LEGEND

WEIA Boundary

Scenic quality values plus scenic priority scores

- 3 - 9
- 9 - 13
- 13 - 17
- 17 - 20.5
- 20.5 - 24.5
- 24.5- 29
- 29 - 34
- 34 - 39.5
- 39.5 - 48.5

MACNAMARA
MACGREGOR
LATHAM
MELBA
EVATT
HOLT
FLOREY
HIGGINS
STRATHNAIRN
SCULLIN
PAGE
BELCONNEN
HAWKER
WEETANGERA
MACQUARIE
COOK
WHITLAM
URIARRA ROAD
URIARRA VILLAGE
DENMAN PROSPECT
MOLONGLO
COOMBS
WRIGHT
CURTIN
COTTER ROAD
DUFFY
HOLDER
WESTON
LYONS
RIVETT
STIRLING
WARAMANGA
CHAPMAN
CHIFLEY
FISHER
KAMBAH
WANNIASSA
GREENWAY

FIG NO. 6-13

FIGURE TITLE Visual Impact Constraint Overview

PROJECT TITLE Western Edge Investigation Area – Capability and Suitability Assessment

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PAGE SIZE A3

SOURCES Landscape Character Values and Visual Assessment, VPA 2020
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LEGEND

WEIA Boundary

Rating

- Least Constrained
- Somewhat Constrained
- Constrained
- Highly Constrained
- Excluded

MACNAMARA
MACGREGOR
LATHAM
FLYNN
MELBA
EVATT
HOLT
FLOREY
STRATHNAIRN
HIGGINS
SCULLIN
PAGE
BELCONNEN
HAWKER
WEETANGERA
MACQUARIE
COOK
WHITLAM
URIARRA ROAD
URIARRA VILLAGE
DENMAN PROSPECT
MOLONGLO
COOMBS
WRIGHT
CURTIN
COTTER ROAD
DUFFY
HOLDER
WESTON
LYONS
RIVETT
STIRLING
WARAMANGA
CHAPMAN
CHIFLEY
FISHER
KAMBAH
WANNIASSA
GREENWAY

FIG NO. 6-14

FIGURE TITLE Visual Impact Capability Assessment

PROJECT TITLE Western Edge Investigation Area – Capability and Suitability Assessment

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6.4 Consolidated Capability Assessment

The consolidated capability assessment brings together all the thematic results and applies the relative weighting which was adopted in Section 6.2. The outcome of the consolidated assessment is provided in Figure 6-15. Noting the competing physical and ecological constraints within the WEIA, it is not surprising that much of the land is classified as being constrained.

Urban Investigation Areas have been drawn around areas with a rating of constrained or highly constrained, to provide key groupings for further investigation in the suitability assessment. These areas for further investigation have been classified as follows:

- **Central Molonglo Cluster (approx. 1,240 ha)**
- **Uriarra Ridge Cluster (approx. 1,798 ha)**
- **West Molonglo Cluster (approx. 1,785 ha)**
- **Bulgar Creek Cluster (approx. 1,500 ha)**
- **Kambah Cluster (approx. 668 ha)**

The suitability assessment in the next chapter provides a more in depth analysis of the opportunities and constraints of each cluster.

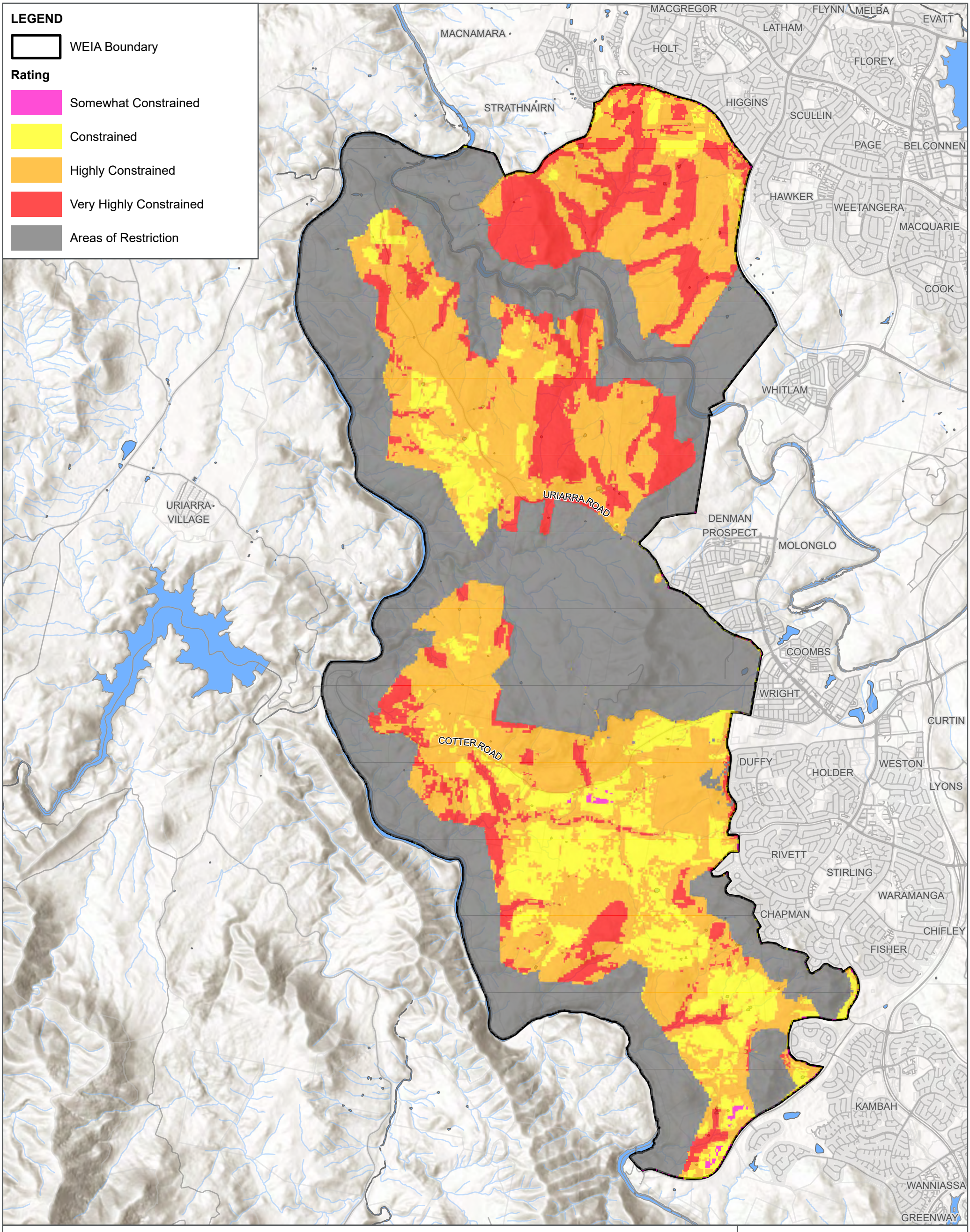

FIG NO. 6-15

FIGURE TITLE Consolidated Capability Assessment

PROJECT TITLE Western Edge Investigation Area – Capability and Suitability Assessment

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Location: C:\GIS\NSW\Outgoing\3002862 Western Edge Investigation Area\02_Maps\WEIA Urban Planning\ArcGIS Masterfile\ArcGIS Masterfile.aprx

Last updated by: LL16284 on 20/01/2023 at 10:33

7. Land Suitability Assessment

The Land Suitability Assessment provides a comparative assessment of each of the investigation areas developed in the capability assessment.

This assessment considers:

- Size of land parcel
- Availability of infrastructure
- Road connectivity
- Slope and topography
- Waterways
- Ecology and biodiversity connectivity
- Nearby facilitating projects
- Existing constraints such as zoning and bushfire
- Outcome of capability assessment

The assessment provides an analysis of characteristics, constraints and opportunities of each of the investigation areas for consideration when developing the potential development scenarios. An assessment of each investigation area is provided below, alongside a discussion of future land uses that may be suitable and subject to confirmation through future assessments.

7.1 Central Molonglo Investigation Area

This investigation area is a grouping of land (approx. 1,240 ha) extending south of Drake-Brockman Drive and west of William Hovell Drive and the Kama Nature Reserve. The area includes 132KV HV lines and the MVIS which follows the northern banks of the Molonglo River. As this potential site interfaces with existing established suburbs in West Belconnen, the land may be more readily serviceable by road and utility networks. Expansion of public transport networks, existing established (or planned) education, health and emergency services, as well as local/regional centres could also potentially service this land. The area also contains a range of environmental values.

An analysis of key characteristics is provided in Table 7–1, with a summary of opportunities and challenges in Table 7–2, followed by future land use visioning.

Table 7–1 | Analysis of characteristics of the Central Molonglo Investigation Area

Central Molonglo Investigation Area	
Bushfire	Large parts of this investigation area around the periphery are classified as high bushfire risk, leaving only some parts in the centre as low risk. As the land within this area is mainly broadacre or hills, ridges and buffers, increased urbanisation would likely result in changes to the bushfire hazard. There is the potential for multiple emergency egress points from the site to nearby collector road of Drake-Brockman Drive and arterial road of William Hovell Drive. Access points to nearby roads would require further consideration as part of a feasibility study considering potential structure planning, land use and traffic generation.
Planning and Zoning	Predominantly zoned as *NUZ3- Hills. Ridges and buffer areas;* with a small area in the north as *NUZ1-Broadacre*. Nearby land uses include future urban areas to the west and existing low density residential suburbs in Holt and Higgins to the north. Nature reserves are located south-east (Kama Nature Reserve) and south (Molonglo River Corridor). The Bicentennial National Trail runs along the northern and eastern boundaries of the investigation area. The area contains Lands End, the former location of the Weetangera Methodist Church and the heritage listed Old Weetangera Cemetery which contains 44 burials. It is noted that Lands End is not a registered heritage place, however, this does not preclude Lands End from being conserved a place of historic interest in response to community views. The Old Weetangera Cemetery was listed on the ACT Heritage Register in 2003 and is significant for its age, location, composition, burials and intact nature. The adjoining Kama Nature Reserve, which was established in 2008, was listed on the ACT Heritage Register in 2012 for its natural heritage values. The heritage curtilage for Kama extends to the Box Gum Woodland species in the road reserve along William Hovell Drive, as they are similar to the vegetation patterns that existed prior to European settlement. The heritage curtilage also extends to the north-west beyond the nature reserve boundary, noting that the heritage curtilage is larger than the nature reserve boundary. The Kama Nature Reserve is not identified as an Investigation Area for

Central Molonglo Investigation Area	
	Potential Development and early ecological investigations of this area are recommended to identify capability to accommodate appropriate uses like walking trails. Aboriginal places which have been registered on the ACT Heritage Register and sensitive information recorded by GML (2020) is mapped in the restricted Attachment A. There are multiple registered Aboriginal places across the area, and it is noted that there may be additional Aboriginal places which are not yet on the Register. Given the lack of spatial data available on these places, future development planning will need to consider information gaps, along with additional heritage assessment in accordance with the operating statutory framework at the time. In 2008, the area was more definitively removed 'in perpetuity' from being considered for future urban development following the Standing Committee on Planning and Environment report on DV 281 in August 2008. The committee's fourth recommendation is that Central Molonglo be removed in perpetuity from being considered as a future urban area. Initially, the ACT Government stated that land would not be required for 20 years. In 2008, an ACT Government commitment removed in perpetuity a significant portion of this area from being considered as a future urban area, and therefore may only be considered for non-urban land uses if this decision is reconsidered. Archaeological site patterning in the region shows a landscape dominated by low density artefact scatters focused on the areas of the Molonglo River to the south and Black Mountain to the east, it is noted that the location of low density artefacts is based on previous heritage studies and assessment in the area and that this may change with future investigations. Heritage studies have been undertaken in the surrounding areas for the future residential developments within the Molonglo Valley which have located numerous small artefact sites within the vicinity of the Central Molonglo Investigation Area. Further investigation would be required to determine the presence of Indigenous heritage sites within the site, and to ensure master planning is responsive to any Aboriginal places of significance or high conservation value.
Road Access	Drake -Brockman Drive and William Hovell Drive are located on the northern and eastern boundary of the site respectively. Pro Hart Avenue joins the western extent of Drake-Brockman Drive, whilst Stockdill Drive runs along the western boundary. A network of existing driveways and private roads provide access to the vineyards and rural land uses currently present within the site. Subject to appropriate consideration by TCCS, connection into these roads could facilitate future urban development.
Evo Energy	Overhead high voltage transmission electricity lines pass centrally through the site (132KV) and the south west of the site (330KV National Grid). The site also has an underground Fibre communications cable within the easement of the 132KV line.
Transgrid	A number of electricity structures are earmarked on the electricity line route running in the north west of the investigation area, including a substation adjacent to Stockdill Drive.
Gas Infrastructure	A gas pipe runs along the northern boundary of the site with gas fittings and gas meters. A gas station is also present on Pro Hart Avenue, near Fullston Way.
Icon Water Infrastructure	A bulk water main runs north-south in the eastern portion of the site to a reservoir that is located near the corner of Drake-Brockman Drive and William Hovell Drive. Reticulation of potable water from this reservoir runs along Drake-Brockman Drive to networks within adjoining suburbs and to the LMWQCC.
Sewer Infrastructure	The MVIS runs along the southern boundary of the site, within the northern extent of the Molonglo River Reserve.
Slope	The terrain is mainly flat with a slope gradient of less than 10%, with the exception of the south western portion of the site which has a slope of 20% to 35%. Suitable uses for this portion of the site would need further investigation. Flatter portions of the site are generally suited to urban development however the steeper extents along Stockdill Drive would have significant challenges.
Soils	The soil type is predominantly *Burra,* with a very small section in the north of the site as *Williamsdale.* There are areas of rocky outcrop within the steeper terrain and adjacent to river courses which would present a constraint for future urban development however due to their location, are unlikely to present as areas of urbanisation.
Visual Impact	The portions of the site toward Drake-Brockman Drive and William Hovell Drive are reasonably elevated with moderate scenic priority scores in the Landscape and Visual Impact Assessment (LVIA).

Central Molonglo Investigation Area	
	Development would need to appropriately consider visual impact on views towards the site from existing urban areas, particularly noting that much of the land is currently zoned *NUZ3 - Hills, Ridges and Buffers* under the Territory Plan.
Vegetation and Habitat	The eastern portion of the site, particularly areas of Box Gum Woodland, have the potential to provide connectivity between the Molonglo River Reserve, Kama Nature Reserve and the Pinnacle Nature Reserve, located to the north of the study area, particularly for bird species. The connectivity mapping shows potential regional links east-west corridors, and areas of high value canopy connections in the steeper option of the site near Stockdill Drive, and eastern portion of the site near the Old Weetangera Cemetery. The existing ecology surveys confirm the potential for Little Eagle Breeding Habitat across most of the area, as well as areas of Superb Parrot Breeding Habitat and potential habitat for the EPBC listed Golden Sun Moth in the south adjacent to the Molonglo River Reserve. Through the course of engagement with the PCG on this project, it has become apparent that a buffer may need to be placed around the known Superb Parrot breeding site in line with the ACT approved Superb Parrot Action Plan. The ACT and Commonwealth commitments to protecting Superb Parrot habitat are acknowledged, given that the nesting colony in this area is one of only two mapped colonies known for the species nationally. As such, it will be necessary to consider these more detailed and targeted matters in the next phase of the project when looking at land use feasibility, regional offsetting and establishing boundaries for Future Urban Areas.
Waterways	There are a number of unnamed waterways through the site and several farm dams. Many of the creek lines and higher order tributaries appear to be in poor condition and show signs of erosion. There is the opportunity to restore these creek lines and utilise them as blue-green corridors for stormwater management, urban amenity and as habitat corridors. The waterways all drain to the Molonglo River located along the south western boundary of the site.

Nearby current and planned projects include:

- Suburban Land Agency undergrounding of electrical infrastructure
- William Hovell Drive duplication
- Drake-Brockman Drive Duplication
- Planned expansion of Ginninderry future urban areas
- LMWQCC projects relating to biosolids management and wastewater processing
- TCCS investigation into suitable sites for a waste transfer facility
- Battery Storage on Blocks 1634 and 1635 Belconnen ('Big Battery')

Table 7–2 | Strengths and Weaknesses of the Central Molonglo Investigation Area

Opportunities	Challenges
Most of the investigation area has a slope of less than 10%	Steep portion of the site on Stockdill Drive presents challenges for urban development
Slope of the site toward the MVIS and LMWQCC provides options for wastewater servicing	Presence of European Heritage sites within the site may require a large curtilage
Presence of water reticulation along the northern boundary and reservoir in the north-east provide reasonably straightforward connection to potable water	Retaining habitat connectivity through the site
Presence of electrical lines and substations provides reasonably straightforward connection to power	Retention of Bicentennial National Trail
Access to nearby road network presents multiple options for access to/from the site	Surrounding arterial roads will also need to accommodate increased traffic from the growing Ginninderry (West Belconnen)
Appropriate management of bushfire hazard could present a fire break to existing residential development in Belconnen	The Planning Strategy does not permit urban development in this area
Restoration of creek lines, and use as 'green fingers' or blue-green corridors	Limited heritage assessment of this area has been undertaken

Opportunities	Challenges
	Presence of Superb Parrot habitat and breeding sites

Based upon the outcomes of the Visioning Workshop held on 28 July 2022 and the above assessment of the investigation area, it is suggested that the following land uses may warrant further investigation in the scenario development:

- Potential for bulky goods retail, light industry or service industries, particularly where there may be opportunity to relocate bulky good uses from land within the nearby Belconnen Town Centre that may be better suited to urban renewal for multi-unit or mixed use development
- Other land uses to support surrounding residential areas
- Waste transfer station
- Potential greenfield urban development

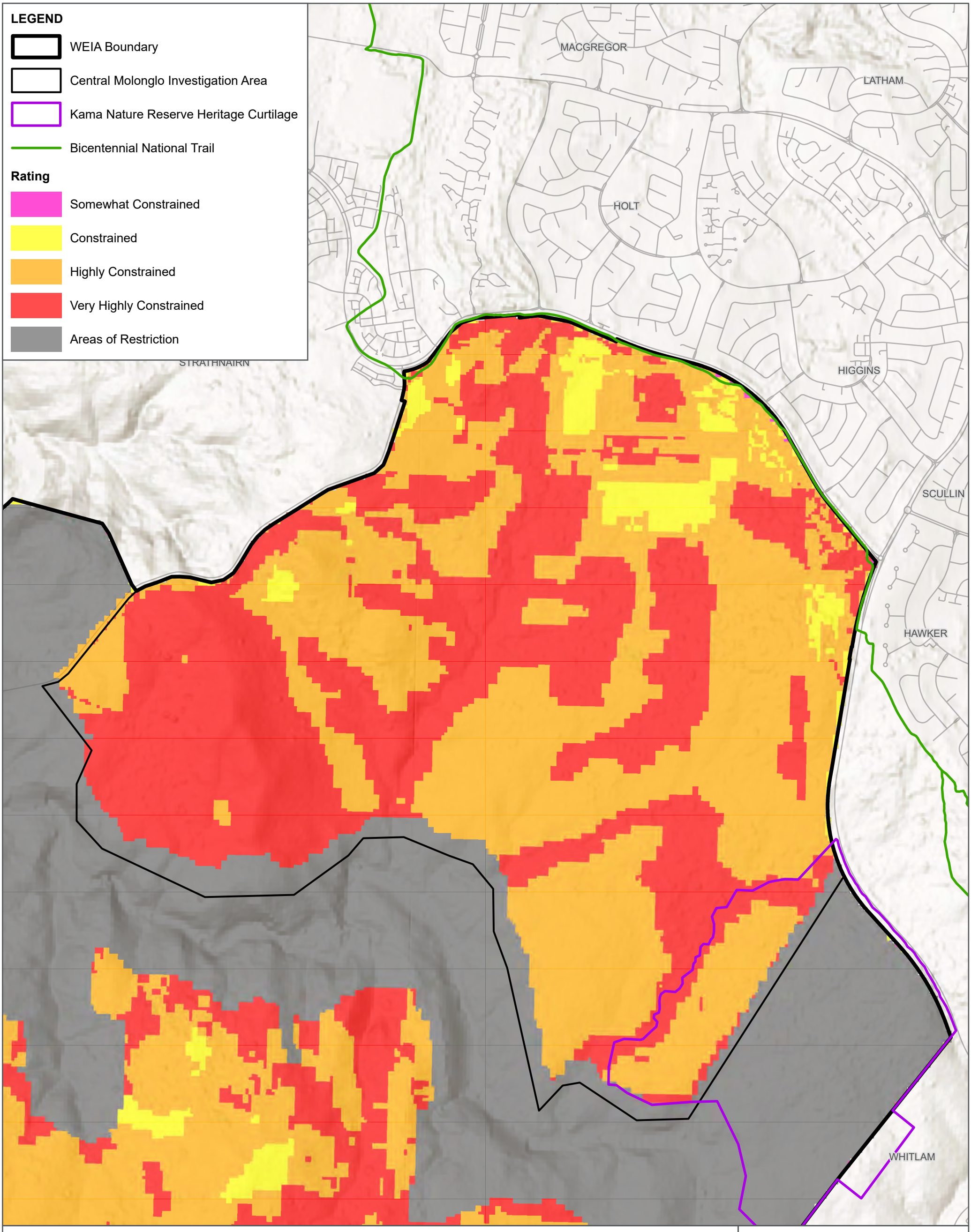

FIG NO. 7-1

FIGURE TITLE Central Molonglo Investigation Area

PROJECT TITLE Western Edge Investigation Area – Capability and Suitability Assessment

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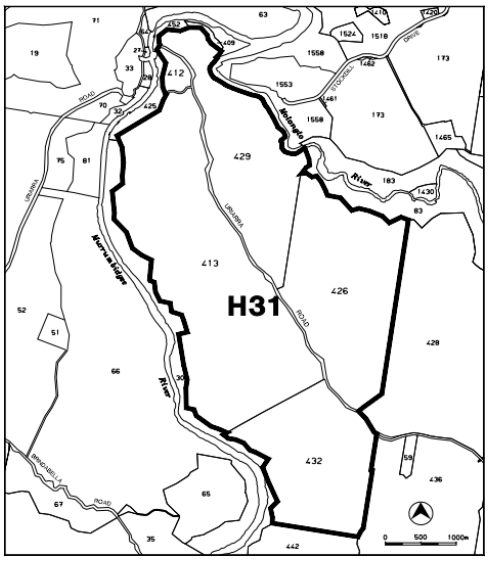
7.2 Uriarra Ridge Investigation Area

The Uriarra Ridge Investigation Area presents a grouping of land (approx. 1,798 ha) north and south of Uriarra Road mostly comprising farmland and rolling hills. This Investigation Area is more isolated, and consideration of proximity to employment, education, community, emergency services and health infrastructure would be a key matter for consideration, as well as connectivity to the transport network.

An analysis of key characteristics is provided in Table 7–3, with a summary of opportunities and challenges in Table 7–4, followed by future land use visioning.

Table 7–3 | Analysis of characteristics of the Uriarra Ridge Investigation Area

Uriarra Ridge Investigation Area	
Bushfire	Mostly low bushfire hazard, with higher hazards along the Murrumbidgee and Molonglo River Corridors.
Planning and Zoning	The site is mostly zoned NUZ2 – Rural, with LMQQCC located to the north. The site is relatively isolated with the closest existing urban area (Denman Prospect) located south of the southern boundary of the site. The ACT Heritage Register lists the property known as Huntly as having heritage significance and covers the majority of the site (Figure 7-2). The ACT Heritage Register notes that Huntly is representative as an element of the rural setting of the National Capital and notes that it is to be preserved as a rural property.  Figure 7-2 | Huntly heritage listed land The site also contains a nominated heritage place identified as 'Travelling Stock Route', which is likely to be of heritage significance as former remnants of rural industry in the area and would place a future constraint on development in this area. A Cultural Area (CCA2) was also identified in this investigation area and conservation of this Cultural Area may be required. Aboriginal places which have been registered on the ACT Heritage Register and sensitive information recorded by GML (2020) is mapped in the restricted Attachment A. There are multiple registered Aboriginal places across the area, and it is noted that there may be additional Aboriginal places which are not yet on the Register. Given the lack of spatial data available on these places, future development planning will need to consider information gaps, along with additional heritage assessment in accordance with the operating statutory framework at the time.
Road Access	Access to the site is via Uriarra Road only, which presents a significant constraint for urban development. An additional bridge over the Molonglo River would likely be required for vehicular access to this site.
Evo Energy	132KV High Voltage overhead lines run east-west from the Murrumbidgee to the Spring Valley Farm (owned by ANU) and then onward to the Molonglo Valley.
Transgrid	330KV high Voltage overhead line traverses north-south through the investigation area.
Gas Infrastructure	There is no gas infrastructure within the site.

Uriarra Ridge Investigation Area	
Icon Water Infrastructure	A bulk water supply runs north from the Stromlo Water Treatment Plant and crosses the eastern portion of the site.
Sewer Infrastructure	There is no reticulated wastewater infrastructure within the site. The area to the north of Uriarra Road that slopes towards the Molonglo River could potentially be gravity fed, however would require a new crossing of the Molonglo River. It is noted that the northern portion of the site is within the 2.4km buffer of LMWQCC.
Slope	Gentle gradients of less than 10% on each side of Uriarra Road.
Soils	Mostly *Burra* soils with some areas of rocky outcrop that could present challenging geotechnical conditions for urban development.
Visual Impact	Land each side of Uriarra Road is elevated however views towards the area from existing suburbs are mostly blocked by the ridge line north of Mount Stromlo.
Vegetation and Habitat	The central portion of the site provides opportunity for habitat connectivity between the Molonglo River corridor, located to the north, and the Murrumbidgee River corridors, located to the west. Vegetation in the central part of the site consists predominantly of Box Gum Woodlands. The existing ecology surveys confirm the potential for Little Eagle Breeding Habitat across most of the area, small areas of Superb Parrot Breeding Habitat and potential habitat for the EPBC listed Golden Sun Moth in the south adjacent to the Molonglo River Reserve. The area also contains potential habitat for Pink-tailed Worm-lizard, as well as along the Murrumbidgee River corridor and further surveys will be required to determine the extent of habitat for this species.
Waterways	Multiple waterways, including Cliffs Creek in the north and Stoney Creek in the south, and a number of existing farm dams extending from Uriarra Road and draining toward the Molonglo River or Murrumbidgee River.

Nearby current and planned projects include:

- LMWQCC projects relating to biosolids management and wastewater processing
- Potential changes to buffer surrounding LMWQCC
- North Denman future urban area
- East West Arterial Road
- John Gorton Drive 3C

Table 7–4 | Strengths and Weaknesses of the Uriarra Ridge Investigation Area

Opportunities	Challenges
Rolling hills with reasonable slope	Sewer servicing would require a new crossing of the Molonglo River to LMWQCC
Development could occur on each side of Uriarra Road	Vehicular connectivity is restricted to movements along Uriarra Road. Additional vehicular connectivity north or south would be required to support transport planning and movement of people and goods to/from the investigation area
Excellent views of the surrounding mountain ranges	Reasonably isolated
Peri-urban uses such as rural residential and lifestyle blocks	Huntly Heritage listed land comprises much of the site.
Eco-tourism uses	There would need to be a reasonable density of development to make the infrastructure costs feasible
	Limited heritage assessment of this area has been undertaken
	Presence of Superb Parrot habitat and breeding sites

Based upon the outcomes of the Visioning Workshop held on 28 July 2022 and the above assessment of the investigation area, it is suggested that the following land uses may warrant further investigation in the scenario development:

- Adaptive reuse of heritage homestead
- Eco-tourism.

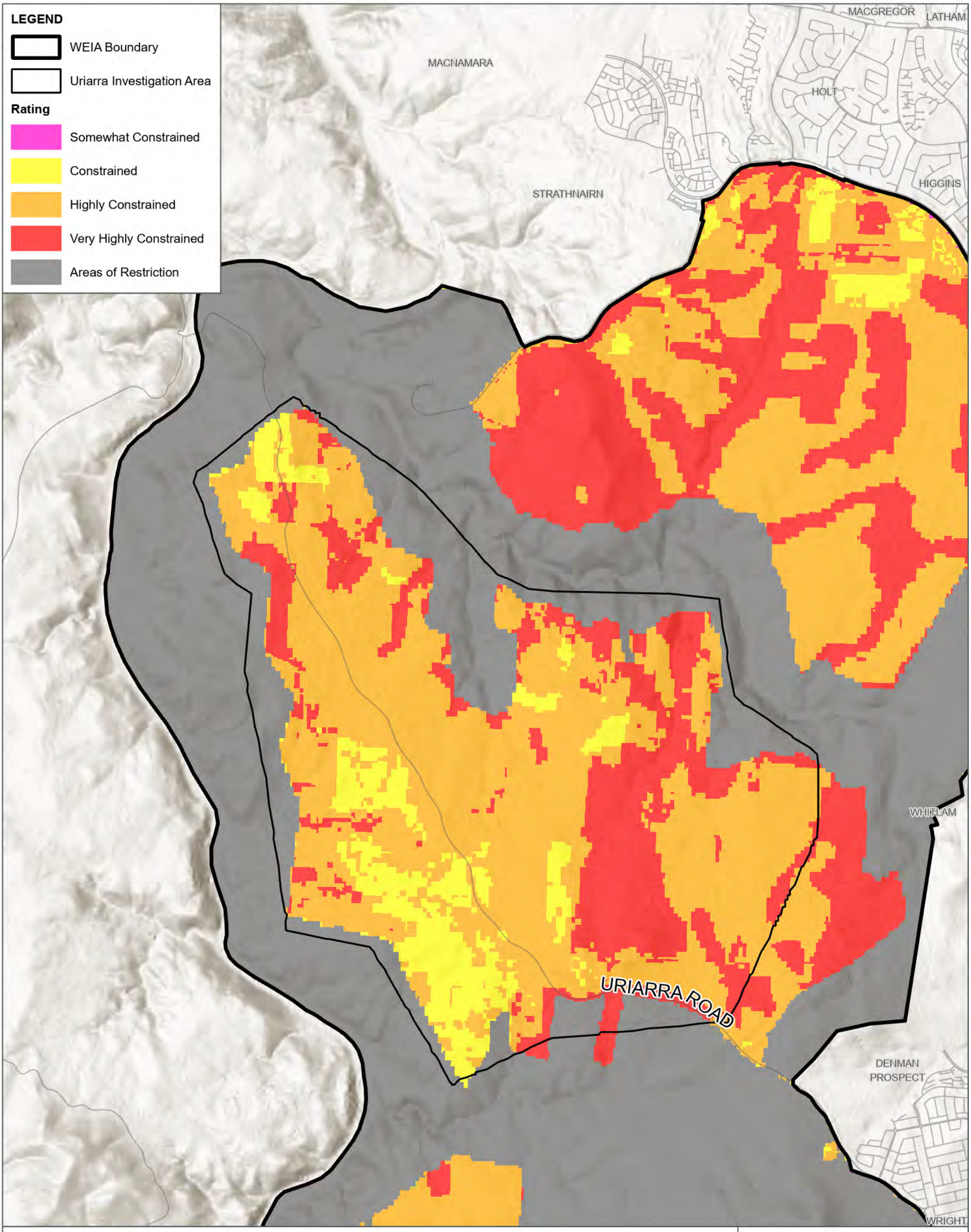


FIG NO. 7-3

FIGURE TITLE Uriarra Ridge Investigation Area

PROJECT TITLE Western Edge Investigation Area – Capability and Suitability Assessment

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7.3 West Molonglo Investigation Area

The West Molonglo Investigation Area has an area of 1,785ha and extends west from Wright in the Molonglo Valley. The investigation area includes a large area of restriction 'excluded' land owing to established recreational uses and infrastructure in Stromlo. The remaining urban capable land extends to the west of these established uses and as such, lacks connectivity to existing development in Canberra. Due to topography, this area is very difficult to service with sewer.

An analysis of key characteristics is provided in Table 7–5 with a summary of opportunities and challenges in Table 7–6, followed by future land use visioning.

Table 7–5 | Analysis of characteristics of the West Molonglo Investigation Area

West Molonglo Investigation Area	
Bushfire	Mostly low bushfire risk with areas of higher risk located towards the eastern boundary of the area. Emergency access could be a concern without additional north or south connectivity.
Planning and Zoning	A significant portion of the investigation area is designated land identified as Mount Stromlo and Mount Stromlo Forest Park and has therefore been identified as an area of restriction and excluded. It is noted that the 'Mount Stromlo Observatory Precinct, Mt Stromlo Rd, Mt Stromlo, ACT, Australia' is listed on the Commonwealth Heritage List. Aboriginal places which have been registered on the ACT Heritage Register and sensitive information recorded by GML (2020) is mapped in the restricted Attachment A. There are multiple registered Aboriginal places across the area, and it is noted that there may be additional Aboriginal places which are not yet on the Register. Given the lack of spatial data available on these places, future development planning will need to consider information gaps, along with additional heritage assessment in accordance with the operating statutory framework at the time.
Road Access	Cotter Road is the only major road that runs along the southern boundary of the site and divides the West Molonglo and Bulgar Creek investigation areas. Uriarra Road runs along the north eastern boundary of the site and separates the West Molonglo investigation area from Denman Prospect. Mount Stromlo Road provides access to the Mount Stromlo Observatory.
Evo Energy	There is a HV overhead electricity line running along Cotter Road as well as an overhead transmission line running through the centre of the site in a north south direction.
Transgrid	The 330KV National Grid high voltage transmission line runs north-south through the centre of the site.
Gas Infrastructure	The only gas infrastructure is a pipe that runs west along Cotter Road and onto Mount Stromlo Road servicing the Mount Stromlo Observatory.
Icon Water Infrastructure	A bulk water supply main runs along Cotter Road to the Stromlo Water Treatment Plant.
Sewer Infrastructure	There are no sewer lines located within the site. Sewer servicing would require a new crossing of the Molonglo River to LMWQCC and a series of micro tunnels.
Slope	Slopes in the western section of the investigation area are generally under <10% and north of Cotter Road having a slope of less than 20%.
Soils	The soil type is mainly *Burra* with some amount of *Campbell variant c* located towards the centre of the investigation area.
Visual Impact	The scenic quality values plus scenic priority scores are mainly between 20.5-24.5 with some parts along the north-eastern boundary having scores as high as 29-34.
Vegetation and Habitat	The investigation area provides an opportunity for habitat connectivity from the Mount Stromlo Forest Park to the Murrumbidgee River Corridor. There are some existing significant areas of Box Gum Woodland throughout the site including threatened plant species around the Mount Stromlo Observatory. Potential habitat for species including the Little Eagle occurs throughout most of the site as well as small areas of habitat for the Superb Parrot and Pink-tailed worm lizard.
Waterways	The Murrumbidgee River corridor is located along the western boundary of the site and there are a number of small watercourses throughout the site. Stony Creek is located along the northern boundary of the investigation area and provides an opportunity to improve connectivity to the Murrumbidgee River.

Nearby current and planned projects include:

- East-West Arterial Road
- Stromlo District Playing Fields

Table 7–6 | Strengths and Weaknesses of the West Molonglo Investigation Area

Opportunities	Challenges
Provides opportunity to provide additional connectivity between the Mount Stromlo Forest Park and Murrumbidgee River	Sewer servicing would require a new crossing of the Molonglo River to LMWQCC and a series of micro tunnels
Potential to connect into the existing active travel network to the service the area	Vehicular connectivity is restricted to movements along Cotter Road. Additional vehicular connectivity north or south would be required to support transport planning and movement of people and goods to/from the site.
Woodlands in the area may be beneficial for the purpose of offsets	Reasonably isolated
Proposes development on the northern side of Cotter Road, which could be consider in conjunction with the Bulgar Creek Investigation Area	Could create an isolated pocket of development
	Limited heritage assessment of this area has been undertaken
	Presence of Superb Parrot habitat and breeding sites

Based upon the outcomes of the Visioning Workshop held on 28 July 2022 and the above assessment of the investigation area, it is suggested that the following land uses may warrant further investigation in the scenario development:

- Tourism and farm uses
- Recreation precinct

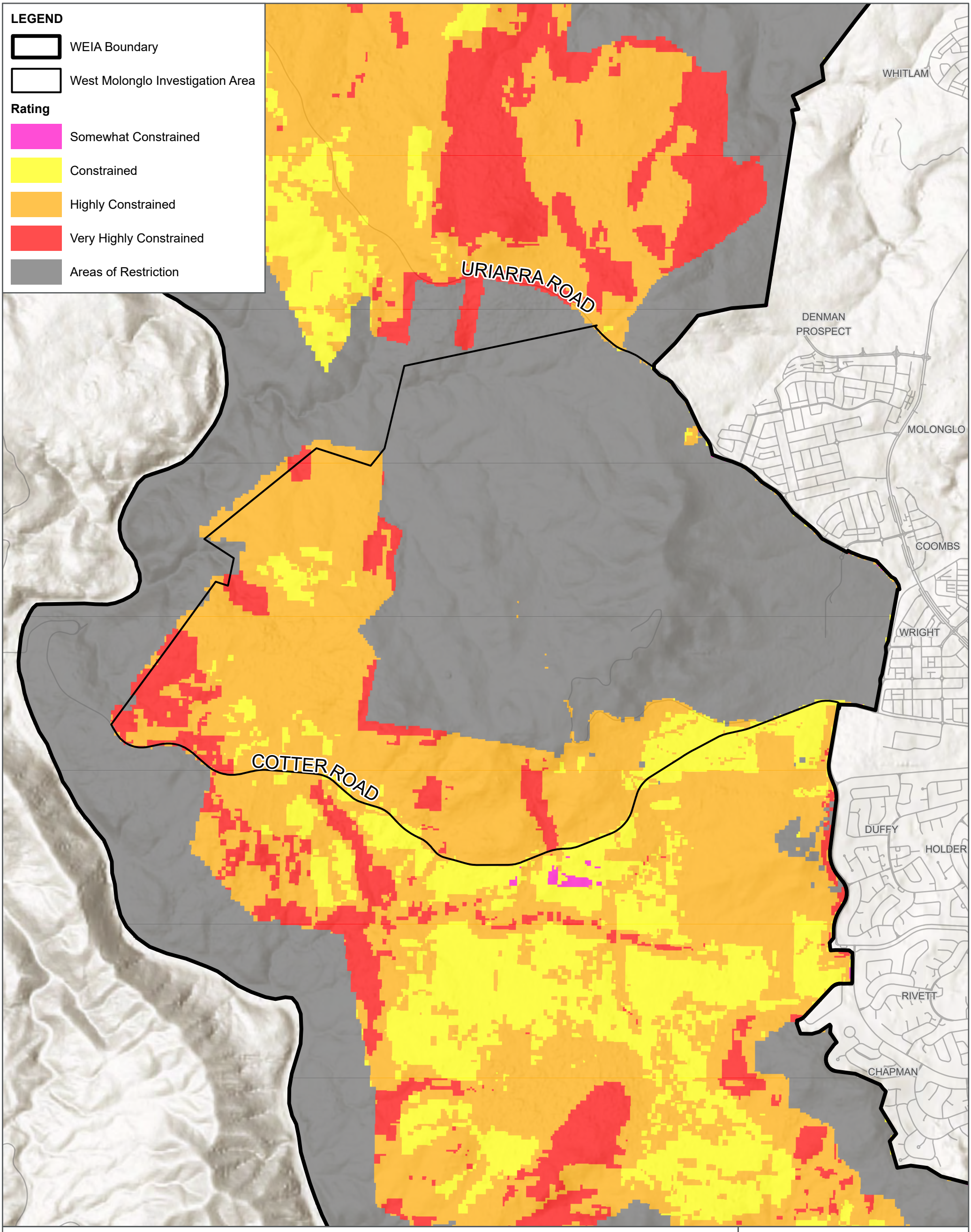

FIG NO. 7-5

FIGURE TITLE West Molonglo Investigation Area

PROJECT TITLE Western Edge Investigation Area – Capability and Suitability Assessment

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Location: C:\GIS\NSW\Outgoing\3002862 Western Edge Investigation Area\02_Maps\WEIA Urban Planning\ArcGIS Masterfile\ArcGIS Masterfile.aprx

Last updated by: LL16284 on 14/12/2022 at 18:53

7.4 Bulgar Creek Investigation Area

The Bulgar Creek Investigation Area is a very large parcel of land (approx. 1,500 ha) extending west of existing development in Weston Creek, and south of Stromlo Forest Park, Mount Stromlo Observatory and Mount Stromlo Water Treatment Plant.

This investigation area neighbours existing urban development in Weston Creek and is accessed via the westernmost extent of Hindmarsh Drive, Eucumbene Drive and Cotter Road. The investigation area is located south of Stromlo Forest Park and has reasonable access to the Weston Group Centre, future Molonglo Group Centre, schools, community facilities, public transport and the ACT road network. If the capacity of existing infrastructure permits, there may be the potential to readily extend existing utility services from the adjoining suburbs into this site.

An analysis of key characteristics is provided in Table 7–7, with a summary of opportunities and challenges in Table 7–8 followed by future land use visioning.

Table 7–7 | Analysis of characteristics of the Bulgar Creek Investigation Area

Bulgar Creek Investigation Area	
Bushfire	Predominantly low bushfire risk category with some high risk pockets in the south and interspersed in the middle of the site.
Planning and Zoning	The site is predominantly classified as NUZ2 *Rural* with the area along the north-eastern boundary as *Designated Areas* under the National Capital Plan. While Designated Areas may be subject to development in the future, further investigation and consultation with the National Capital Authority would be necessary and would require amendment of the National Capital Plan. Nearby land uses include the Stromlo Forest Park, the Stromlo Observatory (and associated light limitation zone), as well as adjoining residential suburbs. A site complex) is located in the north east portion of the area and a registered heritage place identified as 'Greenhills Ruin' is located in the north west section of the area. Aboriginal places which have been registered on the ACT Heritage Register and sensitive information recorded by GML (2020) is mapped in restricted Attachment A. There are multiple registered Aboriginal places across the area, and it is noted that there may be additional Aboriginal places which are not yet on the Register. Given the lack of spatial data available on these places, future development planning will need to consider information gaps, along with additional heritage assessment in accordance with the operating statutory framework at the time.
Road Access	The area has good connectivity into the existing ACT Road network. Cotter Road runs along the northern boundary of the site and divides the West Molonglo and Western Creek Investigation Areas. Eucumbene Drive runs on the eastern boundary of the site and adjoins the western extent of Hindmarsh Drive.
Evo Energy	A High Voltage Overhead electricity line and overhead transmission electricity line pass through the site. The HV overhead electricity line is also located along the north eastern edge of the site bordering Duffy.
Transgrid	The 330KV National Grid high voltage transmission line runs north-south through the centre of the site.
Gas Infrastructure	The only gas infrastructure is a gas pipe with some gas fittings located along the eastern boundary edge of the site.
Icon Water Infrastructure	A bulk water supply main runs along Cotter Road to the Stromlo Water Treatment Plant. An existing reservoir is located on the north-eastern edge of the site.
Sewer Infrastructure	There is no existing sewer servicing within the investigation area. Sewer servicing for this investigation area could be possible via a sewer pump station and new easement connecting into the MVIS. Further consultation with Icon Water would be necessary as part of infrastructure planning and feasibility studies.
Slope	The terrain is mainly flat with a gradient of less than 10% with some pockets of land to the north and east of the site having a slope of less than 20%
Soils	The soil type is mainly *Williamsdale* with some amount of *Burra* located on the eastern side of the site.
Visual Impact	The scenic quality values plus scenic priority scores are mainly between 20.5-24.5 with some parts along the north-eastern boundary having scores as high as 29-34.

Bulgar Creek Investigation Area	
Vegetation and Habitat	A significant area of *Nature Conservation Act 2014* Box Gum Woodland in the south of the site should be retained in open space as this is potentially remnant woodland. The use of Bulgar Creek as a green corridor throughout the area would increase overall connectivity. There is potential Little Eagle breeding habitat located to the north of the site, and tree canopy connectivity corridors should be considered in the scenario development. It is noted that there are areas of Pink-tailed Worm-lizard habitat located in the eastern section of the area as well as areas of suitable Superb Parrot breeding habitat. Further surveys would need to be undertaken to determine the extent of habitat for these species.
Waterways	Bulgar Creek and Holdens Creek run through the area. Many of the creek lines and higher order tributaries appear to be in poor condition and show signs of erosion. There is the opportunity to restore these creek lines and utilise them as blue-green corridors for stormwater management, urban amenity and as habitat corridors.

Nearby current and planned projects include:

- Molonglo Group Centre
- Molonglo East-West Arterial Road
- John Gorton Drive 3C
- Stromlo District Playing Fields
- LMWQCC projects relating to biosolids management and wastewater processing
- North Denman future urban area
- Potential nature reserve at Blewitts Block

Table 7–8 | Strengths and Weaknesses of the Bulgar Creek Investigation Area

Opportunities	Challenges
Relatively gently sloping land would permit a variety of land uses	Balancing population densities with employment, mixed use development and opportunities for containment to reduce impact on the ACT road network – particularly east-west movements
Providing improved connectivity to the Cotter Dam for recreation purposes	Development should occur on both sides of Cotter Road to maximise connectivity to the existing road network
Excellent access to community recreation facilities at Stromlo Forest Park	Connectivity north and south
Continuation of Hindmarsh Drive provides good access to public transport and existing road network	Limited heritage assessment of this area has been undertaken
Potentially the site can be serviced by a sewer pump station to the MVIS	Presence of Superb Parrot habitat and breeding sites
Water servicing may be readily accommodated noting existing reservoir on the eastern side of the site	

Based upon the outcomes of the Visioning Workshop held on 28 July 2022 and the above assessment of the investigation area, it is suggested that the following land uses may warrant further investigation in the scenario development:

- Entertainment precinct
- Containment to provide employment and reduce impact on east-west movements
- Mixed use development
- Residential development
- Schools, community infrastructure
- Combined with the Kambah or West Molonglo investigation areas, this area could have enough population to justify a group centre

LEGEND

- WEIA Boundary
- Bulgar Creek Investigation Area - Scenario Three
- Bulgar Creek Investigation Area - Scenario Two

Rating

- Somewhat Constrained
- Constrained
- Highly Constrained
- Very Highly Constrained
- Areas of Restriction

URIARRA ROAD

COTTER ROAD

WHITLAM

DENMAN PROSPECT

MOLONGLO

COOMBS

WRIGHT

DUFFY

HOLDER

RIVETT

CHAPMAN

KAMBAH

FIG NO. 7-5

FIGURE TITLE Bulgar Creek Investigation Area

PROJECT TITLE Western Edge Investigation Area – Capability and Suitability Assessment

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7.5 Kambah Investigation Area

The Kambah Investigation Area is a parcel of land approximately 668 ha in size with access primarily from Kambah Pool Road. The 330KV National Transmission line passes through this area, along with a 132KV HV line. This area is surrounded by nature reserves, with Cooleman Ridge on the east and the Murrumbidgee River Corridor on the west. Connectivity to McQuoid's Nature Reserve has been considered to ensure it is not isolated because of development.

An analysis of key characteristics is provided in Table 7–9, with a summary of opportunities and challenges in Table 7–10, followed by future land use visioning.

Table 7–9 | Analysis of characteristics of the Kambah Investigation Area

Kambah Investigation Area	
Bushfire	Predominantly low bushfire risk category with some areas of high risk to the southwest along the edge of the site and in the middle of the site. There is a high bushfire risk in the area of restriction 'excluded' rating area outside the boundary along the Murrumbidgee river.
Planning and Zoning	The site is predominantly classified as NUZ2 *Rural Urban Open Space* with a small marginal area to the southeast of the site as *Designated Land* and a smaller area to the west of the site as *River Corridor* along the creek. It is noted that there are multiple heritage constraints within the site including a Cultural Conservation Area and Old Growth Eucalyptus trees which may require further heritage investigation to assess the development potential of this area. Aboriginal places which have been registered on the ACT Heritage Register and sensitive information recorded by GML (2020) is mapped in the restricted Appendix A. There are multiple registered Aboriginal places across the area, and it is noted that there may be additional Aboriginal places which are not yet on the Register. Given the lack of spatial data available on these places, future development planning will need to consider information gaps, along with additional heritage assessment in accordance with the operating statutory framework at the time to better understand development potential.
Road Access	There are no existing roads within the site with the Murrumbidgee River located to the Southwest outside the investigation area boundary and a number of waterline creeks flowing from the north west into the river. Kambah Pool Road is located on the southern boundary of the site.
Evo Energy	A High Voltage Overhead electricity line and overhead transmission electricity line pass through the investigation area. Along the southeast boundary edge of the site, there is both a high voltage and low voltage underground electricity line.
Transgrid	The 330KV High Voltage overhead transmission line associated with the National Grid traverses north-south through the centre of the site.
Gas Infrastructure	Gas infrastructure within this site is limited to existing gas meters and fittings in the south of the area.
Icon Water Infrastructure	There is a bulk water main passing along the eastern boundary of the investigation area.
Sewer Infrastructure	There is no existing sewer infrastructure within the site. Servicing of the western part of this site would be particularly challenging and sewer tunnels would likely be required to accommodate topography in this area.
Slope	The terrain is mainly flat with a slope gradient of less than 10% with very small pockets near the waterlines having a slope of less than 20%
Soils	The soil type is mainly *Williamsdale* with small amounts of *Burra.* There are some Stormwater Management buffer and Environmental offset zones along the south western edge of the site.
Visual Impact	The scenic quality values plus scenic priority scores are generally between the values of 3-9 with some parts in the north west of the investigation area and near the waterlines having value scores between 20.5- 24.5
Vegetation and Habitat	The vegetation includes *NC Act Box Gum Woodlands* with few potential areas of *Golden Sun Moth* and small pockets of *Potential Little Eagle Breeding Habitat* along the waterlines.
Waterways	A number of waterlines run through the site including Station Creek. Potential to use this as a connectivity corridor and blue-green spine for future development.

Table 7–10 | Strengths and Weaknesses of the Kambah Investigation Area

Opportunities	Challenges
Connectivity through blue-green grid using existing waterways	Sewer servicing would require extensive new trunk infrastructure and a new crossing of the Molonglo River to LMWQCC, or a sewer pump station
Use active travel networks to provide fire breaks/APZs	Vehicular connectivity is restricted to movements along Kambah Pool Road. Additional vehicular connectivity north or south would be required to support transport planning and movement of people and goods to/from the site.
Potential to improve habitat values in the area and restore connectivity linkages	Limited heritage assessment of this area has been undertaken
Views and proximity to nature	Presence of Superb Parrot habitat and breeding sites
Access to recreation areas along Murrumbidgee River	
Connectivity into adjoining established suburbs	
Good connectivity into wider ACT arterial road network	

Based upon the outcomes of the Visioning Workshop held on 28 July 2022 and the above assessment of the investigation area, it is suggested that the following land uses may warrant further investigation in the scenario development:

- Low density residential with some areas of medium density
- Central local centre (sized depending on density)
- Primary school (depending on density and educational needs assessment)

LEGEND

- WEIA Boundary
- Kambah Investigation Area - Scenario Three
- Kambah Investigation Area - Scenario Two

Rating

- Somewhat Constrained
- Constrained
- Highly Constrained
- Very Highly Constrained
- Areas of Restriction

DUFFY
HOLDER
WESTON
RIVETT
STIRLING
WARAMANGA
CHAPMAN
FISHER
KAMBAH

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FIG NO. 7-6

FIGURE TITLE Kambah Investigation Area

PROJECT TITLE Western Edge Investigation Area – Capability and Suitability Assessment

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8. Indicative Development Scenarios

The capability assessment resulted in areas of restriction and rated the constraints that were collated for the WEIA against the agreed criteria. The capability assessment also resulted in areas for further investigation that were then configured into smaller areas / clusters for the suitability assessment. This section of the report details the investigation into potential development scenarios for the suitable land.

The boundaries of the investigation areas are somewhat arbitrary and could be subject to change in the future. To define the boundary of future urban areas, detailed analysis of site conditions including targeted ecological and heritage studies, and infrastructure master planning will be required. Due to the high level nature of this project, these detailed assessments have not been undertaken as part of this analysis.

8.1 Important Notes

The outcomes of the capability and suitability assessment were used as the basis for the preparation of three indicative development scenarios:

- Land Use Scenario One – a 'no impact' approach acknowledging the presence of all ecological values (identified and potential habitat, as well as listed vegetation under ACT and Commonwealth legislation). This scenario demonstrates that there are very few areas in the WEIA that do not have some degree of ecological significance.
- Land Use Scenario Two – an approach driven by maintaining and enhancing habitat connectivity in balance with development outcomes.
- Land Use Scenario Three – an approach driven by connectivity to infrastructure, roads and efficiency of land use.

Merge of Bulgar Creek and West Molonglo Investigation Areas

A large portion of the West Molonglo investigation area is dedicated to the Stromlo Forest Park recreation area, Stromlo Observatory and Icon Water infrastructure. It was confirmed that this area should be identified as an area of restriction and excluded from this assessment, as it is not urban capable.

The remaining land within the West Molonglo Investigation area was too small and was deemed unfeasible for development in isolation. In the Scenario Workshop, it was decided to merge the Bulgar Creek Investigation Area (in Scenario Three) to include the more readily serviceable parts of the West Molonglo area, on the northern side of Cotter Road.

Land Use Assumptions

The following land use assumptions are adopted across the three indicative development scenarios:

- Nature Reserves shows existing nature reserves that are present within the study area.
- Potential conservation shows areas with identified ecological sensitivity that should be avoided, or impacts would need to be mitigated / offset.
- Potential habitat connectivity corridors show high level assumptions of the linkages between areas of ecological sensitivity. These are indicative only and would require further targeted ecological survey to confirm width and configuration of corridors, depending on the species movements they are intended to support.
- Further investigation is needed for an area within the Central Molonglo Investigation Area which may not be 'urban suitable', but which could have other suitable such as for waste management or resource recovery.
- Potential Future Development covers land that the land use capability and suitability assessment has identified as potentially urban capable. These areas warrant further investigation through site specific studies and master planning which can consider road access, land use typology and infrastructure placement.

Further Studies Required

The Indicative Development Scenarios provide a basis for ongoing investigation and testing of the capability and suitability for urban development of the WEIA. It is intended that the scenarios be used as a benchmark for further studies and determination of urban development viability. Further targeted environmental, heritage, traffic, hydrology and infrastructure investigations are required as part of future feasibility studies for each investigation area. These site specific studies will provide additional important information to refine and confirm indicative development areas.

8.2 Scenario One Overview

Scenario One has been developed to present a "no impact" or "do nothing" approach to development in the WEIA. The only land identified as 'potential future development' is land which does not have ecological sensitivity. This scenario indicates that Bulgar

Creek holds the largest consolidated area of potentially developable land accessible from Cotter Road. Potential development areas are also shown in Kambah however access from Kambah Pool Road appears constrained.

An area of potentially developable land is also located along the south-western side of Uriarra Ridge. This area is considered in Scenario Two and Three, and it is noted that providing sewerage connection to this low lying area may be difficult.

An overview of Scenario One is provided in Figure 8-1. Overviews of Scenario Two and Scenario Three follow in Figure 8-2 and Figure 8-3, respectively. A summary comparison is provided in Table 8-1, with an in-depth comparison of development areas in each cluster provided in the following sections.

Table 8–1 | Summary Comparison of Scenario Two and Three

	Scenario Two – Connectivity focus	Scenario Three – Growth focus
Area of WEIA	9,800ha	9,800 ha
Total Green Space (i.e. existing and potential conservation)	3,541ha	3,282ha
Percentage of total area	36%	33%

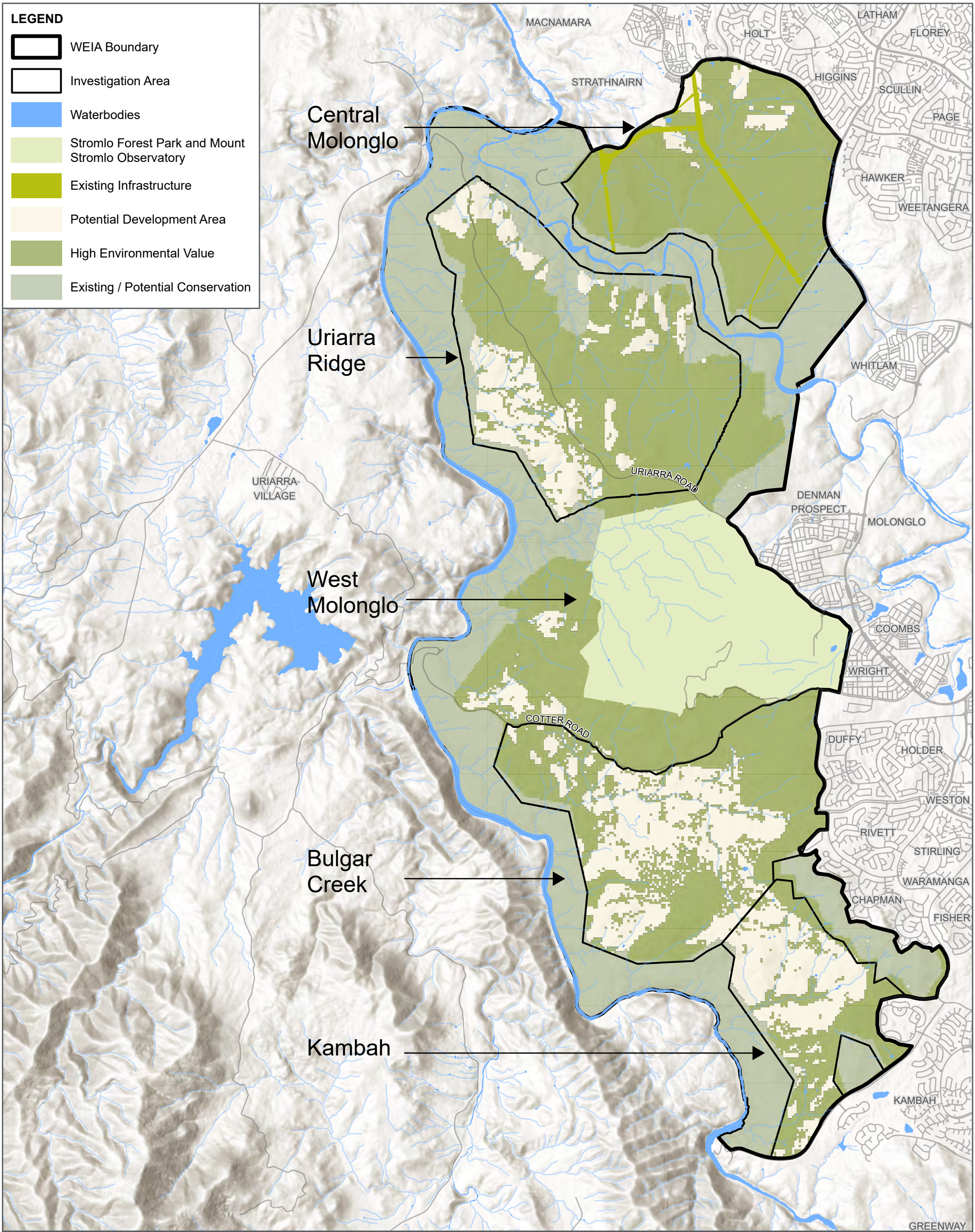

FIG NO. 8-1 **FIGURE TITLE** Scenario One Overview

PROJECT TITLE Western Edge Investigation Area - Capability and Suitability Assessment

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LEGEND

- WEIA Boundary
- Investigation Area
- Waterbodies
- Stromlo Forest Park and Mount Stromlo Observatory
- Superb Parrot nesting and potential breeding habitat
- Nature Reserves
- Potential habitat connectivity corridors

Potential Land Use

- Potential Future Development
- Rural or Open Space Uses
- Potential Conservation Area
- Further Investigation Needed

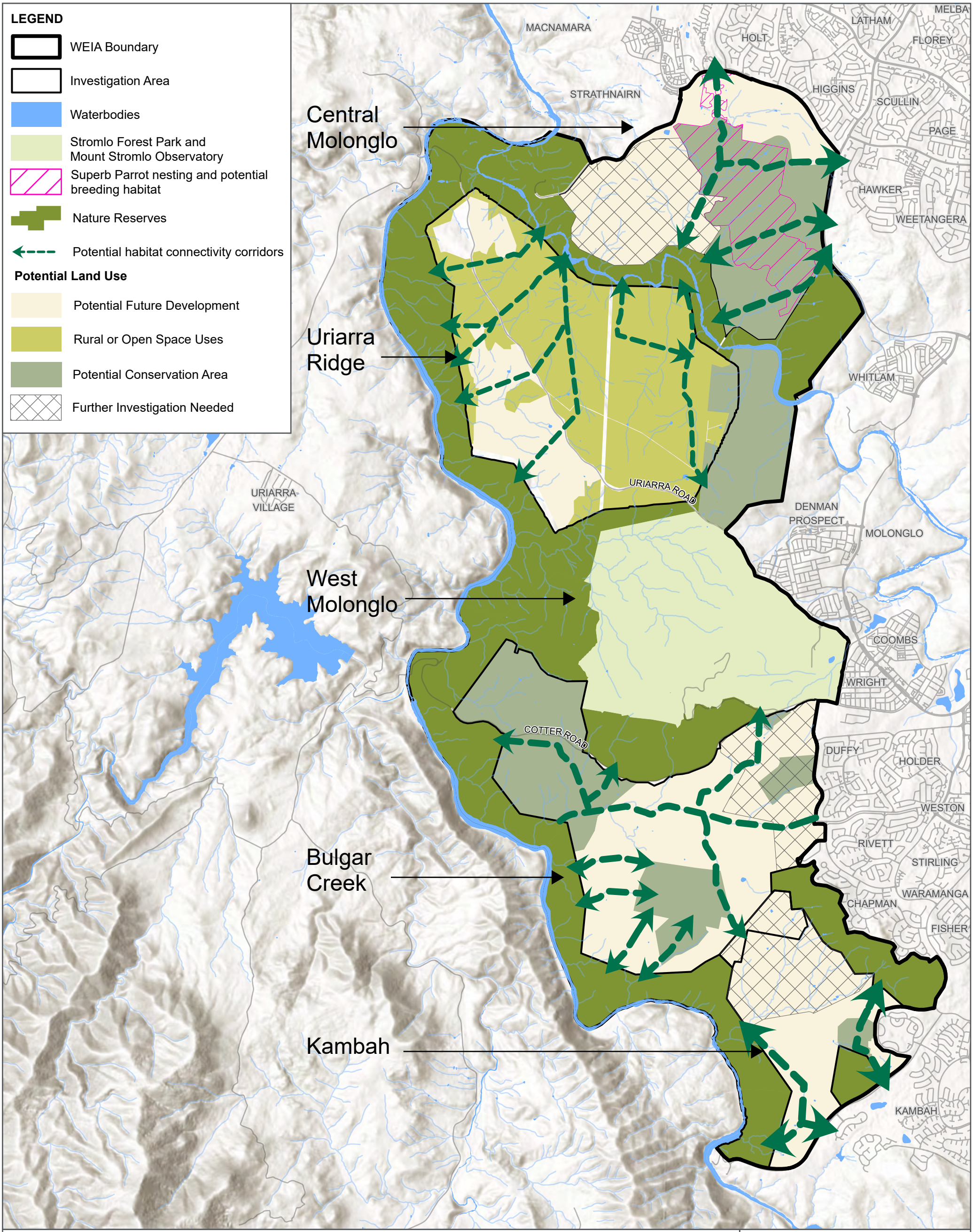

FIG NO. 8-2 **FIGURE TITLE** Scenario Two Overview

PROJECT TITLE Western Edge Investigation Area - Scenario Two

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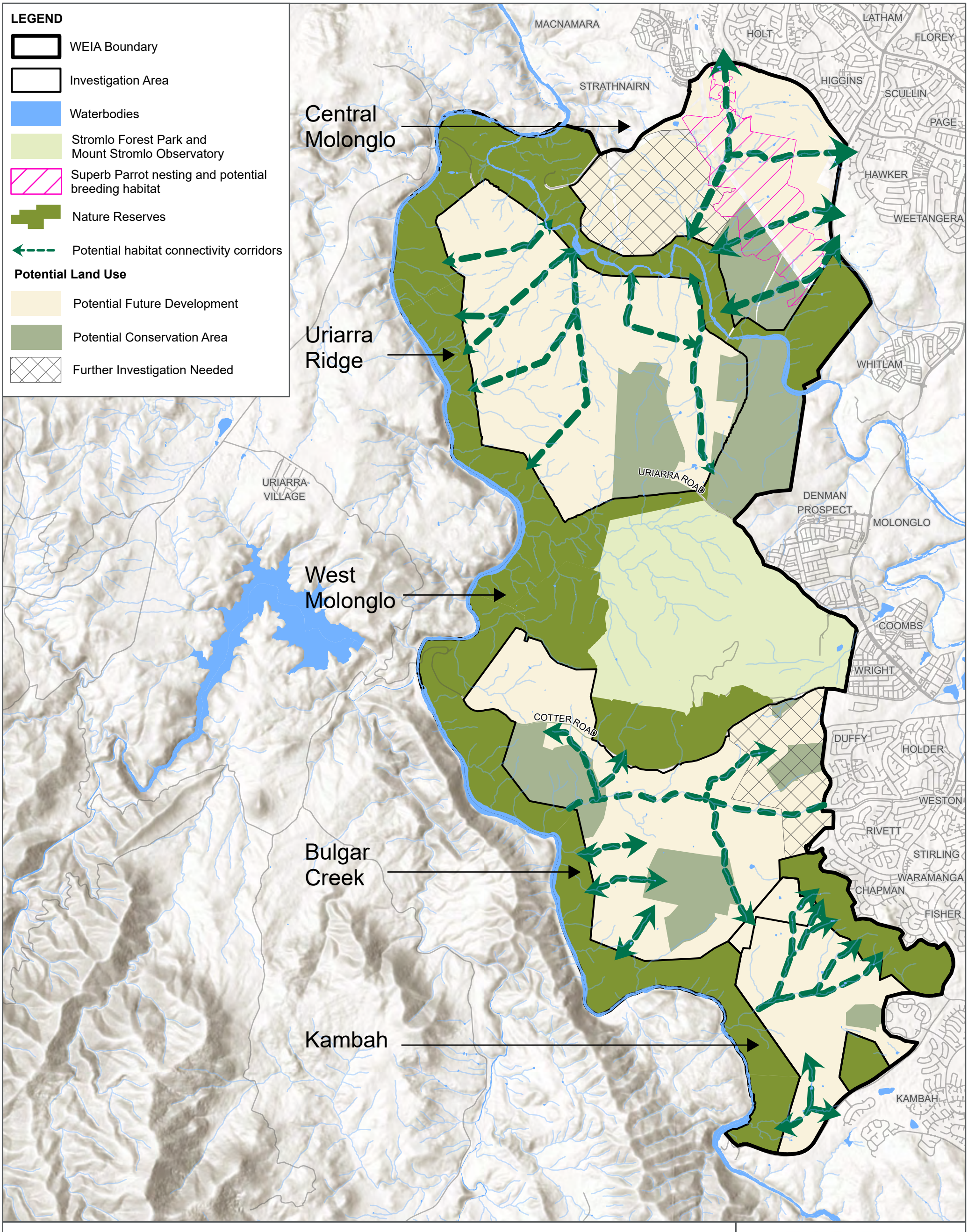

FIG NO. 8-3

FIGURE TITLE Scenario Three Overview

PROJECT TITLE Western Edge Investigation Area - Scenario Three

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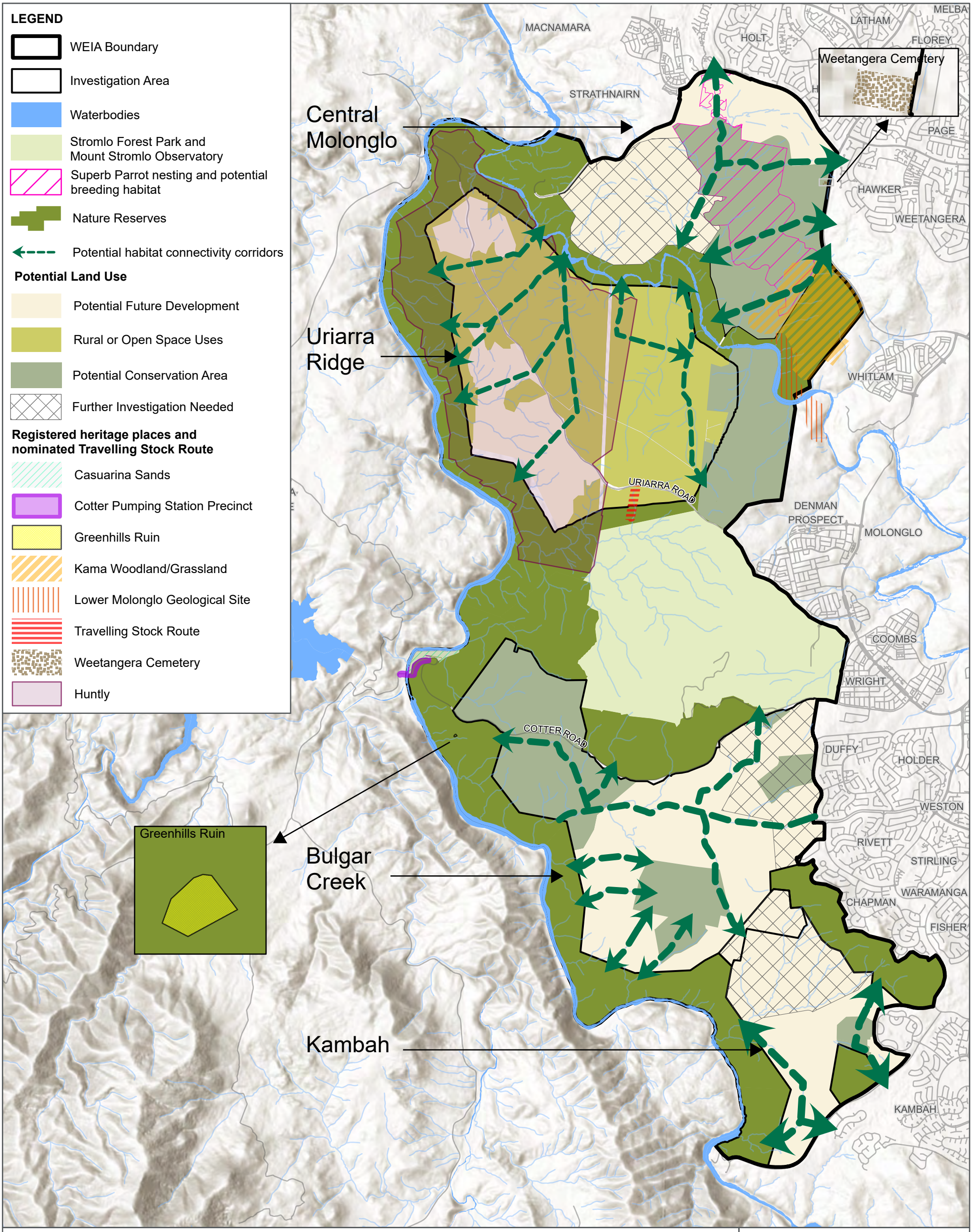

FIG NO. 8-4

FIGURE TITLE Scenario Two Overview Heritage Information

PROJECT TITLE Western Edge Investigation Area - Scenario Two

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8.3 Central Molonglo Investigation Area

The indicative development scenarios prepared for the Central Molonglo Investigation Area present a considerable difference in the area of potential developable land, owing to the presence of the Molonglo Colony of the Superb Parrot.

Areas of Central Molonglo have been highlighted as providing important habitat for the Superb Parrot, which is currently listed as vulnerable under the EPBC Act and NC Act. The Capital Ecology Preliminary Ecological Review (2021) confirmed an area of potential habitat which extends over much of the eastern portion of the investigation area. In addition, a 200 metre buffer was requested by PCS during the course of this engagement around a breeding location in Central Molonglo. This is shown as hatched in both scenarios.

A comparison of the development options in the Central Molonglo Investigation Area across scenarios two and three is provided in the tables below. Of particular note is that the potential future development area increases from 51% to 75% of the investigation area. To inform further consideration of options for this region, it is highly recommended that further studies be undertaken to confirm the presence of Superb Parrot breeding areas and options to avoid and minimise risk to the Molonglo Colony.

It is noted that land identified as potential future development in areas of high heritage sensitivity, as identified in GML (2020) and the ACT Heritage Register (Figure 8-7) will require additional heritage assessment to confirm the suitability of these areas for development. As noted, mapping showing sensitive Aboriginal places recorded on the ACT Heritage Register and GML (2020) is identified in the restricted Attachment A.

A hatched overlay has also been incorporated for land in the south-western portion of the site. The capability assessment identified this land as being constrained due to topography, however the land otherwise appears to be reasonably unconstrained. Options for appropriate land uses on this portion of the site should be further investigated as part of a master planning process.

Table 8–2 | Overview of Central Molonglo Scenario Two

Central Molonglo – Scenario Two	Area (ha)	% Distribution
Total Investigation Area	1,240	-
Potential Future Development	630	51%
Potential Conservation Area	608	49%

Table 8–3| Overview of Central Molonglo Scenario Three

Central Molonglo – Scenario Three	Area (ha)	% Distribution
Total Investigation Area	1,240	-
Potential Future Development	927	75%
Potential Conservation Area	239	19%

The Central Molonglo Investigation Area is located to the west of the Heritage Listed Kama Nature Reserve and includes the Lands End property and the heritage listed Weetangera Cemetery. It is noted that the Lands End property is not listed in the ACT Heritage Register, however this does not preclude the property from being conserved as a place of historic interest. There is no change proposed in the Kama Nature Reserve in either scenario. It is assumed that asset protection zones that may be required for future development would be sited within the development footprint and would not require modifications to the fire management practices within both Kama Nature Reserve and the Molonglo River Reserve which adjoin the investigation area to the south and east.

Indirect impacts would need to be considered in a more detailed environmental analysis and feasibility study of the investigation area. Additional heritage studies would also be required to confirm appropriate development curtilage for Lands End and Weetangera Cemetery. A more detailed breakdown of the percentage of the Central Molonglo Investigation Area that may have conservation values is provided in the following table.

Table 8–4 | Percentage of Central Molonglo Investigation Area that may have conservation values

Scenarios	2	3	2	3	2	3	2	3
Assets	Potential – High Value Environmental Significance		Potential - White box - yellow box - Blakely's red gum grassy woodland and derived native grassland		Potential - Natural Temperate Grassland of the South Eastern Highlands		Potential – Pink-tailed worm-lizard	
Central Molonglo (ha)	522	853	98	267	6	6	115	115

It is noted that previous government recommendations have included that a significant portion of this area be removed in perpetuity from being considered as a future urban area. These past recommendations will need to be reconsidered in light of further studies and evolving needs.

LEGEND

- WEIA Boundary
- Investigation Area
- Waterbodies
- Superb Parrot nesting and potential breeding habitat
- Nature Reserves
- Potential habitat connectivity corridors

Potential Land Use

- Potential Future Development
- Further Investigation Needed
- Potential Conservation Area

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FIG NO. 8-5

FIGURE TITLE Central Molonglo Investigation Area Scenario Two

PROJECT TITLE Western Edge Investigation Area - Scenario Two

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LEGEND

- WEIA Boundary
- Investigation Area
- Waterbodies
- Superb Parrot nesting and potential breeding habitat
- Nature Reserves
- Potential habitat connectivity corridors

Potential Land Use

- Potential Future Development
- Further Investigation Needed
- Potential Conservation Area

MACGREGOR
LATHAM
HOLT
HIGGINS
SCULLIN
HAWKER
WHITLAM
DENMAN PROSPECT
URIARRA ROAD

FIG NO. 8-6

FIGURE TITLE Central Molonglo Investigation Area Scenario Three

PROJECT TITLE Western Edge Investigation Area - Scenario Three

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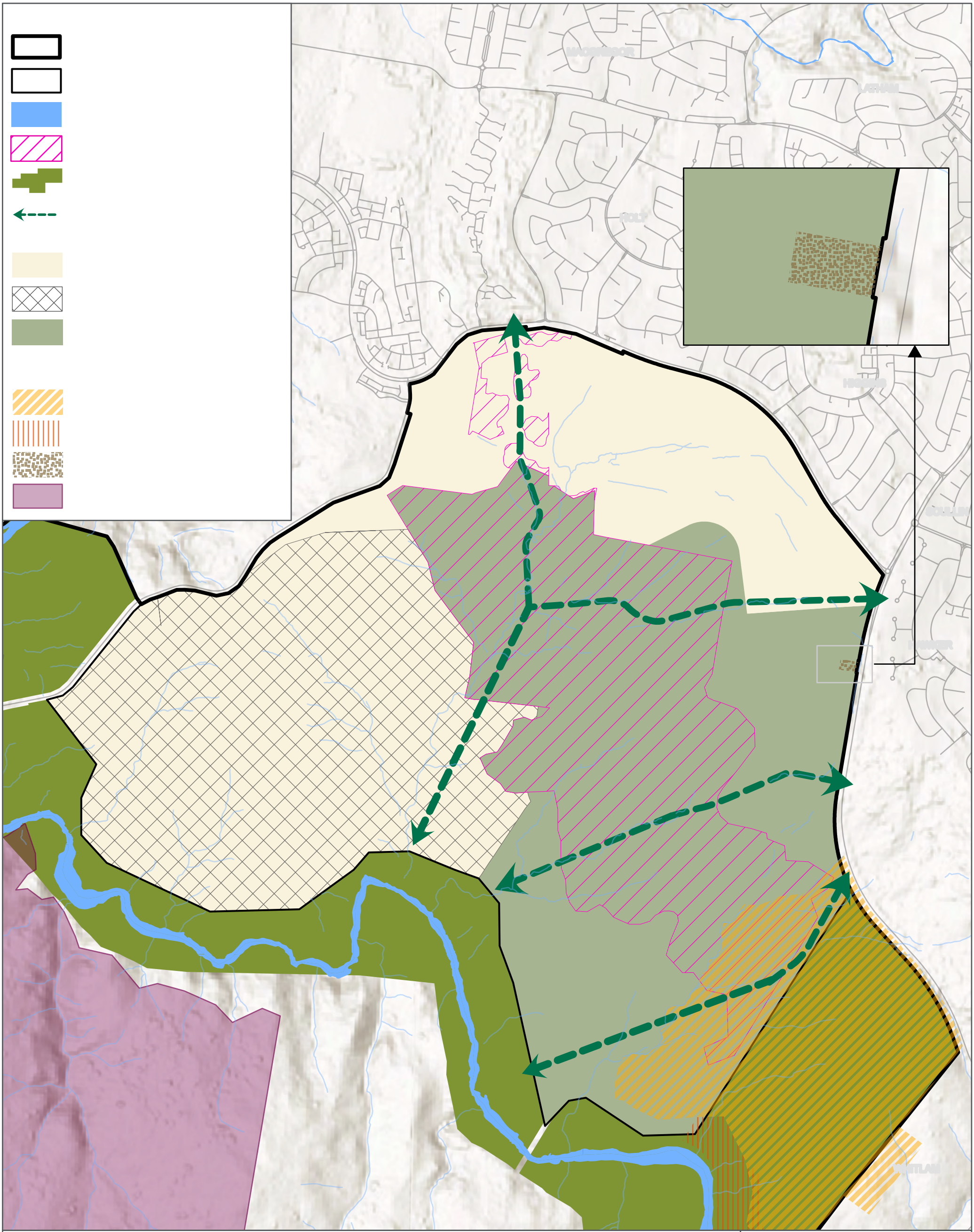

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8.4 Uriarra Ridge Investigation Area

As previously discussed, there are a number of challenges associated with development within the Uriarra Ridge investigation area. Currently, the area only has road access via Uriarra Road which does not provide sufficient redundancy for general traffic movements and emergency services. Whilst the area enjoys unimpeded views towards the Brindabella Ranges, the topography presents infrastructure challenges, particularly for sewer. The Uriarra Ridge Investigation Area also contains the heritage listed Huntly rural property.

Through the capability and suitability assessments it was determined that priority should first be given to development of other investigation areas within the WEIA. Whilst development of Uriarra Ridge may occur in the future, it is likely that this would be in the long term, after release of other investigation areas that are more readily serviceable with higher connectivity to existing and/or adjoining land uses.

It is noted that land identified as Potential Future Development in areas of high heritage sensitivity, as identified in GML (2020) and the ACT Heritage Register (Figure 8-10) will require additional heritage assessment to confirm the suitability of these areas for development. Mapping showing sensitive Aboriginal places recorded on the ACT Heritage Register and GML (2020) is identified in the restricted Attachment A.

The tables below provide a comparison of scenarios two and three for the Uriarra Ridge Investigation Area. The most significant difference is the area of potential future development which increases from 23% to 85%. Given the difficulties in servicing the land on the western side of Uriarra Road, it is unlikely that development of the reduced area shown in Scenario Two would be economically feasible.

Table 8–5 | Overview of Uriarra Ridge Scenario Two

Uriarra Ridge – Scenario Two	Area (ha)	% Distribution
Total Investigation Area	1,798	-
Potential Future Development	420	23%
Potential Conservation Area	51	3%
Rural or Open Space Uses	1,273	77%
Existing Infrastructure Corridors	54	3%

Table 8–6 | Overview of Uriarra Ridge Scenario Three

Uriarra Ridge – Scenario Three	Area (ha)	% Distribution
Total Investigation Area	1,798	-
Potential Future Development	1,525	85%
Potential Conservation Area	273	15%

A more detailed breakdown of the percentage of the Central Molonglo Investigation Area that may have conservation values is provided in the following table.

Table 8–7 | Percentage of Uriarra Ridge Investigation Area that may have conservation values

Scenarios	2	3	2	3	2	3	2	3
Assets	Potential – High Value Environmental Significance		Potential - White box - yellow box - Blakely's red gum grassy woodland and derived native grassland		Potential - Natural Temperate Grassland of the South Eastern Highlands		Potential – Pink-tailed worm-lizard	
Uriarra (ha)	125	891	26	225	N/A	23	114	239

LEGEND

- WEIA Boundary
- Investigation Area
- Waterbodies
- Scenario Two Green Space
- Potential habitat connectivity corridors

Land Use

- Potential Future Development
- Rural or Open Space Uses
- Potential Conservation Area

MARA
STRATHNAIRN
HOLT
HIGGINS
URIARRA ROAD
WHITLAM
DENMAN PROSPECT

FIG NO. 8-8

FIGURE TITLE Uriarra Ridge Investigation Area Scenario Two

PROJECT TITLE Western Edge Investigation Area - Scenario Two

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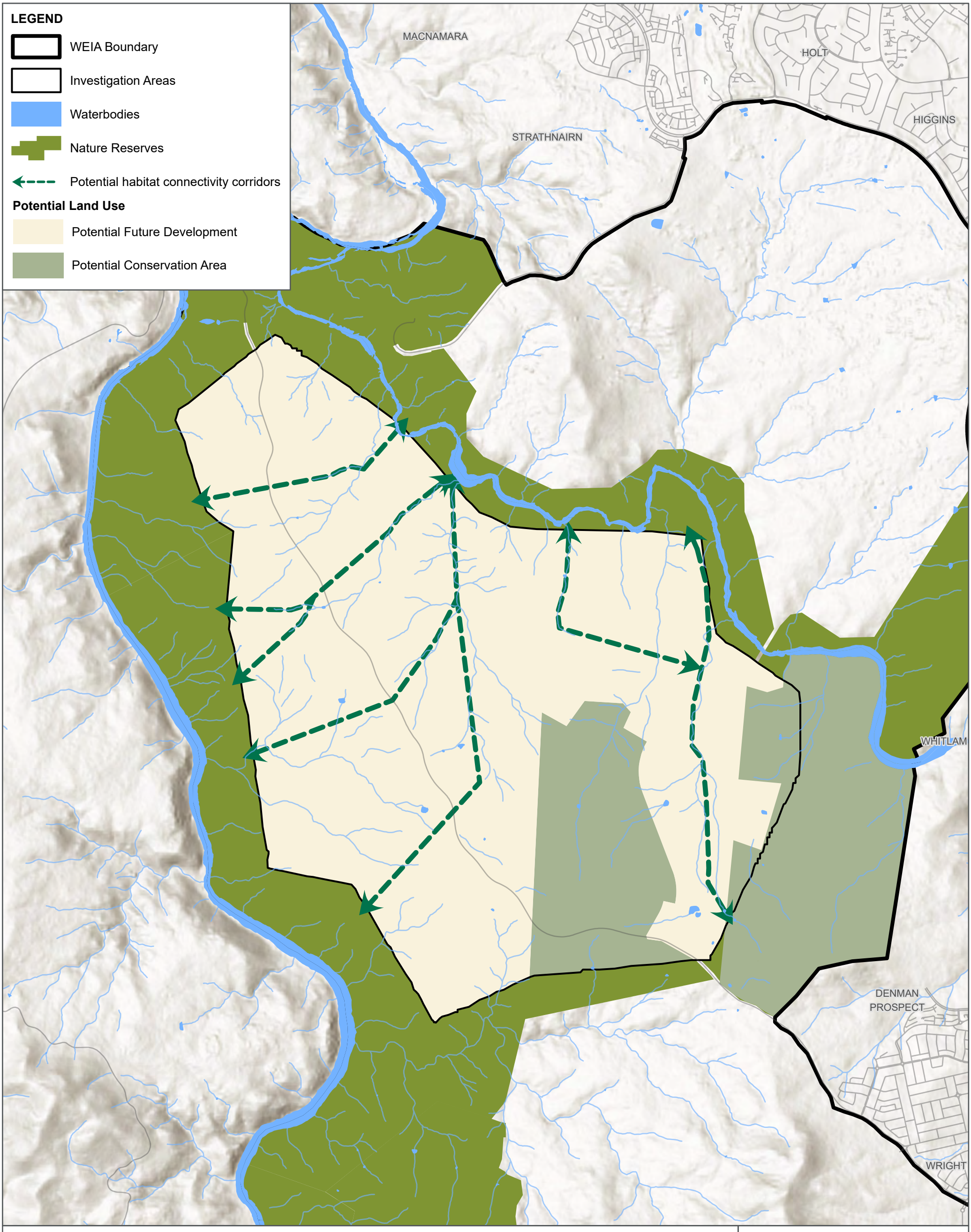

FIG NO. 8-9

FIGURE TITLE Uriarra Ridge Investigation Area Scenario Three

PROJECT TITLE Western Edge Investigation Area - Scenario Three

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LEGEND

- WEIA Boundary
- Investigation Area
- Waterbodies
- Scenario Two Green Space
- Potential habitat connectivity corridors

Land Use

- Potential Future Development
- Rural or Open Space Uses
- Potential Conservation Area

Registered heritage places and nominated Travelling Stock Route

- Kama Woodland/Grassland
- Travelling Stock Route
- Huntly

MACGREGOR
MACNAMARA
HOLT
STRATHNAIRN
URIARRA ROAD
URIARRA VILLAGE
DENMAN PROSPECT

FIG NO. 8-10

FIGURE TITLE Uriarra Ridge Investigation Area Scenario Two Heritage Information

PROJECT TITLE Western Edge Investigation Area - Scenario Two

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8.5 Bulgar Creek Investigation Area

The indicative development scenarios for the Bulgar Creek Investigation Area present slightly different outcomes, with the increase in potential conservation area being substituted by an expansion of potential developable area on the northern side of Cotter Road and south into the Kambah Investigation Area.

The tables below provide a comparison of scenarios two and three for the Bulgar Creek Investigation Area. Scenario Two provides a reasonable amount of future development area (1,341 ha) in a single largely consolidated area with good connectivity to existing suburbs in Weston Creek and with access via Cotter Road and Eucumbene Drive/Hindmarsh Drive. Key habitat connectivity corridors are shown as potentially being required along Bulgar Creek and between the Murrumbidgee River Reserve and potential conservation areas identified as containing remnant Box Gum Woodland. It is noted that land identified as Potential Future Development in areas of high heritage sensitivity, as identified in GML (2020) and the ACT Heritage Register (Figure 8-13), will require additional heritage assessment to confirm the suitability of these areas for development. Mapping showing sensitive Aboriginal places recorded on the ACT Heritage Register and GML (2020) is identified in the restricted Attachment A.

Table 8–8 | Overview of Bulgar Creek Scenario Two

Bulgar Creek - Scenario Two	Area (ha)	% Distribution
Total Investigation Area	1,758	-
Potential Future Development	1,342	76%
Potential Conservation Area	416	24%

Table 8–9 | Overview of Bulgar Creek Scenario Three

Bulgar Creek - Scenario Three	Area (ha)	% Distribution
Total Investigation Area	1,454	-
Potential Future Development	1,036	71%
Potential Conservation Area	416	29%

Figure 8-11 and Figure 8-12 provide the maps for Scenario Two and Three respectively. A more detailed breakdown of the percentage of the Central Molonglo Investigation Area that may have conservation values is provided in the following table.

Table 8–8 | Percentage of Bulgar Creek Investigation Area that may have conservation values

Scenarios	2	3	2	3	2	3	2	3
Assets	Potential – High Value Environmental Significance		Potential - White box - yellow box - Blakely's red gum grassy woodland and derived native grassland		Potential - Natural Temperate Grassland of the South Eastern Highlands		Potential – Pink-tailed worm-lizard	
Bulgar Creek (ha)	778	593	314	234	N/A	N/A	9	9

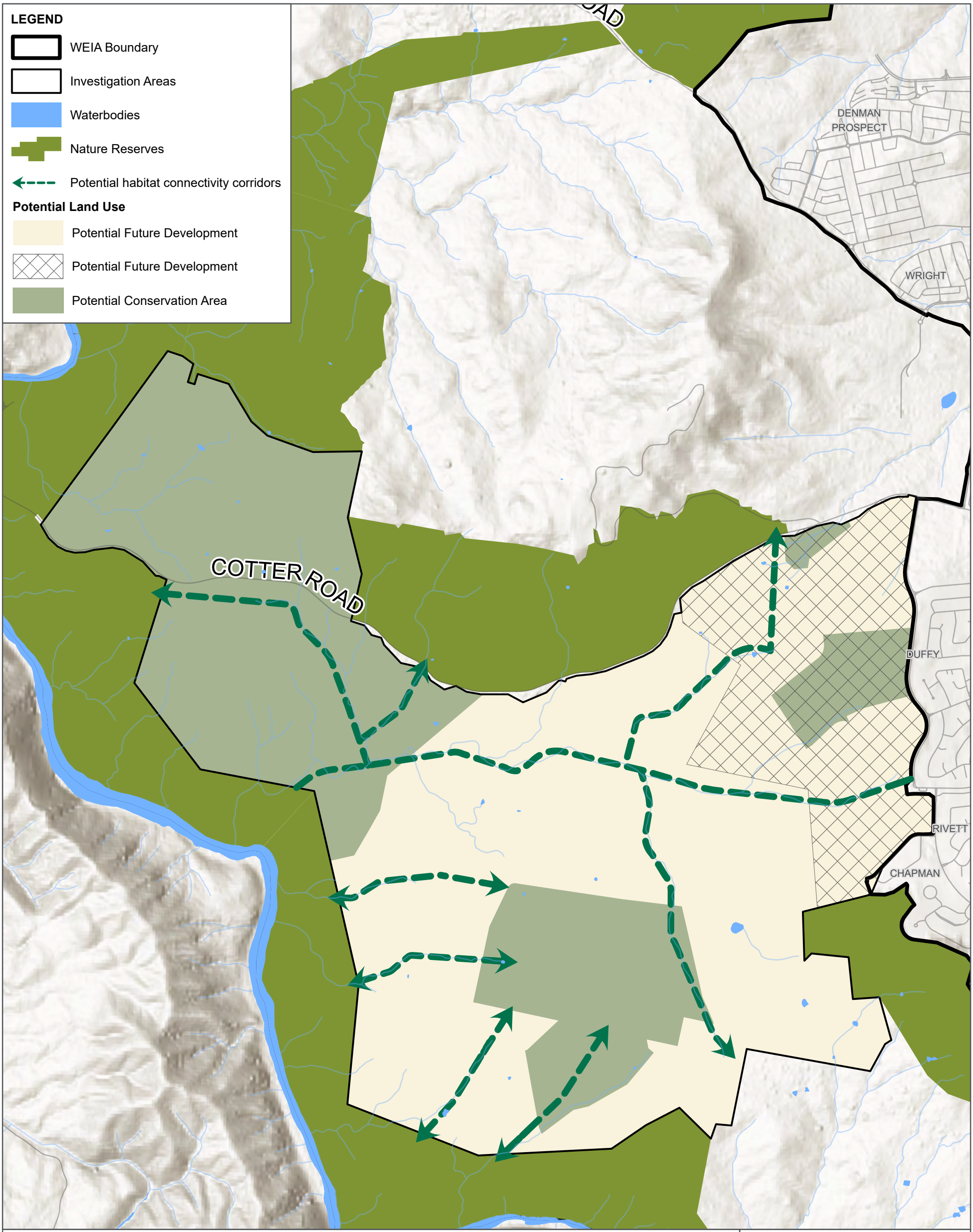

FIG NO. 8-11

FIGURE TITLE Bulgar Creek Investigation Area Scenario Two

PROJECT TITLE Western Edge Investigation Area - Scenario Two

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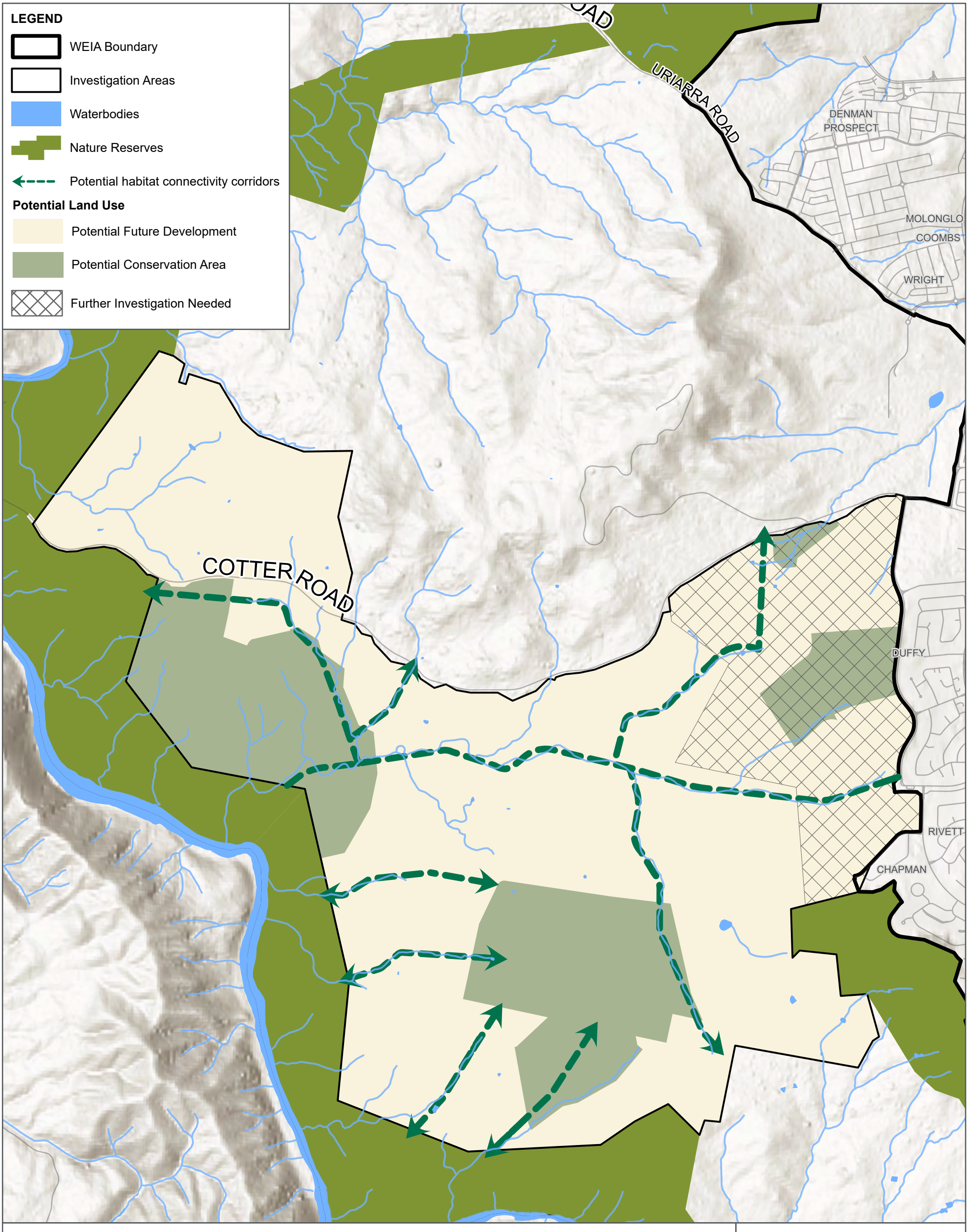

FIG NO. 8-12

FIGURE TITLE Bulgar Creek Investigation Area Scenario Three

PROJECT TITLE Western Edge Investigation Area - Scenario Three

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LEGEND

- WEIA Boundary
- Investigation Areas
- Waterbodies
- Nature Reserves
- Potential habitat connectivity corridors

Potential Land Use

- Potential Future Development
- Potential Future Development
- Potential Conservation Area

Registered heritage places and nominated Travelling Stock Route

- Casuarina Sands
- Cotter Pumping Station Precinct
- Greenhills Ruin
- Lower Molonglo Geological Site
- Travelling Stock Route
- Huntly

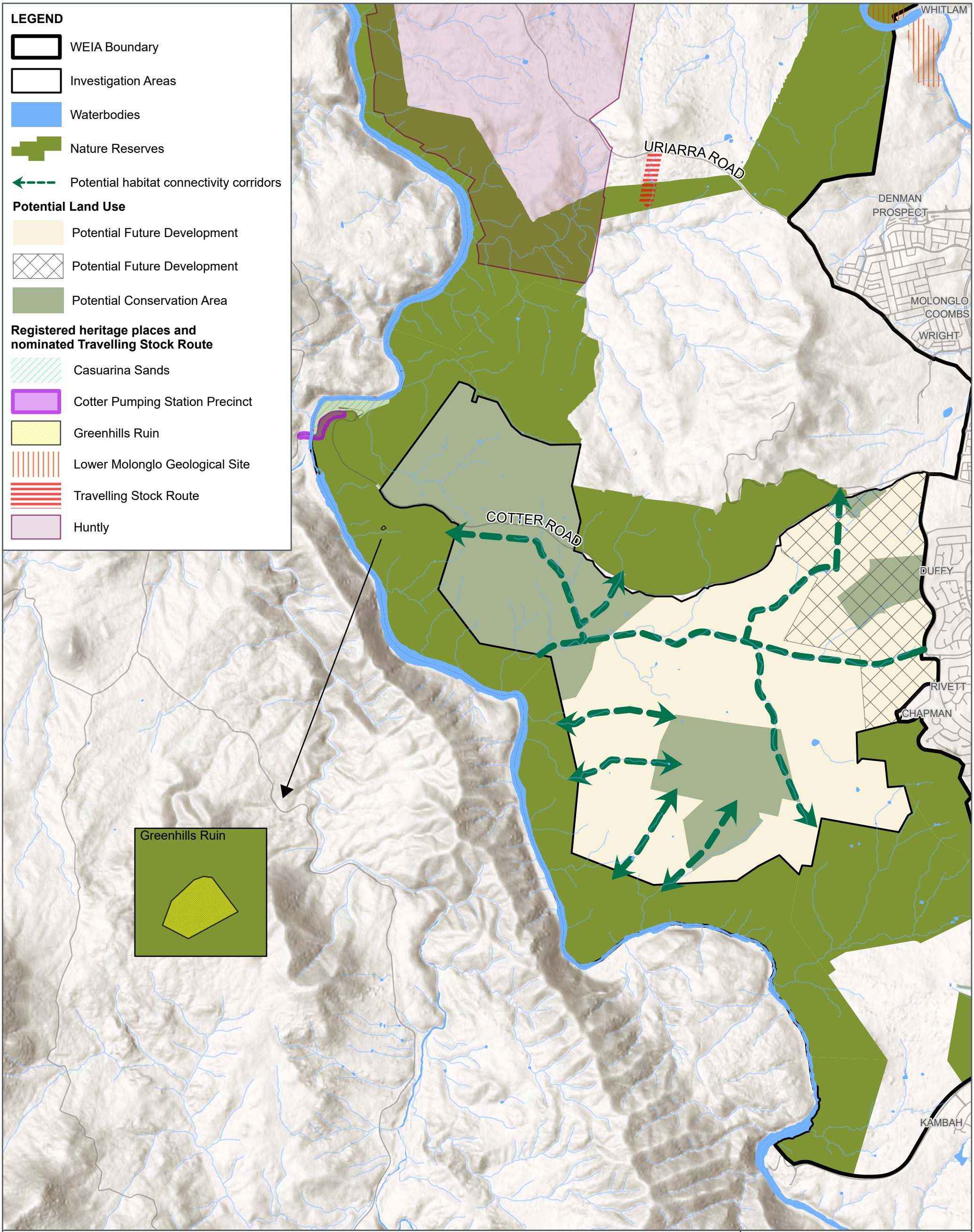

FIG NO. 8-13

FIGURE TITLE Bulgar Creek Investigation Area Scenario Two Heritage Information

PROJECT TITLE Western Edge Investigation Area - Scenario Two

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8.6 Kambah Investigation Area

The indicative development scenarios prepared for the Kambah Investigation Area present significantly different outcomes. As this investigation area is bounded to the north-east by Cooleman Ridge Nature Reserve and to the west by the Murrumbidgee River Reserve, access in and out of this investigation area is constrained. Access points to and from Kambah Pool Road connect to the south, however the connectivity into the Bulgar Creek Investigation Area is required to provide access north. This is a considerable constraint when considering building redundancy into the road network for traffic movements and emergency services. Ultimately this would impact staging and timing if development in this area were to be progressed.

Further targeted heritage survey of this area is required to confirm the presence of any significant places within the landscape. In addition, given that nature reserves adjoin the site to the north, south and west, additional ecological survey is recommended to confirm important habitat linkages and areas of habitat and vegetation that should be avoided. There are no areas of high heritage sensitivity identified in GML (2020) and the ACT Heritage Register for this area, however, additional heritage assessment to confirm the suitability of these areas for development will still be required. Mapping showing sensitive Aboriginal places recorded on the ACT Heritage Register and GML (2020) is identified in the restricted Attachment A.

Table 8–11 | Overview of Kambah Scenario Two

Kambah - Scenario Two	Area (ha)	% Distribution
Total Investigation Area	668	-
Potential Future Development	633	95%
Potential Conservation Area	23	3%

Table 8–12 | Overview of Kambah Scenario Three

Kambah - Scenario Three	Area (ha)	% Distribution
Total Investigation Area	668	-
Potential Future Development	645	97%
Potential Conservation Area	35	5%

Figure 8-14 and Figure 8-15 provide the maps for Scenario Two and Three respectively. A more detailed breakdown of the percentage of the Central Molonglo Investigation Area that may have conservation values is provided in the following table.

Table 8–13 | Percentage of Kambah Investigation Area that may have conservation values

Scenarios	2	3	2	3	2	3	2	3
Assets	Potential – High Value Environmental Significance		Potential - White box - yellow box - Blakely's red gum grassy woodland and derived native grassland		Potential - Natural Temperate Grassland of the South Eastern Highlands		Potential – Pink-tailed worm-lizard	
Bulgar Creek (ha)	241	241	97	97	N/A	N/A	N/A	N/A

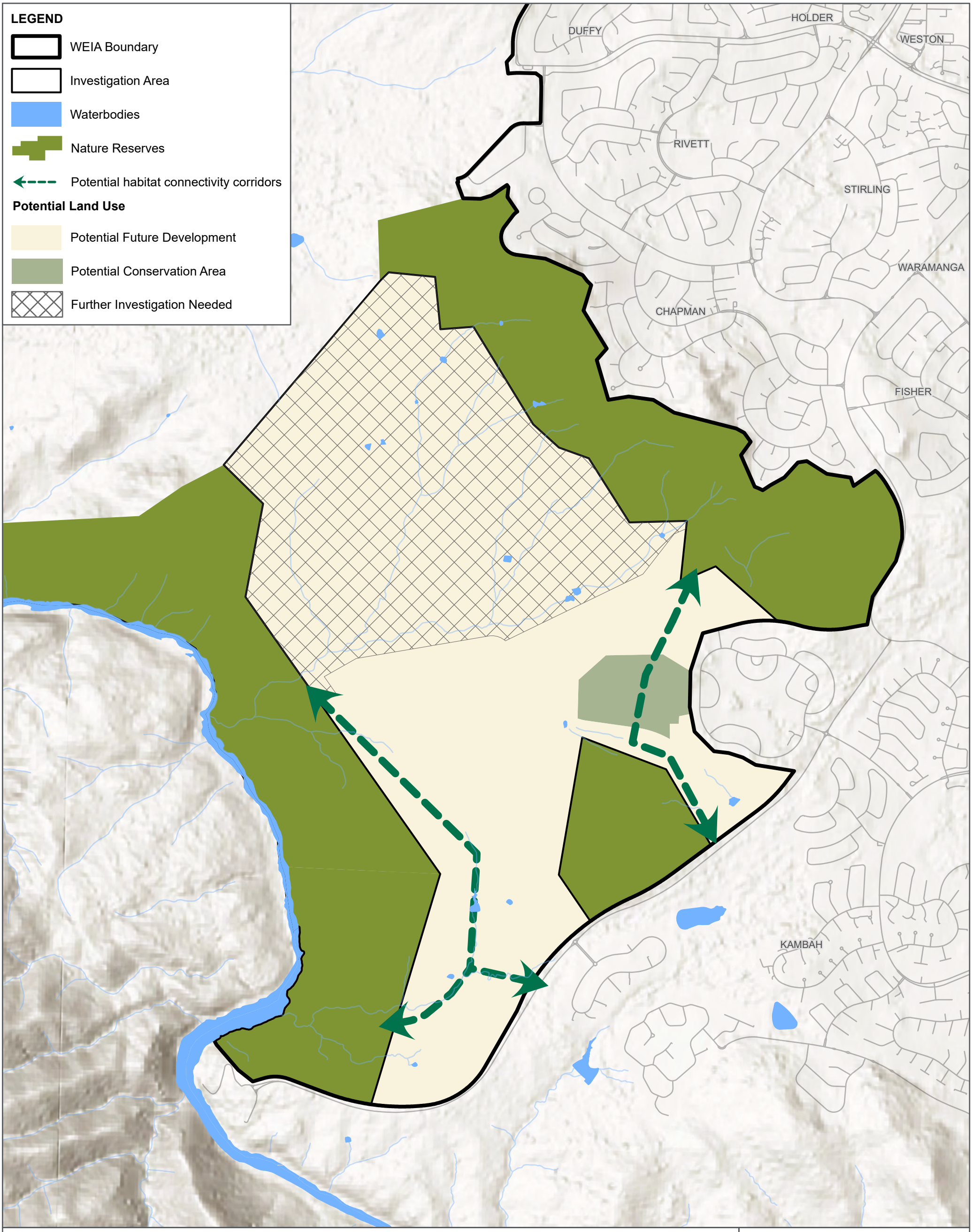

FIG NO. 8-14

FIGURE TITLE Kambah Investigation Area Scenario Two

PROJECT TITLE Western Edge Investigation Area - Scenario Two

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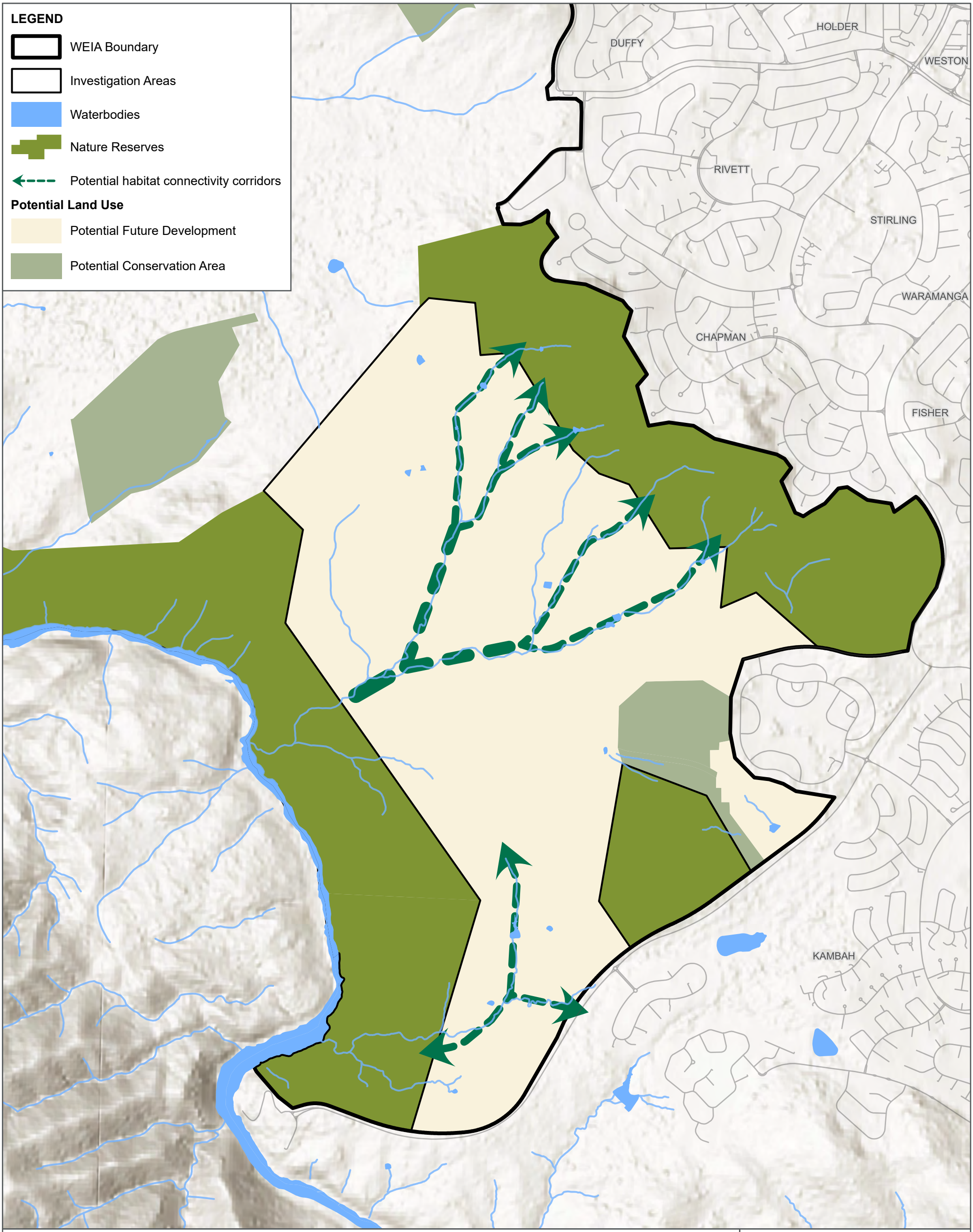

FIG NO.
8-15

FIGURE TITLE Kambah Investigation Area Scenario Three

PROJECT TITLE Western Edge Investigation Area - Scenario Three

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Km

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9. Strategic Merit Test

To enable the comparison of urban development clusters and potential development scenarios, it was necessary to pass each scenario through a decision framework. The Australian Transport Assessment and Planning (ATAP) Guidelines provide a framework for planning, assessing and developing transport systems and related initiatives. Whilst this is not strictly a transport planning project, the use of a Strategic Merit Test is considered an appropriate method to analyse the indicative development scenarios that have been developed. It is intended that the outcome of the Strategic Merit Test would be used to prioritise further investigation into the feasibility of these areas for urban expansion.

9.1 Methodology

SMEC workshopped the indicative development scenarios prepared for the Central Molonglo, Bulgar Creek and Kambah Investigation Areas with the PCG at Workshop 4 on the 1 September 2022. A framework for comparative assessment was discussed, and together the project team and the PCG undertook a Strategic Merit Test. The Strategic Merit Test was run on the basis of the Scenario Two indicative development option, being the habitat connectivity driven outcome.

It is noted that the Uriarra Ridge Investigation Area was excluded from the scoring in the Strategic Merit Test. As discussed in Section 8.4, the Uriarra Ridge Investigation Area currently only has vehicular access via Uriarra Road and the topography of the area presents some infrastructure challenges, particularly for sewer. The area also contains the heritage listed Huntly rural property, and requires further consideration regarding the management of this known heritage attribute. Through the capability and suitability assessment it was determined that priority should first be given to development of other areas within the WEIA. While development of Uriarra Ridge may occur in the future, it is likely that this would be in the longer term, after release of other areas that are more readily serviceable and enjoy better connectivity to existing urban areas.

The workshop participants were asked to consider how each investigation area aligns with each of the design principles and agree on a scoring of High (3), Medium (2) or Low (1). The agreed ratings were then aggregated to confirm the overall score.

Table 9–1 | Strategic Merit Test

Criteria	Design Principle	Central Molonglo Investigation Area Rating	Bulgar Creek Investigation Area Rating	Kambah Investigation Area Rating
Size of urban cluster	To ensure urban capable area is sufficient in size to allow feasible development to occur	High	High	Low
Fragmentation	Cluster shape allows rational staging of development	High	High	Low
Orientation	Topography allows northerly orientation of streets for passive solar access Residential development is least suited to southerly sloping land, due to solar orientation.	Medium	High	Medium
Slope	Slopes are conducive to the land use vision of the cluster	High	High	Medium
Soils	Soil typologies are suited to the land use vision and do not result in expensive risks that must be managed in future developments.	High	Medium	Medium

Criteria	Design Principle	Central Molonglo Investigation Area Rating	Bulgar Creek Investigation Area Rating	Kambah Investigation Area Rating
Proximity to Urbanised Areas	Urban expansion is best undertaken where it is contiguous with existing suburbs to provide logical expansion of public transport and access to existing services (e.g. schools).	High	High	Medium
Adjoining Land Uses	Urban development is best suited where adjoining land uses do not present a conflict	Medium	Medium	Low
Movement Connectivity	Creates a highly connected place with good access to active and public transport and the existing (or planned) road network.	High	High	Low
Habitat Connectivity	Considers connectivity corridors between nature reserves and key areas of native vegetation.	High	High	High
Habitat	Urban development should avoid impacts on threatened ecological communities and protect key areas of habitat[2]	Medium	Medium	Low
Infrastructure Corridors / Servicing	Urban development is best suited to land that can be serviced by existing trunk infrastructure, or minor modifications to existing infrastructure	High	High	Medium
Visual Impacts	Urban intensification is best suited to landforms that can absorb visual impacts.	High	High	Medium
Emergency Egress	Urban development must provide appropriate emergency egress and multiple alternative exit points.	High	High	Low
Urban Heat Island	Climate responsive development should	High	High	High

[2] Rating based on Scenario two for each investigation area only. Scenario One all considered 'low'

Criteria	Design Principle	Central Molonglo Investigation Area Rating	Bulgar Creek Investigation Area Rating	Kambah Investigation Area Rating
	build-in mature canopy cover and blue-green infrastructure to mitigate urban heat island effect.			
Waterways	Urban development should incorporate opportunities for at-source treatment of urban stormwater and improvement of environmental outcomes in existing waterways.	High	High	Medium
Bushfire	Urban development should be sited to minimise bushfire risk	Medium	Medium	High
Totals		12 x High (3) = 36 4 x Medium (2) = 8 0 x Low (1) = 0	12 x High (3) = 36 4 x Medium (2) = 8 0 x Low (1) = 0	3 x High (3) = 9 7 x Medium (2) = 14 Low = 6
Score		**44 points**	**44 points**	**29 points**

The aggregated scores from the Strategic Merit Test rated Central Molonglo and Bulgar Creek Investigation Areas evenly at a total of 44 out of a possible score of 48. Kambah ranked considerably lower at 29. As a result, it is recommended that further investigation and master planning be prioritised for the Central Molonglo and Bulgar Creek investigation areas. Further recommendations are provided in the following section.

10. Recommendations

The approach taken in this project has collated and analysed existing data to determine the capability and suitability of land within the WEIA to accommodate future urban uses. This approach is useful in considering a range of variables, physical and environmental constraints and the risks surrounding the selection of suitable sites for future urban development.

By using GIS as a tool for a Multi-Criteria Analysis (MCA), we were able to form a decision matrix to efficiently and effectively guide the high level determination of urban suitable land within the WEIA. This approach to land use capability and suitability has provided:

- Greater confidence in decision making,
- Reduced risk in site suitability decisions, and
- Increased transparency in relation to decisions surrounding site selection for development.

While this approach has been useful in building an understanding of the development potential of the WEIA, it is noted that the assessment and analysis is high level and desktop only. It is intended that the work within this study be used as a benchmark for further studies and determination of urban development viability, alongside further targeted environmental, heritage, traffic, hydrology and infrastructure investigations are required as part of feasibility studies for each investigation area.

Noting the limitations of this high level analysis of urban capability and suitability, the following recommendations are made for consideration by the ACT Government in progressing master planning for the WEIA.

10.1 Climate Change and Resilience

The WEIA project presents an opportunity to promote best practice sustainability targets and to build community climate change resilience through climate sensitive urban design, water cycle management, green and living infrastructure and habitat connectivity.

Through a review of available climate data for the ACT, it is expected that Canberra will continue to warm in the near future. Increased urbanisation will also contribute to the urban heat island effect and increased stormwater runoff from more intense rainfall events. The frequency and intensity of bushfire events is also expected to increase. It is expected that climate change will also adversely impact sensitive threatened ecological communities, through changes to habitats and reduced biodiversity.

Urban heat will be increased in areas with large expanses of commercial, industrial and residential areas where there is a lack of vegetation. A review of climate change modelling, undertaken in collaboration with the NSW and ACT governments in an initiative known as the NSW and Australian Regional Climate Modelling project (NARCliM), shows that in the near future (2020-39) the ACT is expected to experience an additional +1.8 hot days over 35°c and a decline of 2.8% in annual rainfall. A summary of these projections is shown in Table 10–1.

Table 10–1| Summary of climate change impacts to the ACT (NSW and Australian Regional Climate Modelling)

Climate Projection	Near Future (2020-39)	Far Future (2060-79)
Change in Temperature (Mean)	+0.66°c	+2.04°c
Changes in rainfall (Annual)	-2.8%	-0.4%
Cold nights under 2°c (Annual)	-13.1	-42.5
High fire danger days (Annual)	+0.1	+0.3
Hot days over 35°c (Annual)	+1.8	+6.2

The existing NARCliM modelling provides a downscaled dataset for climate projections within the ACT, however there is a need to further contextualise climate impacts for future communities such as the WEIA. Further investigations should be undertaken to develop precinct scale mapping of the WEIA showing the impacts of higher intensity rain and flooding events on future communities. This could be undertaken as a GIS exercise and incorporated into the capability assessment at a later stage.

An understanding of climate change impacts is critical to ensuring liveability, achieving sustainability objectives, undertaking nature-led development and future proofing of the WEIA and has been viewed as a key driver to the way that the development of the WEIA could be sensitively undertaken. It is recognised that the climate change is likely to result in changes to the distribution and composition of species as well as ecosystems due to changed weather patterns and increased fire weather and storm events.

To ensure both future development and biodiversity of the WEIA is resilient to climate change, future urban areas should be connected by living infrastructure and habitat corridors which would provide both urban cooling and habitat for sensitive species. Future plantings in urban areas should be undertaken using climate resilient species identified in the ACT climate-wise landscape guide and would provide additional habitat connectivity for species. Such matters should be considered in the future stages of master planning for the WEIA.

The inclusion of water sensitive urban design infrastructure would also provide an appropriate option for the management and treatment of stormwater as a result of higher intensity rainfall and prior to discharge into local water courses. Consideration of appropriate planning and development controls, building typologies, and the inclusion of asset protection zones and hazard management areas should be considered given the expected increase to bushfire frequency and severity.

10.2 Cultural and European Heritage

As discussed throughout this assessment, quantifying the presence of heritage values in the WEIA is somewhat difficult due to the level of heritage assessment undertaken to date. The GML (2020) Cultural Heritage Assessment suggested mapping of heritage values in the WEIA including, areas of high sensitivity considered unsuitable for future development; areas of moderate sensitivity which are considered possible for future development; and areas that require further investigation to determine sensitivity. GML (2020) also mapped some registered heritage places, and identified cultural areas, Aboriginal places, including site complexes, and noted intangible values associated with areas of the WEIA.

It is noted that indicative development scenarios presented in SMEC (2022) show these areas as Investigation Areas, and include registered heritage places, Aboriginal places and cultural areas for Potential Development. This approach avoids total exclusion of development in these areas subject to further detailed assessments to establish heritage values and appropriate management approaches. It is acknowledged that these areas may not be suitable for future development and limited consideration of heritage has been applied in Scenario mapping, leading to some areas not currently viable for development to be mapped as potential development areas. Further heritage investigation is recommended at an early stage to consider the development potential of each Investigation Area noting that this will likely result in changes to areas identified for potential development, including significant alterations to mapping of land which is suitable and capable for development.

In addition, managing intangible cultural heritage values such as spiritual places and song lines, is considered important and difficult to quantify at this stage of the project based on the cultural heritage assessments completed to date. Furthermore, heritage surveys over the project area have been limited in scale, and in many instances, not systematic. More Aboriginal places are recorded in areas where survey has previously occurred, compared to areas which have not been surveyed. This would build an unfair bias into any quantitative GIS assessment, as has been undertaken for other variables in the suitability and capability assessment. The recognition of Aboriginal people as the first designers and first planners of the country is an important lens for the future development of the WEIA, and it is recommended that further consultation and engagement with local Aboriginal communities be undertaken to develop a deeper understanding of the previous use of the landscape and how a Designing for Country approach can be taken in the future development of the area.

Aboriginal places which have been registered on the ACT Heritage Register and sensitive information recorded by GML (2020) is mapped in Appendix A and Attachment A, respectively.

It is noted that the ACT Government has commenced an Aboriginal Cultural Values Assessment with the intent of undertaking early engagement with Aboriginal Knowledge Holders on the cultural values of the WEIA, to inform heritage conservation and management outcomes for the future feasibility stages of the project. The findings of this Cultural Values Assessment will likely affect land which is currently mapped as suitable for development.

Consistent with the ACT Heritage Council's Cultural Heritage Reporting Policy (2015), future investigations should also include Cultural Heritage Assessments (CHAs) developed with Representative Aboriginal Organisations to ensure that adequate avoidance and mitigation measures can be considered in the initial planning processes. CHAs are required prior to any formal development approval processes and should be completed at an early stage to allow appropriate management and conservation of Aboriginal places and values. Statutory approvals under the Section 61H of the Heritage Act 2004 will also be required for any works that may diminish the significance of registered heritage places or may damage Aboriginal places and/or objects. Where statutory approvals are sought to damage or diminish the significance, it must be demonstrated to the Council's satisfaction that the proposed activity is justifiable, that there are no reasonably practicable alternatives and that reasonable steps have been identified to reduce the risk of heritage effects.

10.3 Urban Habitat

Noting the ecological importance of the WEIA, particularly in providing connectivity between existing established nature reserves, it is recommended that further ecological studies be undertaken to support more detailed feasibility studies and master planning for the investigation areas. These studies should recommend the location, widths and ecological attributes that should be retained to preserve important connectivity routes across the landscape. It is likely that this work would require additional targeted species services in order to ascertain movement patterns, appropriate buffer areas and areas that should be avoided.

Where impacts cannot be avoided, mitigation through offsetting may be appropriate. Offsetting should be considered at a regional scale, through the preparation of a Strategic Assessment under Part 10 of the Commonwealth *Environmental Protection and Biodiversity Conservation Act* 1999. A Strategic Assessment, including offsetting strategy was prepared in the Molonglo Valley Plan for the Protection of Matters of National Environmental Significance (NES Plan) 2011. This would ensure habitat conservation is prioritised, whilst also allowing development to occur in appropriate areas.

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Attachment A – Sensitive Heritage Information

BLACKASH
BUSHFIRE CONSULTING

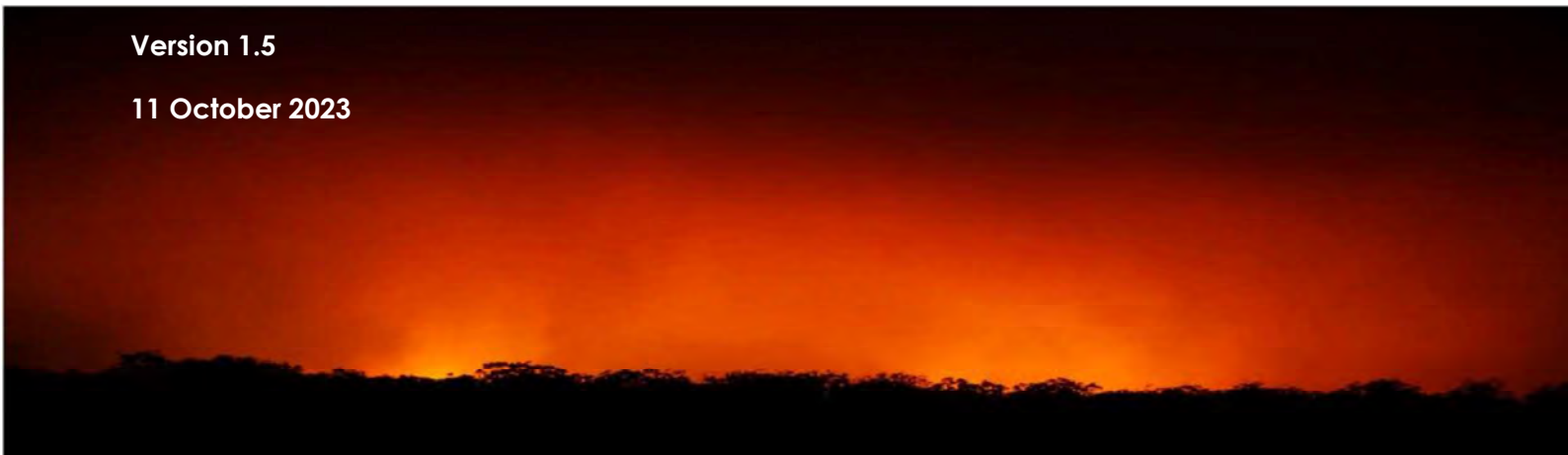
Stage 2 Report - High Level Strategic Bushfire Risk Assessment

Western Edge Strategic Bushfire Risk Assessment

Prepared for

EPSDD – ACT Government

BPAD Bushfire Planning & Design Accredited Practitioner Level 3



Version 1.5

11 October 2023

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Prepared by:	[redacted]
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Disclaimer

Contents

1. Glossary

This section defines those core terms and concepts which are adopted throughout the body of this report.

Term	Definition
ACT Bushfire Management Standards (BMS)	The BMS provide development standards for designing and building on bush fire prone land in the ACT. The BMS also provides detailed fuel management, roads, and access standards for Land Management coordinated by various Government organisations and private land managers. These standards have been prepared under the ACT Strategic Bushfire Management Plan, and detail the measurable outcomes required for better bushfire outcomes.
ACT Strategic Bushfire Management Plan 2019-2024 (SBMP)	The SBMP is the overarching document that directs all levels of bushfire planning in the ACT. Its purpose is to provide a strategic framework to protect the ACT community from bushfires and reduce resulting harm to the physical, social, cultural and economic environment of the Territory. This refers to SBMP Version 4.
Asset Protection Zone (APZ)	A fuel-reduced area surrounding a built asset or structure which provides a buffer zone between a bushfire hazard and an asset. The APZ includes a defendable space within which firefighting operations can be carried out. The size of the required APZ varies with slope, vegetation and Forest Fire Danger Index.
Bushfire	A general term used to describe fire in vegetation, includes grass fire.
Bushfire abatement zone (BAZ)	This is a subset of the bushfire prone area map surrounding Canberra and depicts locations subject to more intensive planning and management to minimise the risk of bushfire.
Bushfire attack mechanisms	The various ways in which a bushfire can impact upon people and property and cause loss or damage. These mechanisms include flame contact, radiant heat exposure, ember attack, fire wind and smoke.

Bushfire Attack Level (BAL)	A means of measuring the severity of a building's potential exposure to ember attack, radiant heat, and direct flame contact. The BAL is used as the basis for establishing the requirements for construction to improve protection of building elements and to articulate bushfire risk.
Bushfire prone land (BPL)	An area of land that can support a bushfire or is likely to be subject to bushfire attack, as designated on a bushfire prone land map.
Bushfire prone area (BPA)	The area of land mapped by the ESA to assist resident bushfire risk awareness and trigger development control provisions in ACT planning. This is periodically updated and generally extends 100m past the urban-bushland interface.
Bushfire Hazard	Any vegetation that has the potential to threaten lives, property, or the environment.
Bushfire Threat	Potential bushfire exposure of an asset due to the proximity and type of a hazard and the slope on which the hazard is situated.
Forest Fire Danger Index (FFDI)	The Mark 5 forest fire danger index (FFDI) was developed by McArthur (1967) in order to assess fire danger and behaviour in eucalypt forest fuel types and has been widely used in Eastern Australia (Noble et al. 1980, Sharples et al. 2009a). The FFDI requires temperature, relative humidity, wind speed and a fuel availability index (i.e. a drought factor) measured at 15:00 as input variables (Matthews 2009).
Hazard	A hazard is any source of potential harm or a situation with a potential to cause loss. A hazard is therefore the source of risk.
Likelihood	The chance of an event occurring. Likelihood may be represented as a statistical probability (such as an annual exceedance probability), or where

	this is not possible, it can be represented qualitatively using measures such as 'likely', 'possible' and 'rare'.
Managed land	Land that has vegetation removed or maintained to a level that limits the spread and impact of bushfire. This may include developed land (residential, commercial, or industrial), roads, golf course fairways, playgrounds, sports fields, vineyards, orchards, cultivated ornamental gardens and commercial nurseries. Most common will be gardens and lawns within curtilage of buildings. These areas are managed to meet the requirements of an APZ.
Mitigation	The lessening or minimizing of the adverse impacts of a bushfire event. The adverse impacts of bushfire cannot be prevented fully, but their scale or severity can be substantially lessened by various strategies and actions. Mitigation measures include engineering techniques, retrofitting and hazard-resistant construction as well as on ground works to manage fuel and separate assets from bushland.
Planning for Bushfire Protection 2019 (PBP)	NSW Rural Fire Service publication effective from 1 March 2020 which is applicable to all new development on bushfire prone land in NSW and is used with respect to a consistent approach between ACT and NSW planning for bushfires and the link to surrounding areas in NSW.
Resilience	The ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management. [1]

[1] UNDRR 2015 https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030

Risk	The degree of risk presented by that interaction will depend on the likelihood and consequence of the bushfire occurring. Risk may be defined as the chance of something happening, in a specified period of time that will have an impact on objectives. It is measured in terms of consequences and likelihood.
Risk assessment	A systematic process of evaluating the potential risks that may be involved in a projected activity or undertaking, having regard to factors of likelihood, consequence, vulnerability, and tolerability.
Risk-based land use planning	The strategic consideration of natural hazard risk and mitigation in informing strategic land use planning activities.
Strategic Bushfire Study (SBS)	Provides the opportunity to assess whether new development is appropriate in the bushfire hazard context.

2. Executive summary

This Strategic Bushfire Risk Assessment has been provided to further refine the process and geographical focus of the Western Edge Investigation Area project with respect to bushfire risk management. This is a large scale consideration of the study area identified by EPSDD and will need to be considered and further refined after integration with other studies. This has been prepared in alignment with the ACT Government framework for managing bushfire and planning with respect to bushfire and is consistent with the ACT Bushfire Management Standards (2023).

In the authors' professional opinion, the Western Edge Investigation Area (WEIA) has substantial scope for development that will be able to meet current and future standards for bushfire protection, and the next stage will be to integrate with other detailed studies to further refine the most suitable locations for future rezonings for urban uses. Bushfire protection of older development areas adjacent to the WEIA such as Hawker, Chapman, and Kambah may be substantially improved through new development towards the hazard vegetation.

The recommendations of this Strategic Bushfire Risk Assessment are as follows:

1. Consolidated guidance as to the relative suitability of the revised five investigation areas based on the areas identified in the *Western Edge Investigation Area Capability and Suitability Assessment* undertaken by SMEC Australia Pty. Ltd. (WEIACSA) and is summarised at Table 3 (p. 73).

2. This Strategic Bushfire Risk Assessment must be integrated with related investigations prior to the next steps in the planning process.

3. Site specific Strategic Bushfire Studies in accordance with the Bushfire Management Standards 2023 must form part of the next stage of the planning process as future investigation areas are refined, particularly with relation to the establishment of environmental corridors.

4. Priority should be given to investigation areas adjoining or adjacent to older development areas to provide additional bushfire mitigation of modern land use planning and building outcomes.

5. Future strategic planning processes related to the Western Edge Investigation Area should consider the site suitability criteria presented in Section 9.2 (p. 75).

6. To enhance bushfire safety into the future and improve practice, additional planning methods and requirements including, but not limited to, those presented in Section 8.3 should be explored by EPSDD and partners.

7. Part of the ongoing planning process must develop a staging strategy based on ensuring planning, operational delivery and bushfire management are coordinated.

3. Western Edge Strategic Bushfire Risk Assessment

3.1. Project overview and context

The ACT Planning Strategy 2018 (the Strategy) is the key planning document developed to guide the continuing sustainable development of Canberra, as both the nation's capital and a thriving city in its own right. This was developed as a refresh and update of the 2012 strategy and reflects significant community engagement reflecting the values of Canberrans and the importance of incorporating these into future growth. The key defining characters of the city include the value of green space, diversity of lifestyle options and the bushland setting. The vision for the Strategy therefore recognises the importance of celebrating the unique bushland setting while being responsive to future growth and resilient in the face of change (including climate change). The Strategy has 5 related themes to guide delivery of the vision through land-use planning:

1. *Compact and efficient*
2. *Diverse*
3. *Sustainable and resilient*
4. *Liveable*
5. *Accessible*

The Strategy is a long term policy designed to guide the strategic management of land for the next 30 years and provide a balanced range of outcomes derived from the broad themes. The Compact and Efficient theme seeks planning outcomes that:

- *grow mostly within our urban footprint or in areas close to our footprint*
- *maintain environmental values*
- *use infrastructure effectively to support an efficient, sustainable and liveable city*

Each of the themes results in a number of strategic directions and then actions to deliver on those directions. Under the Compact and Efficient theme, strategic direction 1.2 is to:

- *Investigate the potential for new residential areas to the west of the city to meet future housing need.*

The Strategy provides significant rationale for the strategic directions and actions, and these clearly are interrelated across the themes. Direction 1.2 recognises that whilst much of the city growth is being achieved on infill sites, there is always a need for new greenfield development areas with a growing population and an expressed preference for housing choices. It is also recognised that the existing areas

are developing quickly and are likely to be fully developed by around 2030. At the broadest level, significant limitations were identified to the north, south and east, and the Western Edge Investigation Area was identified for potential future urban expansion.

Action 1.2.1 sets up the next level of investigation towards ultimately determining the mixture of sustainable land uses:

- *Undertake environmental, infrastructure and planning studies for the western edge of the city to identify suitable areas for:*
    - *potential urban areas (excluding Central Molonglo)*
    - *nature reserves*
    - *environmental offset and potential environmental offset areas*
    - *the consideration of cultural and heritage values*
    - *other uses, for example rural, broad acre, major infrastructure, transport and services.*

A preliminary Bushfire Risk Assessment was completed in December 2020 and contributed to the *Western Edge Investigation Area Capability and Suitability Assessment* undertaken by SMEC Australia Pty. Ltd. (WEIACSA) in early 2023 that has defined the investigation areas for more detailed study. The Western Edge Strategic Bushfire Risk Assessment (SBRA) (this report) uses, in part, the findings of the WEIACSA as the basis for bushfire analysis to further refine the areas for further investigation.

The purpose of Stage 2 of the SBRA is to further drill down at a geographic scale to identify which areas are more or less suitable for development with respect to bushfire risk.

It builds on the concepts and practices introduced in the Stage 1 Report to provide guidance for decision making for bushfire risk management in the strategic planning context. This report will be consistent with the principles of the strategic planning approach laid out in the *ACT Emergencies Bushfire Management Standards 2023* (BMS), adopted as a Notified Instrument in July 2023. The BMS wholly adopts the principles and practice of Chapter 4 Strategic Planning in the NSW RFS document *Planning for Bushfire Protection 2019* (PBP) for consistency across borders. Both documents use the current standard design bushfire as being based on Forest Fire Danger Index (FFDI) 100. The current standards do not attempt to consider the future impacts of climate change and whether higher FFDI bushfires will need to be considered. The SBS will make some further suggestions as to possible additional methods for reducing impacts on the community overall.

3.2. Site context

The Western Edge Investigation Area (WEIA) was originally defined by the Planning Strategy as the area shown hatched orange to the west of the map in Figure 1. Greenfield sites currently under development are shown in solid orange.

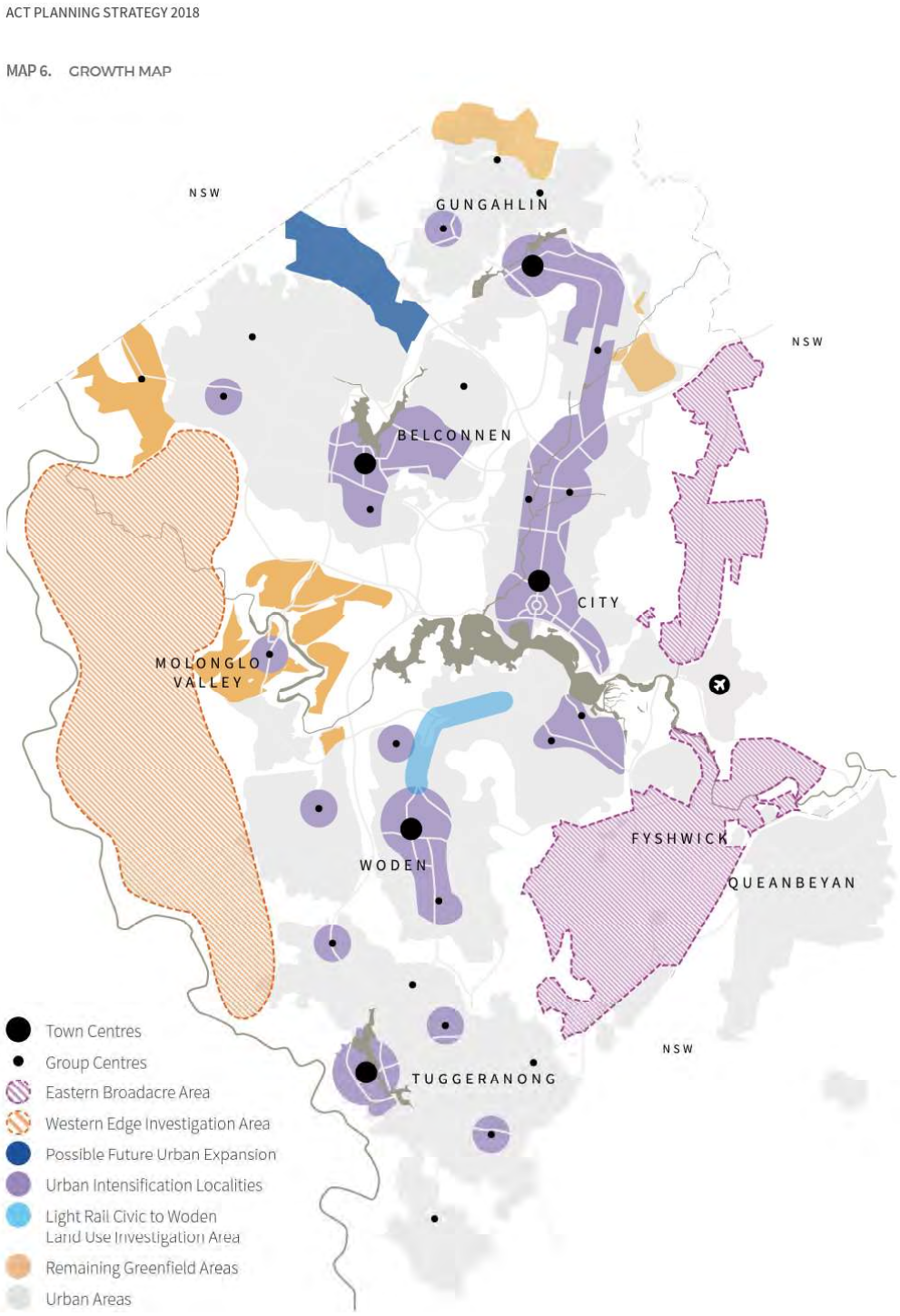

Figure 1: ACT Planning Strategy 2018 - Growth Map

3.3. Existing Development and land uses

The site extends approximately 20km from Holt & Strathnairn in the north to Kambah in the south and covers the majority of the area between the city and the Murrumbidgee River to the west. The WEIA is approximately 9,800ha and includes significant rural and agricultural uses, nature reserves, forest parks, infrastructure including major water and electricity transmission, and the Mount Stromlo Observatory complex. The general location of the WEIA in relation to the existing Canberra urban development area and the current zoning context are shown at Figure 2, and the WEIA in context with aerial photography is shown as Figure 3.

The consideration of suitability for future development areas and staging will be informed, in part, by the WEIACSA, and by the areas shown within the ACTmapi system as being retained as vegetation for the foreseeable future (e.g. Nature Reserves, riparian corridors, Stromlo Forest Park), and further ecological surveys. This includes the areas shown on Figure 2 as DES or 'designated areas' which it is expected will be retained for their environmental and/or recreational values.

It is clear that parts of the WEIA are immediately adjacent to existing urban development, which provides a number of advantages. In the bushfire context this assists by providing:

- significant developed areas which are unlikely to be the source of significant bushfire risk, and which provide places of refuge to retreat to from a major bushfire;
- road infrastructure for access and egress during a bushfire;
- reticulated water for firefighting;
- supporting physical, social, and economic infrastructure; and
- existing emergency services capability within a short distance.

There are significant differences between those areas developed prior to contemporary bushfire planning and those developed more recently, and this is most apparent at the urban-bushland interface.

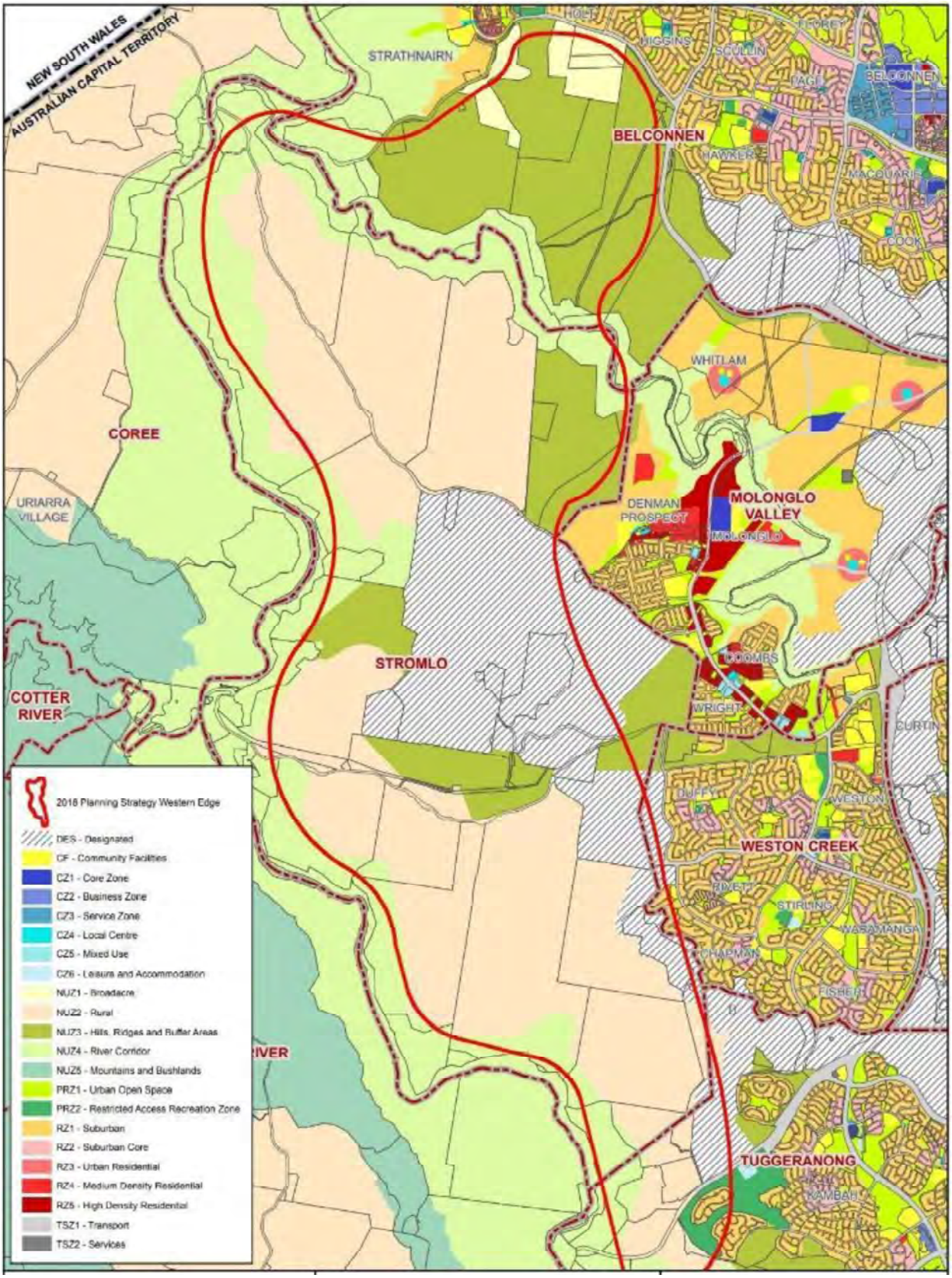

Figure 2: WEIA and current zoning (EPSDD)

Figure 3: WEIA and aerial photo (EPSDD)

3.4. Comparison of recent and older urban development at the WEIA interface

Ongoing new and recent development in areas adjacent to the WEIA such as Denman Prospect and Whitlam are proceeding in accordance with the principles and requirements laid out in the previous version of the BMS (Version 3, 2014). This section provides a snapshot to assist understanding of the supportive nature of existing development adjacent, and the potential positive impact of new urban development with respect to bushfire risk mitigation.

Under the *Strategic Bushfire Management Plan* (SBMP), the Commissioner of the ACT Emergency Services Agency (ESA) designates what constitutes the Bushfire Prone Area (BPA) which is the trigger to apply the relevant bushfire planning and building standards under the ACT regulatory framework. In these locations contemporary building construction standards should be applied to all new development. The Bushfire Abatement Zone (BAZ) is part of the BPA surrounding the Canberra urban area and depicts the locations subject to more intensive planning and management to minimise the risk of bushfires.

Figures 4-6 show a new and recently developed area in Denman Prospect that demonstrates how the ACT Government managed the bushfire risk and new urban release areas under the previous BMS Version 3. Figures 4 and 5 show the typical outcome at the urban interface with respect to bushfire management, resulting in a large separation between the bushfire hazard vegetation and any buildings. This separation typically consists of perimeter roads, managed parkland, drainage infrastructure etc. Figure 6 shows the arrangement of the Strategic Bushfire Management Zones, consisting of an Inner Asset Protection Zone (IAPZ) and an Outer Asset Protection Zone (OAPZ).

The BMS outlines the standards for maintenance for the overall Asset Protection Zones (APZ) in the *Regional Fire Management Plan* (RFMP) and *Bushfire Operational Plans* (BOP) which are the sub-plans developed by the various land management agencies. The majority of the required APZ are maintained by various parts of the ACT government, being the road reserves and managed parklands. This provides for consistent APZ treatment and minimises the number of houses impacted by bushfire construction standard requirements. However, this also imposes ongoing management responsibility, costs and legal exposure. APZ in residential zones built prior to 2022 may use the IAPZ as mapped and determined by ESA to facilitate development. A fundamental premise of new development after 2022 is that the APZ footprint for new development will require the APZ to be provided within the development footprint (BMS p. 22). Distances of 200m and 700m are depicted for comparison with the (generally) 100m buffer applied at the interface and their rationale explored below. These are shown on Figures 4-6 to provide perspective for the analysis to be developed further below. Denman Prospect is used as an example of new development and Hawker of older style development.

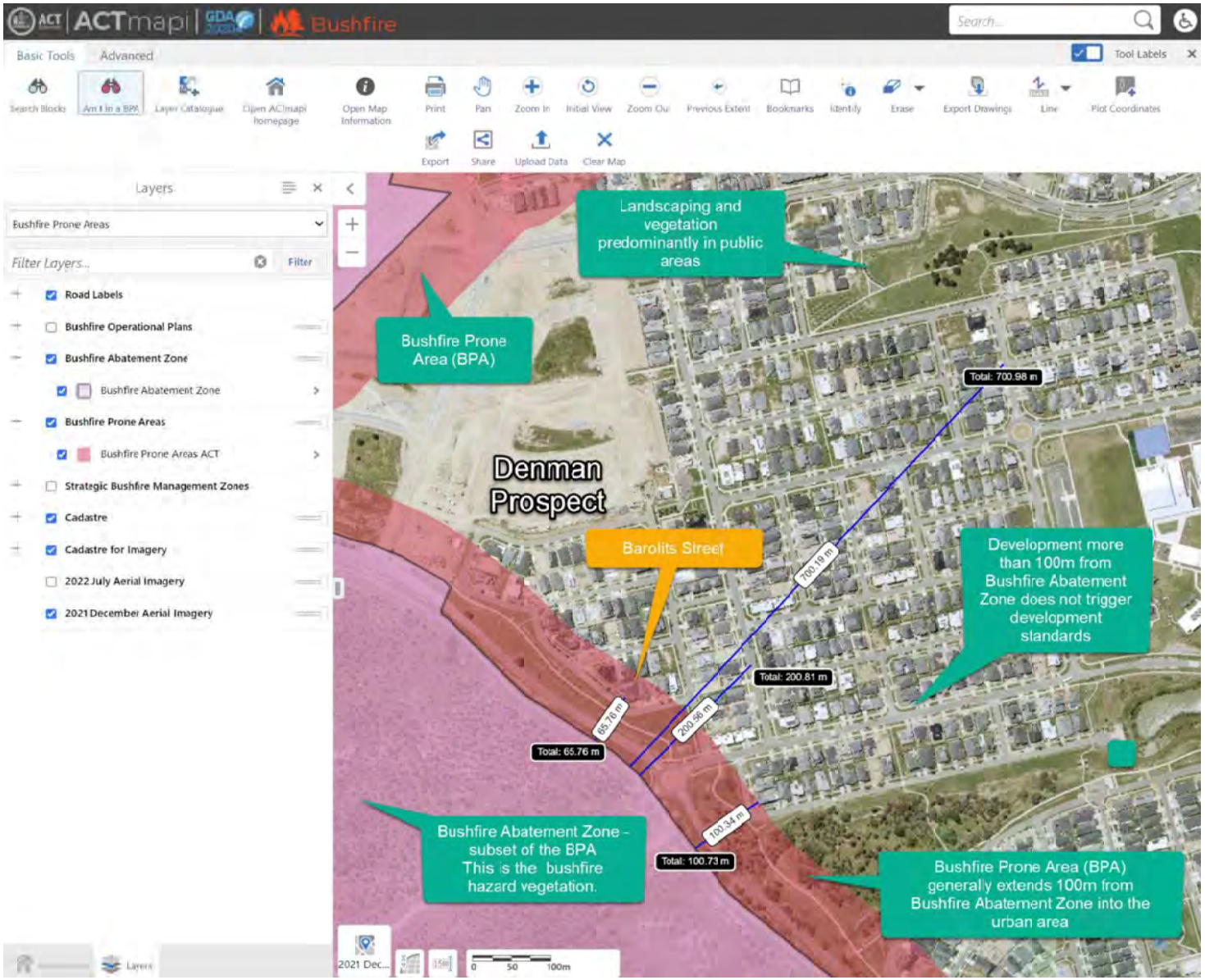

Figure 4: Extract from ACTmapi at Barolitis St, Denman Prospect showing development layout with relation to bushfire planning

Figure 5: Extract from Google streetview showing same location and view of bushfire management measures

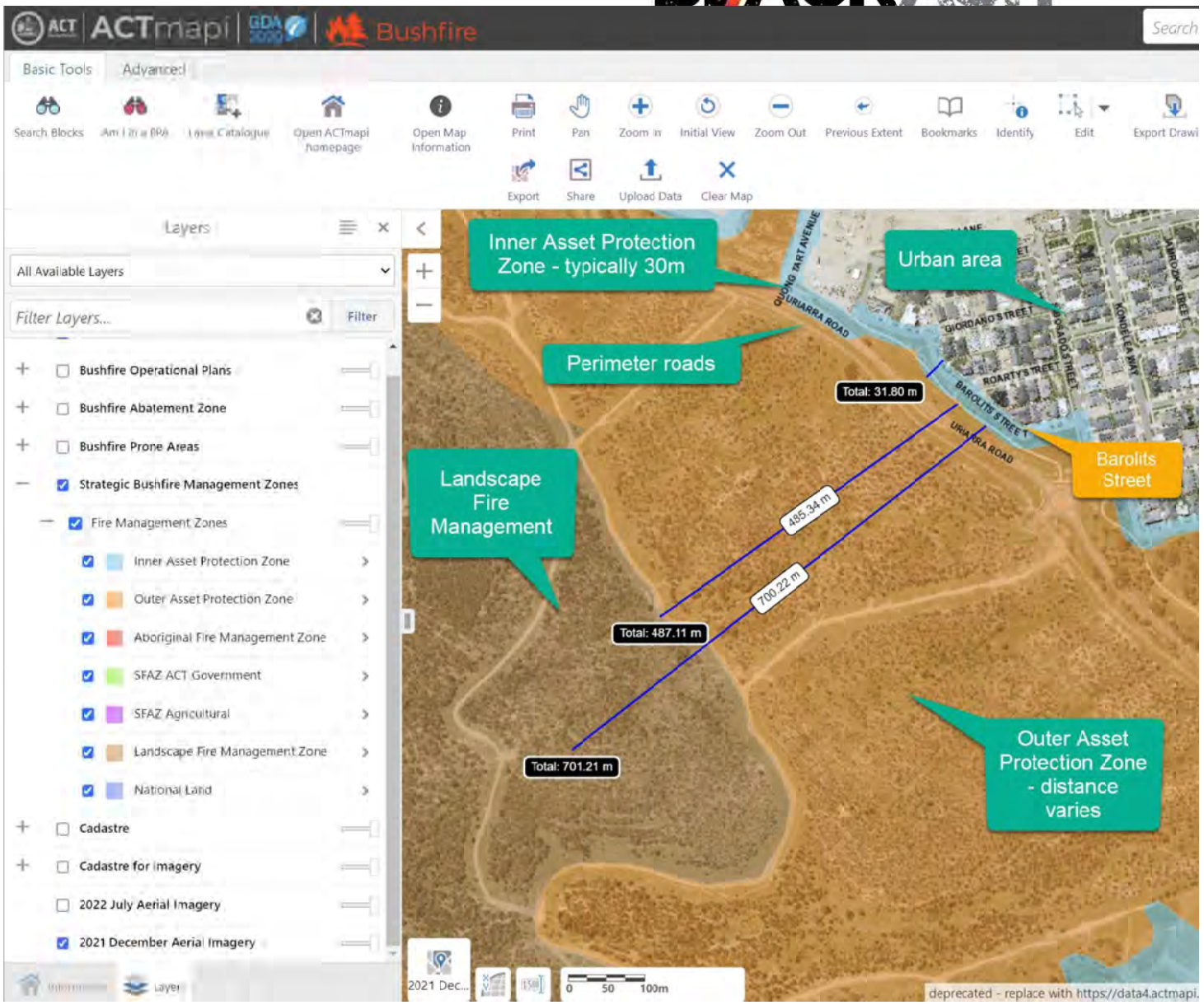

Figure 6: Strategic Bushfire Management Zones in context with urban development

Figures 7-9 provide an equivalent consideration of older development at Hawker. Older development areas adjacent to the WEIA such as Hawker, Chapman, and Kambah were developed prior to 2003 and the introduction of contemporary bushfire management methods. General observations of these older areas show that:

- subdivision design is generally not consistent with contemporary planning standards,
- no bushfire construction standards were applied to buildings,
- setbacks to the urban-bushland interface are often only several metres,
- lots are generally larger, and consequently there is significantly more bushfire vegetation contained within private lots as landscaping. This extends hazard vegetation around buildings and further into the urban area that potentially increases the risk of bushfire spread through house-to-house transmission,
- there are very often no perimeter roads, with development lots extending from cul-de-sacs,
- key infrastructure such as electricity transmission is often located at the urban-bushland interface and is also reliant on APZ maintenance.

Older development areas may also have sensitive use development (occupants are higher risk members of the community) located adjacent to significant bushfire hazard.

For these reasons, large IAPZ and OAPZ have been established in the past two decades for bushfire protection and are maintained by various ACT government units to standards detailed in the BMS and sub-plans. These larger APZ (in comparison to recently developed areas) are required as the full suite of Bushfire Protection Measures (BPM) used in contemporary planning and building have not been applied during the development stage. Therefore, greater separation via APZ is the primary method to mitigate bushfire risk through preventing flame contact, reducing radiant heat loads to development, and reducing the impact of ember attack. Other measures in combination also provide a balanced approach to new development including appropriate zoning and uses of land, access, services and construction standards.

Any future development for urban purposes adjoining this older style of development will significantly improve the bushfire protection to these existing suburbs by creating a greater separation between the older non-contemporary development and the bushfire hazard vegetation. However, development should not be contemplated as a vehicle to compensate for past planning decisions. New development must be designed in consideration of modern requirements that will also provide resilience benefits to legacy development.

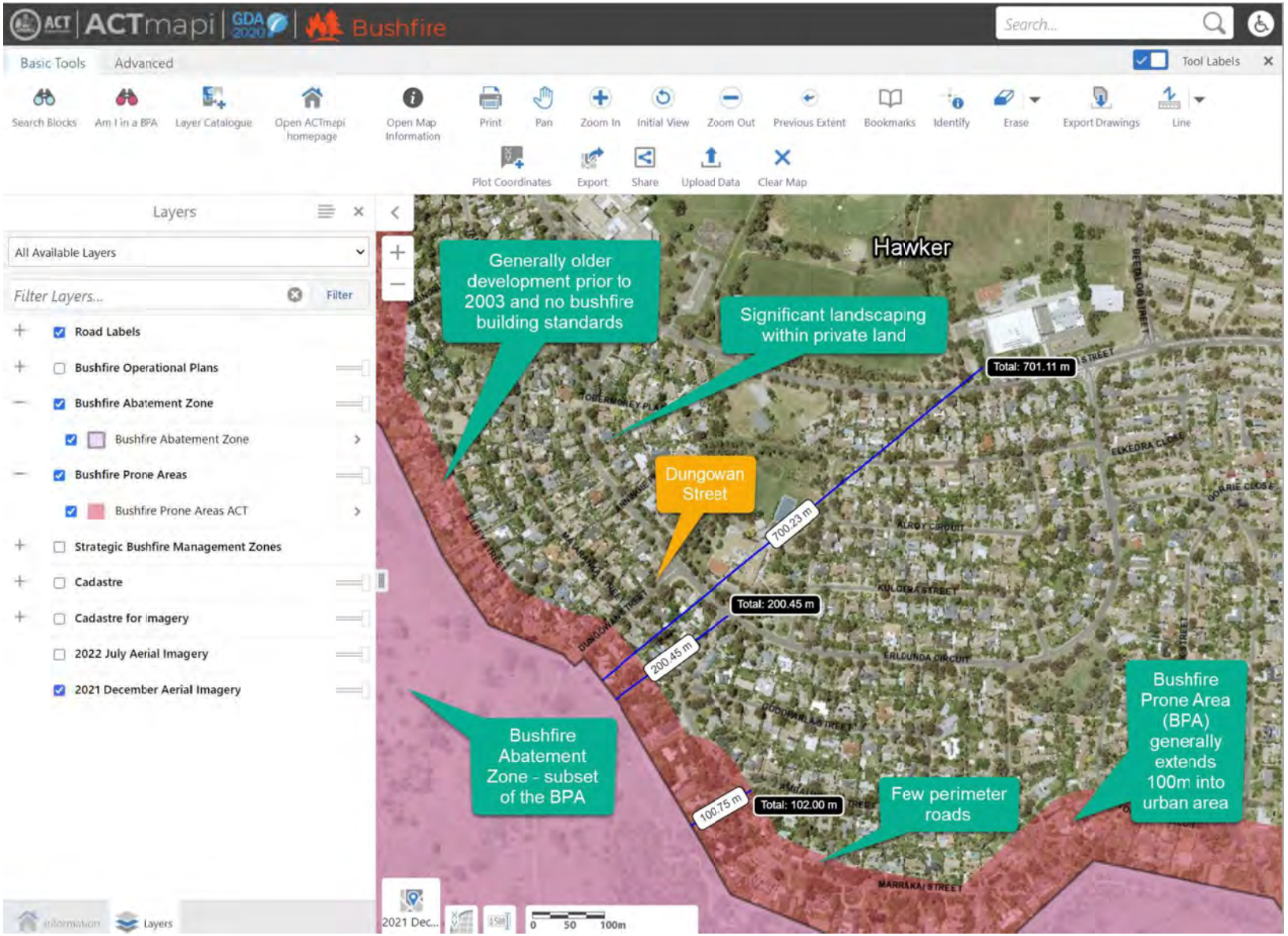

Figure 7: Extract from ACTmapi at Dungowan St, Hawker showing development layout with relation to bushfire planning

Figure 8: Extract from Google streetview showing same location and view of bushfire management measures

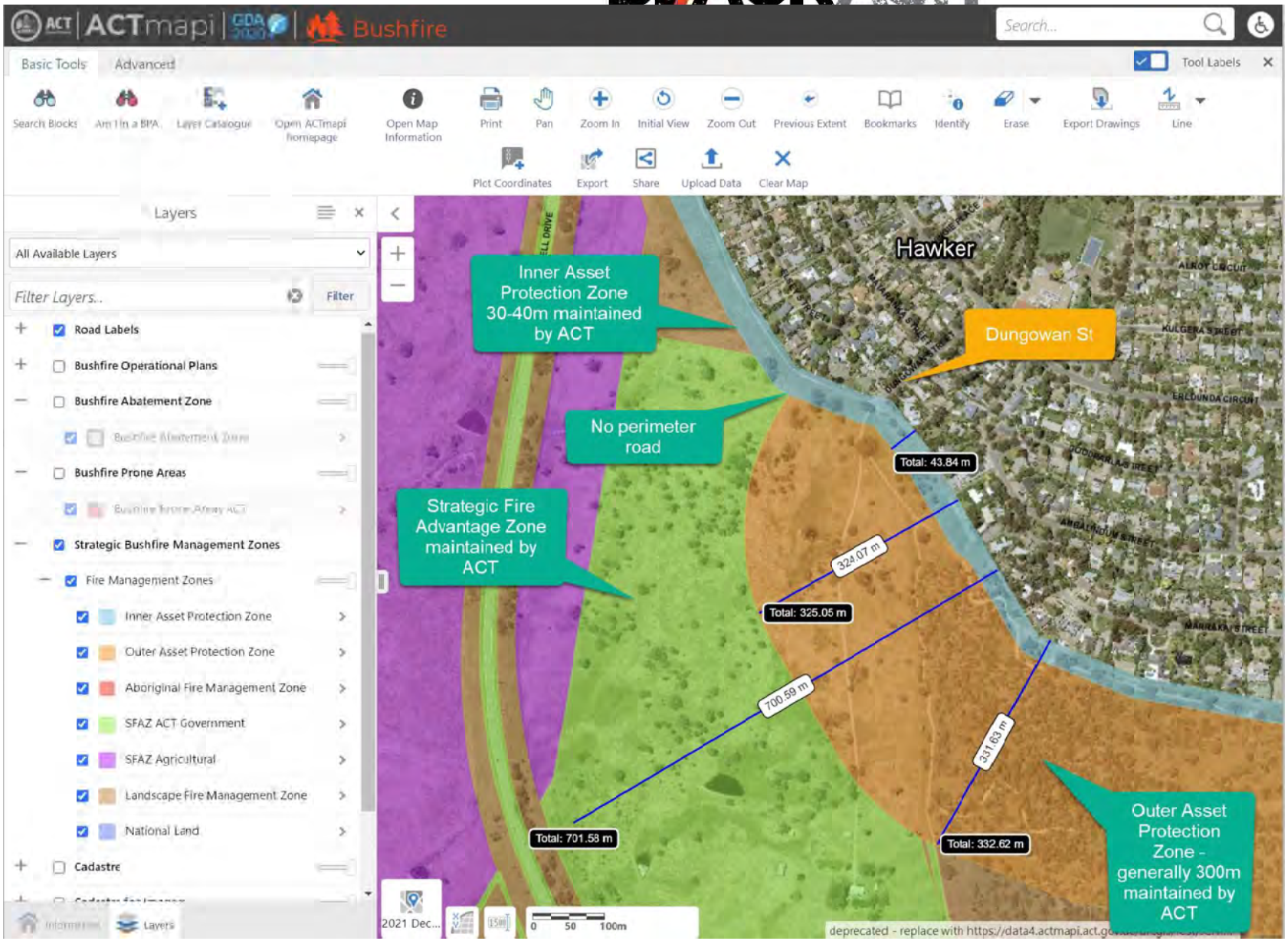

Figure 9: Strategic Bushfire Management Zones in context with urban development

3.5. Identified investigation areas and WEIACSA indicative development scenarios

The WEIACSA has used a three-stage approach using Geographic Information System (GIS) analysis to draw together information from a range of disparate sources building on previous work, public databases, and the initial preliminary WEIA studies.

The first stage, land capability assessment, looked at whether there were known constraints to developing the land for urban purposes and rating it accordingly, and this included high level bushfire risk.

The second stage, the land suitability assessment, clustered and compared areas of land and developed the five investigation areas shown in Figure 10. Three indicative development scenarios were then considered:

1. a 'low impact' footprint;
2. a focus on maintaining and enhancing habitat connectivity; and
3. a focus on building on infrastructure, land use and road efficiency.

The third stage was a multi-criteria analysis (Strategic Merit Test) that was performed using a scoring system developed in workshop with the Western Edge project control group who also undertook the analysis. The outcome of the WEIACSA assessment is qualified by various factors, notably the scale and accuracy of information available during this stage. The WEIACSA also regards the Preliminary Bushfire Assessment as of limited value with a conclusion that up to 95% of the WEIA may be suitable for development from a bushfire perspective and advises that bushfire factors played only a minor part in the assessment.

Whilst the WEIACSA has been used to provide background to this SBRA, this has primarily been through identifying the five broad investigation areas. These investigation areas generally removed areas of significant slope, most protected area reserves, and the areas adjacent to significant watercourses. For the purposes of this report, areas identified as nature reserves and other special use areas including Mount Stromlo Forest Park, as well as the steep areas to the south of Mount Stromlo Forest Park have also been excluded. These areas and those already excluded from the five investigation areas will be considered as bushfire hazard vegetation for the purposes of the report. Whilst some of these areas currently have relatively low threat grassland vegetation it is considered they are likely to be subject to future revegetation.

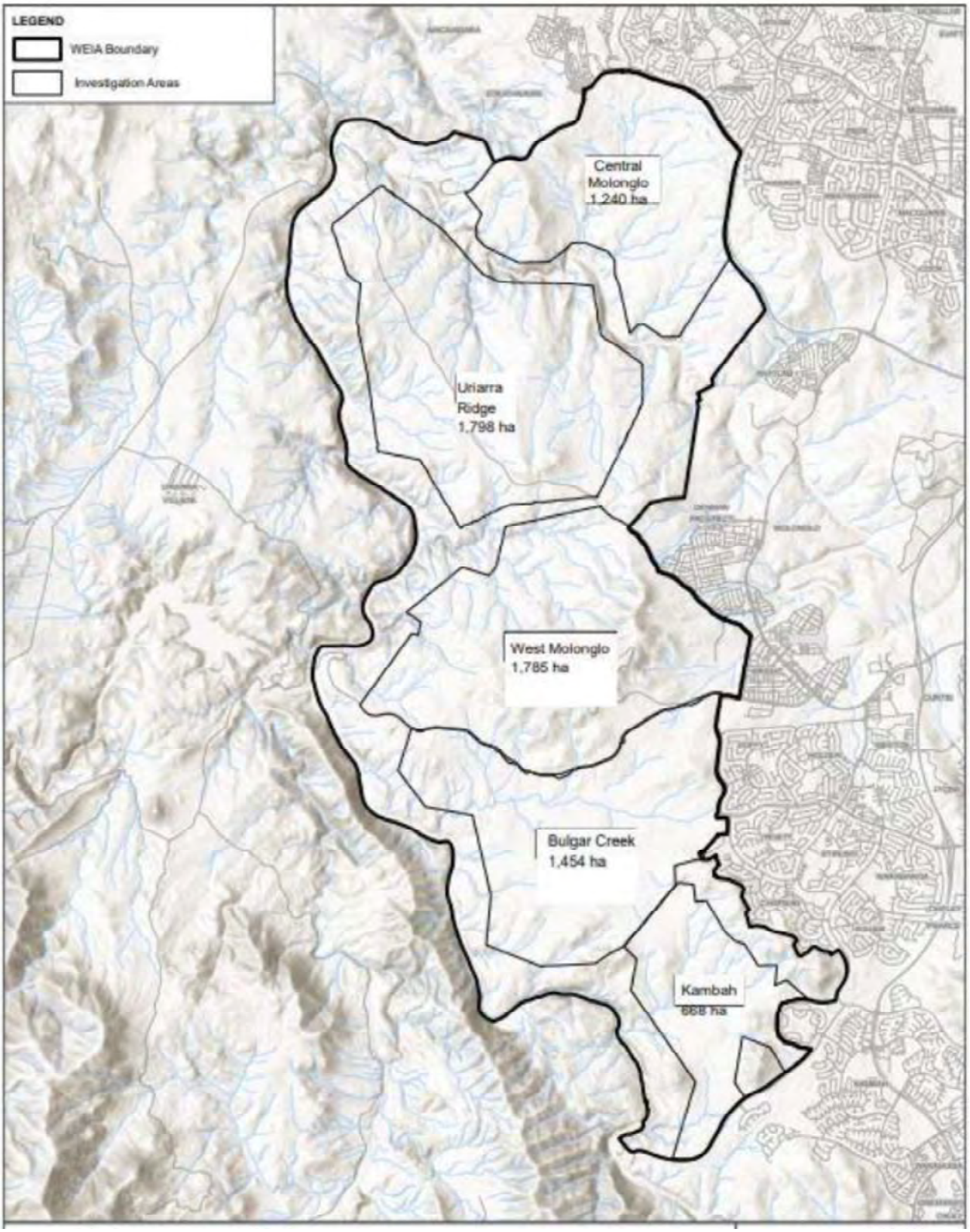

Figure 10: WEIA further investigation precincts (developed from WEIACSA 2023)

The scale of the bushfire hazard vegetation being considered is critical to the development of decision making about the suitability of land for potential urban development. This SBRA is designed to drill down further from the broad findings in the preliminary Bushfire Risk Assessment (EcoLogical Australia 2020). However, the bushfire considerations cannot be contemplated in isolation and are reliant on further detailed studies into biodiversity, water management, transport etc. which will ultimately constrain or facilitate the development pattern at a scale to develop zoning plans or Estate Development Plans. The SBRA will form another of the multiple layers of information that will need further consideration, integration and investigation before zoning plans can be developed.

Decision making regarding other constraints has not yet been finalised, therefore with respect to bushfire risk this SBRA is operating at the scale of kilometres, hundreds of metres, and hundreds of hectares. This will consider the impact of broad landscape scale fires on the five investigation areas identified on the assumption of this concept of scale. More detailed bushfire risk management planning will be required further along the process to accommodate final vegetation patterns determined by riparian or biodiversity requirements that will be internal to the current investigation areas. This is depicted in Figure 11.

Consideration of the impact on bushfire management of individual scenarios will need to be completed with other site constraints and considerations . Figure 12 provides an idea of overall scale consideration.

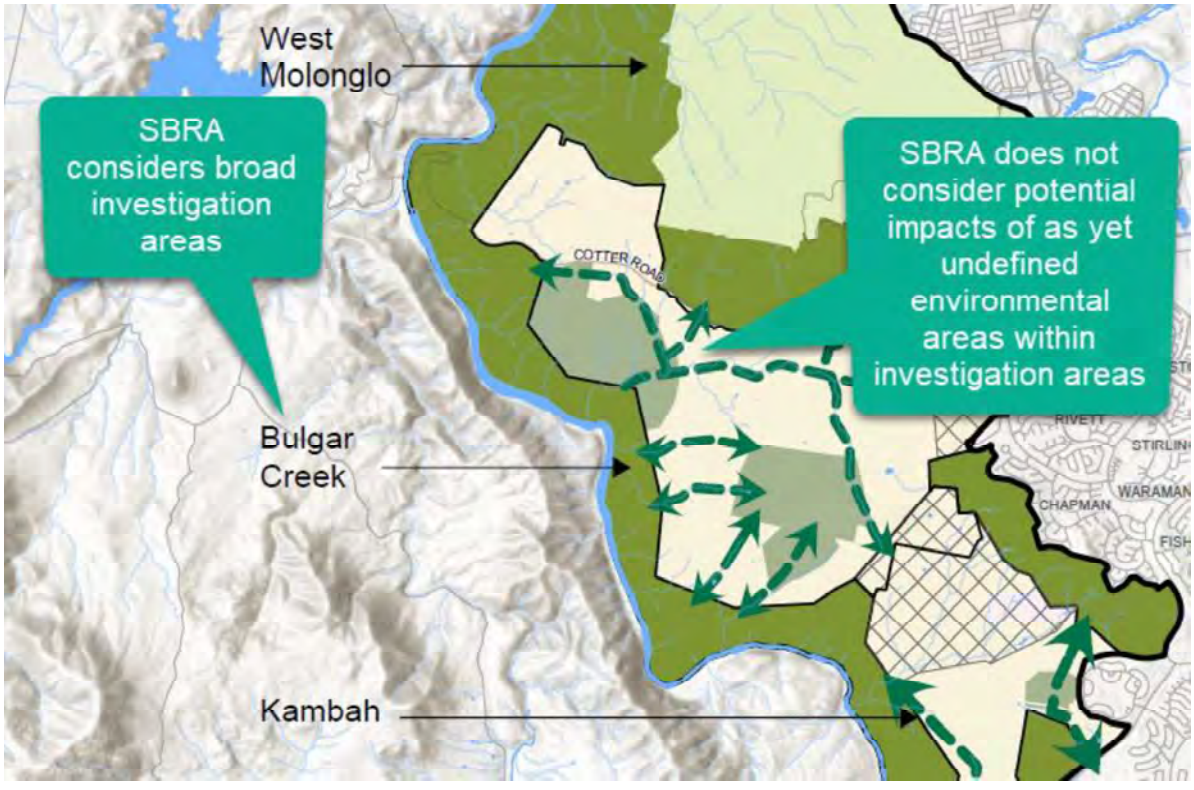

Figure 11: Scale considerations (adapted from an extract from Figure 8-2 "Scenario 2" in WEIACSA)

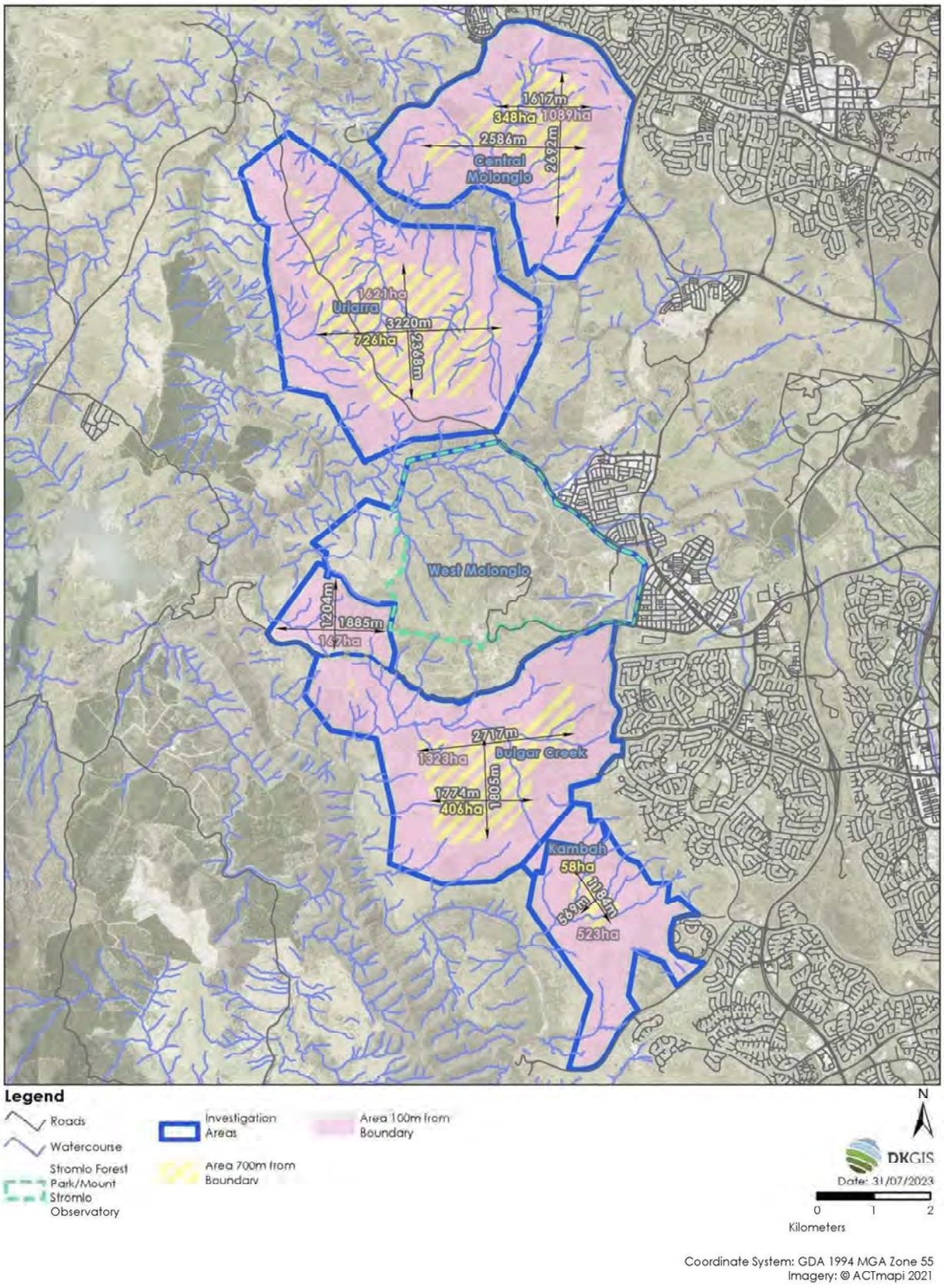

Figure 12: Scale of SBRA assessment showing investigation areas in context

4. Approach to the Strategic Bushfire Risk Assessment

The strategic planning process provides the opportunity to determine if the site complies with the legislative requirements pertaining to safety and potential risk to life and the capability of the site to comply with various bushfire objectives. This report uses a conservative approach suitable to the scale of investigation that demonstrates there are significant areas of land that can reasonably be developed once suitable detailed planning in accordance with BMS standards is applied.

The fundamental issue being tested is the determination of the suitability of the site for rezoning, and to identify those areas that may be more suitable, with respect to bushfire management considering bushfire safety and for the ability of future development to comply with BMS.

In a bushfire context, strategic land use planning must ensure that future land uses are in appropriate locations to minimise the risk to life and property from bushfire attack. The broad principles which apply to the analysis, and which are demonstrated in this report are consistent with the BMS and PBP:

- identifying land suitable for development in the context of bushfire risk and assuming broader environmental impacts can be managed internally to the investigation areas;
- identifying land suitable for development that will provide flexibility to comply with the minimum requirements of BMS;
- highlighting the need to provide adequate infrastructure associated with emergency evacuation and firefighting operations; and
- highlighting the need to accommodate appropriate ongoing land management practices.

This report will demonstrate that with respect to bushfire risk management there are multiple options for further urban development in the WEIA. The report is based on understanding this SBRA is the second stage in the planning process and further investigations and integration with other data will be required prior to undertaking any formal rezoning. The formal rezoning/s and EDP processes will provide the opportunities for greater consideration of detailed constraints and opportunities at the local scale, and the final development application for individual lots will provide another opportunity to ensure compliance with all contemporary standards.

It is further noted that the planning instrument and planning policy stages may be used to provide additional detail to improve outcomes such as setting additional locational requirements for sensitive use development, or requiring additional risk mitigation measures for those areas nearest the hazard.

5. Strategic Planning for Bushfires

Land use planning is widely recognised as an important measure for limiting future vulnerabilities and losses in areas of new development and a critical element for building disaster resilient communities.

The physical design and layout of communities and settlements are central to the many functions that sustain the social, economic and environmental support systems for the community. Land use planning provides the opportunity to manage new growth and residual risk resulting from new development by complying with legislation and standards, limiting or modifying the location of new development and influencing its layout. This can limit both the impacts of new development on natural systems, ecosystem services and hazards and the flow on impacts on the existing community, as well as limiting the impacts that natural hazards can have on new development and its users.

The strategic planning system is particularly important in contributing to the creation of resilient, safe and sustainable communities that are in keeping with the policy and intent of government.

The *National Strategy for Disaster Resilience* (2011)[2] recognises that strategic planning is essential in creating safer and sustainable communities. In keeping with the policy and intent of government at all levels. Priority outcomes of Section 3.6 include:

- *All levels of decision making in land use planning and building control systems take into account information on risks to the social, built, economic and natural environments.*

This SBS has been completed having regard to the following Commonwealth documents:

- *National Strategy for Disaster Resilience* (2011)
- *National Disaster Risk Reduction Framework* (2018)
- *Land Use Planning for Disaster Resilient Communities* (2020)

Comprehensive consideration of bushfires and risks in the planning system needs sound understanding of the landscape context and risks, as well as clarity on risk management principles and on the approach to strategic planning and development controls that will adequately mitigate identified risks. Where there are competing policy objectives, such as biodiversity conservation and fuel reduction, an

[2] NSDR https://www.homeaffairs.gov.au/emergency/files/national-strategy-disaster-resilience.pdf

agreed methodology or guidance is critical. As such, planning decisions must be based on the best available evidence and rigorous merits-based assessment to ensure that new development - people, homes and businesses are not exposed to unacceptable risk from bushfire. The framework provided within PBP provides the minimum requirements for new development within bushfire prone areas.

The importance of sound land use planning has been recognised in most significant bushfire inquiries, including Natural Disasters in Australia which noted that land use planning that considers natural hazard risks is the single most important mitigation measure in preventing future disaster losses in areas of new development, and that planning, and development controls must be effective, to ensure that inappropriate developments do not occur[3]. The application of legislation, policy, and guidelines provides one of the most effective means of bushfire planning to ensure future developments are resilient and capable of protecting life.

This report focuses on disaster resilience which means planners, hazard leaders, emergency managers and other built environment professionals can contribute to:

- understanding and anticipating bushfire risks before they happen and developing more resilient land use and built form tailored to address bushfire risks
- minimising the increase in risks to people and disruptions to social and economic functions when a disaster strikes by ensuring compliance with territory requirements for new development in Bushfire Prone Areas.

This report is consistent with the balanced approach provided within the ACT regulatory framework including the SBMP and BMS for new development in bushfire prone areas. This recognises the need to protect human life and provide safe operating environments for fire and emergency services, while having due regard to the environmental impacts, development potential of land and the need to cater for growing populations.

It is key to understand this planning approach also provides for substantial risk reduction to existing older development where new urban development improves or supports bushfire risk mitigation through removal of hazards or improvements to access and infrastructure. In some cases this may be a significant enough improvement that changes to the Bushfire Prone Area and/or Bushfire Abatement Zone maps may be required. Chapter 19 of the Royal Commission into National Natural Disaster

[3] Ellis, S et al (2004) National Inquiry on Bushfire Mitigation and Management (p.92)

Arrangements Report 2020 (Royal Commission Report)[4] considers land-use planning and building regulation, and makes some clear observations and provides relevant recommendations. Figure 13 provides a summary of the Royal Commission Report findings (p. 399) and suggests using the planning system to potentially address legacy risk. The strategic planning process may provide a method to address legacy risk in older development areas by removing bushfire vegetation and/or reducing the size of the vegetation being retained and/or fragmenting the vegetation that will remain. This is not the only method to manage legacy risk, however it has the advantage of being a one-off significant improvement undertaken by government, as opposed to developing various incentive, compliance, and insurance related measures all of which may have limited take up and or need to be provided on an ongoing basis.

Summary

19.1 Land-use planning regimes and building regulations govern how and where homes, businesses and infrastructure are built. They influence the exposure and vulnerability of structures and communities to natural hazards. They can also be used to mitigate risk and improve resilience.

19.2 Land-use planning decisions and exposure to risk are inextricably linked. Existing, or 'legacy', risk needs to be identified and communicated, and proportionate action taken to reduce risk. Clear risk information supports individuals, communities, and governments to take informed action to manage those risks. Governments should work together to address legacy risk.

19.3 The likelihood of increases in the severity and frequency of natural hazards should be taken into account in land-use planning and building decisions. These decisions should be informed by the best available data on current and future risk.

19.4 The effectiveness of some standards intended to mitigate natural hazard risk is currently unclear and should be assessed to ensure that resources spent on mitigation efforts are effective and proportionate. Consideration should be given to the costs and benefits of amending the National Construction Code to add the resilience of buildings to natural hazards as an objective, in addition to the protection of life.

Figure 13: Summary of Royal Commission Report findings for land-use planning and building standards (p. 399)

[4] Royal Commission Report https://naturaldisaster.royalcommission.gov.au/system/files/2020-11/Royal%20Commission%20into%20National%20Natural%20Disaster%20Arrangements%20-%20Report%20%20%5Baccessible%5D.pdf

6. House loss and distance from bushfire vegetation

It has been long understood that there is a relationship between providing separation from bushfire hazard vegetation and the survivability of life and property during a bushfire. This is built into all current Australian planning and building approaches to mitigating bushfire risk for new development including the BMS, PBP, the National Construction Code (NCC) and *AS 3959:2018 Construction of buildings in bushfire-prone areas* (AS3959). These systems use an approach that the impact of radiant heat and other forms of bushfire attack (flame contact, embers, fire generated wind, smoke) are reduced by providing separation of the development from the bushfire front and the use of materials that reduces ignition potential and ember penetration.

The methodology calculates the range of radiant heat flux generated by the relevant combination of vegetation, slope and weather for a given design bushfire (FFDI 100 in the ACT) and determines an appropriate level of construction to meet the minimum standards required. The heat flux is measured in kW/m^2 and is generally referred to as the Bushfire Attack Level (BAL). Various building elements and systems are then specified for construction to meet the standard, for instance steel framed windows and toughened glass instead of wooden frames and float glass. Figure 14 is a pictorial representation of the forms of bushfire attack and relation to contemporary bushfire construction standards in AS3959, and Figure 15 (BMS Table 17, p. 78) provides additional descriptive details on the relationship to calculated BAL used for new development.

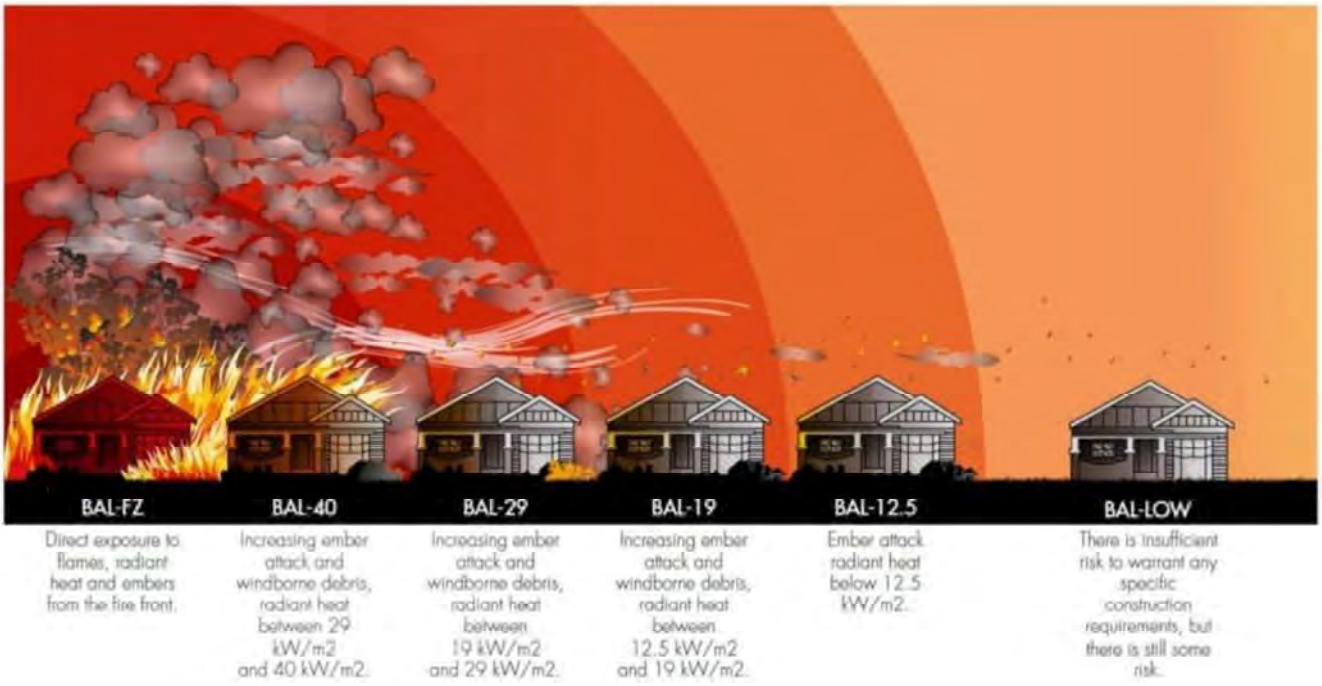

Figure 14: Forms of bushfire attack with relation to BAL construction standards (CFA 2012; AS3959:2018)

HEAT FLUX EXPOSURE	DESCRIPTION	AS 3959 CONSTRUCTION LEVEL
N/A	Minimal attack from radiant heat and flame due to the distance of the building from the vegetation, although some attack by burning debris is possible. There is insufficient threat to warrant specific construction requirements.	BAL-LOW
≤12.5	Attack by burning debris is significant with radiant heat (not greater than 12.5kW/m²). Radiant heat is unlikely to threaten building elements (such as unscreened glass). Specific construction requirements for ember protection and accumulation of debris are warranted.	BAL-12.5
>12.5 ≤19	Attack by burning debris is significant with radiant heat flux (not greater than 19kW/m²) threatening some building elements (such as screened glass). Specific construction requirements for embers and radiant heat are warranted.	BAL-19
>19 ≤29	Attack by burning debris is significant and radiant heat flux (not greater than 29kW/m²) threatens building integrity. Specific construction requirements for ember and higher levels of radiant heat are warranted. Some flame contact is possible.	BAL-29
>29 ≤40	Radiant heat flux and potential flame contact could threaten building integrity.	BAL-40
>40	Significant radiant heat and significantly higher likelihood of flame contact from the fire front will threaten building integrity and result in significant risk to residents.	BAL-FZ

Note: Attack from burning debris increases with the Bush Fire Attack Level. Source AS 3959.

Figure 15: Table 17 of BMS – Radiant heat flux exposure and appropriate Bushfire Attack Level (p. 77)

Figure 16 is taken from the BMS (Table 20, p. 83) and details the acceptable solution for minimum separation between development and the bushfire vegetation, which is the overall APZ, to meet the residential subdivision standard of BAL-29 or less than 29kW/m2 of radiant heat based on a design fire of 1090K using the commonly adopted methodology. Sensitive use developments have significantly larger required separation. The purpose of setting a minimum standard is to ensure any new development lots created will be able to provide a practical building envelope where the building will have to be built to a maximum building standard of BAL-29. This is a recognition of the costs, limitations, and practicalities of building to higher standards (BAL-40 & BAL-FZ). As this methodology has been in use in various forms for over 20 years, the building industry has developed a range of designs, construction materials and elements, and systems that can provide relatively cost effective housing to this standard. Effectively the lower the BAL the lower the cost impact on building. This retains some flexibility that allows a developer to choose to build to a higher standard if they choose, and potentially reduce the required APZ separation.

KEITH VEGETATION FORMATION	EFFECTIVE SLOPE				
	Up slopes and flat	>0°-5°	>5°-10°	>10°-15°	>15°-20°
	Distance (m) from the asset to the predominant vegetation formation				
Rainforest	11	14	18	23	30
Forest (wet and dry sclerophyll) including Coastal Swamp Forest, Pine Plantations and Sub-Alpine Woodland	24	29	36	45	56
Grassy and Semi-Arid Woodland (including Mallee)	12	16	20	25	32
Forested Wetland (excluding Coastal Swamp Forest)	10	12	16	20	26
Freshwater Wetlands	5	6	6	7	8
Grassland	10	12	13	15	17

Figure 16: BMS Table 20 – Minimum distances for APZ – residential development, FFDI 100 areas (<29kW/m2, 1090K)

There is a long-established and sophisticated understanding of the benefits of providing significant separation between development and a bushfire. The methodology adopted by Australian authorities via the National Construction Code 2022 (NCC) and the various regulatory frameworks allow for a BAL-Low rating, and this is the distance beyond which it is considered there is insufficient risk of bushfire attack to warrant requiring specific bushfire construction standards. This distance is measured as 100m for all vegetation formations except for grassland which is measured as 50m, which is recognition of the reduced risk from grassland wildfires. This pertains to the very different fuel type and in particular the significantly lower danger of ember attack as a greater quantity of fuel is consumed and the type of fuel is much less likely to generate burning embers. Figure 17 is an extract from BMS Table 21 (p. 84) demonstrating this.

KEITH VEGETATION FORMATION	EFFECTIVE SLOPE				
	BAL-FZ	BAL-40	BAL-29	BAL-19	BAL-12.5
	Distance (m) asset to predominant vegetatio class				
ALL UPSLOPE AND FLATLAND					
Rainforest	< 8	8 -< 11	11 -< 16	16 -< 23	23 -< 100
Forest (wet and dry sclerophyll) including Coastal Swamp Forest, Pine Plantations and Sub-Alpine Woodland	< 18	18 -< 24	24 -< 33	33 -< 45	45 -< 100
Grassy and Semi-Arid Woodland (including Mallee)	< 9	9 -< 12	12 -< 18	18 -< 26	26 -< 100
Forested Wetland (excluding Coastal Swamp Forest)	< 7	7 -< 10	10 -< 14	14 -< 21	21 -< 100
Freshwater Wetlands	< 4	4 -< 5	5 -< 7	7 -< 11	11 -< 100
Grassland	< 8	8 -< 10	10 -< 15	15 -< 22	22 -< 50

Figure 17: Extract from BMS Table 21 (p.84) highlighting BAL-12.5 cutoff distances

Notwithstanding this, it is recognised that burning debris may be carried much greater distances, potentially over several kilometres in the worst conditions with landscape scale fires in forests with heavy bark fuel loads. Embers are capable of starting spot fires significantly ahead of the fire and are capable of starting fires more than 100m ahead of the urban-bushland interface. Not every ember will start a fire and many small fires away from the fire front may be easily extinguished or self-extinguish if there is insufficient fine fuel (<6mm) to ignite another fire.

It is important to be aware that the methodology used, and the standards derived from it are based on delivering a significant risk reduction, however this does not mean risk is eliminated. It is also important to understand that the methodology used is currently limited to an upper limit of FFDI of 100 as the maximum design fire, and that there is evidence of fires burning under more extreme weather conditions (Catastrophic) and awareness that the impacts of climate change will result in greater FFDI being observed on the worst fire weather days.

Following the Canberra 2003 fires, Chen and McAneney[5] produced a seminal research paper using data from Duffy ACT and several other major fires to establish the extent of bushfire penetration into Australian urban areas. The conclusion was that whilst there is a wide variety of impacts within urban areas, and variables such as action by fire agencies and homeowners as well as consideration of different building types, however there is a clear inverse relationship between distance from the urban-bushland interface and the probability of home destruction. It is important to note that at the time of the study the percentage of development built to any bushfire construction standard was significantly lower than in 2023.

They concluded that:

- '*the maximum distance at which homes are destroyed is typically less than 700m*.'

Figure 18 shows the curves establishing the cumulative distribution of homes destroyed in relation to distance from nearby bushland. Figure 19 shows the percentage of homes destroyed at different distance ranges, with the Victorian 'Ash Wednesday' (1983) figures complicated by the high proportion of houses located within the bushland and 'intermix' area (houses located within a mixed bushland and developed landscape). These demonstrate a clear relationship and support the conclusion that no houses in the fires studied were destroyed beyond the 700m distance.

[5] Chen, K and McAneney, J. 2004 Quantifying bushfire penetration into urban areas in Australia, Geophysical Research Letters Vol. 31

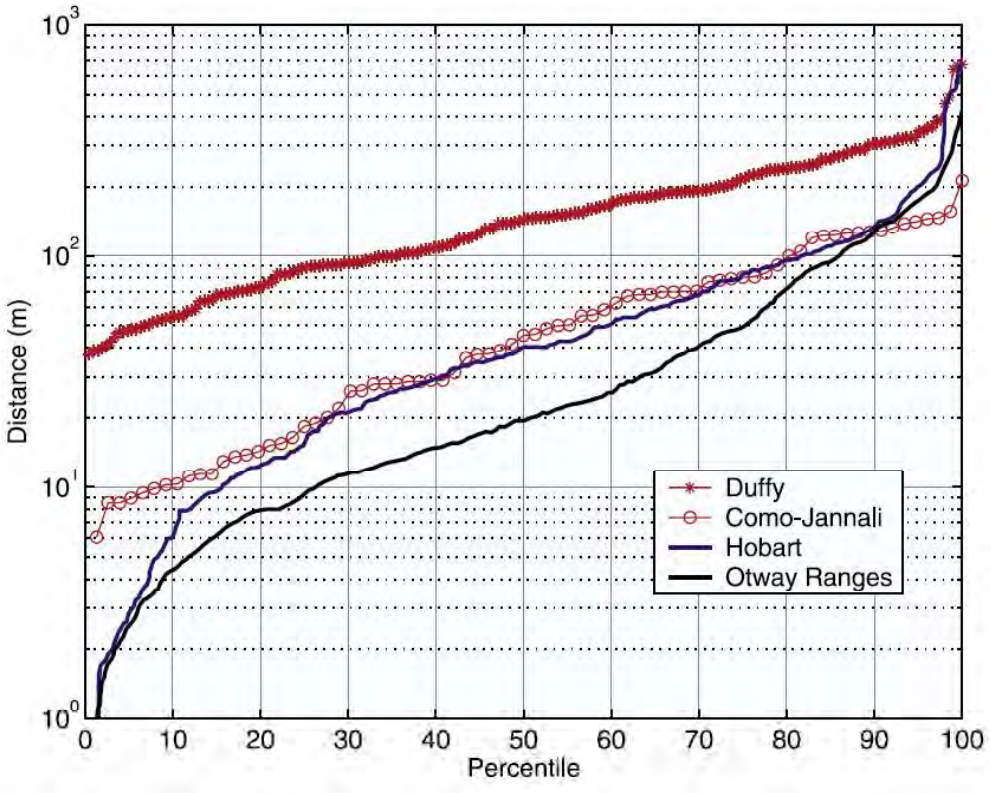

Figure 18: Chen & McAneney 2004 (Figure 1) houses destroyed and distance from bushland.

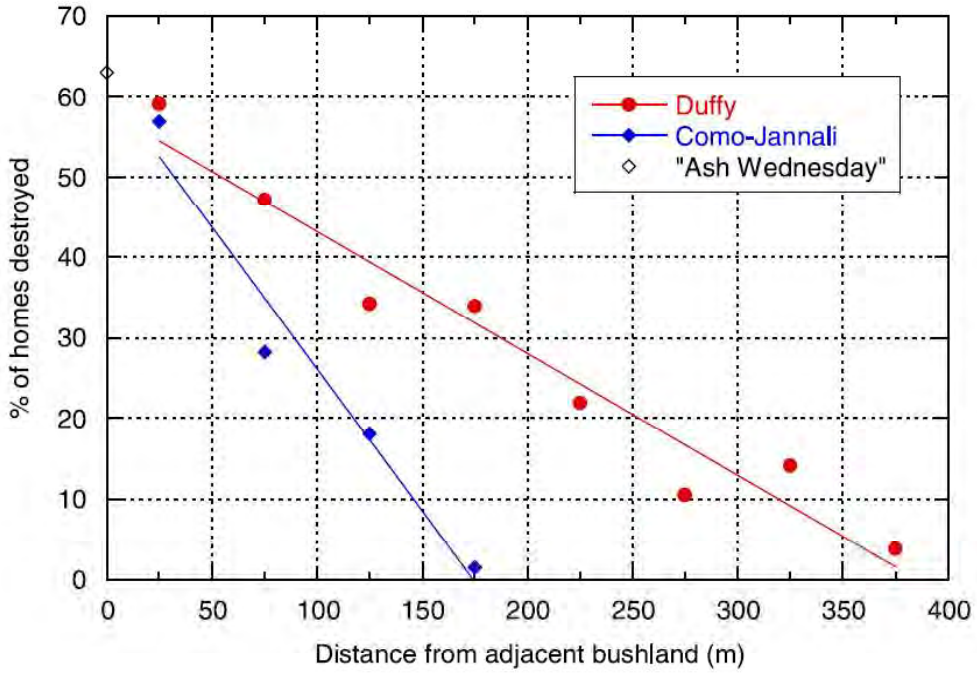

Figure 19: Chen & McAneney 2004 (Figure 2) percentage of homes destroyed at different distance ranges

In 2010, following the Victorian 'Black Saturday' bushfires Crompton et al [6] prepared a paper reevaluating the history of building damage and loss of life since 1925, that both referenced and supported the conclusions of the earlier 2004 work. The conclusions regarding an analysis of the Kinglake and Marysville fires supports the position that the vast majority of homes lost are within 200m from the bushland. Figure 20 is the Figure 4 referred to in the analysis.

> *"Destroyed buildings in Kinglake and Marysville were categorized as a function of distance from bushland boundaries, and these data are presented in Fig. 4. A key feature is that about 25% of destroyed buildings were located physically within the bushland boundary, and 60% and 90% were within 10 and 100 m of bushland (Fig. 4). Most buildings in Marysville lay within 200 m of the bushland boundary and, given the wind change that occurred early in the evening on 7 February 2009, would have been subject to ember attack from multiple directions (Victorian Bushfires Royal Commission 2009)."*

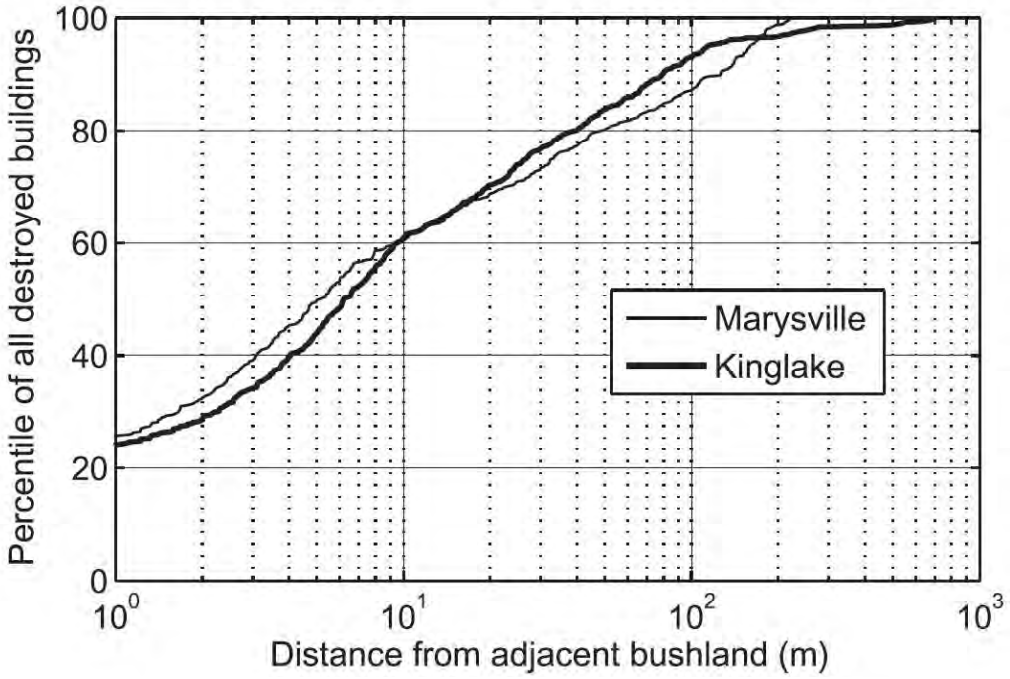

Figure 20: Extract from Crompton et al paper 2010

The reasonable conclusion from this research is that at 700m distance from the interface there is a very high likelihood of significantly limiting damage from bushfires and preventing house loss.

[6] Crompton, RP, McAneney, J, Chen, K, Pielke, RA and Haynes, K 2010 Influence of location, population and climate on building damage and fatalities due to Australian bushfire: 1925-2009. Weather, Climate and Society 2010 Vol. 2

7. Legislative Framework

In the ACT, a dual planning regime has been established with the Australian Government and ACT Government sharing statutory and strategic planning responsibility, with ACT Government responsible for most day-to-day planning matters (BMS, p. 17). The land use planning framework as it relates to land use planning and bushfire in ACT is embedded in the *Planning Act 2023*, *Planning (General) Regulation 2023, Emergencies Act 2004* and the *Emergencies Regulation 2004* and these are enacted through the SBMP and BMS (2023). The SBMP complements the Territory Plan and informs the development of future zoning. The *Planning Act 2023* was passed by the Assembly on 6 June 2023 and while some provisions have commenced, it will not commence in full until later in 2023. Section 4 of BMS deals with strategic planning. The BMS details the requirements for strategic planning as it pertains to bushfire risk management and sets the relevant aim, objectives and standards to be followed.

The BMS articulates the regulatory framework for ACT strategic planning processes and refers specifically to the Planning Strategy and the linkages to the ACT Wellbeing Framework and district and zone policies. The BMS outlines the process to be undertaken during the strategic planning phase and to be applied during the future development of District and Zone Policies that set the future zoning. Figure 21 is an amended extract from BMS Figure 3 showing where this SBRA fits into the strategic planning process.

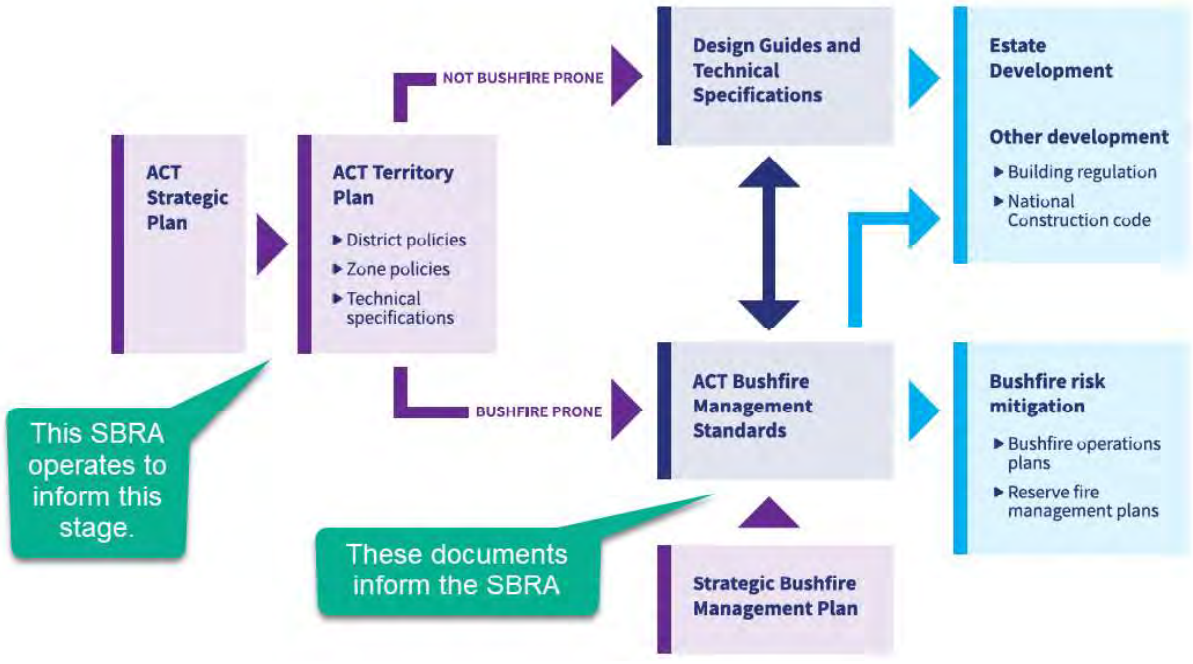

Figure 21: Amended extract from BMS 2023 Figure 3 (p. 28) showing where this SBRA operates.

It is suggested that a formal Strategic Bushfire Study (SBS) should be prepared when developing the relevant District and Zone Policies for any WEIA investigation area that ultimately is proposed for

rezoning. It is critical the SBS principles are followed at the rezoning stage to provide adequate consideration of the site specific characteristics and nature of the proposed rezoning. This is consistent with the first statement of BMS Section 4 (p. 28):

> *Strategic planning is the first stage in the planning process. It is needed to ensure that businesses and future development are not exposed to an unacceptable risk of bush fire. Unacceptable risk is a situation where bushfire protection measures have not been considered or addressed in accordance with AS3959 Construction of buildings in bushfire prone areas, NCC, and the BMS, where development occurs within the bushfire prone area.*

At the subdivision design stage, a formal SBS may be required. It is suggested that should an SBS have not been prepared at rezoning stage, it must be required for any Estate Development Plan.

The BMS requires detailed analysis to support development. The broad principles which apply to this analysis are:

- *ensuring land is suitable for development in the context of bushfire risk*
- *ensuring new development on BPL will comply with PBP*
- *minimising reliance on performance-based solutions*
- *providing adequate infrastructure associated with emergency evacuation and firefighting operations*
- *facilitating appropriate ongoing land management practices*.

BMS also outlines exclusion of inappropriate development in bushfire prone areas which includes:

- *the development area is exposed to a high bushfire risk and should be avoided*
- *the development is likely to be difficult to evacuate during a bushfire due to its siting in the landscape, access limitations, fire history and/or size and scale*
- *the development will adversely affect other bushfire protection strategies or place existing development at increased risk*
- *the development is within an area of high bushfire risk where density of existing development may cause evacuation issues for both existing and new occupants*
- *the development has environmental constraints to the area which cannot be overcome.*

The SBS considers the issues in Figure 22, which have been used to inform this SBRA. The BMS requires that any SBS developed to support a district policy or specification must be endorsed by EPSDD, the ESA and any other relevant agency. The BMS also explicitly recognises that regardless of the combination of bushfire protection measures or fuel mitigation measures, there will always be an element of residual risk and that it is not possible to eliminate all risk (p. 31).

ISSUE	DETAIL	ASSESSMENT CONSIDERATIONS
Bush fire landscape assessment	A bush fire landscape assessment considers the likelihood of a bush fire, its potential severity and intensity and the potential impact on life and property in the context of the broader surrounding landscape.	> The bush fire hazard in the surrounding area, including: • Vegetation • Topography • Weather > The potential fire behaviour that might be generated based on the above. > Any history of bush fire in the area. > Potential fire runs into the site and the intensity of such fire runs; and > The difficulty in accessing and suppressing a fire, the continuity of bush fire hazards or the fragmentation of landscape fuels and the complexity of the associated terrain.
Land use assessment	The land use assessment will identify the most appropriate locations within the masterplan area or site layout for the proposed land uses.	> The risk profile of different areas of the development layout based on the above landscape study. > The proposed land use zones and permitted uses. > The most appropriate siting of different land uses based on risk profiles within the site (i.e., not locating development on ridge tops, SFPP development to be in lower risk areas of the site); and > The impact of the siting of these uses on APZ provision.
Access and egress	A study of the existing and proposed road networks both within and external to the masterplan area or site layout.	> The capacity for the proposed road network to deal with evacuating residents and responding emergency services, based on the existing and proposed community profile. > The location of key access routes and direction of travel; and > The potential for development to be isolated in the event of a bush fire.
Emergency services	An assessment of the future impact of new development on emergency services.	> Consideration of the increase in demand for emergency services responding to a bush fire emergency including the need for new stations/ brigades; and > Impact on the ability of emergency services to carry out fire suppression in a bush fire emergency.
Infrastructure	An assessment of the issues associated with infrastructure and utilities.	> The ability of the reticulated water system to deal with a major bush fire event in terms of pressures, flows, and spacing of hydrants; and > Life safety issues associated with fire and proximity to high voltage power lines, natural gas supply lines etc.
Adjoining land	The impact of new development on adjoining landowners and their ability to undertake bush fire management.	> Consideration of the implications of a change in land use on adjoining land including increased pressure on BPMs through the implementation of Bush Fire Management Plans.

Figure 22: Requirements of a Strategic Bushfire Study (BMS Table 1 p. 31-32)

8. Bushfire Landscape Assessment

8.1. Bushfire Prone Area

Under the Strategic Bushfire Management Plan (SBMP), the Commissioner of the ACT Emergency Services Agency (ESA) designates what constitutes the Bushfire Prone Area (BPA) which is the trigger to apply the relevant bushfire planning and building standards under the ACT regulatory framework. The entire WEIA is identified as being within the BPA as shown in Figure 23.

8.2. Vegetation assessment

Vegetation is the fundamental physical component of determining the bushfire behaviour. Vegetation, in broad terms provides the available fuel to be consumed by a bushfire. Fuel load and arrangement represents a considerable component in dictating to a large degree the behaviour of fire in terms of intensity, rate of spread and flame height, and typically relates to dead plant material less than 6mm thick, and live plant material thinner than 3mm. Vegetation type, density and arrangement can further influence fire behaviour and intensity. Vertical and horizontal continuity is also a significant element. Thus, vegetation forms a key consideration within this report. The vegetation provides a basis for the determination for bushfire intensity mapping.

The vegetation assessment has been completed in accordance with BMS. The predominant vegetation is classified by structure or formation using the system adopted by David Keith (2004) and by the general description using BMS. The predominant vegetation types across the five investigation areas are grassland with smaller areas of grassy woodland. Forest fuels are generally restricted to the reserve system that follows the major riparian corridors. The vegetation mapping used for the basis of the fire intensity mapping is shown as Figure 24.

8.3. Slopes influencing bushfire behaviour

The slope of the land under the classified vegetation has a direct influence on the rate of fire spread, the intensity of the fire and the ultimate level of radiant heat flux. The effective slope is the slope of the ground under the hazard (vegetation). There are a wide range of slopes across the WEIA, however as the investigation areas were defined to remove the steep areas for a variety of reasons the majority of the slopes within the five investigation areas are moderate and in the 0-5 degrees range.

The slope mapping used for the basis of the fire intensity mapping is shown as Figure 25.

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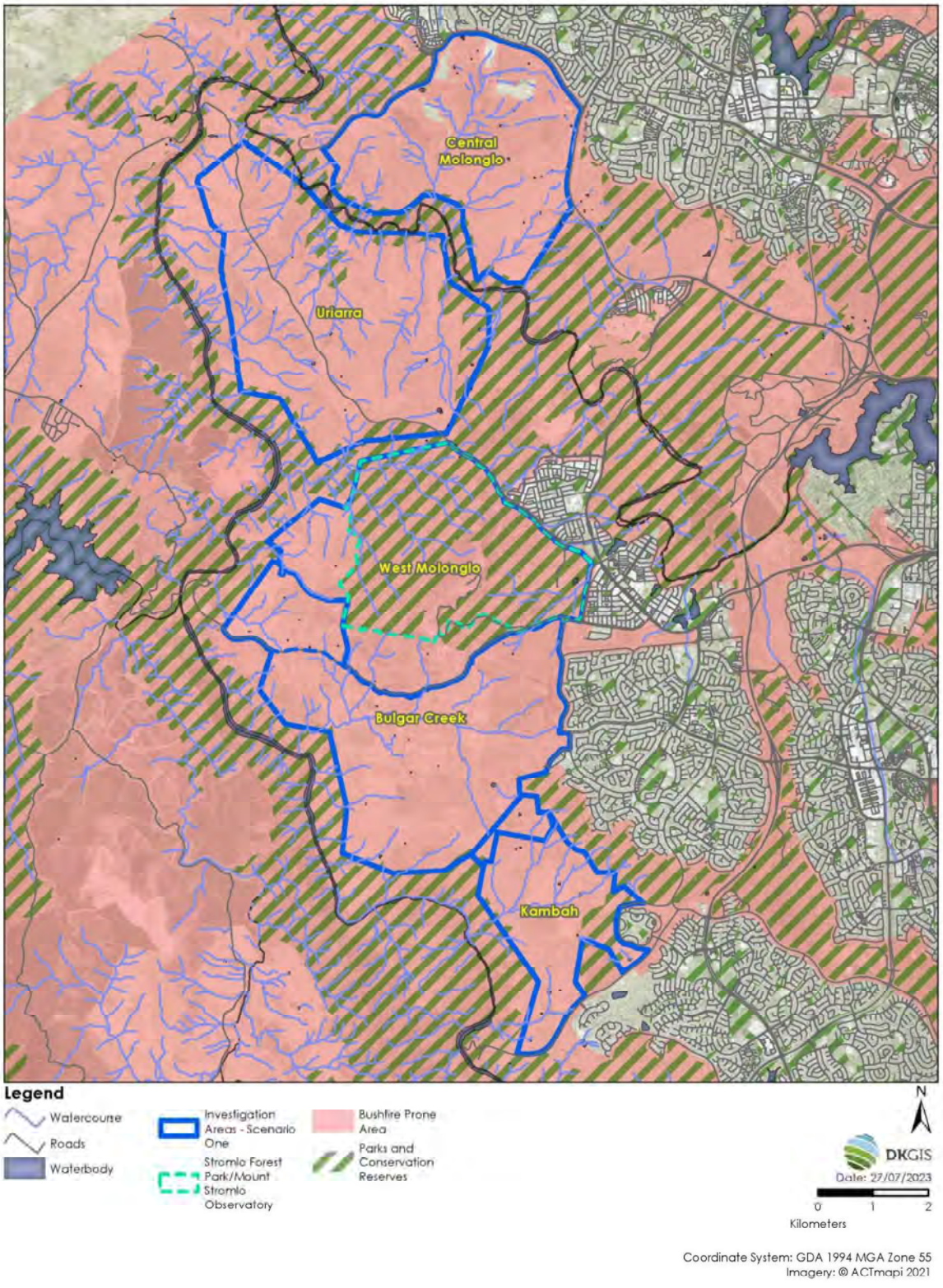

Figure 23: Bushfire Prone Area map

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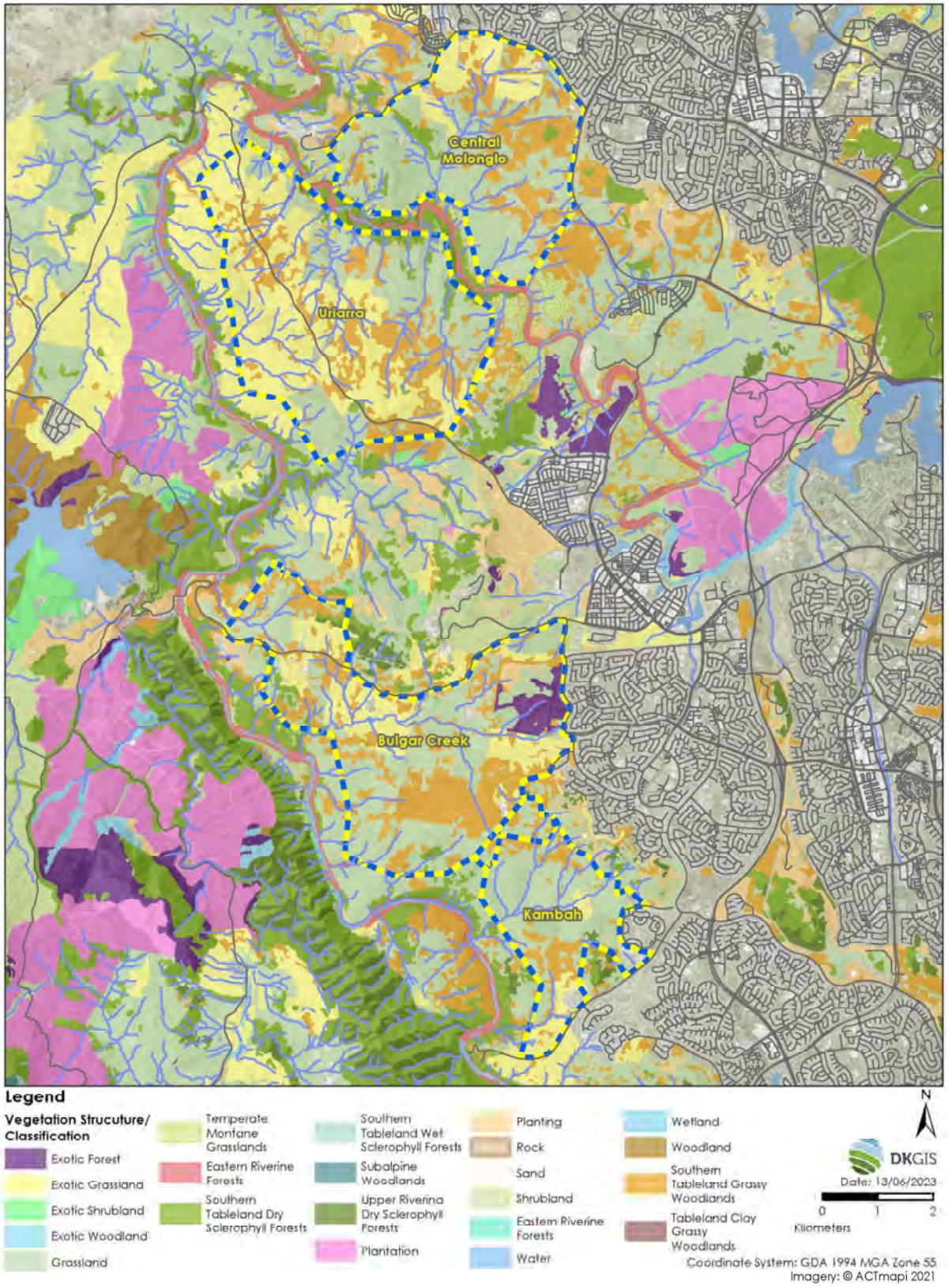

Figure 24: Vegetation map

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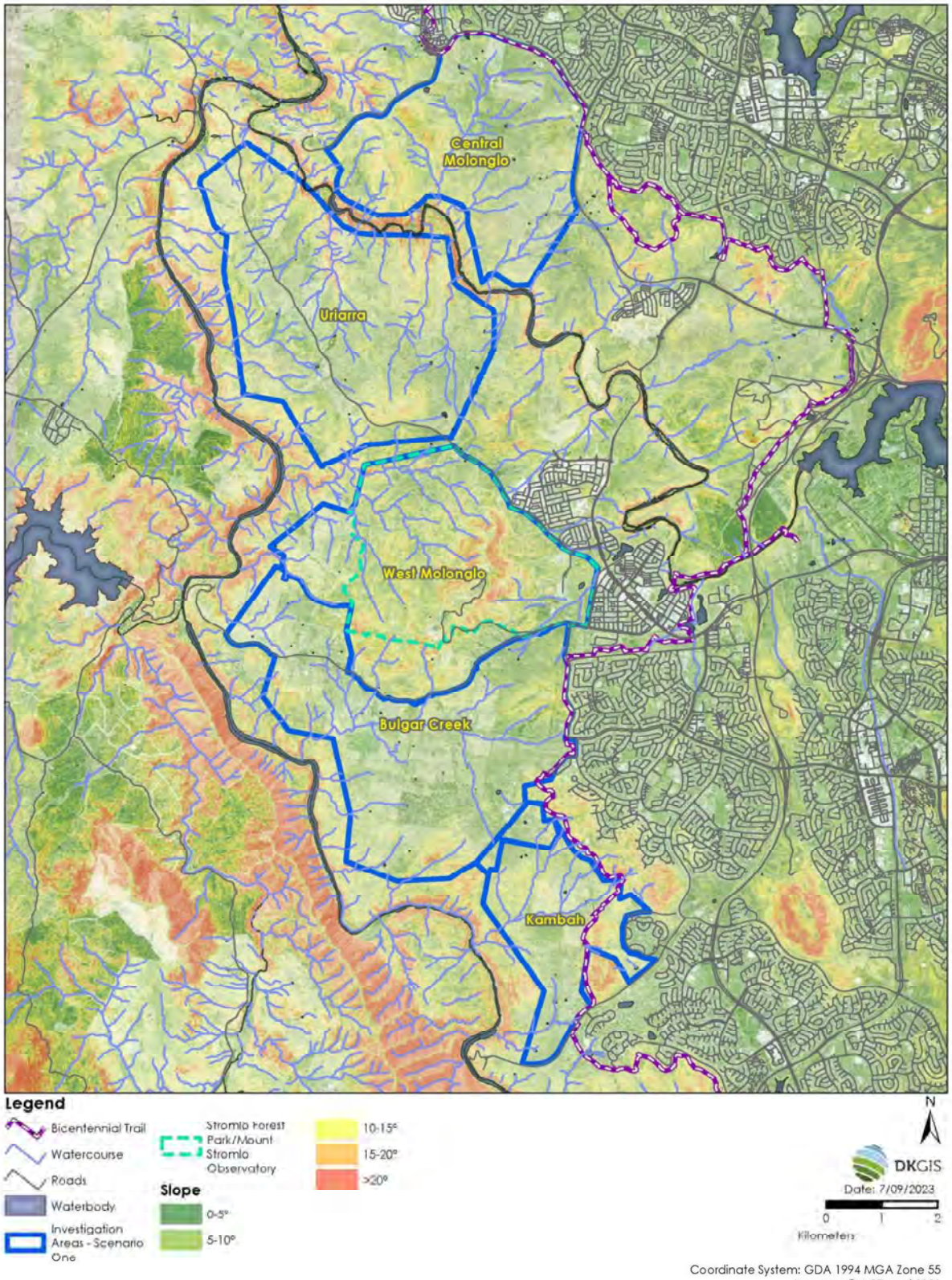

Figure 25: Slope map

8.4. Site suitability

Fire intensity:

The overall purpose of this SBRA is to guide decision making for future rezoning potential considering the bushfire risk at a large scale, using the 5 investigation areas provided. The analysis has been completed using fire intensity modelling based on the current mapped vegetation and slope within the five investigation areas. The modelling used a design bushfire of FFDI 100 and combines a range of fire scenarios with winds ranging from the north through the west to the southwest as these are the conditions likely to occur on bad fire weather days. The modelled intensity is then separated into three categories, Low, Moderate and High to improve legibility on the mapping. The fire intensity mapping is represented by the colours on the mapping. The modelling maps are presented as Figures 26-37.

House loss and distance to interface:

The majority of house loss occurs within the first 100m of the urban-bushland interface, with a high likelihood of 90% of losses occurring within 200m and an upper limit of house loss at 700m. The investigation area boundaries are used as the urban-bushland interface, and consider that the primary bushfire threat will come from outside the investigation areas. The 100m, 200m and 700m distances are shown on the fire intensity mapping as perimeters from the interface to the higher threat vegetation outside, on the assumption that the majority of the investigation areas will be developed as urban land. The relation of the areas inside the perimeters, to the perimeter, provides scale to the potential urban areas available within the relative distances from the interface. Where there is existing urban development adjoining the investigation area (e.g. eastern side of Central Molonglo) that has been considered as managed land not capable of sustaining a significant bushfire and the perimeter distances are affected accordingly.

Scale of consideration:

The five investigation areas have largely excluded the steepest land, and the majority of parks and conservation reserves. The Mount Stromlo Forest Park and the steep area south of the park (north side of Cotter Rd) has also been excluded. There is some intrusion of reserves into the mapped investigation areas of Uriarra and Kambah, however it was considered that for this large scale exercise this was appropriate. The mapping is done at a large scale and provides analysis without considering the impact that other constraints such as future internal green corridors will have on ultimate development areas. These vegetated corridors will ultimately be assessed using the standard methodology to determine bushfire risk and suitable BAL, as will those along the investigation area interface.

Amendment of investigation areas to aid analysis:

Notwithstanding the basic premise of using the investigation areas as provided, the West Molonglo and Bulgar Creek areas have been amended. The West Molonglo investigation area consists largely of area

that is to be excluded by the Mount Stromlo Forest Park, and much of the remaining area to the south bounded by Cotter Road is relatively steep and likely to be unsuitable with respect to bushfire management as it has the potential for increased fire behaviour, and has therefore been excised from the amended investigation area. Additionally, the western part of the Bulgar Creek investigation area has characteristics that are similar to that amended area. Therefore, the western area of Bulgar Creek and the remainder of West Molonglo have been combined at the point in the Bulgar Creek investigation area which is narrowest. The revised investigation area of Bulgar Creek is shown as Figures 30 & 31, and the revised investigation area to be as the West Molonglo area is shown as Figures 32 & 33. This revised West Molonglo investigation area has been created as the characteristics of the new combined area have a different risk profile to the Bulgar Creek area. With respect to the revised West Molonglo investigation area the risk profile differs as:

- it has the potential to be impacted by fire from three aspects, with the northwest and western aspects likely to be subject to significant landscape scale fire impact,
- it has a much larger perimeter to volume ratio,
- it is significantly narrower and provides only limited areas greater than 700m from the interface,
- it is significantly more likely to be isolated during a bushfire,
- it is significantly further away from an established urban area providing safe refuge until such time as the Bulgar Creek investigation area is potentially full developed.

Finally, consideration of the revised Bulgar Creek investigation area and the Kambah investigation area show there may be an advantage in combining these areas, so the respective southern and northern area boundaries are removed, and the two areas considered as a whole (Figures 36 & 37). This provides an additional option for consideration however will not be scored. This is suggested because:

- the potentially developable areas are slightly increased,
- both areas have connection to existing developed areas including alternate road access,
- There may be synergies in coordinating those stages,
- The Cooleman Ridge Nature Reserve would become a lesser bushfire threat to older development in Rivett, Chapman and Kambah if separated by development from the landscape scale threat posed by the Murrumbidgee River corridor and lands to the west.

Each intensity map is followed by a map showing the buffer distances with the current reserve system for additional context (Source: ACTGOV TP Overlay Zone).

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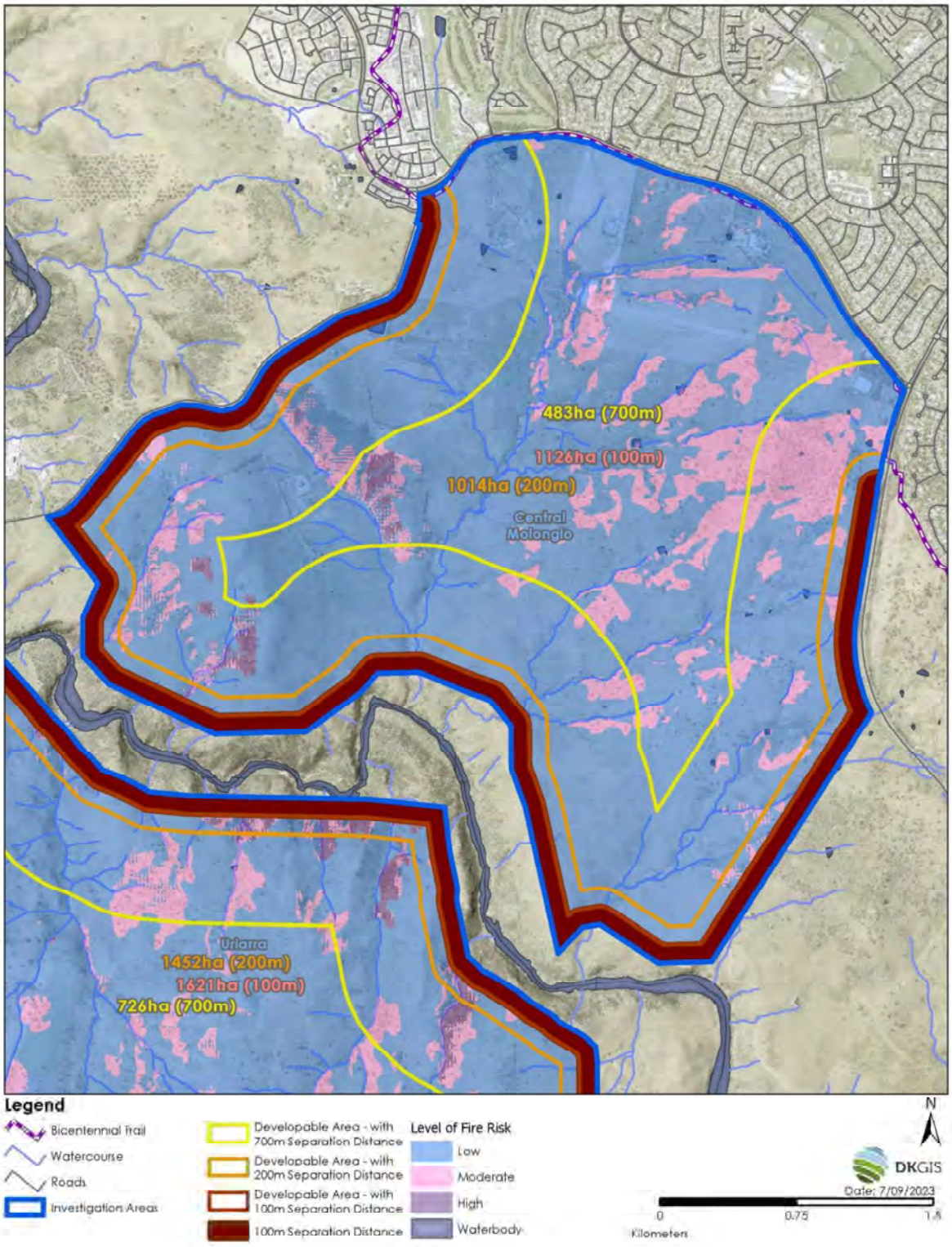

Figure 26: Fire intensity mapping Central Molonglo

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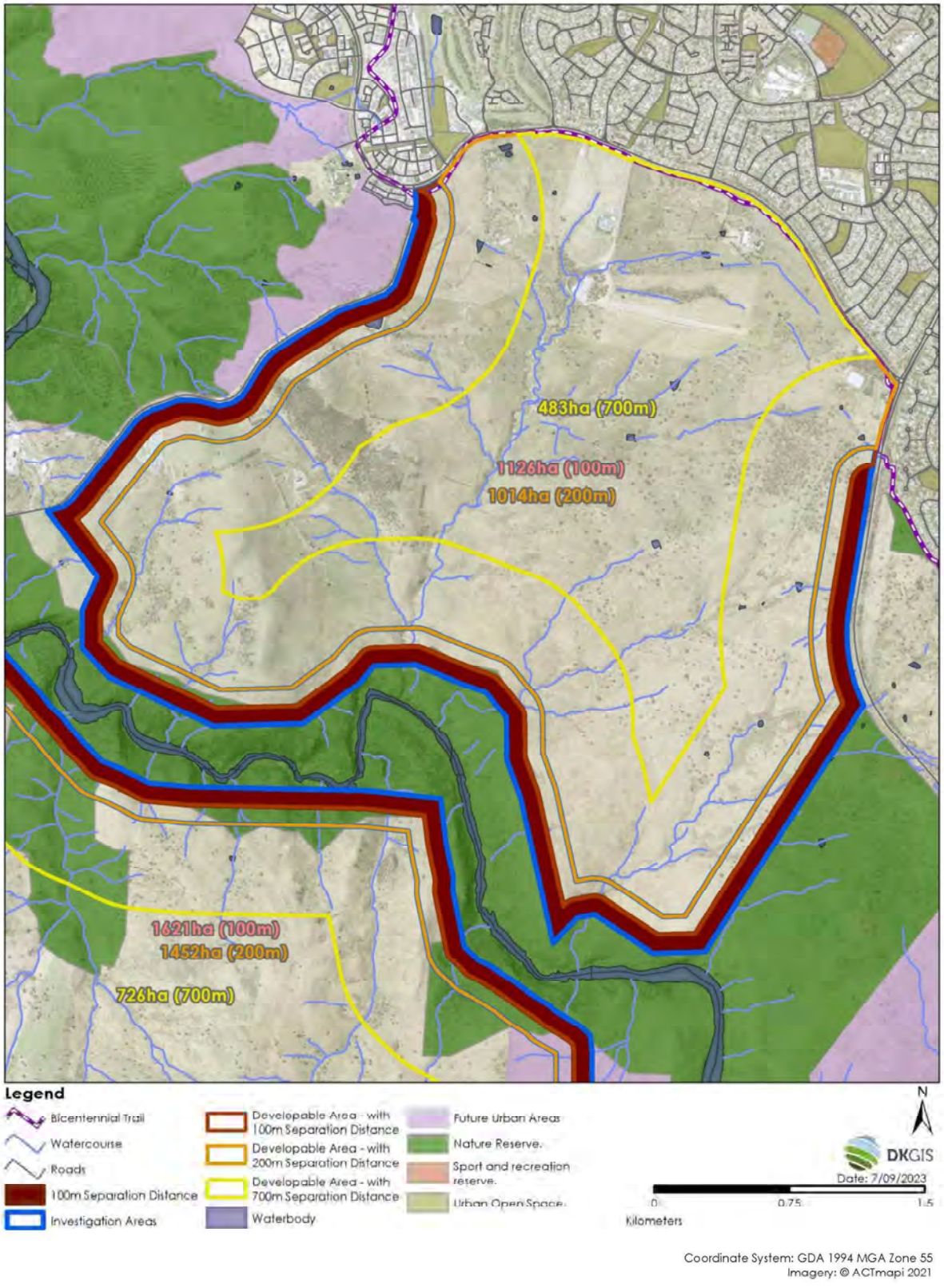

Figure 27: Risk buffers and reserves - Central Molonglo (Source: ACTGOV TP Overlay Zone)

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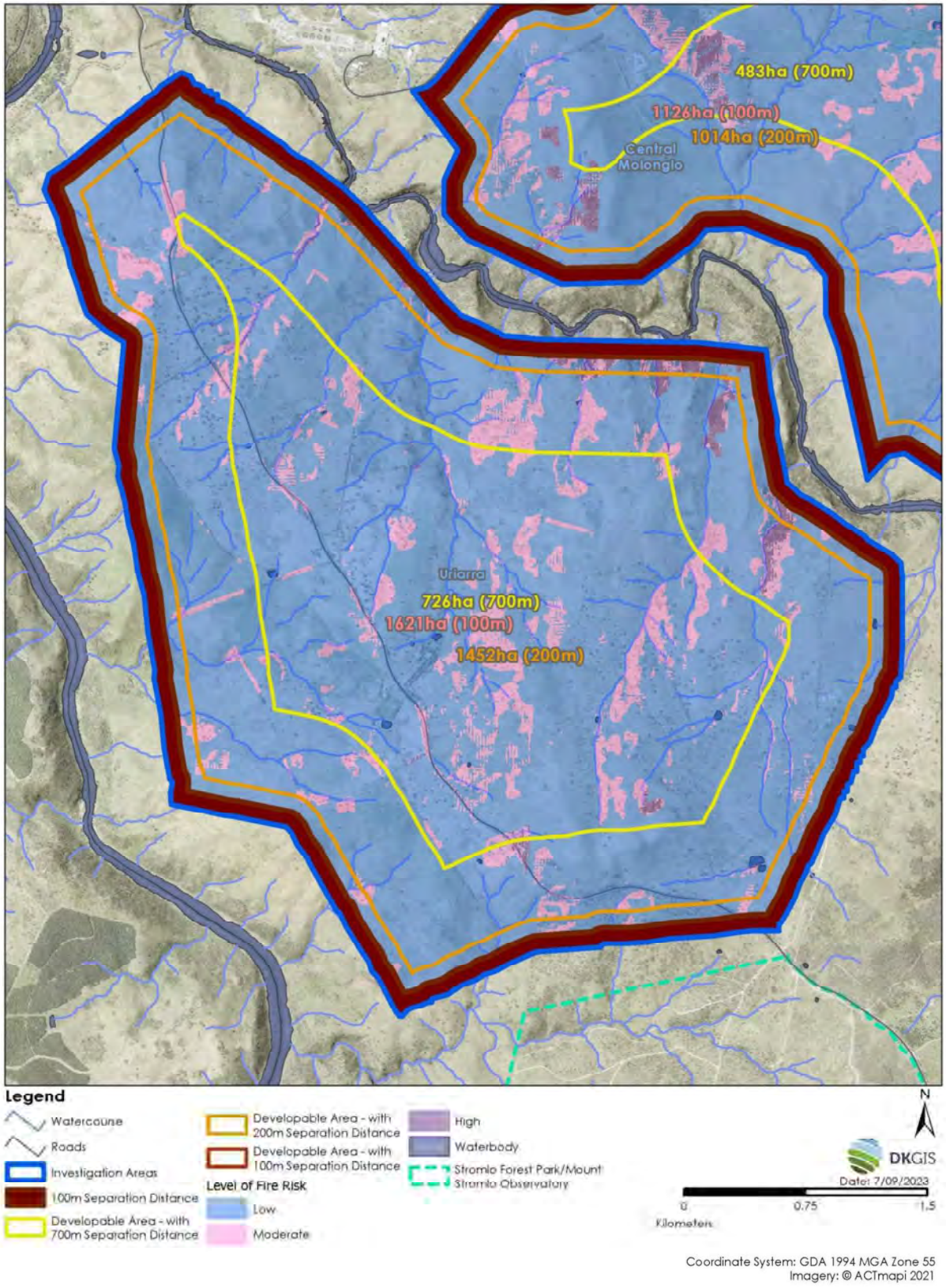

Figure 28: Fire intensity mapping Uriarra

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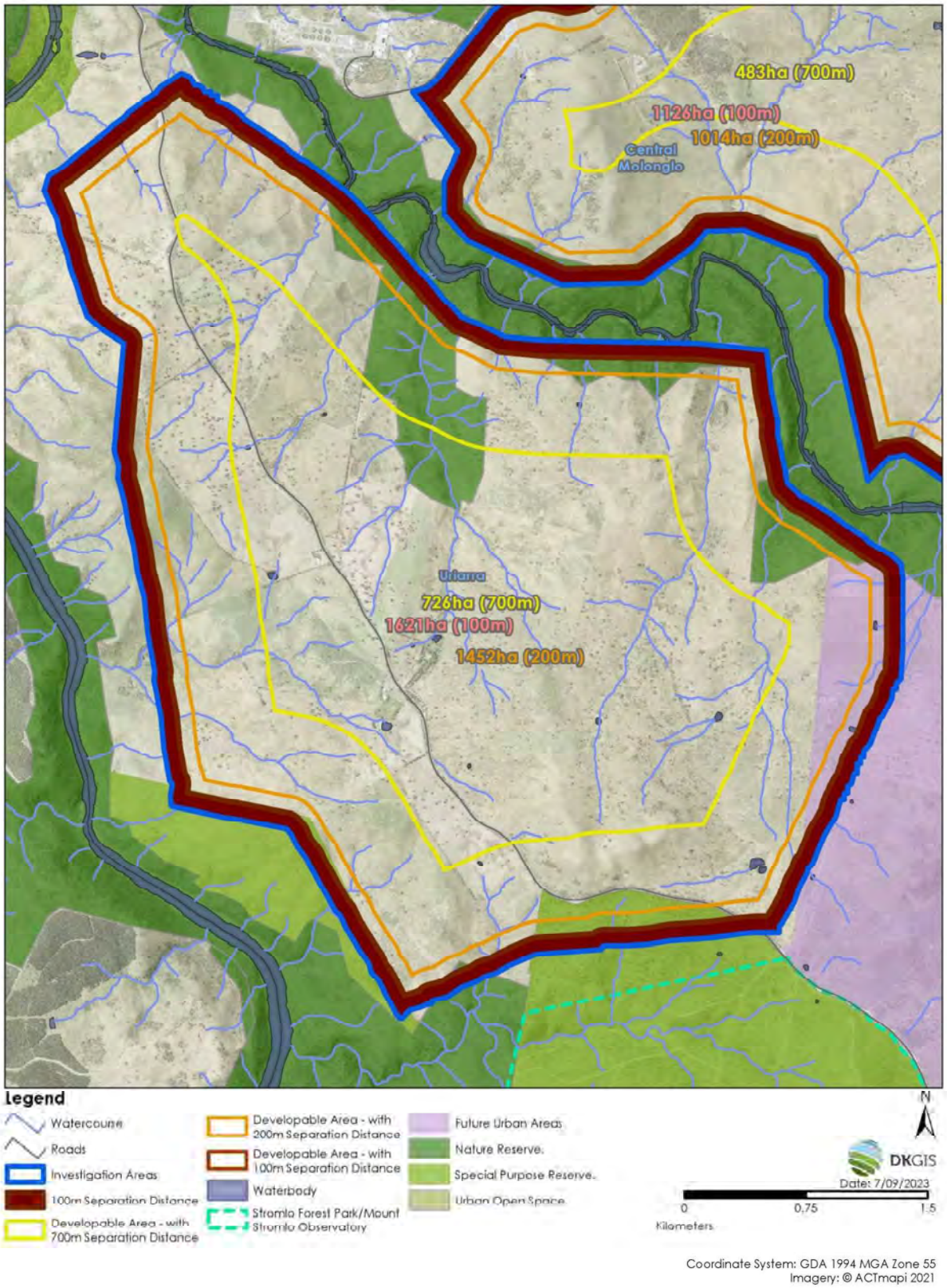

Figure 29: Risk buffers and reserves Uriarra (Source: ACTGOV TP Overlay Zone)

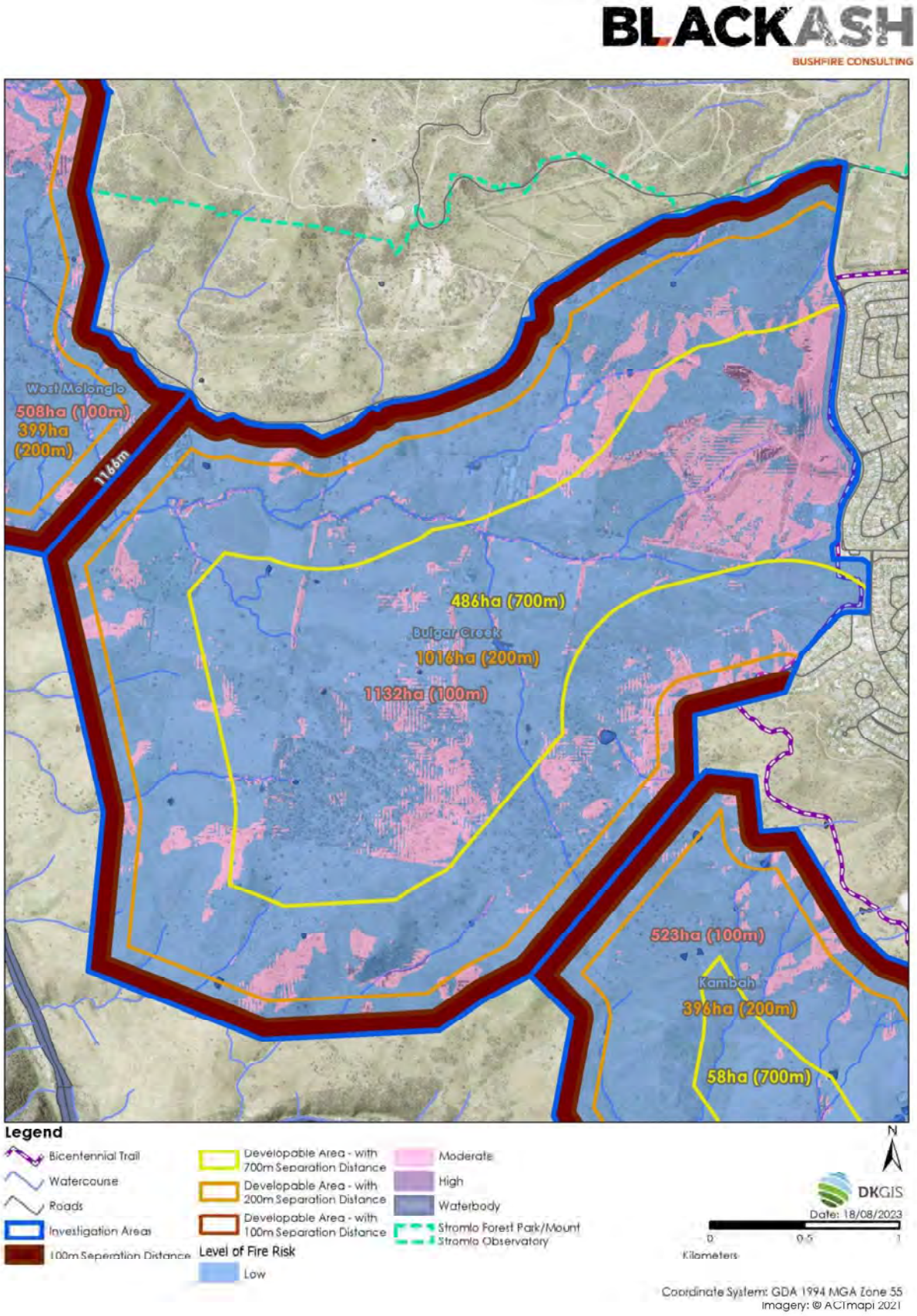

Figure 30: Intensity risk map Bulgar Creek (revised area)

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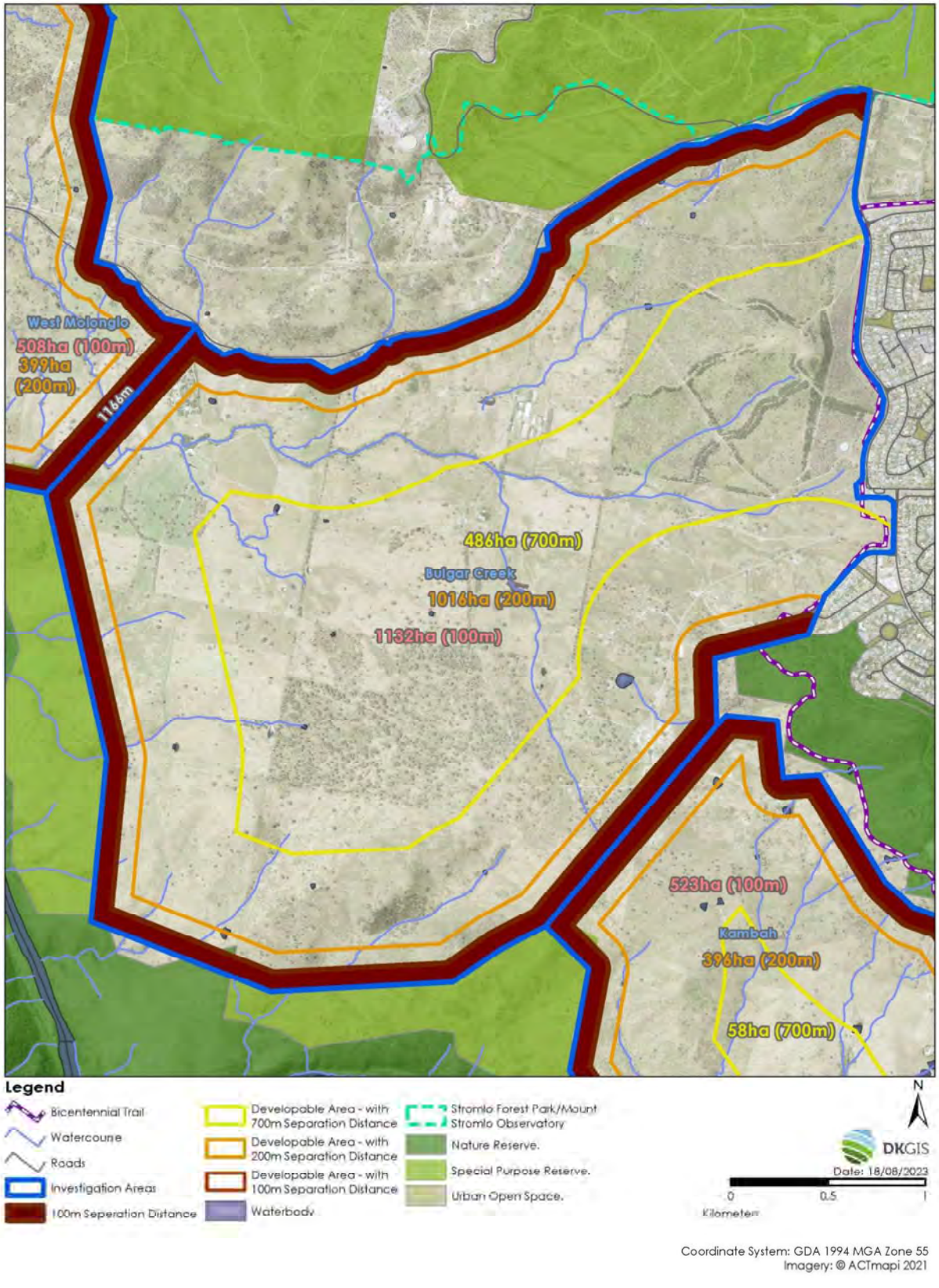

Figure 31: Risk buffers and reserves Bulgar Creek (revised area) (Source: ACTGOV TP Overlay Zone)

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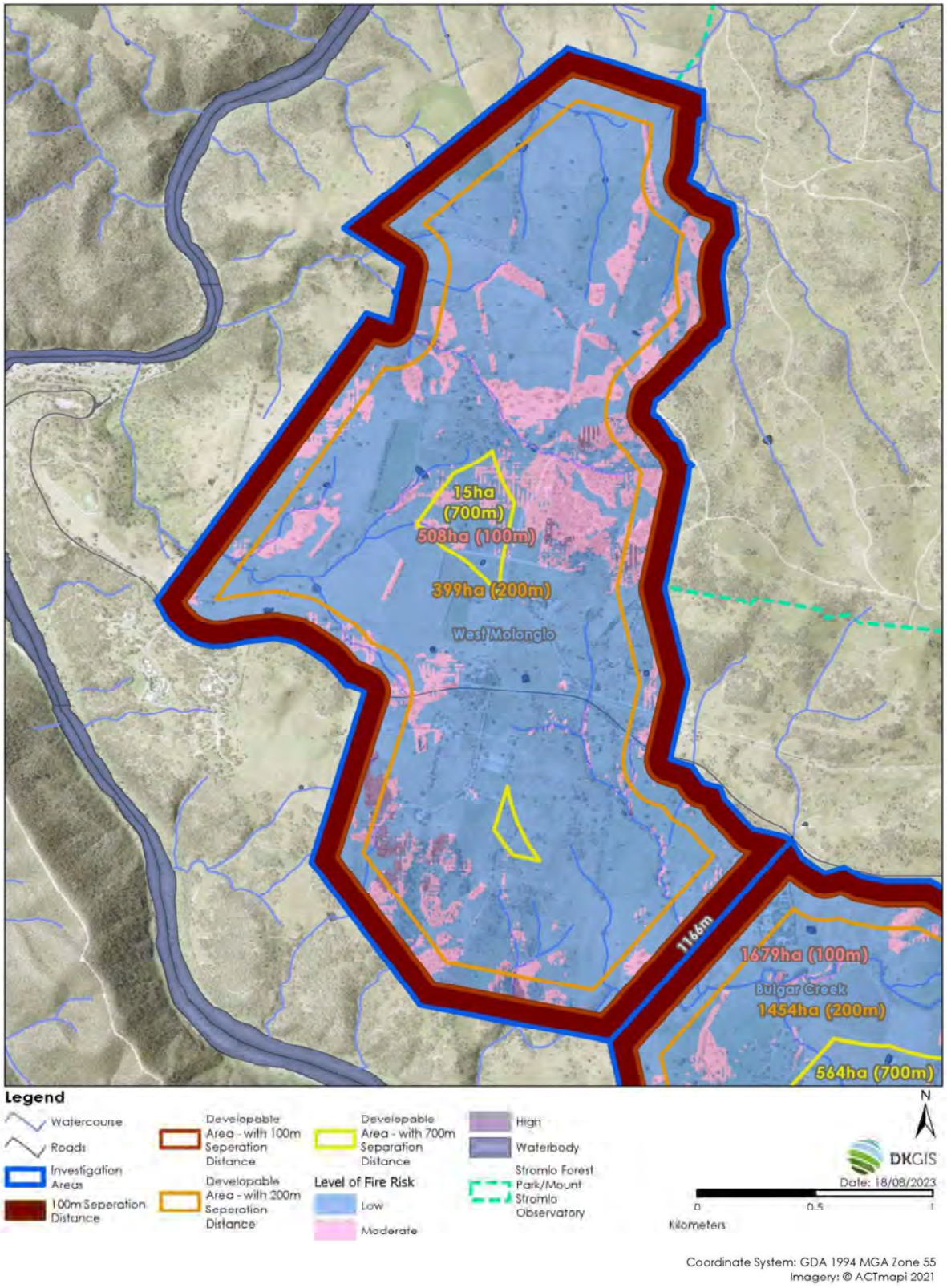

Figure 32: Intensity risk map West Molonglo (revised area)

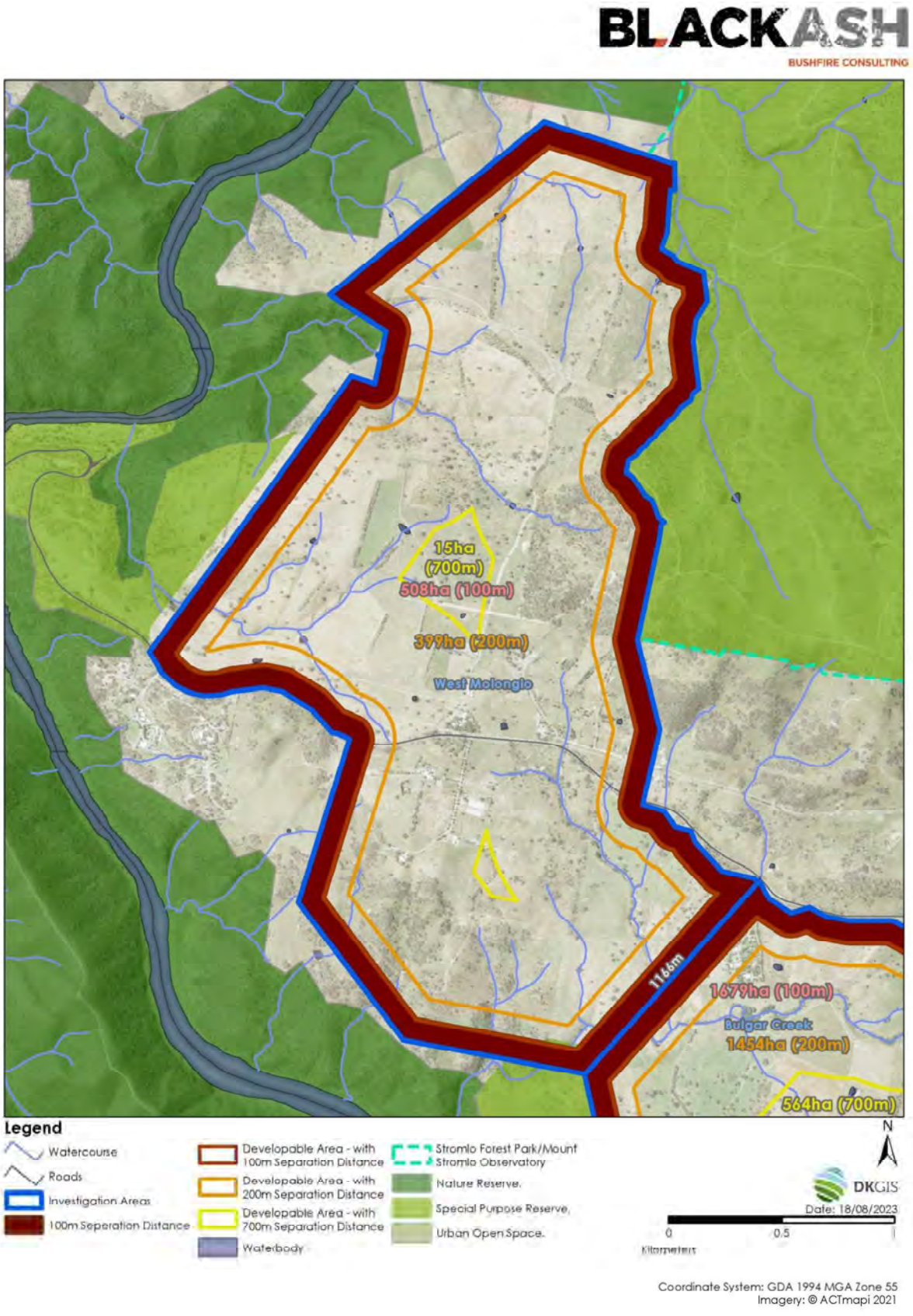

Figure 33: Risk buffers and reserves West Molonglo (revised area) (Source: ACTGOV TP Overlay Zone)

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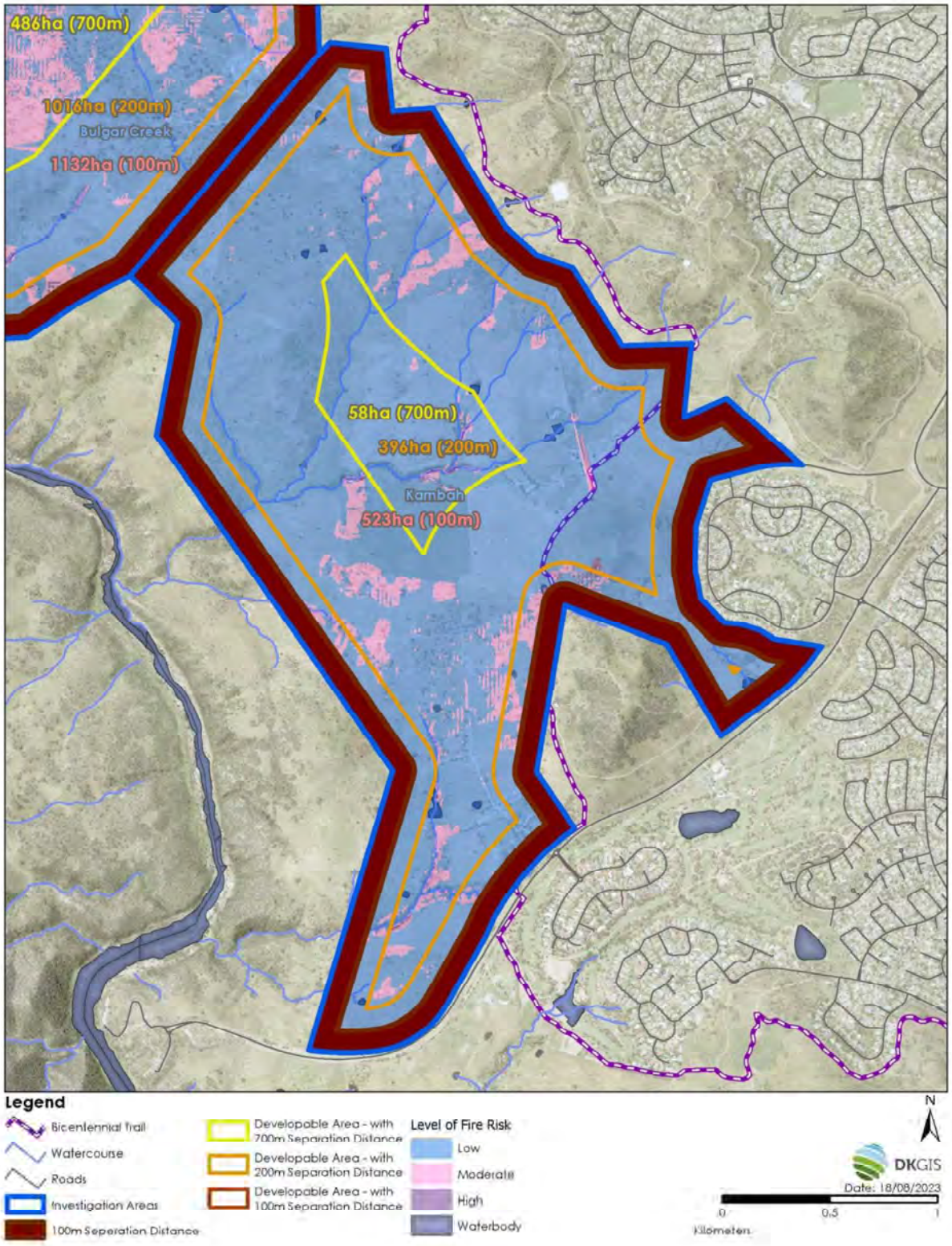

Figure 34: Intensity risk map Kambah

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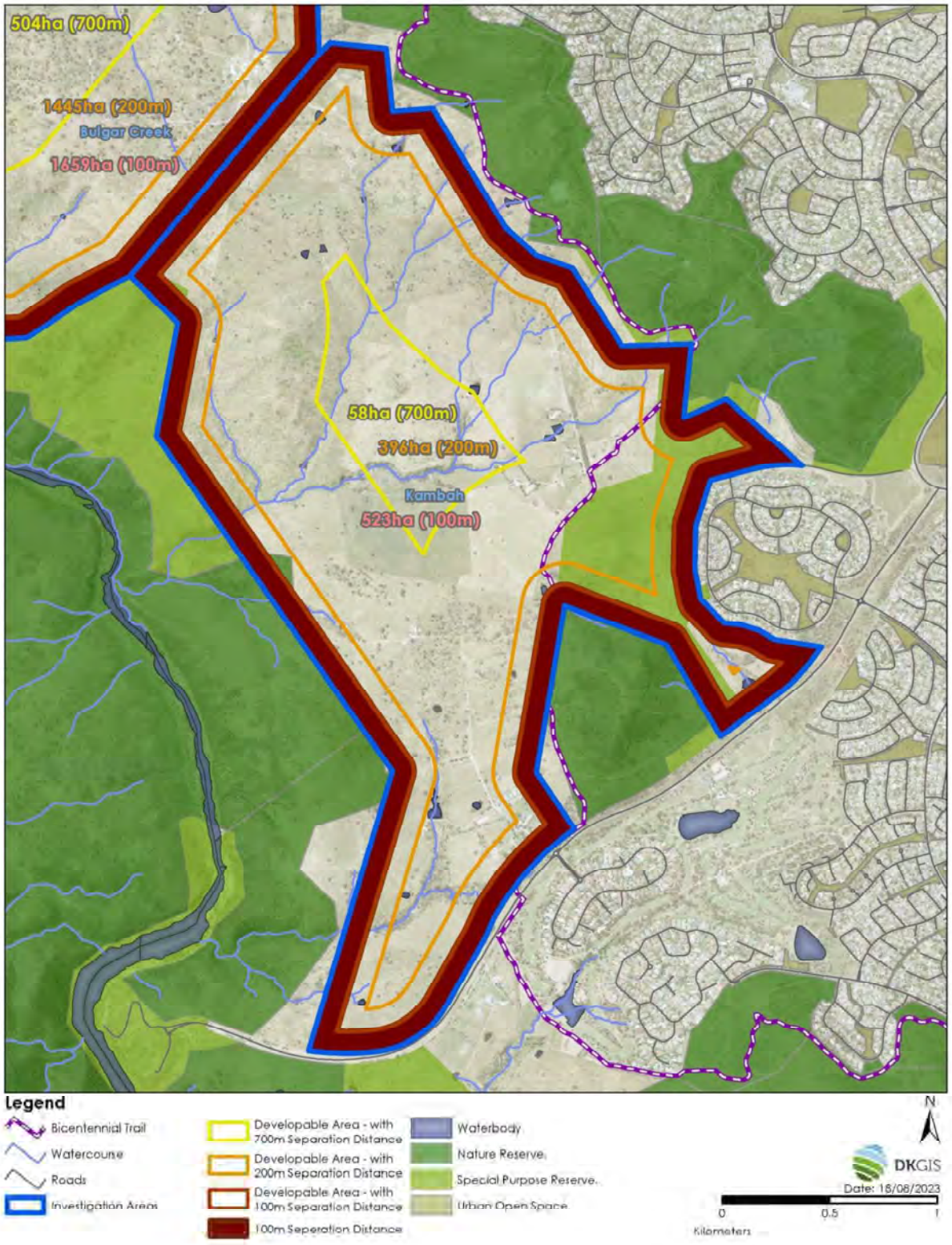

Figure 35: Risk buffers and reserves Kambah (Source: ACTGOV TP Overlay Zone)

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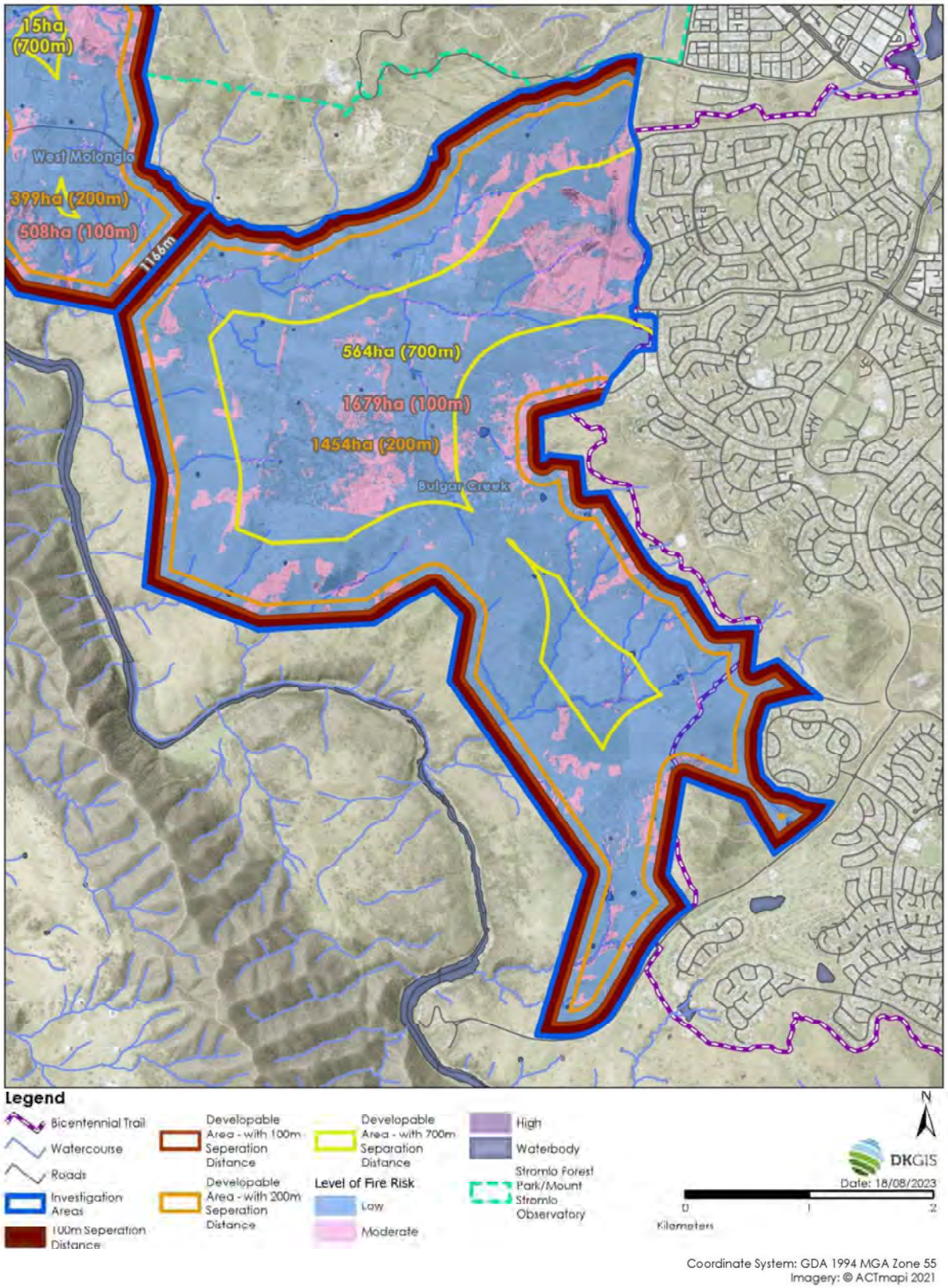

Figure 36: Intensity risk map combined Bulgar Creek-Kambah Investigation area

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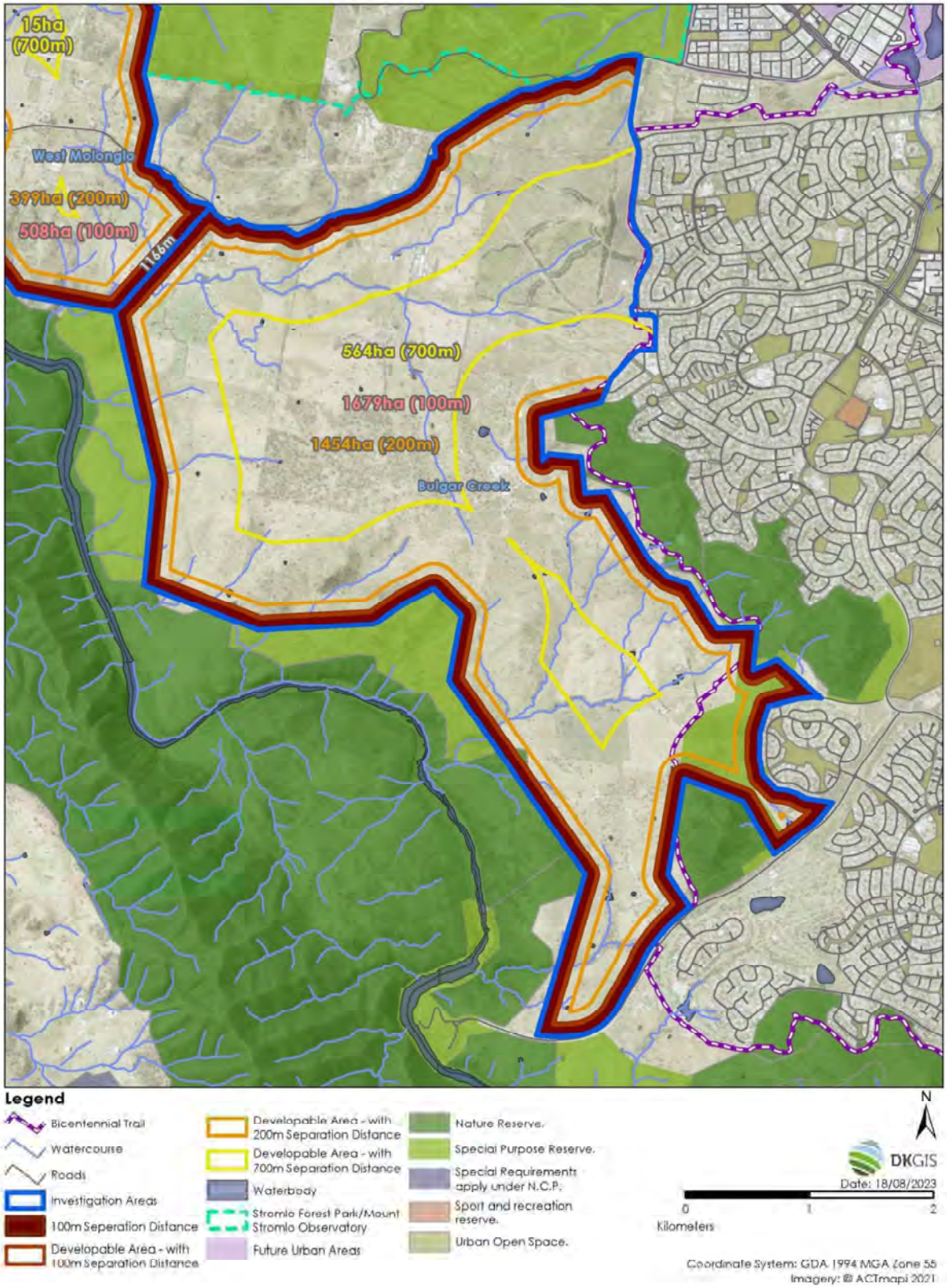

Figure 37: Risk buffers and reserves combined Bulgar Creek-Kambah Investigation area (Source: ACTGOV TP Overlay Zone)

8.5. Mapping discussion

From the analysis shown above, the majority of the internal investigation areas do not exhibit high fire intensity due to modest slopes and predominantly grassland vegetation. Further, due to the size of the revised areas, each is capable of providing substantial areas of potentially suitable urban development land that are more than 100m from the urban-bushland interface. Equally, it is apparent that final decisions cannot be made until significant further analysis is undertaken to integrate the wide range of land characteristics, key biodiversity constraints and other relevant issues. The quantum of developable land will be available only after further design work and decision making regarding other constraints, however each of the areas could reasonably be rezoned to allow for development, with all the caveats around design and compliance with BMS strategic principles.

Table 1 summarises the extent of area potentially available for development internally within the three buffer distances. The percentage of size of the 700m buffer in comparison to the 100m buffer provides an indication of the relative levels of urban development safety and the relationship between perimeter length and internal area. Both metrics are used to rank the investigation areas.

Table 1: Summary of areas contained within buffers - revised investigation areas

	700m buffer zone internal area in ha	**Rank - Area internal to 700m buffer Use in Table 3**	**200m buffer zone internal area in ha**	**100m buffer zone internal area in ha**	**Urban safety - ratio of 700m buffer area to 100m buffer area as percentage**	**Rank - Urban safety 1-5 with 1 the highest for this metric Use in Table 3**
Central Molonglo	483	**3**	1014	1126	42.9%	**2**
Uriarra	726	**1**	1452	1621	44.8%	**1**
West Molonglo (revised)	15	**5**	399	508	2.9%	**5**
Bulgar Creek (revised)	486	**2**	1016	1132	42.9%	**2**
Kambah	58	**4**	396	523	11.1%	**4**

8.6. Landscape Assessment – Scale Context

The bushfire landscape assessment considers the likelihood of a bushfire, its potential severity and intensity and the potential impact on life and property in the context of the broader surrounding landscape. The WEIA is located within a landscape with significant areas of existing bushland and rural uses development on all aspects except to the east. The Preliminary Bushfire Risk Assessment (PBRA) has undertaken substantial assessment of the landscape at a large scale, however with limited consideration of the suitability of specific areas for future development.

As explored in the PBRA, the significant fire weather threat is very clearly from the north through the west to the southwest. Landscape scale fires cannot approach from the east due to the predominance of developed urban areas. The threat from the west of the site under bad fire weather conditions is significant, however consideration of the highly fragmented landscape also needs to consider the role of the river corridor and individual landscape features such as the impact of Mount Stromlo or McQuoid Hill. The ultimate Estate Development Plans will be following the patterns laid down at these earlier planning stages so the strategic stage is where landscape scale bushfires and impacts must be considered.

Over time as development proceeds much of the bushfire vegetation will become urban development with the retained vegetation of perhaps limited width or aligned specifically to consider the bushfire weather on the worst FFDI days. Perimeter roads can provide both a buffer to development and access for firefighting. Riparian corridors may be convoluted and have multiple changes of direction making it difficult for a fire to spread and develop as it would in more open conditions. Whilst conservation corridors will be able to sustain fire they may not have sufficient vegetation for large fully developed fires to be carried into the urban area. As all development will be staged over years, both temporary and permanent mitigation measures in the landscape will also need to be staged to complement known planning and building rules in the urban areas.

Two types of considerations are relevant in terms of assessing the bushfire hazard including:

- landscape scale hazard – where large expanses of bushland over tens to hundreds of hectares are located in immediate proximity to, and may traverse, urban periphery suburbs/townships; or
- localised hazard – which is most commonly presented by fragmented areas of vegetation larger than 1 hectare in size and vegetated corridors.

These two types of hazard present different types of fire behaviour, fire intensity and potential rate of spread characteristics. The site is currently exposed to both landscape scale risk and localised bushfire risk. Consideration of Landscape Scale risk will be used to drill down further into which areas are more

or less suitable with respect to potential future urban development. Local scale fires, whilst not insignificant, are considered to be managed through good integrated planning at the more granular scale in the future.

8.7. Landscape Scale Assessment Tool (LSAT)

The *Victorian Planning Permit Applications Bushfire Management Overlay – Landscape Scale Threat Assessment* has been used as the framework to assess the broader landscape scale potential of bushfire affecting the site. This document is the only Australian contemporary Landscape Scale methodology with legislative weight. Blackash has expanded and modified the criteria to emphasise the priority of life safety, and the criticality of bushfire Emergency Management and Evacuation Planning as part of the risk assessment process.

The Blackash Landscape Scale Assessment Tool (LSAT) combines quantitative and qualitative techniques which are scaffolded by the *Landscape Scale Threat Assessment* and associated documentation. The approach is shown in Table 1 and uses elements of the Bayesian decision making model and Expert Judgment techniques backed by data. Bayesian decision making has been used where there is both objective and subjective data to analyse, and decisions need to be made on the probability of successful outcomes where there are high levels of uncertainty. Expert Judgement has been used in the assessment and determination of the landscape scale risk.

Blackash Expert Judgement (as outlined in Appendix 2) is applied consistent with the criteria used in the *National Construction Code* (NCC)[7] Assessment Methods and NSW Land & Environment Court practice that calls up *Schedule 7 – Expert Witness Code of Conduct* in the *Uniform Civil Procedure Rules 2005*.[8]

The LSAT provides information on the bushfire hazard more than 150 metres away from the site at a landscape scale. The broader landscape and the potential size or scale of a bushfire is an important driver of the design response to determine the most suitable areas for development. The likelihood of a bushfire, its severity and intensity, and the potential impact on life and property varies depending on where a site is in the broader landscape. Landscape scale fires will place greater pressure on emergency response capability and will have a wider impact on roads and the length of time roads cannot be safely used. This will affect the likelihood of successful evacuations taking place across larger areas and may affect the ability of firefighting resources to be deployed. Multiple factors are considered

[7] https://www.abcb.gov.au/sites/default/files/resources/2021/UTNCC_Using_assessment_methods%20%281%29.pdf

[8] https://legislation.nsw.gov.au/view/html/inforce/current/sl-2005-0418#sch.7

for the landscape scale assessment. Key considerations in our assessment tool include:

- extent and continuity of vegetation
- topography
- prevailing winds
- the potential fire runs and area that is likely to be impacted by the fire
- the impact on evacuation routes to safer places considering road networks, distances, and landscape factors
- the location and exposure of the development to bushfire
- the ability to seek bushfire shelter on site or at alternative locations
- the extent of neighbourhood-scale damage the bushfire may produce.

As noted above the appropriate maximum Forest Fire Danger Index (FFDI) to be applied is FFDI 100.

Landscape scale fires are those that can span many kilometres or tens of kilometres, and that burn for days or weeks at a time. Typically, these fires can be many thousands of hectares in size with fire fronts many kilometres in length. On the east coast of Australia this scale of fire is only possible where there are very large areas of forested vegetation, typically National Parks and State Forests that also adjoin substantial areas of private bushland. Canberra 2003 is an example of this scale of fire.

As the WEIA develops, the areas of retained bushland will continue to change as some areas are cleared and others regenerated for conservation corridors. The fragmentation of the remaining bushland by roads and other infrastructure will continue and this needs to be considered over both contemporary and future timescales, noting that the planning process will also continue across decades. As much of the vegetation from these aspects is grassland, breaks in the landscape play a very significant role in fragmenting vegetation and providing containment lines or slowing the advance of a bushfire.

Fires that start in the riparian corridors may have higher fuel load runs (i.e. forest or woodland) that are only measured in a few hundred metres or less, may be impacted by the convoluted (meandering) alignments of the creeks, and under many conditions will present flank fires to the future development rather than a more intense head fire. Fires starting in the very large, forested areas west of the Murrumbidgee River may be very intense, however a combination of grassland areas and fire breaks through infrastructure, roads, water bodies etc. may have a significant impact on the grass fires when they emerge from the riparian corridors.

Not all bushfires are able to develop the size and intensity of a landscape scale fire that can cause neighbourhood scale destruction. These local scale fires may still be significant and can cause local damage. Wherever bushland is retained there will always be some residual risk to manage, however local scale bushfires are less likely to result in widespread property destruction and more likely to be

managed through well planned SFAZ and APZ combinations. Local scale fires also tend to be noticed immediately by the public, are called in to emergency services soon after ignition, and if there is good access via perimeter roads and fire trail networks may be extinguished early before they develop into large fires.

Due to the application of BMS requirements throughout the development process there will be good access for firefighting at the interface; and adequate firefighting resources, well located stations and water supplies can be planned to match the expansion of the urban areas.

Modern firefighting arrangements are also better coordinated than in previous decades, and have the use of more resources such as bulk water tankers, heavy plant (e.g. bulldozers and graders), helicopters and Large Air Tankers that are much more readily available. Combined with much improved command, control and communications, these resources enable a major addition to firefighting capabilities, especially on bad fire weather days.

All these characteristics mean that when such local fires are ignited there is a relatively quick and effective response meaning that the fire is unlikely to grow to a significant scale. Difficult fire weather days or use of resources elsewhere may have an impact on fire response, however, there is a lower likelihood of any significant fire starting within the WEIA that will impact on a poorly prepared community. Such local fires are likely to be managed with local resources as part of normal emergency operations. This is a very different situation to an isolated rural community, or traditional intermix community. Figures 4-9 and discussion of the existing development in Section 2.4 of this report demonstrate the benefit of having a defined interface to manage, and evacuation into an urban area that will be some hundreds of metres from the fire front.

Taking the conservative approach required by BMS, all new development lots ultimately established must be capable of providing practical building envelopes so that future dwellings are built to withstand radiant heat levels of 29kW/m^2 or less and be separated physically from bushland by perimeter roads and an APZ.

Using the WEIA Landscape Assessment Tool

The Blackash LSAT has been recalibrated to better suit the very large scale of the WEIA, and to be more appropriate for considering the relative merits of the five investigation areas. This version is referred to as the WEIA LSAT. The WEIA LSAT is heavily weighted to life safety and places significant emphasis on the ability for the future community to be able to shelter in place or evacuate safely, whilst emergency services can access the site at the same time. Life safety is a key consideration when considering planning proposals and the concept of whether the site is suitable for development. All future development will be subject to additional detailed bushfire assessment during the development process, from subdivision stage and continuing to individual developments. This will ensure that the

requirements of BMS can be met at each stage and will result in built form that meets the appropriate standards for each individual location.

The discussion below expands on the parameters of the WEIA LSAT, and it is critical to understand that whilst the parameters work together to provide analysis to support the SBRA conclusions, the exercise is dependent on reaching agreement between multiple stakeholders and agencies before final scoring can be done in later stages.

The basis for the evaluation relates to the distance from vegetation, therefore in this exercise the consideration will be focused on whether the investigation areas can provide significant areas away from the interface. This also relates to the location and whether or not vegetation allows the approach from one or more aspects; if the vegetation is subject to the impact of landscape scale fires or only local fires; and the relationship of the perimeter to area ratio is likely to allow fire to approach or impact on a neighbourhood scale, rather than simple along a defined interface. The ultimate rezoning of a large area such as one of the investigation areas should be designed to provide a very significant urban area of 'managed land' that will not be capable of carrying a bushfire. All future residents will be capable of quickly moving to an area more than 100m from bushland using local streets, and this puts them outside the range of fire impacts that currently require a planning and building response. As shown in the research there is then a higher margin of safety for locations 200-700m from the interface, and where there are significant areas of urban development more than 700m from the urban-bushland interface the bushfire impacts are equivalent to the indirect impacts (e.g. smoke, disruption) that exist within the large urban areas.

Vegetated corridors are not considered a significant landscape scale threat given they are relatively narrow and often convoluted riparian corridors. Such a fragmented landscape pattern does not provide an opportunity for extreme bushfire behaviour associated with landscape scale fires to develop and combined with contemporary BMS standards, is highly unlikely to result in neighbourhood scale destruction. These vegetated corridors may extend a major fire into the urban area and may also be the source of local scale fires due to the proximity of human activity. It is critical that clearly defined and committed arrangements are permanently in place to manage interfaces and vegetated corridors and this requires agreement of all agencies

Access and egress routes that allow firefighters to respond and residents to evacuate are of critical importance. A shelter in place strategy is often the optimum method of emergency management for ensuring the life safety of the community where good planning has been undertaken. There is considerable risk involved with mass evacuations, particularly those undertaken as the fire approaches and last minute decisions are made. Part of the focus of the WEIA LSAT is to show how good planning is able to reduce the need for any mass evacuation other than local scale to move beyond 100m distance from the fire front. Where evacuation is required, or more commonly, where some people may wish to self-evacuate to larger urban areas the distances of travel and routes giving safe passage are

important. This makes development adjacent to existing developed areas with multiple routes generally a preferred option.

The ultimate incorporation of internal vegetation and riparian corridors needs to be carefully considered before rezoning, and clear agreement between agencies as to the future form of vegetation and management methods is essential. If one agency supports revegetation of forests the outcomes for interface management will be significantly different than if grasslands or stormwater infrastructure is supported by other agencies. Similarly, the use of managed public lands such as sports fields can assist in providing the initial separation distances so that careful consideration of the location of such facilities may assist in the overall development outcomes.

Significant areas of retained bushland may be fragmented against long fire runs, and will be ringed by suitable combinations of perimeter roads, stormwater infrastructure, sports fields, parks and formal APZ. As these fragmented areas of bushland will not be able to develop or maintain landscape scale fires the ultimate built form will be more than 100 metres from areas of extreme bushfire threat, as opposed to local scale bushfire threat. Once developed all lots in the future subdivisions will be serviced with reticulated water and as per Australian Standards the perimeter roads will have multiple hydrant points for firefighting access. There may be a number of significant water detention basins across the site to manage stormwater and these will also be constructed to provide additional firefighting water supplies. Planning for space for emergency services infrastructure and for clear management arrangements at the interface is key. It is also key to remember that unless the entire interface consists of public facilities, which is very unlikely, there will always be residential development within 100m of the interface, and the risk will continue to be managed via the existing standards in the BMS.

The concepts discussed above are distilled into a series of factors with a weighted numerical scoring system focusing on life safety. As the WEIA revised investigation areas are a large scale examination of these issues, and there will be significant variations to scoring within the individual investigation areas the scoring is weighted using expert judgement by considering the percentage size of safer urban areas (>700m from interface), and the relative remoteness from established urban areas. Due to the assumptions made above including good design and planning incorporated from the earliest stage, and the size of the areas, the numerical scores are relatively close, however do provide another method of comparing and ranking the suitability of the five investigation areas. The lower the score means the lower the relative risk (more suitable).

The tool will provide greater clarity between individual sites as the planning process continues to drill down to geographically smaller areas for potential rezoning, particularly when vegetated corridors have been decided.

The score summaries extracted from the LSAT for the five investigation areas are shown as Figures 38-42.

Landscape Scale Assessment Tool (ACT WEIA version)

Central Molonglo

Landscape scale bushfire risk factors

Parameter	Low landscape scale threat	Moderate landscape scale threat	High landscape scale threat	Extreme landscape scale threat	
1. Distance to vegetation mapped as bushfire prone land or capable of sustaining a wildfire	Bushfire prone vegetation is more than 700m from the proposed development area.	Bushfire prone vegetation is between 200-700m from the proposed development area.	Bushfire prone vegetation is between 100-200m from the proposed development area.	Bushfire prone vegetation is less than 100m from the proposed development area.	Low
2. Surrounding Vegetation	Bushfire cannot directly approach the proposed development area as it is surrounded by more than 700m of urban development, non-mapped vegetation and managed land.	Bushfire can only approach the proposed urban area from one aspect. Typically an island of bushfire vegetation within a wider urban development area, or a linear vegetation corridor of less than 100m width.	Bushfire can approach from one or more aspect and site is on the bushland-urban interface. Contiguous bushfire vegetation with a fire run in any direction of 0.1-2.0 km distance.	Bushfire can approach from more than one aspect and site is on bushland-urban interface. Contiguous bushfire vegetation with a fire run of more than 2 km.	High
3. Bushfire Behaviour	Extreme bushfire behaviour at the site is not possible given the broader landscape.	Extreme bushfire behaviour at the site is unlikely in this broader landscape.	Extreme bushfire behaviour at the site is likely due to the broader landscape.	Extreme bushfire behaviour at the site is very likely due to the broader landscape.	Moderate
4. Impact of Catastrophic fire behaviour (FFDI 100)	There is little vegetation beyond 700 metres of the site (except grasslands and low-threat vegetation) which will not result in neighbourhood scale destruction.	The type and extent of vegetation within 100-700m of the site is unlikely to result in neighbourhood-scale destruction.	The type and extent of vegetation less than 100m of the site and the layout of urban development makes possible neighbourhood-scale destruction through house to house transmission and interaction with retained vegetation.	The type and extent of vegetation less than 100m of the site and the layout of urban development is likely to result in neighbourhood-scale destruction through house to house transmission and interaction with retained vegetation.	Moderate
5. Separation and bushfire management arrangements	Future development is separated from bushfire vegetation by more than 700m.	Future development is separated from bushfire vegetation by 100-700m and permanent bushfire vegetation management areas are maintained outside the urban area.	Future development is separated from bushfire vegetation by less than 100m and permanent bushfire vegetation management areas are maintained outside the urban area.	Future development is separated from bushfire vegetation by less than 100m and permanent bushfire vegetation management areas are NOT maintained outside the urban area.	Low
6. Vegetation corridors within development area	Vegetation within the site cannot enable fire to enter and move through the site OR the site is more than 700m from bushfire vegetation.	Vegetation within the site is of less than 1 ha size; or highly fragmented; or a linear configuration unlikely to enable fire to enter and move through the site.	Bushfire vegetation within the site is larger than 1ha; or of a linear configuration more than 100m wide and may provide a passage for fire to enter and move though the site.	Bushfire vegetation corridors within the site link directly to large areas of bushland and are likely to provide a passage for fire to enter and move through the site.	Moderate
7. Evacuation routes	Site is adjoining existing urban area. Good, multiple route evacuation is possible and the site is more than 700m from bushfire vegetation.	Evacuation to alternate location that provides life safety refuge is possible by multiple routes and less than 1km and can be completed by foot or vehicle.	Evacuation to alternate location that provides life safety refuge is possible by multiple routes and is within 1km-3km.	Evacuation to alternate location that provides life safety refuge is via single route only; and/or is more than 3km; and/or is through significant areas of bushfire prone vegetation.	Low
8. Isolation and emergency services access to development area	Seamless integration with existing settlement and adequate emergency services infrastructure for local response.	Short bushland pinch points that may restrict access temporarily or carry fire across roads; and adequate emergency services infrastructure for local response.	Short bushland pinch points that may restrict access temporarily or carry fire across roads; and limited emergency services infrastructure for local response.	Large areas of bushland or multiple pinch points along access routes that could block emergency access for extended time; and/or no emergency services infrastructure for local response.	Low
9. Firefighting infrastructure	Site is within urban area more than 700m from bushfire prone vegetation.	Site is within 100m of bushfire prone vegetation where vegetation is permanently managed and firefighting infrastructure such as fire trails, water supplies and helipads areas have been established in accordance with BMS.	Site is within 100m of bushfire prone vegetation where vegetation is permanently managed however no firefighting resources have been established in accordance with BMS.	Site is within 100m of bushfire prone vegetation where vegetation is NOT permanently managed, and no firefighting infrastructure has been established in accordance with BMS.	Low
		Overall Threat Rating	**Moderate Risk**	**Total**	**140**

Assessed at Forest Fire Danger Index of 100 as the design fire, using Method 1 in accordance with BMS

The scoring system uses a multiplier for each Threat level based on a conservative life safety approach.

The scaled scores for each Threat assessment are totalled and final scores are placed within a range to produce the final Risk Rating

Figure 38: LSAT summary score - Central Molonglo

Landscape Scale Assessment Tool (ACT WEIA version)

Uriarra

Landscape scale bushfire risk factors

Parameter	Low landscape scale threat	Moderate landscape scale threat	High landscape scale threat	Extreme landscape scale threat	
1. Distance to vegetation mapped as bushfire prone land or capable of sustaining a wildfire	Bushfire prone vegetation is more than 700m from the proposed development area.	Bushfire prone vegetation is between 200-700m from the proposed development area.	Bushfire prone vegetation is between 100-200m from the proposed development area.	Bushfire prone vegetation is less than 100m from the proposed development area.	Low
2. Surrounding Vegetation	Bushfire cannot directly approach the proposed development area as it is surrounded by more than 700m of urban development, non-mapped vegetation and managed land.	Bushfire can only approach the proposed urban area from one aspect. Typically an island of bushfire vegetation within a wider urban development area, or a linear vegetation corridor of less than 100m width.	Bushfire can approach from one or more aspect and site is on the bushland-urban interface. Contiguous bushfire vegetation with a fire run in any direction of 0.1-2.0 km distance.	Bushfire can approach from more than one aspect and site is on bushland-urban interface. Contiguous bushfire vegetation with a fire run of more than 2 km.	Extreme
3. Bushfire Behaviour	Extreme bushfire behaviour at the site is not possible given the broader landscape.	Extreme bushfire behaviour at the site is unlikely in this broader landscape.	Extreme bushfire behaviour at the site is likely due to the broader landscape.	Extreme bushfire behaviour at the site is very likely due to the broader landscape.	Moderate
4. Impact of Catastrophic fire behaviour (FFDI 100)	There is little vegetation beyond 700 metres of the site (except grasslands and low-threat vegetation) which will not result in neighbourhood scale destruction.	The type and extent of vegetation within 100-700m of the site is unlikely to result in neighbourhood-scale destruction.	The type and extent of vegetation less than 100m of the site and the layout of urban development makes possible neighbourhood-scale destruction through house to house transmission and interaction with retained vegetation.	The type and extent of vegetation less than 100m of the site and the layout of urban development is likely to result in neighbourhood-scale destruction through house to house transmission and interaction with retained vegetation.	Moderate
5. Separation and bushfire management arrangements	Future development is separated from bushfire vegetation by more than 700m.	Future development is separated from bushfire vegetation by 100-700m and permanent bushfire vegetation management areas are maintained outside the urban area.	Future development is separated from bushfire vegetation by less than 100m and permanent bushfire vegetation management areas are maintained outside the urban area.	Future development is separated from bushfire vegetation by less than 100m and permanent bushfire vegetation management areas are NOT maintained outside the urban area.	Low
6. Vegetation corridors within development area	Vegetation within the site cannot enable fire to enter and move through the site OR the site is more than 700m from bushfire vegetation.	Vegetation within the site is of less than 1 ha size; or highly fragmented; or a linear configuration unlikely to enable fire to enter and move through the site.	Bushfire vegetation within the site is larger than 1ha; or of a linear configuration more than 100m wide and may provide a passage for fire to enter and move though the site.	Bushfire vegetation corridors within the site link directly to large areas of bushland and are likely to provide a passage for fire to enter and move through the site.	Moderate
7. Evacuation routes	Site is adjoining existing urban area. Good, multiple route evacuation is possible and the site is more than 700m from bushfire vegetation.	Evacuation to alternate location that provides life safety refuge is possible by multiple routes and less than 1km and can be completed by foot or vehicle.	Evacuation to alternate location that provides life safety refuge is possible by multiple routes and is within 1km-3km.	Evacuation to alternate location that provides life safety refuge is via single route only; and/or is more than 3km; and/or is through significant areas of bushfire prone vegetation.	Low
8. Isolation and emergency services access to development area	Seamless integration with existing settlement and adequate emergency services infrastructure for local response.	Short bushland pinch points that may restrict access temporarily or carry fire across roads; and adequate emergency services infrastructure for local response.	Short bushland pinch points that may restrict access temporarily or carry fire across roads; and limited emergency services infrastructure for local response.	Large areas of bushland or multiple pinch points along access routes that could block emergency access for extended time; and/or no emergency services infrastructure for local response.	Extreme
9. Firefighting infrastructure	Site is within urban area more than 700m from bushfire prone vegetation.	Site is within 100m of bushfire prone vegetation where vegetation is permanently managed and firefighting infrastructure such as fire trails, water supplies and helipads areas have been established in accordance with BMS.	Site is within 100m of bushfire prone vegetation where vegetation is permanently managed however no firefighting resources have been established in accordance with BMS.	Site is within 100m of bushfire prone vegetation where vegetation is NOT permanently managed, and no firefighting infrastructure has been established in accordance with BMS.	Low
		Overall Threat Rating	**Moderate Risk**	**Total**	**180**

Assessed at Forest Fire Danger Index of 100 as the design fire, using Method 1 in accordance with BMS

The scoring system uses a multiplier for each Threat level based on a conservative life safety approach.

The scaled scores for each Threat assessment are totalled and final scores are placed within a range to produce the final Risk Rating

Figure 39: LSAT summary score - Uriarra

Landscape Scale Assessment Tool (ACT WEIA version)

Bulgar Creek

Landscape scale bushfire risk factors

Parameter	Low landscape scale threat	Moderate landscape scale threat	High landscape scale threat	Extreme landscape scale threat	
1. Distance to vegetation mapped as bushfire prone land or capable of sustaining a wildfire	Bushfire prone vegetation is more than 700m from the proposed development area.	Bushfire prone vegetation is between 200-700m from the proposed development area.	Bushfire prone vegetation is between 100-200m from the proposed development area.	Bushfire prone vegetation is less than 100m from the proposed development area.	Low
2. Surrounding Vegetation	Bushfire cannot directly approach the proposed development area as it is surrounded by more than 700m of urban development, non-mapped vegetation and managed land.	Bushfire can only approach the proposed urban area from one aspect. Typically an island of bushfire vegetation within a wider urban development area, or a linear vegetation corridor of less than 100m width.	Bushfire can approach from one or more aspect and site is on the bushland-urban interface. Contiguous bushfire vegetation with a fire run in any direction of 0.1-2.0 km distance.	Bushfire can approach from more than one aspect and site is on bushland-urban interface. Contiguous bushfire vegetation with a fire run of more than 2 km.	High
3. Bushfire Behaviour	Extreme bushfire behaviour at the site is not possible given the broader landscape.	Extreme bushfire behaviour at the site is unlikely in this broader landscape.	Extreme bushfire behaviour at the site is likely due to the broader landscape.	Extreme bushfire behaviour at the site is very likely due to the broader landscape.	High
4. Impact of Catastrophic fire behaviour (FFDI 100)	There is little vegetation beyond 700 metres of the site (except grasslands and low-threat vegetation) which will not result in neighbourhood scale destruction.	The type and extent of vegetation within 100-700m of the site is unlikely to result in neighbourhood-scale destruction.	The type and extent of vegetation less than 100m of the site and the layout of urban development makes possible neighbourhood-scale destruction through house to house transmission and interaction with retained vegetation.	The type and extent of vegetation less than 100m of the site and the layout of urban development is likely to result in neighbourhood-scale destruction through house to house transmission and interaction with retained vegetation.	Moderate
5. Separation and bushfire management arrangements	Future development is separated from bushfire vegetation by more than 700m.	Future development is separated from bushfire vegetation by 100-700m and permanent bushfire vegetation management areas are maintained outside the urban area.	Future development is separated from bushfire vegetation by less than 100m and permanent bushfire vegetation management areas are maintained outside the urban area.	Future development is separated from bushfire vegetation by less than 100m and permanent bushfire vegetation management areas are NOT maintained outside the urban area.	Low
6. Vegetation corridors within development area	Vegetation within the site cannot enable fire to enter and move through the site OR the site is more than 700m from bushfire vegetation.	Vegetation within the site is of less than 1 ha size; or highly fragmented; or a linear configuration unlikely to enable fire to enter and move through the site.	Bushfire vegetation within the site is larger than 1ha; or of a linear configuration more than 100m wide and may provide a passage for fire to enter and move though the site.	Bushfire vegetation corridors within the site link directly to large areas of bushland and are likely to provide a passage for fire to enter and move through the site.	Moderate
7. Evacuation routes	Site is adjoining existing urban area. Good, multiple route evacuation is possible and the site is more than 700m from bushfire vegetation.	Evacuation to alternate location that provides life safety refuge is possible by multiple routes and less than 1km and can be completed by foot or vehicle.	Evacuation to alternate location that provides life safety refuge is possible by multiple routes and is within 1km-3km.	Evacuation to alternate location that provides life safety refuge is via single route only; and/or is more than 3km; and/or is through significant areas of bushfire prone vegetation.	Low
8. Isolation and emergency services access to development area	Seamless integration with existing settlement and adequate emergency services infrastructure for local response.	Short bushland pinch points that may restrict access temporarily or carry fire across roads; and adequate emergency services infrastructure for local response.	Short bushland pinch points that may restrict access temporarily or carry fire across roads; and limited emergency services infrastructure for local response.	Large areas of bushland or multiple pinch points along access routes that could block emergency access for extended time; and/or no emergency services infrastructure for local response.	Low
9. Firefighting infrastructure	Site is within urban area more than 700m from bushfire prone vegetation.	Site is within 100m of bushfire prone vegetation where vegetation is permanently managed and firefighting infrastructure such as fire trails, water supplies and helipads areas have been established in accordance with BMS.	Site is within 100m of bushfire prone vegetation where vegetation is permanently managed however no firefighting resources have been established in accordance with BMS.	Site is within 100m of bushfire prone vegetation where vegetation is NOT permanently managed, and no firefighting infrastructure has been established in accordance with BMS.	Low
		Overall Threat Rating	**Moderate Risk**	**Total**	**150**

Assessed at Forest Fire Danger Index of 100 as the design fire, using Method 1 in accordance with BMS

The scoring system uses a multiplier for each Threat level based on a conservative life safety approach.

The scaled scores for each Threat assessment are totalled and final scores are placed within a range to produce the final Risk Rating

Figure 40: LSAT summary score – Bulgar Creek

Landscape Scale Assessment Tool (ACT WEIA version)

West Molonglo

Landscape scale bushfire risk factors

Parameter	Low landscape scale threat	Moderate landscape scale threat	High landscape scale threat	Extreme landscape scale threat	
1. Distance to vegetation mapped as bushfire prone land or capable of sustaining a wildfire	Bushfire prone vegetation is more than 700m from the proposed development area.	Bushfire prone vegetation is between 200-700m from the proposed development area.	Bushfire prone vegetation is between 100-200m from the proposed development area.	Bushfire prone vegetation is less than 100m from the proposed development area.	Low
2. Surrounding Vegetation	Bushfire cannot directly approach the proposed development area as it is surrounded by more than 700m of urban development, non-mapped vegetation and managed land.	Bushfire can only approach the proposed urban area from one aspect. Typically an island of bushfire vegetation within a wider urban development area, or a linear vegetation corridor of less than 100m width.	Bushfire can approach from one or more aspect and site is on the bushland-urban interface. Contiguous bushfire vegetation with a fire run in any direction of 0.1-2.0 km distance.	Bushfire can approach from more than one aspect and site is on bushland-urban interface. Contiguous bushfire vegetation with a fire run of more than 2 km.	Extreme
3. Bushfire Behaviour	Extreme bushfire behaviour at the site is not possible given the broader landscape.	Extreme bushfire behaviour at the site is unlikely in this broader landscape.	Extreme bushfire behaviour at the site is likely due to the broader landscape.	Extreme bushfire behaviour at the site is very likely due to the broader landscape.	Extreme
4. Impact of Catastrophic fire behaviour (FFDI 100)	There is little vegetation beyond 700 metres of the site (except grasslands and low-threat vegetation) which will not result in neighbourhood scale destruction.	The type and extent of vegetation within 100-700m of the site is unlikely to result in neighbourhood-scale destruction.	The type and extent of vegetation less than 100m of the site and the layout of urban development makes possible neighbourhood-scale destruction through house to house transmission and interaction with retained vegetation.	The type and extent of vegetation less than 100m of the site and the layout of urban development is likely to result in neighbourhood-scale destruction through house to house transmission and interaction with retained vegetation.	Moderate
5. Separation and bushfire management arrangements	Future development is separated from bushfire vegetation by more than 700m.	Future development is separated from bushfire vegetation by 100-700m and permanent bushfire vegetation management areas are maintained outside the urban area.	Future development is separated from bushfire vegetation by less than 100m and permanent bushfire vegetation management areas are maintained outside the urban area.	Future development is separated from bushfire vegetation by less than 100m and permanent bushfire vegetation management areas are NOT maintained outside the urban area.	Low
6. Vegetation corridors within development area	Vegetation within the site cannot enable fire to enter and move through the site OR the site is more than 700m from bushfire vegetation.	Vegetation within the site is of less than 1 ha size; or highly fragmented; or a linear configuration unlikely to enable fire to enter and move through the site.	Bushfire vegetation within the site is larger than 1ha; or of a linear configuration more than 100m wide and may provide a passage for fire to enter and move though the site.	Bushfire vegetation corridors within the site link directly to large areas of bushland and are likely to provide a passage for fire to enter and move through the site.	Moderate
7. Evacuation routes	Site is adjoining existing urban area. Good, multiple route evacuation is possible and the site is more than 700m from bushfire vegetation.	Evacuation to alternate location that provides life safety refuge is possible by multiple routes and less than 1km and can be completed by foot or vehicle.	Evacuation to alternate location that provides life safety refuge is possible by multiple routes and is within 1km-3km.	Evacuation to alternate location that provides life safety refuge is via single route only; and/or is more than 3km; and/or is through significant areas of bushfire prone vegetation.	High
8. Isolation and emergency services access to development area	Seamless integration with existing settlement and adequate emergency services infrastructure for local response.	Short bushland pinch points that may restrict access temporarily or carry fire across roads; and adequate emergency services infrastructure for local response.	Short bushland pinch points that may restrict access temporarily or carry fire across roads; and limited emergency services infrastructure for local response.	Large areas of bushland or multiple pinch points along access routes that could block emergency access for extended time; and/or no emergency services infrastructure for local response.	Extreme
9. Firefighting infrastructure	Site is within urban area more than 700m from bushfire prone vegetation.	Site is within 100m of bushfire prone vegetation where vegetation is permanently managed and firefighting infrastructure such as fire trails, water supplies and helipads areas have been established in accordance with BMS.	Site is within 100m of bushfire prone vegetation where vegetation is permanently managed however no firefighting resources have been established in accordance with BMS.	Site is within 100m of bushfire prone vegetation where vegetation is NOT permanently managed, and no firefighting infrastructure has been established in accordance with BMS.	Low
		Overall Threat Rating	**High Risk**	**Total**	**220**

Assessed at Forest Fire Danger Index of 100 as the design fire, using Method 1 in accordance with BMS

The scoring system uses a multiplier for each Threat level based on a conservative life safety approach.

The scaled scores for each Threat assessment are totalled and final scores are placed within a range to produce the final Risk Rating

Figure 41: LSAT summary score – West Molonglo

Landscape Scale Assessment Tool (ACT WEIA version)

Kambah

Landscape scale bushfire risk factors

Parameter	Low landscape scale threat	Moderate landscape scale threat	High landscape scale threat	Extreme landscape scale threat	
1. Distance to vegetation mapped as bushfire prone land or capable of sustaining a wildfire	Bushfire prone vegetation is more than 700m from the proposed development area.	Bushfire prone vegetation is between 200-700m from the proposed development area.	Bushfire prone vegetation is between 100-200m from the proposed development area.	Bushfire prone vegetation is less than 100m from the proposed development area.	Low
2. Surrounding Vegetation	Bushfire cannot directly approach the proposed development area as it is surrounded by more than 700m of urban development, non-mapped vegetation and managed land.	Bushfire can only approach the proposed urban area from one aspect. Typically an island of bushfire vegetation within a wider urban development area, or a linear vegetation corridor of less than 100m width.	Bushfire can approach from one or more aspect and site is on the bushland-urban interface. Contiguous bushfire vegetation with a fire run in any direction of 0.1-2.0 km distance.	Bushfire can approach from more than one aspect and site is on bushland-urban interface. Contiguous bushfire vegetation with a fire run of more than 2 km.	High
3. Bushfire Behaviour	Extreme bushfire behaviour at the site is not possible given the broader landscape.	Extreme bushfire behaviour at the site is unlikely in this broader landscape.	Extreme bushfire behaviour at the site is likely due to the broader landscape.	Extreme bushfire behaviour at the site is very likely due to the broader landscape.	High
4. Impact of Catastrophic fire behaviour (FFDI 100)	There is little vegetation beyond 700 metres of the site (except grasslands and low-threat vegetation) which will not result in neighbourhood scale destruction.	The type and extent of vegetation within 100-700m of the site is unlikely to result in neighbourhood-scale destruction.	The type and extent of vegetation less than 100m of the site and the layout of urban development makes possible neighbourhood-scale destruction through house to house transmission and interaction with retained vegetation.	The type and extent of vegetation less than 100m of the site and the layout of urban development is likely to result in neighbourhood-scale destruction through house to house transmission and interaction with retained vegetation.	Moderate
5. Separation and bushfire management arrangements	Future development is separated from bushfire vegetation by more than 700m.	Future development is separated from bushfire vegetation by 100-700m and permanent bushfire vegetation management areas are maintained outside the urban area.	Future development is separated from bushfire vegetation by less than 100m and permanent bushfire vegetation management areas are maintained outside the urban area.	Future development is separated from bushfire vegetation by less than 100m and permanent bushfire vegetation management areas are NOT maintained outside the urban area.	Low
6. Vegetation corridors within development area	Vegetation within the site cannot enable fire to enter and move through the site OR the site is more than 700m from bushfire vegetation.	Vegetation within the site is of less than 1 ha size; or highly fragmented; or a linear configuration unlikely to enable fire to enter and move through the site.	Bushfire vegetation within the site is larger than 1ha; or of a linear configuration more than 100m wide and may provide a passage for fire to enter and move though the site.	Bushfire vegetation corridors within the site link directly to large areas of bushland and are likely to provide a passage for fire to enter and move through the site.	Moderate
7. Evacuation routes	Site is adjoining existing urban area. Good, multiple route evacuation is possible and the site is more than 700m from bushfire vegetation.	Evacuation to alternate location that provides life safety refuge is possible by multiple routes and less than 1km and can be completed by foot or vehicle.	Evacuation to alternate location that provides life safety refuge is possible by multiple routes and is within 1km-3km.	Evacuation to alternate location that provides life safety refuge is via single route only; and/or is more than 3km; and/or is through significant areas of bushfire prone vegetation.	Low
8. Isolation and emergency services access to development area	Seamless integration with existing settlement and adequate emergency services infrastructure for local response.	Short bushland pinch points that may restrict access temporarily or carry fire across roads; and adequate emergency services infrastructure for local response.	Short bushland pinch points that may restrict access temporarily or carry fire across roads; and limited emergency services infrastructure for local response.	Large areas of bushland or multiple pinch points along access routes that could block emergency access for extended time; and/or no emergency services infrastructure for local response.	Low
9. Firefighting infrastructure	Site is within urban area more than 700m from bushfire prone vegetation.	Site is within 100m of bushfire prone vegetation where vegetation is permanently managed and firefighting infrastructure such as fire trails, water supplies and helipads areas have been established in accordance with BMS.	Site is within 100m of bushfire prone vegetation where vegetation is permanently managed however no firefighting resources have been established in accordance with BMS.	Site is within 100m of bushfire prone vegetation where vegetation is NOT permanently managed, and no firefighting infrastructure has been established in accordance with BMS.	Low
		Overall Threat Rating	**Moderate Risk**	**Total**	**150**

Assessed at Forest Fire Danger Index of 100 as the design fire, using Method 1 in accordance with BMS

The scoring system uses a multiplier for each Threat level based on a conservative life safety approach.

The scaled scores for each Threat assessment are totalled and final scores are placed within a range to produce the final Risk Rating

Figure 42: LSAT summary score - Kambah

Table 2: Comparison of summary LSAT scores – lower score means more suitable

	Score Ranges	Score	Risk Rating	Rank – use in Table 3
Central Molonglo	Low risk < 130	140	Moderate	**1**
Uriarra	Moderate risk 130-180	180	Moderate	**4**
West Molonglo	High risk >180-230	220	High	**5**
Bulgar Creek	Extreme risk >230	150	Moderate	**2**
Kambah		150	Moderate	**2**

8.8. Contribution to improvement of bushfire safety for existing development

The assessment of the five revised investigation areas has concentrated on the ability of the areas to provide potential safer urban development opportunities, and the spatial relationship to existing established urban areas of Canberra has been limited to the influence this may have on the future bushfire management of the investigation areas. However, Section 2.4 - Comparison of recent and older urban development at the WEIA interface; Section 4 - Strategic planning for bushfires; and Section 5 - House loss and distance from bushfire vegetation; highlights the relationship of potential new development to assist in making the overall Canberra community safer from bushfire threat.

The strategic planning process provides an opportunity to provide for the expansion of Canberra and significantly improve the bushfire risk management of older development areas that have not been planned and built to contemporary standards. In finalising the relative rankings, the revised investigative areas will be scored as a binary 'yes' or 'no' as to whether they are likely to provide a material improvement to the bushfire safety of existing areas. This means the likely result of future urban development through a combination of:

- directly removing a bushfire threat through creating a significant buffer to the bushfire hazard through new development; or
- reducing the size of bushfire prone vegetation adjoining so it no longer can support landscape scale fires; or
- significantly fragmenting the retained vegetation adjoining the older development area.

Given the potential positive impact a significant score of 5 points will be applied.

8.9. Bushfire landscape assessment conclusion

Quantitative and qualitative methods have been used to consider both the overall bushfire risk of the five revised investigation areas, and the relative suitability of each for the next stages of investigation in the strategic planning process. The final relative rankings are presented in Table 3.

- Each of the rankings summarised in Tables 1 (area and area/perimeter ratio) & 2 (LSAT score) score points in inverse of the ranking. That is, rank 1 scores 5 points and rank 5 scores 1, with any tied rankings sharing the points for the next two positions.
- Given the significant improvement provided to bushfire safety for existing older development, by locating new development towards the threat, the areas scored as 'yes' will receive an additional 5 points.

The final scores are totaled, and these scores indicate the relative suitability of each of the revised investigation areas for further study and rezoning potential. This must assume the caveats discussed at length above regarding the need for integration with other key issues, notably biodiversity and green corridors, and the assumption that all future rezoning proposals will undergo a complete Strategic Bushfire Study during the early stages of that next process. Further, the scores may also provide guidance in the staging of future rezoning proposals.

Table 3: Final scores WEIA Strategic Bushfire Risk Assessment – higher overall is more suitable[9]

	Area within 700m buffer rank Table 1	Points	Urban safety score rank Table 1	Points	LSAT rank Table 2	Points	Support older areas Yes = 5 No = 0	Total point score (max. 20)	Overall suitability ranking
Central Molonglo	3	**3**	2	**3.5**	1	**5**	**Yes - 5**	**16.5**	**1**
Uriarra	1	**5**	1	**5**	4	**2**	**No - 0**	**12**	**4**
West Molonglo	5	**1**	5	**1**	5	**1**	**No - 0**	**3**	**5**
Bulgar Creek	2	**4**	2	**3.5**	2	**3.5**	**Yes - 5**	**16**	**2**
Kambah	4	**2**	4	**2**	2	**3.5**	**Yes - 5**	**12.5**	**3**

[9] Study areas identified by EPSDD following recommendations of WEIACSA report (2023)

9. Next steps

The ACT Government is in a unique position to ensure strategic planning plays a critical role in the future bushfire safety for new urban areas, and that this is supported by direct involvement and coordinated commitments by various land management arms of government. Further, the functioning of the planning system as shown in the BMS (Figure 3 p. 28) provides opportunities to introduce place specific controls and technical specifications, if desired, that can assist in improving the long-term bushfire safety of both new development and adjacent older development. This provides opportunities to consider the likely impacts of climate change by providing requirements that extend beyond contemporary practice (Figure 43). The potential scale of the WEIA provides opportunities to spread any additional costs across a large development area and minimise the development costs on individual developers and future residents. These opportunities focus on the strategic planning principles and requirements outlined in Section 4 of the BMS.

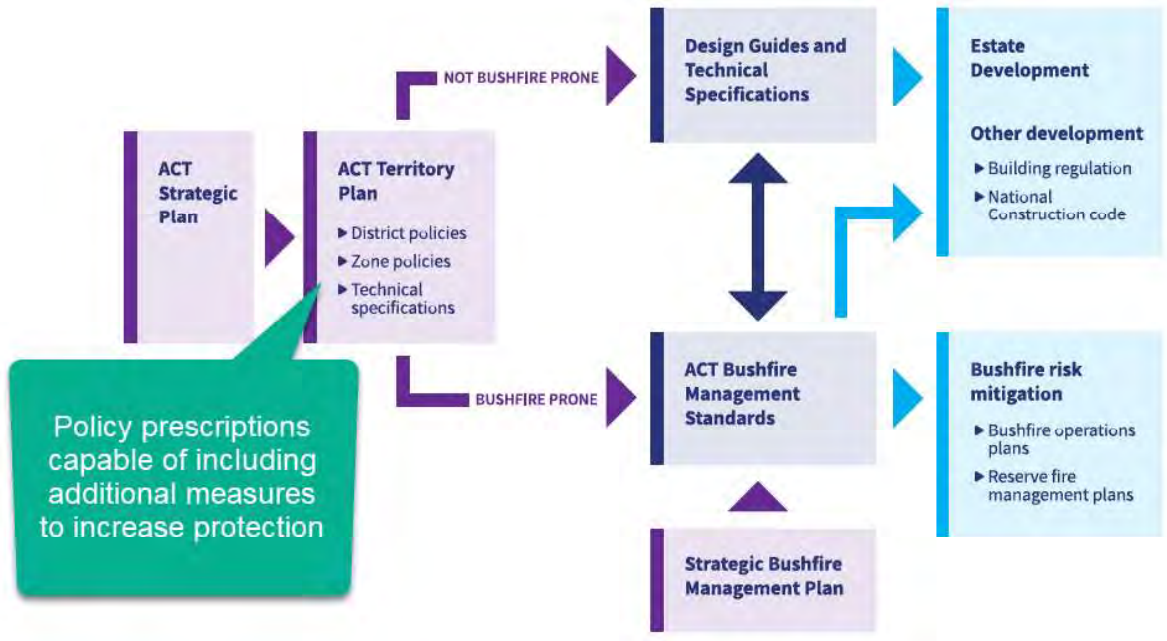

Figure 43: Opportunity to introduce place specific controls (BMS, p. 28)

9.1. Integrate SBRA findings with latest studies

As discussed previously, this large scale SBRA needs to be integrated into the ongoing studies being undertaken as part of the WEIA process, with a particular focus on ecological constraints/opportunities, stormwater management and infrastructure provision. The future spatial location and form of these elements is critical to inform the next stage of bushfire risk management.

It is understood that it is neither sustainable or desirable to remove all bushfire prone vegetation from the Canberra landscape, and that there are multiple competing demands and community desires for land use. This is particularly critical for those areas such as green corridors and nature reserves that may be located within the investigation areas after further decisions have been made. By using the suite of bushfire protection measures identified in the BMS, new development areas can achieve compliance whilst retaining the unique bushland setting. It is critical to undertake a formal SBS at the rezoning stage to ensure sufficient focus is on the integration of all elements and future compliance with the BMS can be assured.

9.2. Suggested site suitability criteria for Policies and Technical Specifications

As shown above there is a very clear inverse relationship between distance from the urban-bushland interface and the resilience of development. It is strongly suggested that a set of site suitability criteria is considered in the strategic planning process (such as in the preparation of a Planning and Response Report in accordance with the *Planning Act 2023*. This will have the advantage of considering requirements at the early planning stage to determine whether specific requirements are needed in the Territory Plan, providing clarity for government development agencies and the private sector alike. It may be practical to directly relate site suitability and development types to the buffer zones discussed in this report. This explicitly recognises (consistent with the BMS) that there will be uses such as ecotourism that may still be located in higher bushfire risk areas and will rely on other bushfire protection measures such as early evacuation. The BMS (p. 22 & 101) also recognises that new development post 2022 can no longer rely on mapped IAPZ determined by ESA and maintained by the ACT, and instead must contain IAPZ to the development site and ongoing maintenance by the resident.

The following site suitability criteria are strongly recommended for further discussion for the next stage of the process following the integration of the SBRA with the related studies. These suggested criteria are based in the BMS bushfire protection principles (p. 12) and the requirements of the SBS p. 31-32) shown as Figure 22 in this report:

1. **Low suitability** – Exclusion of development and zoned for conservation, infrastructure & recreation etc. These areas should not be zoned for urban development and land uses should be compatible with providing support for bushfire management. This area will contain permanently managed OAPZ, SFAZ and LMZ. Typically, the boundary between Low suitability and Moderate suitability areas will be a zone boundary and considered the urban-bushland interface.
    a. Steep land

b. Environmentally constrained lands which cannot be overcome
c. Other areas that may exhibit high bushfire intensity and extreme bushfire behaviour within the retained vegetation e.g. pine plantations
d. Large areas of retained native vegetation e.g. Nature Reserves and water catchment areas
e. Natural setting recreation reserves e.g. equestrian, mountain biking
f. Potential for the area to be isolated in the event of a bushfire and the development is likely to be difficult to evacuate during a bush fire due to its siting in the landscape
g. The development is within an area of high bush fire risk where density of existing development may cause evacuation issues for both existing and new occupants

2. **Moderate Suitability** – Areas 0-200m from the urban-bushland interface. Zoned primarily for suburban residential development and supporting uses. Subdivision design should be compatible with providing support for bushfire management. This area will contain perimeter roads and IAPZ.
    a. Accessible land and access routes not compromised by bushfire
    b. Not environmentally constrained lands
    c. Vegetated corridors and riparian areas assessed as capable of sustaining local scale fires only and are accessible for firefighting operations
    d. Where retained vegetation is likely to generate moderate to high bushfire intensity and extreme bushfire behaviour is possible, assets are protected by perimeter roads, acceptable solution APZ and construction standards.
    e. Provision of hardened infrastructure that will not be degraded by bushfire (services are underground). Suitable water pressure is available to all developed areas for firefighting purposes.
    f. Development types
        i. Residential subdivision - Meet the acceptable solutions and are within 100m of interface including high risk including forest, woodland and plantation and 50m of grassland (including grazing, cropping, exotic and native).
        ii. Sensitive uses
            a. Highly vulnerable sensitive uses not within moderate suitability area
            b. Lower vulnerability sensitive uses located more than 100m from unmanaged Bushfire Prone Areas
        iii. No hazardous industry

iv. Only small scale local commercial uses to prevent social and economic impacts affecting the wider community
v. Managed land including recreation areas, infrastructure etc. that are incorporated into permanent APZ after consultation with all relevant agencies.

3. **High suitability** - Greater than 200m from the urban-bushland interface. Zoned for a range of uses. Subdivision design should be compatible with providing support for bushfire management, offer multiple access away from the interface, and offer opportunities for public space suitable for use as informal safer places during large scale bushfires.
    a. Multiple access routes not compromised by bushfire
    b. Not environmentally constrained lands
    c. Vegetated corridors and riparian areas assessed as capable of sustaining local scale fires only and are accessible for firefighting operations
    d. Where retained vegetation is likely to generate moderate to high bushfire intensity and extreme bushfire behaviour is possible, assets are protected by perimeter roads, acceptable solution APZ and construction standards.
    e. Provision of hardened infrastructure that will not be degraded by bushfire (services are underground). Suitable water pressure is available to all developed areas for firefighting purposes.
    f. Development types
        i. Multiple residential types and densities permitted, with high density residential preferably located more than 700m from the interface.
        ii. Sensitive uses
            a. Highly vulnerable sensitive uses preferably located more than 700m from interface
            b. Lower vulnerability sensitive uses permitted
        iii. Hazardous industry acceptable in accordance with BMS and any specific requirements
        iv. All commercial and industrial uses permitted, with town centres and major commercial areas preferably located more than 700m from interface

9.3. Additional planning and building controls for consideration

The contemporary Australian bushfire risk management standards work from the basis of a design bushfire based on FFDI 100. The current SBMP (p. 11-13; 56-58) recognises the importance of taking an adaptive management approach to considering climate change. This relates to both the increasing risk related to more high fire weather days and potentially longer dry periods and likely increases in FFDI readings in excess of 100.

The impacts of climate change of the increase in fire severity should be considered in relation to the design fire. The western edge is on the leading edge of fires running into Canberra from the west, northwest and north, and susceptible to the "probable worst case" fire weather, and bushfire should be considered as part of the planning timeframe and perspective.

Incorporating climate considerations and projections in line with the lifecycle of the developments and into land use planning is crucial for creating sustainable and resilient communities. The event horizon should be considered for climate change design fires and the FDI and associated APZs adjusted accordingly. Redundancy should be built into the planning system to provide a layered approach to defence and harm minimisation for people, recognising that pyro convective fires will burn beyond what can be reasonably planned for.

Climate change will also likely affect the ability to undertake hazard reduction works and increase the costs of managing bushfire mitigation and operational response capability.

The contemporary framework focusses on managing development within 100m of the urban-bushland interface due to the relationship between historic house losses and distance to bushland. This is out of step with the consequences of large scale fires in 2009 and 2019 – 2020. Lastly, the contemporary framework does not specifically manage the impact of house-to-house transmission of fire, nor does it seek to eliminate building loss from bushfire attack.

There is an opportunity to partially address these issues through the planning process that go beyond the contemporary Australian bushfire development standards, and the controls strongly recommended for incorporation into future Policies and Technical Specifications discussed in section 8.2 above. The following measures are suggested for discussion as either single innovations or combinations as the planning and regulatory framework for the WEIA is developed:

- Requirement for key road crossings through vegetated areas (typically riparian or green corridors) to meet suitable standards (to be developed) to facilitate safe access and egress during a bushfire. This may include mechanisms to prohibit access, asset protection zones adjacent to the roads, design guidelines for the location of stormwater retention ponds, use of large non-flammable batters or radiant heat shields;

- Requirement for detailed guidelines to incorporate suitable future public facilities and infrastructure (e.g. sports fields, roads, car parking, managed playgrounds, stormwater ponds, shared paths) into APZ areas on the development site. This may minimise the impact on retained vegetation, provide a permanent defined urban-bushland interface, reduce maintenance costs on public land, and result in fewer houses within 100m of the interface;
- Requirement for compulsory sprinkler systems to be installed for all new development within 100m of bushland deemed to be capable of being impacted by a landscape scale fire;
- Requirement for BAL-12.5 construction standards to apply for all new development between 101-200m from the interface;
- Requirement for early consultation with the ESA, Parks and Conservation, and combat firefighting agencies prior to rezoning proposals or Estate Development Plans being exhibited. This should include the location and form of all strategic fire management zones and firefighting infrastructure (including potential static water supplies within 100m of the interface) affecting the development;
- Requirement for protection of critical infrastructure guidelines to be improved and updated based on detailed vulnerability assessments specific to the type and criticality of the infrastructure, and detailed site assessments consistent with contemporary bushfire attack methodology.

9.4. Staging

There are significant advantages in finalising the ultimate urban-bushland interface early in the process, and this is generally the future zone boundary. Given the scale of the WEIA investigation areas, the size of rezoned areas potentially to result, and the decades long process to ultimately fully develop the final urban areas, there is a need to develop a clear planning strategy. This needs to be endorsed by all agencies and funded in a clear long term manner to ensure that good strategic planning is not let down with respect to bushfires in the coming decades due to a lack of clarity or resources.

This will have the advantage of setting requirements prior to the Estate Development stage and providing clarity for government development agencies and the private sector alike.

10. Recommendations

The final recommendations of this Strategic Bushfire Risk Assessment are as follows:

1. Consolidated guidance as to the relative suitability of the revised five investigation areas is provided in Table 3 (p. 73).
2. This Strategic Bushfire Risk Assessment must be integrated with related investigations prior to the next steps in the planning process.
3. Site specific Strategic Bushfire Studies in accordance with the Bushfire Management Standards must form part of the next stage of the planning process as future investigation areas are refined, particularly with relation to the establishment of environmental corridors.
4. Priority should be given to investigation areas adjoining or adjacent to older development areas to provide additional bushfire protection.
5. Future strategic planning processes related to the Western Edge Investigation Area should consider the site suitability criteria presented in Section 9.2 (p. 75).
6. To enhance bushfire safety into the future and improve practice, additional planning methods and requirements including, but not limited to, those presented in Section 8.3 should be explored by Environment Planning & Sustainable Development Directorate and partners.
7. Part of the ongoing planning process should develop a staging strategy based on ensuring planning, operational delivery and bushfire management are coordinated.

11. Conclusion

This Strategic Bushfire Risk Assessment has been provided to further refine the process and geographical focus of the Western Edge Investigation Area project with respect to bushfire risk management. This is a large scale consideration of the area identified and will need to be further refined after integration with other studies. This has been prepared in alignment with the ACT Government framework for managing bushfire and planning with respect to bushfire and is consistent with the ACT Bushfire Management Standards (2023).

In the authors' professional opinion, the Western Edge Investigation Area has substantial scope for development that will be able to meet current and future standards for bushfire protection, and the next stage will be to integrate with other detailed studies to further refine the most suitable locations for future rezonings for urban uses.

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12. References

ACT Government (2019) *Strategic Bushfire Management Plan 2019-2024*. Canberra.

ACT Government (2023) *Bushfire Management Standard*. Canberra.

ACT Multi Hazard Advisory Council (2023) *Report on ACT Bushfire Management since 2003*. Canberra.

Australasian Fire and Emergency Service Authorities Council (2019) *Bushfires and Community Safety*.

Australian Institute for Disaster Resilience (2020) *Land Use Planning for Disaster Resilient Communities*.

Chen, K and McAneney, J. 2004 *Quantifying bushfire penetration into urban areas in Australia*, Geophysical Research Letters Vol. 31

Council of Australian Governments (2011) National Strategy for Disaster Resilience

Crompton, RP, McAneney, J, Chen, K, Pielke, RA and Haynes, K (2010) *Influence of location, population and climate on building damage and fatalities due to Australian bushfire: 1925-2009*. Weather, Climate and Society 2010 Vol. 2

Keith, David (2004) – *Ocean Shores to Desert Dunes – The Native Vegetation of New South Wales and the ACT*. The Department of Environment and Climate Change

NSW Rural Fire Service (2015) *Guide for Bush Fire Prone Land Mapping*

NSW Rural Fire Service (2019). *Planning for Bush Fire Protection: A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners.*

NSW Rural Fire Service (2017) *Neighbourhood Safer Places: Guidelines for the Identification and Inspection of Neighbourhood Safer Places in NSW*. Issued November 2019.

NSW Government (1979) *Environmental Planning and Assessment Act 1979*. NSW Government Printer.

Royal Commission into National Natural Disaster Arrangements (2020) *Royal Commission into National Natural Disaster Arrangements Report*. Commonwealth of Australia.

Standards Australia (2018) *Construction of buildings in bushfire-prone areas*, AS 3959-2018. SAI Global, Sydney.

13. Appendix 1 – Stage 1 Report – Context and Concepts

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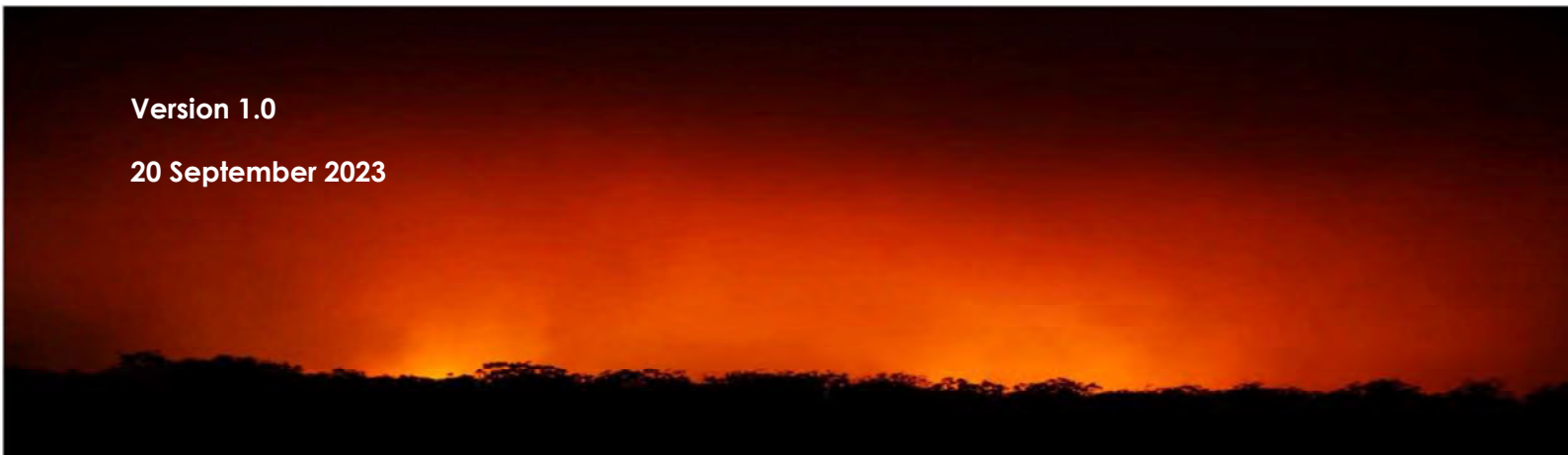
Appendix 1
Stage 1 Report – Context and Concepts

Western Edge Strategic Bushfire Risk Assessment

Prepared for
EPSDD – ACT Government

BPAD Bushfire Planning & Design Accredited Practitioner Level 3



Version 1.0

20 September 2023

Project Name:	Western Edge Strategic Bushfire Assessment – Constraints and Opportunities
Prepared by:	
Client Details:	Syed Ali Project Manager ACT Environment, Planning and Sustainable Development Directorate
Project Address	Western Edge Study Area ACT

Name	Position	Contact No	Email
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Version	Primary Author(s)	Description	Date Completed
0.2		Draft	27 July 2023
1.0		Final incorporating comments	20 September 2023

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Contents

1. Credentials

This Constraints and Opportunities Report has been prepared by David Lemcke and Lew Short from Blackash Bushfire Consulting. Current Curriculum Vitae are at Appendix 2.

David Lemcke is a Senior Planner & Bushfire Specialist who is an active senior RFS volunteer, with over 20 years in the service, having been a field officer for 14 years, with incident management experience at local level and he has held multiple brigade Executive roles. Dave is an experienced town planner with over 20 years experience in local government holding numerous qualifications including a Master of Environmental Planning and Advanced Diploma of Public Safety (Emergency Management).

Lew Short is the Principal at Blackash Bushfire Consulting (FPAA BPAD-A Certified Practitioner No. BPD-PA-16373) who is recognised by the RFS as qualified in bushfire risk assessment and has been accredited by the Fire Protection Association of Australia as a Level 3 BPAD qualified consultant.

Lew established and led the Community Resilience Group for the RFS. His areas of responsibility included land use planning, community engagement, education, vulnerable communities, bunkers, Neighbourhood Safer Places, business systems and projects, social media, integrated risk management and environmental management. He was responsible for the establishment, management and leadership of the development assessment function for the RFS at a State level where he was responsible for the assessment of over 80,000 development applications in Bush Fire Prone Areas.

Lew holds several qualifications including undergraduate and post graduate level in environmental management and specialising in bushfire management. Lew is an active Crew Leader with Ku-ring-gai Rural Fire Brigade and has significant operational experience.

Both Lew and David are experts in the bushfire field and can interpret and apply legislation, policy and bushfire requirements while drawing on extensive professional expertise and operational experience.

2. Western Edge Strategic Bushfire Risk Assessment

2.1. Project Overview

The ACT Planning Strategy 2018 (the Strategy) is the key planning document developed to guide the continuing sustainable development of Canberra, as both the nation's capital and a thriving city in its own right. This was developed as a refresh and update of the 2012 strategy and reflects significant community engagement reflecting the values of Canberrans and the importance of incorporating these into future growth. The key defining characters of the city include the value of green space, diversity of lifestyle options and the bushland setting. The vision for the Strategy therefore recognises the importance of celebrating the unique bushland setting while being responsive to future growth and resilient in the face of change (including climate change). The Strategy has 5 related themes to guide delivery of the vision through land-use planning:

1. *Compact and efficient*
2. *Diverse*
3. *Sustainable and resilient*
4. *Liveable*
5. *Accessible*

The Strategy is a long term policy designed to guide the strategic management of land for the next 30 years and provide a balanced range of outcomes derived from the broad themes. The Compact and Efficient theme focuses on planning outcomes that:

- *grow mostly within our urban footprint or in areas close to our footprint*
- *maintain environmental values*
- *use infrastructure effectively to support an efficient, sustainable and liveable city*

Each of the themes results in a number of strategic directions and then actions to deliver on those directions. Under the Compact and Efficient theme, strategic direction 1.2 is to:

- *Investigate the potential for new residential areas to the west of the city to meet future housing need.*

The Strategy provides significant rationale for the strategic directions and actions, and these clearly are interrelated across the themes. Direction 1.2 recognises that whilst much of the city growth is being achieved on infill sites, there is always a need for new greenfield development areas with a growing population and an expressed preference for housing choices. It is also recognised that the existing areas

are developing quickly and are likely to be fully developed by around 2030. At the broadest level, significant limitations were identified to the north, south and east, and the Western Edge Investigation Area was identified for potential future urban expansion.

Action 1.2.1 sets up the next level of investigation towards ultimately determining the mixture of sustainable landuses:

- *Undertake environmental, infrastructure and planning studies for the western edge of the city to identify suitable areas for:*
    - *potential urban areas (excluding Central Molonglo)*
    - *nature reserves*
    - *environmental offset and potential environmental offset areas*
    - *the consideration of cultural and heritage values*
    - *other uses, for example rural, broad acre, major infrastructure, transport and services.*

A preliminary Bushfire Risk Assessment was completed in December 2020 and contributed, along with other preliminary studies, to the *Western Edge Investigation Area Capability and Suitability Assessment* (WEIACSA) undertaken by SMEC in early 2023 that has further defined the investigation areas for more detailed study. The Western Edge Strategic Bushfire Risk Assessment (SBRA) uses the findings of WEIACSA as the basis for bushfire analysis to further refine the areas for further investigation.

This Constraints and Opportunities Report is Stage 1 of the SBRA and will introduce the concepts and practices that are used to underpin decision making for bushfire risk management in the strategic planning context. This is provided to assist decision makers to understand the rationale applied in the Stage 2 Report without having to contain all the theoretical and practice background. This Stage 1 Report is presented as an Appendix to the overall report. The Stage 2 Strategic Bushfire Study implements the concepts and strategies introduced and focuses on drilling down further to prioritise which areas are most suitable for future urban development and why. The Stage 2 Report follows the strategic planning approach laid out in the ACT Bushfire Management Standards (BMS). The BMS wholly adopts the principles and practice of Chapter 4 Strategic Planning in PBP for consistency across borders and a reference to either BMS or PBP in this context is considered to be the standard required for the ACT.

2.2. Site Description

The Western Edge Investigation Area (WEIA) was originally defined by the Strategy as the area shown hatched orange to the west of the map in Figure 1.

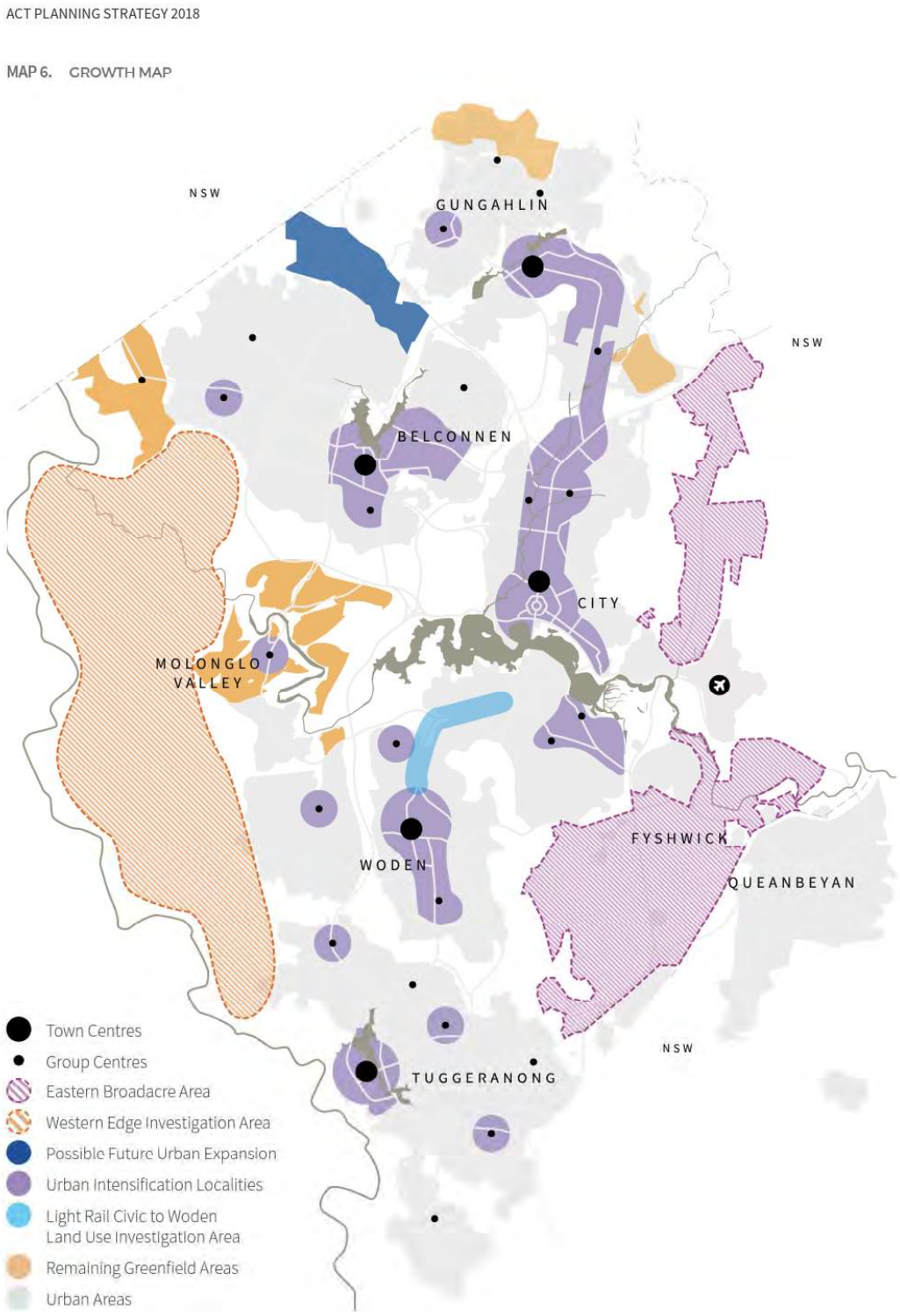

Figure 1: ACT Planning Strategy 2018 - Growth Map

2.3. Existing Development and landuses

The WEIACSA report details the wide range of non-urban uses and management tenures that cover the areas. The report pulls together the results of a wide range of preliminary studies highlighting the diverse range of heritage, environmental, natural resource management considerations. The site extends approximately 20km from Holt & Strathnairn in the north to Kambah in the south and covers the majority of the area between the city and the Murrumbidgee River to the west. The WEIA is approximately 9800ha and includes significant rural and agricultural uses, nature reserves, forest parks, infrastructure including major water and electricity transmission, and the Mount Stromlo Observatory complex.

2.4. Indicative development scenarios

The WEIACSA report has used a three-stage approach using Geographic Information System (GIS) analysis to draw together information from a range of disparate sources building on previous work, public databases and the initial preliminary WEIA studies. The first stage, land capability assessment, looked at whether there were known constraints to developing the land for urban purposes and rating it accordingly, and this included bushfire risk. The second stage, the land suitability assessment, clustered and compared parcels of land and developed the five investigation areas shown in Figure 2. Three indicative development scenarios were then developed for consideration being a 'low impact' footprint; one focused on maintaining and enhancing habitat connectivity; and one focused on infrastructure, land use and road efficiency. The third stage was a multi-criteria analysis (Strategic Merit Test) that was performed using a scoring system developed in workshop with the Western Edge project control group who also undertook the analysis.

The outcome of the WEIACSA is qualified by various factors, notably the scale and accuracy of information available during this stage. The WEIACSA report also regards the Preliminary Bushfire Assessment as of limited value with a conclusion that up to 95% of the WEIA may be suitable for development from a bushfire perspective and advises that bushfire factors played only a minor part in the assessment. Given scale of the project, this requires a continual drilling down in scale and focus of investigation.

For the purposes of this Stage 1 report, the WEIACSA report clearly identifies that most of the Mount Stromlo area is of low suitability as it is predominantly reserved for a Forest Park and recreational uses. The remainder of that investigation area is considered with the Bulgar Creek area. The overall scoring of the investigation areas is noted, however the SBRA will assess all areas for bushfire risk alone.

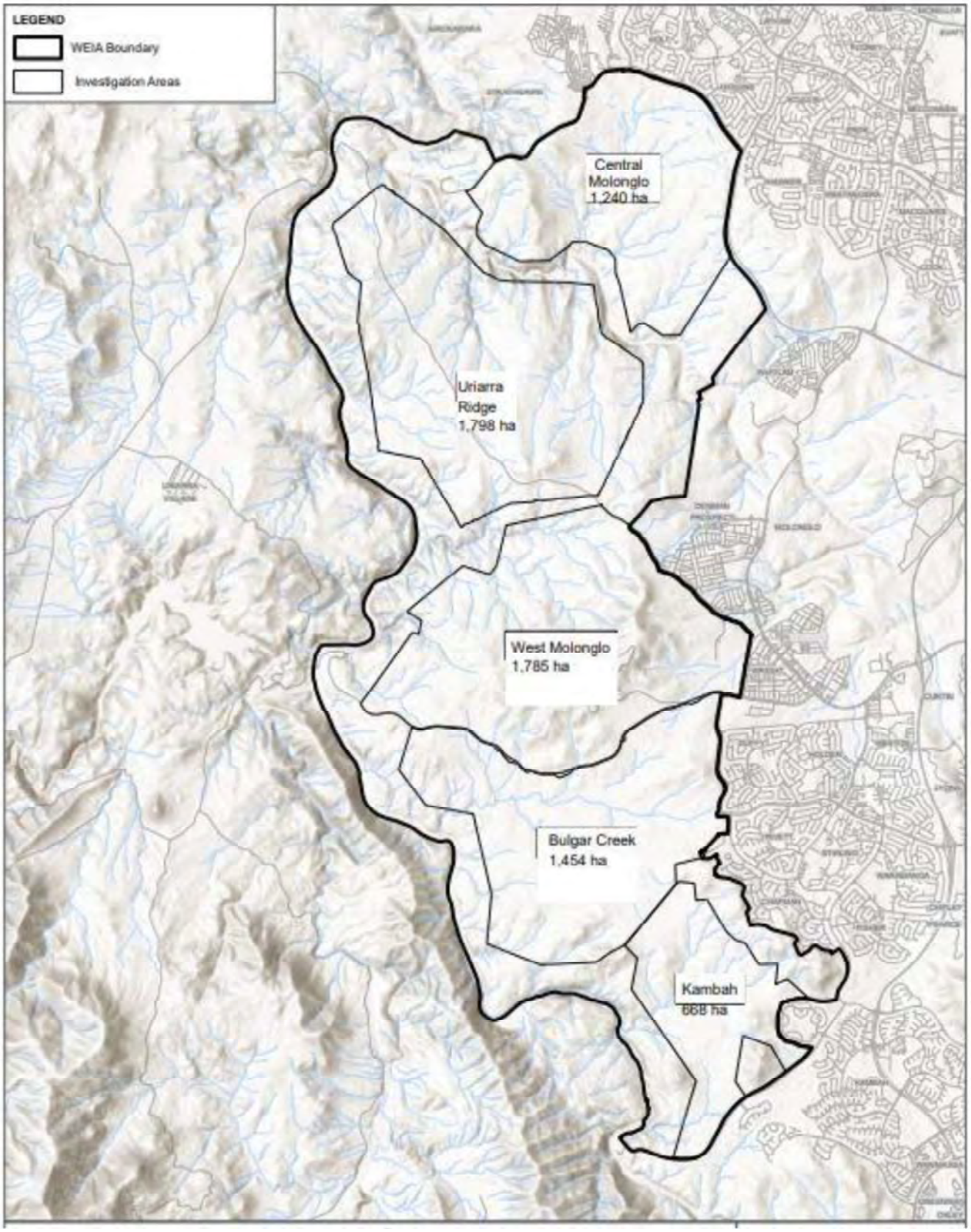

Figure 2: WEIACSA Report investigation areas.

3. The site in bushfire risk management context – historical perspective

The ACT Multi Hazard Advisory Council *Report on ACT Bushfire Management since 2003* (2023), provides a good summary of bushfire risk and preparedness provides a good summary of bushfire risk and preparedness as it is currently and provide background to the major 2003 fire and the 2020 Orroral Valley fire in their *Report on ACT Bushfire Management since 2003* (2023). In 2003, the entirety of the WEIA was burnt by the bushfire that severely impacted the city (Figure 3), and in 2020 the Orroral Valley fire that burnt in Namadji National Park and Tidbinbilla Nature Reserve to the south of the site also had the potential to burn across the WEIA and impact the city. Both this report and the ACT Bushfire Council *Bushfire Preparedness 2021-22 Report* raise the importance of managing bushfire risks, improving bushfire planning and building controls generally in the ACT, and the significance of suitably planning for bushfires in the WEIA and taking into account effects of climate change.

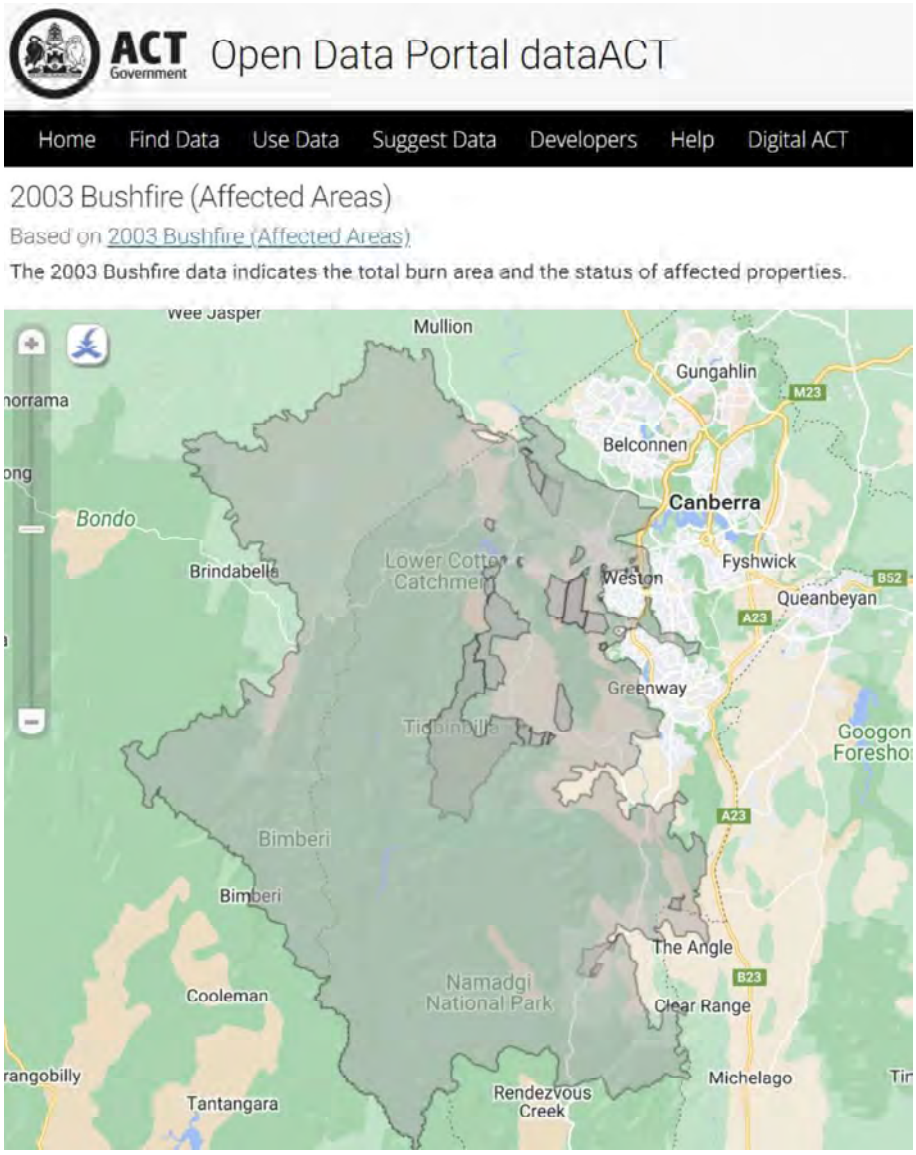

Figure 3: Extent of Canberra 2003 bushfire (ACT Open Data Portal)

4. Strategic Planning for Bushfires

Land use planning is widely recognised as an important measure for limiting future vulnerabilities and losses in areas of new development and a critical element for building disaster resilient communities.

The physical design and layout of communities and settlements are central to the many functions that sustain the social, economic and environmental support systems for the community. Land use planning provides the opportunity to manage new growth and residual risk resulting from new development by complying with legislation and standards, limiting or modifying the location of new development and influencing its layout. This can limit both the impacts of new development on natural systems, ecosystem services and hazards and the flow on impacts on the existing community, as well as limiting the impacts that natural hazards can have on new development and its users.

In keeping with the policy and intent of government, the strategic planning system is particularly important in contributing to the creation of resilient, safe and sustainable communities.

The *National Strategy for Disaster Resilience* (2011)[1] recognises that strategic planning is essential in creating safer and sustainable communities and should be incorporated in policy and intent of government at all levels. Priority outcomes of Section 3.6 include:

- *All levels of decision making in land use planning and building control systems take into account information on risks to the social, built, economic and natural environments.*

This SBRA has been completed having regard to the following Commonwealth documents:

- *National Strategy for Disaster Resilience* (2011)
- *Land Use Planning for Disaster Resilient Communities* (2020)
- *National Disaster Risk Reduction Framework* (2018)

Comprehensive consideration of bushfires and risks in the planning system needs sound understanding of the landscape context and risks, as well as clarity on risk management principles and on the approach to strategic planning and development controls that will adequately mitigate identified risks.

[1] NSDR https://www.homeaffairs.gov.au/emergency/files/national-strategy-disaster-resilience.pdf

Where there are competing policy objectives, such as biodiversity conservation and fuel reduction, an agreed methodology or guidance is critical. As such, planning decisions must be based on the best available evidence and rigorous merits-based assessment to ensure that people, homes and businesses in new development are not exposed to unacceptable risk from bushfire. The framework provided within PBP provides the minimum requirements for new development within bushfire prone areas.

The importance of sound land use planning has been recognised in all recent bushfire inquiries, including Natural Disasters in Australia which noted that land use planning that considers natural hazard risks is the single most important mitigation measure in preventing future disaster losses in areas of new development, and that planning and development controls must be effective, to ensure that inappropriate developments do not occur[2]. The application of legislation, policy, and guidelines provides one of the most effective means of bushfire planning to ensure future developments are resilient and capable of protecting life.

This report focuses on disaster resilience which means planners, hazard leaders, emergency managers and other built environment professionals can contribute to:

- understanding and anticipating bushfire risks before they happen and developing more resilient land use and built form tailored to address bushfire risks; and
- minimising the increase in risks to people and disruptions to social and economic functions when a disaster strikes by ensuring compliance with state requirements for new development in Bushfire Prone Areas.

This report uses the balanced approach provided within PBP for new development in Bushfire Prone Areas (BPA) that recognises the critical need to protect human life and provide safe operating environments for fire and emergency services, protect property, whilst having due regard to the environmental impacts, development potential of land and the need to cater for growing populations.

[2] Ellis, S et al (2004) National Inquiry on Bushfire Mitigation and Management (p.92)

5. Preliminary Bushfire Risk Assessment – Western Edge Investigation Area (Eco Logical Australia 2020)

5.1. PBRA 2020– Introduction

The *Western Edge Investigation Area Preliminary Bushfire Risk Assessment* is referred to as "PBRA 2020". In this section of this report all figures and page references refer to the PBRA 2020 document unless otherwise stated. The PBRA 2020 was produced for the ACT EPSDD to inform the Western Edge Investigation Area studies to support the implementation of the Strategy and the selection of areas suitable for future urban development. It does not consider the impact of other factors such as biodiversity or hydrology, changes to vegetation that may occur because of developing new conservation reserves, or the impact of bushfire protection measures or mitigation activities (p. 5) and is a high level document covering the WEIA as a whole, rather than the individual areas identified in the later WEIACSA document. With respect to climate change impacts, it recognises there is likely to be an increase in the number of days of high Forest Fire Danger Index (FFDI), however does not consider the potential increases in FFDI resulting from climate change. The bushfire risk assessment approach is essentially sound, however the focus on the area as a whole does not assist in making intra area comparisons, with the conclusion therefore less useful than may originally have been sought by EPSDD.

5.2. PBRA 2020 – Bushfire Landscape Risk Assessment

The summary of the landscape bushfire risk assessment concludes "*the study shows no evidence the entire WEIA is in an inappropriate bushfire landscape given the landscape fire advantages identified above and the site capacity to implement appropriate bushfire protection measures fully within the WEIA without the need for reliance on any fire management activities outside of the WEIA*" (p. 22).

The PBRA 2020 explicitly recognises that the potential for large bushfires exists in most years due to weather and fuel continuity, both inside and outside the WEIA. Essentially, the PBRA 2020 is correct under the terms of the various qualifying factors that are provided:

However, the likelihood of these fires impacting the WEIA will be determined by:

- *the likelihood and location of ignitions within the landscape coinciding with adverse fire weather conditions that move a fire toward the WEIA;*
    - *this may include an increased risk of ignitions from within the Murrumbidgee River Corridor as a result of increased access and usage resulting from potential development*
- *factors related to wildfire mitigation and suppression such as timing of fire runs, reduced fuel areas, quality wildfire detection from ACT fire towers, suppression deployment and capability,*

and the coincidence of these with landscape fire advantages (such as the Murrumbidgee River under mild fire conditions), areas of modified fuels (noting limitations as discussed in Section 2.4) and existing road and trail networks.

- *the future arrangement, extent and management of any natural vegetation areas or revegetated areas that do not meet managed open space specifications.*

The PBRA 2020 provides useful information on general bushfire risk and the need to manage interfaces and planning design suitably, and states "*over 95% of future development can be located within BAL-LOW i.e. large internal areas no longer classified as bushfire prone land*" (p. 23).

The PBRA 2020 does not however provide guidance of a more specific nature as to which areas are more suitable for development, and the statement above is made with reference to the definition of bushfire prone land only being within 100m of bushland. Whilst technically correct, this does not assist in "drilling down" to finer grained planning investigations. The PBRA 2020 makes assumptions that all areas other than riparian corridors and some woodland will be developed, and bases APZ planning on that assumption which is not realistic as significant areas will be identified for various reasons as not suitable for urban purposes. The PBRA 2020 concludes that the majority of the WEIA could theoretically be considered suitable for development.

5.3. The PBRA 2020 – Comment

The PBRA 2020 provides useful general information, advises further studies will be required, and provides general advice regarding access and egress issues. The PBRA 2020 recognises the need to ensure resources are provided for emergency services appropriate to the final development, and the need for collaborative discussions with all relevant agencies throughout the process.

The PBRA 2020 makes wide ranging assumptions about future development patterns and the application of treatments of the interface, assuming the development of the WEIA. The PBRA 2020 therefore does not provide specific information or analysis with respect to areas of the WEIA that may be more or less suitable for urban development.

6. ACT Bushfire Management Standards 2023

6.1. Introduction

The ACT Emergencies Bushfire Management Standards (BMS) is a notifiable instrument (NI2023-427) that has been updated using previous ACT standards in combination with the more contemporary NSW Planning for Bushfire Protection 2019 (PBP). Much of the document including the aim and objectives are entirely consistent with PBP which is useful given the close relationship between agencies, similarity of issues and adjoining geography. There is a greater focus on consideration of fire trails and helicopters built into the BMS, whereas the NSW RFS manages policy for these areas through other documents.

The application of the BMS and PBP are also linked through higher level national strategic policy positions, including the operation of the National Construction Code 2022 (NCC) and Australian Standard AS 3959:2018 Construction of buildings in bushfire-prone areas (AS3959).

The **aim** of BMS (p. 10) is:

- *to provide for the protection of human life and minimise impacts on property from the threat of bushfire, while having due regard to development potential, site characteristics and protection of the environment*.

The **objectives** of BMS (p. 10-11) are to:

- *Afford buildings and their occupants protection from exposure to a bushfire*
- *Provide for a defendable space to be located around buildings*
- *Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings*
- *Ensure that appropriate operational access and egress for emergency service personnel and occupants is available*
- *Provide for ongoing management and maintenance of Bushfire Protection Measures; and*
- *Ensure that utility services are adequate to meet the* needs of firefighters

The legislative framework of the ACT is similar, however not the same, as NSW and therefore the overall planning system differences and legislative requirements are different in detail. The significant difference is that without individual Local Government Areas to manage, ESA and EPSDD are able to directly manage matters such as the determination of the Bushfire Prone Area, and to maintain a single consistent point of truth for this critical information.

6.2. Strategic Planning

Section 4 of BMS and Section 4 of PBP both deal with strategic planning. The BMS articulates the regulatory framework for ACT strategic planning processes and refers specifically to the Strategy and the linkages to the ACT Wellbeing Framework and district and zone policies. The BMS and PBP are the same with regard to strategic planning principles and the process to be undertaken during the strategic planning phase at master plan or spot rezoning level. In both cases, a formal Strategic Bushfire Study (SBS) is required. The principles of the SBS will inform the Stage 2 report of this SBRA.

In the Bushfire Prone Area, detailed analysis is required to support development. The broad principles which apply to this analysis are:

- *ensuring land is suitable for development in the context of bushfire risk*
- *ensuring new development on BPL will comply with PBP*
- *minimising reliance on performance-based solutions*
- *providing adequate infrastructure associated with emergency evacuation and firefighting operations*
- *facilitating appropriate ongoing land management practices.*

BMS also outlines exclusion of inappropriate development in bushfire prone areas which includes:

- *the development area is exposed to a high bushfire risk and should be avoided*
- *the development is likely to be difficult to evacuate during a bushfire due to its siting in the landscape, access limitations, fire history and/or size and scale*
- *the development will adversely effect other bushfire protection strategies or place existing development at increased risk*
- *the development is within an area of high bushfire risk where density of existing development may cause evacuation issues for both existing and new occupants*
- *the development has environmental constraints to the area which cannot be overcome.*

A further Bushfire Risk Assessment (Strategic Bush Fire Study) may also be required at the subdivision design application (detail subdivision) stage to further refine and confirm any site-specific requirements identified in the relevant district policy or district specification to be imposed on development. As seen in the extract below (Figure 4) the SBS specifically considers the following matters, which will also be used to inform Stage 2 of this SBRA:

ISSUE	DETAIL	ASSESSMENT CONSIDERATIONS
Bush fire landscape assessment	A bush fire landscape assessment considers the likelihood of a bush fire, its potential severity and intensity and the potential impact on life and property in the context of the broader surrounding landscape.	> The bush fire hazard in the surrounding area, including: • Vegetation • Topography • Weather > The potential fire behaviour that might be generated based on the above. > Any history of bush fire in the area. > Potential fire runs into the site and the intensity of such fire runs; and > The difficulty in accessing and suppressing a fire, the continuity of bush fire hazards or the fragmentation of landscape fuels and the complexity of the associated terrain.
Land use assessment	The land use assessment will identify the most appropriate locations within the masterplan area or site layout for the proposed land uses.	> The risk profile of different areas of the development layout based on the above landscape study. > The proposed land use zones and permitted uses. > The most appropriate siting of different land uses based on risk profiles within the site (i.e., not locating development on ridge tops, SFPP development to be in lower risk areas of the site); and > The impact of the siting of these uses on APZ provision.
Access and egress	A study of the existing and proposed road networks both within and external to the masterplan area or site layout.	> The capacity for the proposed road network to deal with evacuating residents and responding emergency services, based on the existing and proposed community profile. > The location of key access routes and direction of travel; and > The potential for development to be isolated in the event of a bush fire.
Emergency services	An assessment of the future impact of new development on emergency services.	> Consideration of the increase in demand for emergency services responding to a bush fire emergency including the need for new stations/ brigades; and > Impact on the ability of emergency services to carry out fire suppression in a bush fire emergency.
Infrastructure	An assessment of the issues associated with infrastructure and utilities.	> The ability of the reticulated water system to deal with a major bush fire event in terms of pressures, flows, and spacing of hydrants; and > Life safety issues associated with fire and proximity to high voltage power lines, natural gas supply lines etc.
Adjoining land	The impact of new development on adjoining landowners and their ability to undertake bush fire management.	> Consideration of the implications of a change in land use on adjoining land including increased pressure on BPMs through the implementation of Bush Fire Management Plans.

Figure 4: Requirements of a Strategic Bushfire Study (BMS Table 1 p. 29-30)

The BMS requires that any SBS developed to support a district policy or specification must be endorsed by EPSDD, the ESA and any other relevant agency.

The BMS also explicitly recognises that regardless of the combination of bushfire protection measures or fuel mitigation measures, there will always be an element of residual risk and that it is not possible to eliminate all risk (p. 31).

6.3. Development assessment

The BMS uses the same concepts as both NCC and PBP in providing a structure that provides specific objectives for different development types at development stage. There is a clear intent stated for each of the bushfire protection measures (BPM) and then performance criteria to be met and a set of acceptable solutions that satisfy the performance criteria. The system allows flexibility by permitting a combination of performance solutions and/or acceptable solutions. The BPM are the suite of measures used in combination to manage the impacts of bushfire behaviour.

Section 5 provides the requirements for Estate Development Plans required for subdivisions.

Section 6 provides the requirements for sensitive use developments with more vulnerable occupants (e.g. schools, hospitals, aged care facilities, tourism facilities etc).

Section 7 provides the requirements for residential infill development and home occupations, including some departures from PBP that appear to be practical, and designed to simplify development for residents.

Section 8 provides requirements and objectives for other types of development.

6.4. ACT Strategic Bushfire Management Plan (SBMP)

The SBMP is the overarching document that directs all levels of bushfire planning in the ACT and the current version is SBMP4 2019-2024. Part A provides details on context and risk management. The regulatory framework is shown in Figure 5.

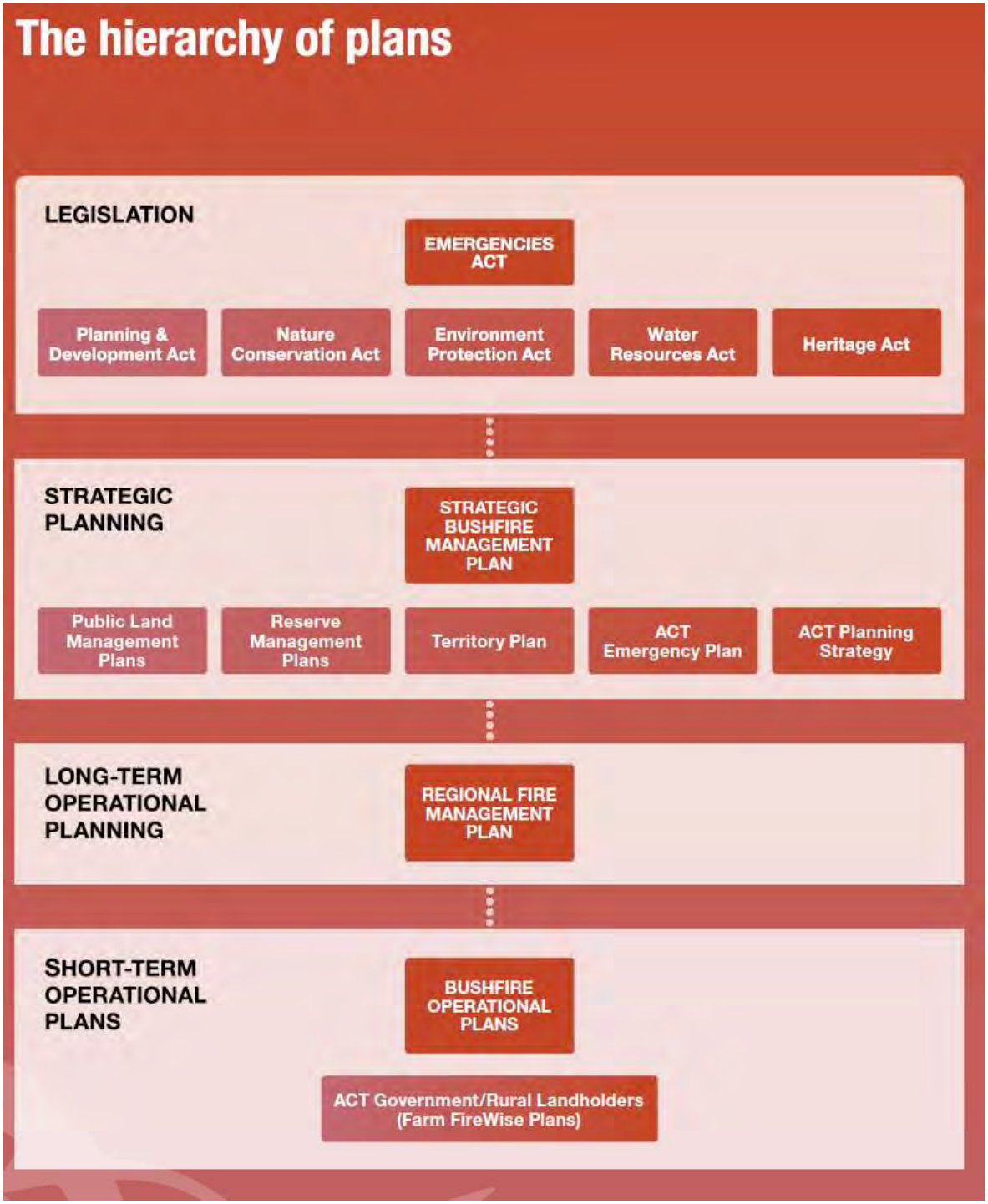

Figure 5: Hierarchy of plans in ACT (SBMP p. 19)

The Bushfire Prone Area (BPA) is enacted by the ESA and drives residents' personal risk assessment and triggers the development control provisions in the BMS. The BPA extends 100m past the bushland urban interface to take into account the impact of bushfire spread into the urban area via house-to-house transmission and ember attack. The BPA is periodically updated to take into account new urban development, improved mapping and site specific issues as required. The entire WEIA is shown as BPA currently. Figure 6 is an extract from ACTmapi showing the BPA covering the WEIA.

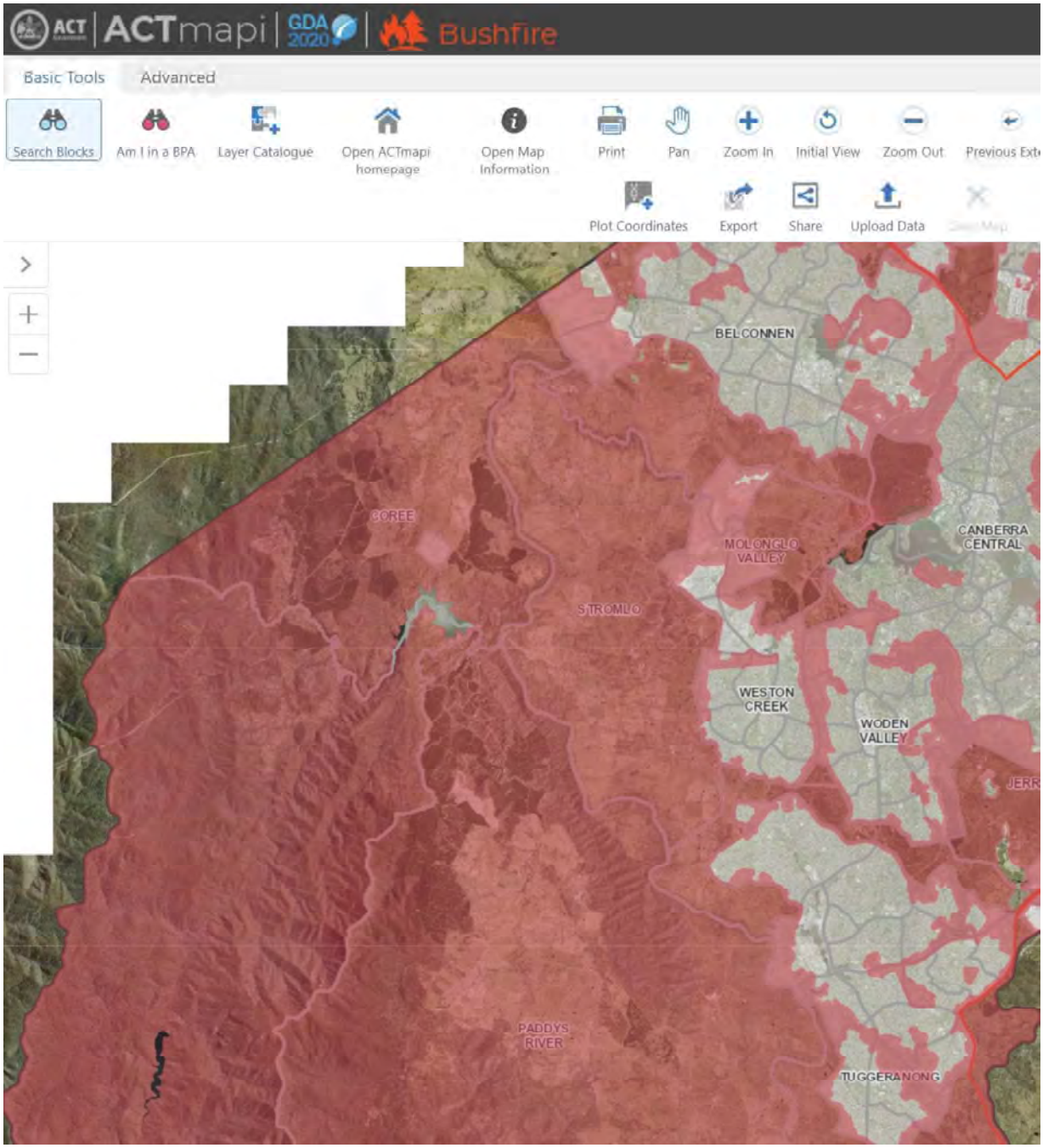

Figure 6: Bushfire Prone Area (ACTmapi)

Fire management zones are areas within the BPA identified as needing priority fuel management actions and access requirements and are linked to widths and maintenance standards for each type of zone in the BMS.

The zones are:

- Inner Asset Protection Zone
- Outer Asset Protection Zone
- Strategic Fire Advantage Zone
- Agricultural Fire Protection Zone
- Landscape Fire Management Zone
- Aboriginal Fire Management Zone

Figure 7 depicts how some of the zones work together in practice to manage risk and these are determined by various factors such as vegetation, aspect, and length of fire run.

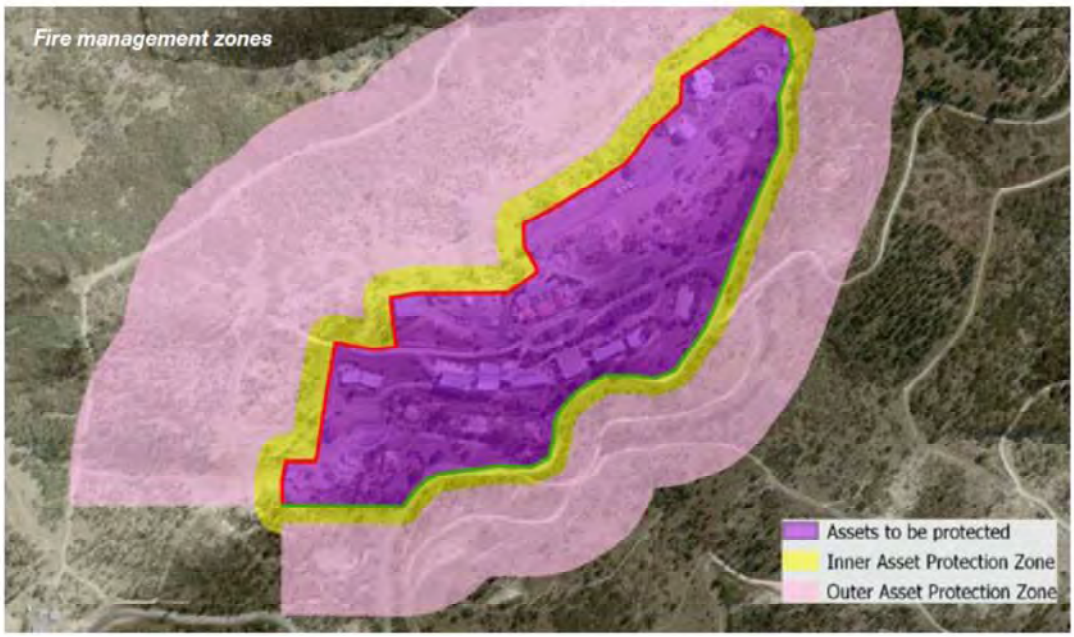

Figure 7: Example of fire management zone configuration (SBMP p. 17)

Figure 8 is an extract showing the type of management zones in part of the WEIA. Land management plans are prepared by public land managers incorporating relevant bushfire management measures.

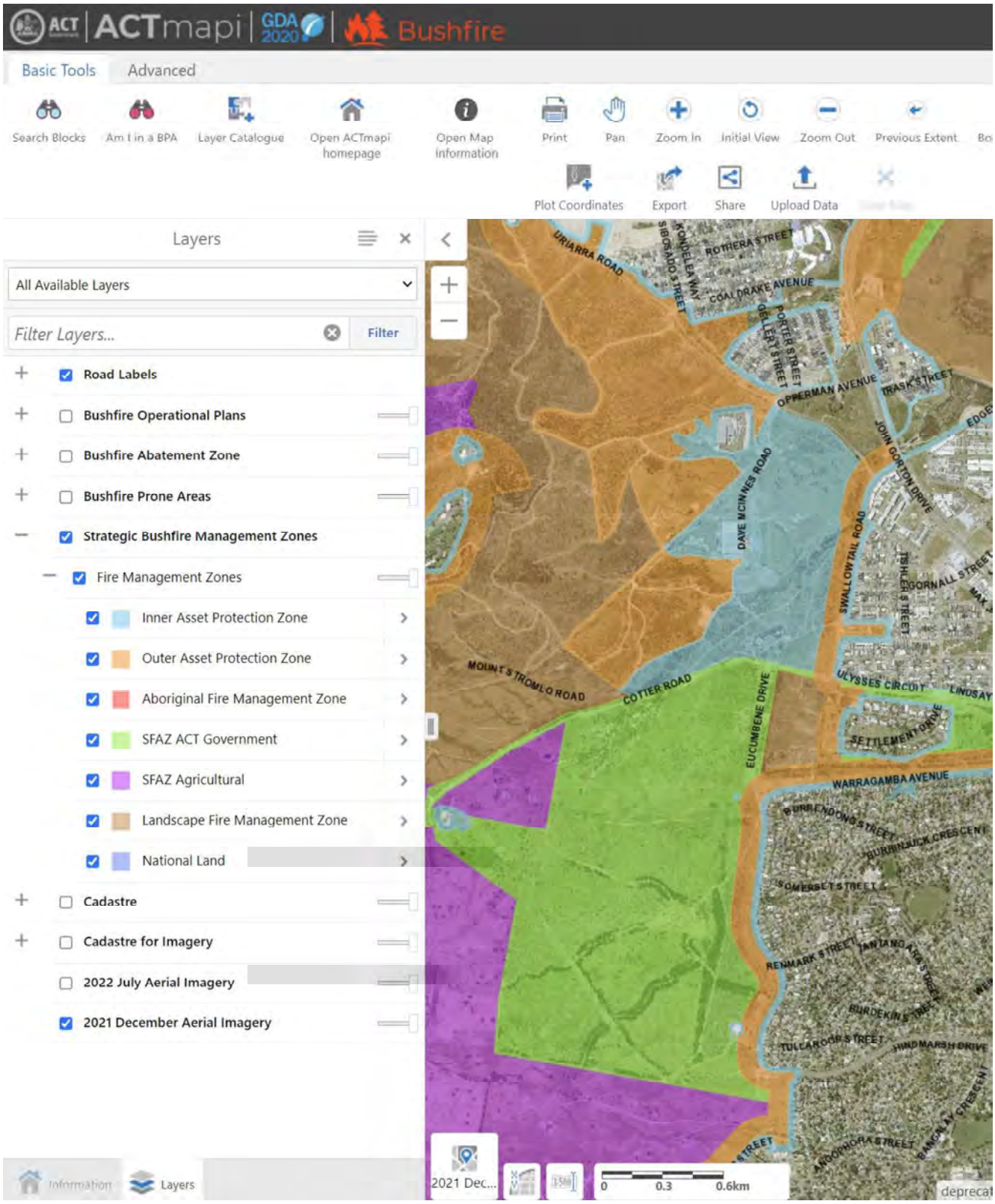

Figure 8: Fire management zone extract - Mount Stromlo to west of picture (ACTmapi)

The Bushfire Abatement Zone (BAZ) is part of the BPA surrounding the Canberra urban area and depicts the locations subject to more intensive planning and management to minimise the risk of bushfires. Figure 9 depicts the BAZ overlaid over the BPA in the area of the WEIA.

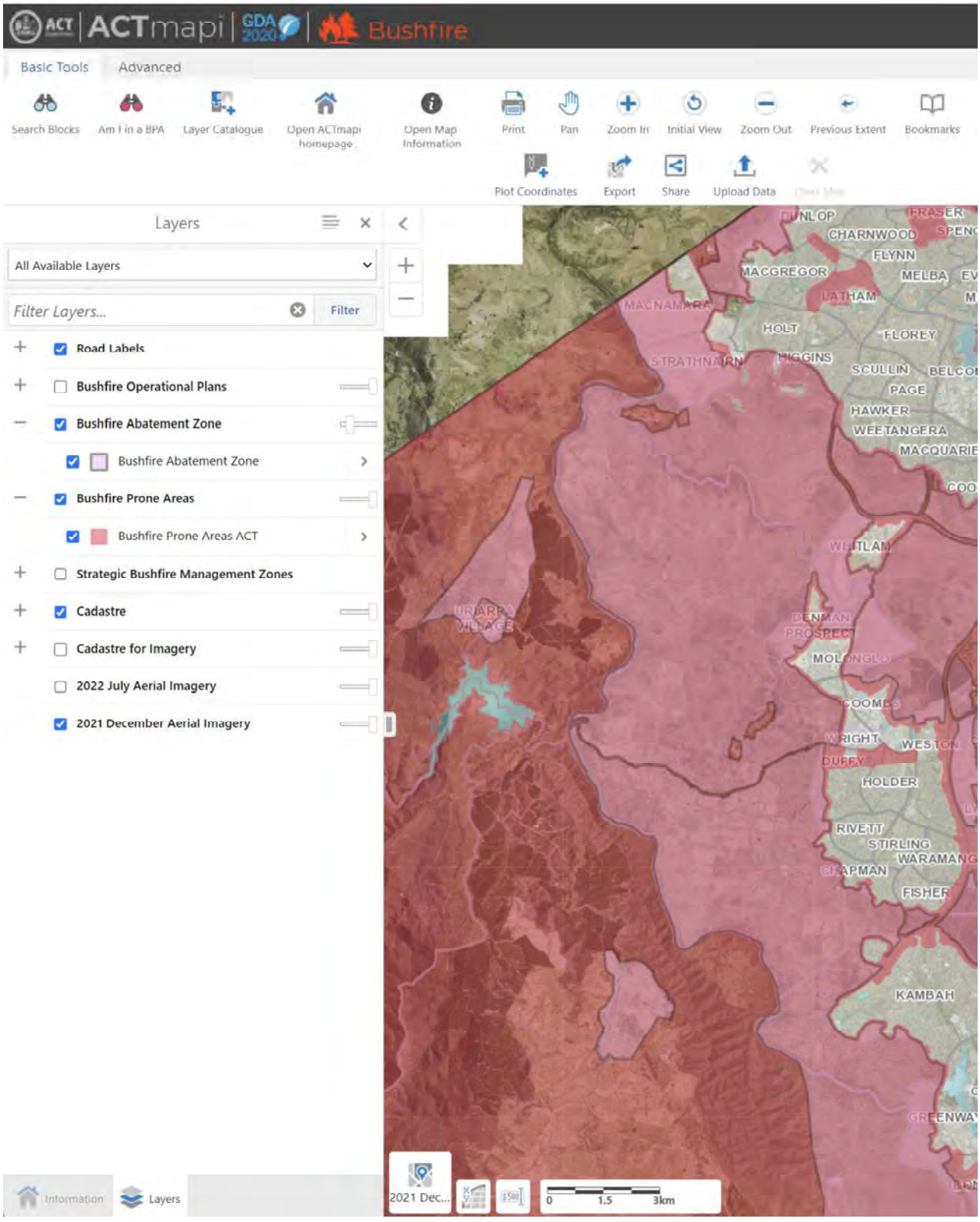

Figure 9: Bushfire Abatement Zone overlaid over the BPA in WEIA area (ACTmapi)

The Regional Fire Management Plan (RFMP) is the link between this plan and more detailed Bushfire Operational Plans (BOP). It is developed in close consultation with community members, key stakeholders and community groups.

The RFMP covers the majority of land managed by EPSDD and Transport Canberra and City Services Directorate (TCCS). It details the major fire fuel management, fire access management and fire infrastructure management strategies that Territory land managers will implement over a 5–10-year period. It also details indicative timings for that work.

The BOP detail the specific type, location and timing of fuel reduction, access and infrastructure activities proposed to be undertaken by the landholder. The Emergencies Act mandates that BOP are required for all unleased territory land or land occupied by the Territory. It also states that BOP may be required for other land in the BAZ if this plan mandates that a BOP be prepared. Under this plan, all landholders within the BAZ must prepare a BOP for that land. Utility providers managing land or assets located within the bushfire abatement zone must also prepare a BOP.

Figure 10 is an extract showing the impact of various BOP in the area east of Mount Stromlo.

Response and coordination plans for firefighting agencies, response capability responsibilities and the approach to community engagement are discussed.

As shown above there is a strong framework of planning and implementation to undertake works and actions to protect life, property and the environment for ACT residents. It is clear that there are direct links between these actions, the management of bushfire at the interface, and ultimately the impact on the built form and future layout and management of new urban areas.

Figures 8 & 10 in particular demonstrates how works programs are focused immediately at the interface, and that moving the interface away from existing communities will take the bushfire development trigger away from those properties (Figure 9). Secondly it is clear that good planning of new urban development at the urban edge will not only improve the bushfire safety for older suburbs but may also be coordinated to reallocate mitigation resources rather than simply increasing the workload. Lastly, it demonstrates the importance of planning with final built and managed impacts at the interface in mind, and the importance of collaborating with relevant agencies. The interface is typically the location for many fire trail heads, helicopter staging areas and water supply points so operational firefighting concerns should also be considered during the planning phase (Figure 11).

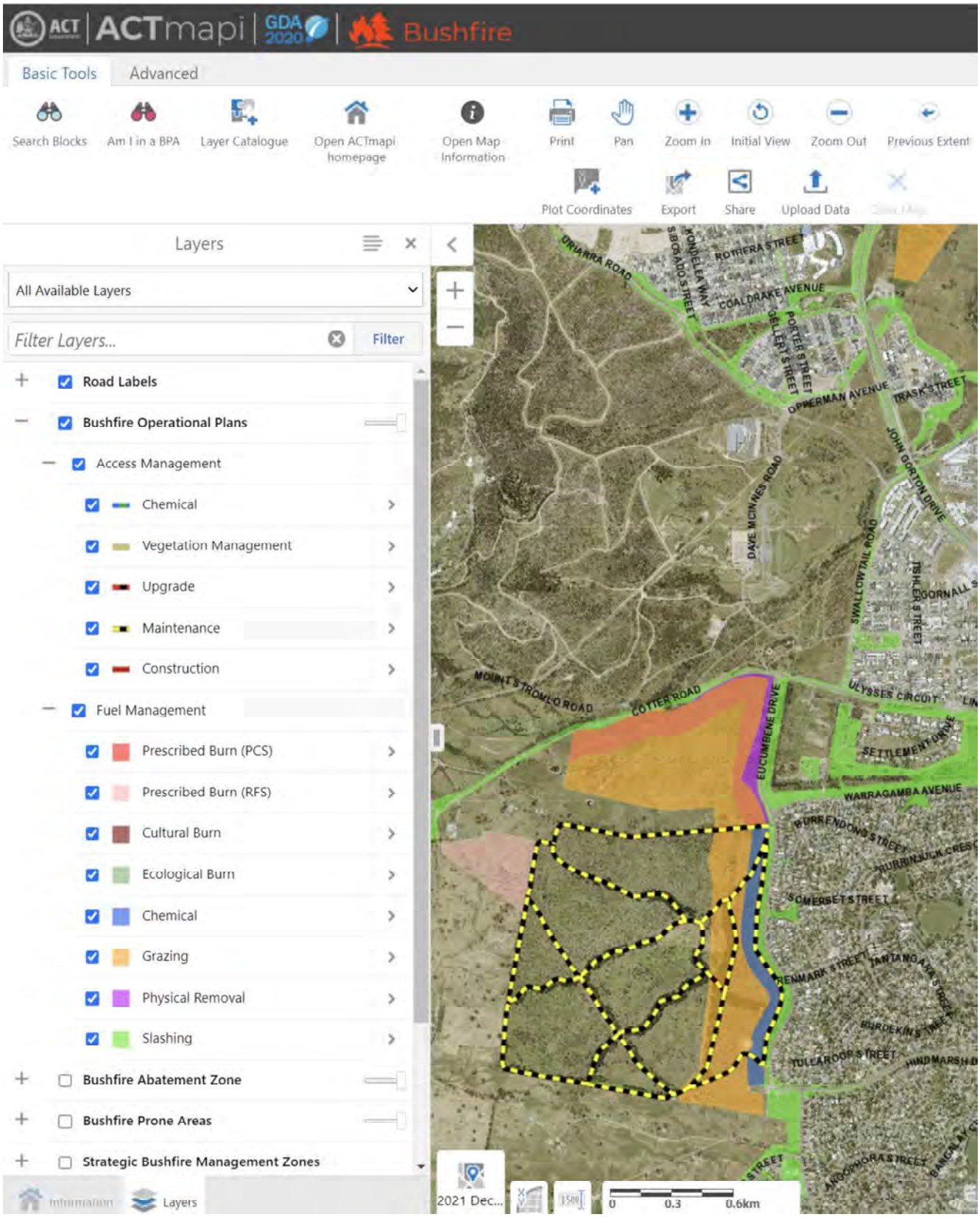

Figure 10: Bushfire Operational Plans in Mount Stromlo area (ACTmapi)

Part B of the SBMP deals with the themes, objectives, strategies and actions necessary to achieve the objectives. Figure 11 summarises the areas detailed in the latter half of the SBMP.

OBJECTIVES		
COMMUNITY		
1	A reduction in bushfire ignitions.	Programs will be implemented to reduce the number of ignitions, targeting systemic and human-caused factors of deliberately lit bushfires (arson) and the careless use of fire.
2	Planned fire management on all private rural lands.	With the support of the ACT Government, private rural land managers will develop a whole-of-property plan to reduce the risk of bushfire to their business and surrounding areas. This plan will be revised every five years or as required.
3	A community that is prepared for bushfires.	Having a community that is prepared for bushfires is a shared responsibility.
FIREFIGHTING OPERATIONS		
4	Effective firefighting operations by skilled and supported personnel.	The ACT Government will support a responsive bushfire fighting capability with sufficient numbers of skilled and motivated personnel to respond to bushfires.
5	The necessary equipment and resources to respond to and extinguish bushfires.	The ACT Government will ensure an adequate supply of equipment and resources, supported by clear principles and systems of work, to support operations, so firefighters can respond to bushfires safely and effectively.
6	Extinguish bushfires when they occur.	A rapid, decisive and coordinated response will provide the best opportunity to control bushfires in the shortest possible time and in a safe manner.
BROAD AREA FUEL REDUCTION AND FIRE ACCESS		
7	Broad area bushfire fuel reduction across the natural and rural landscape of the ACT.	Broad area fuel reduction practices will be used to establish and maintain a range of differing fuel loads across the broader natural and rural landscape of the ACT, to assist in suppressing bushfires and reducing the impact of bushfires on life, property and the environment.
8	Access for vehicles and firefighters to undertake bushfire fighting and fuel reduction.	Government and private land managers will work together to provide a network of fire trails and helipads that provide safe and effective access for firefighting and fuel reduction operations.
ADAPTIVE MANAGEMENT AND CLIMATE CHANGE		
9	Adaptive management of current and future bushfire risks.	The ACT Government will adopt an adaptive management process to address increasing bushfire risks, including climate change, and support continuous improvement based on sound research, modelling, monitoring, evaluation and lessons learned.
LAND-USE PLANNING		
10	Land-use policy and planning that reduces bushfire risk.	The assessment and mitigation of bushfire risk through effective land-use policy and planning will reduce the exposure of built and natural environments to bushfire.
11	Integrated bushfire protection at the urban edge.	A range of complementary measures will be used to achieve integrated bushfire risk reduction on the urban edge.
BUSHFIRE RECOVERY		
12	Supported communities for bushfire recovery.	Recovery from bushfire may start while bushfire response operations are underway and may need to continue for a long time afterwards. Recovery will encompass actions to address the social, economic and environmental impacts of bushfires, as they affect individuals, the broader community and environment.

Figure 11: SBMP themes, objectives and outcomes (p. 27).

Whilst broad acre hazard reduction (HR) burning is no substitute for suitable planning and building regulations, the use of fire is critical in maintaining the environment in good condition (SBMP Objective 7). Mosaic pattern burning to put varied fuel ages across the landscape reduces risk and helps maintain environmental health and protect waterways. Similarly, Aboriginal cultural burning has a role to play in maintaining connections to country and culture for people, and in maintaining and protecting Aboriginal cultural sites. In line with the ACT Aboriginal and Torres Strait Islander Agreement 2019-2028 community leadership and using the expertise of traditional custodians is helping drive greater collaboration in the cultural burning area. The Tidbinbilla Nature Reserve has established an Aboriginal Fire Management Zone in the reserve plan to support cultural activities (p. 53). Figure 12 shows the area mapped in the plan and activities being supported by the Parks & Conservation team.

Figure 12: Aboriginal Fire Management Zone (p. 52)

Similarly, fire trails do not play a direct role in protecting new development where the key bushfire protection measures are providing Asset Protection Zones (APZ), building to relevant NCC and AS3959 standards and providing perimeter roads. Fire trail networks provide quick access to extinguish small fires before they grow, provide access to critical infrastructure, assist with HR burning and provide critical escape routes to urban areas for firefighters. They also provide a valuable recreation resource and when planned and maintained well provide significant opportunities to pursue healthy lifestyles in keeping with the ACT Wellbeing Framework. Figure 13 provides examples of fire trails being used to facilitate HR burning.

THE IMPORTANCE OF MAINTAINED FIRE TRAILS

Fire trails are maintained to allow safe access by firefighters and vehicles.

It is important that trails remain free from fuel hazards because firefighters need to gain access to fire as quickly as possible. Safe exits are also essential.

The fire trail in use during a prescribed burn at Aranda Nature Reserve.

FIRE TRAILS AS CONTROL LINES

Using the fire trail at Gossan Hill as a control line during a prescribed burn.

Figure 13: Fire trails (p. 55)

Adaptive management and climate change are both encouraged by the SBMP with potential long-term land management and bushfire protection benefits. The cycle of plan, implement, monitor evaluate – then continue the cycle, allows for better practice to occur and encourages a culture of resiliency particularly in the face of climate change.

Theme 10 involves land-use planning directly as a key prevention technique, and the linking of land-use planning with other planning and management objectives and actions allows for better design of urban interface areas and more effective use of scarce resources. Bushfire planning and building regulations

raise awareness in the community and promote the concept of shared responsibility. The ACT is unique in Australia in having clear fixed boundaries at the interface which provides opportunities for more integrated approaches and shared responsibility for preparation to protect life and property. The Estate Development Plans (subdivision plans) must reduce the vulnerability of dwellings and residents from the impact of a bushfire. New greenfield estates must provide that all blocks on which residential uses are permitted must not face a Bushfire Attack Level (BAL) greater than 29. As a standard approach, any intensively managed Inner Asset Protection Zones required to achieve that level must be located within the footprint of the area to be developed.

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7. Bushfire Landscape Assessment

7.1. Landscape Assessment – Scale Context

The bushfire landscape assessment considers the likelihood of a bushfire, its potential severity and intensity and the potential impact on life and property in the context of the broader surrounding landscape. The broader landscape and the potential size or scale of a bushfire has been a key design response by the project team throughout the preparation of the Planning Proposal.

The likelihood of a bushfire, its severity and intensity, and the potential impact on life and property varies depending on where a site is located in the landscape. The site is subject to a range of environmental features and historical influences which provide the current urban form of the area, including bushfire, vegetation corridors, existing land uses, drainage, and ecology/biodiversity values. The WEIA is located within a landscape with significant areas of existing bushland and rural uses development on all aspects except to the east. The Preliminary Bushfire Risk Assessment (PBRA) has undertaken substantial assessment of the landscape at a large scale, however with limited consideration of the suitability of specific areas for future development. This two-Stage SBRA report provides greater detail and Stage 2 will drill down to a smaller scale consideration of the areas prioritised by the WEIACSA report.

As explored in the PBRA, the significant fire weather threat is very clearly from the north through the west to the southwest, with substantially lower FFDI associated with weather impacts from the southwest through the east and to the north. This means significant fires starting in the south / east are much less likely to significantly impact the site due to significantly lower FFDI. In addition, the spread through forest vegetation tends to be slower than the grassland wind driven spread.

The threat from the west of the site under bad fire weather conditions is significant, however consideration of the highly fragmented landscape also needs to consider the role of the river corridor and individual landscape features such as the impact of Mount Stromlo or McQuoid Hill. The ultimate Estate Development Plans will be following the patterns laid down at these earlier planning stages so the strategic stage is where landscape scale bushfires and impacts must be considered.

Over time as potential land use change occurs some of the bushfire vegetation will become urban development with the retained vegetation of perhaps limited width or aligned specifically to consider the bushfire weather on the worst FFDI days. Perimeter roads can provide both a buffer to development and access for firefighting. These riparian corridors may be convoluted and have multiple changes of direction making it difficult for a fire to spread and develop as it would in more open conditions. Whilst conservation corridors will be able to sustain fire they may not have sufficient vegetation for large fully developed fires to be carried into the urban area. As any future development will be staged over many

years, both temporary and permanent mitigation measure in the landscape will need to complement existing planning and building rules for urban areas.

Two types of considerations are relevant in terms of assessing the bushfire hazard including:

- landscape scale hazard – where large expanses of bushland over tens to hundreds of hectares are located in immediate proximity to, and may traverse, urban periphery suburbs/townships; or
- localised hazard – which is most commonly presented by fragmented areas of vegetation larger than 1 hectare in size.

These two types of hazard present different types of fire behaviour, fire intensity and potential rate of spread characteristics. The WEIA is currently exposed to both landscape scale risk and localised bushfire risk. Consideration of Landscape Scale risk will be used to drill down further into which areas are more or less suitable with respect to potential future urban development. Local scale fires, whilst not insignificant, are considered to be managed through good integrated planning at the more granular scale in the future.

7.2. Landscape Scale Assessment Tool (LSAT)

The *Victorian Planning Permit Applications Bushfire Management Overlay – Landscape Scale Threat Assessment* has been used as the framework to assess the broader landscape scale potential of bushfire affecting the site. This document is the only Australian contemporary Landscape Scale methodology with legislative weight. Blackash has expanded and modified the criteria to emphasise the priority of life safety, and the criticality of bushfire Emergency Management and Evacuation Planning as part of the risk assessment process.

The Blackash Landscape Scale Assessment Tool (LSAT) combines quantitative and qualitative techniques which are scaffolded by the *Landscape Scale Threat Assessment* and associated documentation. The approach is shown in Table 1 and uses elements of the Bayesian decision making model and Expert Judgment techniques backed by data. Bayesian decision making has been used where there is both objective and subjective data to analyse, and decisions need to be made on the probability of successful outcomes where there are high levels of uncertainty. Expert Judgement has been used in the assessment and determination of the landscape scale risk.

Blackash Expert Judgement (as outlined in Appendix 2) is applied consistent with the criteria used in the

National Construction Code (NCC)[3] Assessment Methods and NSW Land & Environment Court practice that calls up *Schedule 7 – Expert Witness Code of Conduct* in the *Uniform Civil Procedure Rules 2005*.[4]

The LSAT provides information on the bushfire hazard more than 150 metres away from the site at a landscape scale. The broader landscape and the potential size or scale of a bushfire is an important driver of the design response to determine the most suitable areas for development. The likelihood of a bushfire, its severity and intensity, and the potential impact on life and property varies depending on where a site is in the broader landscape. Landscape scale fires will place greater pressure on emergency response capability and will have a wider impact on roads and the length of time roads cannot be safely used. This will affect the likelihood of successful evacuations taking place across larger areas and may affect the ability of firefighting resources to be deployed. Multiple factors are considered for the landscape scale assessment. Key considerations in our assessment tool include:

- extent and continuity of vegetation
- topography
- prevailing winds
- the potential fire runs and area that is likely to be impacted by the fire
- the impact on evacuation routes to safer places considering road networks, distances, and landscape factors
- the location and exposure of the development to bushfire
- the ability to seek bushfire shelter on site or at alternative locations
- the extent of neighbourhood-scale damage the bushfire may produce.

As noted above the appropriate maximum Forest Fire Danger Index (FFDI) to be applied is FFDI 100.

Landscape scale fires are those that can span many kilometres or tens of kilometres, and that burn for days or weeks at a time. Typically, these fires can be many thousands of hectares in size with fire fronts many kilometres in length. On the east coast of Australia this scale of fire is only possible where there are very large areas of forested vegetation, typically National Parks and State Forests that also adjoin substantial areas of private bushland. Canberra 2003 is an example of this scale of fire.

As the WEIA develops the areas of retained bushland will continue to change as some areas are cleared and others regenerated for conservation corridors. The fragmentation of the remaining bushland by

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3 https://www.abcb.gov.au/sites/default/files/resources/2021/UTNCC_Using_assessment_methods%20%281%29.pdf

4 https://legislation.nsw.gov.au/view/html/inforce/current/sl-2005-0418#sch.7

roads and other infrastructure will continue and this needs to be considered over both contemporary and future timescales, noting that the planning process will also continue across decades. As much of the vegetation from these aspects is grassland, breaks in the landscape play a very significant role in fragmenting vegetation and providing containment lines or slowing the advance of a bushfire.

Fires that start in the riparian corridors may have higher fuel load runs (i.e. forest or woodland) that are only measured in a few hundred metres or less, may be impacted by the convoluted (meandering) alignments of the creeks, and under many conditions will present flank fires to the future development rather than a more intense head fire. Fires starting in the very large, forested areas west of the Murrumbidgee River may be very intense, however a combination of grassland areas and fire breaks through infrastructure, roads, water bodies etc may have a significant impact on the grass fires when they emerge from the riparian corridors.

Not all bushfires are able to develop the size and intensity of a landscape scale fire that can cause neighbourhood scale destruction. These local scale fires may still be significant and can cause local damage. Wherever bushland is retained there will always be some residual risk to manage, however local scale bushfires are less likely to result in widespread property destruction and more likely to be managed through well planned SFAZ and APZ combinations. Local scale fires also tend to be noticed immediately by the public, are called in to emergency services soon after ignition, and if there is good access via perimeter roads and fire trail networks may be extinguished early before they develop into large fires.

Due to the application of BMS requirements throughout the development process there will be good access for firefighting at the interface; and adequate firefighting resources, well located stations and water supplies can be planned to match the expansion of the urban areas.

Modern firefighting arrangements are also better coordinated than in previous decades, and have the use of more resources such as bulk water tankers, heavy plant (e.g. bulldozers and graders), helicopters and Large Air Tankers (LATS) much more readily available, and these enable a major addition to firefighting capabilities, especially on bad fire weather days.

All these characteristics mean that when such fires are ignited there is a relatively quick and effective response meaning that the fire is unlikely to grow to a significant scale. Difficult fire weather days or use of resources elsewhere may have an impact on fire response, however, there is a lower likelihood of any significant fire starting within the WEIA that will impact on a poorly prepared community. Such local fires are likely to be manage with local resources as part of normal emergency operations. This is a very different situation to an isolated rural community, or traditional intermix community. Figures 15 & 16 demonstrate the benefit of having a defined interface to manage, and evacuation into an urban area that will be some hundreds of metres from the fire front.

Figure 14: Dangerous intermix type development - rapid fire spread and large impact likely.

Figure 15: Planned interface with perimeter roads and access into large urban area - less chance of spread and lower impact likely.

Taking the conservative approach required by BMS, all new development lots ultimately established must be capable of providing practical building envelopes so that future dwellings are built to withstand radiant heat levels of 29kW/m^2 or less and be separated physically from bushland by perimeter roads and an APZ.

Overall Landscape Scale Assessment

The LSAT is heavily weighted to life safety and places significant emphasis on the ability for the future community to be able to shelter in place or evacuate safely, whilst emergency services can access the site at the same time. A shelter in place strategy is the primary method of emergency management for ensuring the life safety of the community.

Life safety is a key consideration when considering planning proposals and the concept of whether the site is suitable for development. All future development will be subject to additional detailed bushfire assessment during the development process, from subdivision stage and continuing to individual developments. This will ensure that the requirements of BMS can be met at each stage and will result in built form that meets the appropriate standards for each individual location.

Vegetated corridors are not considered a significant landscape scale threat given they are relatively narrow and often convoluted riparian corridors. Such a fragmented landscape pattern does not provide an opportunity for extreme bushfire behaviour associated with landscape scale fires to develop and combined with contemporary BMS standards, is highly unlikely to result in neighbourhood scale destruction.

The ultimate development of a typical large holding of 450ha may result in a large urban area of approximately 350 ha with a north to south distance of approximately 1800m and east-west distance of over 2400m. This will provide a very significant urban area of 'managed land' that will not be capable of carrying a bushfire. All future residents will be capable of quickly moving to an area more than 100m from bushland using local streets and will not have to evacuate the locality to find an immediate life safety refuge.

Significant areas of retained bushland may be fragmented against long fire runs, and will be ringed by suitable combinations of perimeter roads, stormwater infrastructure, sports fields, parks and formal APZ. As these fragmented areas of bushland will not be able to develop or maintain landscape scale fires the ultimate built form will be more than 100 metres from areas of extreme bushfire threat, as opposed to local scale bushfire threat. Once developed all lots in the future subdivisions will be serviced with reticulated water and as per Australian Standards the perimeter roads will have multiple hydrant points for firefighting access. There may be a number of significant water detention basins across the site to manage stormwater and these will also be constructed to provide additional firefighting water supplies.

The concepts discussed above are distilled into a series of factors with a numerical scoring system.

Table 1: Blackash Landscape Scale Assessment Tool – Example

Landscape Scale Assessment Tool

Landscape scale bushfire risk factors

Parameter	Low landscape scale threat	Moderate landscape scale threat	High landscape scale threat	Extreme landscape scape threat	
1. Surrounding Vegetation	Bushfire cannot directly approach the site as it is surrounded by urban development and non-mapped vegetation or managed land.	Bushfire can only approach from one aspect and the site is within a suburban, township or urban area considered managed land. Typically an island of bushfire vegetation within a wider urban development area or interface site impacted only by linear vegetation corridors of 100m width or less.	Bushfire can approach from more than one aspect and site is on the bushland-urban interface with the developed area considered as managed land. Typically contigous bushfire vegetation with a typical fire run in any direction of 0.1-2.0 km distance.	Bushfire can approach from more than one aspect and/or fires have many hours or days to grow and develop before impacting and/or site is surrounded by significant unmanaged vegetation. Typically large areas of contigous bushland with fire runs of more than 2 km possible.	**High**
2. Bushfire Behaviour	Extreme bushfire behaviour at the site is not possible given the broader landscape.	Extreme bushfire behaviour at the site is unlikely in this broader landscape due to combination of factors of vegetation type, vegetation fragmentation, aspect and topography.	Extreme bushfire behaviour at the site is likely in this broader landscape due to combination of factors of vegetation type, vegetation fragmentation, aspect and topography.	Extreme bushfire behaviour is very likely in this broader landscape due to combination of factors of vegetation type, vegetation fragmentation, aspect and topography.	**Low**
3. Impact of severe fire behaviour (FFDI 80 or 100 as relevant) coming onto site from wider fire catchment	There is little vegetation beyond 150 metres of the site (except grasslands and low-threat vegetation) and will not result in neighbourhood scale destruction of the site.	The type and extent of vegetation beyond 150m from the site may result in neighbourhood-scale destruction as it interacts with the bushfire hazard on and close to the site.	The type and extent of vegetation beyond 150m is likely to result in neighbourhood-scale destruction as it interacts with the bushfire hazard on and close to the site.	The type and extent of vegetation beyond 150m will result in neighbourhood-scale destruction as it interacts with the bushfire hazard on and close to the site.	**Moderate**
4. Vegetation Corridors	Vegetation within the site cannot enable fire to enter and move through the site by a continuous fire path from the primary fire source.	Vegetation within the site is unlikely to enable fire to enter and move through the site by a continuous fire path from the primary fire source.	Vegetation within the site may enable fire to enter and move through the site by a continuous fire path from the primary fire source.	Vegetation corridors on site provide for passage of fire to enter and move through the site from the primary fire source.	**Low**
5. Separation	Hazard separation between extreme bushfire hazard and buildings of greater than 100m. Extreme bushfire hazard does not include vegetated corridors of less than 100m width or grasslands.	Hazard separation between extreme bushfire hazard and buildings of 50-100m. Extreme bushfire hazard does not include vegetated corridors of less than 100m width or grasslands.	Hazard separation between extreme bushfire hazard and buildings of 20-50m. Extreme bushfire hazard does not include vegetated corridors of less than 100m width or grasslands.	Hazard separation between extreme bushfire hazard and buildings of <20m. Extreme bushfire hazard does not include vegetated corridors of less than 100m width or grasslands.	**Moderate**
6. Shelter	Immediate access is available to a place that provides shelter from bushfire. This includes existing or proposed buildings on site constructed in accordance with PBP and urban areas more than 100m from bushland hazard.	Access is readily available to a place that provides shelter from bushfire. This will often be the surrounding developed area. In the case of an eco-tourist facility it will be the designated bushfire refuge built in accordance with PBP requirements.	Access to a place that provides shelter from bushfire is not certain during a wildfire and existing buildings are not built to PBP standards.	Access to a place that provides shelter from bushfire is not possible during a wildfire.	**Low**
7. Evacuation	Multiple evacuation routes are available and unlikely to be impacted by fire.	Evacuation to alternate location that provides life safety refuge is <1km and can be completed by foot or vehicle.	Evacuation to alternate location that provides life safety refuge is 1km-10km.	Evacuation to alternate location that provides life safety refuge is > 10km.	**Moderate**
8. Isolation and emergency services	Seamless integration with existing settlement - no impact on evacuation or access for emergency services.	Short bushland pinch points that may carry fire across roads and restrict access briefly during passage of fire. Unlikely impact on evacuation or access for emergency services.	Short bushland pinch points that are likely to carry fire across roads and restrict access temporarily. Likely impact on evacuation or access for emergency services.	Large areas of bushland or multiple pinch points that are likely to carry fire across roads in forest areas and will block evacuation or emergency service access routes for extended time.	**Moderate**
9. Firefighting water supplies	Site is within urban area and has access to reticulated water supply OR site has dedicated firefighting water supply in accordance with PBP requirements.	Site is on the periphery of urban area and has access to reticulated water supply that may be more susceptible to interuption.	Site is outside urban area and relies on an on site water supply not in accordance with PBP.	Site is in an isolated area and relies on an on site water supply not in accordance with PBP.	**Low**
		Overall Threat Rating	**Moderate Risk**	**Total**	150

Assessed at Forest Fire Danger Index of 100 as the design fire, using Method 1 in accordance with PBP 2019

The scoring system uses a multiplier for each Threat level based on a conservative life safety approach.

The scaled scores for each Threat assessment are totalled and final scores are placed within a range to produce the final Risk Rating

8. Conclusion

The purpose of this Stage 1 report for the Western Edge Strategic Bushfire Risk Assessment is to review previous studies and provide an overview of where the overall project is up to, and where the bushfire assessment fits in. It introduces the project and the site; considers the work done to date including the WEIACSA report; and looks at the historical bushfire context. The strategic planning context is introduced; and the Preliminary Bushfire Assessment is reviewed. The report then looks at the key ACT Bushfire framework and relevant documentation. The landscape scale assessment concept is introduced, and the Blackash Landscape Scale Assessment Tool is introduced.

The Stage 2 Report is based around producing detailed high level assessment and prioritisation of the Investigation areas using the tools and concepts introduced at Stage 1.

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9. Bushfire Concepts

Relation - house loss and distance to bushfire vegetation

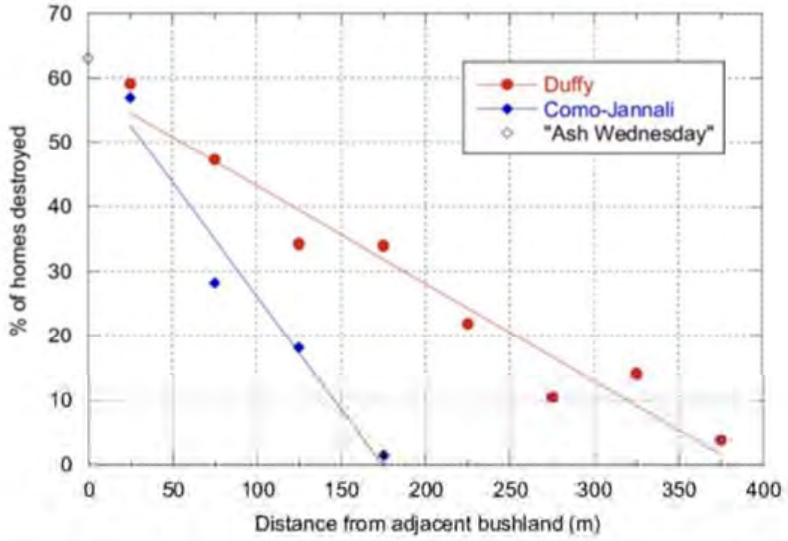
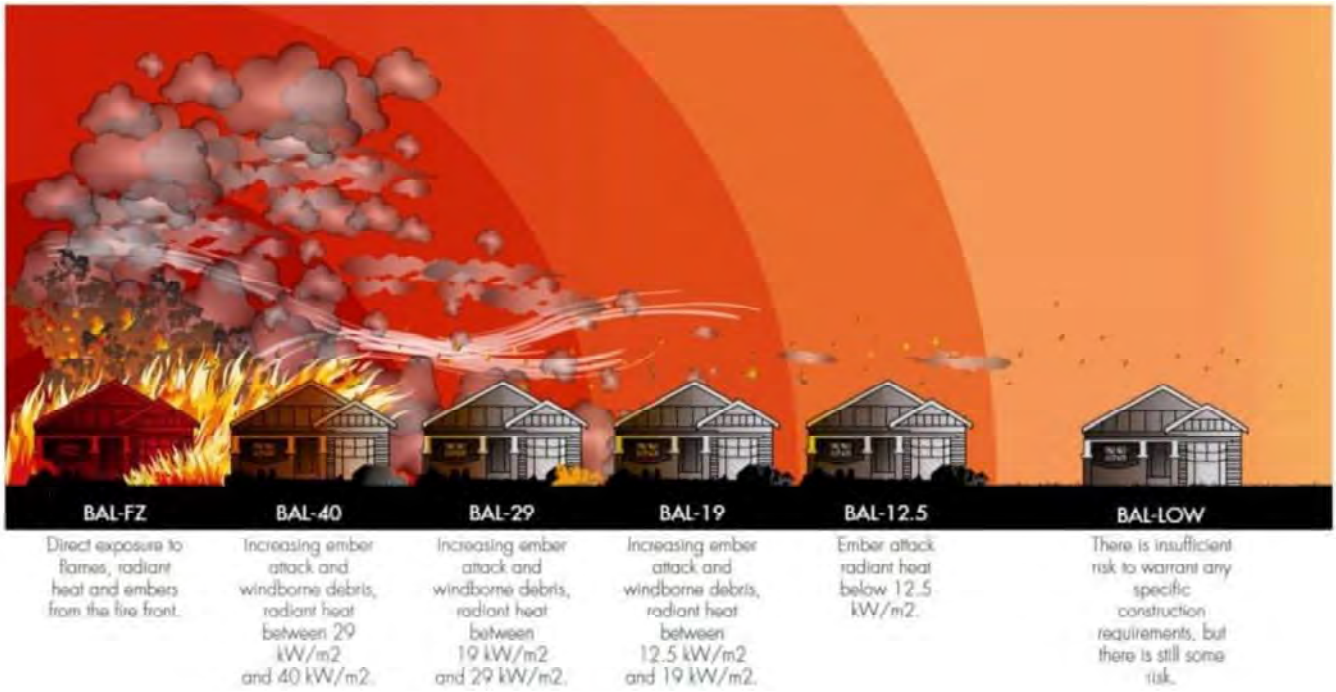


Figure 5: Percentage of homes destroyed at different distance ranges (interval=50 m) in the 2003 Canberra fires, the 1994 Como-Jannali fires in Sydney and the 1983 Ash Wednesday fires in Victoria and South Australia. In four different suburbs (Fairhaven, Airey's Inlet, Macedon and Mount Macedon, the delineation of bushland boundaries was difficult and so post-fire aerial photographs were used to estimate the percentages of homes destroyed for areas immediately adjacent to bushland. The figure plotted is an average of these. (Source: Chen and McAneney 2004.)

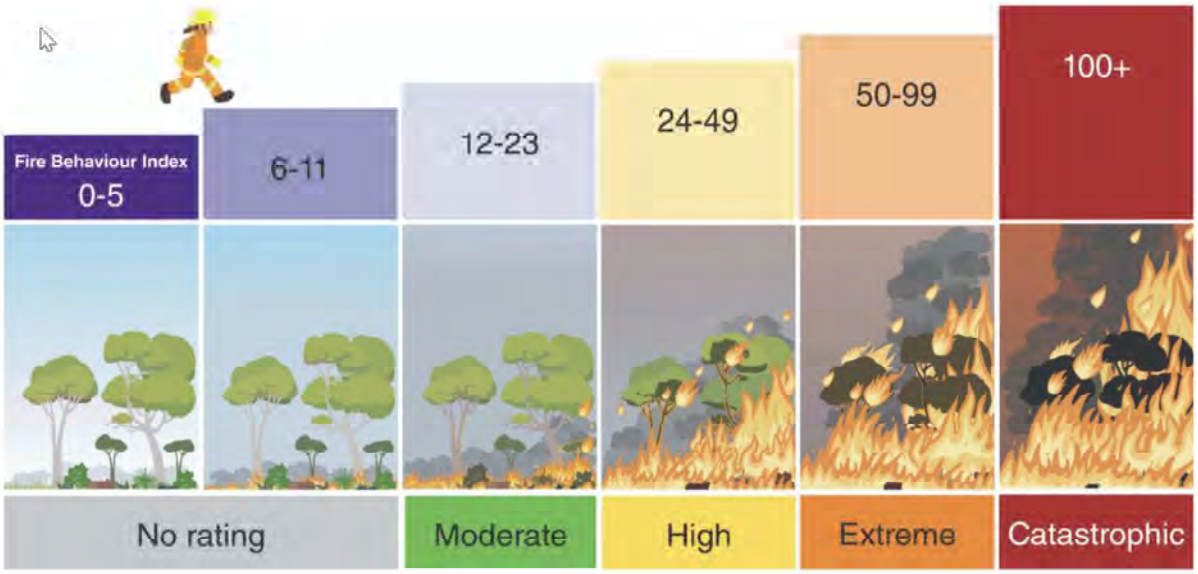
Effects of radiant heat flux (RFS, 2006)

Radiant heat flux kW/m²	Observed effect
1	Maximum for indefinite skin exposure
3	Hazardous conditions, firefighters expected to operate for a short period (10 minutes)
4.7	Extreme conditions, firefighters in protective clothing will feel pain after 60 seconds of exposure
6.4	Pain after 8 seconds of skin exposure
7	Likely to be fatal to unprotected person after exposure for several minutes
10	Critical conditions, firefighters not expected to operate in these conditions although they may be encountered. Considered to be life threatening in less than 60 seconds in protective equipment. Fabrics inside a building could ignite spontaneously with long exposure.
12.5 (BAL-12.5)	Volatiles from wood may be ignited by pilot after prolonged exposure. Standard float glass could fail during the passage of a bushfire.
16	Blistering of skin after 5 seconds
19 (BAL-19)	Screened float glass could fail during the passage of a bushfire.
29 (BAL-29)	Ignition of most timbers without piloted ignition (3 minutes of exposure) during the passage of a bushfire. Toughened glass could fail.
40+	Flame zone – exposure to direct flame contact from fire front.

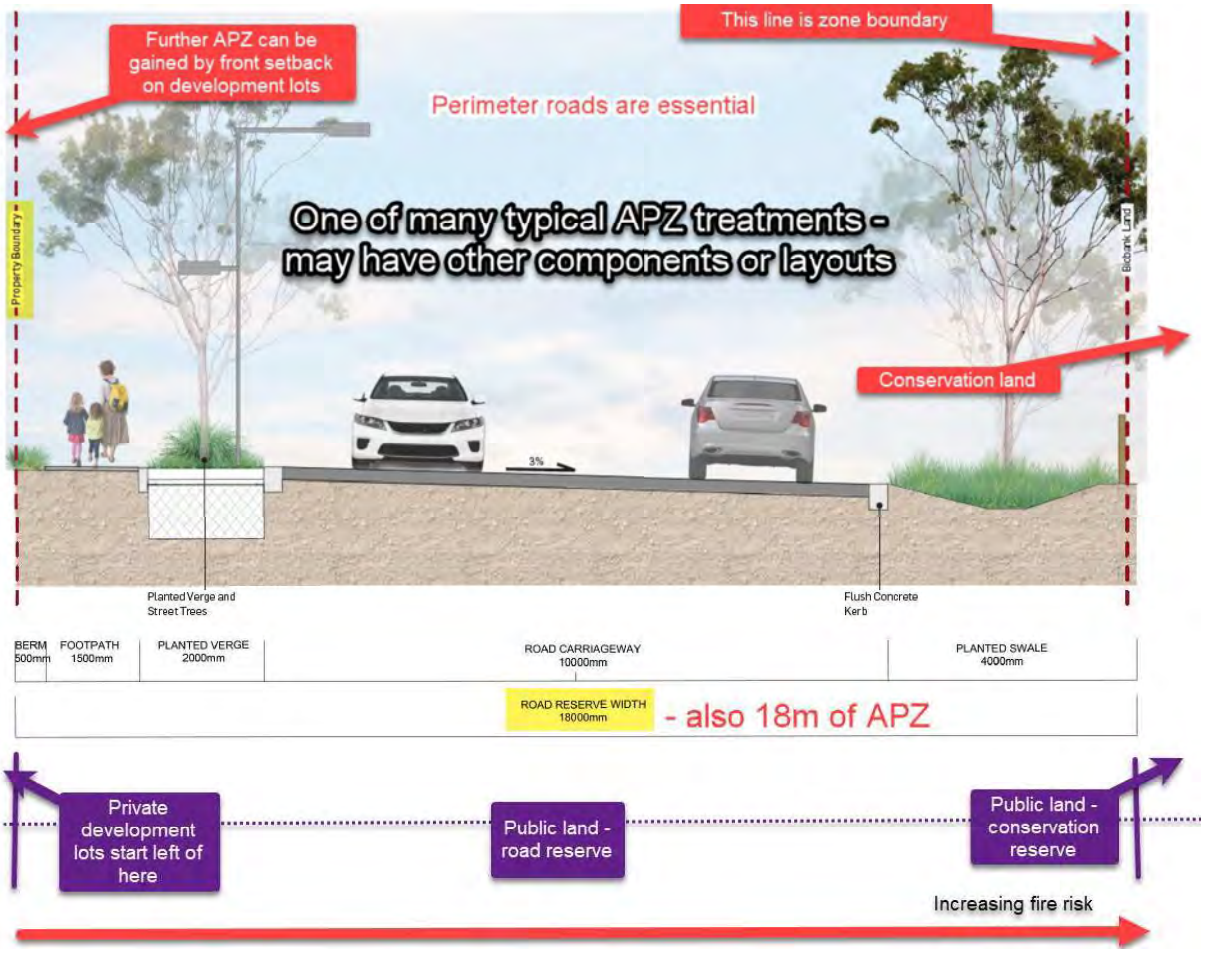
Bushfire Attack Level and forms of bushfire attack



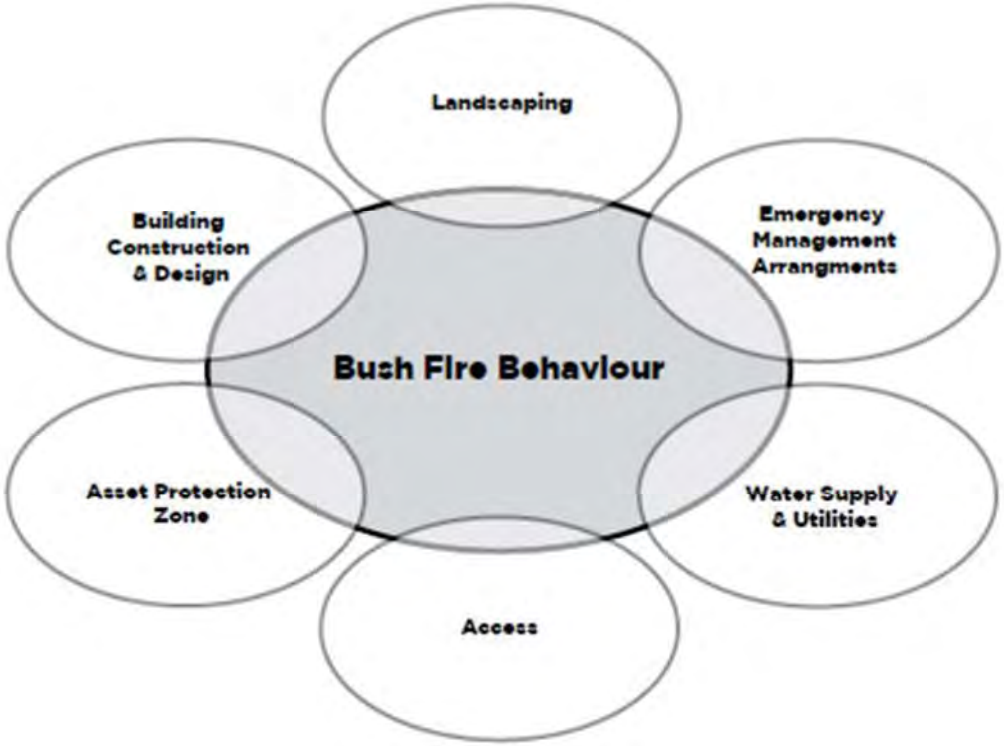
Fire Behaviour Index (AFDRS, 2023)



Interface and Asset Protection Zone



Bushfire Protection Measures (BPM)



Western Edge Growth Management + Engagement Framework

ACT Government | EPSDD
19 December 2023

Final

Prepared by:

The Planning Studio

aqPlanning
STRATEGIC PLANNING SPECIALISTS

We acknowledge the Traditional Custodians of the lands and waters across Australia - particularly the Ngunnawal people, the traditional custodians of the ACT and surrounding region - and pay our respect to Elders, past and present.

We deeply respect the continued connection to Country of Australian First Nations Peoples through stories of place, culture and caring for the natural environment. We recognise + celebrate Australian First Nations peoples as part of the oldest living culture - the original storytellers, planners, designers - who continue to care for Country, culture and community. We acknowledge the contemporary stories of displacement, the truth telling and reconciliation needed for healing.

We are committed to listen, learn and walk alongside as we plan with communities for equitable, sustainable, generous and connected places and communities.

View of the Canberra region with Mount Majura in the foreground, from Old Joe Hill, Goorooyarroo Nature Reserve, Ngunnawal, Ngunnawal and Ngambri country.

Image: Steve Bittinger
Source: National Museum of Australia (nma.gov.au)

Table of Contents

Part 1:

Introduction

“Sustainable growth depends on the careful balancing of our need for more homes with environment, heritage, planning, transport and infrastructure considerations”

- Mick Gentleman MLA,
Minister for Planning and Land Management
(June 2022)

Canberra’s population is expected to reach 784,000 by 2060. Together with development in the established parts of Canberra, the remaining greenfield areas will potentially contribute to meeting the demands of a growing population, including providing homes, employment and local services, into the future.

The Draft Western Edge Growth Management and Engagement Framework sets the broad strategic planning and engagement framework by which future land use, design and engagement decisions can be assessed against to achieve a balanced and responsive approach to growth within this area of the ACT.

The Investigation Area

The Western Edge Investigation Area is identified in the ACT Planning Strategy 2018. The Study Area for this project covers a slightly broader area, aligning at its extent with property boundaries. The Study Area is primarily within the district of Stromlo but also extends into the Tuggeranong, Weston Creek and Belconnen districts.

The Study Area is approximately 9,800 hectares and is generally bounded by the Murrumbidgee River to the west and south and existing suburban development to the east and north. Figure 1 [over the page] illustrates the Study Area in relation to the outline of the WEIA as identified in the Planning Strategy.

It is expected that this study area will be refined as further planning investigations are undertaken and planning and government priorities are confirmed. The current study area is a starting point to define the area identified as the Western Edge Investigation Area.

A detailed background review of previous studies and current ACT Government policy has been undertaken to inform the development of this draft growth management and engagement strategy.

Framework Approach

The Draft Western Edge Growth Management and Engagement Framework has been developed based on the key themes and outcomes of the background analysis and discussions with key ESPDD and ACT Government staff.

This document and approach reflects the work undertaken to date and aims to provides further guidance and a refinement of the scope of future planning investigations.

The draft Framework has considered and collated:

- ACT Government priorities and aspirations;
- existing policy and legislation directions;
- valued attributes of the Western Edge area that the community have expressed through previous engagement; and
- planning investigations that have identified the environmental, spatial, social and cultural opportunities and constraints within the existing Western Edge Investigation Area.

The draft Framework is structured in four parts:

What 'growth management' means in the Western Edge context

A vision for Canberra is ***"to be a sustainable, competitive and equitable city that respects Canberra's unique legacy as a city in the landscape and the National Capital, while being responsive to the future and resilient to change***"[1].

Nowhere in Canberra is this vision most relevant than for the Western Edge. The ACT Government and community both acknowledge that with more people living and working in Canberra, future growth needs to be accommodated, but without compromising the valued characteristics and assets that are important to Canberra as a place, its local community and its role as our national capital.

The recently prepared ACT Biodiversity Sensitive Urban Design Guide provides a starting point to define what future growth and growth management of the Western Edge Investigation Area might be. We know that this area of the ACT has significant landscape features, with the Molonglo River and Mount Stromlo as well as a diversity of habitats and biodiversity.

As the planning investigations progress for the WEIA, it presents an opportunity to think about how we plan and design with Country as well as embedding the principles of biodiversity sensitive urban design and biophilic design as the foundation for the future growth.

How we plan and design for future growth in the Western Edge should aim to be more than business as usual. It should aim to be an exemplar of a more contemporary definition of sustainability - being culturally responsive and sensitive, environmentally connected, where we are part of a larger ecosystem and plan with and not over, socially supportive and economically responsible.

This will ensure that the future growth and management of the urban environments are responsive, adaptable and support health and wellbeing for our place and all living things.

Urriara East Picnic Area on Murrumbidgee River

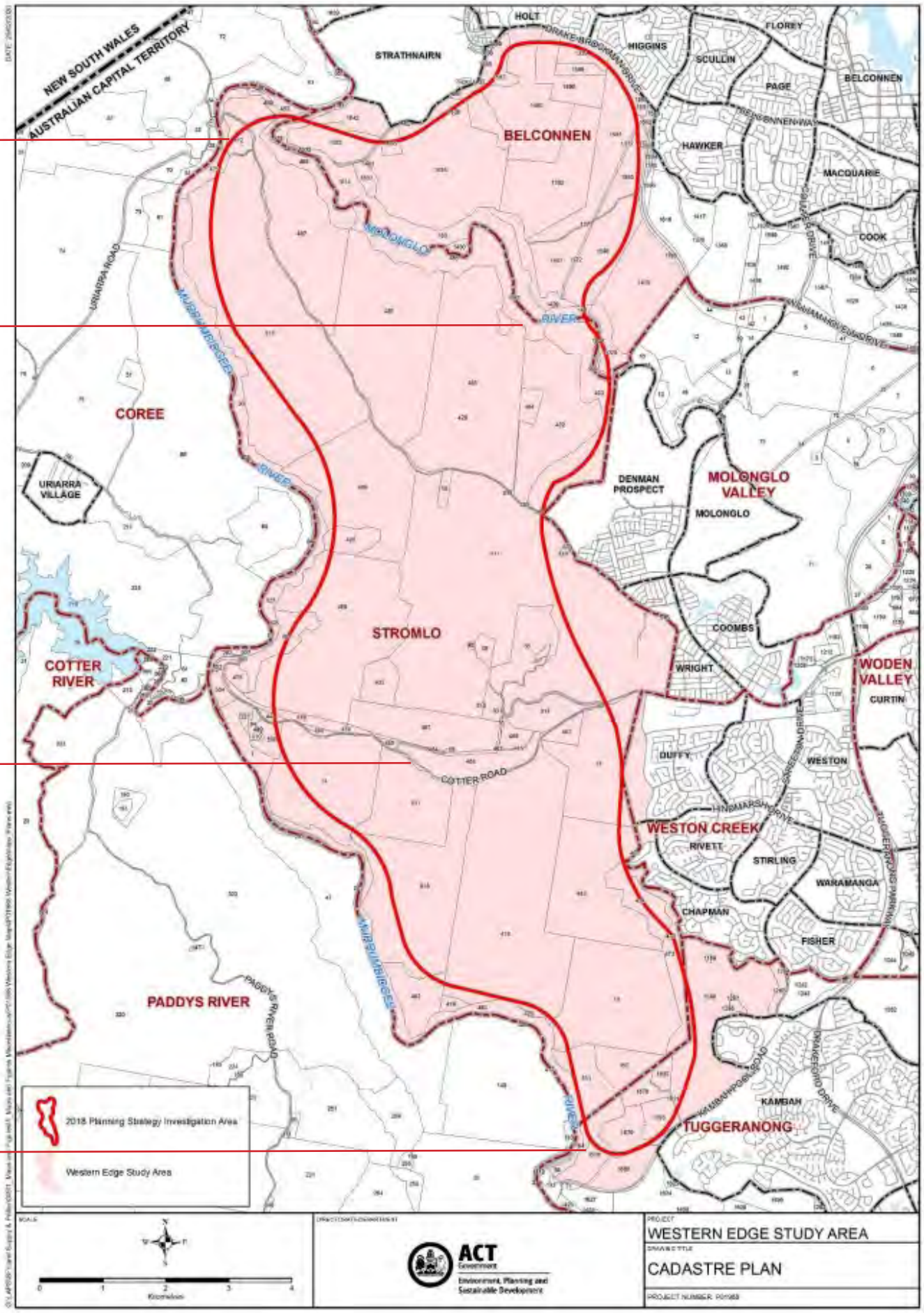
Lower Molonglo Nature Reserve

Existing Cotter Road, through WEIA.

Kambah Pool Reserve

[sources: Visit ACT Government | Canberra Website Google Maps]

Figure 1: Study Area: Western Edge Investigation Area
[source: ACT Government]



Policy Context

The following provides an overview of the policy context that is the foundation of the Western Edge Investigation Area Growth Management and Engagement Strategy. In order to establish the planning principles for the Study Area the existing policy and governance context as well as current best practice principles need to be considered.

International Policy | United Nations Sustainable Development Goals

The United Nations Sustainable Development Goals provide a framework within the global context to help ensure local planning aligns with international best practice in sustainability. The goals enable planning around social, economic and environmental concerns, which are shown in Figure 2. The United Nations approach provides guidance on where to focus efforts toward a sustainable future.

There is a strong emphasis on reducing greenhouse gas emissions from development and mitigating the effects of climate change, to the extent that planning can drive and influence outcomes, and building resilience to natural hazards and extreme weather events such as bushfire risk, flooding and urban heat island effect.

National Policy | Creating Places for People

An urban design protocol for Australian Cities - Australian Government

Creating Places for People is a collaborative commitment to world class best practice urban design in Australia.

The development of the Protocol was a commitment of the National Urban Policy and also responds to the Council of Australian Governments' agreement to encourage world class urban design. It is referenced in sustainability rating tools, including Green Star – Communities (Green Building Council of Australia) and Infrastructure Sustainability (Infrastructure Sustainability Council of Australia).

The Protocol provides a framework to identify, implement, measure and improve best practice in urban design. It establishes twelve principles for quality urban places, being:

Place – productivity + sustainability

- Enhancing – enhances local economy, environment and community
- Connected – connects physically and socially
- Diverse – diversity of options and experiences
- Enduring – sustainable, enduring and resilient

Figure 2: UN Sustainability Development Goals
[Source: The United Nations]

People – liveability

- Comfortable – comfortable and welcoming
- Vibrant – vibrant, with people around
- Safe – feels safe
- Walkable – enjoyable and easy to walk and bicycle around

Leadership and governance

- Works within the planning, physical and social context
- Engagement – engages with stakeholders
- Excellence – excellence, innovation and collaboration
- Custodianship – considers custodianship, management and maintenance over time

Australian Capital Territory (Planning and Land Management) Act 1988 and National Capital Plan

The National Capital Plan (NCP) secures the Australian Government's continuing interest in ensuring that 'Canberra and the Territory are planned and developed in accordance with their national significance', as set out in section 9 of the Australian Capital Territory (Planning and Land management) Act 1988.

The purpose of the NCP is to ensure that whilst the Commonwealth's interests are protected they aren't involved in matters that should be the prerogative of the Canberra community. The object of the NCP is 'to ensure that Canberra and the Territory are planned and developed in accordance with their national significance'.

The Plan sets out principles that give effect to this objective and provides the framework for the planning and policy directions. These principles must be considered in the planning of Canberra and are binding to both the Commonwealth and Territory Governments.

Local Policy | ACT Planning Framework

There is a hierarchy of planning principles embedded in the ACT planning framework, which comprises:

- National Capital Plan - Statement of Planning Principles
- The Planning Act 2023 - Principles of Good Planning and Principles of Good Consultation
- Planning Strategy 2018 - Strategic Directions
- District Strategies – Planning and Design Objectives

Planning Act 2023 (2022)

The *Planning Act 2023* (the Act) represents a shift away from a rules-based approach to an outcome focussed planning system. It promotes and facilitates ecologically sustainable development and provides a greater opportunity for community participation in planning processes.

The Act introduces two new key planning principles, being 'principles of good planning' and 'principles of good consultation'. The principles of good planning must be considered when developing planning strategies, plans and policies. The principles of good planning are:

- Activation and liveability
- High quality design
- Integrated delivery
- Investment facilitation
- Long term focus
- Urban regeneration
- Sustainability and resilience
- Natural Environment Conservation

ACT Planning Strategy

The Planning Strategy sets out the long term planning policy and goals to promote sustainable development of the ACT, consistent with the social, environmental and economic aspirations of the people.

The vision of the Planning Strategy is to be a sustainable, competitive and equitable city that respects Canberra as a city in the landscape and the National Capital, while being responsive to the future and resilient to change.

The vision is underpinned by five related themes (policy areas), which are accompanied by strategic directions and actions. Along with the principles of good planning, the Strategy themes and strategic directions are the basis for the development of this framework.

Compact and Efficient City

- Grow mostly within our urban footprint or in areas close to our footprint
- Maintain environmental values
- Use infrastructure effectively to support an efficient, sustainable and liveable city

Diverse Canberra

- Celebrate our culture, uniqueness and difference
- Be innovative and contribute to diversity
- Support a city structure that strengthens our economy, and the economy of the region

Sustainable and resilient Territory

- Adapt to a changing climate and establish resilience in our built forms, infrastructure and natural assets
- Look after natural resources
- Support the transition to net zero carbon emissions by 2045

Liveable Canberra

- Create cohesive communities through good design, amenity and connectivity
- Be socially and culturally inclusive
- Support housing diversity for greater choice

Accessible Canberra

- Provide equitable access to all that the city has to offer
- Include more options to move around in a connected and fair city
- Better integrate land use and transport planning

The Planning Strategy identifies the Western Edge as an area for investigation for potential future urban growth. This is based on preliminary high-level assessment of ACT-wide opportunities for growth, examining location, physical attributes and infrastructure.

ACT Biodiversity Sensitive Urban Design Guide 2023

The ACT's wildlife and natural assets and habitats are increasingly at risk of further degradation, fragmentation, and loss in the face of climate change and urban development to meet the needs of a growing city with both urban consolidation and sustainability targets.

The Biodiversity Sensitive Urban Design Guide (BSUD Guide) provides guidance on biodiversity and ecological design matters and is critical in supporting the design and assessment processes, particularly those planning provisions that are less prescriptive and leave more room for interpretation and innovation.

In the District Strategies, the Blue-Green Network identifies two major targets to enable biodiversity, nature reserves, open space, water elements and cultural heritage elements to be protected and provide the setting for a city 'in the landscape' and the BSUD Guide will also assist in achieving these targets.

The BSUD guide applies to planning, design and approval processes for development of sites in future urban areas and in non urban zones and is therefore applicable to the Western Edge Investigation Area."

District Strategies

The District Strategies provide long term planning policy and goals for a defined district, consistent with the Planning Strategy. They establish the strategic policy and spatial framework to guide and manage desired future planning outcomes responsive to the characteristics specific to the district.

District Strategy - identifies areas of potential future land use change and provides guidance on the expected character and development of those areas.

District Policy - sets out specific planning requirements, where tailored policies are required to deliver the desired development outcomes.

District Strategies have been prepared for all nine districts in the ACT including districts adjacent to the Study Area, being Molonglo Valley, Weston Creek and Belconnen.

Five big drivers have been identified for all District Strategies and are used to guide district planning. These are supported by planning and design objectives. These five big drivers are:.

- Blue-green network
- Economic access and opportunity across the city
- Strategic movement to support city growth
- Sustainable neighbourhoods
- Inclusive centres and communities

Territory Plan

The Territory Plan is the statutory planning instrument guiding planning and development in the ACT. The Statement of Strategic Directions includes further planning principles to guide sustainable development. 'A new Territory Plan was tabled by the Minister for Planning and Land Management on 12th September 2023. This will support the implementation of the Planning Act 2023.'.

ACT Climate Change Strategy 2019-25

The ACT Climate Change Strategy sets out the ACT Government's response to the declaration, in May 2019, of a state of climate emergency. It outlines actions to meet the ACT's legislated emissions reduction target of 50-60% by 2025 and a pathway for achieving net zero emissions by 2045.

This will require investment in zero emissions infrastructure, sustainable urban design and a substantial shift in travel habits from private car use towards active travel and public transport.

ACT Transport Strategy 2020

The ACT Transport Strategy sets out the ACT Government's approach to achieving flexible, reliable and sustainable options for Canberrans to make their journeys. It also provides a framework for planning and investment in transport over the next 20 years. It describes how government will deliver connected public transport, high quality environments for walking and cycling and a road network that allows people and goods to be moved safely and reliably across the city.

ACT Infrastructure Plan

The ACT Infrastructure Plan provides a framework for how the ACT Government will build new and renew established infrastructure to cater for a city of 500,000 people. The plan is a comprehensive, multi-decade plan detailing over $14 billion worth of infrastructure investments. The focus of the plan is on health, education, transport and community services.

ACT Economic Development Priorities 2022–2025

The priorities for economic development post-COVID include for Canberra to be a city that gives you back time, delivers a net zero city and focusses on knowledge-based economic growth.

The Chief Minister's Statement of Ambition includes building on Canberra's strength as the knowledge capital and continuing Canberra's track record in innovation and entrepreneurship. The three missions underpinning the strategy include a focus on developing innovation precincts to attract talent, and facilitating investment in key industries including space, cyber, security, defence, renewables, and advanced technologies.

ACT Wellbeing Framework

The ACT Wellbeing Framework states that 'having the opportunity and ability to lead lives of personal and community value – with qualities such as good health, time to enjoy the things in life that matter, in an environment that promotes personal growth – are at the heart of wellbeing.'

Canberra's Living Infrastructure Plan

The Canberra Living Infrastructure Plan sets a vision to become better prepared for and more resilient to climate change by ensuring we plan, design, construct and manage the city in a way that values, incorporates and protects natural assets.

Climate vulnerability can be reduced by using living infrastructure options such as increased mature tree cover and permeable surfaces to counter the urban heat island effect and protect existing natural assets.

ACT Water Strategy 2014-44

The ACT Water Strategy sets out how the ACT Government will manage the Territory's water resources to meet urban and environmental needs as well as regional responsibilities. It aims to deliver security of water supply, improved water quality and catchment health, and a 'water smart' community through catchment management, stormwater and flood management, water supply and services, water for the environment, recreational water use and public health.

ACT's Nature Conservation Strategy 2013-23

The ACT Nature Conservation Strategy sets out a vision for biodiversity rich, resilient landscapes stretching from the inner city to the mountains, where well-functioning ecosystems can meet the needs of people and the environment, including creation of appropriate urban open space and nature reserves, retention and restoration of natural hydrology, and creation of a blue-green grid (which will also enhance urban cooling).

ACT Housing Strategy 2018

The ACT Housing Strategy establishes policy interventions to meet the Territory's diverse and changing housing needs and provide a sustainable supply of housing for households at all income levels. The Housing Strategy sets an objective to provide new land and housing development opportunities so that demand can continue to be met.

Canberra Region Local Food Strategy (previously Food and Fibre Strategy)

The Strategy identifies that 15% of the ACT is farmland and is already zoned to permit agriculture therefore there is no need to dramatically expand land for food growing. It should be noted that ACT Government land use investigation projects such as Eastern Broadacre and Western Edge lie within broadacre land use zoning, rural land use zoning and other zoning. These land use zones permit a wide variety of uses other than agriculture and in some cases may be subject to future change.

Part 2:

Planning Principles

The Western Edge Planning Principles ('Planning Principles') articulate a desirable planning and place outcomes.

They are the guide by which policy priorities and future planning investigations are framed and appropriate matters considered in making planning decisions.

The existing principles and directions outlined in the ACT Planning Framework and relevant strategies are the foundation by which the Planning Principles have been established for the WEIA.

The planning principles are supported by a series of considerations that act as prompts to thinking about the form of growth and design of potential urban areas.

The Western Edge will ...

Principle 1

Be planned with biodiversity sensitive urban design and designing with Country principles.

Principle 2

Be a net zero carbon community that is resilient and adaptable.

Principle 3

Provide adequate infrastructure to encourage social wellbeing and inclusion.

Principle 4

Provide a connected, sustainable transport network, prioritising active travel options.

Principle 5

Be planned + designed to reflect and support how we work, live, and participate in our local communities.

Scouts Camp Cottermouth
source: www.campcottermouth.com.au/gallery/

Principle

1

The Western Edge is planned with biodiversity sensitive urban design and designing with Country principles.

Draft District Strategy Drivers: Blue-Green Grid | Sustainable neighbourhoods

How this planning principle could be implemented:

Outcome	Action(s)	Relevant Planning Strategy Themes
Supporting culturally rich communities + a Connection to Country	• Protect and celebrate Aboriginal cultural heritage and other heritage values • Plan and design with Country, including incoporating the objectives and practices set out in 'Caring for Dhawura Ngunnawal' the ACT natural resources plan 2022-2042.	Diverse Sustainable + Resilient Liveable
Protect and support natural environment values, including biodiversity and waterways	• Restore and protect existing blue and green network • Integrate formal and informal conservation areas • Manage the impact of urban development on Matters of National Environmental Significance • Biodiversity protection areas that are of sufficient size, shape and connectivity to sustain their biodiversity values in the longer term • Provide sustainable habitat as part of an integrated open space network • Improve waterway health by managing stormwater and impact on waterways through the use of water sensitive urban design and protecting riparian areas in terms of vegetation, slope and restoration opportunities	Compact + Efficient Sustainable + Resilient
Enhance the benefits of the blue-green grid beyond the environmental factors.	Plan and design blue-green network to: • Improved community health and wellbeing • Placemaking and local identity • Opportunities for recreation, active travel, education, biodiversity, flood management, stormwater quality and treatment, ecological restoration and tree canopy • Opportunities for human movement where compatible with conservation, biodiversity and heritage	Sustainable + Resilient Liveable
Natural attributes part of the network of green spaces and infrastructure	• Enhance key natural areas, such as Casuarina Sands, as recreation destinations • Provide sustainable habitat as part of an integrated open space network • The National Capital Open Space System and river corridors as a visual backdrop is enhanced and establishes the landscape setting for the Western Edge	Compact + Efficient Diverse Sustainable + Resilient Liveable Accessible

Outcome	Action(s)	Relevant Planning Strategy Themes
Respect environmental values and protect and reinforce the physical features that distinguish the area to create communities of high amenity and a strong local identity	• Landscape features e.g. ridgelines, hilltops, waterway corridors, views, and areas of special environmental and heritage significance, contribute to local character and amenity and should be optimised in planning new communities • Improve waterway health by managing stormwater and impact on waterways through WSUD and Biodiversity Sensitive Urban Design principles • Incorporate special planning and design controls, such as biodiversity sensitive and climate wise urban design to prevent gradual erosion of landscape values and to respond to local character	Compact + Efficient Sustainable + Resilient Liveable
Design and development that responds to local context as its foundation to build new places and are balanced with the natural surroudnings.	• Celebrate and plan/design with the natural attributes of the Western Edge • Where culturally appropriate, actively identify and protect natural and cultural heritage • Design with and create harmony between built form and landscape • Ensure that the design of the Western Edge and its places consider the objectives of the ACT Urban Forest Strategy 2021-2045, in particular contribute to the ACT's target of 30% canopy cover across the urban footprint as a minimum. • Highlight and protect existing vistas and views • Protect the night sky from light pollution particularly within the Mount Stromlo Observatory light spill areas	Sustainable + Resilient Liveable

Principle

2

The Western Edge will be a net zero carbon community that is resilient and adaptable.

Draft District Strategy Drivers: Sustainable neighbourhoods

How this planning principle could be implemented:

Outcome	Action(s)	Relevant Planning Strategy Themes
Land use and infrastructure supports best practice zero carbon communities	• Focus on living locally and planning for infrastructure that can adapt to a changing climate, by providing safe, sustainable and productive water resources (integrated water management) with reliable, sustainable and affordable energy services and sustainable waste management • Create energy efficient urban environments supported by living infrastructure to manage urban heat island effect e.g. urban greening/tree canopy cover. • Inclusion of new types of infrastructure to support zero carbon communities, such as electric vehicle charging infrastructure, battery storage and considered design outcomes.	Compact + Efficient Sustainable + Resilient
Improve outcomes for the whole water cycle through integrated water cycle management	• Water supply, stormwater management and sewage treatment should be planned as an integrated system. • Planning for urban development should take account of the increased likelihood of storm events and reduce and delay stormwater runoff from developed areas. Consideration to be provided on modelling flow regimes to determine potential impact and required mitigation measures. • Best practice quality standards for stormwater runoff including consideration of existing and possible future limits on impervious surfaces to reduce runoff and treatment locations to reduce impact on environment • Servicing should consider provision of treated recycled water and harvested stormwater to reduce potable water use/demand • Appropriate buffer around noise or odour emitting infrastructure	Compact + Efficient Sustainable + Resilient
Planning and design should incoporate circular city principles supporting innovation and limit uses of resources.	• Build in Food Organics and Garden Organics (FOGO) solutions to miminise food and organic material waste • Consider opportunities for localised recycling depots considering the needs for both residential and commercial uses • Incorporate the principles and priorities of the ACT Circular Economy Strategy and Action Plan into the planning and design of the Western Edge.	Compact + Efficient Sustainable + Resilient

Outcome	Action(s)	Relevant Planning Strategy Themes
Provide for compact, efficient and sustainable land use	• Use land efficiently to optimise capacity and reduce the need for additional greenfield land for urban development • Ensure the effective use of available land by supporting a diversity uses in places of appropriate size and density. This compact design approach also supports efficient provision of regional and local infrastructure and services • Land required for community purposes is planned to allow for multiple purposes where possible • Local neighbourhoods provide a diversity of housing choices to meet a wide range of needs and lifestyles and include social, affordable and 'missing middle' housing • Locate density with amenity in and around centres and close to public transport and parks	Compact + Efficient Liveable Accessible
Urban structure supports resilience and community wellbeing	• Incorporate contemporary urban design practice to create vital, safe and inclusive communities with high quality, durable and adaptive design, which enhances amenity and local character • Incorporate innovative use of public land for community or environmental purposes such as local food production and heat sinks • Neighbourhoods are resilient and adaptable to a changing climate, incorporating: – Risk mitigation of natural hazards e.g. flood and bushfire management – Water sensitive urban design (WSUD) – Infrastructure to support zero carbon transition – design responses to address urban heat island effect and drought conditions – climate-wise/biodiversity sensitive urban design and materials	Sustainable + Resilient Liveable

Principle

3

The Western Edge provides adequate infrastructure to support social wellbeing and inclusion.

Draft District Strategy Drivers: Inclusive centres and communities

Outcome	Action(s)	Relevant Planning Strategy Themes
Plan a well designed urban structure that provides a sense of place and has desirable locations to live, work and play	• Each neighbourhood has a local centre accessible to as many residents as possible within easy walking distance, which acts as the focal point and social heart of the community • Centres are in appropriate locations and mixed-use to support local liveability • The urban structure allows transport to connect people to employment, economic and education opportunities and to health care, shops, services, leisure and recreation facilities	Diverse Liveable Accessible
Meet the social and cultural needs of community	• A range of supporting facilities are provided in conjunction with centres, corresponding with their position in the centres hierarchy, e.g. a local primary school and early learning childhood centre, local health services, aged care accommodation, community meeting spaces, public and recreational spaces and a good level of shops and services at local and group centres • Integrated planning of active and passive open space takes advantage of opportunities to use land for multiple purposes and contribute to sustainability e.g. protects environmental, heritage, landscape and drainage values and provides for the recreation needs of the community including the Bicentennial National Trail • A diversity of well located open spaces that meets the needs of new communities including district active open space, local parks, walking and cycling paths and tracks	Diverse Liveable Accessible
Local neighbourhoods provide a diversity of housing choices to meet a wide range of needs and lifestyles including social and affordable housing	• Diversity of affordable housing/living, housing for the 'missing middle', social and public housing to meet the needs of community	Diverse Liveable Accessible

Outcome	Action(s)	Relevant Planning Strategy Themes
Co-locate and provide safe interfaces between infrastructure corridors and adjacent land uses	• Co-locate land uses such as social infrastructure, open spaces with higher residential densities and mixed-use centres, in order to facilitate increased liveability, and building of social capital • Provide a convenient cycling and walking network with high levels of pedestrian amenity, connectivity, continuity and permeability • Consider the impact major infrastructure corridors and installations pose in relation to cross movement, amenity and support strong community connections	Compact + Efficient Sustainable + Resilient Liveable Accessible

Principle

4

The Western Edge will provide a connected, sustainable transport network, prioritising active travel options.

Draft District Strategy Drivers: Strategic movement to support city growth

Outcome	Action(s)	Relevant Planning Strategy Themes
Provide a permeable, legible and functional urban structure of streets to support a range of transport options that are safe and easy to access	• The urban structure allows transport to connect people to employment, economic and education opportunities, health care, shops, services and leisure and recreation facilities • Co-locate land uses capable of generating significant public transport patronage levels, such as higher residential densities and mixed-use centres, in order to facilitate combined purpose trips and support the provision of efficient public transport	Diverse Liveable Accessible
Provide strategic and complementary public transport, walking and cycling networks to promote efficient patterns of living and thus efficient provision of infrastructure	• Provide a comprehensive local bus network with links to high frequency services providing rapid connections to key destinations • Provide a comprehensive, legible and safe on and off road commuter cycling network • Provide a convenient cycling and walking network with high levels of pedestrian amenity, connectivity, continuity and permeability. • Provide infrastructure such as bike storage and parking, end of trip facilities and bike repair stations, to encourage active travel.	Compact + Efficient Sustainable + Resilient Liveable Accessible
Land use is supported by infrastructure and development is staged to ensure efficient and orderly provision of infrastructure and services	Priority will be given to facilitating urban development and infrastructure provision for areas that: • Form logical and contiguous extensions of existing urban areas • Will enable the staged extension of infrastructure in a way that minimises the real cost of infrastructure provision • Are not subject to major constraints or uncertainties that may delay development • Are of a size that is likely to result in a substantial and predictable housing yield	Compact + Efficient Accessible

Principle

5

The Western Edge will be planned + designed to reflect and support how we work, live, and participate in our local communities.

Draft District Strategy Drivers: Economic access and opportunities

Outcome	Action(s)	Relevant Planning Strategy Themes
Better access to economic opportunities closer to home	• Centres are in appropriate locations and mixed-use to support local liveability and productivity • Provide employment opportunities locally in the form of local retailing, education, community services, health services, aged care facilities, home based businesses, working from home and other non retailing jobs in and around centres • Provide centres in accordance with the established hierarchy of centres • Centres are serviced by local bus routes and accessible by walking and cycling • Future planning and design aims to reduce the need for major infrastructure investment and self-sufficient development models and partnerships are explored.	Compact + Efficient Diverse Sustainable + Resilient Liveable Accessible
Centres that are high quality, well designed with a sense of place and are desirable locations to live, work and play	• Provide contemporary centres that attract people through mixed-use, diversity of building forms, size, type and affordability • Support public and active travel and public domain with high amenity in centres • Higher order services and facilities requiring a larger catchment (such as shopping, employment and community facilities - secondary schools, regional health facilities and sporting fields) are located in the future Molonglo Town Centre, Tuggeranong Town Centre and Weston Creek Group Centre and are easily accessed by public transport, cycling and by car.	Compact + Efficient Diverse Liveable Accessible
Create places that provide a mix of uses that support productivity, liveability and a place to live and work	• A range of supporting facilities are provided in conjunction with centres, corresponding with their position in the centres hierarchy, e.g. a local primary school and Early learning childhood centre, local health services, aged care accommodation, community meeting spaces, public and recreational spaces and a good level of shops and services at local and group centres • Land required for community and commercial purposes is planned to allow for multiple purposes, where possible • Consider opportunities for live/work spaces, co-working spaces, maker spaces and shared work spaces providing opportunities for small businesses and entrepreneurship.	Compact + Efficient Diverse Liveable

Part 3:

Growth Considerations

This section of the report looks at land use options for the Study Area with a view to identifying potential future urban areas where further investigation for urban development should be prioritised.

The Study Area has been divided into five discrete clusters the same as those identified in the Capability and Suitability Assessment (SMEC 2023).

The following tables provide a summary of the key characteristics of each cluster with a brief commentary on the land use options and potential to accommodate growth.

Central Molonglo	
Area	1,240 hectares
Zoning	Predominantly NUZ 3 Hills, Ridges and Buffer Areas, NUZ4 River Corridor and small areas of NUZ1 Broadacre in the north. Lower Molonglo Valley Water Quality Control Centre located in western corner with associated odour buffer zone.
Ecological	Significant environmental values in relation to individual species, communities and regional habitat connectivity.
Heritage	Kama Nature Reserve contains Aboriginal Places and is listed for its natural heritage values. The curtilage extends beyond the nature reserve to the north west. Old Weetangera Cemetery was listed for its age, location, composition, burials and intact nature. There is potential heritage in response to community views at Lands End, the former location of the Weetangera Methodist Church.
Road Access	Readily serviceable by Drake-Brockman, William Hovell and Stockdill Drives on the northern, eastern and western boundaries respectively.
Servicing	Readily serviceable by utility networks at the edge of the area and cost considered low to moderate. 330kv and 132kV electricity transmission lines traverse the area. Integration or relocation of these lines would be a moderate cost. The bulk watermain traverses the eastern part of the site and could be relocated but would be costly. The Molonglo Valley Interceptor Sewer runs along the southern boundary to the Lower Molonglo Valley Water Quality Control Centre. Lower Molonglo Valley Water Quality Control Centre buffer zone – notionally 2.4km radius, consistent with buffer zone applied to the north.
Slope	Predominantly flat (<10% gradient)
Soils	Predominantly Burra and a small section of Williamsdale.
Visual	Areas to the north toward Drake-Brockman and William Hovell Drives are of moderate scenic value.
Waterways	Bounded by Molonglo River to the south with associated tributaries and creeks.
Bushfire	Large parts around the periphery are classified as high bushfire risk, with only some parts in the centre rates as low risk.
Central Molonglo Land Use Options + Recommendation	
Despite the serviceability of the area and the areas of relatively flat land which are conducive to developable land, the ACT Government in 2008, in considering the Territory Plan Variation for Molonglo and Weston Creek, removed Central Molonglo in perpetuity from being considered as a future urban area due to its ecological significance. The Territory Plan was amended to reflect this and only three small areas of land are available for non urban uses (NUZ1 Broadacre) on the northern boundary. It is noted that these areas are relatively small and are coincident with the Lower Molonglo Valley Water Quality Control Centre buffer zone and Superb Parrot breeding areas and are therefore unlikely to be suitable for development. **Retain current uses and land use zones.**	

West Molonglo	
Area	1,785 hectares
Zoning	Predominantly Designated Area under National Capital Plan, associated with Mount Stromlo Observatory and the University of Canberra Stromlo Forest Park. NUZ Hills, Ridges and Buffer Areas on the flanks of Mount Stromlo and NUZ4 River Corridor. There is a small area of NUZ2 Rural to the west of Mount Stromlo.
Ecological	Environmental values in relation to individual species, communities and regional habitat connectivity, particularly from Mount Stromlo to the Murrumbidgee River.
Heritage	Mount Stromlo Observatory Precinct listed under Environment Protection and Biodiversity Act 1999. Cultural Areas and Aboriginal Places are/may be present.
Road Access	Cotter and Uriarra Roads services the area. Cotter Road would require upgrading to support any urban development in the areas.
Servicing	No sewer services available to the area and would require a crossing of the Molonglo River and series of micro tunnels to provide. 330kV and 132kV electricity transmission lines and bulk water traverse the area.
Slope	Predominantly flat (<10% gradient) in the western area with other areas <20%.
Soils	Predominantly Burra with some Campbell variant C.
Visual	Low scenic value scores in the western area reaching to very high scenic value scores for the eastern face of Mount Stromlo.
Waterways	Bounded by Murrumbidgee River to the west with associated tributaries and creeks.
Bushfire	Predominantly low bushfire risk, with higher risk hazard towards the east. Emergency access potentially a concern without north-south connectivity.

West Molonglo Land Use Options + Recommendation

The bulk of the area is a Designated Area or zoned NUZ3 or NUZ4 and therefore not available for future urban development. Retain current uses and land use zones. The small area of land zoned NUZ2 in the western section and adjacent the Cotter Road may have potential for future urban development. Given its isolated location and relatively small size it should be considered in the context of potential development in the Bulgar Creek cluster.

Uriarra	
Area	1,798 hectares
Zoning	Predominantly NUZ2 Rural with NUZ Hills, Ridges and Buffer Areas, and NUZ4 River Corridor. Lower Molonglo Valley Water Quality Control Centre located to the north in Central Molonglo with associated odour buffer zone.
Ecological	Significant environmental values in relation to individual species, communities and regional habitat connectivity, particularly between the two rivers.
Heritage	Travelling Stock Route nominated as a heritage place. Cultural Areas and Aboriginal Places are/may be present. Huntly listed as a representative element of the rural setting of the National Capital. The Specific Requirements of the heritage listing require Huntly to be preserved as a rural property and maintained predominantly as a grazing property and for other uses consistent with a rural property. The garden is to be maintained according to the design of Mr John Gale and all features intrinsic to the significance of the place are to be conserved and appropriately maintained.
Road Access	Uriarra Road is the only road that services the area and would require upgrading. Holborrow Avenue could be extended and an additional crossing of the Molonglo River would likely be required for servicing and additional road access, at considerable cost.
Servicing	Water supply is available with trunk network extension. Sewer servicing would require significant investment with a potential tunnel through Uriarra Ridge and a sewer bridge across Molonglo Rivers, with pump station or inverted siphon at the river to direct sewage to the Lower Molonglo Valley Water Quality Control Centre. 330kV and 132kV electricity transmission lines and bulk water traverse the area. The transmission lines could be relocated but this would be expensive.
Slope	Predominantly flat (<10% gradient)
Soils	Predominantly Burra with some rock outcrops.
Visual	Views into the area are largely blocked by topography. Elevated views of the area are available from within from Uriarra Road.
Waterways	Bounded by Molonglo River to the north and Murrumbidgee River to the west with associated tributaries and creeks.
Bushfire	Predominantly low bushfire risk, with higher risk hazard along river corridors.

Uriarra Land Use Options + Recommendation

Huntly encompasses the entirety of the Uriarra cluster, with the exception of Rural Block 428 District of Stromlo, and can't be developed for urban purposes. Rural Block 428 is not suitable for urban development on its own as it is relatively small, isolated from nearby urban development, expensive to service and has potential ecological significance. **Retain current uses and land use zones.**

Bulgar Creek	
Area	1,500 hectares
Zoning	Designated Area under National Capital Plan along the ridgeline to the east. The rest of the area is predominantly NUZ2 Rural and NUZ4 River Corridor. A light limitation zone applies associated with Mount Stromlo Observatory.
Ecological	Environmental values in relation to individual species, communities and regional habitat connectivity.
Heritage	Greenhills Ruin is listed as an example of a stone homestead of an earlier selector that is now endangered and which contributes to an understanding of the ACT's cultural history. Cultural Areas and Aboriginal Places are/may be present.
Road Access	Cotter Road services the area. Cotter Road would require upgrading to support any urban development in the area and existing roads in Weston Creek would require extension i.e. Hindmarsh Drive and potentially connectors to Eucumbene Drive.
Servicing	Services could be available through the augmentation of existing services in adjacent residential areas in Weston Creek. Sewer servicing would require a western interceptor sewer above the Murrumbidgee River or through a separate sewer pump station discharging to new trunk sewers in Weston Creek and the Tuggeranong Sewer Tunnel. 330kV and 132kV electricity transmission lines traverse the area and bulk water main runs along the northern side of Cotter Road. The transmission lines could be relocated but would be expensive. This cluster is considered to be the most cost effective to service due to the proximity to trunk infrastructure in Weston Creek.
Slope	Predominantly flat (<10% gradient) in the western area with other areas <20%.
Soils	Predominantly Burra with some Campbell variant C.
Visual	Moderate to very high scenic value scores.
Waterways	Bounded by Murrumbidgee River to the west with associated tributaries and creeks.
Bushfire	Predominantly low bushfire risk, with higher risk hazard associated with areas of existing bushland and the river corridor.

Bulgar Creek Land Use Options + Recommendation

Bulgar Creek is relatively flat and neighbours an existing urban development in Weston Creek. It has reasonable access to the Weston Creek Group Centre, the future Molonglo Group Centre, schools, community facilities and public transport and the ACT road network. If the capacity of existing infrastructure permits, there may be the potential to readily extend existing utility services from the adjoining suburbs into this site.

The potentially developable area in West Molonglo should be incorporated into this cluster to enable its assessment as part of a larger potential future urban area. The suitability of the area for urban development is still subject to further assessment to clarify the extent of ecological and heritage values and a range of studies in relation to housing, community, social, employment and transport needs to determine an appropriate range of land uses and location/connections.

The area appears suitable for urban development, however, it is noted that further work may also include an environmental assessment such as a Strategic Assessment to be undertaken under the provisions of the EPBC Act or other ACT environmental assessment requirements.

Kambah	
Area	688 hectares
Zoning	Designated Area under National Capital Plan along the ridgeline to the east, which includes the nature reserves of Cooleman Ridge and Mcquoids Hill. This is supported by small areas of NUZ Hills, Ridges and Buffer in the southern area around a small area of development in Kambah. The rest of the area is predominantly NUZ2 Rural and NUZ4 River Corridor.
Ecological	Environmental values in relation to individual species, communities and regional habitat connectivity.
Heritage	Cultural Conservation Area and Old Growth Eucalyptus trees. Cultural Areas and Aboriginal Places are/ may be present.
Road Access	Kambah Pool Road on southern boundary and potentially extension of Sulwood Drive and road connections from Bulgar Creek cluster if it is developed providing a north south route. Kambah Pool Road would require upgrading to support any urban development in the area.
Servicing	Services could be available through the augmentation of existing services in adjacent residential areas in Kambah and Weston Creek and the Bulgar Creek cluster if it is developed. 330kV and 132kV electricity transmission lines traverse the area.
Slope	Predominantly flat (<10% gradient) with some areas associated with waterways with slopes <20%.
Soils	Predominantly Williamsdale and some Burra.
Visual	Predominately low scenic value scores with some areas of moderate to high scenic value scores.
Waterways	Bounded by Murrumbidgee River to the west with associated tributaries and creeks.
Bushfire	Predominantly low bushfire risk, with higher risk hazard associated with areas of existing bushland and the river corridor.

Kambah Land Use Options + Recommendation

Kambah neighbours existing urban development in Kambah and has reasonable access to the Kambah Group Centre and Tuggeranong Town Centre, schools, community facilities and public transport and the ACT road network. If the capacity of existing infrastructure permits, there may be the potential to readily extend existing utility services from the adjoining suburb into this site. The area is relatively flat which suits urban development.

The suitability of the area for urban development is still subject to further assessment to clarify the extent of ecological and heritage values and a range of studies relation to housing, community, social, employment and transport needs to determine an appropriate range of land uses and location/connections.

The area appears suitable for urban development pending further investigations.

Based on the review of planning investigations completed to date and further planning analysis, it is considered that Central Molonglo, Uriarra and the majority of the West Molonglo areas are not suitable for future urban development.

The Bulgar Creek, Kambah and a small portion of West Molonglo (adjacent to Cotter Road) areas, based on the review and analysis undertaken for this stage of work are recommended for further planning investigation.

This recommendation is based on the range of characteristics that could be suitable for future urban development which is aligned to the planning principles outlined in the previous section of this report.

The following spatial analysis and plans illustrate and suggest options for the Bulgar Creek-Kambah areas

Bulgar Creek-Kambah Potential Future Area

Whilst the land use option analysis above indicates the potential for urban development in Bulgar Creek-Kambah it is noted that the suitability of this area for urban development is still subject to further assessment to clarify the extent of ecological and heritage values. (See Map 1, page 27).

A range of studies in relation to housing, community, social and employment needs and transport network is needed to determine an appropriate range of land uses, location/connections and appropriate design response.

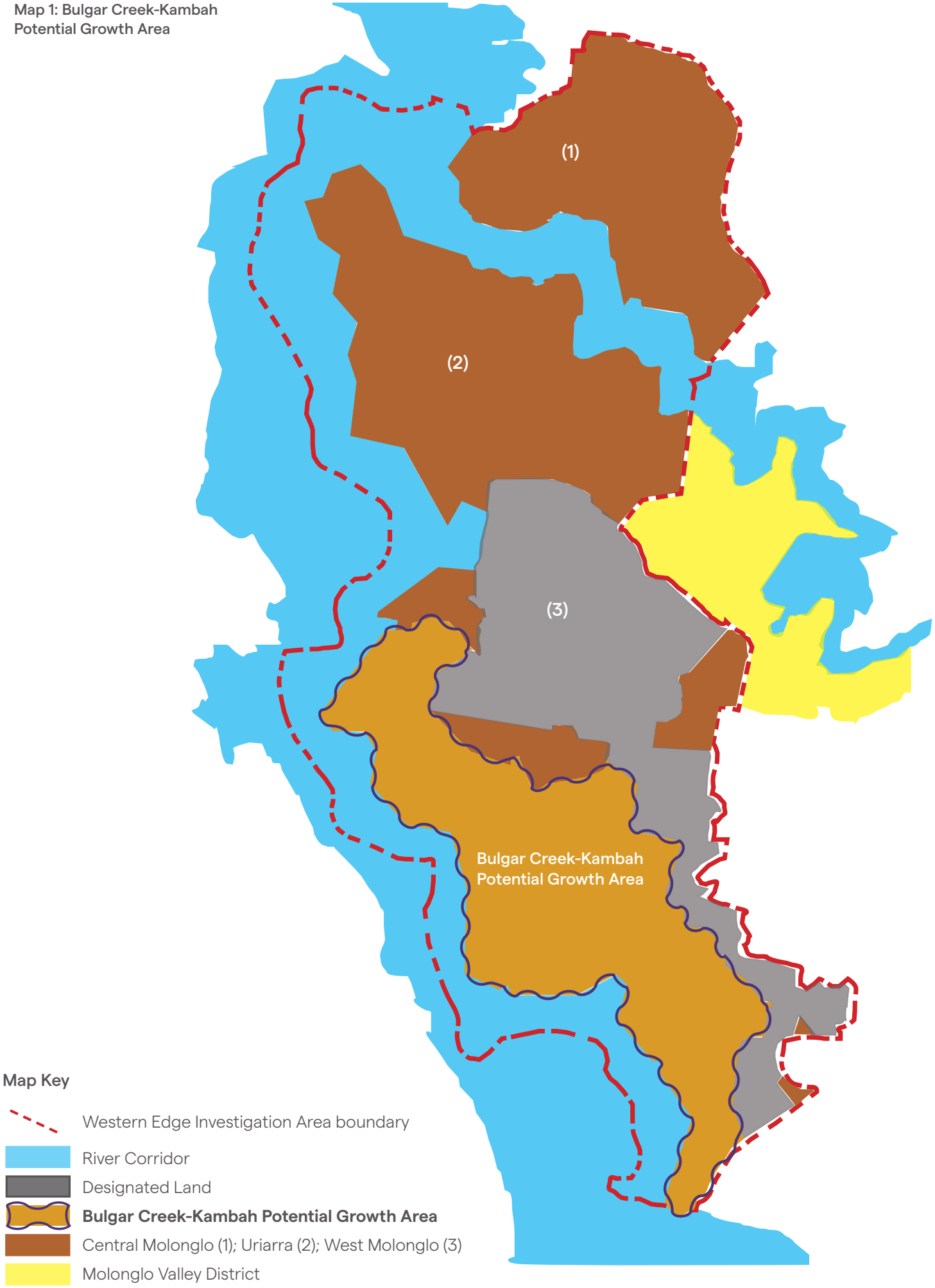
Further work may also include an environmental assessment such as a Strategic Assessment to be undertaken under the provisions of the EPBC Act or other ACT environmental assessment requirements.

Landscape

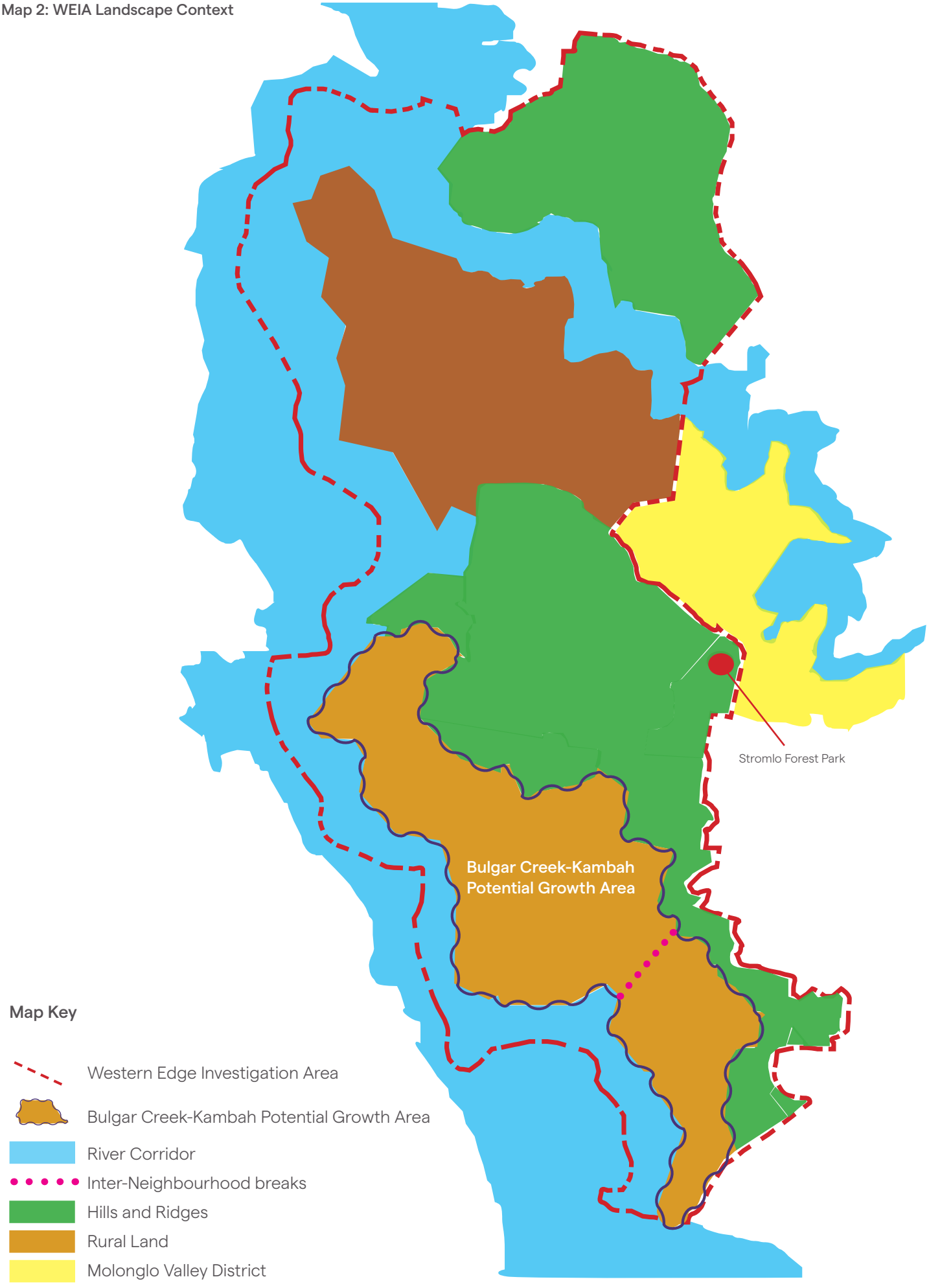
The existing landscape is characterised by rural land, hills and waterways (See Map 2, page 28). The key landscape features that form the broader setting for future urban development include:

- Views to and from hills and ridges that flank Bulgar Creek-Kambah in all directions, including those outside Bulgar Creek-Kambah such as Bullen Range across the Murrumbidgee River and Mount Stromlo
- Distant views to Brindabella Mountains
- Inter-district breaks to urban development e.g. between Weston Creek and Tuggeranong and Bulgar Creek-Kambah, and inter-neighbourhood breaks to future urban development afforded by areas of core habitat and biodiversity corridors
- Utilisation of natural drainage system to create a network of open spaces and habitat corridors with appropriate WSUD to reduce flashiness of storm flows, sediment and nutrient loads whilst minimising impact on riparian values
- Gravity fed infrastructure provision and location.
- Riparian protection of rare and threatened plants, aquatic and fish and threatened fauna habitat.

Map 1: Bulgar Creek-Kambah Potential Growth Area



Map 2: WEIA Landscape Context



Open Space

The open space network is grounded in the National Capital Open Space System (NCOSS) and river corridor. The NCOSS forms the eastern boundary of Bulgar Creek-Kambah and comprises the hills and ridges separating the area from Weston Creek and Tuggeranong and includes the Canberra University Stromlo Forest Park. (See Map 2, page 28)

This provides for nature based passive open space opportunities as well as potential for off road active transport routes connecting with key destinations outside Bulgar Creek-Kambah, including district level open space and recreation.

Local neighbourhood open space requirements will be determined through the structure planning process and will be based on community needs. These facilities should integrate with the NCOSS and river corridor as well as utilise opportunities presented through the drainage system.

Geotechnical and Hydrogeology

A preliminary geotechnical and hydrogeological assessment indicated limitation to development due to slopes and soil characteristics and potential for erosion, landslip, flooding and waterlogging. These areas are largely coincident with the Murrumbidgee River Corridor and land zoned NUZ3 Hills, Ridges and Buffer or are Designated Areas and therefore not available for development. There are some small pockets of these soils that are outside these land use zones and development should be avoided in these areas.

Areas identified as Williamsdale soils, which is the predominant soil type in Bulgar Creek-Kambah present few constraints to urban development, as concerns relating to waterlogging and soil creep, appropriate effluent and surface water disposal can be appropriately managed in the future engineering subdivision design.

Air Quality

Preliminary infrastructure investigations indicate the possibility that sewer servicing may require a western interceptor sewer above the Murrumbidgee River. Odour from any vent stacks will need to be considered and appropriately mitigated.

Hydrology

The Murrumbidgee River forms the western boundary to Bulgar Creek-Kambah and various tributaries traverse the area. Challenges for development include:

- Hydrological constraints (salinity, erosion, stream fragility, terrain slope suitability).
- Water quality and flow regimes.
- Social and community values associated with waterways particularly related to visual amenity and recreation. Increased visitation due to urbanisation may impact visual amenity of water resources and growth in visitation for recreation which could result in deterioration of vegetation, soil compaction, threats and pressure on wildlife, pollution of waterways and erosion.

Opportunities associated with urban development may include:

- Ecological restoration and management – opportunities for riparian revegetation projects to improve ecological function and amenity.
- WSUD to manage stormwater quality and quantity (including flash storm flows) and stormwater harvesting and improved flow management. This may include location of infrastructure outside the river corridor and managing flows down the escarpments and into the Murrumbidgee River to avoid erosion and turbidity in the river.
- Location of sewer infrastructure outside the river corridor, to the extent possible.
- Integrated open space network associated with waterways. Opportunity exists to focus recreation within the Murrumbidgee River corridor to designated walking tracks and destinations.

Biodiversity

Significant biodiversity values exist in Bulgar Creek-Kambah (see Map 3, page 31), including:

- The presence of Critically Endangered Natural Temperate Grassland (NTG) occurring in the northern part of the site.
- Presence of Box Gum Woodland, including potential Critically Endangered Blakely's Red Gum-Yellow Box Grassy Woodland, throughout the study area.
- Threatened flora species were recorded in the WEIA, predominantly clustered around river corridors and identified as Austral Toadflax, Hoary Sunray, Murrumbidgee Bossiaea, Pale Pomaderris, and Small Purple Pea.
- Habitat for threatened Gang-gang Cockatoo, Superb Parrot and Little Eagle is also present, mostly in the central part of the WEIA.
- Habitat for the endangered Rosenberg's Monitor and vulnerable Pink Tailed Worm Lizard (PTWL) were also identified throughout the site. Due to the presence of surface rock throughout the WEIA, PTWL is expected to be reasonably widespread however further survey is required to confirm the quality of habitat.
- Potential for threatened Striped Legless Lizard habitat, requiring further targeted surveys to confirm.
- Potential threatened Golden Sun Moth and Perunga Grasshopper, however further targeted surveys are recommended
- Potential for Spotted-tailed Quoll and noted sightings in the ACT Wildlife Atlas of Brush-tailed Rock Wallaby, Grey-headed Flying-fox and Koala.
- Potential and confirmed habitat for threatened aquatic species including Murray River Crayfish, Macquarie Perch, Murray Cod and Trout Cod within the Murrumbidgee and Molonglo River systems.

The Study Area is likely to hold both local and regional importance for habitat connectivity and significant corridors may include:

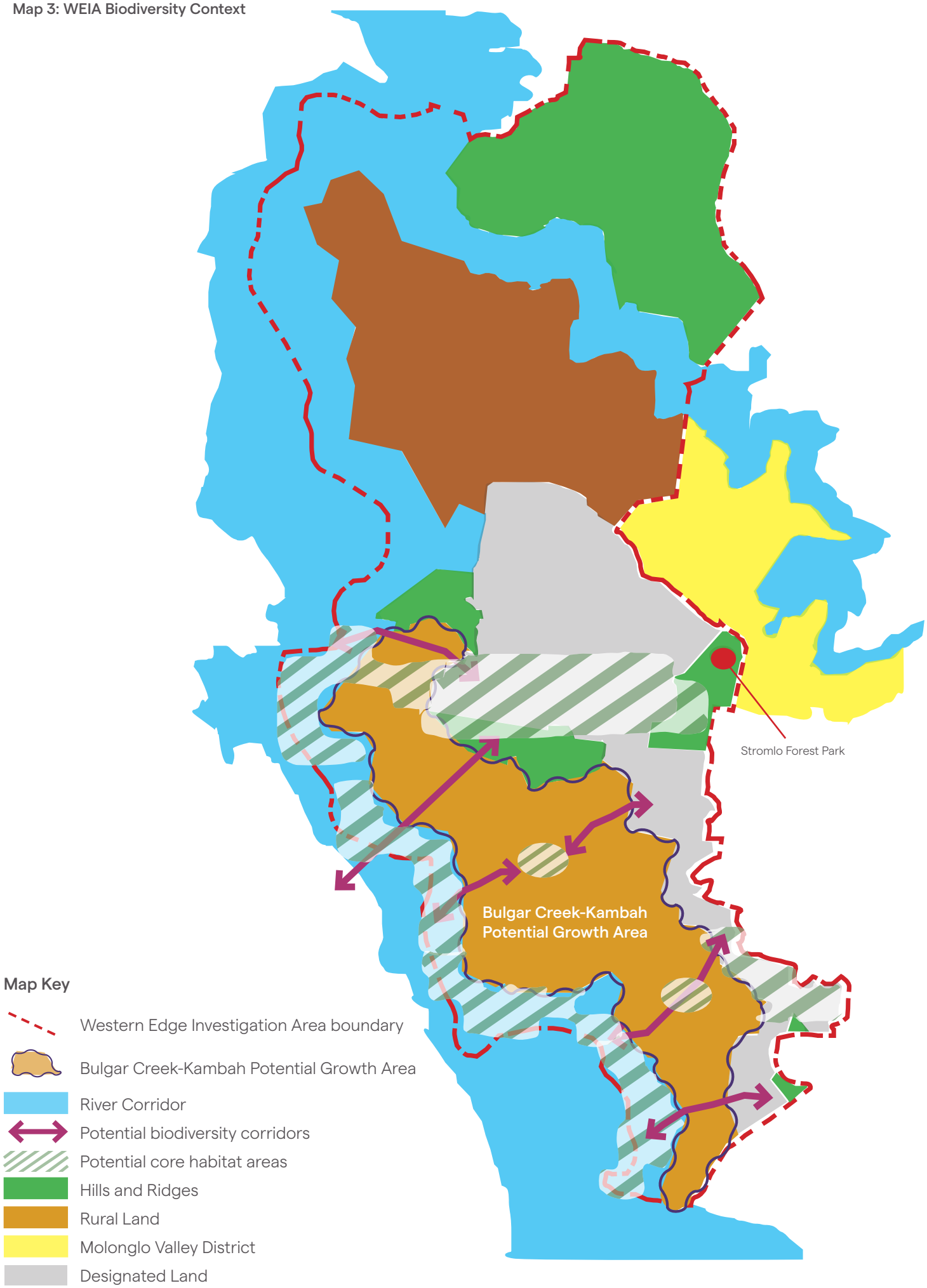
- Murrumbidgee River corridor
- Area around McQuoid's Hill Nature Reserve
- South-west and north-west of Mount Stromlo

Some of these areas are already protected in existing Nature Reserves or by existing land use zones.

Further work needs to be undertaken to assess areas that have not been surveyed or have been inadequately covered in terms of extant or condition so as to determine the extent of habitat and potential habitat and habitat linkages.

Further work may also include an environmental assessment such as a Strategic Assessment to be undertaken under the provisions of the EPBC Act or other ACT environmental assessment requirements.

Map 3: WEIA Biodiversity Context



Sustainable Neighbourhoods and Inclusive Communities and Centres

Residential areas

Bulgar Creek-Kambah is grounded in its local context being the landscape elements and areas of special environmental significance. This provides the basis for landscape sensitive, place based outcomes that provide an immediate local identity for new communities.

Th neighbourhoods are to be of sufficient size and configuration to support a local centre as the heart of the community and provide for a mix of types and densities of housing as well as a range of services and jobs.

Consideration should be given to the relocation of high voltage electricity transmission lines to improve amenity and provide opportunity for a physically connected urban structure. Where this is not possible careful attention will need to be paid to the provision of connections between these communities where they straddle the infrastructure. This is also the case where communities may straddle, or be separated by, the bulk water supply main or an arterial road.

The neighbourhoods will adjoin or be near areas of biodiversity conservation e.g core habitat or habitat corridors and should be designed so as to be sensitive to their values and integrate these features into the character of the neighbourhood through biosensitive urban design principles.

The urban structure should be of sufficient size and configuration to provide appropriate bushfire management to new developments and adjoining existing communities.'

Employment

The urban structure should support the ability for Bulgar Creek-Kambah to provide local jobs close to home. This can be in the form of high amenity local neighbourhoods that support work from home or in local centres that focus as the heart of the community. Good active transport options to nearby existing and proposed Group and Town Centres will also provide opportunities to access jobs close to home. (see Map 4, page 33)

The existing Kambah Group Centre is located within 5km of Western Edge Investigation Area. Duffy, Rivett and Chapman Local Centre are also located, west of the Weston Creek Group Centre, and in close proxminity of investigation area boundary. Future centre locations within the Western Edge Investigation area will need to consider the wider network of centres.

Strategic Movement Network

Public Transport

Development is to be supported by extension of existing bus services providing district and local services to facilitate access to jobs, education, health facilities and community facilities within and without the area.

Higher density residential development and centres are focused on bus route and nodes to increase potential public transport patronage. (see Map 5, page 34)

Cycling and Walking

Cycling and walking routes are to be provided on and off road. The off road network can utilise the open space network and link with interdistrict routes within the river corridor and NCOSS.

Arterial Road Networks

The arterial road network will require upgrading and expansion to facilitate urban development in Bulgar Creek-Kambah. This will include:

- Cotter Road, Hindmarsh Drive, Sulwood Drive to provide east west connectivity
- Kambah Pool Road to provide connection to the south.

Supporting Infrastructure

330kV and 132kV high voltage electricity transmission infrastructure traverses Bulgar Creek-Kambah. This will need to be either relocated or protected with an appropriate easement.

ICON Water's bulk water supply pipeline from the Cotter dam to Mount Stromlo Water Treatment Plant will also require protection and any development on the northern side of Cotter Road will need to pay careful attention to the provision of connections between communities straddling this infrastructure.

Services could be available through the augmentation of existing services in adjacent residential areas in Weston Creek.

Sewer servicing would require a western interceptor sewer above the Murrumbidgee River or through a separate sewer pump station discharging to new trunk sewers in Weston Creek and the Tuggeranong Sewer Tunnel.

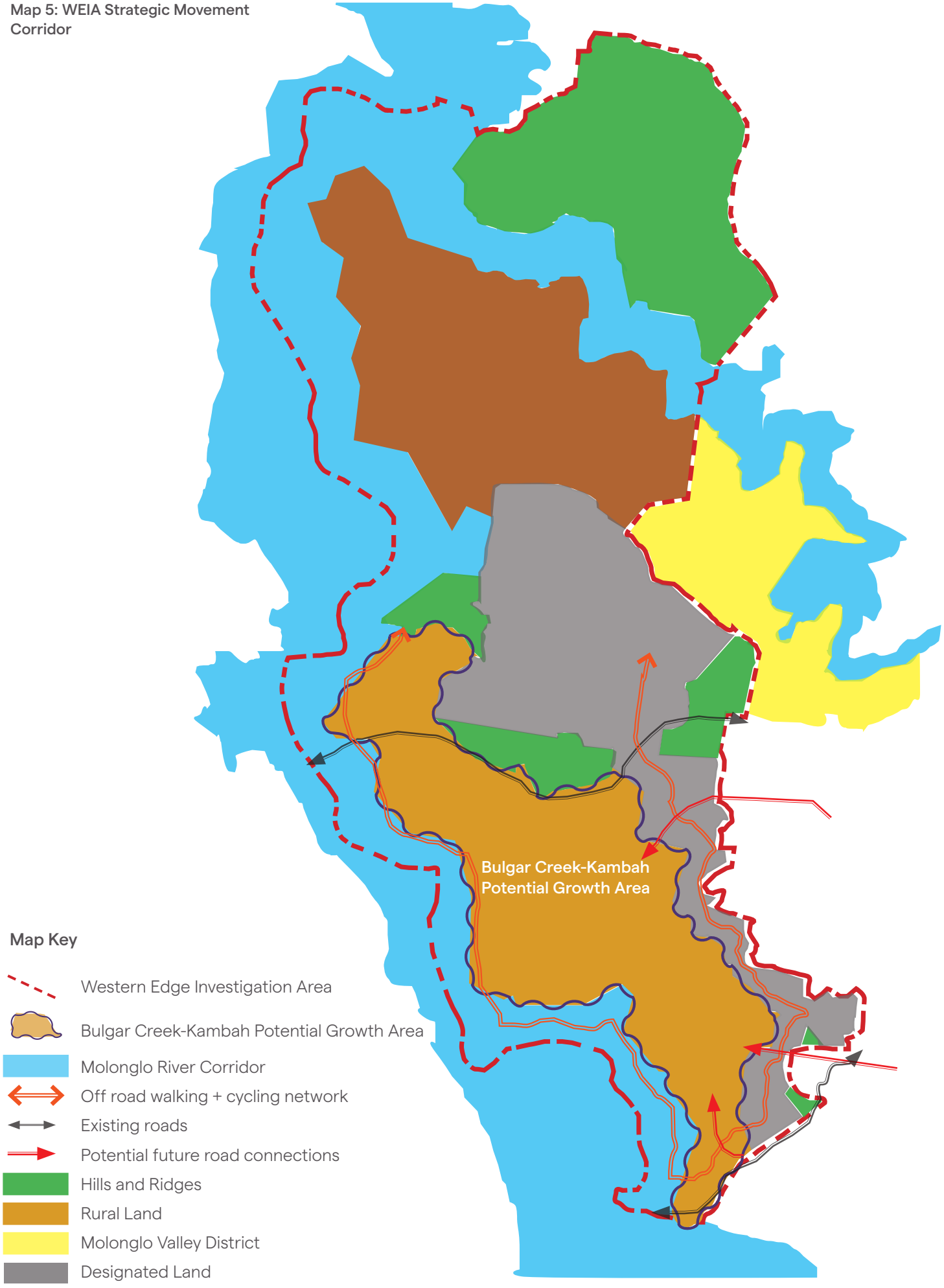
Map 6, page 35 illustrates the possible locations and all the supporting infrastructure.

Map 4: WEIA Employment Context

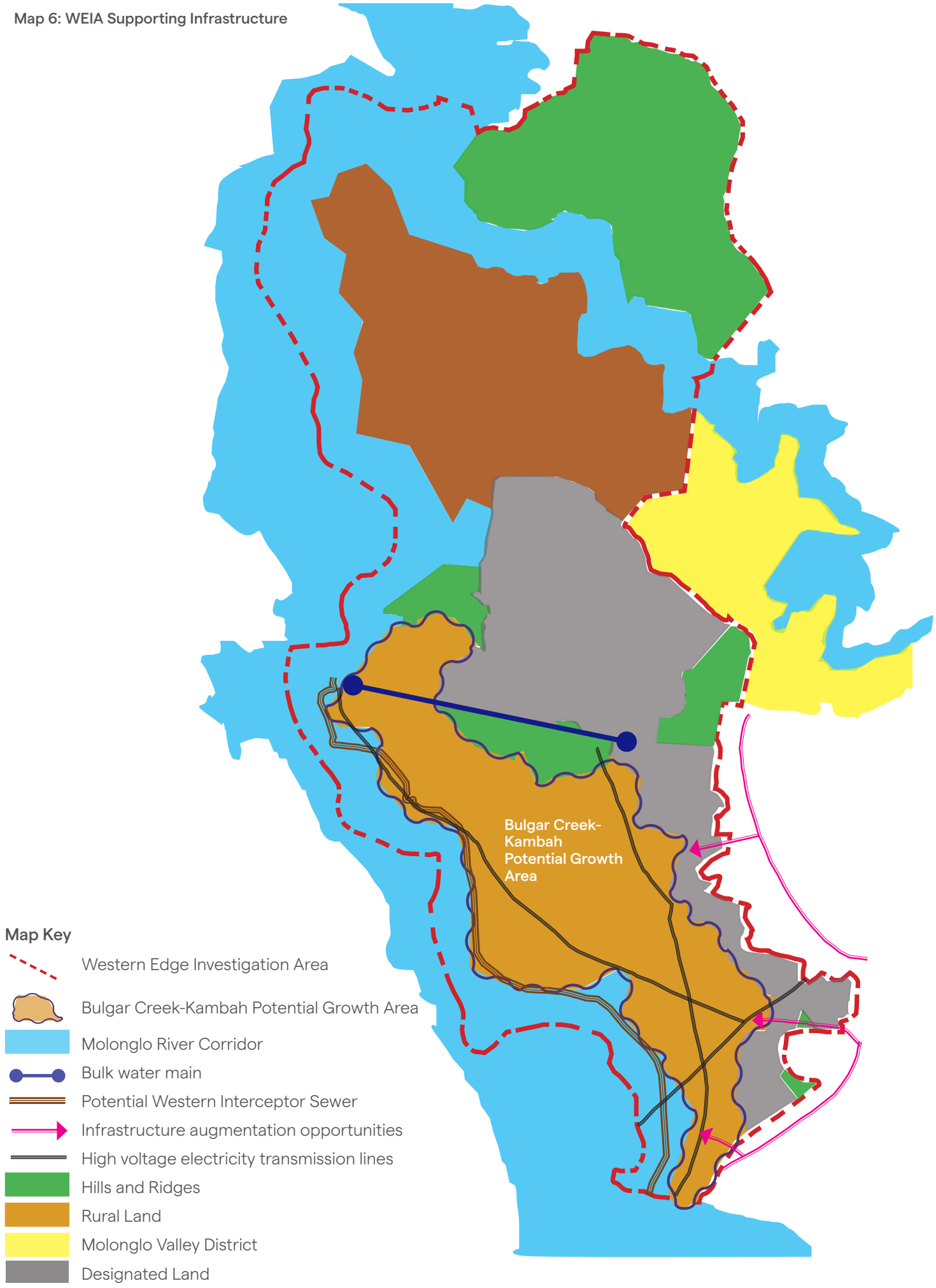
Map Key

- Western Edge Investigation Area boundary
- Bulgar Creek-Kambah Potential Growth Area
- River Corridor
- Potential future centre locations
- Existing and planned centres (indicative locations)
  1. Duffy; 2. Rivett; 3. Chapman Local Centres
- Hills and Ridges
- Rural Land
- Molonglo Valley District
- Designated Land

Map 5: WEIA Strategic Movement Corridor



Map 6: WEIA Supporting Infrastructure



Growth Management Recommendations + Implementation

While the land use option analysis indicates the potential for urban development in Bulgar Creek-Kambah it is noted that the suitability of this area for urban development is still subject to further assessment.

Spatial + planning recommendations to guide the future plannning and decisions about possible land use options for the Bulgar Creek-Kambah Area include:

- Suitability for urban development and the broad form of development that is appropriate for each area.
- Areas of high environmental or landscape value that must be protected from development.
- The urban structure should be of sufficient size and configuration to provide appropriate bushfire management to new developments and adjoining existing communities.
- Locations suitable for job-creating activities.
- The provision of an integrated open space network which will provide for the future amenity and recreation needs of communities and also play a vital role in preserving natural features/character, heritage, sustaining biodiversity and healthy waterways in an urban environment.
- The transport infrastructure required to support urban development sto enable easy and convenient access jobs and services and have a range of transport choices. The spatial analysis and plans identify a mix of options for further investigation such as future arterial roads, active travel.
- Infrastructure networks including, in particular, the water and sewage infrastructure required to enable development.

Possible priority actions to progress the planning of the Western Edge Investigation Area and support effective decision making include:

- A range of studies relating to housing, community, social and employment needs and transport network is needed to determine an appropriate range of land uses, location/connections and appropriate design response.
- Further work may also include an environmental assessment such as a Strategic Assessment to be undertaken under the provisions of the EPBC Act or other environmental requirements.
- The area is likely to hold both local and regional importance for habitat connectivity and significant corridors. Further work needs to be undertaken to assess areas that have not been surveyed or have been inadequately covered in terms of extant or condition so as to determine the extent of habitat and potential habitat and habitat linkages.
- Further consideration of the hydrological constraints (salinity, erosion, stream fragility, terrain slope suitability), water quality and flow regimes and the limitation to development due to slopes and soil characteristics and potential for erosion, landslip, flooding and waterlogging.

Uriarra Loop/Crossing
Source: ACT Parks and Conservation Service

Part 4: Engagement Strategy

This section provides an overview of principles of good planning, best practice approaches and considerations to deliver inclusive engagement for the planning and design of the Western Edge.

Principles of good consultation

Under the *ACT Planning Act 2023*, Part 2.2, Section 11 outlines the principles of good consultation that support the planning system to be effective, efficient, accessible and enabling.

These principles are criteria to planning in the ACT to be outcomes focused and one that provides space for genuine community participation and have formed the basis for the WEIA engagement approach.

Principles of good consultation

The ACT Planning Act 2023, defines good consultation as being:

Accessible: when information provided as part of the consultation, and processes for consultation, are easy to access and are presented in a variety of ways to accommodate different stakeholders.

Balanced: when it is undertaken in a way that facilitates and encourages constructive responses from a wide range of stakeholders and when community views are considered together with the views of other stakeholders.

Inclusive: when it is undertaken in a way that aims to engage all stakeholders affected by the subject of the consultation.

Meaningful: when information provided as part of the consultation is adequate to ensure all stakeholders understand the subject of, and issues relating to, the consultation and can give informed responses. The process genuinely seeks community feedback; and community views are genuinely considered and incorporated into final decisions.

Resourced: when the processes are appropriately supported, taking into account the significance, complexity and likely impact of the subject of the consultation.

Respectful: when it is collaborative, genuine and courteous towards all views expressed.

Timely: when it is undertaken at an appropriate time in the planning process; it is undertaken in a way that considers the needs of stakeholders and facilitates participation; and it allows sufficient time for stakeholders to engage with other members of their group or organisation to form a collective decision. For example, consultation should considers holiday periods or other ACT Government consultations.

Transparent: when information provided as part of the consultation and processes for consultation are clear and observable. That planning decisions are made openly; and government and proponents provide reasons for decisions, including how community views have been taken into account.

Understandable: when clarity about the overall objective of the consultation is provided and when specific issues on which stakeholders are being consulted and what is not open to consultation or change is also clear. It should also be accurate, written in plain language and presented clearly.

The engagement approach for the WEIA will seek to implement these principles into the development of the strategy. The articulation of purpose and what tools are proposed to ensure that it is effectively delivered will enable genuine participation in the development of the strategic planning framework and the 'on the ground' implementation.

Inclusive Engagement

The ACT community are not a homogeneous group. There are various communities which can be defined by their geographical location, their age, culture, identity, gender, or they can be communities of interest. The communities that make up the ACT are diverse and therefore, for the planning and policies to reflect this diversity, the design and implementation of engagement processes should actively seek diverse participation.

Engagement should never be a 'tick the box exercise'. 'It should be a genuine process where people feel valued and their contributions are respected by government.

To demonstrate this value, activities must be adequately resourced with sufficient time, space, funding, and information. The government's intentions and expectations and also the expectations of participants, including about time frames and continuity of communication, information and feedback, must be clearly understood and acknowledged.

Throughout the different stages of the planning and design of the Western Edge, we will not always agree. However, creating lasting and balanced impact requires there to be mutual understanding, openness, and respect to build a productive partnership between the ACT Government, stakeholders and the ACT community.

Providing a space for a diversity of voices and co-designing practical approaches to implement changes are the elements that engagement must be built on and will significantly contribute to making informed and transparent decisions about the future growth of the Western Edge

We acknowledge that there is an existing network of stakeholders, community organisations and advocacy groups that are invested in the future of the Western Edge and are trusted by their communities. We consider that the existing community and government advisory groups, and the existing community network is our starting point for conversations to commence.

Engagement Stages for the Western Edge Investigation Area Planning + Design

Investigation Phase

Strategic Planning + Design Phase

Statutory Planning + Detailed Design Phase

Planning with community through ongoing engagement + participation ••••••••••••••••••••••••►

Reframing the language of engagement to build genuine and respectful partnerships in the future growth of the Western Edge.

This strategic engagement approach demonstrates the ACT Government's commitment to deliver on the principles of good consultation to support long term positive outcomes.

How and when we engage will respond to who the community is and how it is changing, the project staging and scale of impacts. We will be empathic to the impacts of change and acknowledge that this will be experienced differently by individuals.

The table opposite illustrates how the principles of good consultation guide how we may plan, design, show up, act and deliver the engagement as the planning for the Western Edge Investigation Area progresses.

Previous engagement discussions and local knowledge enables a glimpse into what attributes about the Western Edge are important and the values of the wider ACT community. Together, they help to identify the drivers, risks and opportunities that will continually shape the engagement and governance approach.

Drivers...

influencing + shaping community perceptions, + project responses. They also influence how + when we engage with community and partners. To engage with purpose, we must value all inputs and consider the project through multiple lenses' and ensure that there is understanding to ensure informed participation and respectful discussion about issues, values and ideas.

- Opposition to the expansion of the urban footprint of the ACT
- The Western Edge is a highly valued natural landscape with some community groups already expressing concerns about the potential loss of environmental values within this area
- Community acknowledges that additional housing is needed in the ACT to support the growing population.

Risks...

impacting the community, project and the engagement process. The impacts will vary across the life of the project and be experienced differently. Building trust, being inclusive, balanced, transparent and respectful are the building blocks to minimising risk.

- Lack of community trust in the process and reliability of baseline data that informs decisions
- Poor and uncoordinated communication leading to confusion and community feeling a lack of clarity and anxiety about future built form of the area.

Opportunities....

arising from meaningful, well resourced and accessible engagement will significantly contribute to cultivating lasting relationships and effective partnerships. This will result in robust decision making and planning outcomes that can create a place that sits comfortably within its natural and cultural surroundings and supports future communities to be connected, inclusive and thriving.

- Increased collaboration between government agencies, local organisations and the community can deliver meaningful, productive relationships.
- Building local skills, expertise and capacity to strengthen self determination for individuals and collectively as a community
- Exploration and delivery of different and leading planning and design outcomes such as biodiversity sensitive urban design, new housing typologies etc.

Principles *[what guides us]*	Actions *[how we deliver]*	Outcome *[what we aim to achieve]*
 **Accessible**	• Easy to understand and accessible information is provided. • Engagement activities are easy to access • Information is presented in a variety of ways to accommodate different stakeholders.	Adequately resourced engagement program that builds trust in the planning decisions, confidence to participate in the process that leads to ownership of local communities of the project.
 **Balanced**	• Multiple opportunities to participate are provided • Acknowledge the varying impacts - both short and long term- that people will experience with the changes that this project will have on the community and that this will fluctuate across the life of the project.	The planning and design of the Western Edge has been shaped by various viewpoints and a diversity of voices.
 **Inclusive**	• Words and language enable the community to feel safe and comfortable • Approach engagement with curiosity, listen with an open mind and be empathetic towards people.	Everyone's voice and experience is valued and heard - whether from community, government, a project partner, local organisations or community groups.
 **Meaningful**	• Clearly define and articulate when we are engaging, the intent and how information will be used and what outcomes we are seeking. • Demonstrate to the community how their insights, ideas, issues and feedback has been incorporated into the planning and design considerations.	The planning and design of the Western Edge is a genuine collaboration with community and stakeholders.
 **Resourced + Timely**	• Plan & coordinate engagement to be targeted and timely to minimise fatigue and be responsive to the issues and scale of impact. • Be proactive and be committed to building long term relationships, not just to tick a box	Adequately resourced engagement program that builds trust in the planning decisions, confidence to participate in the process that leads to ownership of local communities of the project.
 **Respectful**	• Be honest and establish clear expectations • Value all the different perspectives and experiences that each person brings and acknowledges that no one has all the answers.	We may not always agree, but building mutual understanding and being able to discuss, debate and share information to explore ideas and identify opportunities is critical.
 **Transparent**	• Provide regular reporting to community about issues, opportunities and ideas. • Accurately record feedback, seek endorsement for key documents and report back to community • Establish a clear governance framework that supports community involvement in the development of the project.	Risks to the project and our relationship with the community and stakeholder are minimised.
 **Understandable**	• Understand that people engage and communicate in different ways, so we will provide different opportunities to be involved. • Provide information that is concise, in plain language, being mindful of culture, age, ability and language.	Participants are informed and provided the knowledge that allows them to confidently contribute to the planning and design of the Western Edge, even if they don't have specific expertise.

Part 5:

Engagement Implementation Guidance

This section provides some high level guidance to implement the engagement strategy for to support the future planning and design of the Western Edge. It is expected that an individual engagement planning process will be undertaken for specific phases and engagement activities throughout the process.

Guided by the Principles of Good Consultation, how we plan, design, show up, act and deliver the engagement, acknowledging the impacts of change will be experienced differently by individuals at different stages of planning and development.

Value can be demonstrated through the adequate resourcing of activities with sufficient time, space, funding, information and clear communication about the government's expectations and intentions. Expectations of participants, including time frames and continuity of communication, information and feedback also need to be understood.

Considerations for Effective Engagement

To ensure that engagement is inclusive, the design and delivery of engagement approaches and use of engagement tools should consider:

- whether people have been adequately informed about the process and their role and if they have the ability to decline involvement.
- whether the engagement tools and activities provide people with a sense of belonging and ownership and if people clearly know what will happen with their contribution/input.
- activities that provide opportunities for building active and supportive working relationships between different members of the community - especially across cultural groups, and intergenerational relationships.
- activities that include ongoing critical analysis of experiences, actions taken and outcomes as well as including mechanisms for monitoring, accountability and feedback, both above the engagement process and the project.
- options for participation that are sensitive to availability, commitments, language, skills, culture, financial resources, access to transport.
- mechanisms to address any issues of power imbalance between individuals or groups within your audience.
- that the engagement process is sensitive to the inherent difference in experience, status, power, control, knowledge of resources and language.
- issues of confidentiality and anonymity, especially with children and young people, Aboriginal and Torres Strait Islander peoples, women, people from the LGBTIQA+ community, and people from vulnerable communities.
- whether or not you have presumed what people can or cannot do or what they do and do not know already or understand. This is of particular importance when engaging with young people, older people, culturally diverse communities, people with disability, and Aboriginal and Torres Strait Islander peoples.

1. Knowing your Communities

(Stakeholder Mapping)

Common research methods to identify who should be engaged, and for connecting people to impacts, include stakeholder mapping, stakeholder matrices, values mapping, and issues mapping.

The stakeholder mapping is something that should be done for all individual engagement processes and be kept up to date that the planning and design of the WEIA progresses

Thorough stakeholder mapping and aligning this with the most effective methodology is essential, as it is the foundation of an effective engagement approach. The matrix used to categorise stakeholders has divided them into six groups:

Government Authorities, Agencies + Advisory: Elected representatives (political or cultural leaders); government directorates, elected or community based advisory bodies

Non Government Organisations + Agencies: Non government institutions and organisations that delivery local services, and/or are public policy advocates include educational and research institutions, local service providers, peak and professional associations.

Advocacy Organisations: Local community councils, professional advocacy groups and peak associations (economic, environmental, social); nongovernmental organisations (NGOs); cultural leaders and recognised representative bodies; religious authorities and/or recognised representative bodies.

Community Interest Groups + Organisations: Smaller, locally based or issue/interest specific groups. Usually volunteer-led and focused around a single issue and/or interest. These groups could be environmental, community, cultural, recreation, sporting, social and/or economic/business interests/issues.

Affected Communities: could be residents of areas affected by the project, representatives of affected people, local landowners and local businesses.

Wider ACT Community: individuals that are not directly affected by the project, or are not members of a specific community group or advocacy organisation but are part of a broader community of interest.

2. Being across the issues

(Issues Evaluation)

The past, present and future discussions and decisions of a proposed project and the area, and any similar experiences people in the locality have had, including change prior to, or created by, the project's planning assessment; how people reacted to early discussions; how these discussions and other experiences affected the broader community; and the traditional Aboriginal use of the place, recent history of the place and people and any ongoing traumas.

The analysis of media coverage and the local politics of the project and individual issues is important to consider as to the sensitive nature and how best to proceed with the engagement. Negative or misleading media coverage can mean that participants may come to the engagement activities with preconceived ideas, especially at the early stages of a project.

Where the social locality is demographically, socially and/or culturally diverse, or where some groups may be more affected than others, disaggregate data to illustrate these differences. If these differences are negligible or irrelevant, data may be aggregated.

Mapping and aligning both the stakeholders and issues allows to identify those communities which may potentially be disproportionally impacted or who greater efforts to work with them may be needed.

3. Engagement isn't a one size fits all

(Diverse of engagement tools + methods)

It is important to consider the needs of all communities across the ACT, and that there may be groups requiring specific consideration. This can be due to the sensitivity of engaging with these groups or the recognition that these groups may not have had (past and ongoing) agency or equal representation when it comes to participation in planning and decision making.

Therefore, knowing your communities and having the right practitioners and community members to support the engagement process is important to show respect and create a space that people feel safe to contribute.

Engagement with Aboriginal and Torres Strait Island peoples[1]

'Cultural safety is everybody's business'

Respectful and meaningful relationships can be built by sharing knowledge. It takes genuine efforts to build intercultural understanding and trust. To hear and learn from Aboriginal and/or Torres Strait Islander peoples takes time. Ensure you have allowed enough time to meet with stakeholders and be open to share and listen deeply.

It is important to remember that like any other cultural group, Aboriginal and/or Torres Strait Islander peoples and communities are culturally diverse.

There are many Nations, Traditional Owners, languages, kinships, and ways of living. Building relationships with Aboriginal and/or Torres Strait Islander stakeholders requires rapport building, and taking time to learn about the person, organisation, and Community.

The human rights of Aboriginal and/or Torres Strait Islander people must be recognised, respected and upheld. The United Nations Declaration on the Rights of Indigenous Peoples provides a framework of best practice for engagement.

To engage in culturally appropriate practices, practitioners must develop proficiency in cultural awareness, cultural safety procedures and cross-cultural engagement practices. This is part of mapping realistic Aboriginal and/or Torres Strait Islander stakeholder engagement goals and needs to begin at the earliest stage of the project.

Having the engagement process led by an Aboriginal engagement specialist or another person that is culturally appropriate will help to ensure that cultural protocols and recognition are incorporated into the process and ethical and legal requirements met. Incorporate tailored sessions that support Aboriginal and/or Torres Strait Islander stakeholders to speak up and share knowledge about their Country, heritage, culture, community, and the project.

Some basic strategies can be implemented include:

- Know the Country the session is being facilitated on.
- Learn how to perform an Acknowledgment of Country.
- Through sharing knowledge write down additional stakeholder names that are suggested. This is a method of expanding the stakeholder list that will enable you to speak to the appropriate peoples, this method is called the 'Koori grapevine'.
- Sharing knowledge can be one on one, or in a group.

Cultural and intellectual property rights for Aboriginal and/or Torres Strait Islander peoples include their right to:

- Own, control and protect their cultural and intellectual property in accordance with the principle of self-determination.
- Be recognised as the custodians and interpreters of their culture and oversee how their stories and information is presented.
- Allow or deny the use of their cultural and intellectual property according to customary law.
- Maintain the privacy of their knowledge and other cultural practices.
- Control the recording, sharing, and storing of records which hold their cultural knowledge, skills and customs, expressions, images, and language(s) intrinsic to their cultural identity.
- Be fully and properly acknowledged for sharing their heritage,
- Be remunerated for sharing their knowledge and expertise, and
- ACT Government should include appropriate recognition and cultural intellectual property principles and protections when undertaking consultancies and/or procurement for projects within the Western Edge Investigation Area.

1. *NSW Government (2022) "Movement & Place Aboriginal and/or Torres Strait Islander Engagement' Transport for NSW*

Engagement with Young People[2]

Young people are best placed to suggest solutions to government about the issues that affect them and their communities. Young people have a range of experiences, thoughts, ideas and perspectives that can enrich decision making processes and policy/project outcomes.

Engagement with young people goes beyond giving them a voice. It is about ensuring young people are valued and that their contribution is respected, considered and acted upon. The benefits of engaging young people in a meaningful way is that they:

- feel valued by their community;
- can express their needs and ideas;
- build increased confidence to participate in their communities and in decision making processes; and
- increase their knowledge about government and non-government processes and the ways in which they can influence the decision making processes that impact on them.

We often talk about 'young people' and 'adults' as polarised opposites. But it is important to remember that when we describe 'young people' usually this is defined as people aged 12 to 25 years of age. This means that those who are 18 to 25 are legal adults themselves but still face many of the same challenges, barriers and issues of those under 18.

Therefore, it is important the engagement process and information provided consider the different age groups you will be working with and the differing needs of each age cohort.

Importantly, if you are engaging with young people under 18 years of age then your engagement must comply with ACT legislation and in particular The Children and Young People Act 2008 which is the legislative instrument for the provision of care and protection for children and young people in the ACT. It is always good practice for employees that are working with or engaging with children and young people to have a working with children check.

The Office of Youth Engagement delivers the Youth InterACT Strategy by, supporting and encouraging young people's contribution to consultations on issues that affect them. The Office is actively involved in coordinating and supporting strategic government projects and policies that promote young Canberrans participation and engagement. The Office is located within the Inclusion and Participation Division.

Engagement with people from culturally diverse backgrounds [3]

Multicultural communities make significant social, cultural and economic contributions to the success of the ACT. Like all social and cultural groups, multicultural communities have diverse needs that traditional communications do not always meet.

However, the main reasons why engagement with culturally diverse groups is not done effectively is usually due to the lack of resources, experience or capacity in engaging with culturally diverse communities. Previously failed attempts can result in a belief that the issue was not of interest or there was no need in culturally diverse communities.

Delivering successful engagement with culturally diverse communities not only benefits the design, delivery and use of programs or services, it also establishes relationships that can bear fruit over the medium to long term.

Investing in quality translations, culturally appropriate messages and images that are accessible by diverse communities ensures people feel invited to the discussion. Many NGOs employ culturally diverse and multilingual staff with strong grassroots connections to communities and are often at the coalface of issues affecting CaLD communities.

Given the role of multicultural and ethno-specific organisations in many communities, it is important to understand how to access them and engage with them. Some common barriers to people from diverse cultural backgrounds engaging with government can include:

- Not being used to the invitation to voice an opinion, especially to a government authority
- Limited knowledge about decision making processes and/or lack of trust in authority or government structures

2 *SA Government (nd) "Better Together: A Practical Guide to Effective Engagement with Young People'*

3 *Multicultural NSW (nd) "Tools and Resources for Multicultural Planning Engagement' https://multicultural.nsw.gov.au/resources/tools and resources for multicultural planning/tools and resources for multicultural planning engagement/*

WA Government (2014) Engaging Culturally and Linguistically Diverse Communities

- Low English proficiency and/or poor literacy skills
- For young people from culturally diverse backgrounds, it could be the difficulty of getting parental permission to participate
- Avoidance of potential discrimination such as racism
- Feelings of dislocation and isolation from traditional cultures and practices
- Experiences of past trauma and torture which can introduce physical and mental health issues

Some ways to overcome these barriers include:

- Identify and understand key community leaders and influencers who can help to increase understanding and grow better knowledge.
- Engaging with people in the places and community settings they are comfortable in - at local shops, cultural events, religious structures and sporting events. If you can, meet them where they live, work, and gether rather than expecting them to come to you.

4. Areas of Influence

(Acknowledging the various scales and magnitude of impact)

Stakeholder mapping can be undertaken in various ways. One of those is provides a geo-spatial understanding of the areas impacted by the project and the level of engagement according to each zone.

The Study Area is primarily within the district of Stromlo but also extends into the Tuggeranong, Weston Creek and Belconnen districts, generally bounded by the Murrumbidgee River to the west and south and existing suburban development to the east and north.

The Western Edge Investigation Area engagement approach has defined the following geospatial engagement zones (see Figure 7), which would be reviewed as the project progresses and the investigation area is refined.

The engagement zones for the early stages of investigation could be:

Zone 1: is the closest to the project site and will frequently impact stakeholders. This could include stakeholders such as the rural land holders and Mt Stromlo Observatory (ANU), and University of Canberra Stromlo (UC Stromlo).

Zone 2: is the adjoining areas where stakeholders often deal with the project. Impacts are not as significant as in Zone 1, but they are still important.

Zone 3: 'stakeholders' interactions' with the project are limited or restricted to a specific project phase.

5. Asking the right questions

(Understanding what is valued and important)

Our individual experiences of a place, community interactive, connections and life in general influence how we see the world around us, what aspects we value and what is important.

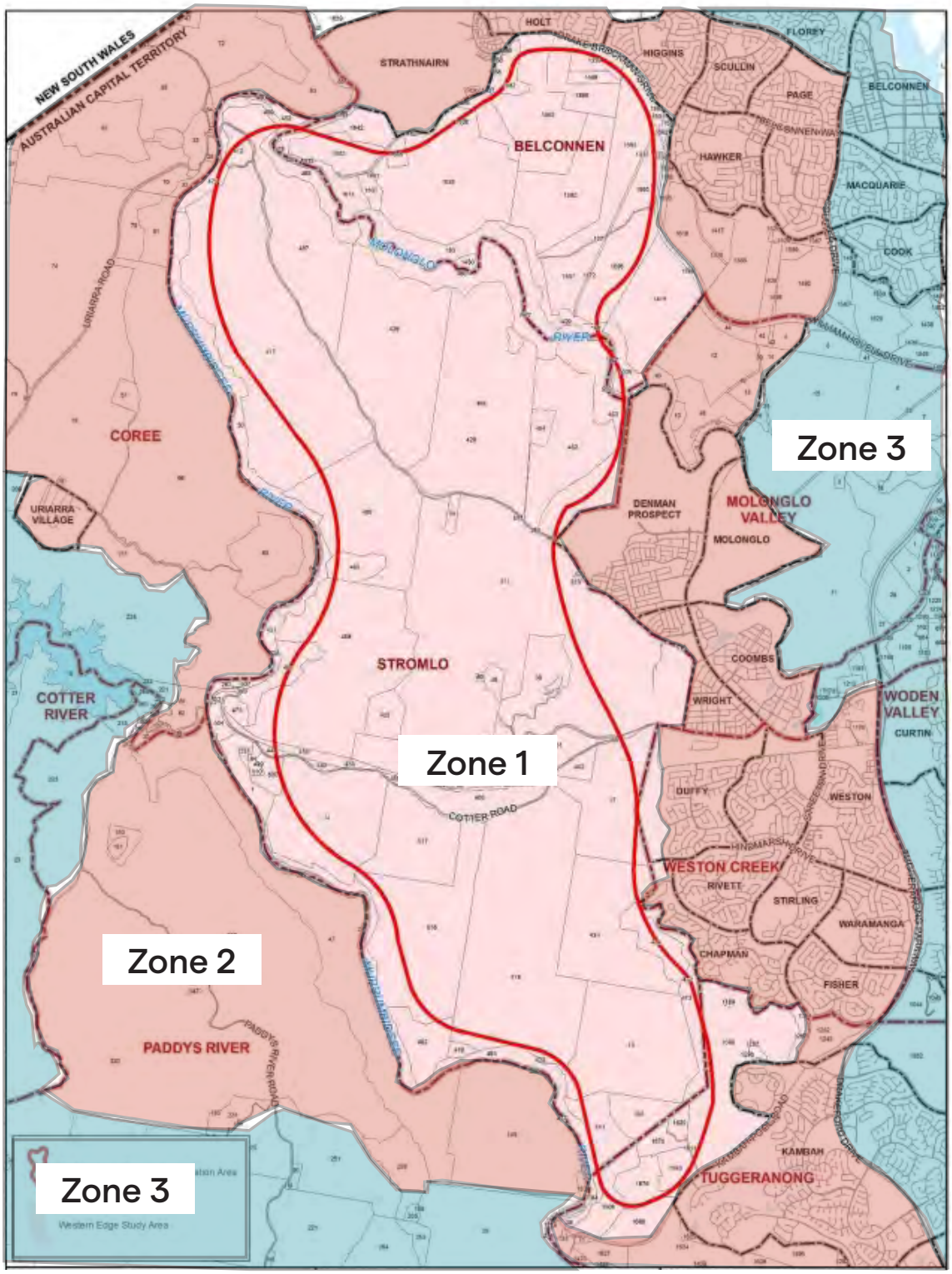
This is not the same for everyone and effective engagement should seek to reveal the various aspect of a place and/or community that are considered valuable and important.

Rather than asking generic open ended questions about what this place would look like in 30 years, questions about what aspects of place and the community do people value and why.

Providing adequate information to communities and stakeholders will also lead to more informed questions. Through the review of previous engagement undertaken for the District Strategies, it is clear that the ACT community understand and acknowledge that more housing is required to support a growing population. By combining this knowledge with questions about values, the future planning can understand the trade offs that communities may be willing to accept and those aspects that they are not.

'Go-Along and walk' with local community members to experience first-hand the important features and aspects of a place, the stories, how they use the built and natural environment and identify the potential disruptions to these resulting from the project. Use jargon free language that communities will understand which will help build confidence and support meaningful participation in discussions and decisions about the project.

Figure 7: Potential areas of influence for the Western Edge Investigation Area.



Key Moves: Potential Priority Engagement Activity Recommendations for the Western Edge Investigation Area.

The ACT Government (ESPDD) have a professional engagement and communications team that are across the most up to date and relevant tools and method to deliver effective engagement. This team should be the first point of contact when planning any future engagement process to support the planning and design for the Western Edge Investigation Area.

The consideration of the engagement approach and activities should be confirmed through a detailed engagement planning process for each individual stage of engagement.

In choosing the most appropriate approach, the decision about the types of activities to be delivered should be:

- Aligned to the purpose of the engagement and whether this can be achieved by the chosen activities.
- Supported with adequate and appropriate information to ensure participants are aware, informed and feel welcome/invited to contribute to the process
- Responsive to the stakeholder and issues mapping appropriate to the stage/scale of the project,
- Mindful and considerate of the sensitivity of the issues

The follow two key moves are suggested as priority engagement activities that enable the community and affected stakeholders to be part of the planning and design process from the beginning of the project. The also allows for ESPDD to consider particular issues and be proactive in working through solutions with community members and representatives of key local organisations.

The two ideas merely serve to illustrate what is possible to deliver on the principle for good engagement and the intentions of the engagement strategy for the Western Edge as the planning progresses.

KEY MOVE:

Western Edge Community Planning Panel

Engagement principles this key move delivers on:

Objective:

To ensure that the ACT Government's commitment to good engagement is demonstrated at the start of the project. The establishment of the Western Edge Community Planning Panel enables a diversity of viewpoints and voices to participate in the design, planning, and growth of the place.

Community working alongside ESPDD and other partners, in making decisions that affect planning and design of the Western Edge is critical to building trust and demonstrate a commitment to equitable representation in all aspects of the project, increased transparency and being inclusive.

Decisions that are made through an intersectional lens, will contribute to building a more inclusive place and nurturing a community that know they have a valued role in the future of a place they highly value.

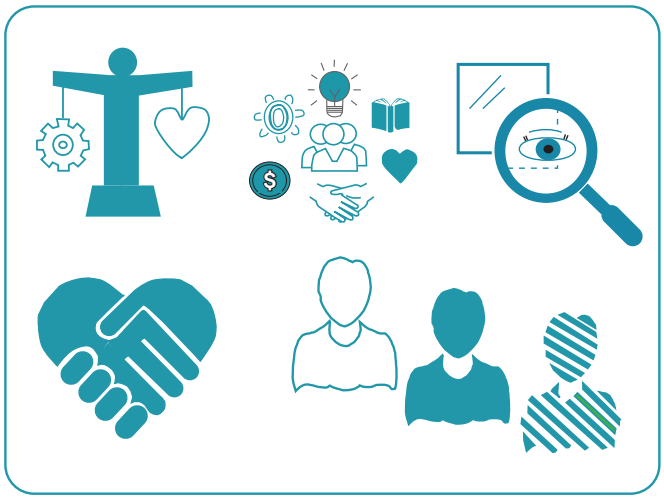
Implementation and Resourcing Recommendations:

- The community panel would be run and guided by established and sound governance principles to ensure there is transparency, accountability, and appropriate representation of interests with community representation as a constant.
- Membership would be a fixed term may evolve though the different phases (e.g., inclusion of construction partners during construction phase). All community members on the panel would be provided with training and up skill as well as be paid for their time and contribute
- A full time funded position would be required to effectively deliver this key move to manage the group and the secretariat function required. Partnerships with other ACT Government agencies could result in a shared funding arrangement.
- Payment to panel members for their time as well as the required leadership and skills training for members need to be costed into the implementation costs.
- Additional items such as venue hire, catering, expert consultant fees, and other discretionary costs (ie. travel) should also be factored in as a reoccurring annual operational budget item.

KEY MOVE:

Western Edge Advisory Groups

Engagement principles this key move delivers on:



Objective:

It is acknowledged that specific cultural groups and social cohorts that may not have easy access to participation require the creation of a deliberative space to explore issues and ideas specific to their communities which will help to build a more inclusive place.

It is challenging for one Community Advisory Group to represent all facets of a community. By identifying contextual places themes and/issues that may be important or of a sensitive nature, an appropriate representation of community and technical expertise can be harnessed to deliberate and provide appropriate and diverse representations to the ACT Government.

The purpose of these groups is to provide a short term focused exploration about an issue raised by government, the community, and stakeholders or to provide advice on the delivery of specific elements pertaining to the planning, design or development of the Western Edge.

Implementation and Resourcing Recommendations:

- First Nations Advisory Group would have a direct connection to and represent the existing groups across the ACT.
- The advisory group for young people could be set up as a partnership with the Youth Advisory Council or the ACT Youth Coalition and provide experience for young people in fulfilling the secretariat roles
- The advisory groups would provide recommendations and request through the ESPDD project team and it would also be at the discretion of ESPDD to delegate authority to these groups for decisions that directly affect their communities, if appropriate.
- Guided by established and sound governance principles (ie. a Terms of Reference) to ensure there is transparency, accountability, and appropriate representation of interests with a combination of community representation and subject matter experts.
- A full time funded position would be required to effectively deliver this key move giving the logistical and management requirements. Partnerships with appropriate community organisations and other ACT Government agencies could result in a shared funding arrangement.
- Additional items such as venue hire, catering, expert consultant fees, and a stipend for advisory group members for the time that attend and prepare for meetings should also be factored in.

Appendix 1:
Additional Engagement Guidance

Preliminary Stakeholder Mapping + General Engagement Tools

Preliminary Stakeholder Mapping for future Western Edge Investigation Area Engagement.

The following provides a preliminary stakeholder mapping exercise undertaken as part of the preparation of the draft framework. This list is not exhaustive and should be considered as a way to provide some context and illustrate an example of the type of organisations that would fall into each of the broad categories outlined in Part 5 of this Draft Framework.

The consideration of key stakeholders should be done for all individual engagement processes and be kept up to date throughout the planning for the Western Edge.

Organisation	Stakeholder Group	Notes
Elected Officials	Government Authorities, Agencies + Advisory | Elected representatives	Electorates of Brindabella; Ginninderra and Murrumbidgee. Relevant Ministers
Aboriginal and Torres Strait Islander Elected Body	Government Authorities, Agencies + Advisory | Elected representatives	The Aboriginal and Torres Strait Islander Elected Body gives Aboriginal and Torres Strait Islander people in the ACT a strong democratically elected voice. The seven members are elected to represent the interests and aspirations of the local Indigenous community.
United Ngunnawal Elders Council	Government Authorities, Agencies + Advisory | Advisory Group | First Nations	Aboriginal body providing advice to the ACT Government in relation to heritage and connection to land matters for the Ngunnawal people. The Council is made up of representatives nominated by each of the Ngunnawal family groups. **The Council meets up to four times a year in Canberra.**
Youth Advisory Council (YAC)	Government Authorities, Agencies + Advisory | Advisory Group | Young People	YAC provides advice on youth issues to the Minister, giving young people a voice in the ACT Government. YAC is made up of 15 members who are all young people aged between 12 and 25 years (inclusive) at the time of their appointment
ACT Disability Reference Group	Government Authorities, Agencies + Advisory | Advisory Group | Disability	The advisory group which works to ensure the ACT Government is aware of the issues which affect people with disability in the ACT. It also advises the ACT Government on ways to be a more inclusive community for people with disability. Members of the Reference Group draw on their own experience and their broader engagement with people with disability, as their carers and service providers to provide that advice.
ACT Multicultural Advisory Council	Government Authorities, Agencies + Advisory | Advisory Group | CaLD	Multicultural Advisory Council gives culturally and linguistically diverse Canberrans opportunities to take leading roles in participation and consultation on issues that affect their lives. The Council is a link between members of Canberra's culturally diverse communities, the ACT Government and the wider community. It provides advice to the Minister to raise awareness of the aspirations, needs and concerns of culturally diverse communities, within government and the community.
ACT Government Directorates	Government Authorities, Agencies + Advisory	Various
National Capital Authority	Government Authorities, Agencies + Advisory	
ACT Conservation Council	Non Government Organisations + Agencies | Peak Body | Environment	The Conservation Council ACT Region is a not for profit, non-government peak body that represents more than 40 member environmental groups. They work to protect the environment of the Canberra region for future generations through advocacy, campaigning and community engagement.
Dhawura Ngunnawal Caring for Country Committee	Non Government Organisations + Agencies | First Nations | Environment	An advisory group that provides the ACT Government with Ngunnawal ecological knowledge in land management to support culturally appropriate decision making,
Buru Ngunnawal Aboriginal Corporation	Non Government Organisations + Agencies | RAO | First Nations	A declared Representative Aboriginal Organisation (RAO), it was established as a NFP to meet the changes in legislation at all levels of Government that requires Aboriginal people to be consulted about their Culture. It also imparts knowledge about Aboriginal culture and practices to build a better community awareness to ensure that the cultural heritage of the Ngunawal people would be protected and conserved for future generations.

Organisation	Stakeholder Group	Notes
King Brown Tribal Group	Non Government Organisations + Agencies | RAO | First Nations	A declared Representative Aboriginal Organisation (RAO)
Mirrabee	Non Government Organisations + Agencies | RAO | First Nations	A declared Representative Aboriginal Organisation (RAO)
Ngarigu Currawong Clan	Non Government Organisations + Agencies | RAO | First Nations	A declared Representative Aboriginal Organisation (RAO)
Belconnen Community Council	Advocacy organisations | local community council	A volunteer-led community organisation that aims to foster Belconnen's community identity, to facilitate community consultation, and to be a strong voice for the community.
Weston Creek Community Council	Advocacy organisations | local community council	A forum for residents to convey concerns to government. It is non-party political group and lobbies government and bureaucrats for services and facilities for the residents of Weston Creek on behalf of residents.
Molonglo Valley Community Forum	Advocacy organisations | local community council	Formed in 2020, this non-political and secular group aims to preserve and improve the social, cultural, economic and environmental wellbeing of the Molonglo Valley and its community.
Tuggeranong Community Council	Advocacy organisations | local community council	The Council is a non political, peak organisation with members from a wide range of residents, in the Tuggeranong Valley. Membership is open to all residents living in Tuggeranong or persons running a business in Tuggeranong as well as individuals who live in the Tuggeranong area.
ACT Scientific Committee	Government Authorities, Agencies + Advisory | Statutory Advisory Body	A statutory expert body appointed by the Minister for the Environment under the Nature Conservation Act 2014. Members of the ACT Scientific Committee have expertise in biodiversity and/or ecology, conservation science and conservation management.
ACT Heritage Council	Government Authorities, Agencies + Advisory | Statutory Advisory Body	An independent, statutory body responsible for a range of provisions under the Heritage Act 2004. The Council comprises 9 members - 3 public representatives one each representing the Aboriginal community, the community, and the property ownership, management, and development sector and 6 experts in architecture, archaeology, history, landscape architecture, Aboriginal history, Aboriginal culture, engineering, town planning, urban design, nature.
Greater Canberra	Advocacy organisations | Housing	A community advocacy group committed to affordable and high-quality housing in Canberra and better planning policy can create a more liveable city.. Members are a mix of renters and homeowners, at different stages of life and levels of wealth, and come from a variety of backgrounds and professions. Members also come from many political parties.
Pedal Power	Advocacy organisations | Peak Body | Transport	Canberra's largest cycling organisation, Pedal Power represents around 6,000 members, and our team of paid staff is supported by hundreds of volunteers. The vision is for Canberra to become the cycling capital of Australia.
Australian National University (ANU)	Non Government Organisations + Agencies | Educational + research Institutions	
University of Canberra (UC)	Non Government Organisations + Agencies | Educational + research Institutions	

Organisation	Stakeholder Group	Notes
Canberra Institute of Technology	Non Government Organisations + Agencies | Educational + research Institutions	
ACT Outdoor Education Association	Non Government Organisations + Agencies | Professional Association | Education	The peak body representing Outdoor Educators in the ACT region. Provides members with ongoing access to professional development, lobbying of Governments and statutory authorities such as NSWNP
ACT Rural Landholders Association	Non Government Organisations + Agencies | Peak Body | Rural	The ACT Rural Landholders' Association is the peak body for primary producers in the Territory. The association exists to support our members – the current custodians of the Territory's rural lands - that produce food and fibre and look after nature on land and water.
Planning Institute of Australia ACT/NSW Division	Non Government Organisations + Agencies | Professional Association | Built Environment	PIA is the national body representing planning and the planning profession, serving and guiding thousands of planning professionals in their role of creating better communities.
Institute of Architects ACT Chapter	Non Government Organisations + Agencies | Professional Association | Built Environment	AIA is the peak body for architecture committed to demonstrating the value of architecture to the public whilst strengthening our profession and the practice of architecture. Dedicated to improving our built environment and the communities we call home by promoting quality, responsible, sustainable design and advocating on behalf of the profession for the benefit of all Australians.
Institute of Landscape Architects ACT Chapter	Non Government Organisations + Agencies | Professional Association | Built Environment	As the peak body for Landscape Architecture in Australia since 1966, AILA represents members' interests at the very highest levels. In this, we are governed by an elected board of directors who receive strategic support from our state chapters.
Community Housing Industry Association	Non Government Organisations + Agencies | Professional Association | Housing	CHIA is the peak industry body for the Australian community housing industry, which provides one in five of Australia's social housing properties, complementing public housing. CHIA undertakes research, policy development and advocacy in relation to social and affordable housing issues.
ACT Shelter	Non Government Organisations + Agencies | Peak Body | Housing	Provides strategic advice and advocacy, consults and represents the community on housing policy issues that affect people with no, or on low to moderate incomes. This includes people who are homeless or who are at risk of homelessness.
Data61 Canberra City	Non Government Organisations + Agencies | Peak Body | Technology	With more than 1,100 staff, including 400+ resident PhD students, we're Australia's leading digital research powerhouse. We have the research capabilities, intellectual property, collaboration programs and global outlook to unleash our digital and data-driven potential.
Property Council of Australia ACT	Non Government Organisations + Agencies | Peak Body | Property Development	
Urban Development Institute of Australia (UDIA) - ACT/NSW	Advocacy Organisation | Peak Body | Property Development	
Real Estate Institute ACT	Non Government Organisations + Agencies | Peak Body | Property Development	Provides administration support to the real estate industry.
Canberra Business Chamber	Advocacy Organisation | Peak Body | Business	Member based, non-government association for retailers in the ACT and region. Provides support and advice on the full range of issues involved in operating a retail business.
Tuggeranong and Regional Business Forum	Advocacy Organisation | Peak Body | Business	Forum for local businesses to connect, share ideas, identify barriers to growth and development, articulate solutions and relay these to the appropriate bodies. Encourages government and private sector investment and re-investment. Develops relationships with other local peak business bodies and community groups. Coordinates community development in aspects including the arts, transport, education, tourism, transport, medical and other scientific discovery.

Organisation	Stakeholder Group	Notes
Landcare ACT	Advocacy Organisation | Peak Body | Environment	An umbrella group who help support and promote the over 60 community groups who help look after urban parklands, countryside, nature reserves and waterways. Landcare ACT has linkages to the National Landcare Network and resources have been provided through the national network to engage volunteers in fire recovery.
National Parks Association of the ACT	Advocacy Organisation | Environment	Conservation group promoting National Parks and the protection of fauna and flora, scenery, natural features and cultural heritage in the ACT.
Friends of Grasslands (FoG)	Community Interest Groups + Organisations | Environment	FOG look to conserve grasslands through hands-on projects, working parties, advocacy and education work. Members of the Friends of Grasslands have a high level of expertise in grassland ecosystems preservation and management.
Canberra Orchid Society	Community Interest Groups + Organisations | Environment	
Canberra Ornithologists Group (COG)	Community Interest Groups + Organisations | Environment	COG is a group of keen bird watchers and carry out a number of bird monitoring programs to better understand bird populations across the ACT.
Upper Murrumbidgee Catchment Network	Community Interest Groups + Organisations | Environment	A key organisation for networking, learning and discussing natural resource management issues and activities across the Upper Murrumbidgee Catchment. The UMCN provides a strong connection between community groups and government bodies
Canberra Astronomical Society	Community Interest Groups + Organisations | Scientific	CAS is committed to promoting cooperation between amateur and professional astronomers and has active public outreach and education programs. CAS undertakes astronomy outreach in the local community. and works with the Research School of Astronomy and Astrophysics (RSAA) at the Mt. Stromlo Observatory
Friends of Mount Stromlo	Affected Communities | Community Interest Groups + Organisations | Recreation	Friends of Mt Stromlo is a place for people who love the outdoors and who use this wonderful facility that is, Mt Stromlo. Be it for bike riding, hiking, running, horse riding or anything else you can do at this Mt in the middle of Canberra.
Canberra Off-Road Cyclists (CORC)	Community Interest Groups + Organisations | Recreation	CORC is the largest mountain bike club in Australia. CORC affiliated with Mountain Bike Australia in 1999 as an MTBA Foundation Club. Offers a variety of competitive and social activities for riders of all ages and abilities. The club runs about 70 racing events each year, including, the Australian 24hour Mountain Bike Championships.
Canberra Bushwalking Club	Community Interest Groups + Organisations | Recreation	With over 400 members, this group founded in 1961 provides a group for people interested in bushwalking, canoeing, canyoning, caving, conservation work parties, cross-country skiing, cycling, geocaching, and liloing.
ACT Equestrian Association	Advocacy organisations | Community Interest Groups + Organisations | Recreation	ACTEA was established in 1970 as an umbrella organisation to represent all equestrians in Canberra. ACTEA represents 20 affiliated groups such as pony clubs, showjumping, trail riding, dressage, horse trials and endurance. Aims include to Promote the development of equestrian facilities in the ACT; and encourage the support of equestrian activities by the Commonwealth and ACT Government and other persons and organisations.
Families ACT	Non Government Organisations + Agencies | Peak Body | Young People	Peak body supporting organisations working with children, young people and families in the ACT and surrounding region. Provides information, sector development and advocacy for members and a proactive voice to government on relevant local and regional issues.
Gugan Gulwan Youth Aboriginal Corporation (Gugan Gulwan)	Community Interest Groups + Organisation | Service Providers | Young People | First Nations	Established and Incorporated under the Aboriginal Councils Act 1976 on 17 August 1992. It was created to support young Aboriginal and Torres Strait Islander people and their families in the ACT and surrounding regions to thrive and succeed.

Organisation	Stakeholder Group	Notes
Council on the Ageing (ACT)	Non Government Organisations + Agencies | Peak Body | Older People	COTA ACT informs and influences Federal, State and Local Government, the business sector and the general community to deliver better outcomes for people aged 50 and over. We regularly undertake research to seek the views of our members. We ask "what concerns an older person?"
ACT Council of Community Services	Non Government Organisations + Agencies | Peak Body | Service Providers | Community	Peak representative body for not for profit organisations, disadvantaged and low income citizens of the ACT. Part of the national COSS network. Promotes equitable socioeconomic policies and supports the development of a well resourced, cohesive and sustainable community sector. Offers advice, information and resources to community organisations.
Volunteering ACT	Non Government Organisations + Agencies | Peak Body | Community	VolunteeringACT is the peak body for volunteering and community information services. We are volunteering experts in the Canberra Region and represent and support volunteerism, to promote its potential and growth for the common good, and to respond to the many opportunities and challenges created by such a diverse activity.
Disability Advocacy Network Australia (DANA)	Community Interest Groups + Organisation | Advocacy | Disability	Disability Advocacy Network Australia (DANA) is a national peak body for Disability Advocacy Services - it does not provide direct services to the community.
Deaf ACT	Non Government Organisations + Agencies | Peak Body | Disability	Providing sports, advocacy and recreational to the deaf and hard of hearing in Canberra and the surrounding area. It promotes the recognition and acceptance of methods of communication preferred by Deaf people and aims to foster pride in the Deaf community, its language and its culture.
Canberra Blind Society	Community Interest Groups + Organisations | Disability	A NFP organisation and provides information, services and assistance to people who are blind or have a vision impairment in Canberra and the local region. Provides a safe and welcoming environment through programs, community engagement and social events.
National Heart Foundation ACT Division	Non Government Organisations + Agencies | Peak Body | Health	The Heart Foundation advocates to government and industry to improve heart health in Australia. Focuses on physical activity, the built environment, healthy eating and being smoke-free.
National Council of Women ACT Inc	Non Government Organisations + Agencies | Peak Body | Gender	Committed to a single goal; equal opportunity for women. A private, non-profit organisation that represents a cross section of womens' organisations from across Canberra. Initiatives to advance the status of women and to promote change.
A Gender Agenda	Community Interest Groups + Organisations | LGBTIQA+ | Gender	Supports the goals and needs of the intersex, transgender and gender diverse communities of Canberra and the surrounding region. Through education, advocacy, peer support and professional networks we connect people to each other and build off the wisdom of collective experiences.
Diversity ACT	Community Interest Groups + Organisations | LGBTIQA+	A community based, registered charity, run by volunteers that provides a service hub, social worker, support networks, groups and community resources to assist the LGBTIAQ+ community of the ACT region.
Canberra Inclusive Partnership	Community Interest Groups + Organisations | LGBTIQA+	This partnerships is made up of lead organisations in Canberra working with the LGBTIQ+ communities and linking people with other relevant services.
Meridian	Community Interest Groups + Organisations | LGBTIQA+	The Consortium is a partnership of four agencies brought together by the common goal of ensuring health, wellbeing, access, social inclusion and equity within the Lesbian, Gay, Bisexual, Transgender, Intersex and Queer (LGBTIQ) community. The Consortium is a robust, inclusive partnership of four Canberra based community organisations, working together to support our communities.
Queer Youth Together	Community Interest Groups + Organisations | LGBTIQA+ | Young people	Queer Youth Together (or QyouT pronounced “cute”) is a program for young people (age 12 to 24) within the sexuality and gender diverse community. It provides a safe space for community connection, learning, mindfulness and fun.
Black Rainbow	Community Interest Groups + Organisations | LGBTIQA+ | First Nations	Black Rainbow is a national Aboriginal and Torres Strait Islander Lesbian, Gay, Bisexual, Transgender, Intersex, Queer, Sistergirl and Brotherboy (LGBQTI+SB) organisation in the pursuit of positive health and wellbeing for Aboriginal and Torres Strait Islander Lesbian LGBQTI+SB*

Organisation	Stakeholder Group	Notes
Communities at Work	Non Government Organisations + Agencies | Service Provider | Children | Young People	Canberra's largest not-for-profit community organisation and the largest provider of Early Education and Care services,
Scouts Camp Cottermouth	Non Government Organisations + Agencies | Service Provider | Children | Young People	Camp Cottermouth is Scouts ACT's camping, training and accommodation centre and is located within the WEIA. The Kangaroo Flat campground has a large number of sites in addition to the cabin accommodation, training and conference facilities, and camping for individual Scout formations or other youth development organisations.
Canberra PCYC	Non Government Organisations + Agencies | Service Provider | Children | Young People	Canberra PCYC is empowering our young stars through a range of programs—sports, arts, education, and leadership training.
Woden Youth Centre	Community Interest Groups + Organisations | Service Provider | Young People	
Belconnen Youth Centre	Community Interest Groups + Organisations | Service Provider | Young People	
YMCA Canberra	Non Government Organisations + Agencies | Service Provider | Children | Young People	YWCA Canberra is a feminist not-for-profit organisation that has provided community services and has represented women's issues in Canberra since 1929 The key areas of work are children's services, community development, housing, youth engagement, education and training and advocacy.
YWCA Canberra Mura Lanyon Youth and Community Centre	Non Government Organisations + Agencies | Service Provider | Children | Young People | First Nations	Mura is a traditional Ngunnawal word meaning 'pathway' is part of the local community and plays an important role in providing pathways for community members to engage in social, cultural, recreational and educational activities within the community.
ACT Youth Coalition	Non Government Organisations + Agencies | Peak Body | Young People	A peak youth affairs body that undertakes policy development, sector development, research and evaluation, advocacy and representation activities to improve outcomes for young people and their families. Responsible for representing and promoting the rights, interests and wellbeing of the estimated 78,000 young Canberrans aged 12-25 years and those who work with them.
Multicultural Association of Canberra	Non Government Organisations + Agencies | Peak Body | Advocacy | CaLD	The Multicultural Association of Canberra (MAC) is a non-profit organisation that aims to promote cultural diversity and inclusiveness in the ACT. The organisation is made up of a diverse group of volunteers from different cultural backgrounds who provide support, information, and resources to people from CaLD communities.
Multicultural Hub Canberra	Community Interest Groups + Organisations | Service Provider | CaLD	Multicultural Hub Canberra is a leading provider of services to the Canberra community. They support migrants, refugees and asylum seekers to access the resources they need to thrive in our city, and to feel connected to their community.
Multicultural Youth Services	Community Interest Groups + Organisations | | CaLD | Young People	Part of the Multicultural Hub Canberra, the programs acknowledge the strengths and challenges of young people and are developed and delivered in consultation with young people themselves
Canberra Multicultural Community Forum (CMCF)	Non Government Organisations + Agencies | Peak Body | Advocacy | CaLD	The CMCF is a peak body representing more than 100 ethnic and associated community organisations in the Australian Capital Territory and its surrounding area. Represents the needs and aspirations of the diverse communities of the ACT, providing strong leadership, cohesion and accountability and advocacy services. Promotes common interests and articulates the purpose and direction of the multicultural community
ScreenACT	Non Government Organisations + Agencies | Peak Body | Advocacy | Arts	Supports the growth of the local screen industry and provides assistance to emerging and established industry members and visiting productions to find a location and production support from the local industry..
Craft ACT	Non Government Organisations + Agencies | Peak Body | Arts	Craft and Design Centre is a NFP organisation which supports artists, craft practitioners, designers and makers at every stage of their careers. We promote and celebrate excellence and innovation in contemporary craft, in the retail space, exhibitions, events and membership program.

Overview of Engagement Tools

The following provides an overview of some of the established community engagement tools and approaches that can be utilised for future community engagement. This list is generic in order to illustrate a diversity of tools that can be utilised and is by no means

The International Association for Public Participation is the peak body for Their Community Engagement Model is a recognised and established model for effective community engagement (See Figure 8).

They also have a framework which is commonly used - IAP2 Spectrum of Public Participation - to assist with the selection of the level of participation that defines the public's role in any public participation process. The table below illustrates this spectrum.

Increasing impact on the decision

	Inform	Consult	Involve	Collaborate	Empower
Public Participation Goal	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision making in the hands of the public.
Promise to Public	We will keep you informed	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.

Organisation Leads I Organisation Acts	Organisations lead engagement and seek input to shape the policies, projects and services for which they are responsible. This is a familiar and traditional approach to policy development, project management and service delivery. Engagement is used to both inform the community about the proposed policy, project or propositions and to provide some input to the shape or execution of the policy, project or proposition. Final decision making sits with the organisation and its governors and the organisation is responsible for its action.
Organisation Leads I Community Acts	Organisations can lead the conversation with communities and individuals take responsibility for action.
Community Leads I Organisation Acts	A community leads in this profile to identify, highlight and propose the acwtion required to solve a problem or take an opportunity. To achieve the desired action requires the response of a focal organisation. The community alone cannot achieve the desired result and therefore advocates to motivate the organisation to act.
Community Leads I Community Acts	Communities can lead the conversation and have responsibility for the action Communities in a range of areas, from sport and recreation to community well-being, environmental action and education, are able to support, design, resource and deliver their own programs, services and activities. Community organisations and NGO's need to engage with community members to gather support, build understanding and commitment and to deliver the session.
Shared Leadership And Action	Leadership and actions can be shared, where communities and organisations participate and contribute to the decisions, and also lead and take responsibility for action towards the outcomes. This collaborative arrangement shared decision making, management and responsibility for delivery required to meet shared outcomes.

Figure 8: IAP2 Community Engagement Model (source: IAP2)

Engagement Tools + Activities

1. Co-Design or Human Centred Design Approach[1]

Co-design enables a wide range of people and stakeholders to contribute to understanding the nature of a problem and make a creative contribution to formulating the problem's solution. This is a participatory approach in which the community and/or representatives of affected stakeholder groups are part of the solutions/policy development. This approach is also at times referred to as design thinking

Co-design involves thinking through policy and service challenges from a customer or citizen's perspective. Stakeholders and communities affected by the policy are involved in its design.

The process of development is iterative (rather than confirming everything up front). This allows the process of learning to influence design. The policy developer's role is seen as being more like facilitators, rather than creators or experts.

The participants collectively draft criteria for the project's success and identify the potential challenge to be solved from a particular perspective and help to make a decision about the relevance of a design-led approach.

Participants are identified, often those affected or impacted by a policy. Policy advisors facilitate a workshop or series of workshops usually with multi-disciplinary teams from relevant parts of government, citizens, and other relevant stakeholders.

Where appropriate, the government team will work with stakeholders to:

- frame the issue and evaluate what further information is needed
- explore lived experiences and key issues
- imagine the opportunities and brainstorm, scope and assess options
- test their risks and costs with prototypes and piloting initiatives.

Figure9 illustrates the co design engagement approach.

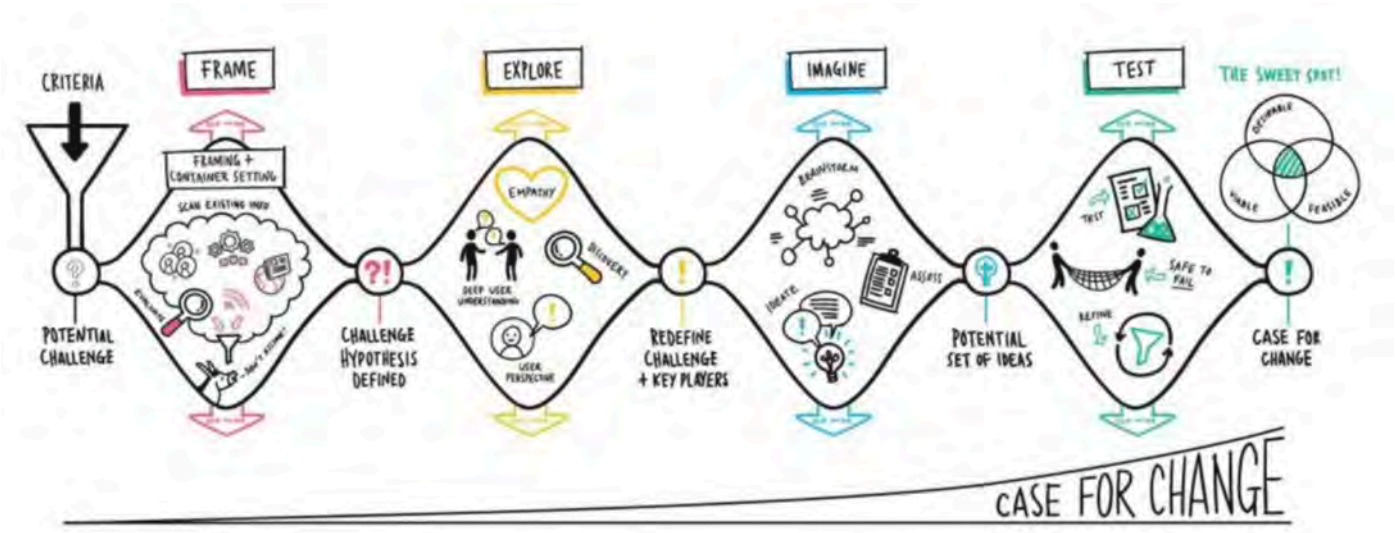


Figure 9: Co-Design/Human Centred Design/Design Thinking process (source: Auckland Co-Design Lab)

1. *Department of Prime Minister and Cabinet (2023) "Selecting Methods for Community Engagement" The Policy Project*

2. Tools to inform about the project, an issue, process, or changes to policy + place.

The following tools are commonly used when it is necessary to provide information about a project, issue, process, change and seek initial feedback to inform the policy, planning and/or design development.

These tools are also commonly used to when a policy, plan or design has already been developed and feedback on a predetermined position/idea is needed. It is important to be clear with stakeholders about the level of influence and change that their input will have on the outcome of the project. As uncertainty may result in unmet expectations and greater risk to the project outcomes. It is suggested that these tools are not used when dealing with issues that are controversial and sensitive or projects proposing significant change.

Public meetings

Public meetings and drop-in sessions are a great way to engage with the community and learn about the community's needs. These meetings can be open to anyone who wants to attend, or they can be invite-only. While this activity allows the provision of information to a large audience, it may also only attract a limited cross section of the community. The primarily purpose is providing information rather than receiving as there is limited opportunity for community members to be heard or provide feedback in a comfortable environment.

For contentious issue, this activity is not appropriate as it doesn't allow for in depth discussions and can easily create significant conflict when community feels they have not had an opportunity to provide their feedback.

Drop In Information Sessions/ Open Days

Involves the provision at a central location of displays, printed information and project team representatives to answer questions or discuss issues within an informal, and less structured environment. This type of activity enables the public to participate at a time convenient to them, obtain information, have a chat, engage at their own pace and even to participate anonymously.

The more informal nature of the activities and being able to have a discussion at a pace suitable to the participant enables a more calm two way conversation about issues, even those that are more contentious.

The ability for one-on-one also provides opportunity to correct misinformation via direct contact with communities of interest and individual and can help to minimise risk to the project.

This type of activity is more likely to meet the information and interaction needs of community members who are not attracted to typical and large public meetings. However, community members may come along expecting a more formal presentation or workshop setting.

However, these sessions are staff intensive and relies on strong communication and interpersonal skills. Participation is not guaranteed or easy to predict and may not attract target audiences instead only be attended by residents that are meeting regulars.

Community briefings/presentations.

The provision of presentations to, and interaction with key stakeholder groups builds a relationship with those who may be significant affected by the project or have a particularly expertise or hold knowledge. Addresses to community groups may be a very useful technique to disseminate information and solicit feedback on a particular project/initiative/issue.

Groups with an identifiable interest and relevance can be targeted and reached. This type of activity is relatively easy to organise, cost effective and provides information directly to people that usually have a large network and community connections.

Peak bodies, advocacy groups, local community organisations, service clubs, churches, men's sheds etc. are most commonly interested in presentations on relevant topics. These briefings/presentations also give the project team the opportunity to reflect, evaluate and adjust messages and explore new working relationships.

Webinar

A webinar is an interactive online event where a group of participants can listen to a speaker who delivers a presentation or seminar by sharing their remote screen. The organiser of a web-based webinar can also conduct interactive polls and Q&A sessions to keep the audience engaged.

This activity is cost effective and enables remote participation with people in a space that they are most comfortable. However, for older communities, remote and rural communities and communities with highly levels of disadvantage, webinars may not be accessible due to poor or no internet connection or limited technology knowledge.

Telephone information hotline

Comprises the use of the telephone to provide and/or solicit information on a particular issue/initiative/concern. Service is personally manned or through the use of an answering service.

Use of this tool provides easy access for community members. It offers an inexpensive and simple device for publicity, information and public input and is a convenient and direct way people can access information about the project. However, this activity is for information giving only and provides no opportunities to interact with community on issues.

Engagement Idea Boards

Involves the design and printing of large display boards through to post card size cards which provide community members with the opportunity to submit ideas or responses to a particular issue or question. Ideal for distribution through community spaces' like local coffee shops or libraries or as an additional response outlet at other engagement activities.

These activities can include 'dotmocracy' boards, survey and poll style questions, post-it note ideas walls, 'big idea' cards etc.

This type of activity is fun and easy for all ages to participate. It can generate many ideas or responses in a single session and taps into individual creativity and ideas. However, it only allows for limited two-way exchange of ideas, and in most cases little to no opportunity to statistically measure agreement on particular responses or ideas.

Vox Pops or Photovoice

Vox Pops or photovoice aims to add a visual element to engagement processes. It is a process where community members record information and express ideas, priorities, issues and concerns through photography or short video interviews.

Vox pops, comes from Latin meaning 'voice of the people'. A vox pop is a short video made up of clips taken from interviews with members of the public. Video's investigate public opinion towards widely known topics, issues and plans and are commonly used as a market research tool. These videos can be on-the-street style, to in-home interviews and mobile video diaries. Traditionally, they refer to an on-the-street intercept interview.

For photovoice, participants photograph their choices, suggestions and/or decisions which are then mounted as a photographic exhibition (with a one-line statement) to stimulate wider community conversation.

These activities are interactive and creative. They provide a pictorial evidence of community issues and is an alternative means of expression which may help include those who are more visual.

Participants are not required to commit a significant amount of time to be involved and is effective to gain the thoughts and ideas of particularly communities of interest such as young people, people with children or caring duties and people who are generally time poor.

Given the visual nature of the engagement activities, the results can easily be used in the media (print/television/interactive technologies) and with the widespread use of mobile phones and digital camera, very easy for people to engage.

The limitation of these type of activities is that is only provides a snapshot of an area or issue from which further discussion will likely be needed. There is also minimal opportunities for a two-way conversation. It also may minimise the participation of older people or people who are not tech savvy as well as people that, for many reasons may require their identity to be protected.

Surveys

Surveying is both a communication channel and an important data collection tool, whereby participants are asked to self-report their experiences or opinions via a questionnaire. Many organisations conduct regular surveys (ie. annual) to gauge the needs of communities and track the changes over time.

A survey questionnaire can be mailed-out, completed as street intercepts, compiled through face to face interviews, completed over the telephone, or increasingly, completed on the internet. This can be in the form of an open online community, with an open conversation through a web page or using a specific platform or survey software.

Surveying may involve blanket, random or selected distribution. Questionnaires ensure that exactly the same questions are presented to each person surveyed, and this helps with the reliability of the results. There are companies that specialise in survey design and delivery and can provide surveys that provide a representative sample of the population. While this type of survey is statistically robust, it is also expensive to deliver.

Surveys are less personal than interviewing, however their anonymity can encourage more honest answers. While they enable the gathering of consistent and specific information, there is no opportunities for follow ups to specific answers and to dig deeper into the issues, idea or solution offered.

Surveys are useful to reach participants who live in remote locations, those who have disability, are unable to attend a workshop or online meeting or are not comfortable these sorts of settings. Online surveys can generate a contact database and are relatively cost effective. In person or intercept surveys are limited to a specific time and place and are staff intensive, while online and telephone surveys allow people to participate at a time that is convenient to them.

Tapping into existing communication methods

These are the standard tools in the community engagement toolbox and some of the most traditional and effective methods. In the 'digital first' world, something on paper can be very powerful and important particularly if you have a elderly or ageing population. Various communication methods include:

- **Website:** general or set up a project specific website. Can also set up a community-based blog or link to various social media channels.
- **Printed Information:** can include fact sheets, brochures, newsletters, media advertising, letterbox drops, position papers, media release, flyers, postcards etc. Such information needs to inform, excite, encourage interest and solicit response. Can be directly mailed or conducted electronically through emails or via SMS.

  While this communication method is relatively straightforward, and can inform large numbers of people, it is not targeted and the information being read and understood is not guaranteed. It also relies on a baseline reading ability of the border community. It is suggested that printed information be provided in multiple languages and also ways for people with visual impairment to also access information. It should also be used with a variety of other, more interactive techniques.
- **Hard copy + eNewsletters:** use this to send out fortnightly communications/updates – include user feedback and create call to actions
- **Newspaper advertisement or advertorial:** use of media through either paid advertising or use of editorial and interviews. Advertising can be used for information dissemination and/or solicitation of feedback through a clip out coupon. Securing free media is either via news release distribution or securing interview opportunities (print, radio or television)
- **Social Media:** organisations can also use social media to engage with their stakeholders. By creating a Facebook page, Instagram or TikTok account, they can provide updates on the progress of the project or advertise upcoming events.

  Providing a 'social media pack' for local community organisations to inform their members. This pack could include social media tiles, FAQ's, project and event information. This allows for a wider reach and information is provided by organisations that have the trust of its members.
- **Information Displays: i**ntended to provide project information and raise awareness about particular issues. Displays can be interactive, and can be used as part of a forum, workshop, exhibition, conference or other event. Sites involving a static display may be located at shopping centres, government offices, libraries, community/ neighbourhood centres, schools, childcare centres etc.
- **Events:** setting up displays or stalls at community days, events and festivals provides the opportunity to build the profile of the project and/or organisation to the broader public. It enables interaction with community members that may not have ordinarily been interested or attracted to a workshop or other activity.

3. Interactive sessions that involve the community in planning and policy development.

The most commonly use engagement activity that enables more interactive sessions, discussions and solutions/ideas development are community and/or stakeholder workshops. However, there are a range of techniques that are used effectively in a workshop setting as well as other activities that can involve the community in the planning and development of places and policy.

Workshops[2]

Designed to generate 'group' discussion and debate, workshops are a useful method to bring together stakeholders with different values. A workshop is best used when there is a specific focus/issue and a need to generate solutions. Workshop can be delivered in multiple ways - in person, online, or in place as a 'walkshop'.

Workshops can deliver a report, opinions, suggestions or plans that have been collaboratively developed and agreed to by all participants, on an issue or proposal.

2. *Bank of I.D.E.A.S & ABC Learning Sites (nd) 'Practical techniques and tools for engaging communities'*

There are a variety of participatory group techniques that can be used in the workshop process; including:

- **Brainstorming :**A method for developing creative options to a specific problem, issue or scenario. Participants come up with as many deliberately unusual solutions as possible and by pushing the ideas as far as possible.

  During the brainstorming session there is no criticism of ideas. Once this has been done the results of the brainstorming session can be analysed and the best solutions can be explored. Brainstorming is particularly useful for generating lots of ideas in a short period; encouraging lateral and creative thinking; expanding, 'piggy backing' or 'leapfrogging' on the ideas of others; helping participants to temporarily suspend judgement or criticism; and helping shy individuals to participate more effectively.

- **Fishbowl:** represents an inner group of participants in a roundtable format involved in a decision- making process that is 'witnessed' by a larger group who have the opportunity for input and questioning

- **Mind Mapping:** developed by Tony Buzan, it is an effective method of notetaking and useful for the generation of ideas by associations. Mind maps help organise information. To make a mind map, one starts in the centre of the page with the main idea, and works outward in all directions, producing a growing and organised structure composed of key words and key images.

- **Nominal group technique**: a group process involving problem identification, solution generation, and decision making. It can be used in groups who want to make their decision quickly but want everyone's opinions taken into account (as opposed to traditional voting, where only the largest group is considered).

  The method of tallying is the difference. Firstly, every member of the group gives their view of the solution, with a short explanation. Then, duplicate solutions are eliminated from the list of all solutions, and the members proceed to rank the solutions, 1st, 2nd, 3rd, 4th, and so on.

- **Force Field analysis:** a technique devised by Kurt Lewin that looks at the factors (forces) that influence a situation. It looks at forces that are either driving movement toward a goal (helping forces) or blocking movement toward a goal (hindering forces). The tool is useful for making decisions by analysing the forces for and against a change, and for communicating the reasoning behind one's decision.

- **Values clarification exercise:** Values answer the question of why people do what they do and guide our actions towards the things we believe are good in some way or another. Value clarification exercises/games help to explore theses values, beliefs, motivations and choices within the group context. Very helpful in prioritising e.g. dot democracy activity.

- **Visioning:** use of gaming and imagination techniques to develop preferred future scenarios, followed by the steps to make them happen.

- **Backcasting:** a method of analysing alternative futures and how desirable futures can be attained. It involves working backward from a desired future endpoint or set of goals to the present to determine the physical feasibility of a particular future and the measures required to reach that end point. End- points are usually chosen for a future of 25 to 50 years.

Focus Groups

Focus groups are a more intimate way to engage with a group of people and get their views on a particular issue, theme or project. They are smaller than workshops and is a structured group conversation-based interview situation. Focus groups are used to gather information focused on a particular topic/ issue. A facilitator conducts a 'group interview' gaining a comprehensive range of views from a small group of people (5-12 persons). A focus group may be conducted to gain opinions and views and/or generate ideas. Focus group discussions typically start broad and progressively focus the discussion on to a single question or point.

This activity allows an in-depth focus on a specific issue and through discussions can reveal subtle variations in community member views. The smaller group environment may generate different dynamics and allowing other issues and topics to be discussed and can often provide deeper insights into complex issues than interviews or larger workshops.

One-one-One/Stakeholder interviews

Involves a conversation with individuals who have a stake or interest in the issue/project. Conversations can occur in people's homes, work places, project office or community meeting locations e.g. local coffee shop. Door knocking initiative to businesses within a street regarding future street improvements is an example of an intercept interview, while one-on-one interviews are usually with invited and targeted key stakeholders.

Citizens' Panels/ Jury[3]

A Citizens' Jury is an innovative means of involving everyday people in the process of government decision-making. Citizen juries can be used to broker a conflict, or to provide a transparent and non-aligned viewpoint providing a transparent participatory process which can be seen to be independent and credible.

It provides a public democracy mechanism – a highly visible form of participation by which citizen jurors simply bring to the situation their own knowledge and personal experience. The Jury provides the opportunity to add to that knowledge and to exchange ideas with their fellow citizens. The result is a collective one, in which each juror has a valuable contribution to make.

Panels involving a couple of thousand stakeholders that represent their local communities are surveyed throughout the year by phone, post or even online. As the panels are held with the same people, it's possible to identify changes over time.

As the name suggests, in essence, a Citizens' Jury is a group of everyday people chosen by democratic lottery convened to consider a given topic and provide a response or recommendation to the governing body. In Australia and around the world, these juries have increasing become recognised for their capacity to deliver outcomes that are trusted by the broader community.

Citizens' Juries work because they can convey to the wider community that citizens like them are being given complete access to information, are studying detailed evidence, and hearing from subject-matter experts of their own choosing.

Delivering this engagement activity however requires strong organisational support and commitment - both of time and financial resources - as the timeframe often requires six months to engage jury, hire facilitator, put together briefing or background papers

Community Liaison Group

Involves the formation of a local reference group comprising selected community members due to their expertise or interest in a topic. Groups are usually formed with a specific purpose and mandate to provide broad based input and advice, and usually over the long term (in contrast to focus groups). Ideally groups should be less than 12 people and no more than 15.

Involvement is open to a wide range of people and it is a cost-effective way to test ideas and options as it's purpose is to build a two-way exchange.

Community Liaison Groups also help to build community commitment and ownership. They provide opportunities for exploring alternative strategies and building on commonalities and alliances as well as a detailed analysis of project issues, timelines and deliverables and a focus on the outcomes.

Participants gain an understanding of other perspectives leading toward an accepted and potentially agreed integrated outcome The group is usually restricted to advisory role, and lacks any decision-making ability.

This activity is also resource intensive, requiring the provision of a staff resource to act in a secretariat role and a payment to participant for their time is common practice. While the membership can be defined by an endorsed terms of reference, depending on the final make up, it may not be representative of all interests and its success is dependent of effective leadership, structured meetings and providing participants with information and resources to add value.

Enquiry By Design[4]

An Enquiry by Design is an intensive planning and design session where community members, designers and others collaborate on a vision for their community development. It provides a forum for ideas and offers the unique advantage of giving immediate feedback to the designers.

Similar in procedure to a Charrette, the Enquiry-by-Design method is used in more specific instances of urban design such as single-sight redevelopment. Enquiry-by-Design is used in cases where an urban redevelopment project is thought to have positive, regenerative effects on the community

3. *New Democracy What is a Citizens' Jury' www.newdemocracy.com.au/what is a citizens jury/*
4. *Enquiry By Design [participedia.net/method/4639]*

The method used to select participants can vary from case to case and is primarily determined by the scope of the project and the level of actual or anticipated contention among stakeholders. Importantly, it allows everyone who participates to be a mutual author of the eventual plans, designs and actions. Usually occurs over a period from two or four days to two weeks long.

The engagement method allows the participation of various technical experts and community to explore local insight of the future and design options and in turn involvement can open up horizons for community members to imagine and visualise possibilities.

It is an excellent option when people need to cut across boundaries and work on a large, collaborative project and allows for input at a number of points in the process. Importantly, the process an exercise of transparency, where information is shared between the design professionals and the stakeholders of a project area.

By involving stakeholders, with the technical staff, this activity helps to builds commitment to implement plans and actions- 'people support what they help to create', can achieve unexpected outcomes, new energized community efforts and community creativity - provides joint problem solving and creative thinking and contributes to building stronger community capacity, local leadership and partnerships.

It should be noted that while this activity is collaborative and an effective engagement method, it is also time and cost intensive as it requires appropriate technical support, the process usually lasts anywhere from 2–14 days and time must be given to provide for reflection and refinement of plans and policy outcomes.

Participatory Budgeting[5]

This engagement method is another form of deliberative democracy. It is a process of democratic deliberation and decision- making, in which ordinary people decide how to allocate part of a public budget.

Participatory budgeting allows community members to identify, discuss, and prioritise public spending projects, and gives them the power to make real decisions about how money is spent. Participatory budgeting processes are typically designed to involve those left out of traditional methods of public engagement.

The often-cited best example of the engagement method being applied is the city government of Porto Alegre in Brazil. It convenes neighbourhood, regional and city-wide assemblies, with over 50,000 citizens participating, in which participants identify spending priorities. Since the practice was established, a range of improvements in governance, wellbeing and citizen engagement have been achieved, with an increase from 75 to 99% of homes having running water and the number of public schools almost tripling.

This participatory method aims to improve representation in participative processes by engaging a cross section of the community. It provides a transparent participatory process which can be seen to be independent and credible and enables citizens to develop a deep understanding of the funding decisions and funding arrangements.

Planning for Real[6]

Planning for Real is an engagement process centred on a 3-D model of a local area. Participants use the model to comment on the strengths and weaknesses of the place, and make suggestions of how they would like to see their community develop.

To begin the process the scale model is constructed by people living within the local community – this is often a task that a local school may take on. This creates a sense of ownership over the process and means the model can benefit from local knowledge.

This method offers community residents a 'voice' to bring about an improvement to their own neighbourhood or community. Community members via the 3D model of their neighbourhood/community; can construct their community vision by placing suggestion cards on the three-dimensional model, then sorting and prioritising the suggestions. The model is made so that it can be moved from venue to venue, allowing more people to participate.

The intended outcome of this technique is to deliver a design or plan that incorporates community ideas, needs and issues and that will therefore be more acceptable and useful to the community. It also aims to give the community a sense of ownership through the highly visual, 'hands-on' and participatory activity which results in a plan that may also incorporate elements of ongoing community involvement and monitoring.

5. *UK Local Government Association 'Participatory Budgeting' www.local.gov.uk/topics*
6. *Involve UK 'Methods: Planning for Real" https://involve.org.uk/resource/planning real*

Planning for Real is especially useful for community planning, neighbourhood regeneration. It is a method that supports communities to identify issues in their neighbourhoods and work together, and in partnership with decision makers, to think about how to change or improve their neighbourhood. It also has appeal for those who are more visual/tactile in their approach and can help bridge language barriers in multicultural communities.

Planning for Real is also often used to build local community capacity and promote social cohesion. There is evidence that people who have been involved in these projects go on to play a more active role in community life.

Particpatory GIS [7]

Participatory GIS (Geographic Information Systems) is a social learning tool that uses visual representations to aid facilitation.

GIS is used as a tool to capture, store, analyse and present data that is linked to a location. Participatory GIS takes this idea and uses it to engage people in particular issues. It uses digital maps, satellite imagery, sketch maps, and others to help involvement and awareness on a local level.

This type of engagement method creates a new perspective for local stakeholders. The visual aspect is easily engaging and its is adaptable for different social and cultural environments.

7. *Involve UK 'Methods: Participatory GIS https://involve.org.uk/resource/participatory gis*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