COVEY
ASSOCIATES PTY LTD
Consulting Engineers

BUSHFIRE MANAGEMENT PLAN REPORT

AT

PARKLAKES II STAGES 12-13
8 KIRRA ROAD, MAROOCHY RIVER

FOR

PARKLAKES II DEVELOPMENTS PTY LTD

PROJECT NO: 162011
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Disclaimer

Not withstanding the precautions adopted within this report, it should always be remembered that bushfires burn under a wide range of conditions. An element of risk, no matter how small always remains, and although the standard is designed to improve the performance of buildings, there can be no guarantee, because of the highly variable nature of bushfires, that any one building will withstand bushfire attack on every occasion.

Terms & Abbreviations

Abbreviation	Meaning
AS3959:2009	Australian Standard AS3959:2009 Construction of Buildings in Bushfire Prone Areas, incorporating amendment 1 (November 2009) and amendment 2 (February 2011).
BAL	Bushfire Attack Level
BMP	Bushfire Management Plan
CA	Covey Associates Pty Ltd
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DNRM	Department of Natural Resources and Mines
FBAN	Fire Behaviour Analyst
FDI	Fire Danger Index, which is an indication of severity of fire weather from wind strength, relative humidity, temperature and drought factor.
FDR	Fire Danger Rating
FFDI	Forest Fire Danger Index
GFDI	Grass Fire Danger Index
QFES	Queensland Fire & Emergency Service
RE	Regional Ecosystem
RFS	Rural Fire Service
VMP	Vegetation Management Plan

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1.0 INTRODUCTION

1.1 Background Information

Parklakes II Developments Pty Ltd have commissioned Covey Associates Pty Ltd to provide a Bushfire Management Plan (BMP) Report for a proposed residential subdivision at 8 Kirra Road, Maroochy River. The development site comprises of ninety-five (95) lots – Appendix A. The real property description is Lot 6 on SP 110911.

The BMP has been prepared in accordance with the requirements of Sunshine Coast Council Planning Scheme Policy – Bushfire Prone Areas. The bushfire assessment report is to accompany a development application which will be submitted to Sunshine Coast Council for a Reconfiguration of a Lot Application under a Preliminary Masterplan Approval (MCU07/0192.05. The assessment is triggered as the site is located within a designated bushfire prone area under the State Bushfire Mapping and Council's Planning Scheme Overlay (Figure 1).

It is acknowledged that the Reconfiguration of a Lot application for the subdivision should be assessed against the Maroochy Plan 2000 Bushfire Code, however the report submitted with the MCU was against the current planning scheme and as such the assessment remains against the current planning scheme bushfire code. No negative impacts or consequences are likely to occur as a result of the development against the current planning scheme as both codes contain similar mitigation and assessment methodologies.

The purpose of the BMP is to identify strategies for mitigating the impacts of bushfire on life, property and the environment. This includes identifying specific risk factors associated with the development proposal, planning for the separation of at-risk elements and providing access and treatments to facilitate an effective response to bushfire.

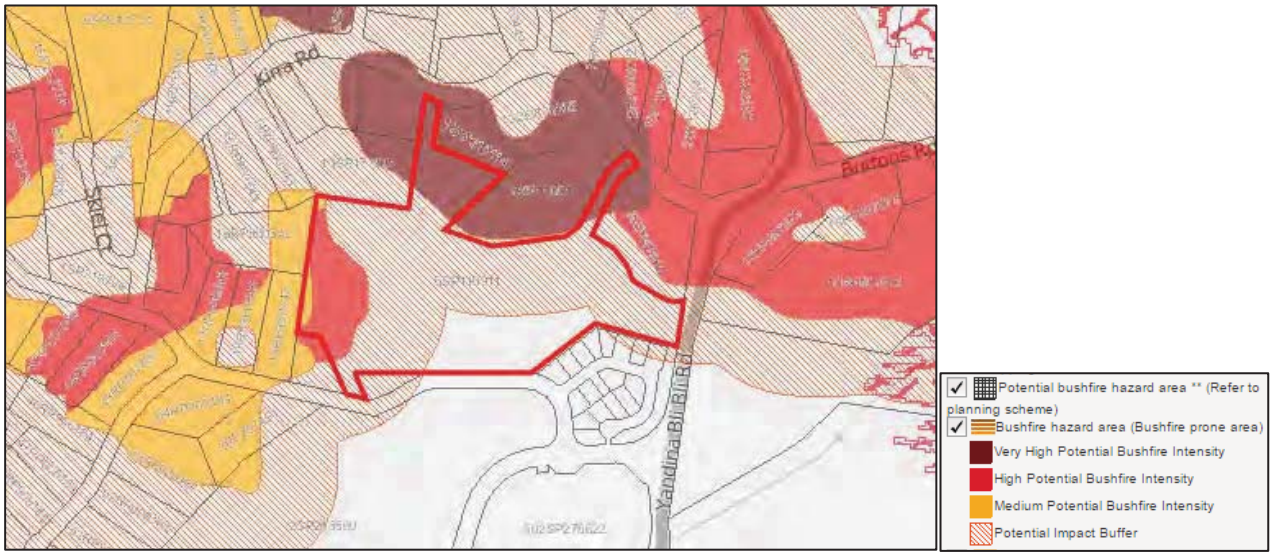


Figure 1 - State Bushfire Hazard Mapping

1.2 Relevant Statutory Requirements

The follow regulatory provisions are relevant to the BMP:

- *Queensland Planning Act 2016*
- *Queensland Nature Conservation Act 1992*
- *Queensland Vegetation Management Act 1999*
- *Queensland State Planning Policy – July 2017 (SPP) Natural Hazards, Risk and Resilience*
- *Sunshine Coast Council – Planning Scheme 2014*
- *Sunshine Coast Council – Planning Scheme Policy for Bushfire Hazard Overlay Code*

- *National Construction Code – Volume 2*
- *Australian Standard AS3959:2009 Construction of Buildings in Bushfire Prone Areas*
- *NASH Standard – Steel Framed Construction in Bushfire Areas 2014*

1.3 Description of the Subject Site

The subject site has an area of approximately 8.99ha. An aerial picture of the site obtained from Nearmap is included in Figure 2. The site is located south of Kirra Road and to the north of the existing Parklakes 2 Master Planned Community development. The site has previously been used for equestrian / lifestyle purposes and has largely been cleared.

The site contains two areas of vegetation (A & B), one to the northern portions of the site which will be retained as part of the development (A) and one to the south which will be cleared (B). Additional vegetation is located to the western boundary of the site.

Figure 2 - Aerial photograph of the site (source: Nearmap, accessed 8 August 2018, photo dated 9 July 2018).

1.4 Description of the Proposal

Parklakes 2 Developments Pty Ltd are proposing to construct ninety-five (95) residential allotments. The residential subdivision will extend the existing Parklakes II Master Planned Community and will form stages 12-13. The proposed development layout is described on the plan prepared by Covey Associates Pty Ltd and is included in Appendix A. A 3d visualisation of the proposal is also included in Figure 3.

The average allotment size of the proposal is 546m^2. Various earthworks including the construction of stone retaining walls will be constructed to accommodate the proposed development. Ingress and egress to the development is via a roundabout fronting East View Court. The stage entrance is not located within a bushfire prone area and provides a safe evacuation route for residents should a severe bushfire impact the estate. An additional informal access to the east of the site is available to Yandina Bli Bli Road through a proposed drainage reserve.

The proposed subdivision layout incorporates two way sealed perimeter roads between allotments and the adjoining bushland. No roads have a gradient exceeding 15 degrees. The perimeter roads provide effective space from which to conduct active firefighting operations and hazard reduction activities. Reticulated water will be provided as part of the development works. Below ground power reticulation is proposed.

Figure 3 - 3d model of the proposed development showing hazardous vegetation elements upslope of proposed allotments

2.0 SCOPE OF WORKS

This report is limited to the following scope:

- Providing Preliminary Bushfire Attack Levels in-accordance with AS3959:2009.
- Providing an assessment of the proposal against Sunshine Coast Planning Scheme – Bushfire Hazard Overlay Code.
- Provide recommendations to achieve compliance with Sunshine Coast Council Planning Scheme Policy – Bushfire Hazard Overlay Code.

No detailed building, engineering or landscape plans have been reviewed as part of this assessment. Detailed assessment of compliance with Building Works to AS3959:2009 will be undertaken by a Building Certifier at Building Works stage. The Preliminary BAL Assessment contains recommendations for Bushfire Attack Levels based on setbacks from hazardous vegetation illustrated on the current proposal plan.

3.0 METHODOLOGY

The assessment methodology for the BMP followed the requirements of SCRC Planning Scheme Policy for Bushfire Prone Areas and Australian Standard AS3959:2009 method 2 for determining Bushfire Attack Levels (BAL's) for proposed residential buildings on the proposed residential allotments. SPARK software was used to determine the bushfire potential risk level. Sections 3.1 and 3.2 outline the methodology followed.

3.1 SPARK - BAL

SPARK-BAL Bushfire Simulation Software produced by the CSIRO was used to calculate the BAL's for the subject site. SPARK-BAL is a software application designed to calculate BAL's as per method 2 in the AS3959 standard (revision 3) over spatial areas.

The application calculates all required fields in the standard from two input layers: a land classification map and topography map and provides a spatial map of the BAL level. The results of the BAL mapping are contained in Appendix B.

3.2 GIS Mapping & Data Input

Quantum GIS software was used to generate the Digital Elevation Model and Land Classification spatial data required by SPARK-BAL as well as the various maps contained in the Appendices. Additional data was obtained as follows:

Data Type	Source
Survey:	LiDAR Survey from Department of Natural Resources & Mines combined with a preliminary design tin for site earthworks to accommodate the subdivision.
Aerial Photography	Nearmaps and Google Earth
Fuel Load:	RE Specific from *A new Methodology for state-wide mapping of bushfire prone areas in Queensland.* CSIRO Australia. These are the maximum potential predicted fuel loads for the Vegetation Hazard Class and RE type. The overall Fuel Load for the vegetation to be retained was assumed to be at 24.2t/ha as consistent with the Vegetation Hazard Class mapped by the State. No fires have occurred on the site and in the adjoining vegetation within the last 15 years, therefore fuel load is assumed to be at its peak state.

4.0 SITE ASSESSMENT

4.1 Vegetation Assessment

A Registered Landscape Architect from Covey Associates with skills in vegetation identification inspected the property on the 8th of February 2018. Photos from the inspection are included in Appendix F. A Regional Ecosystem Map for the site was also obtained from the Queensland at https://environment.ehp.qld.gov.au/map-request/re-broad-veg-group/ and is contained in Appendix E. Regional Ecosystem Data was also downloaded from Queensland Spatial Catalogue and included in the GIS model.

The Regional Ecosystem mapping for the site indicates that two (2) Regional Ecosystems are present at or adjacent to the site, one (1) in the north of the site and one (1) smaller ecosystem to the west of the site:

1. RE12.12.15 – Corymbia intermedia +- Eucalyptus propinqua, E. siderophloia, E. microcorys, Lophostemon confertus open forest on Mesozoic to Proterozoic igneous rocks.

2. RE12.12.14 - Melaleuca quinquenervia or rarely M. dealbata open forest on sand plains

An additional regrowth community is located along an ephemeral stream to the south of the site. This vegetation is proposed to cleared. Further information concerning the vegetation is available in the Ecological Report prepared by Bill Flenady. This report can be accessed via Developmenti under MCU07/0192.05.

Table 1 outlines the applicable vegetation formation class under AS3959:2009 and the vegetation type and the applicable fuel loads assigned in the fire simulation and BAL modelling. The fuel loads and vegetation types listed are considered appropriate. The Tallowwood, Pink Bloodwood and Turpentine trees in the locality would be expected to produce considerable embers which may impact the development in a worst case bushfire event.

Table 1 - Vegetation Formations

Vegetation Type	Description	Vegetation Classification AS3959:2009	Vegetation Hazard Class (SPP Mapping)	Fuel Load Adopted in Model (ground & total) t/ha
RE12.2.14	*Eucalyptus racemosa subsp. Racemosa+- Lophostemon confertus, Syncarpia glomulifera, Eucalyptus acmeniodes woodland usually on rocky near coastal areas on Mesozoic*	Forest (A)	*9.1 Moist to dry eucalypt open forest on coastal lowland ranges*	17.5 / 24.2
RE12.12.15	*Corymbia intermedia +- Eucalyptus propinqua, E. siderophloia, E. microcorys, Lophostermon confertus open forest on Mesozoic to Proterozoic igneous rocks*	Forest (A)	*9.1 Moist to dry eucalypt open forest on coastal lowland ranges*	17.5 / 24.2

4.2 Vegetation Extent and Fire Runs

The subject site is located within a broader variegated area of native vegetation and ex-cane-lands including the Parklakes Conservation Park to the west. Large fire runs (over 1km in length) surround the site from the west and northwest (refer Figure 4). In severe fire weather it is possible, (though unlikely) that large scale landscape scale fires may impact the site with wide fire fronts moving and maximum potential rate of spread and fire intensity under the prevailing fire weather at the time of the fire.

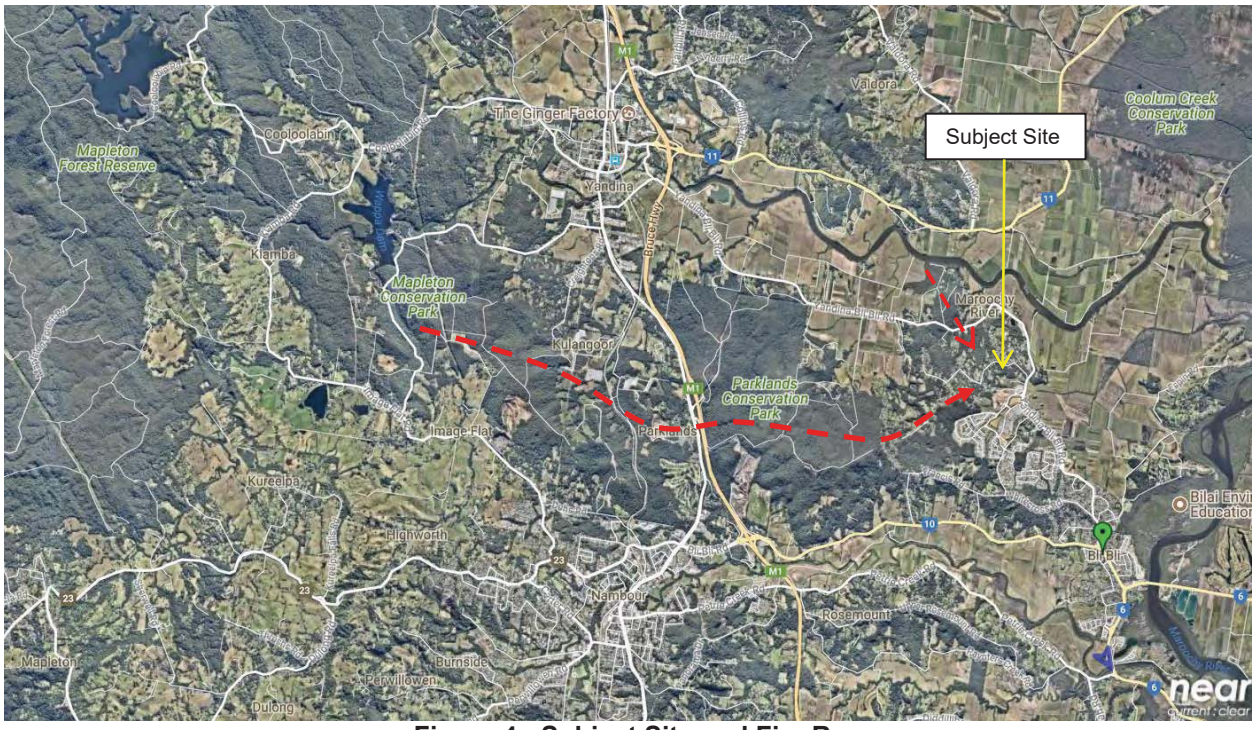


Figure 4 - Subject Site and Fire Runs

4.3 Slope Assessment

Slope was determined by obtaining a Digital Elevation Model (LiDar Survey) obtained from Queensland Department of Natural Resources and Mines.

Effective slope and site slope are automatically calculated in the SPARK-BAL software in every direction from every point following the input of the digital elevation model. A preliminary design tin was produced and meshed with the LiDar survey and input into SPARK-BAL model. The preliminary BAL results are deemed appropriate for Material Change of Use and Reconfiguration of a Lot Stage.

Areas of retained vegetation are located upslope of proposed allotments. Therefore fires approaching the proposed dwellings are likely to be only backing fires with low fireline intensity.

5.0 BUSHFIRE HAZARD ASSESSMENT

5.1 Fire Weather Area

Bushfires can be expected anywhere and at any time of the year, however in Queensland the fire season usually coincides with progressive drying following the autumn rain season, peaking during the spring months of more severe fire weather, and concluding with the arrival of more regular storm events and rain in late spring and summer. On the east coast, this peak fire season is characterised by frequent dry westerly winds and lower humidity. The Fire Danger Index is at its peak in south east Queensland typically in September with August also having a significant frequency of bad fire weather days. The greatest proportion of high to severe fire weather days fall within November. (Leeson 2013). Variation can occur from year to year and location to location.

5.2 Fire Weather Modelling

Fire weather was input into the SPARK – BAL model as a Forest Fire Danger Index (FFDI). FFDI has been developed across Queensland by the CSIRO and is available from the Queensland Spatial Catalogue - DNRM.

The DNRM data set allows interrogation on a site by site basis. The recommended FFDI in the CSIRO data for the site is 50 and also reflected in the Queensland State Planning Policy. A copy of the various FFDI across the Sunshine Coast Council area is contained in Appendix G. Please note that this is significantly higher than the FFDI of 40 adopted in AS3959:2009 for Queensland. The updated FFDI of 50 was developed by the CSIRO on advice from the QFES to represent a 1:20 year or 5% annual exceedance probability (5% chance of occurring any year) for the area surrounding the subject site. The final FFDI was adjusted to reflect the expected climate in the year 2050 using an Intergovernmental Panel on Climate Change A1FI climate scenario.

A FFDI of 50 has a fire danger rating of *severe*. Figure 5 provides a summary of the Fire Danger Rating System used in Australia, the potential fire behaviour, fire impact and action advice. The FFDI index number is displayed in the left-hand column. Fire weather scenarios of extreme or catastrophic would be a very rare event in the Sunshine Coast Region.

Fire Danger Rating	Potential Fire Behaviour and Impact
CATASTROPHIC (CODE RED) FDI 100+	• Fires will be uncontrollable, unpredictable and fast moving – flames will be higher than roof tops. • People will die and be injured. Thousands of homes and businesses will be destroyed. • Well prepared, well constructed and defended homes may not be safe during the fire. Construction standards do not go beyond a Fire Danger Index of 100. • Thousands of embers will be blown around. • Spot fires will move quickly and come from many directions, up to 20 km ahead of the fire. • **Leaving is the best option.**
EXTREME FDI 75-99	• Fires will be uncontrollable, unpredictable and fast moving – flames will be higher than roof tops. • People will die and be injured. Hundreds of homes and businesses will be destroyed. • Only well prepared, well constructed and actively defended houses are likely to offer safety during a fire. • Thousands of embers will be blown around. • Spot fires will move quickly and come from many directions, up to 6 km ahead of the fire. • **Leaving is the safest option for your survival.**
SEVERE FDI 50-74	• Fires will be uncontrollable and move quickly– flames may be higher than roof tops. • There is a chance people may die and be injured. Some homes and businesses will be destroyed. • Well prepared and actively defended houses can offer safety during a fire. • Expect embers to be blown around. • Spot fires may occur up to 4 km ahead of the fire • **Leaving is the safest option for your survival. Your home will only offer safety if it and you are well prepared and you can actively defend it during a fire.**
VERY HIGH FDI 25-49	• Fires can be difficult to control – flames may burn into the tree tops. • There is a low chance people may die or be injured. Some homes and businesses may be damaged or destroyed. • Well prepared and actively defended houses can offer safety during a fire. • Embers may be blown ahead of the fire. • Spot fires may occur up to 2 km ahead of the fire. • **Your home will only offer safety if it is and you are well prepared and you can actively defend it during a fire.**
HIGH FDI 12-24	• Fires can be controlled • Loss of life is highly unlikely and damage to property will be limited • Well prepared and actively defended houses can offer safety during a fire. • Embers may be blown ahead of the fire. • Spot fires can occur close to the main fire. • **Know where to get more information and monitor the situation for any changes**
LOW-MODERATE FDI 0-11	• Fires can be easily controlled • Little to no risk to life and property • **Know where to get more information and monitor the situation for any changes**

Figure 5 - Fire Danger Rating System. Source:
http://www.windellama.bushfirebrigade.com.au/windellama_rfs_fdi_ratings.php

5.3 SCPS Bushfire Overlay Code

An assessment against the Sunshine Coast Council Planning Scheme code for Bushfire Overlay is provided in Appendix H. The proposed development and mitigation methods meet the code requirements.

5.4 History of bushfire frequency

A review of Landsat fire scar data for the years 1987 to 2016 downloaded from Queensland Spatial Discovery Catalogue. This was viewed at a scale of 1:15,000 centred on the site in QGIS providing a 1.5km radius around the site.

- 1991 - small fire scar to the northwest of the site
- 1994 - small fire scars to the northwest of the site
- 1995 - small fire scar to the north of the site
- 1996 - medium fire scar to the north west of the site
- 1997 - small fire scar to the north of the site
- 2000 - medium fire scar to the north of the site
- 2001 - small fire scars to the northwest of the site
- 2004 - small fire scars to the northwest of the site
- 2006 - small fire scar to the west of the site
- 2007 - small fire scars to the northwest of the site
- 2008 - small fire scars to the north and west of the site
- 2012 - small fire scars to the west of the site

Prior to 2012 data used in the Fire Scar mapping was automated / classified and anomalies from cloud cover, building shadows and/or tidal changes were sometimes mistaken for a fire scar. Based upon the locations of the fire scars and correlating with aerial images, it is determined that some of the mapping near the site is incorrect. Landsat Fire Scar data is not available for years 2017 and 2018 at the time of writing.

Two controlled burns were undertaken within the Parklakes 2 bushland conservation reserve in September 2016 and 2017. The fire scar mapping indicates that fires can and do occur from time to time in the Maroochy River area.

5.5 Direct Attack Success

Direct attack is a firefighting technique involving the application of water to the flaming zone of a bushfire. Direct attack can be applied to various parts of a bushfire including the fire head, fire flanks and the backing fire (rear of the fire). The level of effectiveness of this strategy can be estimated as function of the fireline intensity measured in kilowatts per lineal metre (kW/m) of fire front. The fire intensity varies around the perimeter of the fire with the highest intensity at the head of the fire and progressively reducing to approximately 0.1 intensity max at the rear of the fire (refer Figure 8).

Table 2 outlines the likely direct attack success rate into 5 categories based on fireline intensity. Average fireline intensities above 4,000kW/m are too dangerous for ground-based fire crews to employ direct attack firefighting techniques. Above approximately 10,000kW/m ground application of water will not have any substantial effect on suppression success. Much of the water applied onto fire intensities of this scale will turn into steam.

Head fire intensities at an FFDI of 50 as per the modelling produced are unlikely to be controllable with direct attack techniques, especially in areas of forest. Wildfire in areas of grassland in the study area may be controllable by direct attack methods, particularly on the fire flanks and backing fires.

Table 2 - Direct Attack Categories as function of fireline intensity (Source QFES)

Average Direct Attack Success	Fire Intensity
Certainly Not Effective	>30,000kW/m
Not Effective	>10,000 to 30,000kW/m
Probably Not Effective	>4,000 to 10,000kW/m
Probably Effective	>2,000 to 4,000kW/m
Effective	<2,000lW/m

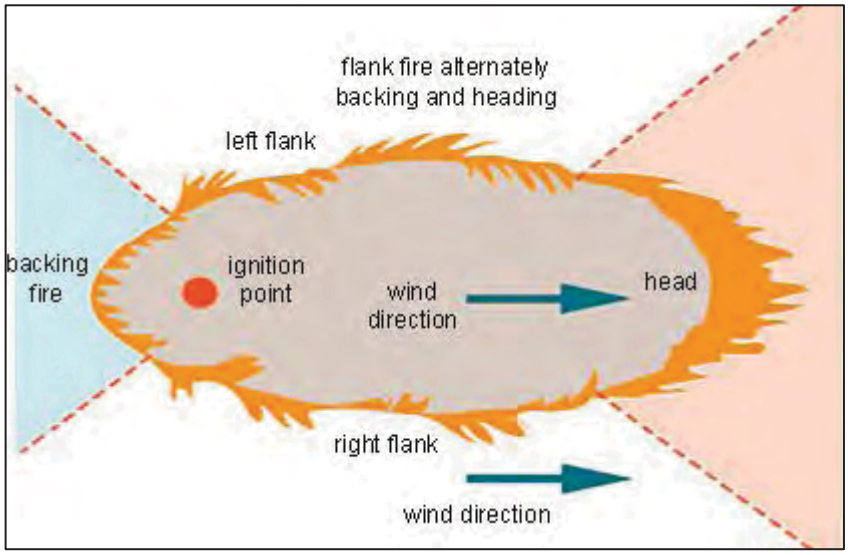


Figure 6 - Diagram of parts of a bushfire. source:
http://www.tathrafirebrigade.org.au/index.php?option=com_content&view=article&id=84&Itemid=198

5.6 Access and Evacuation

Egress and Ingress to the site is obtained from East View Court to the south of the site. It is highly improbable that the main entrance road to the site could be cut by fire. Depending on the ignition location there is likely to be several hours before a large bushfire could impact the subject site during which residents would have sufficient time to enact their bushfire management plans.

5.7 Neighbourhood Safer Places

There are several Neighbourhood Safer Places identified for the Sunshine Coast Council Area. These locations are listed on the Queensland RFS website. Neighbourhood Safer places are dedicated areas that residents can evacuate to during bushfire events.

https://www.ruralfire.qld.gov.au/BushFire_Safety/Neighbourhood-Safer-Places/lgas/pages/Sunshine-Coast-Regional-Council.aspx

The nearest Neighbourhood Safe Place to the subject site is located approximately 7km west in Burnside, Nambour. In reality additional safer places would be available to residents such as at Maroochydore.

6.0 BUSHFIRE MITIGATION MEASURES

6.1 Building Construction Requirements

Dwellings within 100m of Bushfire Prone Areas are required to be constructed to AS3959:2009 Construction of Buildings in Bushfire Prone Areas under the National Construction Code. A Preliminary Bushfire Attack Level Map has been prepared using SPARK_BAL software from the CSIRO to show which Bushfire Attack Levels are applicable the various allotments. The map is contained in Appendix B.

The map provides BAL isolines from the assessable vegetation. The BAL isolines are produced based on LiDar data obtained from DNRM and 'design tin' produced by engineers at Covey Associates and provide a good indication of the likely BAL's across the site. It is recommended that the BAL maps be re-run once complete design levels and layout has been produced. The site earthworks will change the allotment levels and the 'view factor' of future dwellings which is critical in determining the resultant radiant heat flux.

Generally, the BAL assessment revealed that allotments will be able to accommodate dwellings on them that will be able to be constructed to the lower level BAL's, ie BAL12.5 and BAL19. Proposed Lot 537 (the rural residential allotment) may be required to be constructed to a higher BAL depending on final siting and design. Table 3 outlines various Bushfire Attack Levels that are applicable under As3959:2009.

Table 3 - BAL Categories

AS3959:2009 BAL Category	Risk Description as per AS3959:2009
Low	The risk is considered to be **VERY LOW**. There is insufficient risk to warrant any specific construction requirements under AS3959:2009.
12.5	The risk is considered to be **LOW**. There is a risk of ember attack. Construction elements are expected to be exposed to a heat flux not greater than 12.5kW/m^2.
19	The risk is considered to be **MODERATE**. There is a risk of ember attack and burning debris ignited by wind borne embers and likelihood of exposure to radiant heat. Construction elements are expected to be exposed to a heat flux not greater than 19kW/m^2.
29	The risk is considered to be **HIGH**. There is an increased risk of ember attack and burning debris ignited by wind borne embers and likelihood of exposure to an increased level of radiant heat. Construction elements are expected to be exposed to a heat flux not greater than 29kW/m^2.
40	The risk is considered to be **VERY HIGH**. There is a much increased risk of ember attack and burning debris ignited by windborne embers, a likelihood of exposure to a high level of radiant heat and some likelihood of direct exposure to flames from the fire front. The construction elements are expected to be exposed to a heat flux not greater than 40 kW/m2.
Flame Zone - FZ	The risk is considered to be **EXTREME**. There is an extremely high risk of ember attack and burning debris ignited by windborne embers, and a likelihood of exposure to an extreme level of radiant heat and direct exposure to flames from the fire front. The construction elements are expected to be exposed to a heat flux greater than 40 kW/m2. A building assessed as having a BAL-FZ shall have a minimum setback distance of 10 m from the classified vegetation.

Full compliance assessment with the BAL construction requirements will need to be undertaken at Building Works Stage by a suitably qualified Building Certifier for each new dwelling. Any building elements situated within the BAL - Flame Zone are required to satisfy the testing criteria of Australian Standard AS1530.2 Methods for fire tests on building materials, components and structures.

A property rate card notation should be included on each effected allotment stating that building works on the affected allotment will be required to comply with AS3959:2009 Construction of Buildings in Bushfire Prone Areas or subsequent editions.

It is recommended that the BAL model be re-run when software advances enable the modelling of short fire runs. This expected to be achievable in early 2019. Covey Associates is waiting the delivery of this capability from the CSIRO. The use of the Short Fire Run method is likely to reduce the BAL's reported in Appendix B to some allotments.

6.2 Undertake appropriate landscaping on the site to minimise the effects of wildfire.

Fuels that can contribute to the spread and behaviour of fires in the Bushland Urban interface (I-zone) include: private gardens (trees, shrubs, lawns, mulches), external structures (houses, garages, sheds, lean-to's, fences), general lifestyle detritus (rubbish, wood piles, compost heaps, things that will be used one day), and public spaces (green spaces, access ways, roadside verges) (Ellis and Sullivan 2004).

Landscaping must be designed to not include materials and species that are highly combustible and avoid placing combustible materials adjacent building elements which may in turn cause combustion of the buildings.

The following are recommended to be observed by future residents in the design of site landscaping:

- No trees or shrubs greater than 5m tall are to be proposed such that the outer edge of the mature specimen is within 5m of any window of any building. Trees should not be planted in continuous rows;
- Trees used should be 'canopy lifted' as the tree grows such that branches and leaves do not hang close to the ground and understorey planting. Low lying branches may encourage vertical spread of flame into the canopy;
- No garden beds or plants are to be proposed directly adjoining dwellings.;
- Fences adjoining bushland are to be made of non-combustible materials including any sheeting and posts. Suitable fencing includes masonry and colorbond;
- No combustible mulches are to be used within any internal courtyard or immediately adjoining any building;
- The frame of any clotheslines are to made of non-combustible materials such as steel;
- Species are used that contain characteristics of lower flammability including:
    a) High leaf moisture content;
    b) Low volatile oil content;
    c) High mineral content;
    d) Large rather than fine leaves;
    e) Plants that are not prone to retaining dead foliage or material on the plant;
    f) Smooth / tight barked species;
    g) Species that contribute large amounts of ground fuel.
    h) Trees that will overhang buildings;
    i) Trees prone to limb shed.

Koala food trees are <u>not</u> encouraged to be used within the development.

6.3 Fencing

Fences and gates in bushfire prone areas may play a significant role in the vulnerability of structures during bushfires. All fences should be made of either hardwood or non-combustible material. In circumstances where the fence connects directly to the dwelling or in areas of BAL29 or greater, fencing is to be made of non-combustible material.

6.4 Water Supplies

Reticulated water supply is available to the subject site. Hydrant spacing, design and sizing is to comply with AS2419.1-2005. A ring main system is to be provided to the perimeter roads. A hydrant flow pressure test is to be undertaken to ensure compliance with AS2419:2005. Hydrants are not to be located within on-street parking bays.

6.5 Fire-fighting Response

Perimeter roads are provided between existing vegetation and proposed allotments. These roads are traversable by 2wd urban appliances and provide excellent access for fire authorities. A minimum 10m defendable space is provided on the rural residential allotment (Lot 537).

Fire authorities will have access to fire hydrants installed along the road network.

6.6 Powerlines

New electrical transmission lines are to be located underground.

6.7 Maintenance

All elements of the development will require regular maintenance to remain effective in terms of bushfire management. This will include continued maintenance of buildings, fire-trails and landscapes.

6.8 Community Awareness

The developer is to provide each prospective purchaser of land within the estate clear advice with respect to the following:

1. Lots within 100m Assessable Vegetation under AS3959:2009 are subject to requirements of AS3959:2009 and that increased construction costs may apply in the design and construction of dwellings;
2. The indicative Bushfire Attack Levels that may apply to each affected allotment as per Appendix B;
3. Each owner and resident will be supplied with a copy of the 'Are you bushfire prepared? – Prepare. Act. Survive.' brochure or latest equivalent prepared by the Queensland Government. Copies of the brochure are to be supplied at the point of sale / tenancy (refer Appendix D). Additional information is available from the Queensland Rural Fire Service and the following web address:

https://www.ruralfire.qld.gov.au/BushFire_Safety/Pages/default.aspx

Residence are to be strongly encouraged to heed to the advice and plans contained on this website.

7.0 RECOMMENDATIONS

- All proposed dwellings within 100m of the designated bushland be constructed in accordance with the requirements of AS3959:2009 Construction of Buildings in Bushfire Prone Areas and the National Construction Code. Indicative BAL's across the relevant allotments are shown in Appendix B. Any subsidiary structure such a shed within 6m of an affected dwelling is to be built to the same BAL as that dwelling;
- Firebreaks (land between eventually placed dwellings and adjoining bushland) are maintained by future residents and Council across their respective land tenures to manage fuel to acceptable levels. The firebreaks are to be maintained in perpetuity;
- Reticulated water supply is to comply with AS2419.1-2005 and output a minimum 10 litres a second water volume at 200kPa;
- All new electrical lines are to be provided underground;
- All streets are sign posted clearly; and
- In the event that a fire impacts the site, this BMP is reviewed and necessary adjustments made to ensure adequate protection to life and property is afforded.

8.0 CONCLUSION

A Bushfire Management Plan has been prepared for a proposed 95 lot residential subdivision at Kirra Road, Maroochy River. The assessment has confirmed that the site is located within a bushfire prone area and that mitigation measures are warranted.

Various mitigation measures are recommended in the management plan including the provision of BAL's across various allotments and the construction of perimeter roads adjoining the bushland. The mitigation measures outlined provide measures to reduce risk to life and property commensurate with the Sunshine Coast Council Bushfire Hazard Overlay Code.

REFERENCES

ABCB (2015), Building Code of Australia, Australian Building Code Board, Canberra.

Australian Standard AS3959-2009 Construction of buildings in bushfire prone areas.

Ellis, P. & Sullivan, A. (2004). The Significance of Suburban Fuels. Client report for fire management unit department of urban services ACT government. CSIRO

Leonard, J., Newnham, G., Opie, K., and Blanchi, R (2014), *A new methodology for State-wide mapping of bushfire prone areas in Queensland*, CSIRO, Australia.

Leeson, P., (2013). *Queensland's Fire Weather*, *Parts 1 and 2*. Unpublished Report, QPWS, Brisbane.

NSW Rural Fire Service (2006). Planning for Bushfire Protection – A Guide for Councils, Planners, Fire
Authorities and Developers. NSW Rural Fire Service.

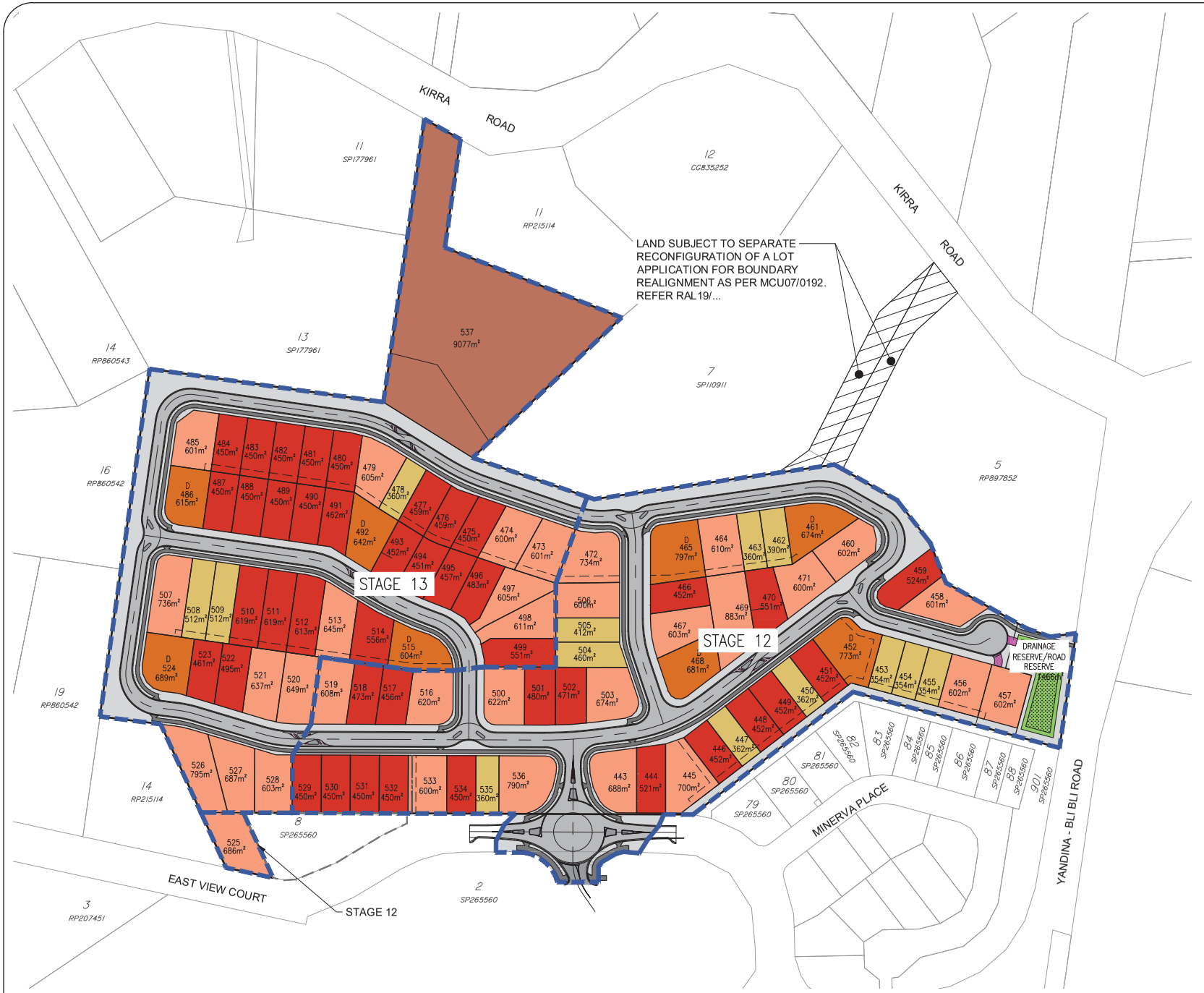
QFES (2014). Fire Hydrant and Vehicle Access Guidelines for Residential, Commercial and Industrial Lots.
Development design guidelines prepared by the Queensland Fire and Emergency (Rescue) Service.

Ramsay, C. & Rudolph, L. (2003). Landscaping and Building Design for Bushfire Prone Areas. CSIRO Publishing, Collingwood Victoria.

Standards Australia (2009). Australian Standard AS3959-2009 incorporating amendment Nos 1, 2 and 3: Construction of Buildings in Bushfire Prone Areas. SAI Global Sydney NSW.

APPENDIX A

PROPOSAL PLAN PREPARED BY COVEY ASSOCIATES PTY LTD



SITE DETAILS (DEVELOPMENT AREA EXCLUDES RURAL RESIDENTIAL ZONE)

SITE AREA:	8.940 ha
NUMBER OF LOTS:	94
SUM AREA OF LOTS:	5.105 ha
AREA OF ROAD & PATH RESERVES:	2.699 ha
AREA OF PARK & DRAINAGE RESERVES:	0.231 ha
MINIMUM LOT AREA:	354m²
MAXIMUM LOT AREA:	883m²
AVERAGE LOT AREA:	543m²

NOTE

THE INFORMATION PROVIDED ON THIS LAYOUT PLAN IS APPROXIMATE ONLY AND INTENDED AS A GUIDE TO ASSIST FURTHER INVESTIGATIONS BY POTENTIAL PURCHASERS. DIMENSIONS AND AREAS ARE SUBJECT TO SURVEY AND MAY VARY. THE DEVELOPER HAS USED REASONABLE ENDEAVOURS TO ENSURE THAT THE INFORMATION IN THIS DOCUMENT IS ACCURATE, BUT ACCEPTS NO RESPONSIBILITY AND DISCLAIMS ALL LIABILITY IN RESPECT OF ANY ERRORS, INACCURACIES OR MISSTATEMENTS IN THIS DOCUMENT. INTERESTED PURCHASERS SHOULD MAKE THEIR OWN ENQUIRIES TO VERIFY THE ACCURACY OF INFORMATION CONTAINED IN THIS DOCUMENT.

LEGEND

- COTTAGE LOT
- COURTYARD LOT
- TRADITIONAL LOT
- DUPLEX LOT
- RURAL RESIDENTIAL LOT
- ROAD/DRAINAGE RESERVE
- EXISTING ACCESS EASEMENT SUBJECT TO ADDITIONAL RECONFIG APPLICATION
- STAGE BOUNDARY

SCALE 1:2000 (A3)

Check all dimensions before commencement of work.
Check Site boundary dimensions from the Title plans
Check Building Boundary clearances by set out.
Notwithstanding the information supplied on this drawing, the location, depth and extent of underground or overhead services are to be confirmed and protected on site by the contractor prior to commencement of works.

Checked – DM
Design – DM Drawn – BJ
Scales – 1:2000(A3) Date – APR 17
Document Stage – APPROVAL

Issue	Date	Description	By
I	28-06-19	RAL APPLICATION	BJ
H	25-03-19	AMENDED LOTS FOR MAINT. BERM ST.12	DM
G	31-10-18	FOR RAL APPROVAL	DM
F	22-08-18	MCU SUBMISSION	BJ
E	14-08-18	AMENDED LOT LAYOUT	BJ
D	02-05-18	AMENDED LOT 538	BJ
C	11-04-18	AMENDED LAYOUT	BJ

COVEY ASSOCIATES PTY LTD
ABN 59 137 305 992
Consulting Civil & Structural Engineers Project Management & Planning

Approved
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PO BOX 16
MAROOCHYDORE QLD 4558
Ph (07) 5443 7777
Fax (07) 5443 7577
E-MAIL: engineers@covey.com.au

Drawing title –
OVERALL RECONFIGURATION LAYOUT STAGES 12 & 13

Project –PARKLAKES 2 ESTATE PRECINCT R3 STAGES 12 & 13

Client – PARKLAKES II DEVELOPMENTS PTY LTD

Site –
8 KIRRA ROAD, BLI BLI

Project 162011 Sheet No. RL100
Digital Ref : RL100 OVERALL RECONFIGURATION LAYOUT STAGES 12 & 13 Issue : I

o:\0JOBS\16\162011\dwg covey\reconfiguration of a lot\uncontrolled\RL100 OVERALL RECONFIGURATION LAYOUT STAGES 12 & 13.dwg

APPENDIX B
PRELIMINARY BUSHFIRE ATTACK LEVELS – SPARK BAL

Legend

- Extent of BAL12.5 (100m)

Post Dev BAL isolines

- BAL 19
- BAL 29
- BAL 40
- BAL FZ

Proposed Subdivision Layout

POST DEVELOPMENT

- Assessable Vegetation AS3959:2009

50 0 50 100 150 200 m

Model Parameters
Model: 1d
FFDI 50
Resolution: 3m
Surface Fuel: 17.5t/ha
Overall Fuel: 24.2t/ha
Int w: 3
Real Sigma: 10.0

POST- DEVELOPMENT SCENARIO
BUSHFIRE ATTACK LEVELS - AS3959:2009

Q:/JOBS/16/162011/GIS/QGIS/Maps/Post-Development Scenario

Job: 162011, BAL1_issB, July 2019, Scale 1:1500 @ A3

COVEY ASSOCIATES PTY LTD
Consulting Engineers

APPENDIX C
STANDARDS FOR ASSET PROTECTION ZONES

standards

for asset protection zones

protection

NSW RURAL FIRE SERVICE

STANDARDS FOR ASSET PROTECTION ZONES

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INTRODUCTION

For thousands of years bush fires have been a natural part of the Australian landscape. They are inevitable and essential, as many Australian plants and animals have adapted to fire as part of their life cycle.

In recent years developments in bushland areas have increased the risk of bush fires harming people and their homes and property. But landowners can significantly reduce the impact of bush fires on their property by identifying and minimising bush fire hazards. There are a number of ways to reduce the level of hazard to your property, but one of the most important is the creation and maintenance of an Asset Protection Zone (APZ).

A well located and maintained APZ should be used in conjunction with other preparations such as good property maintenance, appropriate building materials and developing a family action plan.

WHAT IS AN ASSET PROTECTION ZONE?

An Asset Protection Zone (APZ) is a fuel reduced area surrounding a built asset or structure. This can include any residential building or major building such as farm and machinery sheds, or industrial, commercial or heritage buildings.

An APZ provides:

- a buffer zone between a bush fire hazard and an asset;
- an area of reduced bush fire fuel that allows suppression of fire;
- an area from which backburning may be conducted; and
- an area which allows emergency services access and provides a relatively safe area for firefighters and home owners to defend their property.

Potential bush fire fuels should be minimised within an APZ. This is so that the vegetation within the planned zone does not provide a path for the transfer of fire to the asset either from the ground level or through the tree canopy.

WHAT WILL THE APZ DO?

An APZ, if designed correctly and maintained regularly, will reduce the risk of:

- direct flame contact on the asset;
- damage to the built asset from intense radiant heat; and
- ember attack on the asset.

WHERE SHOULD I PUT AN APZ?

An APZ is located between an asset and a bush fire hazard.

The APZ should be located wholly within your land. You cannot undertake any clearing of vegetation on a neighbour's property, including National Park estate, Crown land or land under the management of your local council, unless you have written approval.

If you believe that the land adjacent to your property is a bush fire hazard and should be part of an APZ, you can have the matter investigated by contacting the NSW Rural Fire Service (RFS).

There are six steps to creating and maintaining an APZ. These are:

1. Determine if an APZ is required;
2. Determine what approvals are required for constructing your APZ;
3. Determine the APZ width required;
4. Determine what hazard reduction method is required to reduce bush fire fuel in your APZ;
5. Take measures to prevent soil erosion in your APZ; and
6. Landscape and regularly monitor in your APZ for fuel regrowth.

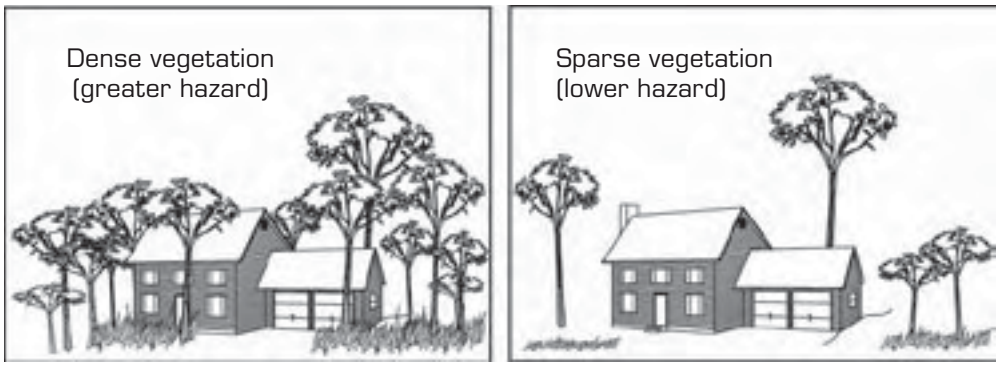
STEP 1. DETERMINE IF AN APZ IS REQUIRED

Recognising that a bush fire hazard exists is the first step in developing an APZ for your property.

If you have vegetation close to your asset and you live in a bush fire prone or high risk area, you should consider creating and maintaining an APZ.

Generally, the more flammable and dense the vegetation, the greater the hazard will be. However, the hazard potential is also influenced by factors such as slope.

- A large area of continuous vegetation on sloping land may increase the potential bush fire hazard.
- The amount of vegetation around a house will influence the intensity and severity of a bush fire.
- The higher the available fuel the more intense a fire will be.



Isolated areas of vegetation are generally not a bush fire hazard, as they are not large enough to produce fire of an intensity that will threaten dwellings.

This includes:

- bushland areas of less than one hectare that are isolated from large bushland areas; and
- narrow strips of vegetation along road and river corridors.

If you are not sure if there is a bush fire hazard in or around your property, contact your local NSW Rural Fire Service Fire Control Centre or your local council for advice.

STEP 2. DETERMINE WHAT APPROVALS ARE REQUIRED FOR CONSTRUCTING YOUR APZ

If you intend to undertake bush fire hazard reduction works to create or maintain an APZ you must gain the written consent of the landowner.

Subdivided land or construction of a new dwelling
If you are constructing an APZ for a new dwelling you will need to comply with the requirements in *Planning for Bushfire Protection*. Any approvals required will have to be obtained as part of the Development Application process.

Existing asset
If you wish to create or maintain an APZ for an existing structure you may need to obtain an environmental approval. The RFS offers a free environmental assessment and certificate issuing service for essential hazard reduction works. For more information see the RFS document *Application Instructions for a Bush Fire Hazard Reduction Certificate* or contact your local RFS Fire Control Centre to determine if you can use this approval process.

Bear in mind that all work undertaken must be consistent with any existing land management agreements (e.g. a conservation agreement, or property vegetation plan) entered into by the property owner.

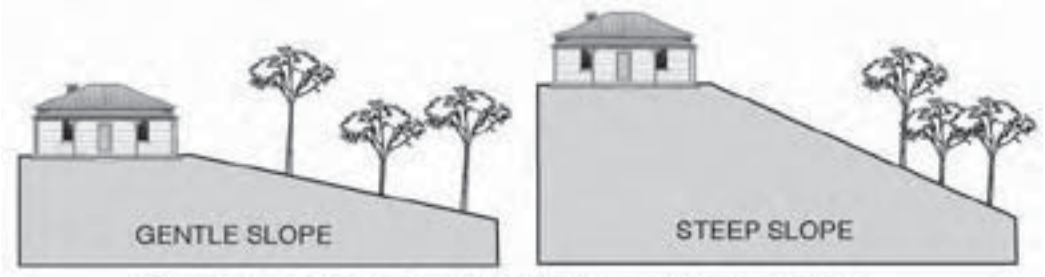
If your current development consent provides for an APZ, you do not need further approvals for works that are consistent with this consent.

If you intend to burn off to reduce fuel levels on your property you may also need to obtain a Fire Permit through the RFS or NSW Fire Brigades. See the RFS document *Before You Light That Fire* for an explanation of when a permit is required.

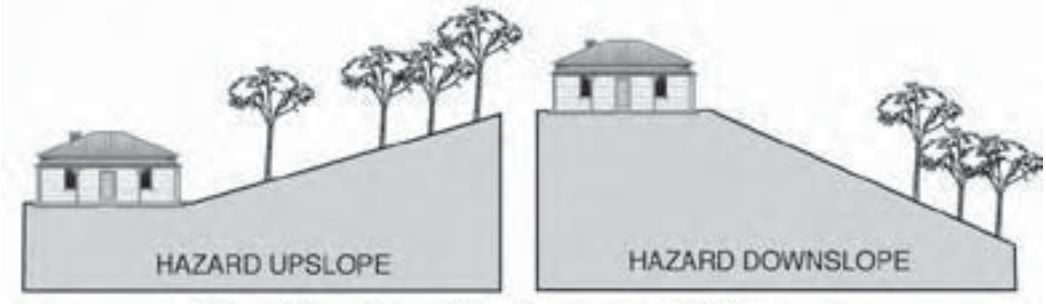
STEP 3. DETERMINE THE APZ WIDTH

The size of the APZ required around your asset depends on the nature of the asset, the slope of the area, the type and structure of nearby vegetation and whether the vegetation is managed.

Fires burn faster uphill than downhill, so the APZ will need to be larger if the hazard is downslope of the asset.



Gentle slopes require a smaller APZ distance than steep slopes



A hazard downslope will require a greater APZ distance then a hazard upslope of the asset

Different types of vegetation (for example, forests, rainforests, woodlands, grasslands) behave differently during a bush fire. For example, a forest with shrubby understorey is likely to result in a higher intensity fire than a woodland with a grassy understorey and would therefore require a greater APZ width.

A key benefit of an APZ is that it reduces radiant heat and the potential for direct flame contact on homes and other buildings. Residential dwellings require a wider APZ than sheds or stockyards because the dwelling is more likely to be used as a refuge during bush fire.

Subdivided land or construction of a new dwelling
If you are constructing a new asset, the principles of *Planning for Bushfire Protection* should be applied. Your Development Application approval will detail the exact APZ distance required.

Existing asset
If you wish to create an APZ around an existing asset and you require environmental approval, the Bush Fire Environmental Assessment Code provides a streamlined assessment process. Your Bush Fire Hazard Reduction Certificate (or alternate environmental approval) will specify the maximum APZ width allowed.

For further information on APZ widths see *Planning for Bushfire Protection* or the *Bush Fire Environmental Assessment Code* (available on the RFS website), or contact your local RFS Fire Control Centre.

STEP 4. DETERMINE WHAT HAZARD REDUCTION METHOD IS REQUIRED TO REDUCE BUSH FIRE FUEL IN YOUR APZ

The intensity of bush fires can be greatly reduced where there is little to no available fuel for burning. In order to control bush fire fuels you can reduce, remove or change the state of the fuel through several means.

Reduction of fuel does not require removal of all vegetation, which would cause environmental damage. Also, trees and plants can provide you with some bush fire protection from strong winds, intense heat and flying embers (by filtering embers) and changing wind patterns. Some ground cover is also needed to prevent soil erosion.

Fuels can be controlled by:

1. raking or manual removal of fine fuels
Ground fuels such as fallen leaves, twigs (less than 6 mm in diameter) and bark should be removed on a regular basis. This is fuel that burns quickly and increases the intensity of a fire.

Fine fuels can be removed by hand or with tools such as rakes, hoes and shovels.

2. mowing or grazing of grass
Grass needs to be kept short and, where possible, green.

3. removal or pruning of trees, shrubs and understorey
The control of existing vegetation involves both selective fuel reduction (removal, thinning and pruning) and the retention of vegetation.

Prune or remove trees so that you do not have a continuous tree canopy leading from the hazard to the asset. Separate tree crowns by two to five metres. A canopy should not overhang within two to five metres of a dwelling.

Native trees and shrubs should be retained as clumps or islands and should maintain a covering of no more than 20% of the area.

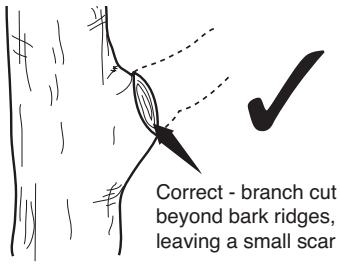
When choosing plants for removal, the following basic rules should be followed:

1. Remove noxious and environmental weeds first. Your local council can provide you with a list of environmental weeds or 'undesirable species'. Alternatively, a list of noxious weeds can be obtained at **www.agric.nsw.gov.au/noxweed/;**
2. Remove more flammable species such as those with rough, flaky or stringy bark; and
3 Remove or thin understorey plants, trees and shrubs less than three metres in height

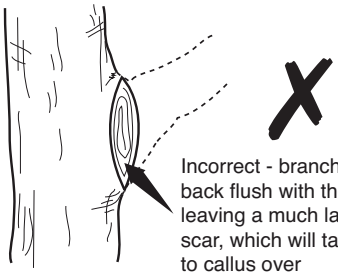
The removal of significant native species should be avoided.

Prune in acordance with the following standards:

- Use sharp tools. These will enable clean cuts and will minimise damage to the tree.
- Decide which branches are to be removed before commencing work. Ensure that you maintain a balanced, natural distribution of foliage and branches.
- Remove only what is necessary.
- Cut branches just beyond bark ridges, leaving a small scar.
- Remove smaller branches and deadwood first.



Correct - branch cut just beyond bark ridges, leaving a small scar



Incorrect - branch cut right back flush with the trunk, leaving a much larger scar, which will take longer to callus over

There are three primary methods of pruning trees in APZs:

1. Crown lifting (skirting)
Remove the lowest branches (up to two metres from the ground). Crown lifting may inhibit the transfer of fire between the ground fuel and the tree canopy.

2. Thinning
Remove smaller secondary branches whilst retaining the main structural branches of the tree. Thinning may minimise the intensity of a fire.

3. Selective pruning
Remove branches that are specifically identified as creating a bush fire hazard (such as those overhanging assets or those which create a continuous tree canopy). Selective pruning can be used to prevent direct flame contact between trees and assets.

Your Bush Fire Hazard Reduction Certificate or local council may restrict the amount or method of pruning allowed in your APZ.

See the *Australian Standard 4373 (Pruning of Amenity Trees*) for more information on tree pruning.

4. Slashing and trittering
Slashing and trittering are economical methods of fuel reduction for large APZs that have good access. However, these methods may leave large amounts of slashed fuels (grass clippings etc) which, when dry, may become a fire hazard. For slashing or trittering to be effective, the cut material must be removed or allowed to decompose well before summer starts.

If clippings are removed, dispose of them in a green waste bin if available or compost on site (dumping clippings in the bush is illegal and it increases the bush fire hazard on your or your neighbour's property).

Although slashing and trittering are effective in inhibiting the growth of weeds, it is preferable that weeds are completely removed.

Care must be taken not to leave sharp stakes and stumps that may be a safety hazard.

5. Ploughing and grading
Ploughing and grading can produce effective firebreaks. However, in areas where this method is applied, frequent maintenance may be required to minimise the potential for erosion. Loose soil from ploughed or graded ground may erode in steep areas, particularly where there is high rainfall and strong winds.

6. Burning (hazard reduction burning)
Hazard reduction burning is a method of removing ground litter and fine fuels by fire. Hazard reduction burning of vegetation is often used by land management agencies for broad area bush fire control, or to provide a fuel reduced buffer around urban areas.

Any hazard reduction burning, including pile burns, must be planned carefully and carried out with extreme caution under correct weather conditions. Otherwise there is a real danger that the fire will become out of control. More bush fires result from escaped burning off work than from any other single cause.

It is YOUR responsibility to contain any fire lit on your property. If the fire escapes your property boundaries you may be liable for the damage it causes.

Hazard reduction burns must therefore be carefully planned to ensure that they are safe, controlled, effective and environmentally sound. There are many factors that need to be considered in a burn plan. These include smoke control, scorch height, frequency of burning and cut off points (or control lines) for the fire. For further information see the RFS document *Standards for Low Intensity Bush Fire Hazard Reduction Burning,* or contact your local RFS for advice.

7. Burning (pile burning)
In some cases, where fuel removal is impractical due to the terrain, or where material cannot be disposed of by the normal garbage collection or composted on site, you may use pile burning to dispose of material that has been removed in creating or maintaining an APZ.

For further information on pile burning, see the RFS document *Standards for Pile Burning*.

In areas where smoke regulations control burning in the open, you will need to obtain a Bush Fire Hazard Reduction Certificate or written approval from Council for burning. During the bush fire danger period a Fire Permit will also be required. See the RFS document *Before You Light that Fire* for further details.

STEP 5. TAKE MEASURES TO PREVENT SOIL EROSION

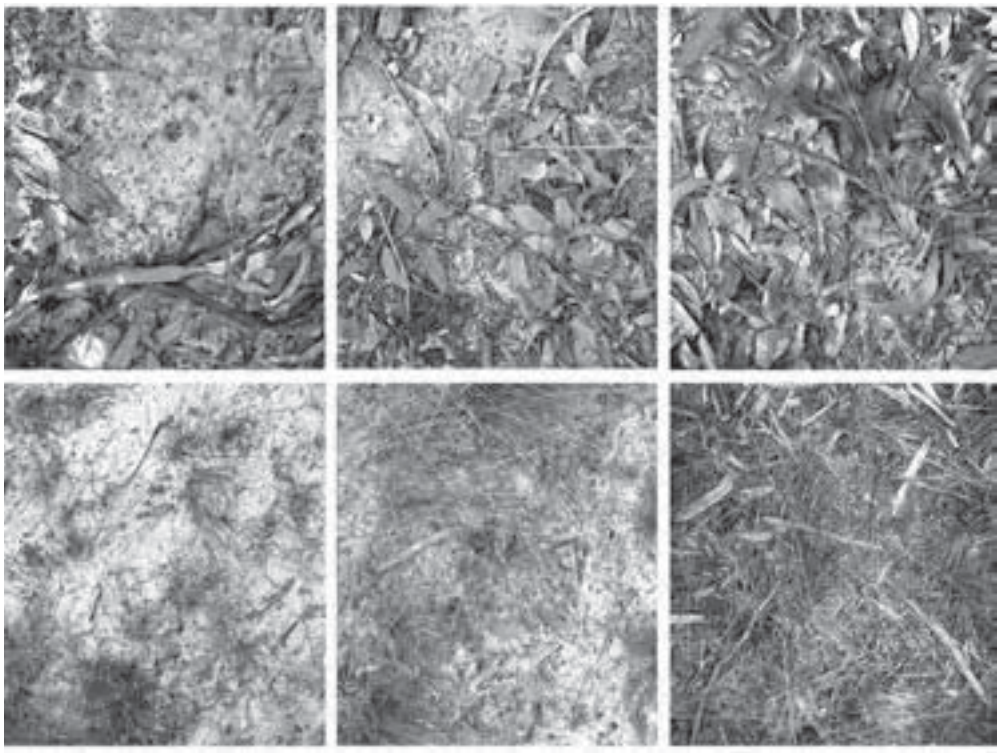
While the removal of fuel is necessary to reduce a bush fire hazard, you also need to consider soil stability, particularly on sloping areas.

Soil erosion can greatly reduce the quality of your land through:

- loss of top soil, nutrients, vegetation and seeds
- reduced soil structure, stability and quality
- blocking and polluting water courses and drainage lines

A small amount of ground cover can greatly improve soil stability and does not constitute a significant bush fire hazard. Ground cover includes any material which directly covers the soil surface such as vegetation, twigs, leaf litter, clippings or rocks. A permanent ground cover should be established (for example, short grass). This will provide an area that is easy to maintain and prevent soil erosion.

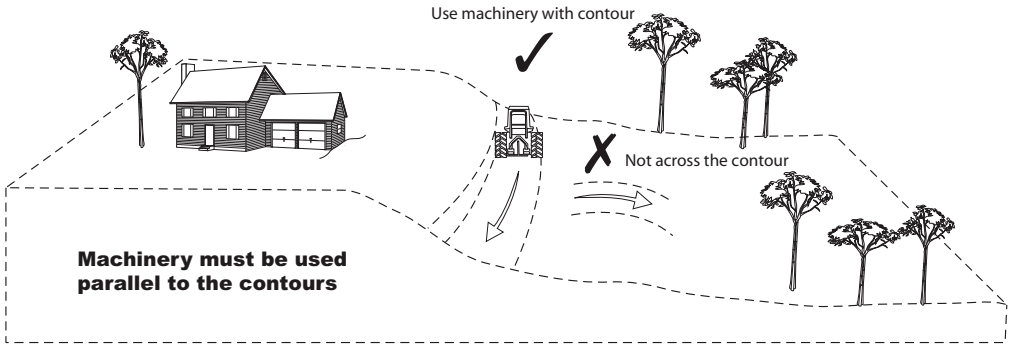
When using mechanical hazard reduction methods, you should retain a ground cover of at least 75% to prevent soil erosion. However, if your area is particularly susceptible to soil erosion, your Hazard Reduction Certificate may require that 90% ground cover be retained.



50% **75%** **100%**

Ground Cover

To reduce the incidence of soil erosion caused by the use of heavy machinery such as ploughs, dozers and graders, machinery must be used parallel to the contours. Vegetation should be allowed to regenerate, but be managed to maintain a low fuel load.

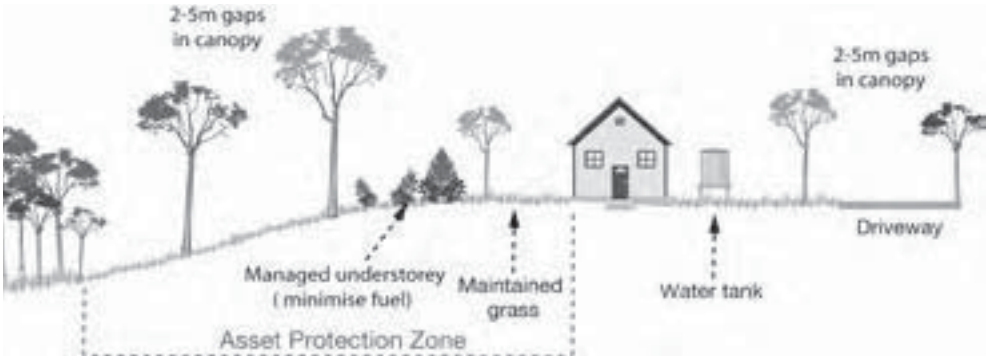


STEP 6. ONGOING MANAGEMENT AND LANDSCAPING

Your home and garden can blend with the natural environment and be landscaped to minimise the impact of fire at the same time. To provide an effective APZ, you need to plan the layout of your garden to include features such as fire resistant plants, radiant heat barriers and windbreaks.

Layout of gardens in an APZ
When creating and maintaining a garden that is part of an APZ you should:

- ensure that vegetation does not provide a continuous path to the house;
- remove all noxious and environmental weeds;
- plant or clear vegetation into clumps rather than continuous rows;
- prune low branches two metres from the ground to prevent a ground fire from spreading into trees;
- locate vegetation far enough away from the asset so that plants will not ignite the asset by direct flame contact or radiant heat emission;
- plant and maintain short green grass around the house as this will slow the fire and reduce fire intensity. Alternatively, provide non-flammable pathways directly around the dwelling;
- ensure that shrubs and other plants do not directly abut the dwelling. Where this does occur, gardens should contain low-flammability plants and non flammable ground cover such as pebbles and crush tile; and
- avoid erecting brush type fencing and planting "pencil pine" type trees next to buildings, as these are highly flammable.



Removal of other materials
Woodpiles, wooden sheds, combustible material, storage areas, large quantities of garden mulch, stacked flammable building materials etc. should be located away from the house. These items should preferably be located in a designated cleared location with no direct contact with bush fire hazard vegetation.

Other protective features
You can also take advantage of existing or proposed protective features such as fire trails, gravel paths, rows of trees, dams, creeks, swimming pools, tennis courts and vegetable gardens as part of the property's APZ.

PLANTS FOR BUSH FIRE PRONE GARDENS

When designing your garden it is important to consider the type of plant species and their flammability as well as their placement and arrangement.

Given the right conditions, all plants will burn. However, some plants are less flammable than others.

Trees with loose, fibrous or stringy bark should be avoided. These trees can easily ignite and encourage the ground fire to spread up to, and then through, the crown of the trees.

Plants that are less flammable, have the following features:

- high moisture content
- high levels of salt
- low volatile oil content of leaves
- smooth barks without "ribbons" hanging from branches or trunks; and
- dense crown and elevated branches.

When choosing less flammable plants, be sure not to introduce noxious or environmental weed species into your garden that can cause greater long-term environmental damage.

For further information on appropriate plant species for your locality, contact your local council, plant nurseries or plant society.

If you require information on how to care for fire damaged trees, refer to the Firewise brochure *Trees and Fire Resistance; Regeneration and care of fire damaged trees.*

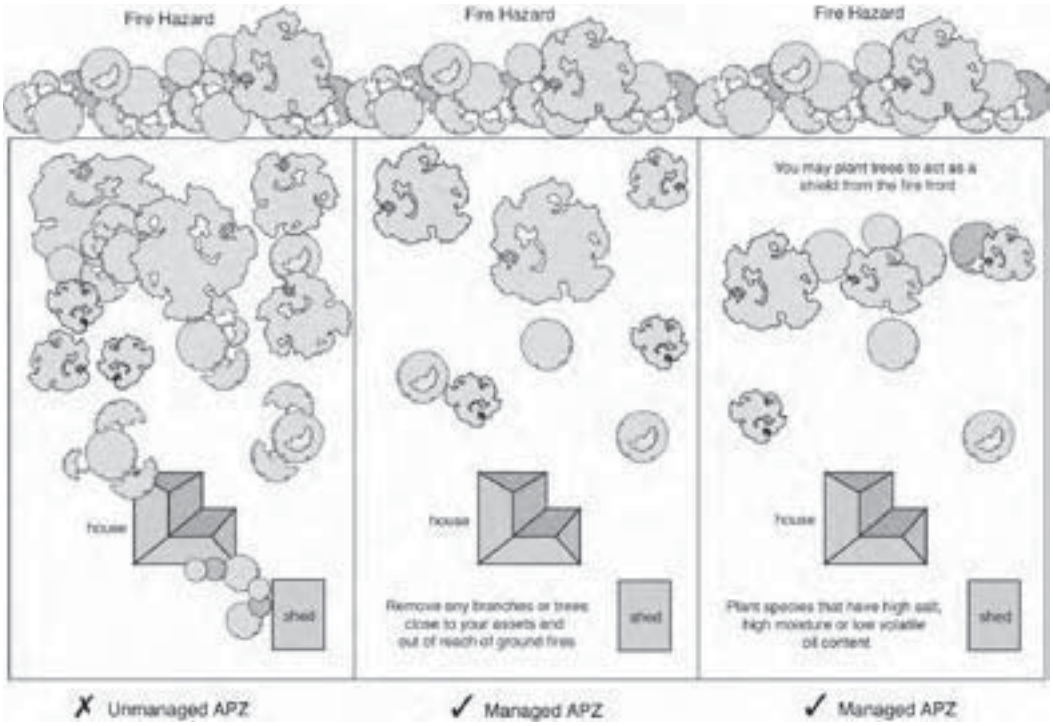
WIND BREAKS

Rows of trees can provide a wind break to trap embers and flying debris that could otherwise reach the house or asset.

You need to be aware of local wind conditions associated with bush fires and position the wind break accordingly. Your local RFS Fire Control Centre can provide you with further advice.

When choosing trees and shrubs, make sure you seek advice as to their maximum height. Their height may vary depending on location of planting and local conditions. As a general rule, plant trees at the same distance away from the asset as their maximum height.

When creating a wind break, remember that the object is to slow the wind and to catch embers rather than trying to block the wind. In trying to block the wind, turbulence is created on both sides of the wind break making fire behaviour erratic.



HOW CAN I FIND OUT MORE?

The following documents are available from your local Fire Control Centre and from the NSW RFS website at **www.rfs.nsw.gov.au.**

- Before You Light That Fire
- Standards for Low Intensity Bush Fire Hazard Reduction Burning
- Standards for Pile Burning
- Application Instructions for a Bush Fire Hazard Reduction Certificate

If you require any further information please contact:

- your local NSW Rural Fire Service Fire Control Centre. Location details are available on the RFS website or
- call the NSW RFS Enquiry Line 1800 679 737 (Monday to Friday, 9am to 5pm), or
- the NSW RFS website at **www.rfs.nsw.gov.au.**

Produced by the NSW Rural Fire Service, Locked Mail Bag 17, GRANVILLE, NSW 2142. Ph. 1800 679 737
www.rfs.nsw.gov.au

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APPENDIX D
PREPARE ACT SURVIVE BROCHURE

Are you bushfire prepared?

Are your family and home at risk?

1. Do you live within a few kilometres of bushland?
2. Does your local area have a bushfire history?
3. Is your home built on a slope?
4. Do you have trees and shrubs within 20m of your house?
5. Is your 'Bushfire Survival Plan' more than one year old?

If you answered 'Yes' to one or more of these questions you may be at risk in the event of a bushfire.

PREPARE.ACT.SURVIVE.

Tomorrow's Queensland: strong, green, smart, healthy and fair

Department of **Community Safety**

V. 2 06/11

RURAL FIRE SERVICE

QUEENSLAND FIRE AND RESCUE SERVICE

Toward 2 Tomorrow's Queensland

Queensland Government

Message from the Minister

You don't have to live in the bush to be threatened by bushfire, just close enough to be affected by burning material, embers and smoke. For Queensland residents, that can be just about anywhere.

In 2009 Queensland experienced one of its worst bushfire seasons on record and at one point firefighters attended 4491 vegetation fires across the state over a 36-day period. In many cases homes and lives were at risk and residents were faced with the decision to stay with their property or leave the area early.

This booklet is full of information that will help you to prepare your home and your family for bushfire season. It will assist you in making the decision to stay or to leave and will outline the steps you need to take as a result of your decision.

Please take time to sit down with your family and discuss your bushfire survival plan and what steps you will take to **PREPARE. ACT. SURVIVE.** this bushfire season.

Neil Roberts MP
Minister for Police, Corrective Services and Emergency Services

Commissioner

Every year bushfires put the lives and properties of Queenslanders like you and me at risk.

Everyone has a part to play in bushfire mitigation and it is vitally important that we all take steps to ensure we **PREPARE. ACT. SURVIVE.** this bushfire season.

This booklet is not only full of information about bushfire preparation, but it also includes advice on the new fire danger ratings and how you can get involved with your local Rural Fire Service.

If we all play our part we can build more resilient communities that know what to do when faced with a bushfire situation.

Rural and urban firefighters spend months preparing for the bushfire season but if we all took a few hours over a couple of weekends, we can all be a lot better prepared.

Lee A Johnson AFSM MIFireE
Commissioner, Queensland Fire and Rescue Service

Emergency Warnings

Queensland has adopted a new national Fire Danger Rating Index (FDRI). This includes two new levels of severe and catastrophic.

The new FDR is used as a trigger for the level of advice and messaging to the community when a bushfire starts.

There are three types of alert messages – Advice, Watch and Act, and Emergency Warnings.

- Advice messages keep people informed and up to date with developments on a fire.
- Watch and Act messages advise people to take action to prepare and protect themselves.
- Emergency Warnings, accompanied by a siren sound effect, advise that you must take action immediately, as you will be impacted by the fire.

The Standard Emergency Warning Signal (SEWS) is also used when bushfire threatens life. The siren sound effect is the same used for cyclone warnings.

These messages are delivered through local TV and radio. However, you should not expect that detailed information will be available every time there is a bushfire.

You may receive an Emergency Alert on your phone

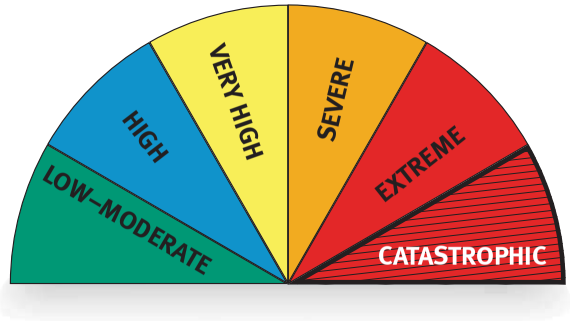
Emergency Alerts are sent by emergency services to landline telephones based on the location of the handset, and to mobile phones, based on the billing address. These alerts are used in a range of emergency situations, including bushfires and other extreme weather events.

In the case of an emergency, you may receive a voice message on your landline or a text message on your mobile phone. If you receive an Emergency Alert and want more information, follow the instructions in the message received.

It is important that you do not rely on receiving an alert: you and your community must still prepare yourselves and have an action plan in case of an emergency.

For more information on the Emergency Alert system visit **www.emergencyalert.gov.au**.

FIRE DANGER RATING



CATASTROPHIC

A fire with a rating of 'catastrophic' may be uncontrollable, unpredictable and fast moving. The flames will be higher than roof tops. Many people may be injured and many homes and businesses may be destroyed.

During a 'catastrophic' fire, well-prepared and constructed homes will not be safe. Leaving is the only option for your survival.

EXTREME

A fire with an **'extreme'** rating may be uncontrollable, unpredictable and fast moving. The flames will be higher than roof tops. During an **'extreme'** fire, people may be injured and homes and businesses may be destroyed.

During an **'extreme'** fire, well-prepared and well constructed homes may not be safe. Leaving is the only option for your survival.

SEVERE

A fire with a **'severe'** rating may be uncontrollable and move quickly, with flames that may be higher than roof tops. A **'severe'** fire may cause injuries and some homes or businesses will be destroyed.

During a fire with a **'severe'** rating, leaving is the safest option for your survival. Use your home as a place of safety only if it is well prepared and well-constructed.

VERY HIGH

A fire with a **'very high'** danger rating is a fire that can be difficult to control with flames that may burn into the tree tops. During a fire of this type some homes and businesses may be damaged or destroyed.

During a fire with a **'very high'** danger rating, you should use your home as a place of safety only if it is well prepared and well constructed.

HIGH

A fire with a **'high'** danger rating is a fire that can be controlled where loss of life is unlikely and damage to property will be limited.

During a fire with a **'high'** danger rating, you should know where to get more information and monitor the situation for any changes.

LOW–MODERATE

A fire with a **'low to moderate'** rating can be easily controlled and pose little or no risk to life property.

During a fire with a **'low to moderate'** rating, you should know where to get more information and monitor the situation for any changes.

PREPARE

The first step is to prepare. It forms the basis for how you act and whether you and your family will survive.

Prepare a Bushfire Survival Plan

Whether you live in the city, on the urban fringe or in regional or rural Queensland, it is essential you have a Bushfire Survival Plan. Your bushfire survival plan details how you'll prepare and what action you will take if threatened by a bushfire. A well-prepared home has an increased chance of survival in a bushfire. During a large-scale event, Queensland Fire and Rescue Service (QFRS) will not be able to place a fire truck at every property so it is therefore even more important to have a solid plan in place.

The first step is simple: make a commitment to do it! Your plan must be written down and practised regularly and should take into consideration the ages and physical capabilities of everyone in your household including children and elderly residents.

Your plan needs to take into account what you will do based on the Fire Danger Rating (see page 3). On days of catastrophic and extreme fire weather the QFRS advises that people leave the area well in advance of any fire (the night before or early in the morning is recommended). So you need to decide under what conditions you will stay (if any) and when it would be best to leave well in advance of a fire.

Children, the elderly and those who are vulnerable are advised to leave well before a bushfire threatens and should not be part of any plans to stay with your property.

To prepare your Bushfire Survival Plan visit www.ruralfire.qld.gov.au and follow the links.

Some of the issues you need to consider

- Does everyone in your family understand the dangers of bushfire and how your plan will be put into action?
- Have you arranged appropriate car and household insurance?
- Do you know what you will take with you if you need to leave early?
- Have you considered how to deal with pets and livestock?

Prepare your property

Properties that are well prepared are far more likely to survive a bushfire, so everyone living in a bushfire-prone area should prepare their property, regardless of whether their plan is to stay or go.

- Clear space around buildings.
- Clear and remove undergrowth.
- Fill any gaps in the eaves and around windows and door frames.
- Protect larger under-deck areas with non-flammable screens.
- Remove any fire hazards from around the house.
- Rake up bark, leaves and twigs.
- Make sure you have appropriate water and firefighting equipment.
- Make sure your property has cleared access for fire trucks.

More tips for preparing your property are available in your Bushfire Survival Plan at www.ruralfire.qld.gov.au.

Prepare to leave

If you plan to leave you should leave early, before a fire reaches your area, even the night before or early in the morning. Listen to your local radio station for community messages and warnings.

Photo courtesy of Morning Bulletin Rockhampton

Prepare yourself

In the event of a fire everyone should wear:

- natural fabrics such as cotton, denim or wool
- sturdy work boots (non-metal caps) and a pair of wool socks to prevent burns to your feet and support your ankles
- a wide-brimmed hat to stop embers dropping onto your head or down the back of your shirt
- work gloves to protect your hands
- a good pair of safety goggles to safeguard your eyes against smoke, embers and debris in the air
- a smoke mask or a damp cloth (non-synthetic) to cover your nose and mouth to protect you from inhaling smoke and embers.

More tips for preparing yourself are available in your Bushfire Survival Plan at www.ruralfire.qld.gov.au.

Bushfire Survival Kit

You need to have a Bushfire Survival Kit stored in an area of the house that is safe to access. It should contain:

- mop
- gloves
- torch
- hoses
- shovel
- towels
- buckets
- safety goggles
- ladder
- medications
- bottled drinking water
- fire extinguishers
- battery-operated radio
- spare batteries
- smoke mask
- woollen blankets
- first aid kit
- knapsack sprayer
- protective clothing for the whole family.

Mental and physical preparation

You also need to be prepared mentally and physically for the ferocity of a bushfire.

In a bushfire you'll experience strong, gusty winds, intense radiant heat and flames, heavy smoke which makes it difficult to see and breathe, embers causing spot fires, the sounds of roaring fires approaching, power and water being cut off and an environment which can be dark, noisy and terrifying.

You need to realistically consider the potentially over-whelming physical and psychological demands of facing a bushfire.

If you have any doubts about your ability to cope you should plan to leave early.

ACT

Photo courtesy of Morning Bulletin Rockhampton

ACT now – use the diagram on the next page to help you and your family prepare for bushfire season.

If you decide to stay

Firefighting equipment and protective clothing

If your plan is to stay you need at least the following firefighting equipment and protective clothing:

- sufficient lengths of hose to reach all buildings that could be threatened
- external and internal ladders
- buckets and alternative water supplies
- shovels, rakes and wet towels, sacks or other heavy material that can be used to put out small fires
- fire extinguisher (for internal fires only)
- plugs for downpipes (can be bought from hardware stores, or alternatively use a supermarket bag filled with sand or soil)
- torch
- first aid kit
- full length clothing (wool, cotton), including:
  - gloves
  - eye protection, work boots and a broad-brimmed hat
  - water bottles or containers to carry drinking water with you.

High fire danger days

On hot dry days when bushfires are likely, listen to local radio stations for bushfire information, drink plenty of water and, if you live on acreage or a farm, move stock to fully grazed areas. It is also a good idea to check water pumps and generators (if you have them) to make sure they are working, and prepare your protective clothing in case you need it quickly.

Fire in the area

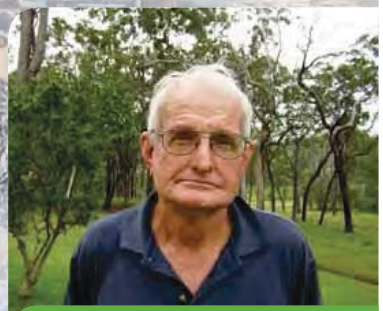
- Listen to local broadcasts or check websites for updates.
- Put on protective clothing.
- Drink lots of water.
- Move car/s to a safe location.
- Close windows and doors and shut blinds.
- Take down curtains and move furniture away from windows.
- Bring pets inside and restrain them (leash, cage, or secure room) and provide water.
- Block downpipes (at the top) and fill gutters with water if possible.
- Wet down the sides of buildings and close shrubbery in the likely path of the bushfire.
- Wet down fine fuels close to buildings.
- Turn on sprinklers in garden for 30 minutes before bushfire arrives.
- Remove garden furniture, door mats and other items.
- Seal all gaps under doors and screens.
- Fill containers with water – baths, sinks, buckets, wheelie bins.
- Have ladders ready for roof space access (inside) and against roof (outside).
- Have generator or petrol pump ready.
- Check and patrol outside for embers and extinguish any bushfires.

When the fire front arrives

- Disconnect hose and fittings and bring inside.
- Go inside for shelter.
- Drink lots of water.
- Check and patrol for embers inside, particularly in the roof space.
- Check family and pets.

Photo courtesy of Morning Bulletin Rockhampton

Photo courtesy of CFA & Public Affairs Vic.



Ross's Story

Ross has always been bushfire prepared and after a fire he was glad he had been.

During the fire season Ross became aware of a large bushfire in his area. Once he knew it was headed towards the family's property at Mount Fox in North Queensland, he enacted his bushfire plan and began preparations for the approaching fire.

Ross has had firebreaks on all sides of his property which he kept well maintained. He also had a tractor with a tank and a hose and large-capacity water tanks on his property.

As the fire approached the boundary fence of the property Ross's firebreaks slowed the advance but the intensity of the fire was so great that it jumped the breaks. "The fire came so quickly it just went straight over the firebreak," Ross said. "Without these preparations my family home would have been lost, along with a lot more in the district. Even though the fire came within 20 metres of my house, because of the firebreaks I had put in, a neighbour and I were able to halt the advance of the fire front".

"The biggest lesson I took from this was to be prepared and encourage everyone around you to be prepared. This fire was able to increase in speed as the neighbouring block of land was unprepared and very overgrown. I will definitely be keeping all my firebreaks in place and well maintained in the future."

Long term fire precautions

- **A** Reduce fuel by controlled landscaping.
- **B** Use smooth-barked trees – prune lower branches.
- **C** Clear overhanging trees and shrubs from house area.
- **D** Enclose all eaves.
- **E** Fill ends of corrugated roofing
- **F** Fit wire screens to doors, windows and roof vents.
- **G** Enclose under-floor space; shift woodpile away from house.
- **H** Install taps at strategic places – with long hoses.
- **I** Have a standby water pump.
- **J** Ensure LPG safety valves face away from building.

Pre-Summer checklist

- **K** Check firefighting equipment (including standby pump).
- **L** Clear fences of rubbish and undergrowth.
- **M** Check all screens – doors, windows, roof vents.
- **N** Ensure roof is in good condition and gutters clear of leaves and rubbish.
- **O** See that under-floor area is fully protected.
- **P** Water tank – make sure it has a 50mm camlock so firefigthers can use water if needed.

As fire approaches

1. Fill knapsacks, buckets – assemble firefighting equipment.
2. Place ladder and hose to protect roof.
3. Take car out of garage.
4. Attach hoses to taps, check standby pump.
5. Block downpipes and fill gutters with water.
6. Call roll, check children at school.
7. Dress in protective clothing.
8. Keep children and pets inside – responsible children could help in some way.
9. Wet down house and close shrubbery, refill gutters.
10. Monitor radio and internet (www.fire.qld.gov.au).

- Watch lawn and roof for small fires.
- Follow fire officer's instruction.

When the fire front arrives

- Disconnect hose and fittings and bring inside.
- Go inside for shelter.
- Drink lots of water.
- Check and patrol for embers inside, particularly in the roof space.
- Check family and pets.

SURVIVE

Sheltering during the fire

Information about how to survive if you choose to stay.

- Shelter in your house on the opposite side of approaching fire.
- Maintain a means of escape.
- Continually monitor conditions.

After the fire front has passed:

- wear protective equipment
- go outside once it is safe
- check for small spot fires and burning embers
  - inside roof space
  - under floor boards
  - under house space
  - on veranda and decks
  - on window ledges and door sills
  - in roof lines and gutters
  - garden beds and mulch
  - woodheaps
  - outdoor furniture
  - sheds and carports
- continue to drink lots of water
- stay at your property until the surrounding area is clear of fire
- monitor media outlets – radio, TV and internet.

Contingency Plan

Even if your choice is to stay, you must still have a contingency plan as a part of your Bushfire Survival Plan. A change in household circumstances (i.e. someone home alone or unexpected visitors), fire danger rating of extreme or catastrophic and the current preparedness of your home are all reasons for you to reconsider your Bushfire Survival Plan. You should identify a safer location (i.e. a neighbour's home), a Neighbourhood Safer Place and consider if you should leave early well before bushfire threatens.

For more information if you choose to stay please refer to and complete the Bushfire Survival Plan (available at www.ruralfire.qld.gov.au).

The safest place is to be away from the fire. Being involved in a fire maybe one of the most traumatic experiences in your life. Survival and safety depend on the decisions you make. Are you bushfire prepared?

On days where the Fire Danger Rating is predicted to be extreme or catastrophic for you and your family's survival, leaving is the best option.

Thinking 'I will leave early' is not enough.
You must **PREPARE. ACT. SURVIVE.**

It is important for your own safety and the safety of your community that you don't return to your home before the all-clear is given by emergency services or your local council. It is equally important that when you do return home you are aware of the hazards and other issues you will face.

Returning to your property can be both physically and mentally challenging so it is essential that you use caution. Emergency services will attempt to eliminate obvious hazards. However, you are responsible for ensuring your property is safe before undertaking any activity in or around damaged structures – you must seek professional advice to do this. A hazard assessment by experts may be necessary to determine the stability of full and partially standing walls, roofs and chimneys and the safety of services. Your insurance company may also have conditions about what you can or cannot do until the loss assessor visits.

On the way to your home

Watch for fallen objects; downed electrical wires; and weakened walls, bridges, roads, trees, low branches, burning debris and footpaths.

Returning home

For safety reasons, initial access should be limited to adults.

The following is a checklist of the things that you should do when you arrive at your home:

- Consider the use of a face mask and protective clothing.
- Walk around the outside of your house to check for the following hazards:
  - live electricity
  - leaking gas (odour or gas hissing)
  - septic or sewage leaking
  - hot embers
  - trees and over hanging branches
  - major structural damage.

There are numerous other hazards that you may be faced with. If you are unsure refer to your local authorities for further advice.

Neighbourhood Safer Places (NSP)

An NSP is a local open space or building where people may gather, as a last resort, to seek shelter from a bushfire. Use of an NSP may be your contingency plan when:

- your Bushfire Survival Plan has failed
- the extent of the fire means you have planned to stay but your home cannot withstand the impact of the fire and therefore is not a safe place to shelter.
- the fire has escalated to an extreme or catastrophic level and relocation is your safest option.

The main purpose of an NSP is to provide some level of protection to human life from the effects of a bushfire. Your NSP will not guarantee safety in all circumstances. The following limitations of an NSP need to be considered if you plan to use one as a last resort:

- Firefighters may not be present, in the event that they will be fighting the main fire front elsewhere.
- NSPs do not cater for animals or pets.
- NSPs do not provide meals or amenities.
- NSPs may not provide shelter from the elements, particularly flying embers.
- If you are a person with special needs you should give consideration to what assistance you may require at an NSP.
- Although QFRS cannot guarantee an immediate presence during a bushfire, every effort will be made to provide support as soon as resources are available.

Not all areas will have a designated NSP and a register can be found on the Rural Fire Service website www.ruralfire.qld.gov.au. Remember to regularly visit the website for changes and updates.

If the Fire Danger Rating is not extreme or catastrophic, and your plan is to stay with your property, it may involve the risk of psychological trauma, injury or death. Your property must be well prepared if you intend to stay. The better prepared your home, the more likely it will survive a bushfire.

You cannot just stay and protect your property without careful planning and preparation. You must **PREPARE. ACT. SURVIVE.**

For more information please refer to and complete the Bushfire Survival Plan (available at www.ruralfire.qld.gov.au).

Photo courtesy of Matt Hayes

FAQs

Will there always be a fire truck available to fight a bushfire threatening my home?

No, not always. Fire trucks and firefighters are a limited resource so it is important they are deployed in an appropriate manner to best manage the fire. The QFRS cannot guarantee a fire truck will be available to defend every home during a large bushfire event.

What does leaving early mean?

Leaving early means before a bushfire event has reached your neighbourhood. Leaving early could be the day before or morning of predicted extreme or catastrophic bushfire weather.

If I know the back streets in my suburb or town very well, is it okay for me to leave at the last minute?

If your decision in your Bushfire Survival Plan is to leave early, then you should leave well before the fire front reaches your property. Irrespective of your local area knowledge you must stick to your plan and leave early. Leaving late can be fatal.

Will someone from an emergency service knock on my door when it is time to leave?

Emergency services personnel are not always available to alert the community of potential risks by door knocking and encouraging you to leave. Monitor local radio stations, television networks and emergency service websites for information updates. Remember the safest option is to leave early. Leaving too late can be fatal.

Can I be made to leave my home during a bushfire?

In Queensland you can be ordered by the Police or Fire Service to evacuate if they believe it is necessary for your safety.

Is my house at risk of burning if there is more than 50 metres between my home and nearby bushland?

Yes, most houses destroyed in bushfires are lost as a result of ember attack. Under certain conditions embers can cause fires to ignite up to 20 kilometres in front of the main fire. A combination of your level of preparation and your home construction will determine the survivability of your home.

Is cleaning my gutters and mowing my lawns enough to prepare my property for bushfire?

No! Fire requires fuel, heat and oxygen to occur. The radiant heat and flying embers produced by bushfires mean that overhanging trees, shrubs and mulch against homes, woodpiles, old building materials, outdoor furniture or other objects stored under the deck or chemicals in the garden shed will quickly ignite. Do yourself and your neighbours a favour by taking the time to properly prepare your whole property, which includes yourself, your house and your land.

FIRE BAN

The QFRS can restrict the use of fire and impose a fire ban in communities where predicted conditions and weather forecasts indicate fires would be difficult to control and pose a danger to communities.

Restrictions on the issue of permits are normally imposed locally by fire wardens and local fire bans may be imposed over an entire local government area, prohibiting the lighting of all open fires (gas and electric barbecues may still be used). During a local fire ban all permits to light fire issued in the designated area are cancelled.

Fire bans are advertised widely and remain in force until cancelled. To find out if there is a current fire ban enforced in your local government area visit the Rural Fire Service (RFS) website or phone the free call info line on 1800 020 440.

All the information you need in relation to Fire Wardens, permits to light fires and fire bans can be found at www.ruralfire.qld.gov.au.

Fire Wardens and fire permits

In rural Queensland the use of fire is controlled through the volunteer Fire Warden network. However if you live in an urban or rural fringe community the Fire Warden could be your local fire station.

In Queensland a permit to light fire is required by members of the public when intending to light a fire. Some exemptions may apply and advice should be sought from the Fire Warden. A Fire Warden is responsible for safe fire management within the community and controls the use of fire through the issuing of permits to light fire.

The Fire Warden's role includes:

- granting or rejecting applications for permit to light fire
- determining the conditions under which permitted fires can be lit
- advising owners and occupiers of the need for fuel and hazard reduction
- recommending safety precautions for the protection of homes and assets
- To find your Fire Warden go to www.ruralfire.qld.gov.au and use the "Fire Warden finder" tool, or contact your local RFS area office with the details provided on page 15 of this magazine.

Your Rural Fire Brigade (RFB)

For many Queenslanders the mention of the fire service conjures up images of red trucks, but for Queenslanders in rural and semi-rural areas, this is not the case. For these Queenslanders the fire service means yellow trucks and a crew of dedicated local volunteers.

What is the Queensland Rural Fire Service? (RFS)

There is no urban fire service coverage of rural, semi-rural and some urban fringe areas. The RFS, made up of approximately 34 000 volunteers, is the volunteer side of the QFRS and it is these volunteers who provide fire services to 93 per cent of Queensland. Although there is a general perception that the main role of RFS volunteers is active firefighting, there is much more to being a member of a Rural Fire Brigade (RFB).

What services do RFB provide to communities?

Members of the RFS and your local rural fire brigade provide a range of services to help keep Queensland communities safe.

Fighting fires – RFS respond to the outbreak of fires within their local area and in surrounding areas in support of other RFB and emergency service workers.

Fire prevention – RFB's in conjunction with Rural Operations staff, undertake a range of planning and preparation activities throughout the year to ensure communities are well prepared for the fire season. One of these activities is hazard reduction burns. Hazard reduction burns use fire to reduce excess vegetation and minimise the potential for bushfires to get out of control.

Community education – RFS Volunteer Community Educators deliver a range of community education programs within their communities. Their local knowledge paired with their knowledge of fire behaviour and prevention ensures the community gets information and education specific to their circumstances.

Permits to light fire – In Queensland the RFS controls the use of fire by not allowing fires to be lit without a specific permit. RFS volunteer Fire Wardens and authorised fire officers manage the permit to light fire system.

Deployments and assistance during disasters – RFS volunteers are often sent on deployment to assist other states during fire disasters. Members are also called upon to assist other emergency service agencies during disasters such as floods and storms.

How do I become involved in the RFS?

The RFS needs all types of people, with a wide range of skills, to help keep your community safe. There are a number of roles in the RFS. These include firefighting, community education, fundraising, administration, communication and more.

As a member of a RFB you have the opportunity to not only help your community, you will also meet great people and make new friends, become part of a team and learn a range of new skills through the wide variety of training available to you. To find out how you can become a volunteer firefighter contact your local RFB.

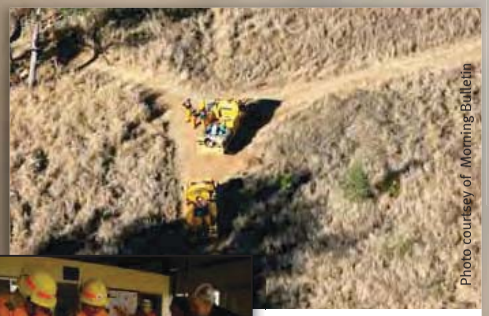


Photo courtesy of Morning Bulletin

> "The Rural Fire Service is made up of approximately 34 000 volunteers, who provide fire services to 93 per cent of Queensland."

Rural Operations Areas

Cairns Area Office
Phone: (07) 4042 5468

Innisfail Area Office
Phone: (07) 4061 0650

Townsville Area Office
Phone: (07) 4796 9082

Charters Towers or Cloncurry Area Office
Phone: (07) 4787 8213

Mackay Area Office
Phone: (07) 4965 6641

Barcaldine or Emerald Area Office
Phone: (07) 4651 1190

Rockhampton Area Office
Phone: (07) 4938 4736

Bundaberg Area Office
Phone: (07) 4153 3244

Maryborough Area Office
Phone: (07) 4190 4839

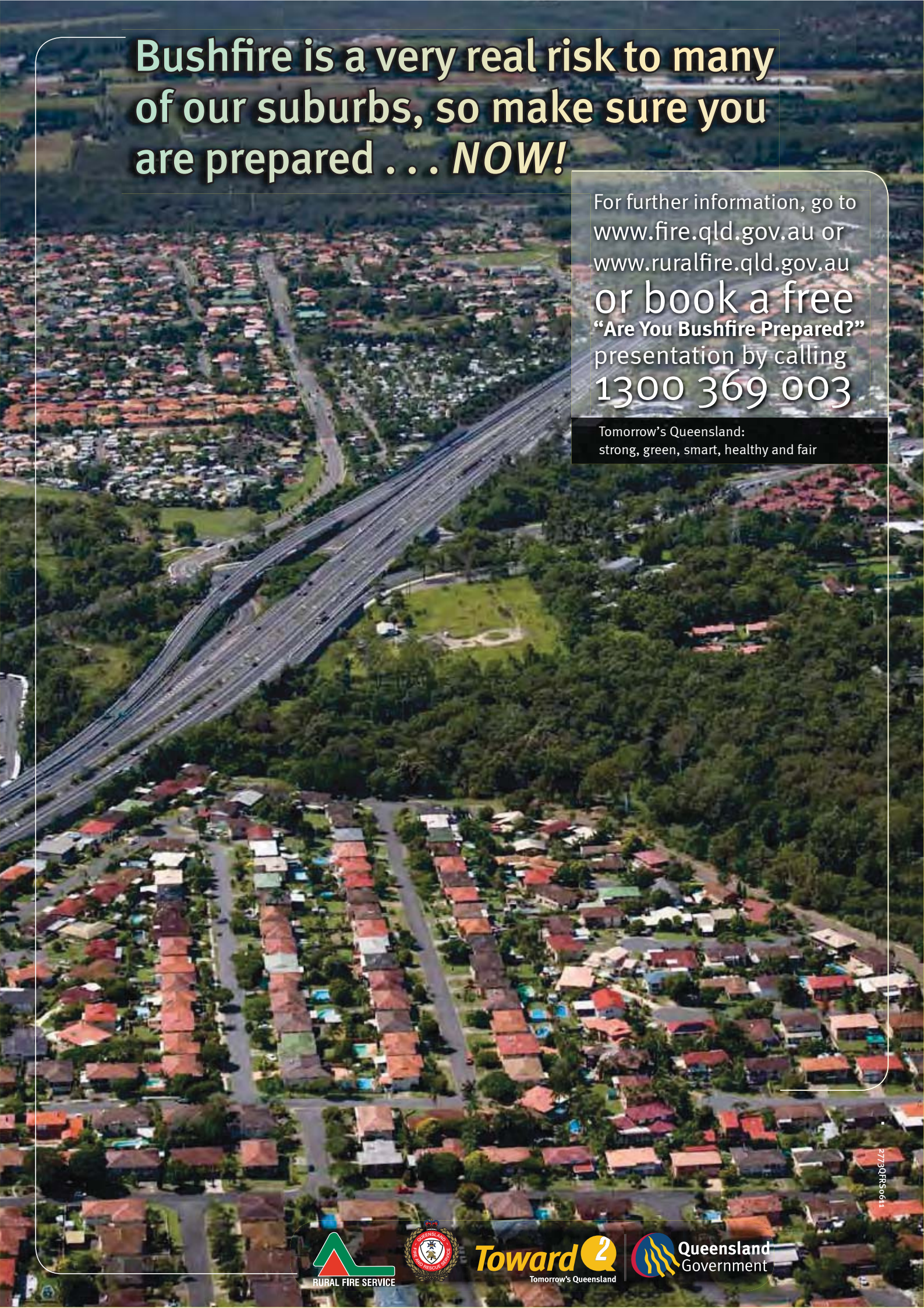
Caloundra Area Office
Phone: (07) 5420 7517

Toowoomba Area Office
Phone: (07) 4616 1945

Roma Area Office
Phone: (07) 4622 2074

Caboolture Area Office
Phone: (07) 5420 1333

Ipswich Area Office
Phone: (07) 3381 7122


Bushfire is a very real risk to many of our suburbs, so make sure you are prepared . . . NOW!
For further information, go to www.fire.qld.gov.au or www.ruralfire.qld.gov.au or book a free "Are You Bushfire Prepared?" presentation by calling 1300 369 003
Tomorrow's Queensland: strong, green, smart, healthy and fair
RURAL FIRE SERVICE
QUEENSLAND FIRE AND RESCUE SERVICE
Toward 2 Tomorrow's Queensland
Queensland Government
27/3QFRS0611

APPENDIX E
REGIONAL ECOSYSTEM MAPS

Department of Natural Resources, Mines and Energy

Vegetation management report

For Lot: 6 Plan: SP110911

Current as at 18/07/2018

Queensland Government

Recent changes

New vegetation clearing laws

New vegetation management laws were passed by the Queensland Parliament on 3 May 2018 and may affect the clearing you can undertake on your property.

For more information, read about the new vegetation management laws (https://www.dnrme.qld.gov.au/land-water/initiatives/vegetation-management-laws/) or call 135VEG (13 58 34) between 8.30am and 4.30pm Monday to Friday.

Updated mapping

The Regulated Vegetation Management Map and Supporting Map was updated in March 2018 to reflect the most up to date information available in relation to regional ecosystems, essential habitat and wetland mapping (Version 10).

Overview

Based on the lot on plan details you have supplied, this report provides the following detailed information:

- *Vegetation management framework* - an explanation of the application of the framework.
- *Property details* - information about the specified Lot on Plan, lot size, local government area, bioregion(s), subregion(s), catchment(s), coastal or non coastal status, and any applicable area management plans associated with your property.
- *Vegetation management details for the specified Lot on Plan* - specific information about your property including vegetation categories, regional ecosystems, watercourses, wetlands, essential habitat, and protected plants.
- *Contact information.*
- *Maps* - a series of colour maps to assist in identifying regulated vegetation on your property.
- *Other legislation contact information.*

This information will assist you to determine your options for managing vegetation, which may include:

- exempt clearing work
- accepted development vegetation clearing code
- an area management plan
- a development approval.

Other laws

The clearing of native vegetation is regulated by both Queensland and Australian legislation, and some local governments also regulate native vegetation clearing. You may need to obtain an approval or permit under another Act, such as Queensland's Protected Plants framework or the Commonwealth Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Section 6 of this guide provides contact details of other agencies you should confirm requirements with, before commencing vegetation clearing.

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1. Vegetation management framework

The *Vegetation Management Act 1999* (VMA), the Vegetation Management Regulation 2012, the *Planning Act 2016* and the Planning Regulation 2017, in conjunction with associated policies and codes, form the Vegetation Management Framework.

The VMA does not apply to all land tenures or vegetation types. State forests, national parks, forest reserves and some tenures under the *Forestry Act 1959* and *Nature Conservation Act 1992* are not regulated by the VMA. Managing or clearing vegetation on these tenures may require approvals under these laws.

The following native vegetation is not regulated under the VMA but may require permit(s) under other laws:

- grass or non-woody herbage;
- a plant within a grassland regional ecosystem prescribed under Schedule 5 of the Vegetation Management Regulation 2012; and
- a mangrove.

1.1 Exempt clearing work

Exempt clearing work is an activity for which you do not need to notify DNRME or obtain an approval. Exempt clearing work was previously known as exemptions.

In areas that are mapped as Category X (white in colour) on the regulated vegetation management map (see section 5.1), and where the land tenure is freehold, indigenous land and leasehold land for agriculture and grazing purposes, the clearing of vegetation is considered exempt clearing work and does not require notification or development approval. For all other land tenures, contact DNRME before commencing clearing to ensure that the proposed activity is exempt clearing work.

A range of routine property management activities are considered exempt clearing work. A list of exempt clearing work is available at
https://www.qld.gov.au/environment/land/vegetation/exemptions/.

Exempt clearing work may be affected if the proposed clearing area is subject to development approval conditions, a covenant, an environmental offset, an exchange area, a restoration notice, or an area mapped as Category A. Contact DNRME prior to clearing in any of these areas.

1.2 Accepted development vegetation clearing codes

Some clearing activities can be undertaken under an accepted development vegetation clearing code. The codes can be downloaded at
https://www.qld.gov.au/environment/land/vegetation/codes/

If you intend to clear vegetation under an accepted development vegetation clearing code, you must notify DNRME before commencing. The information in this report will assist you to complete the online notification form.

You can complete the online form at
https://apps.dnrm.qld.gov.au/vegetation/

1.3 Area management plans

Area Management Plans (AMP) provide an alternative approval system for vegetation clearing. They list the purposes and clearing conditions that have been approved for the areas covered by the plan. It is not necessary to use an AMP, even when an AMP applies to your property.

As a result of the new laws, AMPs for fodder harvesting, managing thickened vegetation and managing encroachment will continue for 2 years. New notifications cannot be made for these AMPs.

New notifications can be made for all other AMPs. These will continue to apply until their nominated end date.

If an area management plan applies to your property for which you can make a new notification, it will be listed in Section 2.2 of this report. Before clearing under one of these AMPs, you must first notify the DNRME and then follow the conditions and requirements listed in the AMP.
https://www.qld.gov.au/environment/land/vegetation/area-plans/

1.4 Development approvals

If your proposed clearing is not exempt clearing work, or is not permitted under an accepted development vegetation clearing code, or an AMP, you may be able to apply for a development approval. Information on how to apply for a development approval is available at
https://www.qld.gov.au/environment/land/vegetation/applying/

2. Property details

2.1 Tenure

All of the lot, plan and tenure information associated with property Lot: 6 Plan: SP110911, including links to relevant Smart Maps, are listed in Table 1. The tenure of the property (whether it is freehold, leasehold, or other) may be viewed by clicking on the Smart Map link(s) provided.

Table 1: Lot, plan and tenure information for the property

Lot	Plan	Tenure	Link to property on SmartMap
6	SP110911	Freehold	http://globe.information.qld.gov.au/cgi-bin/SmartMapgen.py?q=6\SP110911
A	SP110911	Easement	http://globe.information.qld.gov.au/cgi-bin/SmartMapgen.py?q=A\SP110911

The tenure of the land may affect whether clearing is considered exempt clearing work or may be carried out under an accepted development vegetation clearing code.

2.2 Property location

Table 2 provides a summary of the locations for property Lot: 6 Plan: SP110911, in relation to natural and administrative boundaries.

Table 2: Property location details

Local Government(s)
Sunshine Coast Regional

Bioregion(s)	Subregion(s)
Southeast Queensland	Sunshine Coast - Gold Coast Lowlands

Catchment(s)
Maroochy

For the purposes of the accepted development vegetation clearing codes and the State Development Assessment Provisions (SDAP), this property is regarded as*
Coastal

*See also Map 5.4

Area Management Plan(s): Nil

3. Vegetation management details for Lot: 6 Plan: SP110911

3.1 Vegetation categories

Vegetation categories are shown on the regulated vegetation management map in section 5.1 of this report. A summary of vegetation categories on the subject lot are listed in Table 3. Descriptions for these categories are shown in Table 4.

Table 3: Vegetation categories for subject property. Total area: 8.99ha

Vegetation category	Area (ha)
Category B	1.93
Category X	7.06

Table 4

Category	Colour on Map	Description	Requirements / options
A	red	Compliance areas, environmental offset areas and voluntary declaration areas	Special conditions apply to Category A areas. Before clearing, contact DNRME to confirm any requirements in a Category A area.
B	dark blue	Remnant vegetation areas	Exempt clearing work, or notification and compliance with accepted development vegetation clearing codes, area management plans or development approval.
C	light blue	High-value regrowth areas	Exempt clearing work, or notification and compliance with managing Category C regrowth vegetation accepted development vegetation clearing code.
R	yellow	Regrowth within 50m of a watercourse or drainage feature in the Great Barrier Reef catchment areas	Exempt clearing work, or notification and compliance with managing Category R regrowth accepted development vegetation clearing code or area management plans.
X	white	Clearing is considered accepted development on freehold land, indigenous land and leasehold land for agriculture and grazing purposes. Contact DNRME to clarify whether a development approval is required for other State land tenures.	No permit or notification required on freehold land, indigenous land and leasehold land for agriculture and grazing. A development approval may be required for some State land tenures.

Property Map of Assessable Vegetation (PMAV)

This report does not confirm if a Property Map of Assessable Vegetation (PMAV) exists on a lot. To confirm whether or not a PMAV exists on a lot, please check the PMAV layer on the Queensland Globe2, or contact DNRME on 135VEG (135 834).

3.2 Regional ecosystems

The endangered, of concern and least concern regional ecosystems on your property are shown on the vegetation management supporting map in section 5.2 and are listed in Table 5.

A description of regional ecosystems can be accessed online at
https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/descriptions/

Table 5: Regional ecosystems present on subject property

Regional Ecosystem	VMA Status	Category	Area (Ha)	Short Description	Structure Category
12.12.14	Of concern	B	0.05	Eucalyptus racemosa subsp. racemosa +/- Lophostemon confertus, Syncarpia glomulifera, Eucalyptus acmenoides woodland usually on rocky near coastal areas on Mesozoic to Proterozoic igneous rocks	Mid-dense
12.12.15	Least concern	B	1.88	Corymbia intermedia +/- Eucalyptus propinqua, E. siderophloia, E. microcorys, Lophostemon confertus open forest on Mesozoic to Proterozoic igneous rocks	Mid-dense
non-rem	None	X	7.06	None	None

Please note:

1. All area and area derived figures included in this table have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 1994). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.
2. If Table 5 contains a Category 'plant', please be aware that this refers to 'plantations' such as forestry, and these areas are considered non-remnant under the VMA.

The VMA status of the regional ecosystem (whether it is endangered, of concern or least concern) also determines if any of the following are applicable:

- exempt clearing work
- accepted development vegetation clearing codes
- performance outcomes in State Development Assessment Provisions (SDAP).

3.3 Watercourses

Vegetation management watercourses and drainage features for this property are shown on the vegetation management supporting map in section 5.2.

3.4 Wetlands

There are no vegetation management wetlands present on this property.

3.5 Essential habitat

Protected wildlife is native wildlife prescribed under the *Nature Conservation Act 1992* (NCA), and includes endangered, vulnerable or near-threatened wildlife.

Essential habitat for protected wildlife includes suitable habitat on the lot, or where a species has been known to occur up to 1.1 kilometres from a lot on which there is assessable vegetation. These important habitat areas are protected under the VMA.

Any essential habitat on this property will be shown as blue hatching on the vegetation supporting map in section 5.2.

If essential habitat is identified on the lot, information about the protected wildlife species is provided in Table 6 below. The numeric labels on the vegetation management supporting map can be cross referenced with Table 6 to outline the essential habitat factors for that particular species. There may be essential habitat for more than one species on each lot, and areas of Category A, Category B and Category C can be mapped as Essential Habitat.

Essential habitat is compiled from a combination of species habitat models and buffered species records. Regional ecosystem is a mandatory essential habitat factor, unless otherwise stated. Essential habitat, for protected wildlife, means an area of vegetation shown on the Regulated Vegetation Management Map as assessable vegetation -

1) that has at least 3 essential habitat factors for the protected wildlife that must include any essential habitat factors that are stated as mandatory for the protected wildlife in the essential habitat database. Essential habitat factors are comprised of - regional ecosystem (mandatory for most species), vegetation community, altitude, soils, position in landscape; or

2) in which the protected wildlife, at any stage of its life cycle, is located.

If there is no essential habitat mapping shown on the vegetation management supporting map for this lot, and there is no table in the sections below, it confirms that there is no essential habitat on the lot.

Category A and/or Category B and/or Category C

Table 6: Essential habitat in Category A and/or Category B and/or Category C

No records

3.6 Protected plants (administered by the Department of Environment and Science (DES))

In Queensland, all plants that are native to Australia are protected plants under the *Nature Conservation Act 1992* (NCA), with clearing of protected plants in the wild regulated by the Nature Conservation (Wildlife Management) Regulation 2006. These requirements apply irrespective of the classification of the vegetation under the *Vegetation Management Act 1999*.

Prior to clearing, if the plants proposed to be cleared are in the wild (see Operational policy: When a protected plant in Queensland is considered to be 'in the wild') and the exemptions under the Nature Conservation (Wildlife Management) Regulation 2006 are not applicable to the proposed clearing, you must check the flora survey trigger map to determine if any part of the area to be cleared is within a high risk area. The trigger map for this property is provided in section 5.5. The exemptions relate to:

- imminent risk of death or serious injury (refer s261A)
- imminent risk of serious damage to a building or other structure on land, or to personal property (refer s261B)
- *Fire and Emergency Service Act 1990* (refer 261C)
- previously cleared areas (refer s261ZB)
- maintenance activities (refer s261ZC)
- firebreak or fire management line (refer s261ZD)
- accepted development vegetation clearing code (refer s261ZE)
- conservation purposes (refer s261ZG)
- authorised in particular circumstances (refer s385).

Some exemptions under the NCA are the same as exempt clearing work (formerly known as exemptions) from the *Vegetation Management Act 1999* (i.e. listed in the Planning Regulations 2017) while some are different.

If the proposed area to be cleared is shown as blue (i.e. high risk) on the flora survey trigger map, a flora survey of the clearing impact area must be undertaken in accordance with the flora survey guidelines. The main objective of a flora survey is to locate any endangered, vulnerable or near threatened plants (EVNT plants) that may be present in the clearing impact area.

If a flora survey identifies that EVNT plants are not present within the clearing impact area or clearing within 100m of EVNT plants can be avoided, the clearing activity is exempt from a permit. An exempt clearing notification form must be submitted to the Department of Environment and Science, with a copy of the flora survey report, at least one week prior to clearing. The clearing must be conducted within two years after the flora survey report was submitted.

If a flora survey identifies that EVNT plants are present in, or within 100m of, the area to be cleared, a clearing permit is required before any clearing is undertaken. The flora survey report, as well as an impact management report, must be submitted with the application form clearing permit.

In an area other than a high risk area, a clearing permit is only required where a person is, or becomes aware that EVNT plants are present in, or within 100m of, the area to be cleared. You must keep a copy of the flora survey trigger map for the area subject to clearing for five years from the day the clearing starts. If you do not clear within the 12 month period that the flora survey trigger map was printed, you need to print and check a new flora survey trigger map.

Further information on protected plants is available at
http://www.ehp.qld.gov.au/licences-permits/plants-animals/protected-plants/

For assistance on the protected plants flora survey trigger map for this property, please contact the Department of Environment and Science at palm@des.qld.gov.au.

3.7 Emissions Reduction Fund (ERF)

The ERF is an Australian Government scheme which offers incentives for businesses and communities across the economy to reduce emissions.

Under the ERF, landholders can earn money from activities such as planting (and keeping) trees, managing regrowth vegetation and adopting more sustainable agricultural practices.

The purpose of a project is to remove greenhouse gases from the atmosphere. Each project will provide new economic opportunities for farmers, forest growers and land managers.

Further information on ERF is available at https://www.qld.gov.au/environment/land/state/use/carbon-rights/.

4. Contact information for DNRME

For further information on vegetation management:
Phone 135VEG (135 834)
Email vegetation@dnrme.qld.gov.au
Visit www.dnrme.qld.gov.au/our-department/contact-us/vegetation-contacts to submit an online enquiry.

For contact details for other State and Commonwealth agencies, please see Section 6.

5. Maps

The maps included in this report may also be requested individually at:

https://www.dnrme.qld.gov.au/qld/environment/land/vegetation/vegetation-map-request-form
and
http://www.ehp.qld.gov.au/licences-permits/plants-animals/protected-plants/map-request.php

Regulated vegetation management map

The regulated vegetation management map shows vegetation categories needed to determine clearing requirements. These maps are updated monthly to show new property maps of assessable vegetation (PMAV).

Vegetation management supporting map

The vegetation management supporting map provides information on regional ecosystems, wetlands, watercourses and essential habitat.

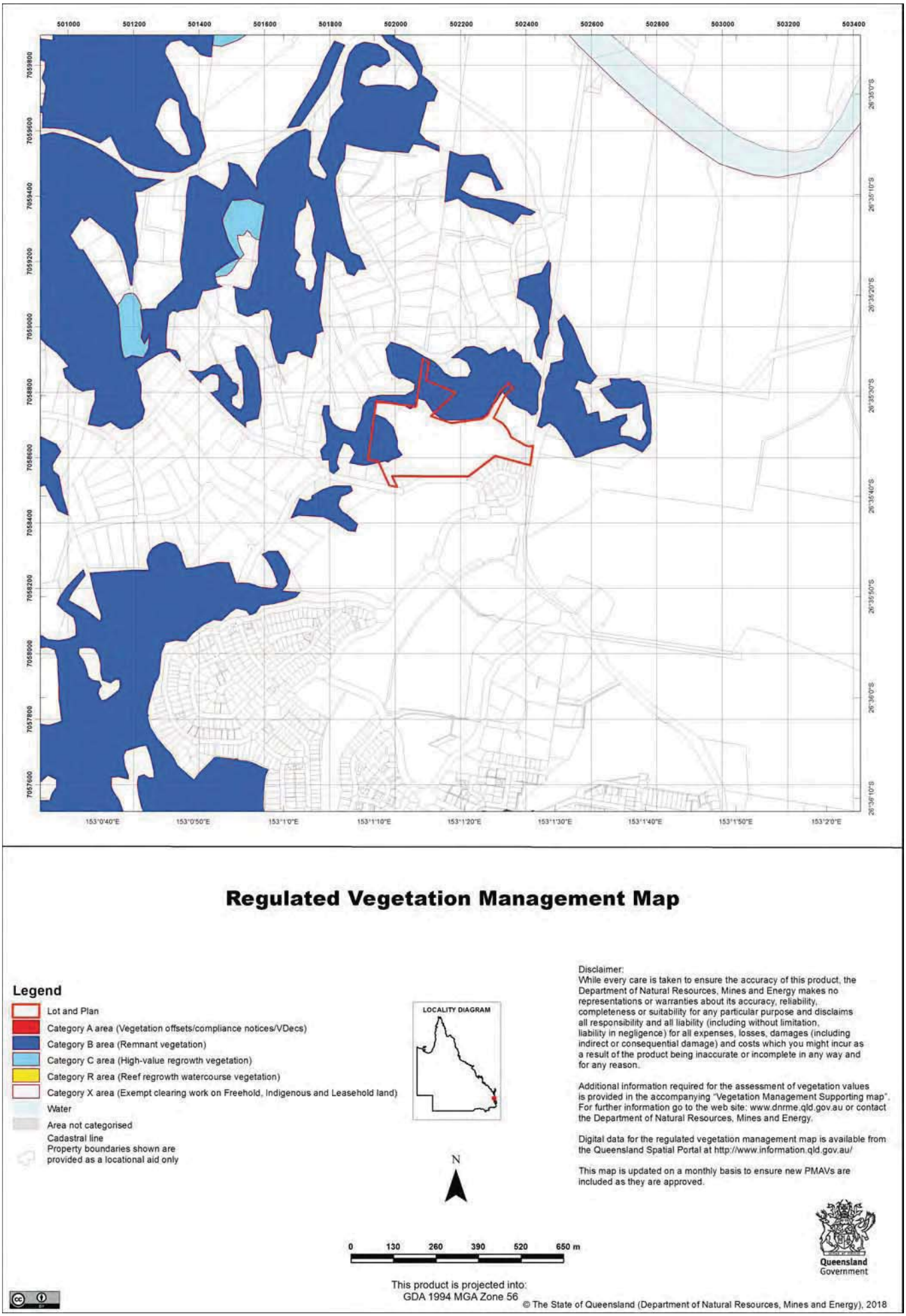
Coastal/non coastal map

The coastal/non-coastal map confirms whether the lot, or which parts of the lot, are considered coastal or non-coastal for the purposes of the accepted development vegetation clearing codes and the State Development Assessment Provisions (SDAP).

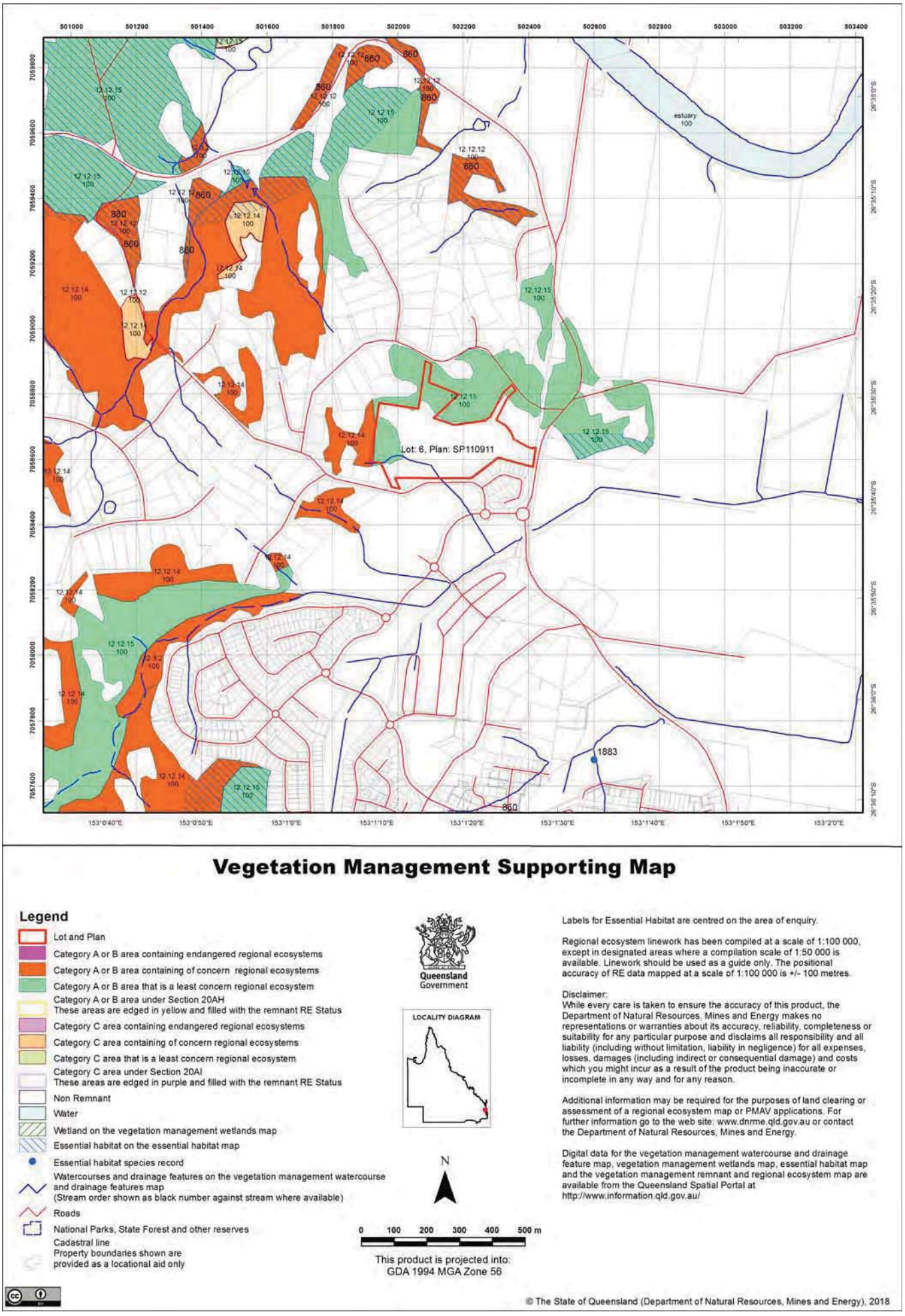
Protected plants map

The protected plants map shows areas where particular provisions of the *Nature Conservation Act 1992* apply to the clearing of protected plants.

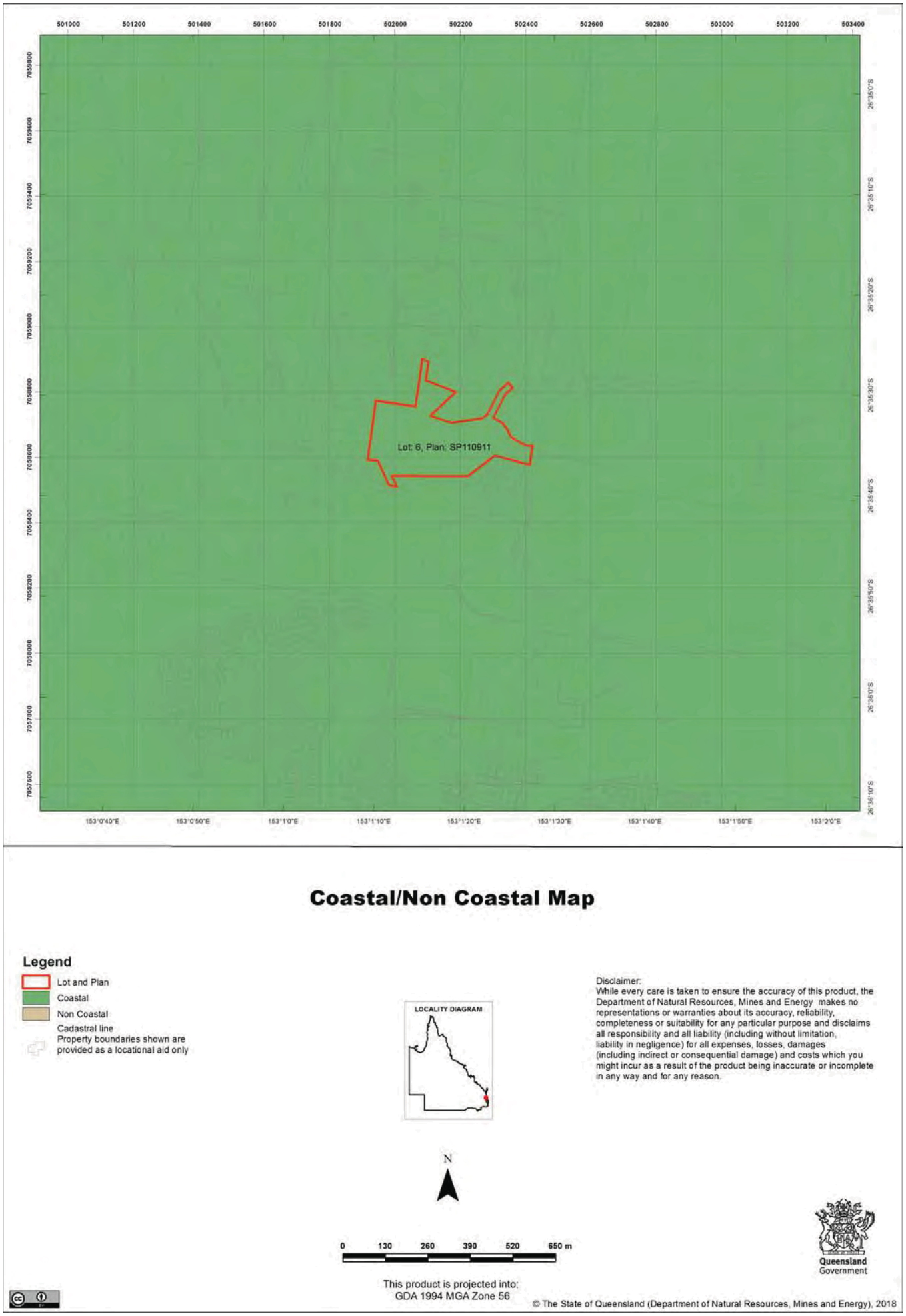
5.1 Regulated vegetation management map



5.2 Vegetation management supporting map



5.3 Coastal/non coastal map



5.4 Protected plants map administered by DES

Protected Plants Flora Survey Trigger Map

Legend

- Lot and Plan
- High risk area
- Cadastral line
  Property boundaries shown are provided as a locational aid only
- Freeways / motorways / highways
- Secondary roads / streets

LOCALITY DIAGRAM

This map shows areas where particular provisions of the Nature Conservation Act 1992 apply to the clearing of protected plants.

This map is produced at a scale relevant to the size of the area selected and should be printed as A4 size in portrait orientation.

For further information or assistance with interpretation of this product, please contact the Department of Environment and Science at palm@ehp.qld.gov.au

N

0 100 200 300 400 500 m

This product is projected into:
GDA 1994 MGA Zone 56

Disclaimer:
While every care is taken to ensure the accuracy of the data used to generate this product, the Queensland Government makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaim all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damages) and costs which might be incurred as a consequence of reliance on the data, or as a result of the data being inaccurate or incomplete in any way and for any reason.

6. Other relevant legislation contacts list

Activity	Legislation	Agency	Contact details
Interference with overland flow Earthworks, significant disturbance	*Water Act 2000* *Soil Conservation Act 1986*	Department of Natural Resources, Mines and Energy (Queensland Government)	Ph: 13 QGOV (13 74 68) www.dnrme.qld.gov.au
Indigenous Cultural Heritage	*Aboriginal Cultural Heritage Act 2003* *Torres Strait Islander Cultural Heritage Act 2003*	Department of Aboriginal and Torres Strait Islander Partnerships (Queensland Government)	Ph: 13 QGOV (13 74 68) www.datsip.qld.gov.au
Mining and environmentally relevant activities Infrastructure development (coastal) Heritage issues Protected plants and protected areas[1]	*Environmental Protection Act 1994* *Coastal Protection and Management Act 1995* *Queensland Heritage Act 1992* *Nature Conservation Act 1992*	Department of Environment and Science (Queensland Government)	Ph: 13 QGOV (13 74 68) www.des.qld.gov.au
Interference with fish passage in a watercourse, mangroves Forestry activities[2]	*Fisheries Act 1994* *Forestry Act 1959*	Department of Agriculture and Fisheries (Queensland Government)	Ph: 13 QGOV (13 74 68) www.daf.qld.gov.au
Matters of National Environmental Significance including listed threatened species and ecological communities	*Environment Protection and Biodiversity Conservation Act 1999*	Department of the Environment (Australian Government)	Ph: 1800 803 772 www.environment.gov.au
Development and planning processes	*Planning Act 2016* *State Development and Public Works Organisation Act 1971*	Department of State Development, Manufacturing, Infrastructure and Planning (Queensland Government)	Ph: 13 QGOV (13 74 68) www.dsdmip.qld.gov.au
Local government requirements	*Local Government Act 2009*	Department of Local Government, Racing and Multicultural Affairs (Queensland Government)	Ph: 13 QGOV (13 74 68) Your relevant local government office

1. In Queensland, all plants that are native to Australia are protected plants under the *Nature Conservation Act 1992*, which endeavours to ensure that protected plants (whether whole plants or protected plants parts) are not illegally removed from the wild, or illegally traded. Prior to clearing, you should check the flora survey trigger map to determine if the clearing is within a high-risk area by visiting www.des.qld.gov.au. For further information or assistance on the protected plants flora survey trigger map for your property, please contact the Department of Environment and Science on 13QGOV (13 74 68) or email palm@des.qld.gov.au.

2. Contact the Department of Agriculture and Fisheries before clearing:

- Any sandalwood on state-owned land (including leasehold land)
- On freehold land in a 'forest consent area'
- More than five hectares on state-owned land (including leasehold land) containing commercial timber species listed in parts 2 or 3 of Schedule 6 of the Vegetation Management Regulation 2012 and located within any of the following local government management areas-Banana, Bundaberg Regional, Fraser Coast Regional, Gladstone Regional, Isaac Regional, North Burnett Regional, Somerset Regional, South Burnett Regional, Southern Downs Regional, Tablelands Regional, Toowoomba Regional, Western Downs Regional.

APPENDIX F
SITE PHOTOS

Photo 1

Photo 2

Photo 3

Photo 4

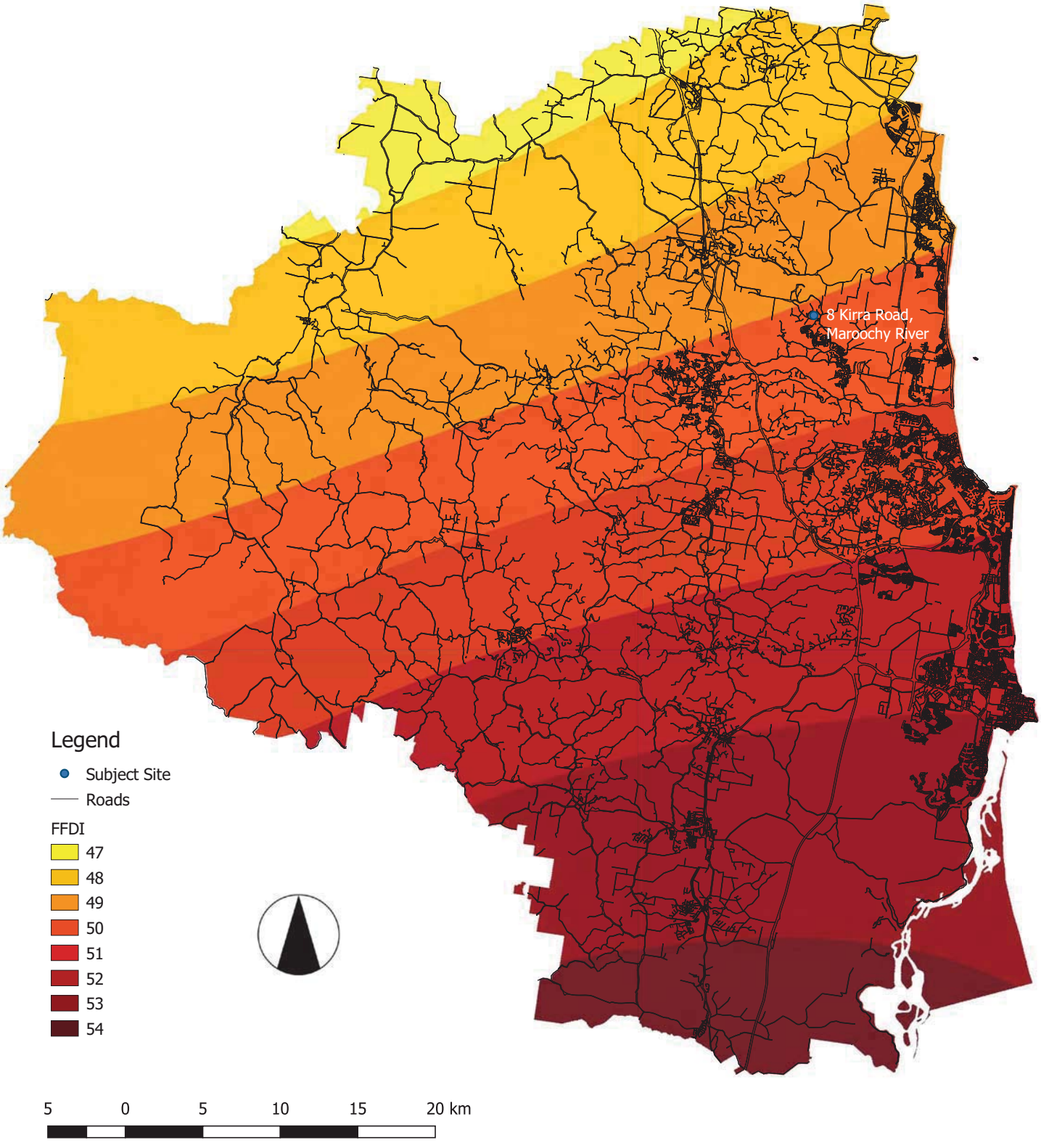
Photo 5

Photo 6

Photo 7

Photo 8

APPENDIX G
CSIRO FOREST FIRE DANGER INDICES MAP



5% exceedance probability Forest Fire Danger Index for Sunshine Coast with A1FI Climate Change Applied

Taken from: Leonard, J., Newnham, G., Opie, K., and Blanchi, R. (2014) A new methodology for State-wide mapping of bushfire prone areas in Queensland. CSIRO, Australia

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APPENDIX H
ASSESSMENT AGAINST SCC BUSHFIRE HAZARD OVERLAY CODE

BUSHFIRE HAZARD OVERLAY CODES

Sunshine Coast Planning Scheme

Performance Outcomes		Acceptable Outcomes		Compliance ×/✓/NA	Comments
Bushfire Hazard Assessment and Management					
PO1	Bushfire mitigation measures are adequate for the potential bushfire hazard level of the *site,* having regard to the following:- (a) *Vegetation* type; (b) Slope; (c) Aspect; (d) On-site and off-site bushfire hazard implications of the particular development; (e) Bushfire history; (f) Conservation values of the *site*; and (g) Ongoing maintenance. Note – where a bushfire hazard assessment and management plan has previously been approved for development proposed on the *site* (eg. As part of a prior approval), design of the proposed development in accordance with that plan shall be taken as achieving compliance with this performance outcome.	AO1.1 AO1.2	The level of bushfire hazard shown on a Bushfire Hazard Overlay Map is confirmed through the preparation of a site-specific bushfire hazard assessment and management plan, prepared in accordance with the **planning scheme policy for the bushfire hazard overlay code.** Development is located, designed and operated in accordance with a *Council* – approved bushfire hazard assessment and management plan, prepared in accordance with the **planning scheme policy for the bushfire hazard overlay code.**	Yes	A bushfire management plan has been prepared for the estate. The assessment confirmed that the site is located within a bushfire prone area. the development has been designed to respond to the hazard as per the planning scheme policy for the bushfire hazard overlay code. Key mitigation measures are outlined in the BMP.
Impact of Bushfire Mitigation Measures on Ecologically Important Areas					
PO2	Bushfire mitigation measures do not adversely impact on:- (a) Biodiversity values and functionality; and (b) The long-term physical integrity of *waterways, wetlands* and native *vegetation* areas.	AO2	No acceptable outcome provided.	Yes	Bushfire mitigation measures do not require additional vegetation clearing to be undertaken beyond that which has otherwise been proposed to accommodate the layout.
Safety of People and Property					
PO3	Development maintains the safety of people and property from the adverse impacts of bushfire.	AO3	Development which will materially increase the number of people living or congregating on premises, including reconfiguring a lot, is not located or intensified within a confirmed medium or high bushfire hazard area. This includes, but is not limited to, the following uses:	n/a	The proposed development application does not include any of the uses listed in A03.

Performance Outcomes		Acceptable Outcomes		Compliance ×/✓/NA	Comments
			(a) *Child care centre;* (b) *Community care centre;* (c) *Community residence;* (d) *Community use;* (e) *Educational establishment;* (f) *Emergency services;* (g) *Hospital;* (h) *Indoor sport and recreation;* (i) *Nature based tourism;* (j) *Outdoor sport and recreation;* (k) *Relocatable home park;* (l) *Resort complex;* (m) *Short term accommodation;* (n) *Residential care facility;* (o) *Retirement facility;* (p) *Short term accommodation;* (q) *Tourist attraction; and* (r) *Tourist park*. Note – the level of bushfire hazard shown on a Bushfire Hazard Overlay Map is to be confirmed through the preparation of a site – specific bushfire hazard assessment and management plan, prepared in accordance with the **planning scheme policy for the bushfire hazard overlay code.**		
Essential Community Infrastructure					
PO4	Essential community infrastructure is able to function effectively during and immediately after bushfire events.	AO4	Development involving *essential community infrastructure* is not located within a confirmed medium or high bushfire hazard area. **OR** Where located in a confirmed medium or high bushfire hazard area, development involving *essential community infrastructure* is designed to function effectively during and immediately after bushfire events in accordance with a Bushfire Hazard Assessment and Management Plan	n/a	The proposed application does not involve essential community infrastructure.

Performance Outcomes		Acceptable Outcomes		Compliance ×/✓/NA	Comments
			prepared in accordance with the **planning scheme policy for the bushfire hazard overlay code.**		
Hazardous Materials					
PO5	Public safety and the environment are not adversely affected by the detrimental impacts of bushfire on hazardous materials manufactured or stored in bulk.	AO5	Development involving the manufacture or storage of hazardous materials in bulk is not located within a confirmed medium or high bushfire hazard area.	n/a	The proposed application does not include uses that involve the bulk manufacture or storage of hazardous materials.
Access and Evacuation Routes					
PO6	Where development involves provision of a new public or private road, the layout, design and construction of the road:- (a) Allows easy and safe movement away from any encroaching fire; (b) Allows easy and safe access for fire fighting and other emergency vehicles; and (c) Provides for alternative safe access and evacuation routes should access in one direction be blocked in the event of a fire.	AO6.1 AO6.2	The road layout provides for 'through roads' and avoids cul-de-sac and 'dead end roads' (except where a perimeter road isolates the development from hazardous *vegetation* or the cul-de-sac are provided with an alternative access linking the cul-de-sac to other through roads). Roads have a maximum gradient of 12.5%	n/a	Perimeter roads have been provided to separate residential allotments from adjoining areas of bushfire hazard. Although cul-de-sacs are proposed they are not included as perimeter roads in the estate design. Egress from the estate is through an area not impacted by bushfire hazard onto East View Court. Roads comply with the maximum gradient specified in the acceptable outcome.
Fire Breaking Trails					
PO7	Fire breaking trails are located, designed and constructed to mitigate against bushfire hazard by:- (a) Ensuring adequate access for fire fighting and other emergency vehicles; (b) Ensuring adequate access for the evacuation of residents and emergency personnel in an emergency situation, including an alternative safe access routes should access in one direction be blocked in the event of fire; and (c) Providing for the separation of developed areas and adjacent bushland.	AO7	Where development involves the creation of a new road, fire breaking trails are provided between the development *site* and hazardous *vegetation*. Such fire breaking trails:- (a) Are located along and within a cleared road reserve having a minimum width of 20 metres; and (b) Have a maximum gradient of 12.5%. **OR** Where development does not involve the creation of a new road, fire breaking trails are provided between the development *site* and hazardous *vegetation*. Such fire breaking trails:- (a) Have a cleared minimum width of 6 metres;	yes	Perimeter roads have been provided with a road reserve width of 18m. these are considered acceptable in lieu of 20m due to the fact that vegetation hazard is located upslope of the allotments and sufficient separation is provided to enable the creation of allotments that are subject to low Bushfire Attack Levels under AS3959:2009. No fire trails are proposed or required.

Performance Outcomes		Acceptable Outcomes		Compliance ×/✓/NA	Comments
			(b) Have a maximum gradient of 12.5%; (c) Provide continuous access for fire fighting vehicles; (d) Allow for vehicle access every 200 metres; (e) Provide passing bays and turning bays every 400 metres; and Are located within an access easement that is granted in favour of *Council* and Queensland Fire and Rescue Service.		
Lot Layout					
PO8	The lot layout of development is designed to:- (a) Mitigate any potential bushfire hazard; and (b) Provide safe building sites.	AO8.1 AO8.2	Residential lots are designed so that their size and shape allow for efficient emergency access to buildings and for fire fighting vehicles (eg. By avoiding battle-axe/ hatchet lots and long narrow lots with long access drives to buildings). Residential lots are designed so that their size and shape ensure buildings and structures:- (a) Are sited in locations of lowest hazard within the lot; (b) Achieve setbacks from hazardous *vegetation* of 1.5 times the height of the predominant mature tree canopy or 10 metres, whichever is greater; (c) Achieve a setback of 10 metres from any retained *vegetation* strips or small areas of *vegetation*; and (d) Are sited so that elements of the development least susceptible to fire are sited closest to the fire hazard.	yes	Setbacks from adjoining vegetation of approximately 24m are achieved incorporating an 18m perimeter road and 6m setback. Proposed allotments are located downhill of bushfire hazard areas.
Water Supply for Fire Fighting Purposes					
PO9	Development provides an adequate water supply for fire fighting purposes which is reliable, safely located and freely accessible.	AO9.1	Premises are connected to a reticulated water supply with a minimum pressure and flow of 10 litres a second at 200kPa at all times. **OR**	yes	Reticulated water supply complying with AS2419 is proposed. Please refer to engineering plans prepared by Covey Associates Pty Ltd.

Performance Outcomes		Acceptable Outcomes		Compliance ×/✓/NA	Comments
			Where there is no reticulated water supply:- (a) The premises has a minimum water supply capacity of 5,000 litres dedicated for fire fighting purposes; and (b) The water supply dedicated to fire fighting purposes is sourced from:- i) A separate tank; ii) A reserve section in the bottom part of the main water supply tank; iii) A swimming pool installed immediately upon construction of the development; or iv) A permanent dam. Note – due consideration should be given to the location of the water storage in relation to the most likely fire fronts on the *site*, as well as to the resistance of the water storage to the effects of radiant heat and direct flame.		
		AO9.2	The water supply outlet for fire fighting purposes is:- (a) Located remote from any potential fire hazards, such as venting gas bottles; (b) Provided with a pipe 50mm in diameter and fitted with a 50mm female camlock (standard rural fire brigade fitting); and (c) Provided with a hardstand area within 6 metres of the outlet for fire vehicles.		
		AO9.3	The pumps that pressurise water output from the tank, swimming pool or drain are able to be operated without reticulated power.		
		AO9.4	Fire hydrants along perimeter roads adjacent to National Parks and other conservation reserves are located not more than 100 metres apart.		

Performance Outcomes		Acceptable Outcomes		Compliance ×/✓/NA	Comments
Landscape Works in Bushfire Hazard Areas and Bushfire Hazard Area Buffers					
PO10	Development ensures that landscape treatment and species selection does not exacerbate potential bushfire hazard.	AO10.1	Development provides for road verges and/ or nature strips to be landscaped so as to form a swale drain for stormwater run-off with:- (a) Low form, non-fire promoting native vegetation; or (b) Low form and sparsely planted *vegetation*. Note – the **planning scheme policy for development works** provides guidance on selection of non-fire promoting vegetation species.	Yes	Guidelines with respect to landscaping and Asset Protection Zones within bushfire prone areas are included in the Bushfire Management Plan.
		AO10.2	Development incorporates low form, non-fire promoting native *vegetation* on areas of the *site* that are adjacent to or abutting bushland.		