, and outlines provisions relating to the management of catchments, land, noxious weeds and pest animals that may negatively impact on the productivity, social, and environmental assets of Victoria.

The Act also sets out the responsibilities of private and public land owners, including preventing land degradation, soil conservation, the protection of water resources, eradication of regionally prohibited weeds, preventing the growth and spread of regionally controlled weeds, and preventing and eradicating (where possible) pest animals.

Land Management Notices or Directions requiring weed eradication or control may also be issued by the Department of Primary Industries to land managers under this Act.

3.3 Fire management planning context

Emergency management is undergoing significant reforms, as set out in the White Paper (Victorian Government, 2012), including new governance structures and responsibilities. The following sets out the fire management planning context in Victoria as it currently stands, as it is assumed that during the transition to implementing the changes set out in the White Paper, existing arrangements will persist.

The Bushfire Management Strategy for natural reserves is nested within a broader context of state and regional fire management planning, and FCC planning. The relationship between FCC documents is shown in Figure 3.1, with a summary of key documents given below.

Under the Integrated Fire Management Planning (IFMP) initiative, processes have been implemented in Frankston through the establishment of the Frankston Municipal Fire Management Planning Committee (FMFMPC) and the development of the Frankston Municipal Fire Management Plan (MFMP). The MFMP forms the basis for municipality wide risk analysis, whilst this Strategy focuses on fire management priorities in FCC reserves.

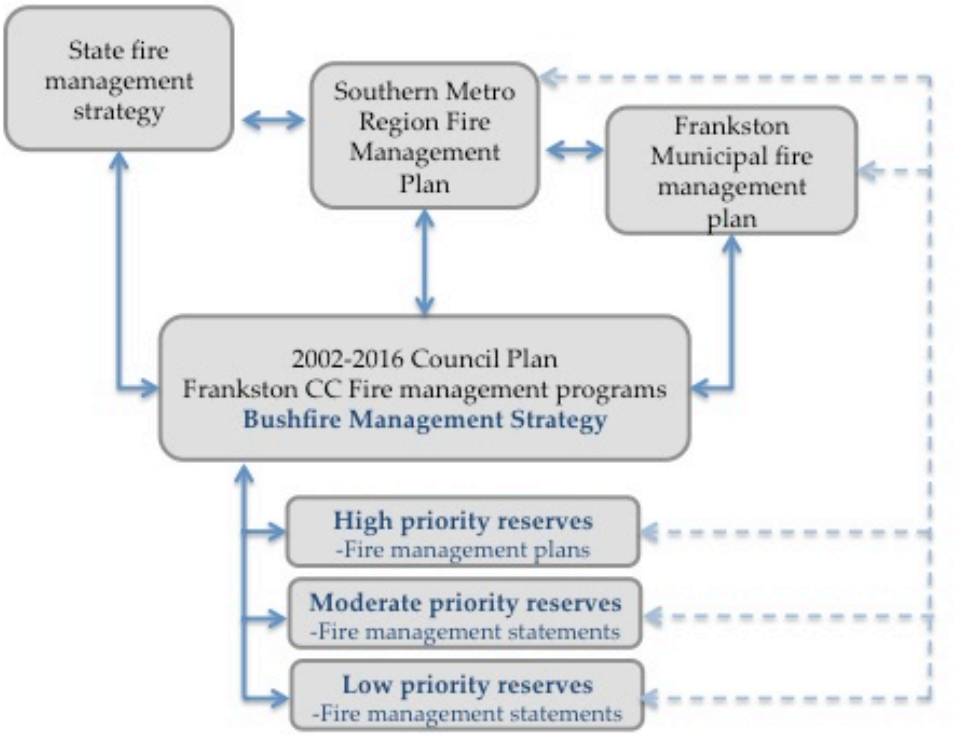


Figure 3.1 - Frankston City Council fire management planning relationships

3.3.1 State fire management planning

The *Bushfire Safety Policy Framework* (FSC, 2012) provides direction and guidance for the management of bushfire risk and establishes the principles that underpin Victoria's approach to community bushfire safety. The Framework sets out priority areas for action and details objectives relevant to each area. These are shown in table 3.1.

Table 3.1 – *Bushfire Safety Polity Framework* (FSC,2012) priority areas for action

Priority area	Objectives
Education and engagement	• Individuals and households are aware of and informed about the bushfire risk and how to prepare for and respond if a fire occurs. • Bushfire safety information and programs meet the needs of different groups and communities and address their local circumstances.
Bushfire preparation and planning	• Prepared and resilient individuals and households with appropriate bushfire plans and the capacity to cope with unexpected events.
Local community fire planning	• Communities and other stakeholders are effectively engaged in the development of local community fire plans. • Local community fire plans are developed for high-risk locations with a focus on what actions to take in an emergency. • Local community fire plans are integrated with other municipal fire and emergency management plans.
Fire danger information and warnings	• Appropriate and effective warnings are delivered to communities under threat from bushfires. • Communities are able to access and understand warnings and fire danger information and advice.
Bushfire safety options	• Communities have a range of bushfire safety options available that are appropriate to the local circumstances and are identified in local plans. • People are aware of and understand the bushfire safety options for their community.

The State Fire Management Planning Committee (SFMPC) is chaired by the Fire Services Commissioner and has membership from all government departments involved in fire prevention, preparedness, response and recovery. The Committee was formed to oversee the development and implementation of IFMP for Victoria. The IFMP State Fire Management Strategy (State Strategy) (SFMPC, 2009) provides a model for the development of consistent structures, systems, process and products for fire management planning across Victoria.

The State Strategy contains five key themes with associated objectives. These objectives relate to the implementation of IFMP (process objectives) rather than being outcome objectives.

3.3.2 Regional fire management planning

The Southern Metropolitan Regional Strategic Fire Management Planning Committee (SMRSFMPC) is one of eight regional sub-committees established through IFMP. It has representatives from local government (including FCC), Country Fire Authority, Metropolitan Fire Brigade, Department of Sustainability and Environment, Department of Education and Early Childhood Development, Department of Human Services, Department of Planning and Community Development, Department of Primary Industries, Melbourne Water, Parks Victoria, SP AusNet, Victoria Police, VicRoads, and Victoria State Emergency Service (SMRSFMPC, 2011). The Southern Metropolitan Region Fire Management Plan (Southern Metro Plan) aims to inform and improve the integration and coordination of bushfire work across the region, in particular the development of municipal fire management plans.

The Sothern Metro Plan establishes fire management objectives and strategies developed in line with the key themes and objectives set out in the State Strategy. The objectives are:

- Planning together - Develop regional, municipal and local fire management plans and planning with a clear purpose and a consistent assessment of risk.
- Collaborative implementation - Develop and implement fire management programs and activities in a collaborative manner.
- Building knowledge – Build and share knowledge in the fire management sector across the community.
- Building capacity – Improve the capability of communities, the fire management sector and the government to deal with fires.
- Using fire – Using fire to manage fuels and support the health of environmental, social and economic environments. In this context this objective relates solely to bushfire management.

The Southern Metro Plan uses a risk-based approach to identify priority risk areas across the region. At risk assets are identified using the Victorian Fire Risk Register (VFRR).

3.3.3 Municipal fire management planning

Goals and objectives relevant to the fire management of bushland reserves are documented at a number of levels:

1. Council visions and values and a set of objectives to meet these, are set out in the *2002-2016 Council Plan*;
2. Policies, principles, arrangements, plans and procedures for the management of emergencies and disasters are addressed in the *Municipal Emergency Management Plan;*
3. Fire safety objectives and programs in the *Frankston Municipal Fire Management Plan 2012* (FMFMP);
4. Objectives and specific works in the overall reserve management plan for individual reserves (NB. not all reserves have a reserve management plan); and
5. Objectives and specific works in the individual reserve fire management works plans.

This Strategy sits between the FMFMP and the specific reserve management plans, reserve fire management plans and/or works plans to provide fire management objectives, principles and treatments specific to reserve fire management.

FCC's *2012-2016 Council Plan* (FCC, 2012a) sets out the vision and values for the municipality which guide the strategic direction of Council for the next four years. The *Council Plan* articulates the key strategies required to meet the objectives and identifies actions needed to deliver the key outcomes. The *Council Plan* is reviewed each year and the progress in meeting the objectives is measured against performance indicators specified in the plan and reported in the Council's Annual Report.

The *Council Plan* does not directly reference bushfire in the objectives or related strategies and actions. The fire management objectives of the Strategy are, however, implicit in the sentiment of the *Council Plan,* particularly objectives 2, 4 and 5, as listed below.

Objective 2 – A safe city

Objective 4 – Well planned, well built and well maintained

Objective 5 – Clean and green for our future

In accordance with the provisions of Section 55A of the CFA Act 1958, the Frankston Municipal Fire Management Planning Committee (FMFMPC) has drafted the *Frankston Municipal Fire Management Plan* (FMFMP) (FMFMPC, 2012) which contains the following elements:

- Fire prevention (including the audited elements of the Municipal Fire Prevention Plan which must comply with the provisions of Section 55A of the Country Fire Authority Act 1958);
- A documented analysis and evaluation of identified risk and treatments for the municipal area;
- Implementation arrangements, timelines and accountabilities; and

- Preparedness, response and recovery provisions.

The objectives of the plan are to:

- Protect life and property without unnecessary impact on biodiversity values;
- Provide effective co-ordination of preparedness, prevention, response and recovery activities across all agencies;
- Collectively identify and treat fire risks;
- Ensure the FMFMP complies with all relevant legislation;
- Increase the capacity of communities within Frankston to prevent occurrences of fire;
- Ensure the FMFMP implements the strategic Southern Metropolitan Region Fire Management Plan, August 2011; and
- Monitor, review and evaluate all activities across this fire plan

The *FMFMP* (FMFMPC, 2012) incorporates a risk assessment methodology consistent with the statewide Victorian Fire Risk Register (VFRR, 2009).

FCC also have a *Fire Management Standard Operating Procedures* (FCC, 2011) which outlines the Council's (in particular the Natural Reserves Team) procedures for:

- Reserve management practices to reduce fire risk whilst maintain conservation values;
- Ecological and fuel reduction planned burns;
- Planning and implementation of planned burning;
- Interagency cooperation for planned burning and wildfire response;
- FCC staff training and OH&S procedures for planned burns and wildfires; and
- Wildfire response procedures.

This documents sets out an extensive list of activities FCC undertakes as part of its fire management responsibilities, including ongoing staff training; suppression plans; planned burns, fire danger period patrols; and procedures for days of high fire danger.

3.4 Bushfire in Frankston

Frankston is a predominantly urban municipality on the south-eastern outskirts of Melbourne, with major business activity centres and coastal suburbs. To the north are the mainly urban areas of the City of Kingston and the City of Greater Dandenong; whilst to the east is the City of Casey and to the south the Shire of Mornington Peninsula both of which contain increasingly rural residential areas and agriculture.

The only part of the City of Frankston with the potential to carry a bushfire of significant size is the south-east corner in the Langwarrin – Baxter area. There is, however, a significant complex of bushland reserves, vegetated creek gullies and water industry reserves throughout the municipality. These are managed by a number of different land management agencies the most important of which are FCC, Parks Victoria and Melbourne Water. The combination of steep slopes and fire prone vegetation running up to and between suburban residential streets can produce short, sharp but locally severe and damaging fires.

There is also potential for fires originating in reserves on the eastern or southern edge of the municipality to spread beyond the municipal boundaries through the more rural areas of Langwarrin, Baxter, Mt Eliza and Moorooduc and grow to a more considerable size.

Frankston's position with its northern and western sides protected by Port Philip Bay and the metropolitan area means there is relatively little opportunity for an established fire to burn into the municipality. Whilst the Bangholme area to the north-east still contains grasslands it is not considered credible for a major bushfire to spread into the municipality.

A summary of significant fires and impacts are shown in Table 3.2. A comprehensive data set detailing the fire history in Frankston was not available for this study. If it becomes

available in the future it would be a useful consideration for identifying and addressing areas subject to accidental ignitions and arson.

Historically there have been a number of significant fires within what is now the southern metropolitan region that have impacted the Frankston area, however the level and cause of impacts for Frankston specifically is unknown. There is some information regarding more recent fires. These data shows that although fires within the municipality are reasonably frequent (two to four every ten years), the damage caused to life and property is quite minimal (a total of three houses and one shed).

Table 3.2 - Fire history in the Frankston area

Event	Date	Description	Area burnt	Property loss	Life loss
Red Tuesday	February 1898	Fire spread through the Mornington Peninsula, reaching the border of Hastings. Thousands of acres of grassland burnt, thousands of livestock killed.			11
Black Tuesday	1944	Large grassfires throughout Victoria, impacting Mornington Peninsula, Somerville and Langwarrin.	>million hectares		
Ash Wednesday	February 1983	Large bushfires throughout Victoria, including impact in Cardinia Shire.			
Mornington Peninsula	January 1997	Fires threatened Mount Martha, Safety Beach, Langwarrin, Mount Eliza and Arthurs Seat.		2 houses	0
Langwarrin	1997	Studio Park in Langwarrin substantially burnt out.			
Nepean Highway	1998	Reserve running parallel to the rail line was burn, Nepean Highway was blocked.			
Langwarrin	1998/99	Langwarrin Military Reserve and Pines Flora & Fauna Reserve. Road blocks and traffic diversions.		2 sheds	
Frankston	January 2009	Bypass reserve between Ballarto Rd and Frankston-Dandenong Rd burnt.		1 house damaged (ember)	
Langwarrin	January 2009	Boggy Creek (Melbourne Water)			

Section 4 – Methodology

The approach taken to develop the Bushfire Management Strategy is consistent with ISO 31,000 (ref). . The Strategy provides a systematic process for assessing and mitigating the bushfire risk of FCC managed natural reserves to ensure a consistent approach is applied throughout the municipality. The development of the Strategy included the following steps:

- Establish the context of bushfire management for FCC
- Identify and assess the elements of hazard, exposure and vulnerability that contribute to the bushfire risk at each of FCC natural reserves;
- Identify existing controls;
- Evaluate the risk to determine management priority;
- Establish a treatment toolbox;
- Establish processes for monitoring and reviewing; and
- Establish processes for communication and consultation.

Fire management in Victoria is being reformed through the Integrated Fire Management Planning (IFMP) process. The IFMP process is integrating the planning processes across all levels of government in Victoria through a consistent, risk-based planning framework (IFMP, 2010). Crucial to the IFMP process is the idea of risk assessment that assesses the hazard, the exposure of an asset to risk, and the potential impact. The approach used for the risk assessment of the reserves in the Frankston Municipality is largely consistent with the processes outlined ISO 31,000:2009, but tailored to provide a more detailed analysis of the risk relevant for the Frankston LGA. All risk assessment tools currently in use are underpinned by ISO 31,000:2009 including the IFMP risk assessment process, the National Emergency Risk Assessment Guidelines (NEMC, 2010) and the risk assessment outlined in the Victorian Fire Risk Register (VFRR, 2009).

4.1 Establish the context of the Bushfire Management Strategy

The context of the bushfire management strategy was established by interrogating key documents, such relevant State legislation (CFA Act, Victorian planning scheme), relevant

bushfire management documents such as the Southern Metropolitan Region Strategic Fire Management Plan and the Frankston Municipal Fire Management Plan, and more general guiding documents, such as the FCC Council Plan. Extensive consultation was also undertaken with FCC, in particular the Compliance and Safety unit, Reserves and Parks team, and the planning unit. External stakeholders were also consulted, including the CFA, DEPI, Parks Victoria and Melbourne Water.

4.2 Identify and assess the elements of hazard, exposure and vulnerability

Risk can be defined as the 'effect of uncertainty on objectives' (Purdy, 2010), and is described by likelihood and consequence. Likelihood and consequence can also be considered as the assessment of hazard, exposure and vulnerability.

In relation to bushfire risk, ***hazard*** is considered to be potential fire behaviour, which is influenced by fuel, weather and topography. ***Exposure*** is considered to be the number of, and degree to which assets, such as homes or infrastructure are exposed to the hazard. ***Vulnerability*** is how susceptible the exposed assets are to damage by the hazard. The elements that have been assessed as relevant to bushfire risk can be seen in table 4.1 and are expanded upon below under subheadings 4.7 and 4.8.

Table 4.1 - Elements of hazard, exposure and vulnerability assessed

Hazard	
Fuel	**Topography**
Reserve Size	Slope
Native vegetation present	Aspect
Part of bushland complex	Orientation
Longest run	
Run Direction	**Other Factors**
Average width	BPA or BMO
Vegetation fragmentation	Ignitions Sources
Vegetation classification	Fire History
EVC's present	Credible Fire Scenario
Exposure and Vulnerability	
People (reserve use, surrounding area)	Infrastructure (significant infrastructure within 100m)
Houses (Built assets with 100m)	Environmental values

4.3 Identify existing controls

An understanding of the existing controls was established by analysing the list of current works, plans and policies supplied by FCC. Information was supplied as either spatial (i.e. GIS) or tabular data.

Each reserve was checked against the relevant spatial dataset and cross-checked against the tabular datasets to ascertain the current controls in place.

4.4 *Evaluate to determine management priority*

In order to assign the reserves a management priority, a system to classify the reserves into Low, Moderate or High based on bushfire risk and management priority was developed.

Reserves classified as having a Low management priority are those that that fit the following criteria:

- Vegetation that can be classified as 'low threat' according to the criteria set out in *AS-3959*: *Construction of buildings in bushfire prone areas* (Standards Australia, 2009).
- Vegetation patches less than 4ha
- Vegetation in the reserve isolated by at least 150m
- No adjacent homes/assets
- Linear reserves of less than 50m in width

To be classified as Low, the reserve doesn't need to me*et all* of the listed criteria. Instead the criteria act as a guide to assist the filtering out of those reserves that possess inherently low bushfire risk or that the works currently in place are considered adequate.

Reserves classified as having a Moderate management priority are those that that fit the following criteria:

- Reserve size between 4ha and 7ha
- Exposure of 1 – 10 homes
- Reserve orientation conducive for fire run under severe conditions (i.e. has a NW – SE orientation).
- Slopes less than 5^{O}
- Run lengths less than 700m
- Significant asset exposure

Again, the criteria act as a guide to assist filtering into the Moderate category, rather than providing a definitive set of characteristics. Reserves in the Moderate category are those that

could support a reasonable sized fire under severe fire weather conditions, but the extent of potential fire run is not considered adequate to generate a high intensity fire, and is certainly unlikely to reach quasi steady state.

Reserves classified as having a Moderate management priority are those that that fit within the following criteria:

- Reserve size greater that 7ha;
- Slope greater than 5°;
- Significant home exposure (greater than 10 homes);
- Significant asset exposure (e.g. electricity sub-station);
- High value vegetation present;
- Other FFG or EPBC considerations present;
- Run lengths greater than 700m; and
- Reserve orientation conducive for long run under severe fire conditions.

Reserves in this category are considered to possess a combination of factors that make them conducive to potentially extreme fire behaviour. The characteristics that define a High priority reserve are those that are directly related to the potential for a fire to develop into a quasi steady-state, producing potentially extreme fire behaviour, such as reserve size, run length, slope and reserve orientation.

4.5 Treatment toolbox development

The suite or 'toolbox' of treatment options available to reduce bushfire risk was developed as a collaborative process. Techniques were identified by drawing on many sources, such as the body of work that exists in current fire management works plans, techniques in use by other agencies and techniques identified by Terramatrix whilst undertaking similar work for other clients.

Workshops were held with the relevant FCC business units to tease out potential constraints or issues related to the various treatment options. This also provided a backstop to ensure that no relevant treatment options were missed.

These techniques were then analysed to develop an idea of the potential and limitations of each tool.

4.6 *Reserve assessment methodology*

A four stage approach was taken to gain an understanding of the bushfire risk and management priority of the FCC natural reserves. The stages were

- A desk top assessment
- Ground-truthing
- Group assessment
- Stakeholder workshop

The first stage was a desktop assessment of the risk using a combination of GIS analysis and aerial photograph interpretation. Each reserve was assessed against a common set of criteria (set out in Table 4.1 and discussed in more detail in the following section) to understand the potential hazard and exposure present.

As there are limitations to desktop analysis, the ground-truthing of assumptions was required in some reserves. A set of criteria was developed to determine reserves that required field checking, as listed below. Reserves that required field checking are shown in table 4.2. They were:

- Reserves with significant native vegetation
- Reserves with run lengths >60m
- Reserves with complex topography

- Reserves without a current Terramatrix report

Table 4.2 - Reserves that required field checking

Armstrong Link
Austins Reserve
Baxter Park
Baxter Trail
Casuarina Reserve
Cell 3 (Pines Flora & Fauna)
Escarpment Reserve
Flame Robin Reserve
Frankston Foreshore
Lloyd Park (North and South
North Rd (and Equestrian Centre)
Rinnella Reserve
Robinsons Reserve (130R)

Once all the data had been collected, a Terramatrix staff undertook an independent assessment of the reserves against the management priority criteria. A group exercise was then used to classify the reserves, in particular to discuss differences in assessment between each staff member and apply expert judgment where reserves did not neatly fit into a category.

A workshop was then held with key stakeholders identified by FCC, including FCC staff, CFA, DSE (now DEPI), Parks Victoria, Victoria Police and Melbourne Water to add local knowledge and expert judgment to the final classification of the reserves into Low, Moderate or High.

4.7 Hazard

4.7.1 Vegetation

Vegetation classification

Vegetation was classified according to the schema provided by AS3959-2009 (Standards Australia, 2009) based on EVC data supplied by FCC. It was assumed the data provided was accurate and no further vegetation analysis was undertaken. In situations where a number of vegetation types were present, the predominant vegetation (worst-case scenario) was used as the overall classification. Vegetation type boundaries we generally delineated by aerial photograph interpretation.

Generic steady-state fuel loads were assumed for each EVC (see Table 4.3). Fuel sampling was not undertaken for the high level assessment. Some reserves may require further assessment of the fuel type and structure in a more detailed analysis. As Terramatrix has a body of previous work performed in the area, some indicative examples of average fuel loads have been included as a comparison to that assumed by AS-3959:2009.

Table 4.3 - Comparison of fuel loads given in AS-3959 and fuel loads measured by Terramatrix

EVC	Vegetation Classification as per AS-3959:2009	Fuel Load (t/ha) as per AS-3959:2009	Terramatrix measured fuel-load (t/ha)
Coast Banksia Woodland (2)	Forest	35	15.3
Coast Dune Scrub (160)	Scrub	25	16
Coast dune scrub/banksia woodland mosaic (921)	Forest	35	16
Heathy Woodland (48)	Forest	35	16.5
Swamp Scrub (53)	Scrub	25	19.3
Wet Heathland (8)	Shrubland	15	12
Lowland Forest (16)	Forest	35	19.6
Sand Heathland (6)	Shrubland	15	10
Swampy Riparian Woodland (83)	Forest	35	16
Plains Grassy Woodland (175)	Forest	35	15
Wetland Formation (74)	Grassland	4.5	n/a

Low threat vegetation

Reserves that contain vegetation classified as low threat under AS3959-2009 are assigned as Low risk and require no additional analysis or further specific fire management works. The maintenance of the vegetation as low threat should be assessed at regular (every 5 years) intervals to ensure no change to the level of risk.

Low threat vegetation is assessed as per AS3959-2009.

- Single areas of vegetation less than 1 ha in area and not within 100m of other areas of vegetation
- Multiple areas of vegetation less than 0.25ha in area and not within 20m of the dwellings or each other
- Strips of vegetation less than 20m in width regardless of length and not within 20m of the dwellings or each other or other areas of classifiable vegetation

- Non-vegetated areas, including waterways, roads, footpaths, buildings and rocky outcrops.
- Low threat vegetation – grassland managed in a minimal fuel condition, maintained lawns, golf courses, maintained public reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks

Minimal fuel condition means there is insufficient fuel available to significantly increase the severity of the bushfire attack (recognisable as short-cropped grass for example, to a nominal height of 100mm). The degree of curing of annual grasses (Garvey and Millie, 2000) was assumed to reach 100% during the driest period of the year.

Vegetation fragmentation

The degree of fragmentation (or separation) between areas of vegetation will influence the potential for fire spread and severe fire behaviour. Large gaps between vegetated areas will decrease the likelihood of fire spread through flame impingement (by acting as a fuel break), reduce fire behaviour (rate of spread and intensity), and may aid suppression efforts.

Aerial imagery and the digital EVC layer were used to determine the degree of fragmentation according to Table 4.4.

Table 4.4 - Descriptions for the classification of fuel fragmentation

Classification	Description
High	> 50m between areas of classified vegetation.
Moderate	> 25m between areas of classified vegetation.
Low	<10m between areas of classified vegetation.

4.7.2 Landscape scale hazard

The location of the reserve in the landscape, particularly whether the reserve is part of a large vegetation complex, will inform:

- The potential for a bushfire to spread into the reserve.
- The potential for a bushfire within the reserve to spread into the broader landscape.
- The fire behaviour potential within the reserve (length of run).

A landscape scale hazard exists where there is vegetation within 100 metres of the reserve that is classifiable under AS3959 (not classified as low threat vegetation). The vegetation was assessed to ascertain if it was part of a wider bushland complex. This point was particularly relevant if substantial vegetation existed to the NW or SE as there is greater potential for a fire to burn ***into*** the reserve (from the NW) or a fire to burn ***out of*** the reserve (in a SE direction).

4.7.3 Maximum run length and fire front width

The length and width of potential fire runs can be used to indicate the potential for fire behaviour. All fires increase their rate of spread after ignition until they reach a reach a quasi-steady rate for the prevailing weather conditions, with the width of the head fire determining how quickly this quasi-steady state is achieved (Cheney and Sullivan, 2008). Credible run lengths and fire front widths were measured using GIS software, and both were assessed considering the vegetation complex within the area, not just the vegetation present within the reserve boundary.

4.7.4 Fire run scenario

Potential fire run scenarios were determined based on orientation of the vegetation and slope to wind directions associated with severe fire weather. Orientation will influence the likelihood of fire spread through, into or out of the reserve under credible fire scenarios. Severe fire weather is most often associated with north-westerly winds, and south-westerly

winds that usually accompany a wind change. The opportunity for fire spread under severe weather conditions with a south-westerly wind is often relatively short lived, as the wind change tends to cause a drop in temperature and an increase in relative humidity. It should not be discounted as a risk, however, as most bushfire losses often occur half an hour either side of the wind change (Petris, 1995), and there have been documented fires within the Frankston municipality that occurred on the SW wind change, notably the Ballarto Rd fire in 2009, where ember attack on the SW change caused minor damage to one home.

4.7.5 Topography

Slope and aspect that would influence fire behaviour and impact on assets were identified using contour data supplied by FCC. Slope analysis was performed by converting the supplied contour data into a digital elevation model (DEM) and creating slope transects with spot data taken along points at 10m intervals. From this data, an elevation profile was developed for each reserve and an average slope value was determined by the formula

Rise/Run * $\tan^{-1}$. An example of slope analysis can be seen in figure 4.1.

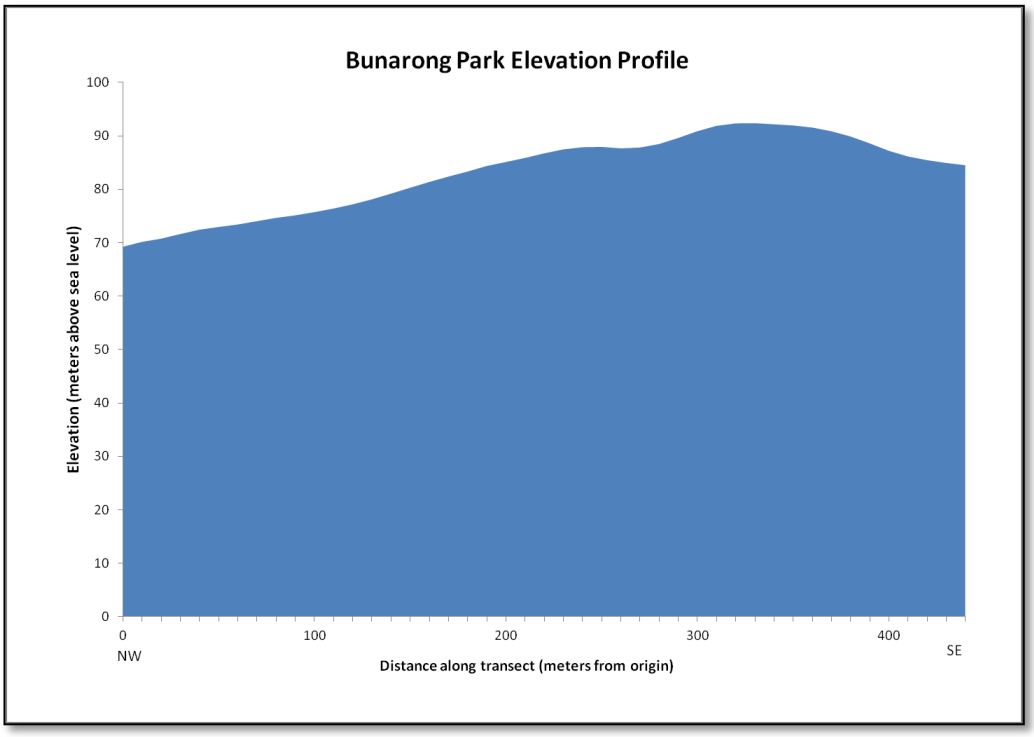


Figure 4.1 - Elevation profile of Bunarong Park from the NW to the SE.

4.7.6 Ignition sources

Potential sources of fire ignition were identified. Factors considered included reserve use, ignition history, presence of powerlines, presence of solid fuel BBQs, proximity to roads (particularly major roads). No spatial data of ignitions was available for this report, but an excerpt from the Southern Metropolitan Region 'Strategic Fire Management Plan' (SMRSFMPC, 2011) has been supplied below, in figure 4.2, indicating a high occurrence of small fires across the Frankston Municipality.

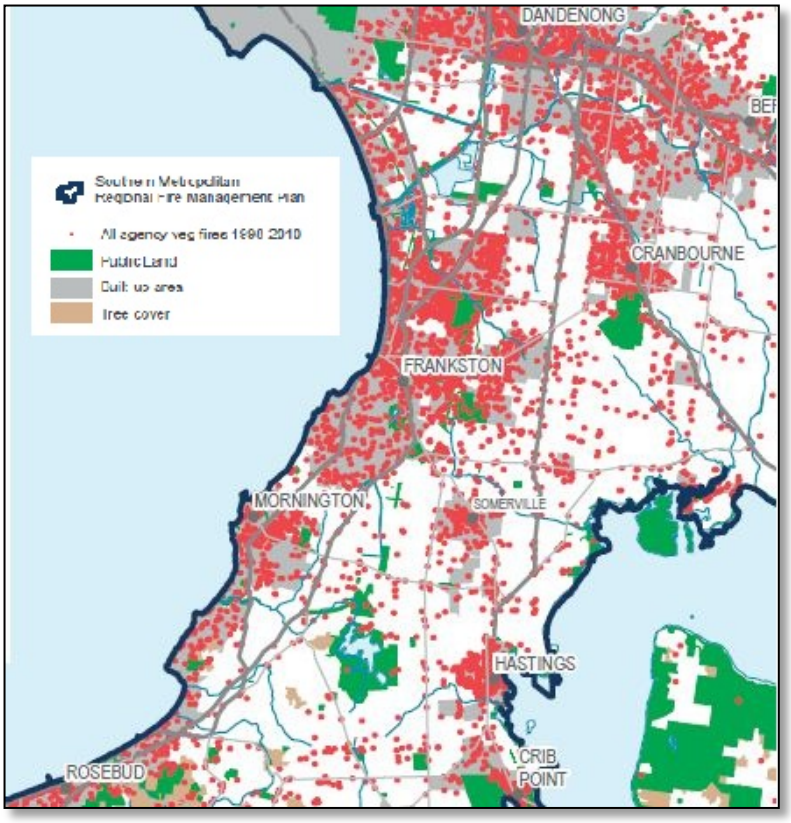


Figure 4.2 - All agency vegetation fires for the Frankston Municipality, taken from the Southern Metropolitan Region Strategic Fire Management Plan SMRSFMPC, 2011)).

4.8 Exposure and vulnerability

4.8.1 Life

FCC provided a description of the type and level of use of the reserve, in particular during summer or on high fire danger days. The number of houses or other buildings where people may be was used as a proxy of the number of people who might be exposed. Particular note was taken where facilities that may house "vulnerable" people, such as kindergartens, schools, childcare centres, aged care facilities and hospitals.

4.8.2 Built assets within the reserve

An inventory of built assets within the reserve was provided by FCC. A description of their level of use, cultural and/or social significance was also provided.

4.8.3 Built assets around the reserve

The number of houses and other built assets within 100 metres of the reserve was determined from aerial imagery. For the most part, a built asset was identified as a house, school, business or community building. The assessment did not include unoccupied buildings, such as sheds or garages, or other built features, such as fences, play equipment, roads, bridges or reserve infrastructure (such as boardwalks).

FCC also indicated areas that may be earmarked for further development, such as subdivisions adjacent to reserves. This was used to inform whether fire management issues may need further consideration.

4.8.4 Service infrastructure

Information about the presence of infrastructure related to service delivery, such as electricity, gas, water, rail transport and telecommunications either in the reserve or within 100 metres of the reserve was provided by FCC and other project stakeholders.

4.8.5 Environmental values

The significance of the flora and fauna, including the presence of threatened species, was determined using information provided by FCC and the state and national databases. The ecological vegetation community (EVC) supplied to Terramatrix was cross checked against the data found in the DSE (now DEPI) 'Interactive Biodiversity Mapper' for consistency.

4.9 Current treatments

4.9.1 Fuel management

FCC provided GIS files showing fuel management works in reserves, such as asset protection zones, strategic fire moderation zones and ecological management zones. Works plans for the reserves were also provided. The adequacy of these works were assessed, based on the level of fire hazard.

4.9.2 Access

The ease with which fire fighters could access the reserve was considered based on the presence of roads around the perimeter of the reserve, and/or dedicated fire access or management tracks within the reserve.

4.9.3 Water

Water supply concerns how readily available water is to fire fighters to assist suppression activities. This considers whether there is access to a reticulated water supply in the streets

surrounding the reserve or whether there is a reliable static water supply (such as dam, reservoir or water tank) available for fire fighter uses within or nearby the reserve.

4.9.4 Egress

Pedestrian tracks and exits from the reserve were located from shapefiles and aerial imagery provided by FCC. An on ground assessment of the track network complexity and the ease of egress for reserve users in an emergency, was undertaken in higher risk reserves.

4.9.5 Refuge

The location of community refuges and neighbourhood safer places in or near the reserve was recorded.

4.9.6 Community education and engagement

An inventory was made of publications on fire safety FCC make available or distribute to the public. This includes material on the FCC website, available from FCC offices, distributed via mail or at meetings.

The dates and number of attendees at meetings regarding the reserve or fire safety were collated. Particular bushfire management related issues raised by residents with FCC were noted.

4.9.7 Friends (or other) groups

FCC provided information regarding whether the reserve has a Friend's Group, or other community group (eg. Sports) associated with it and the level of activity of the group. The presence of community groups or active resident's groups may provide potential for community engagement programs about fire safety and fire management.

4.9.8 Existing plans

FCC provided an inventory, and where possible copies, of existing reserve management plans, reserve fire management plans, and works plans was made for each reserve. The adequacy of these plans was not assessed.

4.9.9 Neighbouring land managers

The authority responsible for the management of land adjacent or nearby the reserves was recorded. Where there is a landscape scale risk, cooperative management of the fire risk may be pertinent. A consistent approach to fire management between land managers within FCC should be considered good practice and a central theme in any IFMP initiatives.

Section 5 – Treatment toolbox

Good risk management practice is to implement multiple controls to address potential risk factors, to allow for the fact that some treatments may fail in certain situations. The decision about what treatments should be applied, and where they should be applied, is based upon the level of risk, the efficacy in treating the risk, how practical the treatment is to implement, and the cost-benefit of the treatment. An integrated multi-control approach will best ensure FCC meet the fire management objectives for their reserves, and demonstrate compliance with their legislated obligations.

5.1 *Principles of Selecting an Appropriate Management Regime*

In selecting a risk treatment reserve managers should:

- Be clear about what risk the bushland reserve poses;
- Have assessed the level of risk as it is important that the degree of treatment is commensurate to the risk;
- Ensure that the works being proposed address one or more of the risk factors present at that particular location;
- Consider whether the potential benefits of the treatment justify the economic, environmental and aesthetic costs of the works;
- Ensure that all appropriate permits and permissions have been obtained;
- Consider what treatments in and beyond the bushland reserve may be most effective; and
- Consider whether alternative treatments such as community education, emergency management arrangements etc. may be appropriate.

5.2 *Treatment toolbox*

An extensive list of treatments, along with a brief summary of the efficacy of each, is provided in table 5.1, with a detailed discussion following. It is not anticipated that all the treatments should be implemented by FCC in every reserve. In some cases the suggested controls may not be appropriate, in others they may currently be implemented by other

organisations (such as CFA's community safety programs) in conjunction with FCC. Existing programs and controls already in place should be a consideration when determining the treatment mix.

To simplify the presentation of the actions, the list is divided into treatments that address hazard (fire ignitions and spread) and impact (people, houses, infrastructure, environment). It is acknowledged that the list of recommended treatments is extensive and there are several duplications, as a single treatment may be relevant to more than one risk factor. It should also be recognised that although extensive, the treatment toolbox is by no means exhaustive, and where the listed treatments may not be appropriate, there are opportunities to find alternatives.

Table 5.1 - Treatment toolbox

Treatment	Efficacy	Suggested frequency
HAZARD		
Ignitions		
Arson programs	Moderate – may deter but unlikely to prevent deliberate ignitions.	Ongoing
Ranger patrols and signage	Moderate – rangers may deter arson and increase detection	During declared fire danger period
Community engagement programs	Moderate – Significant amount of information available, but difficult to engage all people	Before and during the declared fire danger period
Regulation of fire use	Moderate – will reduce accidental ignitions, but unlikely to deter deliberate ignitions	Ongoing, particularly throughout the declared fire danger period
Signage advising regulation of fire use and deterring use of reserve on high fire risk days	Moderate – may reduce accidental ignitions, but unlikely to deter deliberate ignitions	Ongoing
Vegetation management under powerlines	Moderate – there is a history of powerline caused bushfires despite vegetation management	During declared fire danger period
Maintain high use areas in a minimal fuel condition	High – will limit fire spread from these areas	During declared fire danger period
Prevent unauthorised vehicular access	Moderate – will deter entry, but not prevent it	Ongoing
Spread		
Bushfire Moderation Zones	Moderate – may reduce the likelihood of fire spread from flame and radiant heat, but not embers	During declared fire danger period
Provide fire fighter access to the reserve	High – but depends on presence of fire services	Ongoing
Provide adequate water supply for fire fighters	High – as long as reticulated supply is available during a fire	Ongoing
Ensure reserve is in CFA operational	High – will aid effective priorisation of fire fighting resources	Ongoing, update annually before the

plan		declared fire danger period
Weed control	Moderate – impact will depend on other vegetation present and what replaces the weeds	During declared fire danger period
In-depth fuel management throughout the reserve	High – will significantly reduce fire intensity and spread, but may have significant biodiversity impacts	Ongoing
Low flammability planting	Moderate – will reduce fire intensity and spread, but may have significant biodiversity impacts	Ongoing
IMPACT		
People		
Community engagement	Moderate – significant amount of information available, but difficult to engage all people	Before and during the declared fire danger period
Plans for vulnerable people	High – creating and enacting plans will reduce the likelihood of exposure	Ongoing
Egress signage	Moderate – will facilitate egress but is not designed for emergency evacuation	Ongoing
Closure of reserve on high fire danger days	Moderate - may reduce the number of people exposed, but access cannot be totally restricted	On Extreme and Code Red days
Asset protection zones	Moderate – will reduce risk of flame and radiant heat impact on adjacent properties if complemented by works on private property.	During declared fire danger period
Houses		
Community engagement	Moderate – significant amount of information available, but difficult to engage all people	Before and during the declared fire danger period
Low fuel garden design	High - vegetation management close to homes reduces flame, radiant heat and ember ignitions	Ongoing
Target adjacent properties for hazard inspections around reserve	High – vegetation management close to homes reduces flame, radiant heat and ember ignitions	Before and during the declared fire danger period
Asset Protection Zones of sufficient width	Moderate – will reduce risk of flame and radiant heat impact on adjacent properties if complemented by works on private property. Will not reduce embers	During the declared fire danger period
Bushfire Moderation Zones	High – will significantly reduce fire intensity and spread, but may have significant biodiversity impacts	Ongoing

House construction standard (and retrofitting)	High – will reduce ember, radiant heat and flame impact, but must be complemented with fuel management and maintenance	Ongoing
Housekeeping	Moderate – will reduce the chance of fine fuel build up, ember ignitions and penetration into houses	Ongoing, particularly during the declared fire danger period
Infrastructure		
Increase fire resistance of infrastructure	High – will reduce radiant heat and flame impact, but must be complemented with fuel management	Ongoing
Fire management plans and works	High – appropriate identification and treatment of risks	Ongoing
Asset Protection Zones of sufficient width	High – will reduce the likelihood of excessive flame and radiant heat impact	During the declared fire danger period
Plans for restoration	Moderate – recovery costs can be high and infrastructure may not be replaced	Ongoing
Environment		
Integrated planning for fire management and biodiversity	High – increases the chance that both fire management and biodiversity management objectives are met	Ongoing
Manage EVCs within Tolerable Fire Interval	High – fire regime important to EVC health	Ongoing
Weed management	High – will improve reserve health and may reduce overall fuel hazard	Ongoing
Fire recovery program	Moderate – efficacy will depend on vegetation type and extent of damage	Ongoing
Pre-suppression plan with CFA to minimise damage by suppression	Moderate – success will depend on location of fire and attending fire service's knowledge	Ongoing – updated annually before declared fire danger period

Each reserve should have a written fire management plan (short bushfire management statements for Low and Moderate reserves, and detailed plan for High category reserves), detailing the standard to which treatments should be maintained, and the timing of their implementation. In addition annual works plans and records of works undertaken should be kept. The Strategy recommends generic treatments standards and timing for treatments, however they should be tailored to suit the site-specific conditions and management objectives of each reserve.

The recommended frequency column in table 5.1 has reference to the 'declared fire danger period'. The CFA declare fire danger period by municipality. The timing of the declaration depends on the local conditions such as weather and vegetation moisture, and may commence as early as October and continue as late as May, depending on the season (CFA, 2012a).

A common sense approach also needs to be applied to the planning and implementation of treatments and works. In drier years, FCC should anticipate an earlier onset to the fire danger period, and be prepared for such. During wetter spring and summer seasons, high growth can be expected and therefore the maintenance cycle for fuel management may need to increase. In areas nominated for fuel management (such as and APZ or BMZ) that are seasonally inundated, or contain standing water during wet years, the APZ need only be constructed when the area is dry.

The range of treatments applicable to a given reserve is dependent on the management objectives set for that reserve. For example, if the primary objective is asset protection then treatments that address fuel management, ignition management, suppression effort, community engagement and the retrofitting of assets to BAL construction standards would be applicable (Wakefield *et al.*, 2009). However, if the reserves primary reason is for biodiversity conservation a different suite of option may be more applicable as both biodiversity conservation and asset protection may not necessarily be achievable in all situations (Driscoll *et al.*, 2010). It is therefore important to be clear about management objectives and their relative priority in each area, and be aware of the implications of different treatments. Treatment options are discussed below.

5.3 *Fire management zones*

In 2009 Terramatrix undertook a project to review fire management zones for FCC's bushland reserves (Terramatrix, 2009). Three types of fire management zones were adopted by FCC to meet fire management objectives and that reflected the purpose of fire management in the reserves. The zone terminology adopted was consistent with that used by DSE (now DEPI) in their Code of Practice for Fire Management on Public Land (DSE, 2006), although the performance standard and prescribed management techniques were tailored to better suit the FCC reserves . The zones were:

- Asset Protection Zone
- Strategic Wildfire Moderation Zone
- Ecological Management Zone

The Code of Practice has since been updated (DSE, 2012) consistent with recommendations made by the 2009 Victorian Bushfire Royal Commission (VBRC, 2010), with the Strategic Wildfire Moderation Zone replaced with the Bushfire Moderation Zone. The Ecological Management Zone has been replaced with Landscape Management Zone. For consistency in terminology, these new names has been adopted for this Strategy.

5.3.1 Asset Protection Zones

The objective of the Asset Protection Zone (APZ) is to prevent direct flame contact or radiant heat ignition of houses or other significant assets in, or adjacent to, the reserve, from vegetation burning within the reserve. The APZ will typically be in areas of the reserve that abut houses or other valuable assets vulnerable to bushfire, such as electricity or water infrastructure.

It is recommended that an APZ is implemented within both Moderate and High priority reserves. A decision-tree is provided in Figure 5.1 to assist FCC in determining the appropriate locations for an APZ within a reserve. It should be highlighted that the decision of where to locate APZs within High Priority reserves should be embedded within the development of a fire management plan, taking into account the broad suite of considerations, as outlined in Box 5.1 and 5.2.

The recommended APZ width for the Moderate priority reserves is six metres from the fence line where houses are located close (within 10 metres) to the reserve. The purpose of the APZ is to reduce the likelihood of flame and radiant heat impingement on the dwelling, and is some areas may facilitate access for firefighting and other fire management treatments. The width of the APZ in Moderate priority reserves is minimal, as the chance of significant fire behaviour is considered limited. The standard of fuel management within the six metre APZ should be grass mown to ten centimetres, maintained throughout the declared fire danger period.

The width and location of APZs in High priority reserves should be based on the site specific conditions. Terramatrix previously consulted on the width of APZs for 11 FCC reserves (Terramatrix 2009, 2011). Of the reserves classed as High priority in this Strategy, an assessment of APZs has not been undertaken for North Reserve/Stringy Bark, and Seaford Wetland.

The APZs for Bunarong Park, Kananook Creek, Monique Bushland Reserve, Paratea Flora and Fauna Reserve, Studio Park, Lower Sweetwater Creek and Upper Sweetwater Creek, and Stevens/Lexton/Little Boggy Creek (Terramatrix, 2009, addendum Terramatrix, 2012 and Terramatrix, 2011) were modelled using an FFDI of 100 and a radiant heat threshold of 12.5kW m^{-2}, using an approach consistent with that used to calculated defendable space in the (now redundant) Wildfire Management Overlay (WMO).

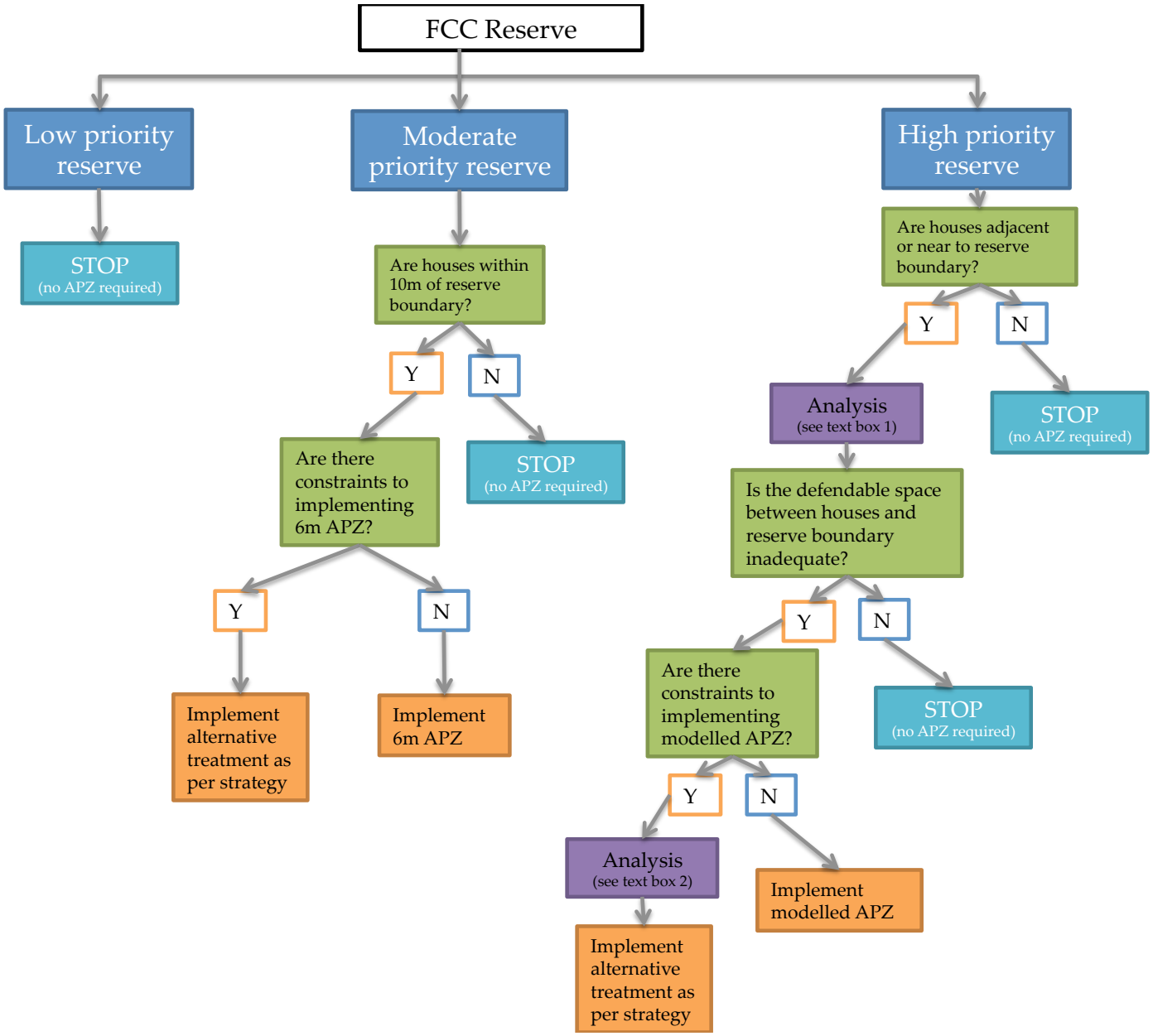


Figure 5.1 - APZ decision tree for Low, Moderate and High priority reserves

Box 1 – Modelling APZs

To determine the width of an APZ to avoid flame contact on houses and reduce radiant heat to less than 12.5kW m^{-2}, Terramatrix analyse the following:

- Credible fire scenarios
- Weather
- Vegetation type
- Vegetation structure
- Fuel load
- Slope
- Aspect
- Reserve size
- Direction of fire spread

Box 2 – Constraints to implementing an APZ

The following are constraints that may hinder or limit the implementation of an APZ. The list is not exhaustive.

Social	Environmental	Operational
• Landscape/amenity values • Resident opposition • Heritage values	• Locally significant flora or fauna • EVC conservation status • Threatened species • Soil/erosion • Wetland/riparian vegetation • Legislative or permit requirements	• Safety • Slope • Rocks • Water/wet areas • Access • Cost

As fire management plans are reviewed in the future, there will be an opportunity to reassess APZs using a consistent approach, in line with the most relevant techniques for assessing and managing vegetation for dwelling protection. Until this time, the existing APZs are considered adequate to meet the fire management objectives.

Currently the most valid approach would be one consistent with that used for determining defendable space for new development under AS3959-2009 (Standards Australia, 2009) and the Bushfire Management Overlay (BMO) (DPCD, 2011). It is recommended the radiant heat threshold should be set at 12.5kW m^{-2}, in areas where dwellings were constructed prior to the introduction of building and planning for bushfire protection was introduced. 12.5kW

m^{-2} is the level at which unprotected float glass may fail (Standards Australia, 2009). This radiant heat threshold may be increased in areas where a construction standard on the adjacent dwellings (or an alternative protection measure) is present to justify increasing the threshold.

The vegetation management standard required for APZs designed using the BMO approach is consistent with that of the BMO defendable space inner zone standards. Works in the APZ should aim to manage fuel in the following condition:

- Within 10 metres of a building flammable objects such as plants, mulches and fences should not be located close to the vulnerable parts of the building such as windows, decks and eaves.
- Trees must not overhang the roofline of the building, touch walls or other elements of a building.
- Grass should be kept short.
- All leaves and vegetation debris must be removed at regular intervals.
- Shrubs should not be planted under trees.
- Plants greater than 10 centimetres in height at maturity must not be placed directly in front of a window or other glass feature.
- Tree canopy separation of two metres and overall canopy cover of no more than 15% at maturity.
- As the APZ is not intended to protect assets from ember attack, the bark hazard is not included in the management regime. It would, however, be beneficial to remove the loose bark from on and around trees in areas close to assets where the bark hazard is Very High to Extreme.

The APZ should be maintained to this period throughout the declared fire danger period

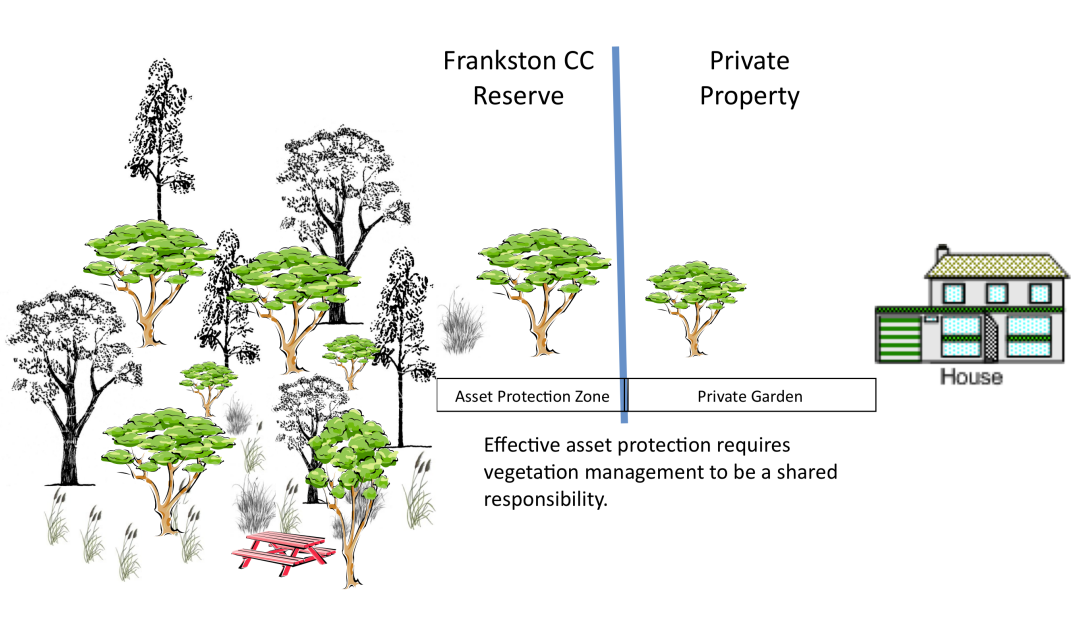


Figure 5.2 - Shared responsibility to provide adequate defendable space around dwellings

The effectiveness of APZs is heavily reliant on commensurate fuel management being undertaken on adjacent private land between the reserve and the dwelling. In instances where there is garden between the reserve boundary and the house, the purpose of the APZ is to moderate the fire behaviour such than any vegetation management undertaken by residents on their property is effective. In instances where there is little or no vegetation management, the APZ may not prevent ignition of garden vegetation and the subsequent ignition of the house. The concept of shared responsibility is essential, where fuel management on both sides of the reserve boundary contributes to the requisite defendable space (see Figure 5.2).

APZs immediately adjacent to reserve boundaries may have additional functions such as providing emergency access, a control line under moderate fire conditions, reducing the impact on private assets near the boundary such as fencing and sheds, and providing residents with a highly visible indicator that the reserve is being managed responsibly. In such areas stringent management such as removing elevated fuel and slashing the grass is appropriate.

The fuel management required in the APZ may have significant impact on ecological, cultural and economic values. In such cases, the requisite fuel management takes precedence over other management objectives, but should be undertaken in a manner that minimises negative impacts as far as possible without compromising the fuel management outcome.

5.3.2 Bushfire Moderation Zones

Bushfire Moderation Zones (BMZs) were previously known as Strategic Wildfire Moderation Zones (SWFZ). The nomenclature has been changed to provide consistency with the recommendations of the VBRC. The objective of the BMZ is to provide strategic areas of sufficient width and continuity to provide a substantial reduction in bushfire behaviour.

Management of the BMZ aims to reduce the speed and intensity of a bushfire, reduce the potential for spot fire development, and provide areas which enhance the effectiveness of suppression activities (DSE, 2012).

Given the relative isolation and small size of the bushland reserves in the City of Frankston it is considered unlikely that there will be significant scope for BMZs, which are designed to provide a substantial barrier to fire spread by moderating fire behaviour over a considerable geographic area. An exception to this assumption might be where the FCC reserve is part of a larger complex of contiguous bushland. They may also be advantageous in moderating fire spread in long narrow reserves where existing features (such as roads) may assist in creating these zones. In the BMZ, fire management objectives should be balanced with ecological management objectives. Management prescriptions may include burning in ecologically accepted timeframes, mechanical removal of fuels, and removal of woody weeds.

5.3.3 Landscape Management Zone

Landscape Management Zones were previously Ecological Management Zones. The objective of the Landscape Management Zone (LMZ) is to maintain or enhance the ecological values (flora and fauna). The priority within these zones is to provide a range of management regimes, including burning if appropriate, weed removal and ecological enhancement.

Any fuel hazard reduction achieved through this process will enhance bushfire safety. It should be recognised, however, that planned burning in some EVCs can actually increase the fuel hazard of some elements for a period of time. For example, an increase in elevated fuel hazard in a long unburnt area can result as peas and wattles germinate from a soil-stored seed bank. Similarly weed control in the LMZ should be undertaken with consideration of the integrity of the adjacent APZ. The physical removal of weeds from the reserve following treatment should be considered on a case-by–case basis. Some weeds (particularly woody weeds and vigorous climbers) that are sprayed and left standing may pose an increased fuel hazard for a significant time after death.

It is also important to ensure that any increase in fuel hazard does not compromise the effectiveness of the adjacent APZ.

5.4 Vegetation management techniques

There are a number of different methods by which the management prescription can be achieved within each of these zones. The following outlines some of the techniques. Their selection must be based on what is appropriate for the site.

5.4.1 Planned burning

Planned burning is a multi-faceted tool that involves the use of fire under controlled conditions, and can be described as the application of fire at specific intensities, seasonality and frequencies to achieve desired management outcomes (Tolhurst, 2003). In relation to reserve management in the City of Frankston, planned burning refers to fuel reduction burning, ecological burning and bark candling. Each of these techniques will be discussed.

Fuel reduction burning

Fuel reduction burning (FRB) for asset protection aims to maintain large areas of native vegetation below a pre-determined fuel load/hazard threshold to reduce the risk of uncontrollable bushfire. FRBs are generally used in conjunction with other fuel management as a means of providing asset protection. The effectiveness of an FRB in providing protection is dependent on its proximity to the asset (Gibbons *et al*., 2012; Driscoll *et al*., 2012), size and the frequency at which the area is burnt. To maintain fuels at low levels, short burning rotations are needed, which may be as frequent as 1 – 4 years as litter fuels re-accumulate quickly post burn (Ashton, 1975; Attiwill and Guthrie, 1978; Fox *et al*., 1979; Raison *et al*., 1986; Denham *et al*., 2009). It is also becoming clear that the effect of FRB on protecting assets diminishes under severe weather events (i.e. FFDI >100) as the effect of weather (wind speed, relative humidity and temperature) overrides the effect of topography and fuel load (Fernandes and Botelho, 2003, Morrison *et al*., 1996). It is also important to note that high frequency FRB is likely to have negative consequences for biodiversity in some Australian ecosystems (Morrison *et al*., 1996). The effect of one-off FRBs may be short lived (with the exception of bark fuel reduction) and FRB needs to be considered as part of a wider fuel management program, understanding that asset protection and biodiversity conservation may be in direct conflict in some circumstances (Morrison *et al*., 1996).

Bark candling

Bark candling is the application of controlled fire to the bole of trees either within burn units or on fuel breaks for the purpose of reducing bark hazard (Vandenborn, 2010). This reduction in bark hazard enhances the effectiveness of fuel breaks by reducing the impact of short distance spotting (Vandenborn, 2010). This technique is used extensively by DEPI/Parks Victoria fire managers as part of pre-burn preparation works and has direct application within the City of Frankston as a useful technique aimed at reducing the incidence of ember attack from trees on the edge of reserves and/or APZs.

Empirical data for bark hazard re-accumulation in Victorian forest-types is scant, however some comparisons can be drawn from the results of 'Project Vesta' (Gould *et al.*, 2007) that was carried out in Jarrah (*Eucalyptus marginata*) forest in Western Australia. This forest is structurally similar to Messmate dominated (*E. obliqua*) forest types in Victoria, both being stringybark dominated dry sclerophyll forests. Gould *et al.*, (2007) show a bark hazard accumulation curve which demonstrates bark hazard remaining below the Vesta score of 2 for approximately 5 years after the burn. The conversion table in the back of the Overall Fuel Hazard Assessment (OFH) Guide (Hines *et al.*, 2010) converts a Vesta score of 2 to a bark hazard rating of 'High'. This rating is in turn equates to approximately 2 t/ha.

Ecological burning

Distinct from FRB, ecological burning has clear management objectives of applying controlled fire for the health of a given ecosystem. Fire, or lack of fire, is an essential component of the ecology of Victoria's native vegetation communities and their constituent species, with vegetation communities displaying a wide range of adaptations to fire (Cheal, 2010). The integration of ecology into fire management planning is based on knowledge of the life history or 'vital attributes' of the flora species within a community (Cheal, 2010). Vital attributes are those attributes of a plant species that are vital to its role in a vegetation replacement sequence (Noble and Slatyer, 1980).

From knowledge of plant vital attributes, the concept of 'tolerable fire intervals' (TFIs) has been developed. TFIs are burning parameters, set in years, and are expressed as a minimum and maximum TFI. The *shortest* TFI is set by those species that take the *longest* time to reach maturity and the *longest* TFI is set by those species with the *shortest* time to local extinction due to the absence of fire (Friend *et al*., 2003). It is clear that the shortest TFI for many communities may be much higher than the 1-4 year rotation set for asset protection. While ecological burning may result in a short-term reduction in fuel loads, the purpose of ecological burning is for biodiversity conservation rather than asset protection.

5.4.2 Mechanical/chemical vegetation management and weed control

Mechanical weed control/vegetation removal may be necessary to maintain defendable space created by APZs. Ongoing maintenance will be required at a cost to FCC. It is important that vegetation cleared for fire management purposes is removed from the site, or to a location (away from assets) where it does not pose a fire hazard.

Many areas of bushland in close proximity to urban settlement are prone to invasion by exotic weeds. This is considered a major threat to biodiversity in some ecosystems (Paynter and Flanagan, 2004). There is some evidence to suggest that a change in fire behavior can be expected due to the differences in architecture, biomass and combustibility characteristics of the invasive species (Aires, 2012). It is logical that in many cases the removal of such weeds may result in a reduction in fire hazard, however the reverse may result if weeds of low flammability such as Ivy (*Hedera spp.*) or *Tradescantia* are removed and revegetated with fire prone natives.

Chemical herbicide is another method that is useful for weed control, however this technique will need careful follow up due to the fact that the plant material is not removed

from site, and fire hazard may increase for a period of time following the herbicide application.

5.4.3 Vegetation management by hand

In high value conservation areas, or where high value species are present, vegetation removal and maintenance may need to be undertaken by hand. This technique may also be appropriate in areas that are difficult to reach due to constraints on access. Although this is a resource intensive technique, it allows selective removal and can reduce the overall impact of the work.

5.5 Firefighter/emergency vehicle access

Whilst providing adequate firefighter or vehicle access into the reserve may not reduce potential ignitions or modify fire behavior, it will help to reduce the spread of fire by increasing the effectiveness of suppression efforts. Many reserves currently have access around their perimeter in the form of an APZ and in many situations this will be adequate for access. If access is inadequate or non-existent, the construction of a fuel break or fire fighting access track (up to 6m in width) is exempt from requiring a vegetation clearing permit under clause 52.17 of the Victoria Planning Provisions. It is recommended that the minimum standards for access should be consistent with that set out in the CFA Fire Service Guideline 0002 (CFA, 2012b):

- A minimum trafficable width of 4m, with a 1m slashed edge; and
- A maximum grade of 15 degrees at any point along its length.

It is also worth noting that DSE (now DEPI) have minimum design standards set out for the various forest road classes in the *Road Operational Guidelines* (DSE, 2007).

Given that each reserve is likely to be different in its specific requirements, it is advisable to liaise with the CFA to determine their minimum access requirements.

5.6 Community engagement programs

Community engagement and empowerment is a central tenant of good emergency management practice (Elsworth *et al.*, 2010). It is well recognised that involving communities in building capacity and resilience can significantly reduce the impact of a disaster.

The International Association for Public Participation (IAP2) provide significant resources to inform and support the development and implementation of appropriate community engagement programs. These resources are a useful starting point when developing a community engagement strategy and related programs. The IAP2 Public Participation Spectrum (IAP2, 2004) details engagement from simply consulting with the public to involving, collaborating and empowering. The spectrum shows that differing levels of participation are legitimate depending on the desired outcomes.

The level of public involvement in decision-making about fire management is something that needs to be decided by FCC. The level of engagement will guide what programs may be run. A number of possible community engagement actions are listed below. This list is by no means exhaustive. It is recognised that FCC are currently undertaking many of these actions.

- Include bushfire awareness information in FCC newsletters, the local paper and the FCC website;
- Public displays of reserve bushfire management plans;
- Provide pre-fire season information, including contacts to find further information, such as the CFA and Victorian Bushfire Information Line;

- Publicise the existence of local laws prohibiting burning off;
- Promote green waste collection services, and consider increasing green waste collection during high growth periods before and during the fire danger period;
- Use networks to promote bushfire safety;
- Investigate and update bushfire information given to new residents living near or adjacent to a reserve (owner occupiers and renters);
- Promote and distribution CFA publications, such as "Prepare, Act, Survive";
- Promote and distribute information on retrofitting houses , CFA's "A guide to retrofit your home for better protection from a bushfire";
- Promote fire agency websites;
- Provide information about the effects of fire;
- Support reserve friend's groups;
- Working bees with residents;
- Hold pre-fire season bushfire safety meetings (in conjunction with the CFA), particularly for residents around high priority reserves; and
- Distribute information to commercial ratepayers and tenants about potential impacts, particularly embers, smoke and traffic disruption.

The best community safety program will be designed with the outcomes and audience in mind. In particular Terramatrix recommend FCC strengthen engagement around fire management, with neighbours immediately adjacent and in close proximity to reserves (in particular high priority reserves). As community involvement is a fundamental part of bushfire safety, it is also recommended FCC employ a dedicated member of staff to develop and implement the programs.

5.7 Bushfire Attack Level (BAL) construction standard retrofitting

The Victoria Planning Provisions now require that all new dwellings within a declared Bushfire Prone Area (BPA) or within the Bushfire Management Overlay (BMO) be built with the consideration of bushfire risk. The Australian Standard 3959 (AS3959-2009) (Standards Australia, 2009) provides clear direction on how to construct buildings to achieve enhanced

bushfire protection under a range of bushfire attack levels (BALs). Many existing homes, however, were constructed prior to the introduction of building and planning controls, and are unlikely to meet any building standard for bushfire.

The CFA publication *A Guide to Retrofitting Your Home for Better Protection from a Bushfire* (CFA, 2011a) is a good resource for residents living adjacent to bushland reserves. Increasing the construction standard will reduce the likelihood of fire igniting a dwelling. In addition, where the construction standard is above BAL12.5, there is justification for increasing the radiant heat threshold used in the design of APZs, thus reducing their width.

5.8 Garden design/appropriate planting

The survivability of buildings, and those that occupy and shelter within them, can be significantly enhanced or endangered by the type of plants around the building (CFA, 2011). The condition of vegetation within close proximity of the house may determine its survivability, with a recent study (Gibbons *et al.*, 2012) showing that the condition of vegetation within 40m of the house was a major factor in determining its survivability on Black Saturday.

The CFA publication *Landscaping for Bushfire* (CFA, 2011b) is a good resource for residents living near a bushland reserve. The guide sets out clear principles for landscaping that will reduce the likelihood of bushfire impact. It also provides examples and lists appropriate plant species for a range of settings. To enhance the relevance of this guide, FCC should consider developing a product (eg. pamphlet or webpage) that lists plants residents should plant (such as native species) and shouldn't plant (such as invasive weeds).

Section 6 – Monitoring and evaluation

Undertaking a methodical practice of monitoring and evaluation ensures actions and decisions are documented for future reference, the efficiency of treatments can be tracked and the effectiveness of controls confirmed. Monitoring and evaluation also provides a basis for reporting, enables assessment of treatments for their impact and appropriateness, leading to continuous improvement, and a process to promote accountability.

6.1 Record keeping

Systems for record keeping and filing (such as documenting what works are planned, when they are undertaken, how they are maintained and any monitoring to assess requirement for additional work) should be developed and maintained. In addition, any resident (or other stakeholder) queries about a reserve, and how that query was managed, should be collated and stored for historical reference. Any decisions regarding changed management practices should be documented, detailing the reasoning that underpins the change.

Ideally, any information about a reserve would be spatially referenced to that reserve (see 'Spatial data and visibility' below).

6.2 Monitoring flora and fuel hazard

The fuel load/hazard of vegetation is dynamic, and can decrease and increase for a variety of reasons. Ongoing fuel hazard assessment within reserves will be a valuable resource for understanding the fuel dynamics and inform what fuel load is appropriate to use when determining APZs and other fuel management treatments (particularly for High priority reserves). There is little data available on fuel loads and fuel accumulation in native vegetation, and even less on vegetation within small urban reserves.

Fuel hazard assessment and an indicative fuel load can be obtained using the *Overall Fuel Hazard Guide* 4th Edition (Hines *et al.*, 2010). To accurately measure fuel loads requires destructive fuel sampling, which although more accurate, is resource intensive.

In addition to fuel hazard, life-stage assessment for monitoring flora and community outcomes and planning prior to burning, should be undertaken. A key resource to ensure monitoring is consistent with statewide protocols is the *Flora Monitoring for Planned Burning: a user's guide* (Cawson and Muir, 2008).

6.3 Spatial data and visibility

The use of GIS to store, sort, manage, retrieve, analyse and visually express information has the potential to be a valuable and powerful monitoring and evaluation tool. A well-designed and maintained GIS database will be able to access most information relevant to a reserve management.

6.4 Periodic review

A period review of both the Strategy and individual reserve fire management plans should be undertaken at regular intervals (every 5-10 years). The review process should include an audit to ensure works are being implemented as specified, evaluation of current treatment effectiveness (informed by the ongoing data collection) and consideration of whether there have been any changes in either the context, hazard, exposure or vulnerability.

Significant changes in or around a reserve (for example the expansion of a reserve, or new residential development adjacent to a reserve) should be a prompt to review and update the reserve bushfire management plan and required treatments.

6.5 Benchmarking

The initial project plan incorporated a workshop with other council's to ensure FCC are adopting a best practice approach to fire management. This style of meeting would also provide the opportunity for FCC to consult with other councils on issues such as approaches to fire management and resourcing. Due to time constraints this was not possible to prior to the completion of the Strategy. In addition, FCC Natural Reserves team sought benchmarking data from other councils in regards to resourcing and funding in reserves. This information was not also unavailable in time to be included in the report.

The sentiment of FCC to consult with other councils and agencies should be commended. It is recommended FCC seek to take an active role in establishing relationships with other councils and agencies to both share information, establish best practice management techniques and also work towards setting up a consistent approach to fire management, particularly within in Frankston to strengthen cross-tenure planning.

Section 7 – Communication and consultation

Managing for bushfires can be complex, particularly where there are many stakeholders involved and a variety of different (and often competing) management objectives. Terramatrix favour a collaborative approach to decision making, whereby stakeholders are involved throughout the process, enabling the identification of possible issues or conflicts and the opportunity for negotiation to find a best-fit solution. In our experience, time and resources invested in good planning can significantly reduce problems (and their associated costs) down the track.

Issues in management priorities commonly arise between bushfire management objectives, ecological management objectives and development (building and planning) objectives. To reduce the incidence of issues becoming actual conflict, developing strong relationships and communication processes between FCC departments and other stakeholders is a pragmatic way to identify issues early, seek common ground and negotiate a resolution.

7.1 Bushfire management, building and planning

Tensions between new development (particularly residential) adjacent to reserves and fire management, appears to a recurring theme throughout Frankston (and many other municipalities in Victoria). The majority of FCC is declared a Bushfire Prone Area (BPA), and/or sits within the Bushfire Management Overlay (BMO). Areas covered by the BPA and BMO require that bushfire be a consideration in the development, and informs the construction standard of the building (for both BPA and BMO) and vegetation management, access and water requirements (BMO only).

It is recommended that FCC undertake a stock take of potential future development, including both infill in existing subdivisions and new subdivisions. This information can then be used to understand how significant the problem may be. A systematic and

consistent approach can then be negotiated within FCC and with the CFA (or other relevant stakeholder).

With regard to infill development next to natural reserves, a consideration for FCC will be what level of vegetation management is the Council willing to undertake to satisfy the bushfire management requirements of the CFA in order to facilitate development. A possible resolution may be that if the development is unable to meet the defendable space requirements within the block, FCC will consider additional works in the reserve, commensurate with the level of protection provided for existing dwellings.

New subdivisions should be designed such that all the requisite defendable space is located within the property boundary, according to the subdivision design principles set out by the CFA (CFA, 2011c).

In the situation where there is a requirement to offset vegetation removal, or there are plans to create or expand a reserve, full consideration should be given to the bushfire hazard implications of the works. Common sense should prevail, whereby offset sites are located so as not to increase the bushfire hazard to residents; and where changes result in an increase to the potential bushfire risk, treatments are put in place to mitigate that risk.

7.2 Bushfire management and ecological management

Strong tension also exists between managing the reserves for ecological purposes and for bushfire safety purposes, as treatments such as intensive fuel management will invariably compromise ecological values. Again, the suggested solution will come from involving all relevant stakeholders early on in the planning phase to negotiate a resolution. Whilst managing the bushfire risk for life safety takes primacy over any other objective, factors such as reserves in Frankston being of a relatively small size, well serviced by the CFA and

there being no recorded history of life loss due to a bushfire in or around an FCC reserve (or possibly any similar reserve in Australia), there is significant opportunity to negotiate bushfire management options, rather than simply applying a one-size fits all vegetation removal strategy.

Section 8 – Reserve analysis

SEE RESERVE ANALYSIS - ATTACHED

Section 9 – References

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Appendix 1 – Strategy implementation: actions and timelines

No.	Action	Priority	Completion target	Responsibility	Tasks	Progress
Administration						
1.	Endorsement of the Strategy from the Frankston MFMPC.	High	December 2013			Complete
2.	Endorsement of the Strategy from the Frankston CC.	High	December 2013			
3.	Form an FCC bushfire management working group ('Working Group') to oversee the implementation of the Strategy and coordination of fire management across the municipality.	High	December 2013			
4.	Working Group to add detailed tasks to each Strategy implementation actions.	High	June 2014			
5.	Working Group to assign FCC officers responsible for ensuring delivery of each action.	High	June 2014			
6.	Working Group to develop a Strategy implementation plan and schedule to inform budget and resource allocation.	High	June 2014			
7.	Periodic review of the Strategy every 5-10 years.	High	5-10 years			

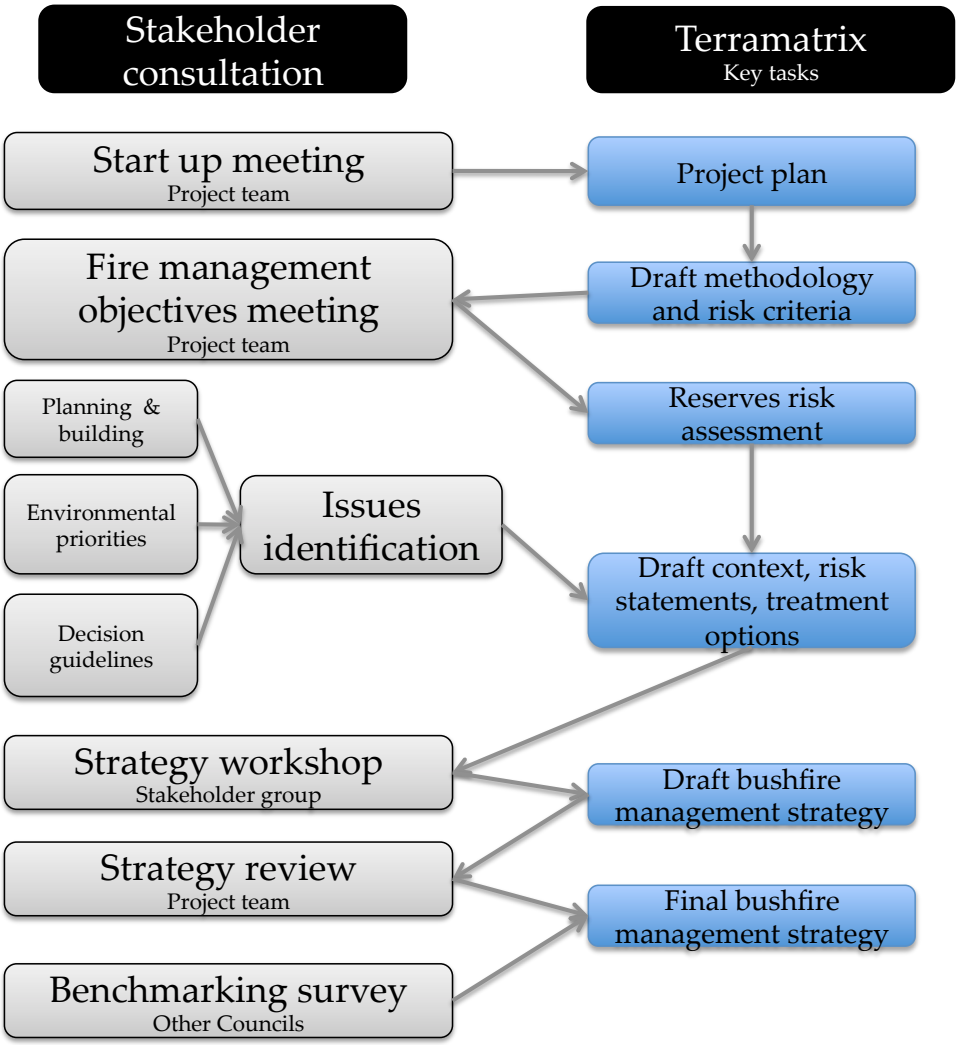
No.	Action	Priority	Completion target	Responsibility	Tasks	Progress
8.	Establish record keeping protocols for all reserves, to ensure any events or changes in management regime are documented, and the rationale can be traced.	Moderate/ High	June 2015			
9.	Establish a monitoring program to inform the evaluation of treatments, including collecting fuel hazard data and ecological information (such as vital attributes).	High	June 2015			
10.	Perform a stock take of future development to assess the scale and impact of the BPA and BMO across the municipality.	Moderate	June 2015			
Reserve Management						
11.	Develop fire management plan for all High priority reserves (not currently covered by a 'fire management zone' report)	High	December 2015			
12.	Upgrade 'fire management zone' reports to fire management plan for all High priority reserves	Moderate	<5 years of FMZ report			
13.	Develop a bushfire management statement template for medium priority reserves	High	June 2014			
14.	Develop a bushfire management statement for each medium priority reserve	High	June 2015			

No.	Action	Priority	Completion target	Responsibility	Tasks	Progress
15.	Develop a bushfire management statement template for low priority reserves	Moderate	June 2016			
16.	Develop a bushfire management statement for each low priority reserve	Moderate	June 2017			
17.	Periodic review of the reserve fire management plans and statements every 3-5 years.	High	3-5 years after FMP			
18.	Maintain annual works plans and records of work undertaken for each reserve.	High	Ongoing			
Communication						
19.	Maintain relationships with other agencies and FCC departments, regarding reserve management (eg. through IFMP).	High	Ongoing			
20.	Build relationships with other organisations with similar bushfire management responsibilities (such as other councils) to share information, establish best practice and work towards developing consistent approaches.	Moderate	Ongoing			
21.	Create and maintain relationships with stakeholder groups that may be impacted by reserve fire management planning	High	Ongoing			

No.	Action	Priority	Completion target	Responsibility	Tasks	Progress
22.	Develop a community engagement strategy for delivering bushfire safety information, in particular for residents living close to bushland reserves.	High	June 2015			
23.	Provide residents with bushfire information tailored for FCC, such as fire season newsletters, local planting guides for bushfire protection.	Moderate	Ongoing			

Appendix 2 – Consultation plan

The consultation plan for the development of the FCC Bushfire Management Strategy.



Appendix 3 – Glossary

AS3959:2009* -

The Australian Standard for *Construction in Bushfire Prone Areas*.

BMO*

Clause 44.06 of the Victorian Planning Provisions- *Bushfire Management Overlay*

BPA (Bushfire Prone Area)

Areas in Victoria designated as bushfire prone where specific bushfire construction standards apply.

Bushfire#

Unplanned vegetation fire. A generic term which includes grass fires, forest fires and scrub fires both with and without a suppression objective.

BAL (Bushfire Attack Level)*

A means of measuring the severity of a building's potential exposure to ember attack, radiant heat and direct flame contact, using increments of radiant heat expressed in kilowatts per square metre, which is the basis for establishing the requirements for construction to improve protection of building elements from attack by a bushfire (AS 3959:2009).*

BAL ratings*

Used as the basis for establishing the requirements for construction to improve protection a (proposed) building from bushfire attack. There are 6 BAL ratings, low, 12.5, 19, 29, 40 and FZ.

Defendable space*

An area of land around a building where vegetation is modified and managed to reduce the effects of flame contact and radiant heat associated with a bushfire. Defendable space generally comprises an **inner zone** and an **outer zone**.

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*Source: CFA (2012) *Planning for Bushfire Victoria*.
#Source: AFAC (2012) *Glossary*

Embers[#]

Glowing particles cast from the fire (as 'showers' or 'storms').

FDI (Fire Danger Index)[#]

A relative number denoting the potential rates of spread, or suppression difficulty for specific combinations of temperature, relative humidity, drought effects and wind speed.

FDR (Fire Danger Rating)[#]

A relative class denoting the potential rates of spread, or suppression difficulty for specific combinations of temperature, relative humidity, drought effects and wind speed, indicating the relative evaluation of fire danger.

Fuel[#]

Any material such as grass, leaf litter and live vegetation which can be ignited and sustains a fire. Fuel is usually measured in tonnes per hectare.

Rate of spread[#]

The speed with which a head fire moves in a horizontal direction across the landscape.

Steady state fuel load*

The amount of available fire fuel when the fuel bed is in equilibrium and the rate of accumulation is equal to the rate of decomposition.

Acronyms

APZ Asset Protection Zone

BAL Bushfire Attack Level

BPA Bushfire Prone Area

BMO Bushfire Management Overlay

BMZ Bushfire Moderation Zone

CFA Country Fire Authority

DPCD Department of Planning and Community Development

DEPI Department of Environment and Primary Industries

EVC Ecological Vegetation Class

FCC Frankston City Council

FDI Fire Danger Index

FDR Fire Danger Rating

FFDI Forest Fire Danger Index

FMFMPC Frankston Municipal Fire Management Planning Committee

GFDI Grassland Fire Danger Index

IFMP Integrated Fire Management Planning

LMZ Landscape Management Zone

MFMP Municipal Fire Management Plan

NSP Neighbourhood Safer Place

VBRC 2009 Victorian Bushfires Royal Commission

VFRR Victorian Fire Risk Register