Bushfire

Services

Preliminary Bushfire Protection Assessment

Lot 15 Sealark Road
Hare Bay
Shoalhaven

February 2005

Our Reference: 04622

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PRELIMINARY BUSHFIRE PROTECTION ASSESSMENT

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Prepared February 2005

for

Hare Bay Development Consortium

PROJECT TEAM:

Rod Rose

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Preliminary Bushfire Protection Assessment

Proposed Development Lot 15 DP 1102772, Sealark Road, Hare Bay

1. Introduction

This report provides preliminary bushfire protection advice on the feasibility and constraints related to the proposal for a Caravan – Cabin Park / Affordable housing development at Hare Bay.

2. General comment on fire risk

The development site is mapped as bushfire prone land by Shoalhaven City Council and therefore must meet the requirements of bushfire legislation and particularly the *Planning for Bushfire Protection* guidelines of the RFS.

Bushfires occur at moderate frequency in the locality of the subject land. In past decades significant bushfires have occurred within a few kilometres of the subject land and can be expected to continue to occur in the future.

Existing residential areas to the west and south of the site will mitigate a significant portion of the bushfire attack, with the most problematic direction of attack occurring from the Northwest. Bushfire attack from the east and northeast is possible, but typically this is a lower intensity and less frequent fire event.

3. Asset Protection Zones (APZs)

An APZ (*i.e.* the separation of asset from fire prone vegetation) is required at the interface between all fire-prone vegetation and built assets vulnerable to bushfire damage.

3.1 APZ dimensions

The gradient of the slope and whether it is upslope or downslope from the asset, and the type of vegetation on that slope determine the size of the APZ. An indicative APZ for the subject land is displayed in Map 1 for residential development and Map 2 for tourism development (defined as special purpose development by the document *Planning for Bushfire Protection*)

The issues of note related to the APZ are as follows:

- The adjoining parcel of land to the north is national park and as a result of past clearing activities is currently in an open woodland condition. As the land is now national park the site will presumably be allowed to regenerate and it is expected that it will regenerate to a woodland / shrubland structure. This will therefore be classified as a Group 2 vegetation type and require a APZ setback of 30 m for residential housing and 40 m for any tourist accommodation (caravans and cabins). If however the caravans or cabins are used for permanent residents then the NSW RFS will consider this appropriate for a residential development APZ setback (see Map 1).

- A 35 m wide APZ setback is required from the 15 m wide EEC buffer along the tributary to Wowly Creek (see Dimitri Young's preliminary report and Map 1). This APZ is required to be 50 m wide if tourism facilities are proposed to adjoin this buffer (see Map 2).

- No APZ setbacks are required from the western and southern boundary as these adjoin existing residential development.

- In their current state the water channels running from west to east through the development site do not constitute a bushfire hazard and in my opinion do not require an APZ setback. However if the banks of these channels are required to be planted up (buffered) then there is a risk that it will be classified as bushfire prone vegetation and require an APZ setback up to 20 m in width either side of the riparian planted vegetation.

  If these buffers are required it is possible with careful planning to avoid the APZ setbacks. The key to avoiding setbacks is to keep the buffer plantings to less than 10 m wide in total and use a replanting pattern and species that is less fire prone. For example the banks of these channels could be planted with grasses with occasional shrubs rather than dense plantings of tea tree species such as found in the locality. It is also desirable to as far as possible minimise the connectivity of replanted areas with other major areas of vegetation to the east or at least do this with lower concern vegetation. However it is expected that DPINR will require such buffers to be as strongly connected as possible.

- An APZ of between 10 – 20 m wide (for both residential and tourist development) is potentially required around the remnant vegetation (woodland and heath) on the adjoining parcel of land to the south (*i.e*. the drainage and sediment/erosion controls). The more separated or isolated this patch of vegetation is made by development on the subject land, the less likely an APZ setback will be required. This requires more detailed investigation of the potential arguments to avoid having an APZ. If NSWRFS 'play difficult', then this APZ could be as large as 20 m wide.

- Extensive landscaped areas that join the existing vegetation to the east and north should be avoided as these may also require setbacks if a potential for fire transfer into these areas exists.

- Tent camping is permissible within an APZ provided that fire vehicle access between the tents and the bushland is available. Verbal advice from the NSWRFS indicates that they would require this access corridor to be 20 m wide, but I believe this is excessive and the matters upon which they base this figure may be worth negotiating.

- A tent camping site may be feasible on the area between Wowly Creek and its tributary (eastern side of subject land) but this would be conditional on an appropriate refuge are being available nearby (*e.g.* a footbridge over the watercourse to the centre of the developed portion of the subject land to the west).

3.2 Fuel management with the APZs

Fuel management within the APZ is likely to be as follows:

- Existing trees (at least 150 mm in diameter measured at chest height) may remain provided that no part of their crown occurs within 4 m of any building (identified habitat trees can remain 2 m out from the building line);
- Smaller trees (i.e. less than 150 mm in diameter), shrubs, fallen trees and tree-limbs and stumps are to be removed and continually suppressed;
- Any landscaping or plantings should preferably be local endemic rainforest species or other low flammability species. The presence of a few shrubs, vegetable gardens or fruit trees is also acceptable provided that all plantings and residual vegetation are well spread out, do not form a contiguous pathway to the dwelling and do not constitute more than 5% of the total APZ area.
- A minimal ground fuel is to be maintained to include either mown grass, paving, concrete, bare ground, or less than 3 tonnes per hectare of fine fuel (*i.e.* material of <6 mm. in diameter);
- Any structures (*e.g.* fences, garden sheds, decks, pergolas *etc*) within the APZ are to be non-combustible (*i.e.* non-combustible under Australian Standard 1530.1 and not deemed combustible pursuant to clause C1.12 of volume 1 of the Building Code of Australia);
- Any structures storing combustible materials such as firewood (*e.g.* sheds) must be sealed to prevent entry of burning debris;
- Gutters, roofs and roof gullies shall be kept free of leaves and other debris.

4. Building construction standard

A building construction standard is required under Australian Standard AS 3959 for all habitable buildings on the development site.

The building construction standard varies according to the distance from unmanaged vegetation, the slope and the vegetation type. The building construction standard will be level 1 under AS 3959 (Standards Australia 2000) for most buildings, with a higher standard required for buildings on the northern and eastern ends of the development. Caravans are not affected by this building standard.

5. Roading and access

5.1 Evacuation and egress

Two alternative access roads are required from the subject land and no cul-de-sacs of greater than 200 m are permitted.

Research indicates more lives are lost during bushfire evacuation than by staying with the home. Research also indicates that there is a substantially higher risk of a house being destroyed by bushfire if it is attended. This research and the general undesirable effects of mass evacuation (road congestion, welfare *etc.*) suggests that an on-site assembly or refuge area is desirable within the development if this is possible within the design plans. If this is feasible the building needs to be designed to an appropriate standard and be

located as part of a low fire hazard, easy to access site *e.g.* a building in the centre of the western end of the development area.

5.2 Perimeter road/trail requirements

A perimeter road or trail is required between all development and vegetation that is considered bushfire prone, that is, the vegetation on the eastern, northern and southeastern boundaries of the developable areas (Maps 1 and 2). The perimeter road should have a minimum reserve width of 20 m. Care is also required to not create a wide buffer of vegetation along the water channels (referred to above) as these may also necessitate the provision of a perimeter road between the vegetation buffer and the development.

The road construction standards for public roads will be as shown in Table 1 and if private roads are used *e.g.* to a cabin site then the construction requirements are as shown in Table 2.

Table 1: Perimeter and public road design criteria for residential developments

PBP guidelines (RFS 2001, page 19 – 21)	
section 4.3.1 (b)	**Design criteria**
dot point 1	Roads two-wheel drive, all weather.
dot point 2	Roads two-way, that are, at least two traffic lane widths (8m minimum) with shoulders on each side allowing traffic to pass in opposite directions.
dot point 3	The perimeter road should be linked to the internal road system at an interval of no greater than 500 m in urban areas
dot point 4	Restricted use of speed humps and chicanes to control traffic
dot point 5	Roads should be through roads. Dead end roads are not recommended, but if unavoidable, dead ends should be not more than 200 m in length, incorporate a minimum 12m radius turning circle, and should be clearly sign posted as dead ends.
dot point 6	The capacity of road surfaces and bridges should be sufficient to carry fully loaded firefighting vehicles (approximately 28 tonnes or 9 tonnes per axle).
dot point 7	Curves should have a minimum inner radius of 6 m and be minimal in number to allow for rapid access and escape.
dot point 8	The minimum distance between inner and outer curves should be 6m.
dot point 9	Maximum grades should not exceed 15^0 and preferably not more than 10^0 or gradient specified by road design standards, whichever is the lesser gradient.
dot point 10	There must be a minimum vertical clearance to a height of 6 m above the road at all times.
dot point 11	Roads should provide sufficient width to allow firefighting vehicle crews to work with firefighting equipment about the vehicle.
dot point 12	Roads clearly sign-posted (easily distinguished names) and buildings clearly numbered. Bridges should clearly indicate load rating.

Table 2: Private road design criteria for residential developments

PBP document (RFS 2001, page 19 – 21)	
section 4.3.2 (b)	**Design criteria for the property access roads from PBP 2001**
dot point 1	A minimum trafficable width of 4m with an additional 1m (minimum) wide strip kept clear of bushes and long grass.
dot point 2	The road should have a passing bay about every 200 m where possible, which should be 20 m long by 3 m wide, making a minimum trafficable width of 7 m at the passing bay.
dot point 3	The capacity of the road surface should be sufficient to carry loaded firefighting appliances (approximately 28 tonnes or 9 tonnes per axle).
dot point 4	A minimum vertical clearance of 6 m to any overhanging obstruction, including trees branches
dot point 5	Curves should have a minimum inner radius of 6 m
dot point 6	The minimum distance between inner and outer curves should be 6m
dot point 7	Maximum grades should not exceed 15^{o} and preferably not more than 10^{o}
dot point 8	Roads should provide sufficient width to allow firefighting vehicle crews to work with firefighting equipment about the vehicle
dot point 9	Dwellings not sited within 200 m of the road system should have an alternative access road providing emergency egress to the through road system.
dot point 10	Roads should be clearly signposted. Bridges should clearly indicate load rating

6. Water supply

It is assumed that reticulated water is to be available throughout the development. Hydrants will need to be installed according to the Australian Standard AS 2419.1 – 1994. Taps and pipes at each habitable building should be at least 19 mm diameter for adequate water flow. Some taps should be located away from buildings to avoid heat if the building catches fire. Taps and fittings should be metal rather than plastic.

Fire hydrants must be located such that a tanker can park within a distance serviceable by a 20 m hose and the habitable building must be located such that a fire at the furthest extreme can be attacked by the tanker using a 60 m hose and 10 m jet of water. A clear unobstructed path between the hydrant and most distant point of the building cannot exceed 90 m allowing for the tanker to be parked in-line.

If any building is located such that the distances do not comply with AS 2419 for the location of hydrants, then a static supply of water (5000 litres minimum), or an additional hydrant must be supplied.

7. Conclusion

The available area for development after the bushfire constraints related to APZ setbacks are applied over the ecological constraints (see report by Dimitri Young) is shown in Maps 1 and 2. There is a considerable difference in the development area available between residential development (Map 1) and tourist development (Map 2).

It is possible in some cases to have a combination of residential development and tourist development to reduce the lost yield associated with large tourist development APZ setbacks. For example, residential development or permanent caravans could be located in the outer perimeter of the developable land. This design would however require negotiation with the NSWRFS as they have on occasion classified the whole development site as a tourist facility and not recognized the residential development around the perimeter. Advice from individuals in the NSWRFS have proven inconsistent on this matter in recent years.

The use of tent camping is also a viable use of the APZ provided evacuation issues and a 'defendable space' for firefighters is maintained between tent sites and the bushland.

It may also be possible to design the replanting of the outer 5 m of the 15 m buffer around the EEC (see Dimitri Young's report) to achieve the requirements of an Outer Protection Area (*i.e.* a required subset of the APZ), but this would require further investigation of the re-vegetation requirements.

The drainage and erosion control area on the adjoining land to the south currently represents a potential bushfire planning concern as it will require an APZ setback of 10 m – 20 m. It may be possible to avoid this APZ all together by having the heath on the northern part of this 'reserve' maintained as an APZ by legal agreement with the adjoining land owner.

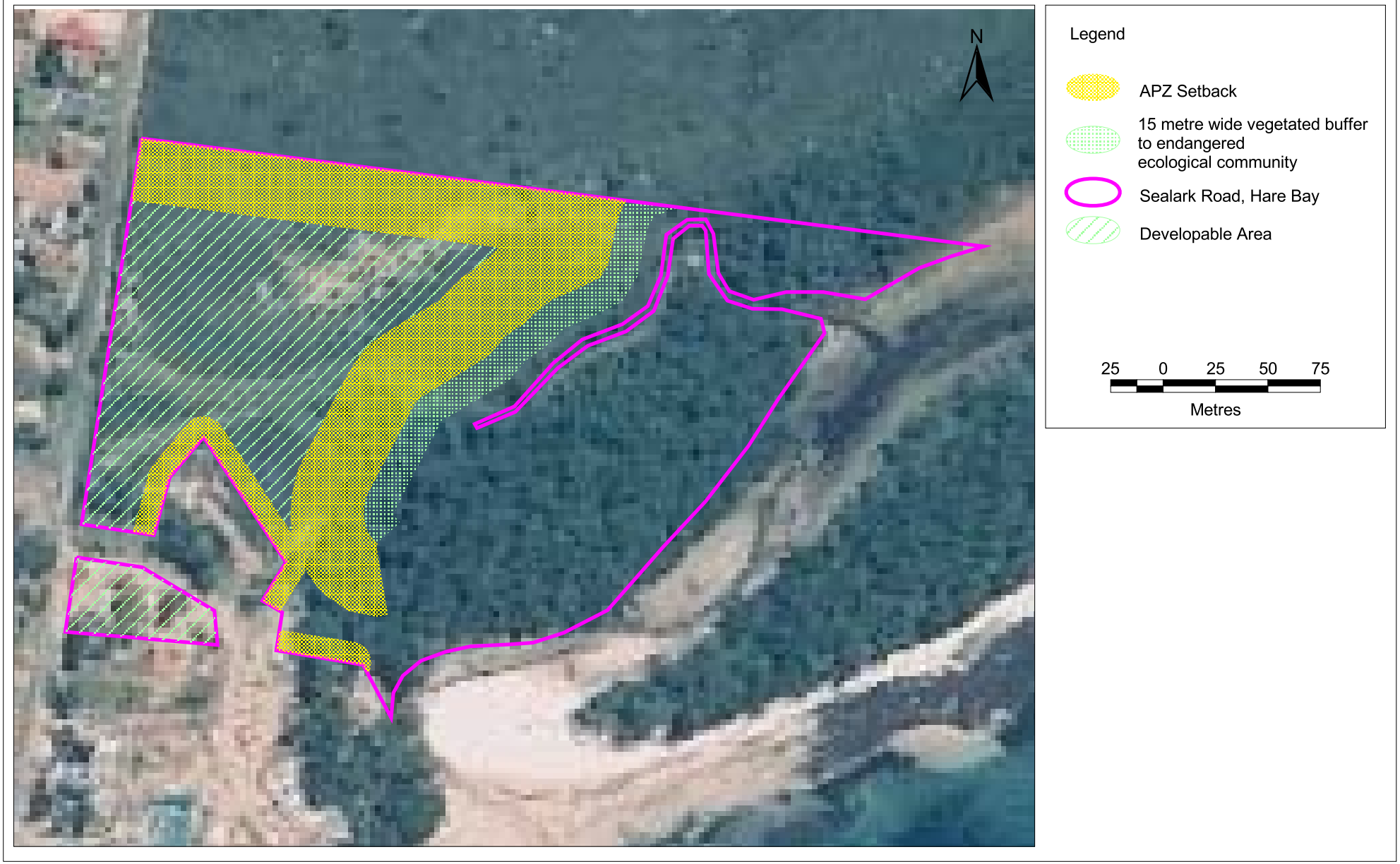
Rod Rose
Managing Director

8. References

NSW Rural Fire Service (RFS). 2001. *Planning for Bushfire Protection: A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners.* Australian Government Publishing Service, Canberra.

Standards Australia 2000, *Construction of buildings in bushfire-prone areas, AS 3959*, Second edition 1999 and Amendment 1, 2000, Standards Australia International Ltd, Sydney

Map 1: APZ Setbacks for Residential Developments



Map 2: APZ Setbacks for Tourism Developments