

27 August 2020

John Holman 13 Bungendore Street, Ingleside NSW 2101

Re: Review of APZ at 13 Bungendore Street Ingleside NSW

Advanced Bushfire Performance Solutions Pty Ltd (ABPS) has been engaged to review the asset protection zone (APZ) associated with the Bush Fire Safety Authority granted to a Farm Stay development at the above site.

Background

On 6 April 2020 the NSW Rural Fire Service (RFS) granted a Bush Fire Safety Authority (BFSA) (DA20200127000321-Original-1) for Northern Beaches Development Application DA2019/1381. The BFSA condition APZ1 requires the APZ to inner protection area (IPA) standards as detailed below.

- North for a distance of 40 metres;
- North east for a distance of 33 metres;
- East to the property boundary;
- South to the property boundary;
- West for a distance of 49 metres; and,
- North west for a distance of 49 metres.



Spatial depiction of the required APZ about the Farm Stay building.



The Northern Beaches Council with NSW Rural Fire Service approval, revised the Bush Fire Prone Land Map on 7th August 2020. This revision recognised the absence of Bushfire Hazard Vegetation within the lot. The Lot is within the 100m Vegetation Buffer and as such any development will still be subject to compliance with bushfire requirements.



Extract of BFPL Map from Northern Beached interactive mapping website

It should be noted that the entire APZ required by the BFSA is within existing 10/50 Vegetation Clearing Code application areas (see Appendix B).

10/50 Rule

The property at 13 Bungendore St Ingleside benefits from the following 10/50 Vegetation Clearing Code applications:

- a) Farm Building to the West of the site
- b) Farm Building to the East of the site (the building that is proposed to be changed to Farm Stay accommodation).
- c) The main house which has recently been completed
- d) The house at 11 Bungendore St Ingleside. Mia Holman (the owner of 13 Bungendore St Ingleside) has written permission from the owner of 11 Bungendore St Ingleside to utilise the 10/50 rule as per section 7.1 of the 10/50 Vegetation Clearing Code of Practice for New South Wales (2015).

The above application of the 10/50 rule covers 19,553m² of the property as per the drawing in Appendix B attached. The area where understorey management is currently permitted exceeds the area required to be managed to maintain IPA standards as per the BFSA.

Survey

On 27 July 2020, ABPS conducted a detailed survey of the site. The location and structure of each tree was assessed with emphasis on the quantifying projected foliage cover of the current canopy.

Assessment

Canopy cover was assessed using a photo comparative assessment methodology accepted by NSW Rural Fire Service. Each tree canopy is photographed from below looking up to capture a full spread. Photos are digitally modified to render a near silhouette and compared with a known projected foliage cover matrix (Appendix A).



Image of the existing APZ viewed from the north west as at 27 July 2020. Farm Stay building is in the background. The APZ begins beyond the rocks in the centre of the image.

A detailed survey of the vegetation across the entire site was conducted. A photo record was taken for each tree. All tree locations were confirmed against the supplied tree survey plan. 29 distinct trees canopies were surveyed within the APZ. This represented half the trees on the site. Canopies were quantified by creating actual polygon representations for each canopy within a GIS (see Appendix C).

The total solid canopy coverage of the site is 2771m². This does not represent the actual canopy coverage as it includes spaces not occupied by leaves and as such overestimates the canopy coverage.

The canopy coverage is best represented by multiplying the solid coverage by a projected foliage cover factor (see Appendix A). This is a practice accepted by the RFS as it can remove some of the subjectivity inherent in photo comparative techniques. This is a technique provided by NPWS and is commonly used in forestry research.

Photos of each tree canopy were taken from directly below the centre of the canopy to capture a balanced canopy spread. Photos were then digitally modified to increase contrast and convert to grey scale enhancing the difference between leaves and the sky above. Each photo was then compared with the Projected Foliage Cover (PFC) Matrix in Appendix A (Source NPWS) to determine a PFC factor to apply to the solid canopy. This process was repeated to confirm the original estimate as a means of further minimizing the subjectivity and improving the consistency.





Example of a digitally modified photo for use in a comparative assessment (Tree 24 & 25).

Results and Discussion

Total area of solid canopy within the Farm Stay asset protection zone (APZ) is 1643m².

While the Median and Mode projected canopy cover was estimated to be 50% for the APZ each tree canopy was applied its individual PFC factor to provide a higher level of accuracy and to remove any biased influence between large and small canopies.

Total calculated projected canopy cover within the Farm Stay APZ was calculated to be 893m² (see Appendix E).

Total area of Farm Stay APZ is 8226m².

Existing canopy represents 11% coverage of the APZ.

The Bush Fire Safety Authority requires the APZ to be managed to inner protection area (IPA) standards. Planning for Bush Fire Protection 2019 recommends a maximum 15% canopy cover within an IPA. The existing canopy as surveyed and quantified meets the requirements for an IPA. No additional tree removal will be required to meet the standards. The existing coverage allows for additional growth before canopy management is required to maintain the standard.

Tree canopies within the IPA are separated by more than 2m with the exception of some minor overlap in trees 20 & 25. While the aerial imagery suggests more overlaps occur an inspection has confirmed there is special separation by stratification of the canopy. Shadows in the imagery show clear stratification of the canopies in relation to nearest neighbours for many trees in the APZ.

The vegetation management external to the IPA is equally consistent with IPA standards. The external APZ covers the remainder of the site to all boundaries. This ensures a break in the potential fire paths to the APZ. There is no connectivity between the bushfire hazard vegetation and the trees in the APZ.

IPA management recommends the pruning of limbs below 2m from the ground to ensure that surface fires are not provided with an opportunity to engage the canopy fuels. The survey/inspection confirmed that all tree limbs below 2m from the ground were removed.

Trees overhanging the building present a risk of falling branches creating a breach in the roof structure allowing ember penetration. No trees overhang within 5m of the Farm Stay building.



Unmanaged understorey vegetation can provide fuel to support fire intensities that may engage the canopy and can provide a contiguous path for fires to penetrate into the canopy or the APZ. The entire site has been managed to minimise the retention of shrubs and other understorey vegetation. No more than a few shrubs are located within the IPA. These are isolated from each other and do not present a significant risk. Shrub coverage does not exceed the 10% maximum permitted in the standard.

Surface coverage is predominantly managed lawn (<100mm) with small portions of bare earth and rock. It was noted that the grasses were quite lush at the time of the inspection.

All parts of the APZ and remainder of the site are readily accessible for ongoing management. There were no impediments to ongoing maintenance noted.

The existing APZ management within the APZ and across the site does not appear to have created any soil stability issues. No erosion due to APZ management was noted.

Conclusion

It is my opinion, based on 20 years' experience both with the NSW Rural Fire Service and as a recognised Bushfire consultant, that the existing APZ provided for the Farm Stay development satisfies the minimum requirements for compliance as an IPA. This opinion extends to the management of the entire site.

I find no additional measures are required to satisfy the Bush Fire Safety Authority's APZ condition and see no reason to believe the ongoing management would not be practical or achievable.

Regards,

Terence O'Toole B.App.Sc Environmental Health Grad.Dip Design in Bushfire Prone Areas

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Appendix B APZ and 10/50 Rule management zones





Appendix C Existing canopy extent within the lot at 2 August 2020





Appendix D Canopy extent and tree number within the Farm Stay APZ



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Appendix E Table of Percentage Foliage Cover (PFC) for trees within the Farm Stay APZ

Tree No.	Canopy polygon area (m ²)	PFC Factor %	PFC (m ²)
20	46	45	20.7
25	291	50	145.5
19	35	50	17.5
17	16	50	8
24	59	55	32.45
28	5	40	2
18	53	45	23.85
31	42	50	21
29	106	45	47.7
30	21	60	12.6
50	43	50	21.5
55	18	60	10.8
56	27	70	18.9
58	45	50	22.5
57	18	45	8.1
54	35	50	17.5
60	25	60	15
35	34	60	20.4
59	39	50	19.5
61	69	40	27.6
70	64	50	32
67	78	60	46.8
68	21	60	12.6
69	16	55	8.8
41	108	50	54
42	124	70	86.8
43	42	70	29.4
74	136	70	95.2
unidentified	27	50	13.5