

Bushfire Assessment Report

prepared for

Peter and Vicki Ulrick

163 The Saddle Rd

Brunswick Heads

Lot 1 DP 631177



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Executive summary

Peter and Vicki Ulrick have commissioned this Bushfire Assessment Report which is to form an essential component of their development application for a new dwelling on their property at 163 The Saddle Rd, Brunswick Heads, in the Byron Shire Council (BSC) local government area, Lot 1 DP 631177.

The property on which this development is proposed is mapped as bushfire prone by BSC. The development, not being a state significant development, must, under the Environmental Planning and Assessment Act (EP&A) 4.14, be assessed for bushfire risk and shown to conform to Planning for Bushfire Protection (PBP), National Construction Code and Australian Standard - Construction of buildings in bushfire prone areas (AS3959) so that BSC can give development consent.

The Bushfire Attack Level (BAL) for this dwelling has been assessed using Method 1 in AS3959 and is determined to be BAL 12.5.

The proposed dwelling, a home which is being relocated, providing recommendations within this report, including but not limited to establishment and maintenance of satisfactory Asset Protection Zone (APZ) to maintain a BAL 12.5 and installation of an appropriate water supply for bushfire fighting, are implemented, will comply with the requirements and specifications of PBP, AS3959, the BCA and planning and development controls of BSC and is able to be assessed by BSC.

It must be remembered, by all parties, that while every effort has been made to obtain true and accurate data and analysis of this data was conducted within the framework of PBP and AS3959 as well as other standards, there is no guarantee when it comes to bushfire. While all recommendations contained in this report need to be complied with to meet the requirements of PBP and AS3959, EP&A and hence BSC's planning requirements any fire event could pose a threat to both the property and the people therein.

Introduction

This report has been produced for Peter and Vicki Ulrick and is to form part of submissions to BSC for a Development Application for the construction of a dwelling comprising a relocated dwelling and detached carport.

To assess the development and reach the conclusions and recommendations contained in this report the following were consulted:

Pre-release Planning for Bushfire Protection 2018 (PBP) including Appendix 3 2014 (NSW Rural Fire Service, 2006);

Australian Standard – Construction of buildings in bushfire prone areas (AS3959) including Amendments 1, 2 and 3 (Standards Australia, 2009);

Building Code of Australia (BCA) (Australian Building Codes Board, 2014);

Rural Fires Act ; and

other documents and standards, as noted throughout the report.

The methods and procedures outlined in these were used. In particular Method 1 in PBP and AS3959 was used to determine the BAL.

The proposed development site is classified as bushfire prone land on BSC Bushfire Prone Land Maps which have been ratified by the Commissioner, NSW Rural Fire Service (RFS).

This report has two goals: 1) to determine the Bushfire Risk as represented by the BAL for this development and 2) outline measures which will enable an adequate level of safety and compliance with AS3959, PBP and BSC's planning requirements so that this development application can be determined favourably.

Site assessment

Location

The development site is located at 163 The Saddle Rd, Brunswick Heads, Lot 1 DP 631177 (Fig 1).

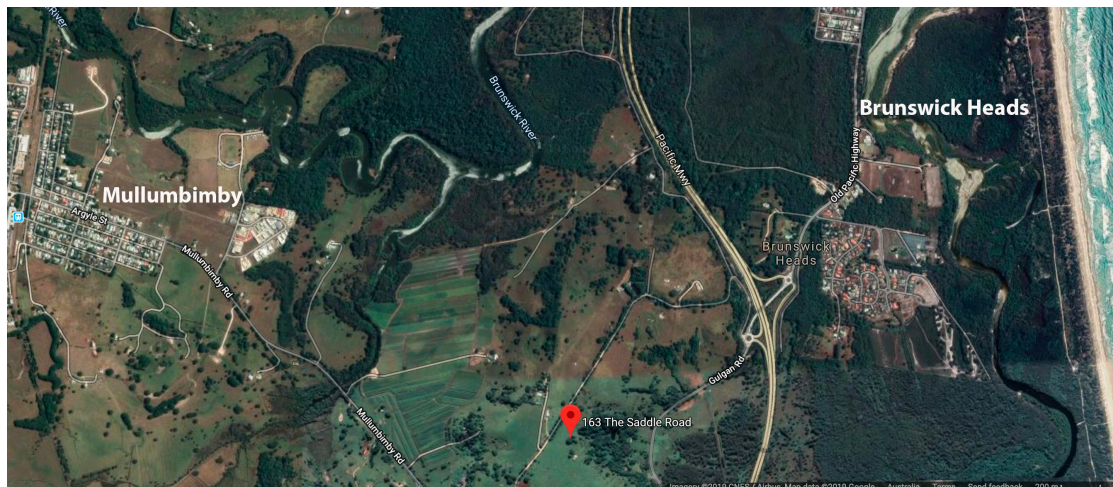


Figure 1: Locality Map for 163 The Saddle Rd, indicated in red..

The development

The proposal is for a dwelling which is to be relocated from another site to be placed on the lot and appropriate infrastructure to be constructed including a driveway and carport. The carport, while close to the dwelling is constructed of non-combustible materials and will therefore not be involved in any fire. It is therefore not considered as part of this assessment.

Access

The property is accessed via the Pacific Highway and Gulgan Road then the Saddle Rd. the distance from the entrance way to the Pacific Highway is approximately 1.8km. This access route, while requiring some maintenance, is capable of accommodating access by emergency services vehicles and egress by owners.

Vegetation

The vegetation is mapped as bushfire prone by BSC as outlined in *Guide to Bush Fire Prone Land Mapping* (NSW Rural Fire Service, 2014).

Vegetation was assessed in accordance with Keith (Keith, 2004), PBP (Table A2.1) and AS3959 to a distance of 140m from each margin of the development (Fig 2).

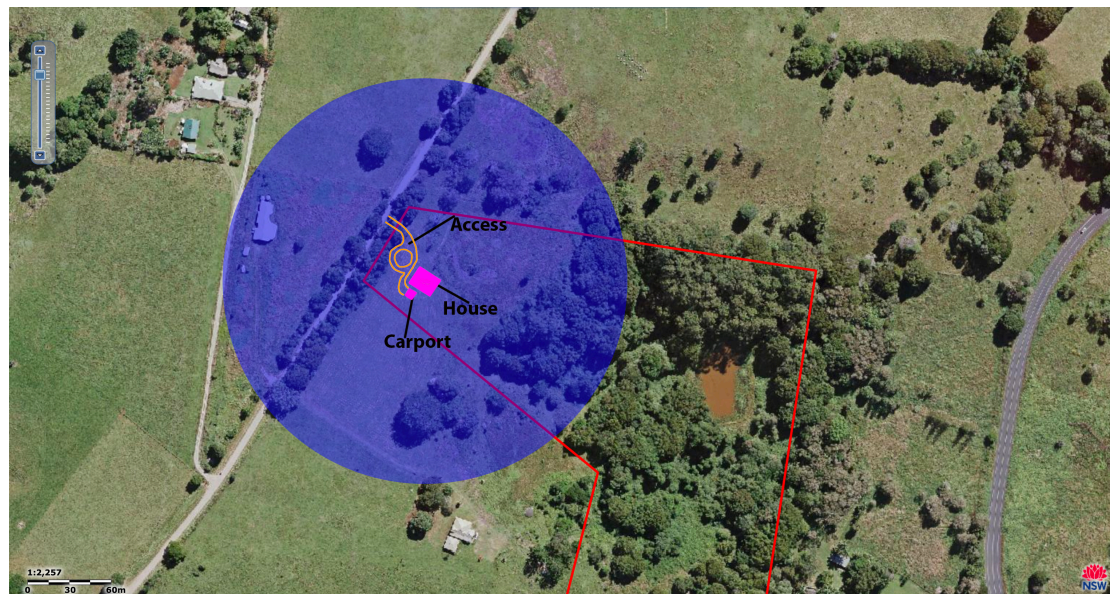


Figure 2: Vegetation surrounding proposed development site to a distance of 140m indicated in blue (dwelling and carport in pink and boundary in red).

Figure 3 shows classified vegetation surrounding the proposed development. The degraded vegetation complex covering most of the east of the property classifies as rainforest as it mostly consists of endemic rainforest trees, *Cinnamomum camphora* and other exotic weeds and has closed canopy. Those areas of this vegetation which do not yet have closed canopy will in time.

To the south and on the adjoining property the vegetation is well managed grazing land and of little risk to the dwelling. There are though no guarantees how it or any other vegetation on surrounding properties will be managed in the future so it is classified as grassland.



Figure 3: Classified vegetation. Dark green = rainforest; light green = grassland; orange = managed land.

Slope and aspect

Slope and aspect were assessed in accordance with PBP and AS3959 to a distance of 100m, using a 10m contour map (Fig 4), from each margin of the development.

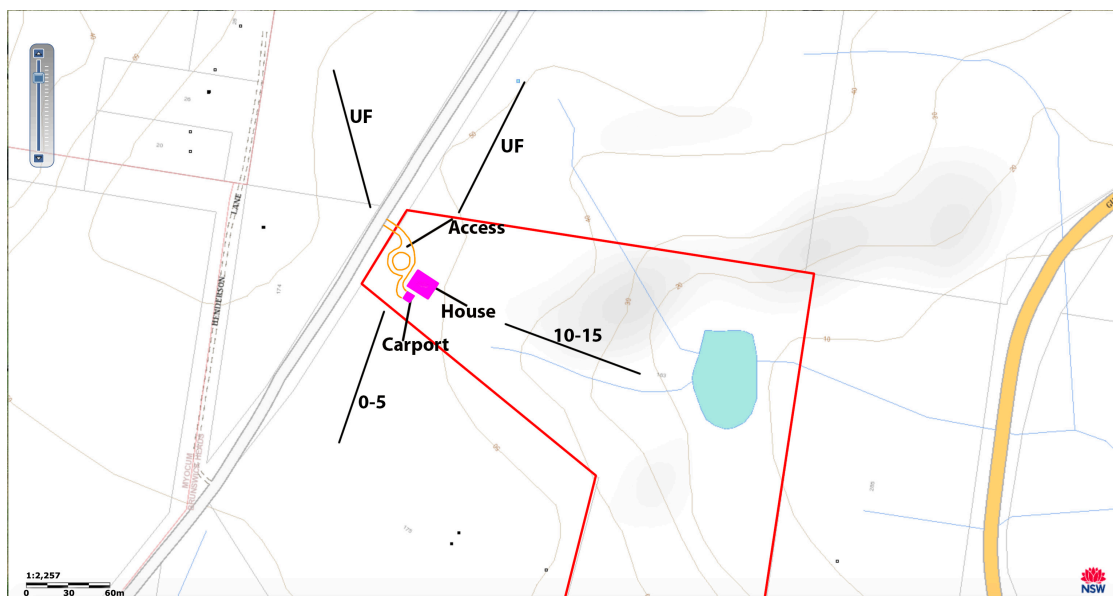


Figure 4: 10m contour map with slopes under classified vegetation. Dwelling and garaged marked in pink and boundary indicated in red.

These results are presented with vegetation classification in Table 1 below. The dwelling and garage, being in close proximity to each other, are assessed as one.

Table 1: Principle factors affecting bushfire impact on the development site

Aspect	Vegetation classification	Distance between vegetation and development (m)	Effective slope under vegetation degrees	BAL
North	Grassland	40	Upslope/flat	12.5
East	Rainforest	76	10 - 15	12.5
South	Grassland	17.7	0 - 5	12.5
West	Managed land	n/a	Upslope/flat	LOW

Adjoining sites – features affecting bushfire impact

The properties to the north and south of this development are used for grazing. They are well managed and the grass is kept short. They present little bushfire risk to this proposed dwelling.

Fire danger index (FDI)

From Table A2.3 in PBP the FDI rating for the North Coast of NSW, where this development is located, is 80.

BAL assessment

Using Method 1 in AS3959, as set out in Appendix 3 (2014) of PBP, the existing Bushfire Attack Level (BAL) has been determined as follows:

Dominant vegetation type affecting BAL – Rainforest

Distance from development to vegetation – 76 m

Effective slope under vegetation – 10 - 15°

FDI – 80

From Table 2.4.3 in AS3959 the BAL for this development is BAL 12.5

Bushfire protection measures

The bushfire protection measures listed here are, unless stated otherwise, mandatory to enable this development to comply with AS3959 and PBP.

This development site has been assessed as BAL 12.5.

Asset protection zone (APZ)

An APZ shall be maintained in perpetuity around the dwelling. The minimum distances for this APZ are listed in Table 1. Other conditions for the APZ follow.

Table 1: Minimum APZs to maintain a BAL 12.5 on all aspects of the dwelling.

Aspect	Vegetation classification	Effective slope under vegetation degrees	BAL	Minimum APZ (m)
North	Grassland	Upslope/flat	12.5	17
East	Rainforest	10 - 15	12.5	39
South	Grassland	0 - 5	12.5	To the boundary
West	Managed land	Upslope/flat	LOW	To the boundary

As the dominant vegetation type for this development is rainforest the entire APZ shall be managed as an Inner Protection Area (IPA) (PBP A4.1).

The IPA shall (PBP A4.1):

Trees

- have tree canopy cover <15% at maturity
- have tree canopy not touch or overhang the building at maturity
- have canopies separated by a minimum of 2m
- have all limbs below 2m removed
- preferably be smooth barked or evergreen

Shrubs

- have large discontinuities or gaps between beds
- not be located under trees
- form less than 10% of ground cover
- be separated from exposed windows and doors by at least twice the height of the vegetation

Grass/ground cover

- kept mown - \leq 1cm in height
- leaves and vegetation debris removed.

These conditions meet the requirements of PBP.

Maintenance

The dwelling shall be maintained in perpetuity by:

- regularly removing all litter from gutters and roof
- ensuring external painted surfaces are in good condition
- ensuring water supply is available and tanks and outlets are in good working order
- maintaining driveways in good condition
- ensuring roofing materials are firmly fixed
- screens on windows and doors are in good order with no gaps or holes
- doors are fitted with draft seals to ensure no gaps of greater than 2mm
- mats are of non-combustible materials
- woodpiles, garden sheds and other combustible materials are located away from the dwellings

Gardens and APZs shall be maintained in perpetuity as outlined in PBP A4 and NSW RFS Standards for Asset Protection Zones by:

- a clear area of low cut lawn, ground cover or pavement adjacent to the dwelling
- areas under fences, near fence posts and under trees raked and cleared of fuels

- non-combustible fencing and retaining walls
- canopy not continuous, that is gaps between tree canopies

Carrying out this level of maintenance in perpetuity meets the requirements of PBP in particular Appendix 5 Bush Fire Provisions – Landscaping and Property Maintenance.

Access

The access shall be constructed and maintained as follows

- two wheel drive all weather road
- a minimum carriageway width of 4m with an additional 1m wide strip on each side of the trail (clear of bushes and long grass) except for a couple of locations where a solitary but environmentally significant tree/s is/are standing in this 1m wide strip.
- a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches is provided.
- a slope on the carriageway is not more than 10° unless sealed. For sealed sections the slope is not more than 15°.
- a crossfall of the carriageway is not more than 10° at any point.
- curves have a minimum inner radius of 6m.
- ample areas for fire fighting appliances (RFS Cat 1) to turn around at both dwellings in accordance with PBP A3.

The proposed access will:

- be gravel and suitable for two wheel drive vehicles
- have a minimum carriageway of 4m
- have no overhead obstacles
- be across almost flat land
- be short (< 50m)
- be across almost flat land
- have curves that have a minimum inner radius of 6m
- have a turning circle suitable for RFS Cat 1 appliances.

This access conforms to the requirements of PBP.

Water supply

There is no reticulated water supply, therefore a static water supply (SWS) of 10,000L for fire fighting shall be maintained in perpetuity (PBP Table 5.3d).

This water supply shall (PBP 6.4c):

- Have access point located within the IPA but away from structures
- Have a hardened ground surface for truck access within 4m of the access point

- Have all above ground fittings and pipes of metal
- Be either above or below ground
 - Above ground tanks shall:
 - Be of metal or concrete construction
 - Have 65mm metal Storz fitting with gate or ball valve
 - Have an inner diameter of minimum 50mm for all fittings
 - Have above ground pipes of metal
 - Below ground tanks shall:
 - Be clearly marked
 - Have an access hole of 200mm

Other acceptable solutions for water supply, providing they meet volume, location and access criteria above, are inground pools and dams (PBP 3.5).

Emergency measures

There is no requirement for a dwelling to develop an emergency management plan. However, it is highly recommended that anyone living on or in close proximity to Bushfire Prone Land develop such a plan, review it and practise it annually (<http://www.rfs.nsw.gov.au/resources/bush-fire-survival-plan>).

Construction measures

As this is a relocated dwelling it is not feasible for it to meet all the requirements of AS3959 Section 3 - Construction General and Section 5 – Construction for Bushfire Attack Level 12.5 (BAL-12.5) therefore some retrofitting shall be applied to enhance the dwelling's ability to survive a bushfire particularly to withstand ember attack.

- All external painted surfaces shall be in good condition
- All joints in the external surface material of walls shall be covered to prevent gaps greater than 3 mm.
- Roof sarking shall conform to AS3959 3.10.
- Where fitted, screens for windows and doors shall have a mesh with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium. Gaps between the perimeter of the screen assembly and the building element to which it is fitted shall not exceed 3 mm.
- Sheet roofs have any gaps greater than 3 mm (such as under corrugations or ribs of sheet roofing and between roof components) sealed at the fascia or wall line and at valleys, hips and ridges by mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium
- Roof penetrations, including roof lights, roof ventilators, roof-mounted evaporative cooling units, arials, vent pipes and supports for solar collectors shall be

adequately sealed at the roof to prevent gaps greater than 3 mm. The material used to seal the penetration shall be non-combustible.

- Gutter guards if installed, shall be non-combustible.

Environmental impacts of proposed bushfire protection measures

There will be no environmental impacts from any of the proposed bushfire protection measures.

Conclusion

If all the measures outlined above are adhered to as outlined and construction is in accordance with the BCA and AS3959 for a BAL 12.5 this development will meet the requirements of PBP and AS3959 and can be determined by Council.

References

- AUSTRALIAN BUILDING CODES BOARD 2014. National Construction Code Series 2014 Volume Two - Building Code of Australia Class 1 and Class 10 Buildings. Canberra, Australia: Australian Building Codes Board.
- KEITH, D. 2004. *Ocean shores to desert dunes: the native vegetation of New South Wales and ACT*, Hurstville, NSW, Department of Environment and Conservation (NSW).
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- STANDARDS AUSTRALIA 2009. Australian Standard Construction of building in bushfire-prone areas - AS3959. In: AUSTRALIA, S. (ed.). Sydney, Australia.