



Mapping Standard for Bush Fire Prone Areas 2023

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The information contained within this document is correct at the time of publication and will be reviewed as required to maintain currency. The latest version is available at www.dfes.wa.gov.au/bushfireproneareas.

Currency of the Standard

The Department of Fire and Emergency Services (DFES) Mapping Standard for Bush fire Prone Areas (the Standard) was approved by the Director Office of Bush fire Risk Management (OBRM) in September 2023. This is the seventh revision of the Standard that was first published in May 2014.

The current version of the Standard is available at www.dfes.wa.gov.au/hazard-information/bushfire/bushfire-prone-areas.

Amendment		Details	Amended by	Release
No.	Date			
V 7.0	September 2023	Major amendment introducing Bush Fire Prone Areas 1 and 2. Amendments to methodologies used to assess bush fire prone vegetation.	OBRM	Public
V6.0	August 2021	Updated to reflect current review and that this standard does not apply to the Central Planning Sub-region	DFES	Public
V5.0	May 2018	Minor amendment to reflect minor changes in approval timelines.	OBRM	Public
V4.0	November 2017	Minor amendment to terminology to reflect maturity of review process (provision of 'mapping' rather than 'datasets'). Update of contact details and agency names to reflect machinery of government changes.	OBRM	Public
V3.0	May 2017	Major amendment to Section 1.1 to remove text "Where a bush fire prone area cuts across a portion of a parcel of land, the entire parcel is treated as a bush fire prone area for the purposes of this Standard." Minor updates to other sections.	OBRM	Public
V2.0	November 2015	Annual review undertaken as outlined in 2014 Standard. Consultation with Department of Fire and Emergency Services, Department of Planning, Lands and Heritage, Department of Mines, Industry Regulation and Safety – Building Commission, Department of Biodiversity, Conservation and Attractions, and Landgate.	OBRM	Public
V1.0	May 2014	Initial release	OBRM	Public

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Definitions

The following definitions apply to terms used in the Standard.

Bush fire	An unplanned fire burning in vegetation. 'Bushfire' and 'bush fire' should be taken to have the same meaning, with the latter used in this document to align with the <i>Fire and Emergency Services Act 1998</i> .
Bush fire prone area	An area that has been designated by the Fire and Emergency Services (FES) Commissioner under section 18P of the <i>Fire and Emergency Services Act 1998</i> as an area that is subject, or likely to be subject, to bush fires.
Bush fire prone buffer	An area 100 metres wide that surrounds bush fire prone vegetation.
Bush fire prone vegetation	Vegetation classified as bush fire prone in accordance with the criteria and vegetation key specified in the Standard.
Map of Bush Fire Prone Areas	An online map identifying areas of WA that are designated as bush fire prone, produced in line with the requirements of the Standard.

1. Introduction

The identification of bush fire prone areas is a fundamental step to allow controls for bushfire risk to be implemented through the planning and building system. The Map of Bush Fire Prone Areas (Map) shows areas of Western Australia (WA) designated by the Fire and Emergency Services Commissioner as likely to be subject to bush fire attack. The Mapping Standard for Bush Fire Prone Areas (Standard) defines the methodology applied to identify bush fire prone areas and develop the Map.

The Map and Standard ensure the accurate and consistent designation of bush fire prone areas in WA and improve consistency in applying bushfire planning and building controls. DFES is responsible for the development of the Map, working with local government and partner agencies.

1.1 Definition of a bush fire prone area

A bush fire prone area (BPA) is an area that is likely to be subject to bush fire attack¹. Research has shown about 85 per cent of houses destroyed in bushfires were within 100 metres of bushland, with ember attack being a significant cause of property ignition². As such, a BPA is defined as any area within 100 metres of bush fire prone vegetation (BPV).

Under Section 18P of the *Fire and Emergency Services Act 1998* the Fire and Emergency Services Commissioner can, by order published in the Gazette, designate areas of Western Australia as bush fire prone if satisfied that the area is likely to be subject to bush fires.

1.2 Purpose of the Map of Bush Fire Prone Areas

Development and building proposals in locations designated as BPA must meet additional planning and construction requirements. These requirements are set out in *State Planning Policy 3.7 Planning in Bushfire Prone Areas* and the *National Construction Code*. Further information on the bush fire planning policy and regulatory framework is available at [Bushfire planning - Department of Planning, Lands and Heritage](#).

1.3 Area 1 and Area 2 on the Map of Bush Fire Prone Areas

The 2023 update of the Map includes two categories of bushfire risk. Area 1 comprises suburbs located on the Swan Coastal Plain within the Perth, Peel and Greater Bunbury Region Schemes. The intensity of development and fragmented nature of vegetation in Area 1 reduces the risk of landscape scale bush fire. Area 2 comprises the remainder of the State. All BPA within suburbs identified as Area 1 are labelled as BPA 1. All other BPA is labelled as BPA 2.

¹ Standards Australia 2019, *Australian Standard Construction of buildings in bushfire-prone areas AS 3959:2018*, Fourth Edition incorporating Amendment No. 1, Standards Australia, Sydney, Australia p. 8.

² K. Chen & J. McAneney 2010, *Bushfire Penetration into Urban Areas in Australia: A Spatial Analysis*, Risk Frontiers Macquarie University for Bushfire CRC, p. 16.

2. Identifying bush fire prone areas

2.1 Vegetation data

Data used to identify vegetation extent and type was sourced from the Department of Primary Industries and Regional Development, the Forest Products Commission and PF Olsen. These data were modified to reflect the current extent of vegetation using high-resolution imagery of the Perth, Peel and Greater Bunbury Region Scheme areas. Imagery was sourced from *WA Now*.

2.2 Classification of bush fire prone vegetation

BPV may consist of any of the seven vegetation classifications described in *Australian Standard 3959-2018 Construction of Buildings in Bushfire Prone Areas* as shown in Table 1. Appendix 1, *Vegetation Classification Summary*, provides a visual guide to assist with classifying vegetation. Managed grassland and low threat vegetation, as described in clause 2.2.3.2. (e) and (f) of AS 3959-2018, are not bush fire prone.

Table 1: Vegetation classifications that can comprise bush fire prone vegetation³.

Vegetation Classification ⁴	Vegetation Type	Description
A Forest	Tall open forest Tall woodland	Trees over 30 m high with 30-70% foliage cover (may include understorey of low trees and tall shrubs). Found in areas of high reliable rainfall.
	Open forest Low open forest	Trees up to 30 m high; 30-70% foliage cover (may include understorey of low trees or shrubs). Includes eucalypt plantations.
	Pine plantations	Trees 30 m in height at maturity, comprising softwood species, planted as a single species for the production of timber.
B Woodland	Woodland Low woodland	Trees up to 30 m high; 10%–30% foliage cover. May contain isolated shrubs.
C Shrubland	Closed (low) heath Open heath	Found in wet areas and/or affected by poor soil fertility or shallow soils. Shrubs 1m–2 m high. Wet heaths occur in sands adjoining dunes of the littoral (shore) zone. Montane heaths occur on shallow or water-logged soils.
	Low shrubland	Shrubs <2 m high; greater than 30% foliage cover. Understoreys may contain grasses.
D Scrub	Closed scrub (Tall heaths)	Found in wet areas and areas affected by poor soil fertility or shallow soils; >30% foliage cover. Dry heaths occur in rocky areas. Shrubs >2 m high. Typical of coastal areas and tall heaths up to 6 metres in height.
	Open scrub	Shrubs greater than 2 m high, 10%–30% foliage cover with a mixed species composition.
E Mallee/ Mulga	Tall shrubland	Vegetation dominated by low trees or tall shrubs some with a multi-stemmed habit (mallee); usually greater than 2 m in height; <30% foliage cover. Understorey of widespread dense low shrubs or sparse grasses and generally found in the arid and semi-arid zones, but not within the rangelands.
F Rainforest	Tall closed forest Closed forest Low closed forest	Trees >90% foliage cover; understorey may contain a large number of species with a variety of heights. Not dominated by eucalypt species.
G Grasslands	Hummock grassland Closed tussock grassland Tussock grassland Open tussock Sparse open tussock Dense sown pasture Sown pasture Open herbfield Sparse open herbfield	All forms (except tussock moorlands), including situations with shrubs and trees, if the overstorey foliage cover is less than 10%. Includes pasture and cropland.

³ Source: AS 3959-2018: Table 2.3 © Standards Australia. Reproduced with permission under Standards Australia licence number CL0821dfe.

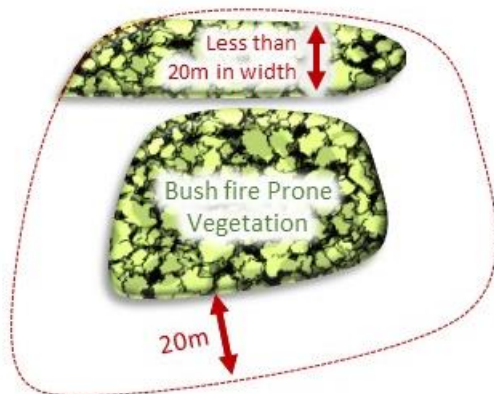
⁴ Vegetation Classification relates to those shown in Appendix 1 – Classification of Vegetation Summary.
Mapping Standards for Bush Fire Prone Areas

2.3 Spatial definition of bush fire prone vegetation

An area of vegetation is identified as BPV if it meets any of the four criteria below at the time the assessment is undertaken. Changes in vegetation are identified via regular reviews of the Map.

Criterion 1. Patches of vegetation greater than 1 hectare in area and at least 20 metres in width.

Criterion 2. Strips of vegetation that are within 20 metres of a patch of BPV.



(a) Strip of vegetation less than 20m wide and within 20m from other BPV

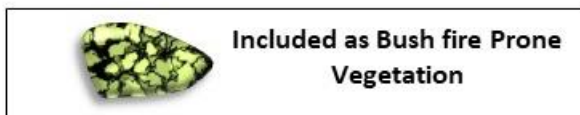
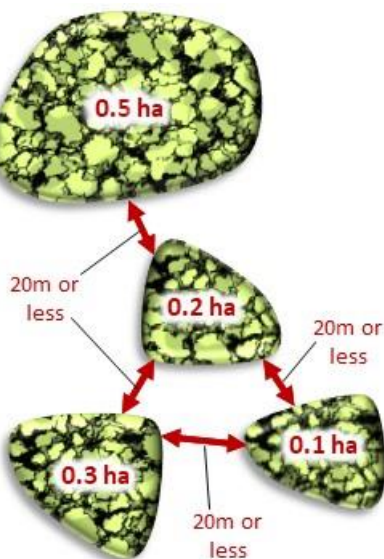


Figure 1 – Depiction of criterion 2 for defining bush fire prone vegetation.

Criterion 3. Patches of vegetation that are within 20m of each other, with a combined area of 1 hectare or greater.



(a) Group of vegetation plots with combined area ≥ 1 ha

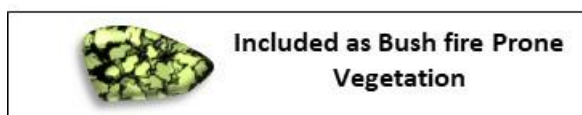


Figure 2 – Depiction of criterion 3 for defining bush fire prone vegetation.

Criterion 4. Patches of vegetation that are within 20m of each other, with a combined area of 0.25 to 0.99 hectares and that are within 100 metres of BPV.

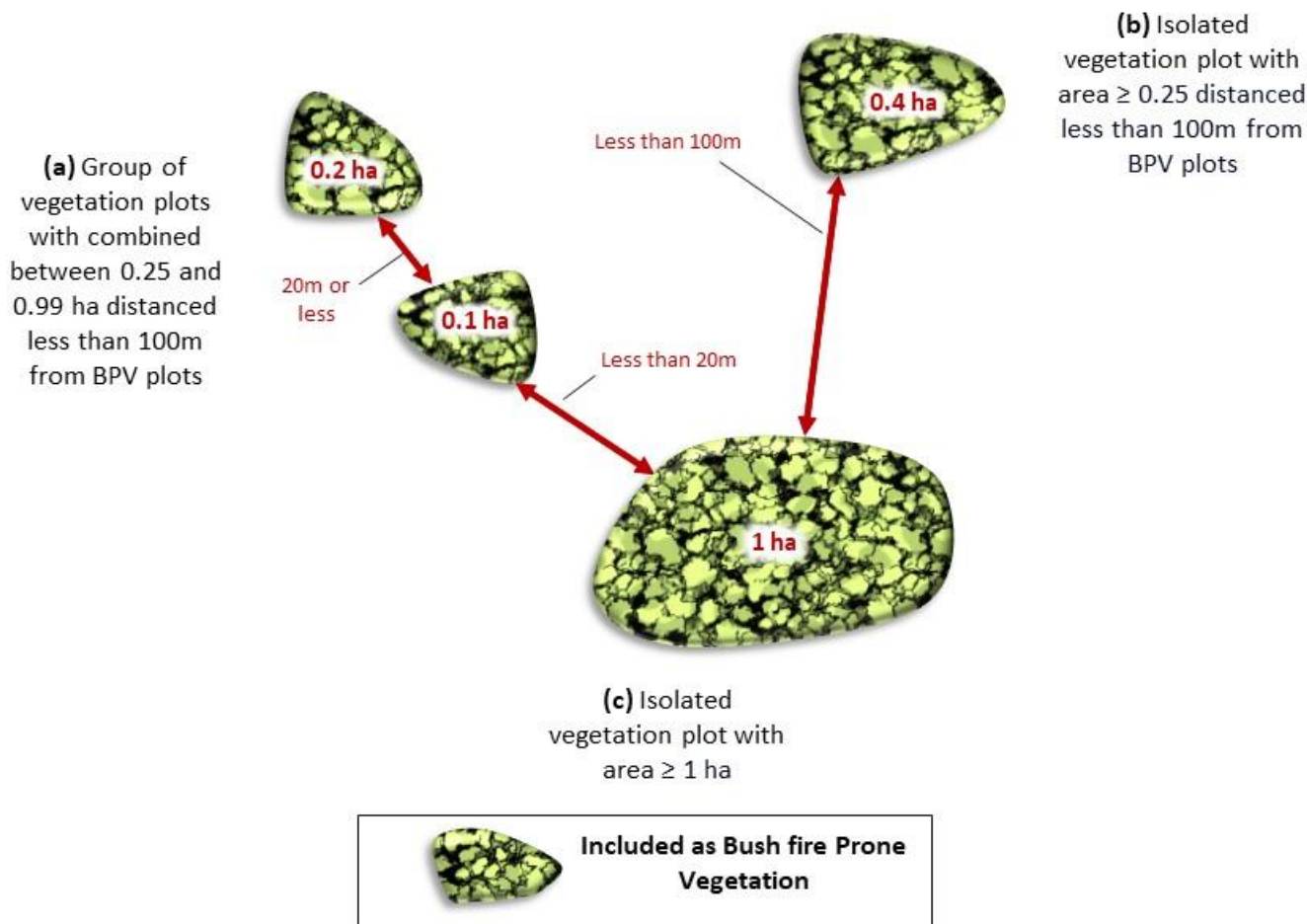


Figure 3 – Depiction of criterion 4 for defining bush fire prone vegetation.

2.4 Exceptions for the Perth Central Planning Sub-region

Within the Perth Central Planning Sub-region⁵ patches of vegetation less than four hectares in area are not identified as BPV. This is in recognition of the reduced bushfire risk associated with this highly urbanised area. Additional field validation has also been undertaken in the Perth Central Planning Sub-region to identify areas of managed vegetation and exclude them as BPV.

2.5 The precautionary principle

DFES takes a precautionary approach to defining identifying BPV. Unless an area of vegetation clearly does not meet criterion 1, 2, 3 or 4, it is identified as bush fire prone. DFES may undertake additional assessments to determine the characteristics of vegetation.

2.6 Defining the Bush Fire Prone Area

The BPA is defined by applying a 100-metre buffer to the periphery of all BPV with the BPA comprising the totality of the BPV and the area encompassed by the 100-metre buffer.

⁵ City of Stirling, City of Bayswater, Town of Bassendean, Town of Cambridge, City of Vincent, City of Nedlands, City of Subiaco, City of Perth, City of Belmont, Town of Claremont, City of South Perth, Town of Victoria Park, Town of Cottesloe, Shire of Peppermint Grove, Town of Mosman Park, City of Fremantle, Town of East Fremantle, City of Melville and City of Canning.

3. Identifying Bush Fire Prone Areas 1 and 2

Area 1 comprises suburbs located on the Swan Coastal Plain within the Perth, Peel and Greater Bunbury Region Schemes where urban density, topography and the absence of contiguous vegetation reduces the risk of landscape scale bushfires. Area 1 was identified by applying criteria via analysis of imagery and cadastral data and on-ground vegetation assessment.

The suburbs investigated for suitability for inclusion in Area 1 were as follows:

- All suburbs within the Perth Metropolitan Region Scheme (MRS) except for the following locations:
 - East of Tonkin Hwy (north) from intersection with Reid Hwy until end of MRS boundary.
 - North and East of Reid Hwy between intersection with Roe Hwy and Tonkin Hwy (north).
 - East of Roe Hwy between Tonkin Hwy intersection and Reid Hwy intersection.
 - East of Tonkin Hwy between intersection with Roe Hwy and Albany Hwy.
 - East of Albany Hwy between the intersection with Tonkin Hwy and the South West Highway.
 - East of South West Hwy from intersection with Albany Hwy to end of MRS boundary.
- The City of Mandurah (Peel Region Scheme).
- The City of Bunbury and Shire of Dardanup (Greater Bunbury Region Scheme).

These suburbs were subject to field assessment for suitability for inclusion in Area 1 if:

- at least 50% of their total area is developed;
- at least 25% of the area within the suburb’s BPA is developed; or
- the suburb is surrounded by suburbs identified for further assessment as Area 1.

Land is considered to be developed if it is:

- Zoned urban or urban deferred under the region scheme and has a building or structure in place or is subdivided to a size consistent with an urban form (equivalent to an R-Code of R10 or greater).
- In the central city area zone or regional centre, industrial zone or public purpose zone under the region scheme and local planning scheme and has been built on.
- A road.

Suburbs that met the criteria above were subject to field assessment to better characterise their bushfire risk profile. This included on ground vegetation classification and fuel assessment and consideration of vegetation connection and distribution. Table 2 shows the criteria applied to determine whether a suburb was included in Area 1.

Table 2: Field assessment characteristics used to identify Area 1 suburbs.

Desirable characteristics	Undesirable characteristics
Minimal BPV	Significant extent of BPV
Vegetation distributed in isolated remnants	Significant extent of BPV in adjacent suburb(s)
Significant areas of primary dune vegetation	Contiguous vegetation
Significant areas of manageable grassland	Undeveloped areas with development potential
Extensive residential areas	Fewer roads
Extensive Industrial areas	
Significant road network	

All parts of the State not included in Area 1 are Area 2.

4. Technical Specifications of the Map of Bush Fire Prone Areas

4.1 Map and Data Accessibility

The Map can be viewed online through the [DFES website](#) utilising the Shared Location Information Platform (SLIP) administered by Landgate. The dataset depicting designated BPA is available from the WA open data website, www.data.wa.gov.au.

4.2 Map depiction of Bush Fire Prone Areas

Area 1 suburb: Suburbs included in Area 1 are depicted by a thick black dashed line on the Map.

Bush fire prone areas will appear with the following colours on the Map:

BPA Area 1: Fill colour: RGB 197, 0, 255 (75% transparency)

Outline: continuous pattern with same colour of fill (0% transparency)

BPA Area 2: Fill colour: RGB 255, 0, 197 (75% transparency)

Outline: continuous pattern with same colour of fill (0% transparency)

For the first four months following designation, new BPA will be depicted with the following colours on the Map:

New BPA 1: Fill colour: RGB 0, 197, 255 (75% transparency)

Outline: dotted pattern with same colour of fill (0% transparency)

New BPA 2: Fill colour: RGB 0, 92, 230 (75% transparency)

Outline: dotted pattern with same colour of fill (0% transparency)

Following the end of the four-month transition period, all designated BPA will be depicted as BPA Area 1 or BPA Area 2 as appropriate.

5. Reviews of the Map of Bush Fire Prone Areas

5.1 Review of Bush Fire Prone Mapping

It is the responsibility of local government and relevant state agencies to monitor and review BPAs identified within their administrative areas, to support regular updates to the Map. DFES consults local governments on BPAs in their district as part of each Map review. Relevant state government agencies will be provided with the opportunity to contribute to the review of the Map as appropriate. Any feedback on the Map from members of the public or industry groups should be provided to the relevant local government to be considered for inclusion in DFES's consultation process.

DFES' Office of Bushfire Risk Management (OBRM) undertakes regular reviews of the Map via the following procedure:

- OBRM undertakes analysis to identify suburbs suitable to include in Area 1.
- OBRM writes to local governments and relevant state government agencies to invite their contribution to the review of the Map.
 - Local governments and state government agencies are given about three months to review⁶ the mapping for their administrative areas.
 - Some assistance may be provided by OBRM if required.
- Local governments and state government agencies provide requests for amendments to OBRM or advise if no changes are required.
- OBRM reviews all proposed amendments.
 - Any amendments must comply with the Standard to be accepted.
 - OBRM may liaise with relevant parties or conduct desktop or field-based reviews to validate proposed amendments.
 - Should a difference of opinion not be resolved, the issue will be escalated to the Director OBRM for a final decision.
- OBRM will use all accepted amendments to update the BPV data.

5.2 Finalisation of the Bush Fire Prone Areas dataset

- Landgate will use the accepted BPV data to prepare the BPA dataset and Map.
- DFES will review the BPA dataset and Map and provide to the FES Commissioner for approval.

5.3 Publication of the Map of Bush Fire Prone Areas

- The FES Commissioner designates the BPAs by an order published in the Government Gazette.
- DFES stores the designated BPA dataset and makes it publicly accessible through Landgate:
 - to view as the Map on the DFES website;
 - to view and download through www.data.wa.gov.au⁷; and
 - as a field in relevant Landgate Property Interest Reports.
- OBRM will inform local governments of the publication of a new version of Map by email and through the Western Australian Local Government Association's networks and newsletters.

⁶ In most cases, a desktop assessment and application of local knowledge is an adequate process for verifying the bush fire prone vegetation data. A field assessment is appropriate where data or local knowledge is not sufficient to make a determination.

⁷ Previously designated bush fire prone area data will continue to be publicly available in the Map of Bush Fire Prone Areas and www.data.wa.gov.au, and will be identified by its designation date.

6. Monitoring and Review

The Standard is subject to regular review to maintain its currency and improve the accuracy of the resulting Map. Review is undertaken in conjunction with consultation on revised versions of the Map. Local Government, state government agencies, industry groups and members of the public are invited to provide feedback during the consultation processes.

Appendix 1 - Classification of Vegetation - Summary

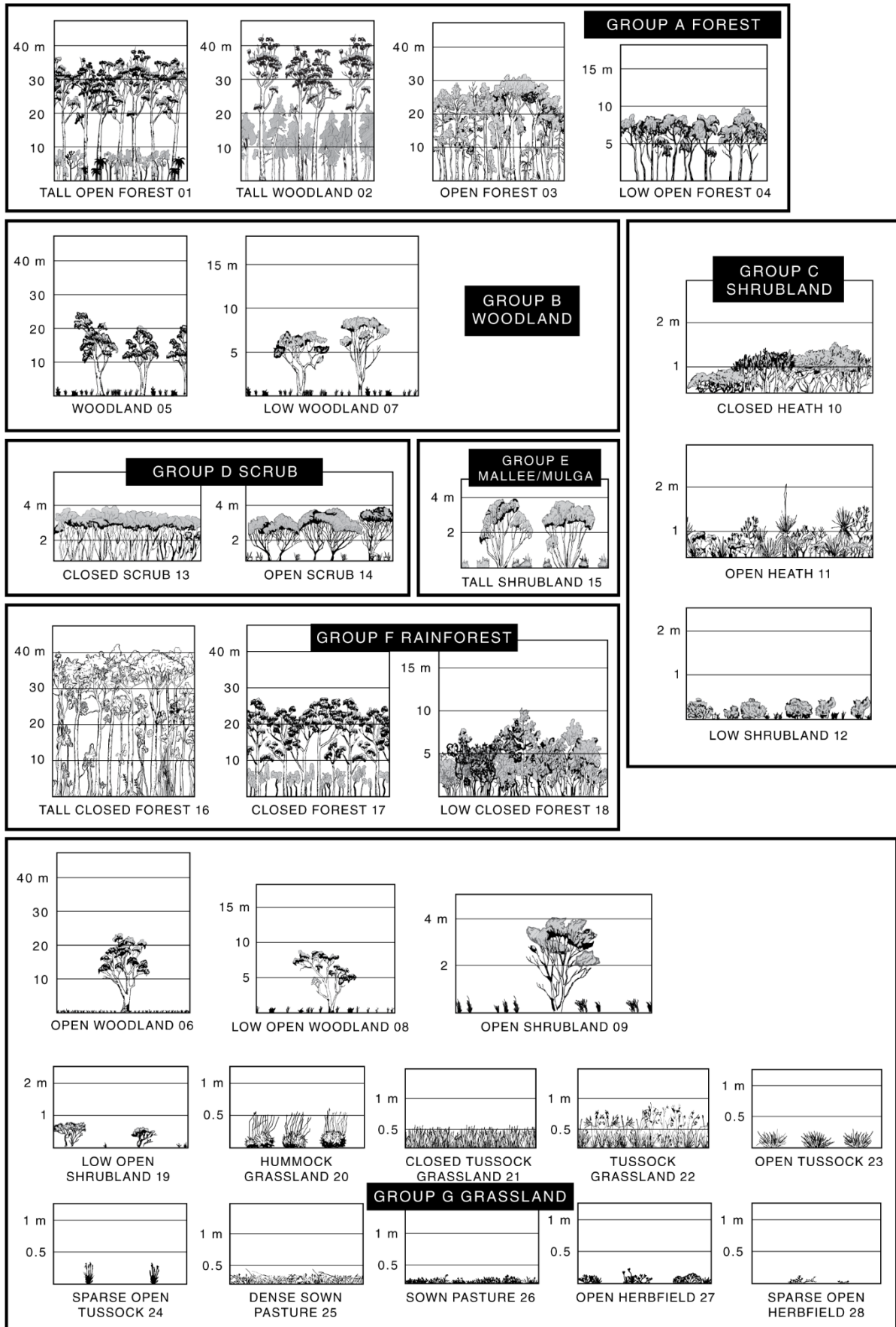


Figure 4 – Classification of vegetation – summary⁸

⁸ Source: AS 3959-2018: Figure 2.4a © Standards Australia. Reproduced with permission under Standards Australia licence number CL0821dfe.

Western Australian Photographic Examples

Group A Forest



Jarrah open forest trees to 30 m height and more than 30% foliage cover



Karri tall open forest over 30 m and more than 30% foliage cover



Tuart open forest trees to 30 m height and more than 30% foliage cover



Melaleuca low open forest trees over 6 m in height and more than 30% foliage cover.



Peppermint mixed low forest over 6 m in height and over 30% foliage cover



Pine plantation over 30 m in height at maturity

Group B Woodland



Eucalypt low open woodland over 10 m and less than 30% foliage cover with grassy understorey



Eucalypt woodland over 10 m and less than 30% foliage cover with isolated shrubs



Melaleuca low woodland trees over 6 m in height and less than 30% foliage cover over a native grass understorey



Low woodland with trees over 6 m, native grass and sedge understorey with isolated shrubs

Group C Shrubland



Low shrubland (Kwongan) less than 2 m in height



Closed (low) heath with 1 m - 2 m high shrubs

Group D Scrub



Closed tall shrubland (scrub) greater than 2 m in height



Open shrubland (scrub) greater than 2 m in height

Group E Mallee/Mulga



Mulga dominant with low shrubs in foreground over sparse grasses.



Mallee greater than 6 m in height and less than 30% foliage cover

Group F Rainforest

Rainforest in WA is restricted to the Kimberley Region which contains small areas of dry rainforest scattered across sheltered valleys and high rainfall coastal areas. The majority of these sites are protected within the reserve system and are unlikely to be associated with future development.



Kimberley vine thicket with greater than 90% foliage and dense understory.

Group G Grassland



Low open woodland with less than 10% foliage cover



Open sedgeland



Northern tussock grassland



Closed tussock – Sedgeland



	
<p>Hummock grassland – Spinifex</p>	<p>Sown pasture</p>

Figure 5 – Western Australia Photographic Examples⁹

⁹ Western Australian photographic examples courtesy of the Bushfire Technical Services team of the Department of Fire and Emergency Services.