



**Bushland Protection
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Specialising in
**BUSHFIRE HAZARD
PLANNING & MITIGATION**

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SUB-PRECINCT SPECIFIC BUSHFIRE HAZARD ASSESSMENT AND MITIGATION PLAN

FOR

**SUB-PRECINCT 5A
YARRABILBA**

PREPARED BY

BUSHLAND PROTECTION SYSTEMS PTY LTD

FOR

LEND LEASE

**PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL**

Approval no: DEV2017/860

Date: 23 August 2019



DATE: 24th July, 2018.

1. Background

A Bushfire Mitigation Plan is designed to identify and minimise the potential bushfire risk to a given property and to help property owners to minimise bushfire risk to themselves, their property and their neighbours. It will not completely eliminate that risk. Ultimately it is a community responsibility to protect the environmental values, life and property in their area.

This plan is a Sub-Precinct Specific Plan for Sub-Precinct 5A of Yarrabilba, produced in accordance with:

- Bushfire hazard assessment in accordance with the State Planning Policy 7/14, under the Queensland Sustainable Planning Act 2009, based on the Bushfire Assessment Methodology provided by the Public Safety Business Agency (PSBA) & Rural Fire Service Qld (RFSQ).
- Code assessment in accordance with the approved Conceptual Bushfire Risk Assessment and Mitigation Plan (BMP), being the agreed assessment code for the Yarrabilba Project, produced by Bushland Protection Systems, dated 18/7/2012, based on the State Planning Policy 1/03, *Mitigating the Adverse Impacts of Flood, Bushfire and Landslide*, under the Queensland Sustainable Planning Act 2009, the Logan City Council Planning Code Part 5 Bushfire Hazard Area.
- The Context Bushfire Hazard Assessment and Mitigation Plan for Precinct 5 of Yarrabilba produced by Bushland Protections Systems, dated 14/7/17.
- This report also takes into consideration the 'Pre-Development Bushfire Mitigation Concept' Plan prepared by Bushland Protection Systems, dated 30/1/12.

This plan is based on the following material supplied by Lend Lease, and a number of site visits.

- 1.1. A copy of the Precinct 5 ROL Application 1 – Bushfire Hazard Assessment and Management Plan, drawn by Lendlease, Drawing No. YAR-P05-BFA, sheet 1 of 2, dated 19/7/18, is included as Appendix 1 in this report.
- 1.2. A copy of the Precinct 5 ROL Application 1 – Bushfire Hazard Assessment and Management Plan, drawn by Lendlease, Drawing No. YAR-P05-BFA, sheet 2 of 2, dated 19/7/18, is included as Appendix 2 in this report.

2. Description

Sub-Precinct 5A is located in the northeast corner of Precinct 5 and consists of residential allotments which will be cleared for development, providing a 'not bushfire prone area' rating, a Future District Sports Park to the east of the residential lots and a balance lot to the south of the residential lots which will eventually be a mixture of Future District Recreation Park and residences.

Running along the southern side of these two park areas, adjacent to the lots in Sub-precincts 5B & 5C, is a narrow corridor along a small waterway (see Appendix 1). The unmanaged bushland within the corridor varies in width from 40 metres to 75 metres approximately. A corridor of less than 100 metre in width with Urban uses either side for a minimum of 25 metres, is downgraded to a Low/No hazard under corridor and patch filtering (CSIRO report, Section 2.2.1) due to not being of sufficient size to carry a significant bushfire. The park areas adjoining the corridor will be

regularly slashed and kept as a Low hazard until developed, in order to define the corridor and provide for its Low hazard rating, as per the approved Pre-development Bushfire Mitigation Plan and Concept Plan.

To the southeast, south and southwest are Sub-precincts 5B & 5C consisting of residential allotments which, until developed, will also have a regularly slashed grassland buffer establishing a minimum 100 metres of separation for dwellings in Sub-precinct 5A from unmanaged bushland in accordance with the Concept and Context BMP's.

The power line easement area (to the north), up to the National Park bushland area, is to be managed by regular slashing in accordance with the approved Concept BMP. The buffer area between the allotments and the power line easement is also to be a managed area, as outlined in Section 6 of this report, having a maximum VHC 39.2 with associated fuel loads of up to 8t/Ha, over slopes of up to 1 degrees with an FFDI of 54, providing for a potential fire line intensity of up to 2,296kw/m equating to a 'Not Bushfire Prone Area' rating.

To the east of proposed Lots 942, 943, 951-953, 962 & 963 will be bushland as an addition to the Plunkett Conservation Park further east. The Conservation Park bushland consists of grassy eucalypt vegetation, upslope of the Yarrabilba site with a west to southwest aspect. The bushland would be assigned a VHC 9.2 with associated fuel loads of up to 17.2t/Ha, upslope with an FFDI of 54, providing for a potential fire line intensity of up to 9,905kw/m equating to a Medium hazard rating. This presents the dominant bushfire hazard for Sub-precinct 5A.

Table 1

POTENTIAL HAZARD CLASS	POTENTIAL FIRELINE INTENSITY
Not Bushfire Prone Area (Low)	<4,000 kw/m
Medium	4,000 to 20,000 kw/m
High	20,000 to 40,000 kw/m
Very High	>40,000 kw/m

The Bushfire Hazard Mapping also incorporates a 100 metre Potential Impact Buffer meaning that any land within 100 metres of a Potential Bushfire Hazard is also assigned the same rating as that bushland and triggers the Bushfire Code if Medium, High or Very High. Whilst having the same distance for all three levels of hazard is not considered a fit for purpose application, it is unfortunately what is legislated at this current time. Therefore Lots 891-902 & 940-967 would be assigned a Medium hazard rating. Part of the Management Lot (within 100 metres of the unmanaged bushland) will also have a Medium rating. The remainder of the lots in Sub-precinct 5A would be assigned a Low/No hazard rating.

3. Appropriate Building Location & Managed Buffers

As the site is relatively level to undulating topography, there are no significant steep slopes causing dwellings to be located along ridgelines or the like. Sub-precinct 5A is on the lower slopes, where future dwellings will not be exposed to significant upslope bushfire approach.

Being a residential community, it would be recommended that dwellings be located on allotments so as to maximise setbacks from any unmanaged bushland, allowing for optimal defensible space.

In accordance with the approved Concept Bushfire Risk Assessment and Mitigation Plan, dwellings are to have a minimum bushfire buffer of 20 metres, or the distance required to achieve a Bushfire Attack Level BAL-29 (as identified under AS3959), whichever is the greater from large bushland areas and corridors over 100 metres in width. This includes the Medium Rated Bushland to the east of Lots 942, 943, 951-953, 962 & 963.

Dwellings on Lots 942 & 943 will have a minimum 3 metre in-lot front setback plus a 13.5 metre roadway plus a 3.5 metre managed buffer area on the opposite side of the roadway, totalling 20 metres of separation for dwellings.

Dwellings on Lots 951-953 will have a minimum 3 metre in-lot front setback plus a 10 metre roadway plus a 7 metre managed buffer area on the opposite side of the roadway, totalling 20 metres of separation for dwellings.

Dwellings on Lots 962 & 963 will have a minimum 3 metre in-lot setback from the eastern boundary plus a 13.5 metre roadway plus a 3.5 metre managed buffer area on the opposite side of the roadway, totalling 20 metres of separation for dwellings.

In accordance with the approved Concept Bushfire Risk Assessment and Mitigation Plan, dwellings are to have a minimum bushfire buffer of 10 metres, or the distance required to achieve a Bushfire Attack Level BAL-29 (as identified under AS3959), whichever is the greater from small pockets and narrow corridors of less than 100 metres in width. This includes the narrow waterway corridor along the southern side of the Management Lot. Any future residences within the Balance Lot are to have a minimum 10 metre separation from unmanaged bushland in the corridor.

All dwellings have been provided their minimum separation distances from hazardous bushland in accordance with the approved Concept Bushfire Risk Assessment and Mitigation Plan.

4. Roads, Driveways and Fire Trails

As with any proposed development of this size, it will have a substantial road network. Roads in the area will provide for multiple access/egress options for the proposed development. It is considered that access/egress is highly unlikely to be restricted by bushfire. The internal roads are all loop roads and through roads. There are connections provided to existing and future precincts. All allotments have road separation from bushland.

Being residential allotments, the dwellings will have short direct driveway access.

A fire trail is to be provided from the eastern roadway to the existing trail within the conservation area to the east. The trail is to be 6 metres in width with 4 metres formed. It should be low impact preferably with a mowed or slashed surface which would minimise disturbance or erosion, Appendix 4 on fire trails is included in this report as a guide on establishing and maintaining fire access trails. The exact position of the trail is optional and can be chosen during operational works to minimise impact on desired vegetation. This will provide access to the existing trail network and improve bushfire suppression and hazard reduction options.

5. Appropriate Building Construction

The bushfire provisions of the Building Code of Australia (BCA) are applied to Class 1, 2 & 3 buildings and associated Class 10a buildings, located in designated bushfire prone areas. “Designated bushfire prone area means land which has been designated under a power in legislation as being subject, or likely to be subject, to bushfires” (BCA 1.1.1 Definitions).

The Logan Planning Scheme 2015, Table 5.7.1 – Building Work, Editor’s note, states “Land identified in a bushfire hazard area on Bushfire hazard overlay map-OM-03.00 is a designated bushfire prone area for the Building Code of Australia and the Queensland Development Code.” OM-03.00 only maps areas of Very High, High or Medium Potential Bushfire Hazard (PBH).

As Lots 891-902 & 940-967 are assigned bushfire rating, as outlined in Section 2 of this report, these allotments require the Building Code of Australia (BCA) and where relevant the Australian Standard for Construction of Buildings in Bushfire-Prone Areas (AS3959) to be addressed.

P2.3.4 of the BCA requires:- “A Class 1 building or a Class 10a building or deck associated with a Class 1 building that is constructed in a designated bushfire prone area must be designed and constructed to reduce the risk of ignition from a bushfire while the fire front passes.”

Section 3.7.4.0 (Qld variation) of the BCA states:-

- (a) Subject to (b), Performance Requirement P.2.3.4 is satisfied for—
 - (i) a Class 1 building; or
 - (ii) a Class 10a building or deck associated with a Class 1 building, located in a designated bushfire prone area if it is constructed in accordance with—
 - (iii) AS 3959; or
 - (iv) NASH Standard – Steel Framed Construction in Bushfire Areas.
- (b) The requirements of (a) do not apply when, in accordance with AS 3959, the classified vegetation is Group F rainforest (excluding wet sclerophyll forest types), mangrove communities and grasslands under 300 mm high.

The following levels of construction are reliant on the recommendations of this report being implemented and maintained.

5.1. Lots 891-902 & 940-967

Lots 891-902 & 940-967 are within 100 metre of the Medium rated bushland to the east with a minimum of 20 metres separation.

In accordance with AS3959-2009 – Table 2.4.5 ‘Determination of Bushfire Attack Level (BAL)-FDI 40 (1090K)’, the vegetation class is woodland, distance from unmanaged vegetation is between 19 and 100 metres and slope is upslope, which equates to a BAL-12.5 Bushfire Attack Level for the proposed dwelling. A BAL-12.5 Bushfire Attack Level requires Sections 3 and 5 of AS3959-2009 to be applied.

5.2. Remaining Lots

The remaining lots in Sub-precinct 5A have a Low/No hazard rating.

Under the Logan Planning Scheme 2015, Table 5.7.1 – Building Work, Editor’s note, a site with a low PBH rating does not require assessment under the Building Code of Australia or under the Australian Standard (AS3959) for *Construction of Buildings in Bushfire Prone Areas* and therefore no specific level of construction would be required in relation to bushfire.

6. Appropriate Clearing and Landscaping

The residential allotments are to be maintained with low ground fuel levels at all times and may include domestic gardens, lawns with grass kept under 100mm in height and scattered trees with discontinuous canopy.

As a guide to landscaping and gardening in a bushfire prone area, the document ‘Landscaping for Bushfire’ produced by the CFA Victoria, is a useful guide on plant selection, garden design and ongoing maintenance. It can be found at <http://www.cfa.vic.gov.au/plan-prepare/landscaping-for-bushfire/>.

The narrow corridor of retained bushland adjoining the southern side of the parks is to be managed by the removal of weed species and control of non-endemic grass growth. Any slash pine is to be removed from the site including within the retained bushland areas and future regrowth slash pine is also to be removed.

The buffer areas adjacent to Lots 942, 943, 951-953, 962 & 963 are to be managed by regular mowing.

The active park areas in the Balance Lots are to be cleared during operational works in the residential area and managed by regular slashing until developed to avoid posing a bushfire hazard to adjoining development areas.

The full width of the power easement to the north is to be managed (grass kept under 300mm high) by regular slashing/mowing/brush cutting, up to the Conservation Park bushland area. This includes the buffer area between the residential development and the power line easement.

Where proposed allotments have an exposure to bushland on adjoining future residential areas, a slashed buffer should be provided in the future stage that provides a 100 metre buffer when combined with other separations such as roadways. Quality trees and habitat trees can be retained within the slashed buffer zone provided they do not pose a threat to persons or property. OPW applications should ensure that this requirement is met. Such buffers would consist of slashed grassland with retained mature trees for a distance of 100 metres or as can be achieved. Where a stage being developed adjoins a retained vegetation corridor and the opposite side of the corridor is a future development stage, then the buffer must be maintained on the opposite side of the corridor to define the vegetation as a corridor, if the vegetation is to be downgraded for being a narrow linear corridor.

In bushland areas, the areas around the fringes of the bushland and along fire trails have a tendency to have increased ground fuel loading, as a result of increased sunlight penetration producing better growing conditions for grass and weeds (known as 'Edge Effects'), which can have an adverse impact on the local ecosystem and safety issues for fire suppression personnel during unplanned fire events. These non-endemic grasses penetrate into the edges of the retained bushland, creating conditions for high intensity fire which damages the edges of the bushland, opening up the canopy which then allows more sunlight in and promotes grass and weed intrusion further into the bushland. This cyclic process has the effect of decreasing the size of quality bushland and increasing grass and weed dominated areas. The most cost effective way to control grass and weed growth is to create a good closed in canopy cover, which will shade out the undesirable species. The control of fuel loads along the edges by regular mowing, brush cutting or in some cases poisoning may be suitable. Areas with a build-up of volatile fuel levels along the open edges of bushland, where full sunlight is available, can be where the most damage is inflicted on the bushland during a bushfire. Added protection from bushfire can be achieved by establishing green fire breaks which include green lawns, trees arranged to create a shield to catch sparks or fire brands or the expanding of rainforest species. Trees and shrubs not subject to drought stress will cope better during bushfires. The higher the moisture content in the plant the slower it burns. Therefore by keeping the surrounding area green and low in dry ground fuel, the intensity of an approaching fire will be reduced and the risk of spot fires minimised.

For optimal bushfire safety and best practise, the required vegetation management practises for allotments must be established during operational works and maintained by the developer until sold. Once sold the purchaser must maintain the allotment at all times, before, during and after construction of the dwelling.

All land under the control of the developer is to be managed to control ground fuel levels and prevent uncontrolled regrowth, in areas identified as developable in accordance with the Pre-development Bushfire Mitigation Concept plan dated 30/1/12.

7. Provision of Adequate Water Supplies

The area of the proposed development is to be serviced by reticulated water supplies with the inclusion of fire hydrants for firefighting purposes. These services are to comply with the relevant standards as required by the local authorities, including a minimum pressure and flow of 10 litres per second at 200kPa.

8. Provision of Fire Fighting Infrastructure

Dwellings are to have external taps and hoses that are positioned so water supply is capable of reaching to all parts of the building. All water lines are to be covered by at least 300mm of soil or be of metal above ground. Residents should maintain good access around their homes for fire suppression activities by fire authorities.

9. Local Fire Brigades

The subject property is currently in the Tamborine Rural Fire Brigade district and they would be responded on a 000 emergency call, with back-up from Logan Village Rural Fire Brigade. If further back-up is required, additional units would be engaged by the

Beaudesert/Logan Rural Fire Brigades Group. Urban fire appliances would be responded in the event of a structural fire or specialised structural protection being required.

In time as urban development progresses in this area it will most likely become the responsibility of the Urban Fire Service.

10. Improved Community Awareness

Managing ground fuel in small pockets of bushland at the interface between urban development and bushland (Izone) is the easiest way of reducing bushfire hazard, particularly the removal of non-endemic grass and weeds.

It would be recommended that a copy of this report be placed on display at any sales office, and a copy of the plans including Appendix 3 on being prepared, be given to the purchasers of lots to provide them with the necessary information required for the building application process.

It would be recommended that residents of Lots 891-902 & 940-967 prepare a 'Bushfire Survival Plan', which is available from the Rural Fire Service Queensland website at www.ruralfire.qld.gov.au. The 'Bushfire Survival Plan' document provides information on Bushfire Danger Ratings, Community Warning Information, how to prepare your property, what to do in the event of a bushfire and what to expect. The Bushfire Survival Plan should be updated annually. Further information is also available through the Prepare•Act•Survive brochure also available on the Rural Fire Service website. For further information contact your local Fire Brigade for assistance or phone 1300 369 003.

The Bushland open space is a very sensitive ecosystem and could be altered drastically if not cared for properly. Residents can assist in maintaining this fragile ecosystem by preventing unwanted fires from encroaching into the parkland, ensure that dumping of rubbish does not degrade the area and that exotic plant species do not invade the bushland. Hot fires on a regular basis will degrade the bushlands biodiversity.

11. Conclusion

This plan is a Sub-Precinct Specific Plan for Sub-Precinct 5A of Yarrabilba, produced in accordance with:

- Bushfire hazard assessment in accordance with the State Planning Policy 7/14, under the Queensland Sustainable Planning Act 2009, based on the Bushfire Assessment Methodology provided by the Public Safety Business Agency (PSBA) & Rural Fire Service Qld (RFSQ).
- Code assessment in accordance with the approved Conceptual Bushfire Risk Assessment and Mitigation Plan (BMP), being the agreed assessment code for the Yarrabilba Project, produced by Bushland Protection Systems, dated 18/7/2012, based on the State Planning Policy 1/03, *Mitigating the Adverse Impacts of Flood, Bushfire and Landslide*, under the Queensland Sustainable Planning Act 2009, the Logan City Council Planning Code Part 5 Bushfire Hazard Area.
- The Context Bushfire Hazard Assessment and Mitigation Plan for Precinct 5 of Yarrabilba produced by Bushland Protections Systems, dated 14/7/17.

- This report also takes into consideration the 'Pre-Development Bushfire Mitigation Concept' Plan prepared by Bushland Protection Systems, dated 30/1/12.

With the appropriate management of the passive open space areas, adequate water supply, good access provisions and minimising of ground fuels, the risk of bushfire damage can be managed and improve the safety of residents and fire services in attending to a bushfire threat, as well as maintaining the localised ecosystems.

This plan should remain current for a period of 5 years, until 2023, at which time it should be subject to review to take account of changing land use and vegetation patterns. Any major bush fire event affecting the subject site should also trigger a review in order to determine effectiveness of protection measures and annual hazard reduction initiatives.

Ultimately, persons living in a bushfire prone area must take the precautions necessary to protect themselves, their families and their homes if Brigades are stretched and are unable to attend immediately.

If you require any further assistance please do not hesitate to contact this office.



C. L. Bain
Principal Consultant.



- MINIMUM SEPARATION OF ANY BUILDING TO EDGE OF CORRIDOR
- MINIMUM SEPARATION OF 20m ANY BUILDING TO EDGE OF CORRIDOR
- 100m OFFSET TO EDGE OF CORRIDOR
- MINIMUM SEPARATION OF 10m BUILDINGS AND LOW RATED BUILDINGS
- LINEAR PARK UNMANAGED
- 100m WIDE FAUNA CORRIDOR
- CONSERVATION OPEN SPACE

PREPARED BY LENDLEASE ON BEHALF OF BUSHLAND PROTECTION SYSTEMS



APPENDIX 3

Being Prepared

Knowing how to prepare your property for bush fire, both pre-fire and during a fire, can assist in protecting people and property. It can also alleviate a lot of the stress and panic and the feeling of helplessness that is commonly felt by the inexperienced and by the ill-prepared.

It is generally accepted that South East Queensland does not experience the same degree of extreme fire conditions as the southern states of New South Wales, Victoria and South Australia. Having said this it is also accepted that this State's bushland experiences a relatively regular fire regime. From time to time conditions may occur that will institute a serious and potentially destructive fire. These conditions can be recognised and precautions taken. It must be remembered that during extreme fire conditions the fire services may be stretched to the limit and may not be able to respond immediately to your particular emergency. Fire trucks and fire fighters are a limited resource so it is important that they are deployed in an appropriate manner to best manage the fire. The Queensland Fire and Rescue Service do not guarantee a fire truck will be available to defend every structure during a large bushfire. So it would be desirable to be as prepared and self-reliant as possible to protect yourself, your family and your assets. It is not difficult if appropriate preparation is undertaken and the following information is provided to be of some assistance.

1. Conditions that may lead to a Serious Fire:

- 1.1. Higher than average air temperatures for prolonged periods.
- 1.2. Large and very dry fuel loads.
- 1.3. Prolonged dry spell with little or no rain resulting in low soil moisture content.
- 1.4. Very low relative humidity, ie. there is very little moisture in the air.
- 1.5. Strong and gusty winds, usually from the north through to the west contribute to increased fire hazard. The longer these winds continue the drier the conditions become, and the higher the risk of serious fire.

Observation of local weather conditions past and present will give the best indication of the potential intensity of a fire at any given time or place.

Notification of potential bushfire conditions are available from the Queensland Rural Fire Service and Local Brigades, in the form of Fire Danger Ratings often seen on roadside signs, Advice Messages, Watch and Act Messages and Emergency Warnings. More information on these information sources, where to find them and what they mean, is available on the Rural Fire Service Website www.ruralfire.qld.gov.au or through the local Fire Brigade.

2. Basic Fire Behaviour.

Having some idea of what a fire is likely to do in your local area, will help you make the right decisions and give you the confidence to deal with an approaching fire if necessary. Following are some basic fire behaviours.

- 2.1. Fire will travel faster and hotter uphill. The steeper the slope the faster the rate of spread, in some cases allowing little time to react. The speed of a fire will double for every 10 degrees of upslope.
- 2.2. Fire will usually travel relatively slower down hill even with reasonably high fuel loads, which will give more time to prepare. The speed of a fire will halve for every 10 degrees of down slope.
- 2.3. A fire will generally travel faster and at higher intensities with a wind behind it. The stronger the wind, the faster the rate of spread. Likewise a fire will slow considerably when burning against the wind in some cases it may even go out.
- 2.4. The fire will usually burn at a higher intensity and spread faster during the hottest times of the day and tend to slow down considerably as the evening approaches and air temperatures drop.
- 2.5. The greater the supply of dry ground fuel available to the fire, ie. grass, dry leaf litter, hanging bark and twigs, the greater the intensity of the fire. If the ground fuel is minimised the intensity of the fire reduces considerably and so does the personal risk and the potential for damage.
- 2.6. If ground fuels are kept relatively low the chances of a fire progressing into the treetops (crown fire) would be considerably reduced within the Queensland coastal bushlands. For a fire to progress into the tree tops ground fuels and elevated fuels must be present providing a 'ladder' of fuels from ground level to tree top. Control of these fuels is the best way of minimising fire intensity and therefore limiting the destructiveness of a bushfire.

Talk to neighbours that have been present during previous bushfires or consult the local Fire Brigade to develop an understanding of usual fire behaviour for your specific location.

3. Preparing for the bushfire season.

Most cases of damage to property are caused by radiated heat, direct flame contact or most commonly by burning debris or sparks landing in, on, or around buildings and starting small spot fires which if not attended to may destroy the property long after a fire front has passed. There are many steps that should be taken prior to the onset of a fire season to help protect your property.

- 3.1. Keep ground fuel cleared from around buildings such as long dry grass, branches, dead leaves, bark and thick undergrowth.
- 3.2. Remove elevated fuels, such as hanging bark and fallen debris hung up on lower branches.

- 3.3. Ensure fire breaks/trails/buffers are checked and maintained, even a well-watered lawn can be an effective firebreak.
- 3.4. Flammable material around buildings should be kept well clear, such as firewood piles, rubbish, fuels, hazardous materials, plant pots, boxes, paper, patio and garden furniture.
- 3.5. Ensure flammable materials are not stored in open areas under the building.
- 3.6. Make sure that rainwater gutters are kept clear of leaf litter build-up. Consider a method of blocking off down pipes so gutters can be filled with water during a fire to extinguish sparks landing in gutters. There are commercially made products available or you can create your own.
- 3.7. Make sure that the roofing is well secured, as winds created during a fire may lift roofing and allow the entry of burning embers into the roof space. Also clear any leaf litter or debris build-up from roof areas.
- 3.8. All windows and vents should be screened with fine wire mesh and all roof areas closed in to prevent entry by sparks.
- 3.9. Ensure gas tanks have their emergency relief valves facing away from the building (this includes barbeque bottles).
- 3.10. Make sure of reserve water supplies. Power frequently fails during a fire. If petrol or diesel pumps are available make sure they and associated hoses and fittings are in good working order.
- 3.11. Ensure your bushfire survival kit is up to date and complete.

The Queensland Fire and Rescue Service provide detailed lists for preparation prior to fire season and what to do during a bushfire event. This information can be found at www.ruralfire.qld.gov.au or obtained from your local fire brigade.

4. Green Fire Breaks

Added protection from bushfire can be achieved by establishing green fire breaks which include green lawns, trees arranged to create a shield to catch sparks or fire brands or the expanding of tropical rainforest species. Excess rainwater or tertiary treated waste water could be stored and used for this purpose during dry periods to maintain the green fire breaks. Trees and shrubs not subject to drought stress will cope better during bushfires. The higher the moisture content in the plant the slower it burns. Therefore by keeping the surrounding area green and low in dry ground fuel, the intensity of an approaching fire will be reduced and the risk of spot fires minimised.

5. Personal Protection

- 5.1. If you plan to evacuate, make sure you do so early, long before the fire front arrives. Evacuating at the very last moment results in the majority of deaths at bushfires. People remaining to fight the fire need to be physically and mentally fit to do so.

5.2. Those staying to protect the property should make sure they protect themselves from radiant heat, flying embers, smoke and most importantly heat stress.

Protection measures should include the following:

- Long trousers and long sleeve shirt made of wool, denim or cotton (no synthetics)
- Woollen socks and sturdy work boots for foot protection
- Goggles for eye protection
- A good pair of work gloves to protect hands from burns
- A smoke mask or a damp cloth (non-synthetic), to cover your nose and mouth to protect you from inhaling smoke and embers.
- Have plenty of drinking water available to protect against dehydration (not refrigerated as this can cause cramping).

5.3. During the fire

When a fire is approaching and given that you have already carried out your pre-fire precautions, established adequate buffers, implemented mitigation measures and established the degree of risk to your property, protection from the actual fire should be relatively straight forward.

5.3.1. Dress in the appropriate clothing and be sure to drink water regularly.

5.3.2. Fill up bathtubs, sinks, buckets, laundry tubs etc. in case of blackouts.

5.3.3. Close doors and windows.

5.3.4. Close gaps under doors and windows with wet towels.

5.3.5. Block up down pipes, wet down roof, walls and gardens, paying particular attention to the side the fire is approaching from.

5.3.6. Have a battery-powered radio on hand to listen for information about the fire's progress from local radio stations.

5.3.7. Patrol your property while the fire is approaching and take shelter inside as the fire front passes. Then continue patrolling the property for many hours after it has passed, to ensure that any spot fires or smouldering debris do not get a chance to develop into a major fire, paying particular attention to the roof cavity of your buildings. Smouldering embers have been known to start fires hours or even days after the initial passing of the bushfire front.

The Queensland Fire and Rescue Service provide detailed lists for preparation prior to the arrival of a bushfire and what to do during a bushfire event. This information can be found at www.ruralfire.qld.gov.au or obtained from your local fire brigade.

6. Further Information?

The local fire brigade is a good source of local district knowledge, they also have pamphlets and literature produced by the Queensland Fire and Rescue Service available. Most brigades will also be happy to advise local residents.

The information provided above is only a basic guide. Further and more details information is available from the Queensland Fire and Rescue Service. It would be recommended that residents in bushfire prone areas prepare a 'Bushfire Survival Plan', which is available from the Queensland Rural Fire Service website at www.ruralfire.qld.gov.au. The 'Bushfire Survival Plan' document provides information on Bushfire Danger Ratings, Community Warning Information, how to prepare your property, what to do in the event of a bushfire and what to expect. The Bushfire Survival Plan should be updated annually. Further information is also available through the Prepare•Act•Survive brochure also available on the Rural Fire Service website. For further information contact your local Fire Brigade for assistance or phone 1300 369 003.

APPENDIX 4

Recommendations for Fire Trails

Fire trails can be a very effective tool in the management of bushland, for weed control, hazard reduction requirements, prescribed burns and fire suppression activities. A good well maintained trail network can effectively enhance and maintain desired ecosystems, while providing added safety for the protection of life and property. The following is some ways in which fire trails can be constructed and maintained to improve their viability.

1. Fire trails should preferably be constructed to a cleared width of 6 metres and a formed width of 4 metres, and be able to be negotiated by light and medium 4 wheel drive fire appliances.
2. They should preferably have a maximum gradient of 25%, a maximum cross slope of 5%, avoid large cut and fill and avoid sharp corners.
3. Fire trails up to 25% can be of compacted earth surface designed with water shedding devices, such as pipes under trail, woa boys or change of gradients, to prevent washouts or gouging of slopes. It would also be advantageous in some cases if grass coverage can be established, which with periodic slashing or mowing will assist in preventing washouts.
4. Fire trails should have access at each end and multiple access/egress points where possible.
5. Fire trails are to have passing and turn around areas at maximum intervals of 400 metres.
6. Periodic management of ground fuel levels along the edges of fire trails should be implemented to at least one metre each side to improve accessibility during a fire event.
7. Trees alongside fire trails should have low branches removed to a height of 2 metres to assist in preventing fire from climbing into treetops. Branches overhanging fire trails should be removed to a minimum height of 4 metres to ensure access by fire vehicles.
8. Fire trails should be inspected each year prior to fire season, to ensure their condition and carry out remedial work if required.
9. Dead or dying trees that are close to fire trails and may pose a risk to fire services should be removed.
10. Fire trails should not be seen as fire breaks. They are an aid in the management of fuel levels and fire suppression activities.
11. Fire trails should be identifiable to land managers and fire services by signage and map records. Where a fire trail network exists, intersections should also be identifiable.



Bushland Protection Systems

Specialising in
**BUSHFIRE HAZARD
PLANNING & MITIGATION**

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Fire is a part of nature. Its effects can be catastrophic and fire can never be totally eliminated, however there are steps that can be taken to reduce the chances of uncontrolled fires occurring and the risk to life, property and the environment, in the event of uncontrolled fires. This is what we concentrate on, how the threats from bushfire can be minimised. There are many methods to do so, however deciding which method/s is best to use can be a complex decision to make. There are so many factors to consider such as ecological values, biodiversity, fire history, availability of resources, cost effectiveness and public awareness just to name a few. No guarantees can ever be given when dealing with Mother Nature, with ever increasing complexities it has now become a specialist field to be able to create plans to try and minimise the risk from bushfire. Ultimately it is a community responsibility to protect the environmental values, life and property in their area

COMPANY PROFILE

Bushland Protection Systems Pty Ltd (BPS) is a leading Bushfire Management Consultancy firm in Queensland, with many clients, ranging from private landowners to multi-national companies and government bodies.

BPS consultants began operating as Bushfire Management Consultants with the introduction of the Gold Coast Bushfire Management Strategy in 1998 and spread their operations across the state with the implementation in 2003 of the State Planning Policy for mitigating the adverse impacts of flood, bushfire and landslide.

During that time over 3000 projects have been successfully completed, including large residential estates such as Coomera Waters, Spring Mountain, Pacific Pines, Coomera Springs, Observatory, Highland Reserve, Delfin Woodlands & Yarrabilba as well as commercial or Government project sites such as Paradise Country, Wacol Police Academy, Numinbah Correctional Facility, Silkwood Steiner School, Canon Hill Community Links Project & Griffith University. Clyde Bain, the Principal Consultant, is also one of the two most highly sought after expert witnesses for Land and Environment Court Appeals, in Queensland, having worked as the Bushfire Expert for several Regional and City Councils throughout the state on a number of various projects before the Land and Environment Court.

With a strong background in bush fire fighting and involvement with numerous industry bodies, Bushland Protection Systems continues to deliver realistic and cost effective advice, solutions to provide higher levels of safety for the community, improve wildfire suppression and mitigation options for emergency services and land managers, while maintaining and improving environmental values for the future. All our Consultants are members of the Rural Fire Association of Queensland.