

Appendix 4 Bushfire Services & Protection Assessment



Proposed Primitive Camping Area Re-Development & Foreshore Area, Part Lot 1 DP125750, Part Lot 228 DP752155 & Part Lot 310 DP752155, Mystery Bay

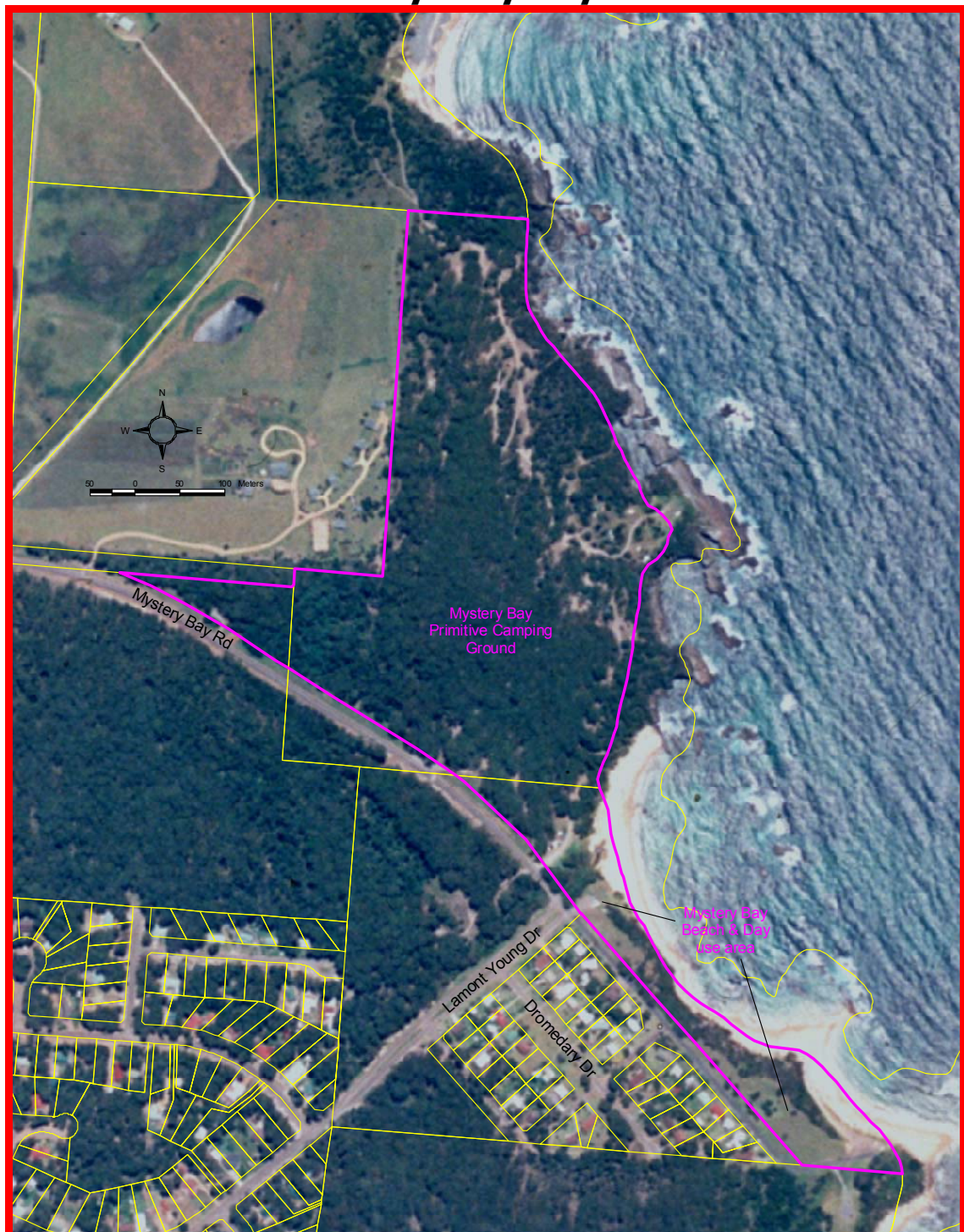


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Mystery Bay Primitive Camping Area Proposed Redevelopment (including foreshore area) Bushfire Risk Assessment & Recommendations for Bushfire Fire Services, Mitigation & Evacuation Plan.



1.0 INTRODUCTION

The following report outlines a bushfire risk & protection assessment to assist with the development of a Plan of Management for the Mystery Bay Primitive Camping and Foreshore Area (herewith 'subject site'), and at least 140m beyond - herewith 'the study area' (denoted maps 1 & 2).

Report content and detail are outlined as per requirements set out in clause 46 of the Rural Fires Regulation 2002.

Methodology for site assessment for bushfire attack (ie. to neighbouring residential dwellings located along Mystery Bay Rd), radiant heat flux and effects, and recommended mitigation measures are based on Planning for Bushfire Protection (PBP) guidelines (Appendix 2 & 3).

Residential dwelling asset protection zone estimates are based on PBP prescriptions for residential purposes.

Vegetation extent within the study area is derived from aerial photo interpretation (api) and a site inspection (7/03/05).

Slope analysis is derived from 25m grid elevation modelling and site inspection.

A comprehensive literature review and site survey for natural or cultural assets potentially effected by the proposed development has not been undertaken as part of this assessment.

Photographic evidence of the subject site and surrounds are appended to this report.

1.1 Property / Development Description & Address:

The subject site is comprised of three allotments, being;

- Part Lot 1 DP125750 Lamont Young Dr, Mystery Bay,
- Part Lot 228 DP752155 Mystery Bay Rd, Mystery Bay, &
- Part Lot 310 DP752155 Schnieder Dr, Mystery Bay.

The subject site is approximately 20.4ha in area and is entirely within the Eurobodalla Shire Council jurisdiction.

The subject site is located on Council owned 'Community Land' at Mystery Bay and is bounded to the north and south by Eurobodalla National Park. Mystery Bay is located approximately 10.5km by roadway S of the Narooma township area.

The subject site is mapped as fire prone as defined in s.146 Environmental Planning & Assessment Act 1979 (Bushfire Prone Land Map).

The reserve is currently mapped as a moderate risk to community assets and a moderate/major risk to environmental assets as defined in s.52 of the NSW Rural Fires Act 1997 (Bushfire Risk Management Plan).

Council is currently in the process of developing a Plan of Management for this area. The Plan of Management will be developed in accordance with the requirements of the Local Government Act 1993 and the Local Government (Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation 1995.

The subject site is currently approved to accommodate 40 tents, caravans and/or camper vans at any one time. However, this does not reflect the actual numbers of visitors to the camping ground where, during the peak times, over 200 tents, caravans and/or camper vans may be occupying the camping ground.

In respect of the above activities that occur within the subject site, the Council contracts a Caretaker on a commission basis, to manage the subject site and activities occurring within.

The Plan of Management for the subject site seeks to establish a level of camping facilities and area considered to be acceptable and facilitating primitive based camping as required under the NSW Local Government Act 1993/ Regulations 1995 and potential amendments to the related legislation pending September 2005.

It is the Council's and the community's view that the site can accommodate more than 40 tents, caravans or campervans and that it can support 40 camp sites of various sizes to accommodate the various sized groups that camp at Mystery Bay. This could be achieved in a sustainable way - to minimise the impact on the environment, to protect the significant Aboriginal sites and allow a sustainable number of people to enjoy the camp site.

Given the existing or proposed further development of the subject site does not include any habitable buildings, the application of the Building Code of Australia 1996 (in respect to compliance with Planning for Bushfire Protection Guidelines and/or AS3959) would not apply to this proposal.

Aside of the installation and construction of the associated access roads and infrastructure associated with fire protection services for the subject site, this proposal seeks to retain, as much as possible, the surrounding natural amenity of the subject site. Where vegetation management is otherwise required to comply with bushfire protection / setback standards, the proposal seeks to 'off-set' the potential bushfire threat of partially retained natural areas (unmanaged vegetation) with alternate mitigation measures further outlined in this report.

1.1.1 Overview of issues in regard to fire management and the occupation of the Mystery Bay Primitive Camping Area

Based on our initial assessment of the subject site and documentation (Mystery Bay Camping Ground & Foreshore Discussion Paper, 16/12/04 & 2/03/05) provided to date, we have identified the following issues;

- Unprotected / unseparated camping activities within a bushfire prone area.
- Poorly formalised access trails servicing the subject site (camping area only).
- Limited water supply points for fire fighting within the subject site.
- No formal arrangements for camp fire location or infrastructure (fire rings and clearings).
- No signage describing fire emergency access, evacuation or refuge areas.
- One public access roadway only servicing the subject site and Mystery Bay urban development.

Furthermore, the Moruya Rural Fire Service have made the following comments to date (16 December 2004):

- *The site does present a risk and it is pleasing that council plan to improve the situation.*
- *Efforts to reduce the chance of ignition is the priority and could be achieved by improved maintenance and hazard reduction around the camp sites.*
- *Designated fire pits with appropriate breaks i.e. 4m, BBQ plates etc could also reduce the possibility of ignitions.*
- *Water supply around the camp ground may assist to properly extinguish fires.*
- *Camping densities may also be addressed insuring there is adequate space for tents and buffers between them.*

- *Evacuation could be considered. It would be appropriate for the local caretaker to have clear guidelines on the appropriate location of an evacuation area and response protocol to an emergency.*
- *Signage may be used to support any evacuation plan.*

In respect of the above issues and comments, it becomes apparent that the most significant risk of bushfire damage likely to occur to the subject site is the chance of fire igniting within the subject site and affecting or trapping persons within.

Survey results from standard questions posed to stakeholders concerned with the future development and management of the subject site generally support this ascertainment; the majority of responses suggesting a belief that Mystery Bay is well protected from wildfire, but the camping area itself is vulnerable.

1.1.2 Risk Management

AS/NZS 4360:2004 states '*Risk management involves managing to achieve an appropriate balance between realising opportunities for gains while minimising losses*'. In this respect, the following assessment seeks to identify an acceptable balance between the opportunities for primitive based camping and measures to mitigate the adverse effects of a wildfire (the risk) occurring within the subject site.

As an assumption, the chance of a bushfire negatively impacting upon the subject site (or the objectives for the subject site) is considered likely. Given the subject site itself is '*a source of potential harm*' (the 'Hazard'), the likelihood of a bushfire event impacting upon the subject site and causing a negative consequence or loss of assets or life within is considered significant. This assumption is supported by the NSW Rural Fire Service comments as stated previously within this report.

As identified by AS/NZS 4360:2004, key options for treating risks with negative outcomes include;

- avoid the risk,
- changing the likelihood of the risk,
- changing the consequences,
- sharing the risk, &
- retaining the risk.

Throughout the following assessment, the above options are **indicated** to identify those recommendations consistent with the key options for treating the risk.

1.2 Vegetation Classification:

The primary vegetation types influencing bushfire behaviour upon and within the subject site has been assessed as Group 1 forest per PBP guidelines (denoted Map 2).

The surrounding vegetated areas are noted to be:

- Coastal Lowlands Cycad/Shrub Dry Forest - *Corymbia maculata* (Grp 1)
- Coastal Moist Shrub Forest / Tall Wet Heath – *C. maculata*, *E. pilularis* / *Casurina spp.*, *Melaleuca ericifolia* (Grp 1)
- Coastal Shrub / Grass Dry Forest (Grp 1)
- Coastal Headland Heathlands (Grp 2)

The subject site would be subject to bushfire attack primarily from all directions, although most significantly from the W-NW under severe wild fire conditions.

However, an assessment of the subject site (camping area) notes areas significantly disturbed and fuel reduced through camping activities (ie. timber and kindling removal, foot and vehicular traffic). In this

respect, these areas are likely to produce less intense bushfire or radiant heat than what would otherwise emanate from undisturbed vegetated areas.

1.3 Slope Assessment:

In general, the effective slope (within 100m) surrounding and within the subject site, primarily influencing bushfire behaviour, has been assessed as predominantly <5 degrees, occasionally exceeding 5 degrees but generally not exceeding 10 degrees.

In respect of PBP Guidelines compliance, maintenance or construction of access roads / trails or the application of fuel reduction activities or asset protection zoning should not be restricted.

The subject site (camping area) is affected by a predominant drain / gully line running WNW to ESE towards the S side of the subject site (camping area). In this respect, the proposed location of additional reticulated water line (as described (g)(ii) of this assessment) may need to be more suitably defined.

The above is more accurately denoted map 4.

1.4 Significant Environmental Features:

Apart from the naturally and relatively undisturbed and intact forested areas within and adjacent to the subject site and an area of Coastal Tall Wet Heath Swamp Forest and Headland Heath (coastal low open forest), no other significant environmental features within the study area have been noted, recorded or advised of as part of this assessment.

However, where the primitive camping ground activities or recommendation provisions within this report are likely to have a significant impact upon the adjacent forested areas stated above, an Environmental Impact Statement (EIS) or Review of Environmental Factors (REF) may be required.

1.5 Threatened Species, Population or Ecological Community:

The reserve is partly (currently) mapped as Vulnerable Vegetation 27 (Ecotonal Coastal Swamp Oak - Bangalay Swamp Forest) through the camping area which has been nominated to be listed as an Endangered Ecological Community under the Threatened Species Conservation Act.

However, recent advice from a vegetation survey undertaken over the subject site has established, *that while the area is an interesting mix of vegetation communities, it does not fit into the vulnerable Terrestrial Ecosystem of the Eurobodalla Local Government Area No. 27*.

Two species of avifauna, noted in and around the vicinity of the subject site, are listed under the Threatened Species Conservation Act. This includes the Hooded Plover *Thinornis rubricollis* (listed as Endangered) and the Sooty Oyster Catcher *Haematopus fuliginosus* (listed as Vulnerable).

Anecdotal advice also suggests the presence of Glossy Black Cockatoo and Bat species on occasion within the subject site.

Apart from the above advice, no other threatened species, populations or ecological communities have been noted, recorded or advised of as part of this assessment.

However, where the primitive camping ground activities or recommendation provisions within this report are likely to have an impact upon any other Threatened Species, Population or Ecological Community potentially located within the subject site, an Eight-part Test or Species Impact Statement to address the effected species should be undertaken.

1.6 Detail & Location of any known Aboriginal Relic or Place:

The subject site includes at least one registered Aboriginal Site (No. 62-7-0106) as recorded on the National Parks Registered Site (ASRSYS).

However, ESC has been advised that there are several other significant Aboriginal Relics / Sites located within the subject area.

Considering the sensitivity of these sites to un-authorised disturbance or damage, these sites are not identified within this assessment. Exact details and locations of the subject Aboriginal Sites & Relics should be formally sort through the NSW National Parks & Wildlife Service.

Where the primitive camping ground activities or recommendation provisions within this report are likely to have an impact upon known Aboriginal Relics or Places located within the subject site, an Aboriginal cultural heritage assessment and investigation should be undertaken to locate and record any archaeological sites, or other Aboriginal heritage items or values, and to provide recommendations for the appropriate management of these sites, items or values.

1.7 Bushfire Assessment Methodology:

Methodology for this site assessment for bushfire attack (on campers and visitors to the subject site) are based on Planning for Bushfire Protection (PBP) guidelines (Table 5.1).

Methodology for this site assessment for bushfire attack (on adjacent residential dwellings) and recommended mitigation measures are based on Planning for Bushfire Protection (PBP) guidelines (Appendix 2 & 3).

1.7.1 Development Setback & Asset Protection Zone (APZ):

Campers and visitors to subject site

The APZ / setback required for the above parameters as determined from PBP guidelines (Table 5.1 – IPA* distances for unprotected persons potentially exposed to a forest fire of $80'000 \text{ kWm}^{-1}$ [FDI# of 80] on flat ground) would be a minimum;

- 140m from adjacent bushfire vegetation (140m IPA* only).

However, the likelihood of a full $80'000 \text{ kW/m}$ forest fire impacting upon campers or visitors within the subject site is unlikely considering;

- the relatively disturbed and fuel reduced state of natural vegetation within the camping area or along the foreshore areas, &
- campers and tourists / visitors within the subject area will have otherwise been evacuated where an FDI > 50 (Extreme) may prevail or as otherwise specified within the proposed Bushfire Evacuation Plan appended to this report.

As such, considering a worst case scenario as the basis for recommended separation distance and associated mitigation measures, a separation distance of 140m is most likely overstating the minimum required distance to mitigate radiant heat upon an unprotected person or provide refuge for persons potentially on or near the site during a significant wild fire event.

Retaining the risk.

Adjacent Residential Development – Mystery Bay Rd

The estimated APZ dimensions required for the above parameters, as determined from PBP guidelines, would be a minimum;

- 20m (20m IPA* only) from unmanaged Group 3 Forest Remnant.

Considering the current separation of existing residential dwellings from unmanaged vegetation on the opposite side of Mystery Bay Rd (see map 5c), technically these dwellings are only potentially exposed to 'Low' bushfire attack conditions likely to emanate from remnant vegetation associated with the foreshore area. A brief survey of local residents and stakeholders on the Mystery Bay Camping Ground & Foreshore Reference Group supports this conclusion.

In this respect, no additional construction standards or vegetation removal (from foreshore areas) would be required to facilitate technical bushfire compliance (ie. BCA Provisions, AS3959 and PBP Guidelines) - see section (g)(vii) of this report.

* IPA - Inner Protection Area as defined 4.2.2(b) PBP Guidelines

FDI – Fire Danger Index as calculated using McArthur Mk V formula

Development Setback / APZ Recommendation:

- R1. *The immediate area (approximately 5-10m) surrounding the existing toilet and showers blocks within the subject site be managed / maintained to IPA standard as defined 4.2.2(b) PBP Guidelines.*

Changing the consequence.

1.7.2 Fire Fighting Water Supply:

The subject site is currently serviced by a system of reticulated water line (rural poly-pipe, approx 870m in total length).

The current system is described as in a 'very poor standard' (*pers.com.* Steve Speers, ECS 2005).

At least five (5) water access points are noted to exist along the existing water line. All available outlets are either standard garden style taps or basic shower heads. No existing fittings within the subject site would easily facilitate standard connection (eg. standard storz fittings) with local fire services.

In our considered opinion, in the event of a significant wildfire impacting upon the subject site, the availability of the existing water infrastructure (within the camping area) would be inadequate to supply fire fighting vehicles.

However, given proposed evacuation strategies and the potential risk of remaining within the subject site during an extreme fire event (for either campers or fire fighters), we would only propose the existing system of reticulated water is maintained to a reliable and effective working condition.

We would also further propose additional water access points be installed within the subject site so as to ensure all designated camping sites are within 90m of a water source. The recommended (indicative only) location of additional water points are denoted map 5b.

Within 'reasonable' distance (<200m) of the subject site, a water filler stand and roadside hydrant point are noted to exist (demoted map 5b). In the event of significant wildfire event impacting upon the subject site and surrounds, these water points would undoubtedly assist in the provision of water supply (re-supply) for fire fighting vehicles.

However, given the proximity of the above water points to the subject site, the use of the existing filler stand or hydrant point for direct reticulated connection to a fire fighting pumper unit would be limited (with respect to fire fighting operations within or directly adjacent to the subject site). In the event of a fire emergency occurring within or directly adjacent to the subject site (eg. vehicle / van fire, neighbouring holiday cabins fire, ect), fire suppression units would need to carry their respective water supply as there is currently no readily available connection to a hydrant point.

Given the above, we would recommend an additional water main be extended into the subject site for provision of hydrant / water main access. A recommended location and extent of proposed water main is denoted map 5B. The recommended location would not only provide a hydrant point within the subject site, but also provide increased fire fighting water provision for the neighbouring holiday cabins.

Fire Fighting Water Supply Recommendations:

- R2. *The existing water line servicing the camping area be maintained to an effective and reliable working standard.*
- Changing the consequence.*
- R3. *Additional water line be incorporated within the camping as denoted Map 5B, or else as otherwise to ensure all identified camping locations are within 90m or less of an available water point (tap).*
- Changing the consequence.*
- R4. *Additional water access points (taps) be incorporated along the existing and proposed water line (servicing the camping area) as denoted Map 5B, or else as otherwise to ensure all identified camping locations are within 90m or less of an available water point (tap).*
- Changing the consequence.*
- R5. *A water main be further extended along the Mystery Bay Road Reserve & common boundary between the subject property and Mystery Bay Cabins (as otherwise denoted Map 5B & Map 5A – Emergency Access) to provide a hydrant point to service;*
- *the subject camping area, &*
 - *the Mystery Bay Cabins development.*
- Changing the consequence*
- R6. *During periods of very high fire danger (or else preferably at all times), a static water supply (e.g. 4-5 litre bucket / container of water) be available within 5 meters of any open fire within the subject site.*
- Changing the consequence*

1.7.3 Public Road Capacity to Handle Increased Traffic Volume:

Mystery Bay Rd is a well formed, approximately 8-10m wide, sealed public roadway servicing the Mystery Bay precinct and subject site.

Mystery Bay Rd provides the main link from the Princes Highway into the Mystery Bay residential precinct.

In our considered opinion, all public roadways servicing the subject area should easily handle an increase in traffic either associated with the primitive camping ground activities, foreshore visitation or a potential fire emergency impacting upon the area.

1.7.4 Public Road Links to Fire Trail Network and Two-Way Access:

All public roadway access servicing the subject site provides two way access, with further provision for passing and parking arrangements.

Mystery Bay Rd and Lamont Young Dr have numerous linkages to other fire trail systems (eg. 1080 Trail) and informal roadway access (Schneider Dr) which could be used for fire suppression or mitigation.

1.7.5 Access & Egress from Subject Site for Emergency Response:

The subject site (camping ground) is currently accessed by numerous vehicular trails which provide direct links onto the subject site from Mystery Bay Road.

The primary trail system servicing the subject site (camping ground) would currently and mostly facilitate the passage of the heavy firefighting vehicles (including category one firefighting tankers).

A number of 'well formed' walking trails also links the subject site / camping areas to beach and coastal rock areas to the E. At least two of these areas would be suitable and reasonable options for escape and refuge from a significant bushfire impacting upon the site.

The subject site (camping area) is also affected by a predominant drain / gully line running WNW to ESE of the subject site (camping area). With respect to access trails crossing this drain / gully line, the existing trail (currently) safely and adequately passes over the gully line depression.

However, with respect to heavy firefighting vehicles accessing the entire subject site / designated camping areas, the existing network of trails (secondary trails) would most likely be inadequate – particularly during a potential bushfire event impacting upon or within the subject site.

In respect of the above, we would recommend that 'permanent access' arrangements be identified and maintained within the subject site so as to ensure the safe and unimpeded passage of heavy firefighting vehicles (Category 1 Tankers) at all times. Furthermore, the designated 'permanent access' trails should be located so as to ensure all designated camping sites are within 90m*. The recommended location and extent of such 'permanent access' trails are denoted map 5a.

** 90m being a recommended maximum effective distance from a fire fighting tanker / water supply, ie. no more than 3 X 30m lengths of standard canvas fire fighting hose.*

PBP Guidelines recommends road systems should provide through access and does not recommend dead-ends.

In respect of the above, we would recommend that an 'emergency only' access trail be located and maintained along the common boundary of the subject site with Lot 5 DP570596 (Mystery Bay Holiday Cabins), linking at least the N most point of the 'permanent access' trail back through to Mystery Bay Rd. The recommended (indicative) location and extent of such 'emergency only' access and links are denoted map 5a.

Furthermore, given the potential for persons or vehicles to be trapped by a potential wildfire towards the N end of the subject site, we would also recommend the installation of a gateway between the subject site and the neighbouring Holiday Cabins. This recommended action would need to be negotiated with the neighbouring land owner.

Property Access / Egress, Alternate Access Recommendations:

- R7. *Where required and permissible, the recommended 'permanent access' (denoted map 5a) be maintained to the minimum design criteria as outline in PBP guidelines, section 4.3.2(b), including;*
- *Minimum trafficable width of 4m with an additional 1m wide strip on each side of the road kept clear of bushes & long grass.*
 - *Where possible, passing bays about every 200m (20m long by 3m wide),*

- *The capacity of the trail surfaces should be sufficient to carry fully loaded firefighting vehicles (approximately 28 tonne or 9 tonne per axle),*
- *Curves should have a minimum inner radius of 6m and be minimal in number to allow for rapid access and escape,*
- *The minimum distance between inner and outer curves should be 6m,*
- *Maximum grades should not exceed 15° and preferably not more than 10°,*
- *There must be a minimum vertical clearance to a height of 6 metres above the road at all times,*
- *Roads should provide sufficient width to allow firefighting vehicle crews to work with firefighting equipment about the vehicle,*

Changing the consequence.

R8. *As permissible, the recommended 'emergency access only' (denoted map 5a) be maintained to the minimum design criteria as outlined in PBP guidelines, section 4.3.3(b), including;*

- *Minimum trafficable width of 4m with an additional 1m wide strip on each side of the road kept clear of bushes & long grass.*
- *Curves should have a minimum inner radius of 6m and be minimal in number to allow for rapid access and escape,*
- *There must be a minimum vertical clearance to a height of 6 metres above the road at all times,*
- *Passing bays about every 200m (20m long by 3m wide),*

Changing the consequence.

R9. *As permissible and considered acceptable by the neighbouring Mystery Bay Cabins land owner (Lot 5 DP570596), gate way / vehicular access between the subject site Lot 5 DP570596 (N most point of identified 'permanent access' trail) be established to facilitate emergency access / egress for the subject site.*

Sharing the risk.

1.7.6 Subject Site Bushfire Maintenance Plans & Fire Emergency Procedures:

In our considered opinion, the nature of this development and the existing and potential surrounds of the subject property will require a site specific bushfire maintenance plan and fire emergency procedures.

Considering the application and intent of PBP Guidelines, the subject development would be considered as requiring 'Special Protection'. In this respect, prescriptions for separation, access, water supply, ect are likely to more stringent than otherwise described for normal development and regular activities.

Should a bushfire emergency impact upon this area, the implementation (only) of the existing Eurobodalla Sect. 52 Operations & Risk Plan maybe inadequate for bushfire hazard management and associated emergency procedures.

Bushfire Maintenance Plan Recommendation:

R10. *A Bushfire and Vegetation Maintenance Plan be further developed (in consultation with the local fire authorities) for the subject development site which, at least, clearly identifies;*

- *Forest and shrub vegetation to be retained and allowed to naturally accumulated available bushfire vegetation (unmanaged vegetation),*
- *Fire management zones for undeveloped areas of the primitive camping ground (eg. APZ areas, Strategic Fire Advantage Zones [SFAZ], Heritage Area Management, etc),*
- *Prescriptions or performance measures for proposed fire management zones,*

- *Contemporary biodiversity fire threshold analysis for the subject site and adjoining natural vegetation,*
- *A proposed schedule of maintenance and activities which ensure the provisions of proposed fire management zones,*
- *Potential ignition management (fire places, cooking facilities ect)*

Draft advice to assist developing a Bushfire & Vegetation Maintenance Plan for the Mystery Bay Primitive Camping Area and Surrounds is attached appendix 2 to the report.

Changing the consequence.

Retaining the risk.

Fire Emergency Procedures Recommendation:

R11. *A recommended Fire Emergency and Evacuation Procedures Plan for the Mystery Bay Primitive Camping Area is attached appendix 1 to this report.*

Avoiding the risk.

R12. *During periods of 'High' or above FDI, signage simply outlining the basic concept of the Fire Emergency and Evacuation Procedures Plan for the Mystery Bay Primitive Camping Area be displayed at the main entrance point(s) to the subject site and shower / toilet facilities within the subject site.*

The local Authority may also consider the installation of additional / permanent signage at the designated assembly and refuge points (as specified within the Fire Emergency and Evacuation Procedures Plan), denoting the locations as designated assembly and/or refuge points during a significant wildfire event.

Avoiding the risk

Changing the consequence

1.7.7 Development Construction Standards for Building Elements:

No additional or new buildings are proposed as part of this re-development.

1.7.8 Sprinkler Systems & Other Fire Protection Measures to be Incorporated:

No other additional fire protection measures (above and beyond recommendations stated above) or sprinkler systems would be required for compliance with PBP guidelines.

1.8 General Assessment of Compliance with Planning for Bushfire Protection (Chapter 4):

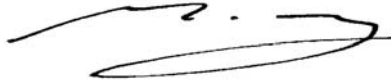
- Access to the camping and foreshore area should be achievable for all types of vehicles (incl. Category 1 Tankers) via existing roadways and recommended upgrade sections of the internal trail system. Recommended upgrade trails section can easily meet PBP guidelines.
- The availability of the existing and proposed reticulated water supply & recommended additional water service points should ensure provision of an appropriate water supply for basic fire suppression.

1.9 Conclusion:

In the event emergency evacuation from the subject site is required, the limited relief for the general area, the network of existing and recommended upgrade trails and options for secondary access / escape routes joining onto cleared beach areas should ensure the safe egress of affected tourists / transient visitors.

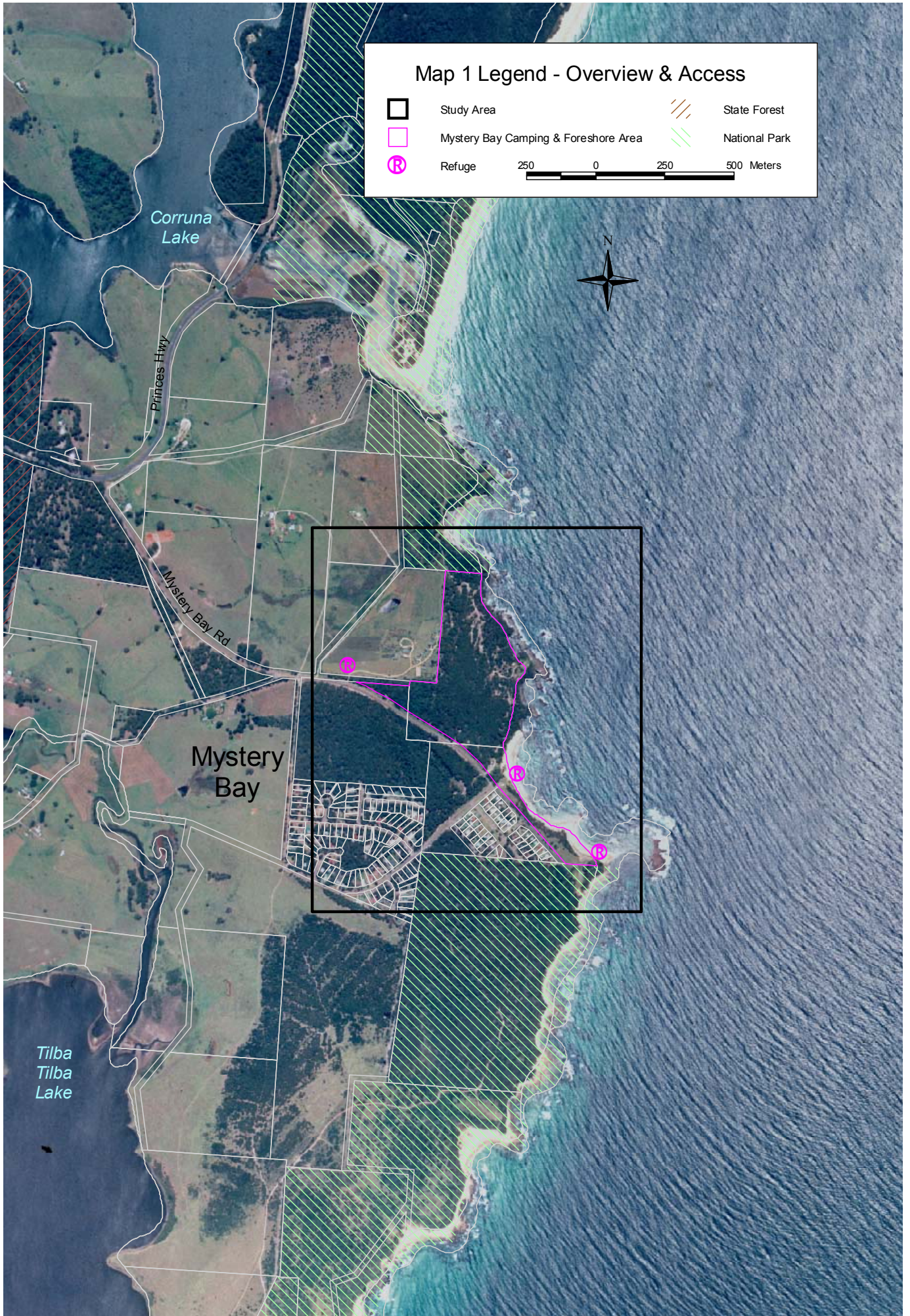
Based on the implementation of above 12 recommendations to protect persons and their property from the danger that may arise from a bushfire, it should otherwise be determine that the proposed re-development of the Mystery Bay Primitive Camping and Foreshore Areas can comply with Planning for Bushfire Protection Guidelines 2001 and its intent as required under section 100B of the Rural Fires Act 1997.

Should any the above information need clarification or further discussion, please contact the author.









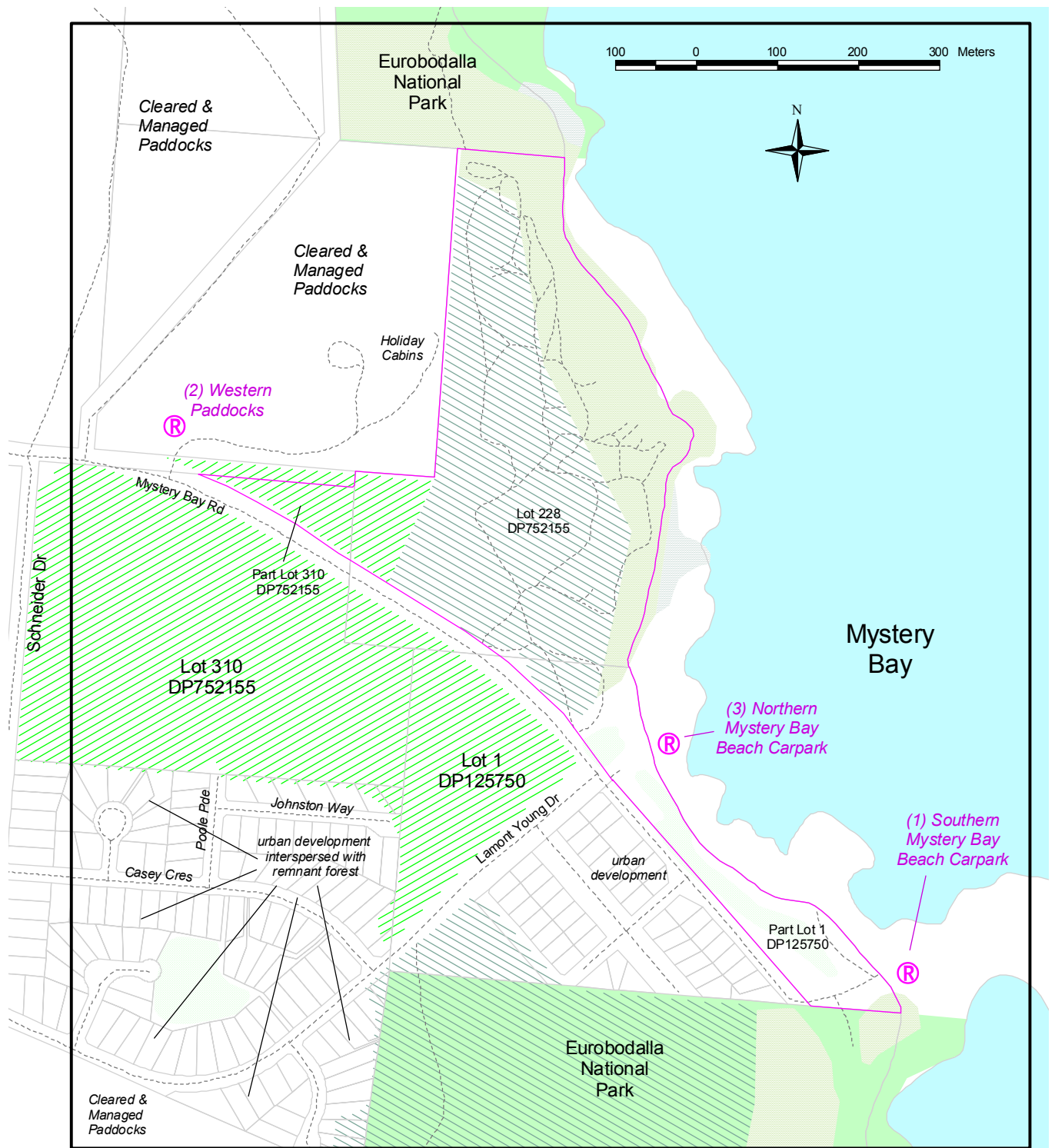
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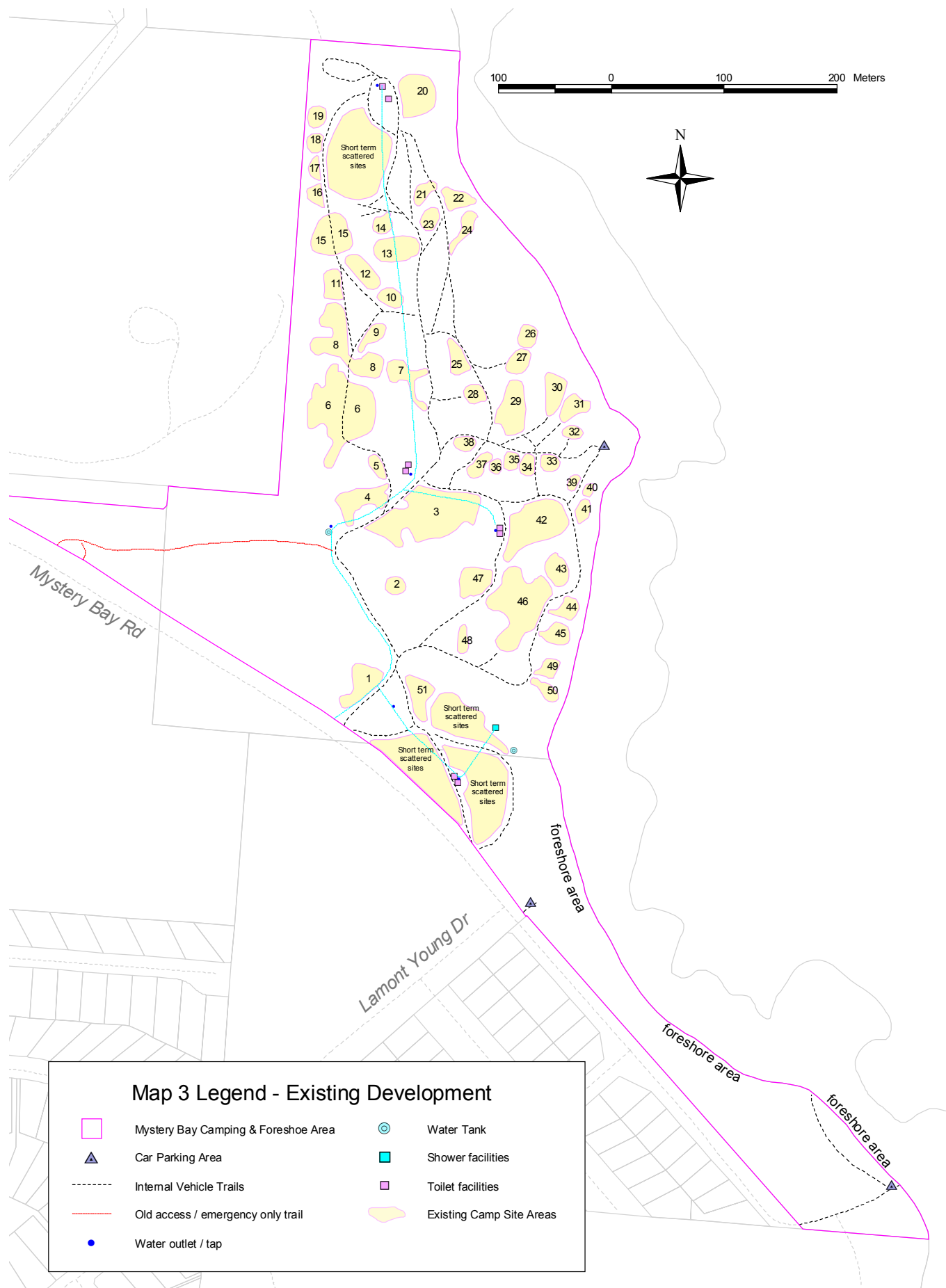
Map 1 Legend - Overview & Access

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|---|--------------------------------------|---|---------------|
|  | Study Area |  | State Forest |
|  | Mystery Bay Camping & Foreshore Area |  | National Park |
|  | Refuge |  | |












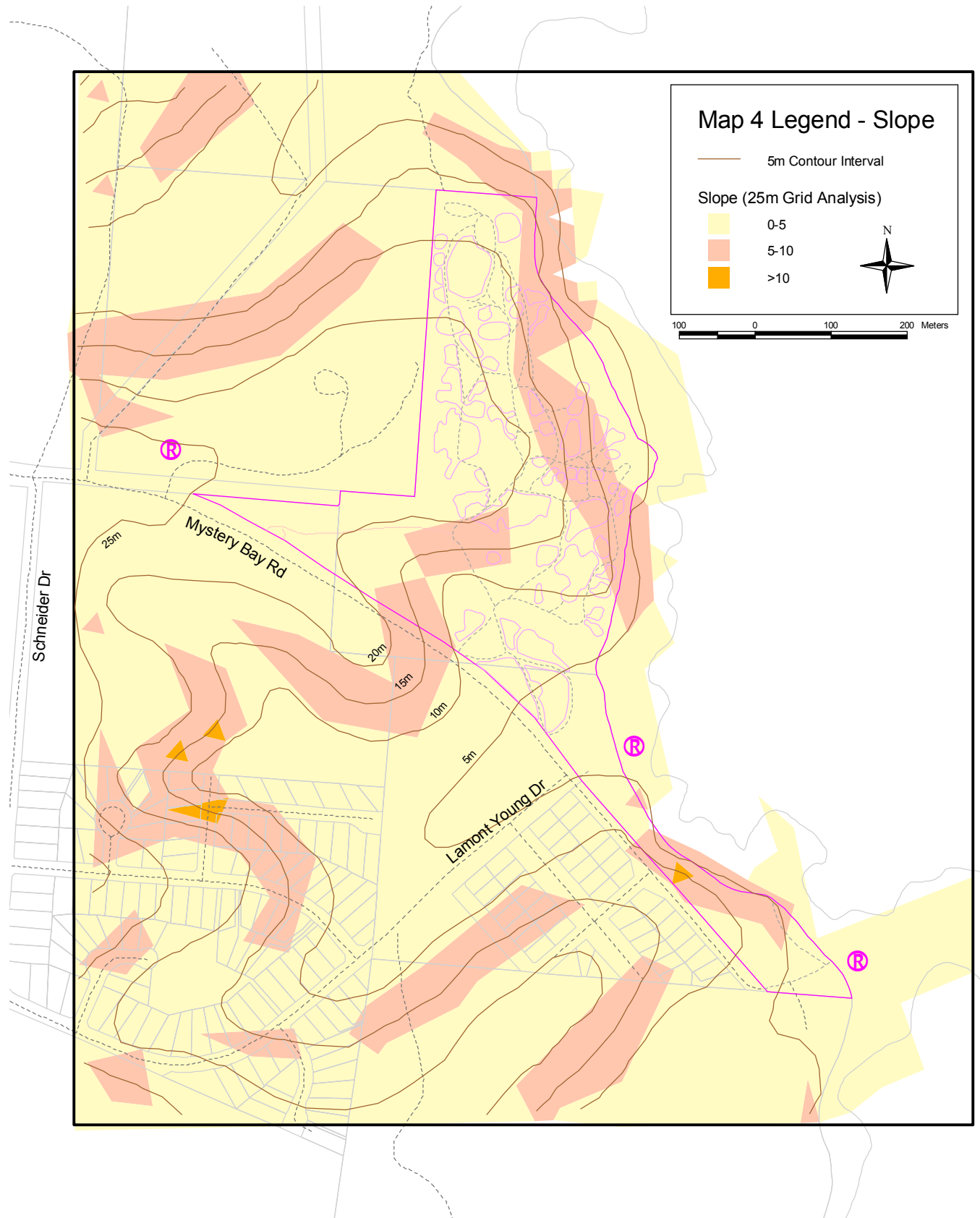
Map 2 Legend - Study Area & Vegetation

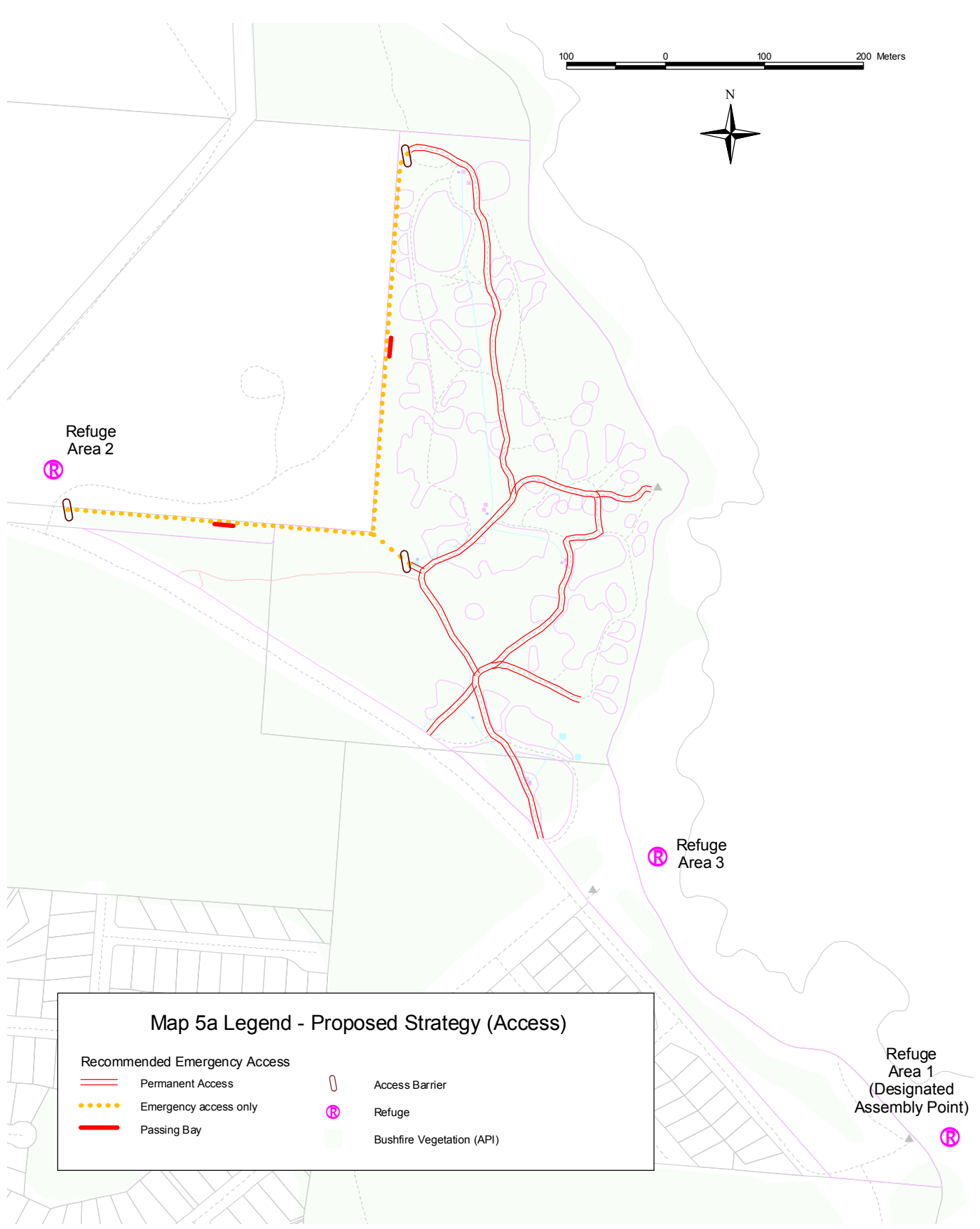
<ul style="list-style-type: none"> Study Area Mystery Bay Camping & Foreshore Area Refuge Existing Road / Trail National Park 	<p>Bushfire Vegetation (API)</p> <ul style="list-style-type: none"> Coastal Remnant (Grp 3) Coastal Lowlands Cycad / Shrub Dry Forest (Grp 1) Coastal Shrub / Grass Dry Forest (Grp 1) Coastal Headland Heathlands (Grp 2) Moist Shrub Forest / Tall Wet Heath Swamp Forest (Grp 1)
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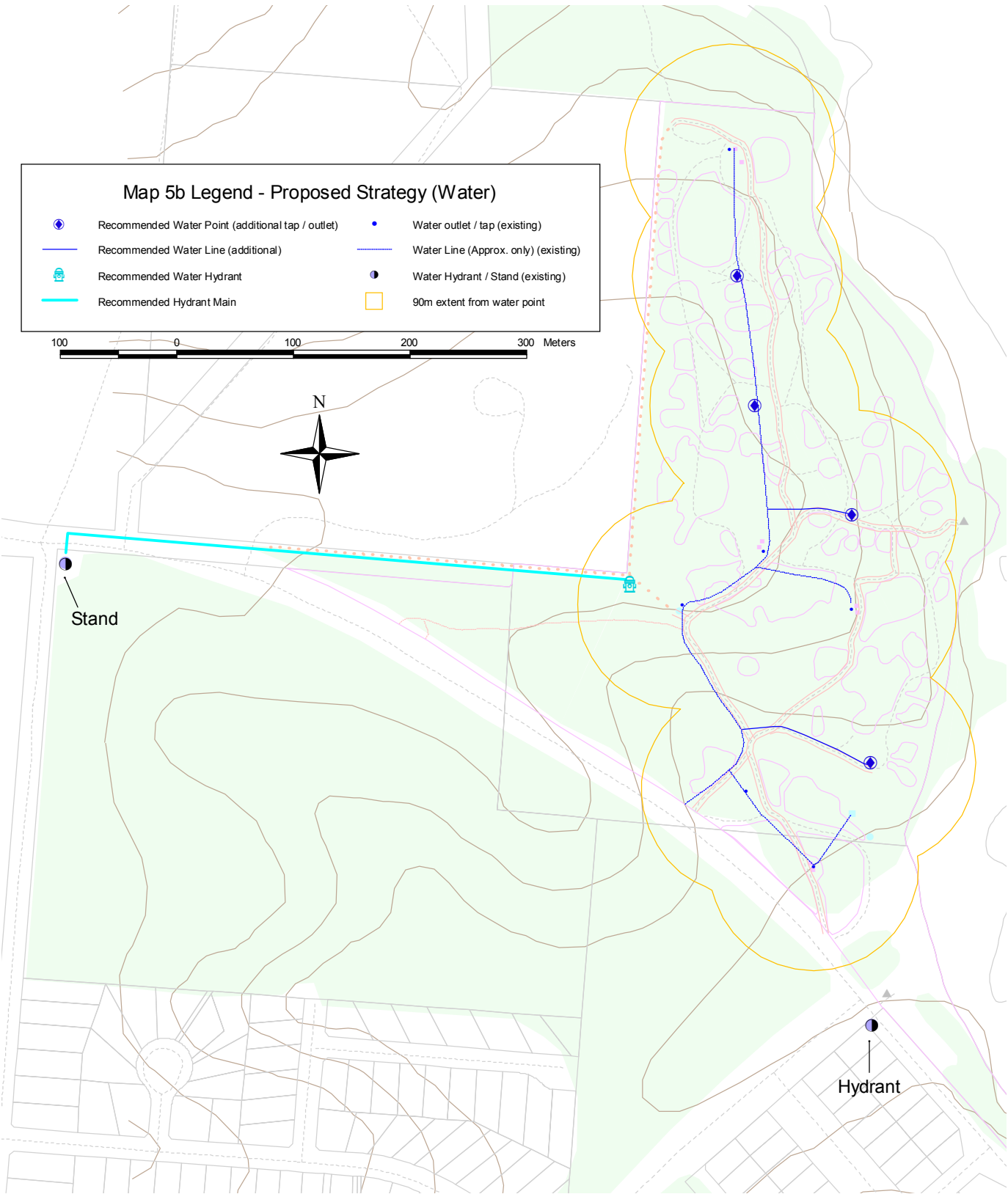
Map 3 Legend - Existing Development

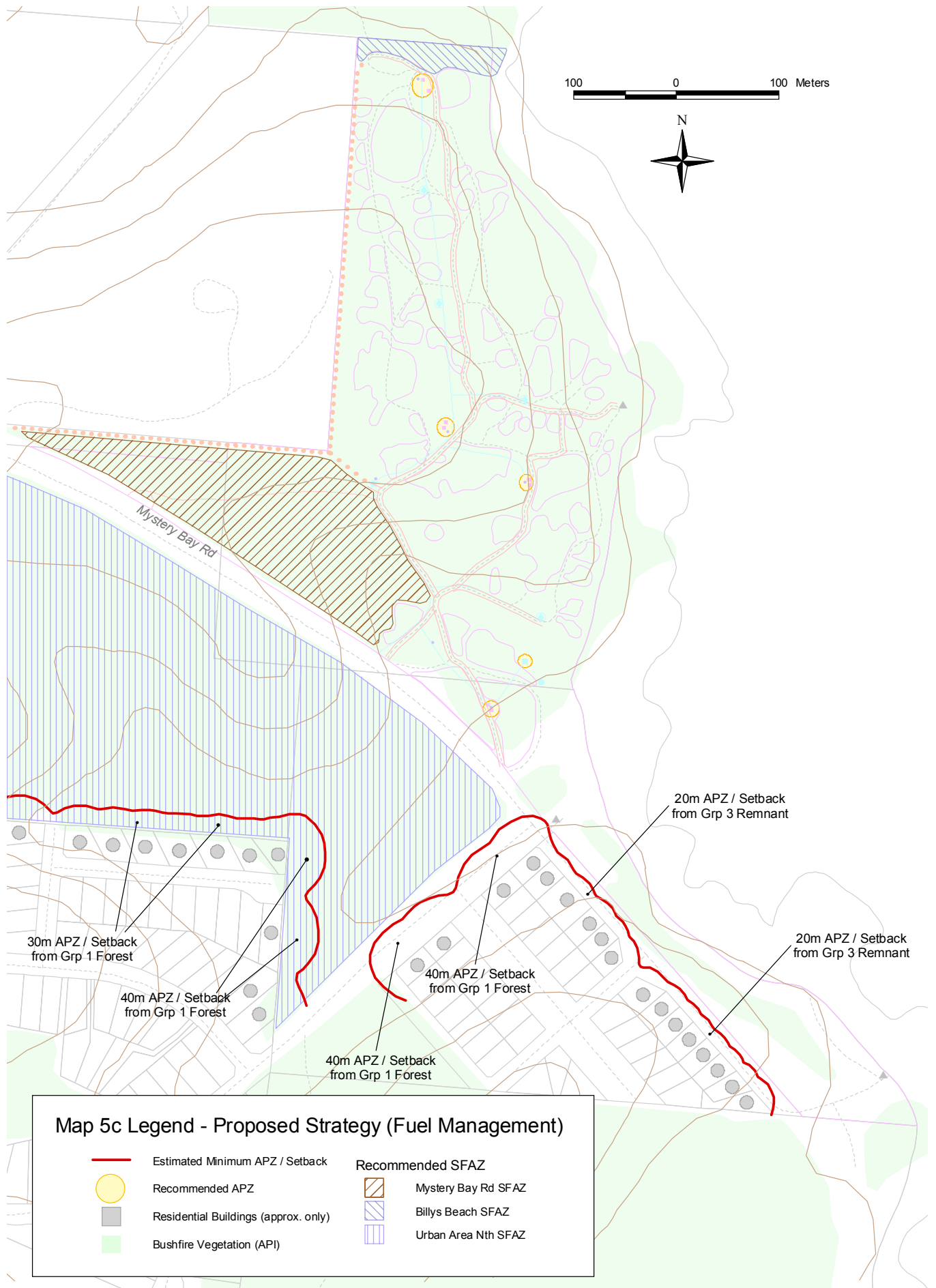
	Mystery Bay Camping & Foreshoe Area		Water Tank
	Car Parking Area		Shower facilities
	Internal Vehicle Trails		Toilet facilities
	Old access / emergency only trail		Existing Camp Site Areas
	Water outlet / tap		

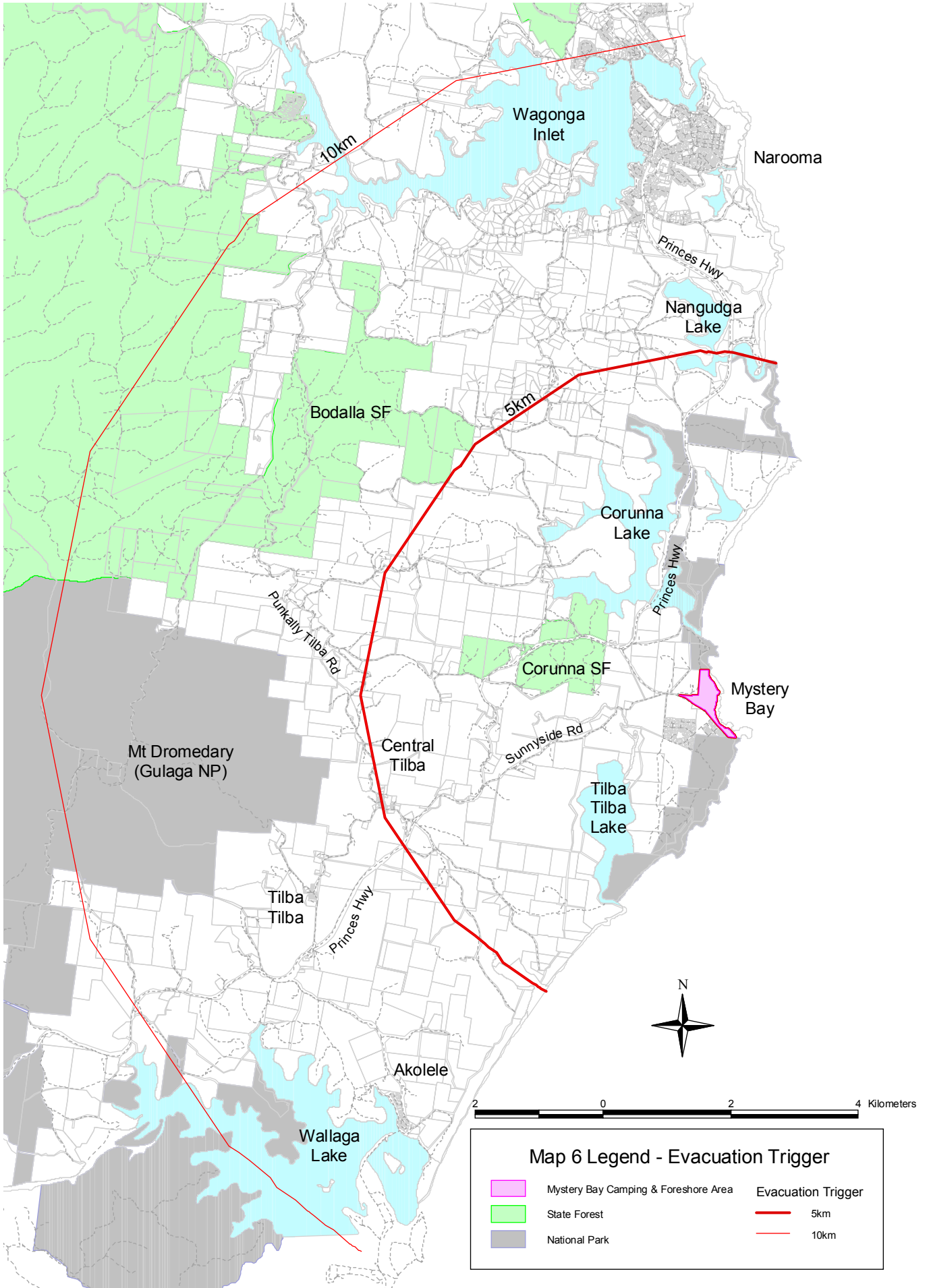




Map 5a Legend - Proposed Strategy (Access)	
Recommended Emergency Access	
	Permanent Access
	Emergency access only
	Passing Bay
	Access Barrier
	Refuge
	Bushfire Vegetation (API)







Map 6 Legend - Evacuation Trigger






	Mystery Bay Camping & Foreshore Area	Evacuation Trigger
	State Forest	 5km
	National Park	 10km



Photo Location: Refuge Area 2
Looking towards cleared and open beach and vehicle parking areas.



Photo Location: Refuge Area 1
Looking towards cleared and open beach and vehicle parking areas.



Photo Location: Refuge Area 1
Looking SW along Mystery Bay Rd / towards remnant coastal shrub / heathlands / road access to Refuge Area 2.



Photo Location: Approx. Southern most Entry Point to Subject Camping Area
Looking SW along Mystery Bay Rd / towards adjacent urban settlement / towards Lamont Young Dr intersection / road access to Refuge Areas 1 & 2.



Photo Location: Approx. Northern most Entry Point to Subject Camping Area

Looking NW along Mystery Bay Rd / road access to Refuge Area 3.



Photo Location: Subject Site.

Example access trail proposed for 'Permanent Access' for fire and emergency services.



Photo Location: Subject Site.

Example camp site.

Note: fuel reduced and disturbed area.



Photo Location: Subject Site.

Example camp fire location.

Appendix 1

MYSTERY BAY PRIMITIVE CAMPING AREA, BUSHFIRE EVACUATION PLAN