

- Legend**
- Impact assessment area
 - Impact area
 - Underbore
 - Targeted flora surveys
 - Hollow bearing tree
- Threatened flora records**
- ★ *Acacia pubescens* - Downy Wattle
 - ★ *Marsdenia viridiflora subsp. viridiflora* - Native Pear
- Vegetation zones**
- Urban Native/Exotic
 - PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
 - PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees
 - PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Intact
 - PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
 - PCT 1800 - Swamp Oak open forest on riverflats of the Cumberland Plain and Hunter valley -Thinned

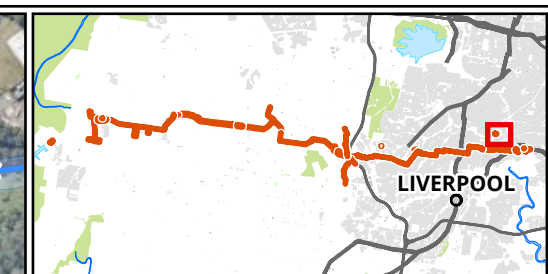
Figure 9.1 Threatened species surveys and results

0 40 80 120 160 200
Metres
Scale: 1:5,000 @ A3
Coordinate System:
GDA 1994 MGA Zone 56

biosis

Matter: 31617,
Date: 23 September 2021,
Prepared for: CW, Prepared by: LW, Last edited by: lwilson
Location: P:\31600s\31617\Mapping\31617_Working\31617_BDAR2020_LW

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- Legend**
- Impact assessment area
 - Impact area
 - Targeted flora surveys
 - Hollow bearing tree
- Vegetation zones**
- PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned

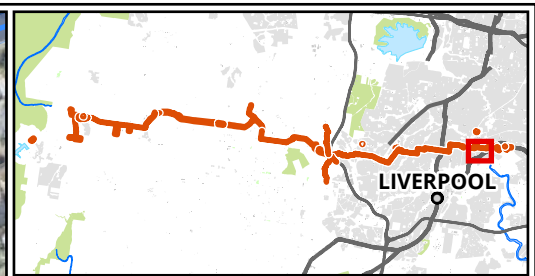
Figure 9.2 Threatened species surveys and results

0 40 80 120 160 200
Metres

Scale: 1:5,000 @ A3
Coordinate System:
GDA 1994 MGA Zone 56

biosis

Matter: 31617,
Date: 23 September 2021,
Prepared for: CW, Prepared by: LW, Last edited by: lwilson
Location: P:\31600s\31617\Mapping\31617_Working\31617_BDAR2020_LW



Legend

- Impact assessment area
- Impact area
- Underbore
- Targeted flora surveys

Vegetation zones

- Urban Native/Exotic
- PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees
- PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
- PCT 1800 - Swamp Oak open forest on riverflats of the Cumberland Plain and Hunter valley -Thinned

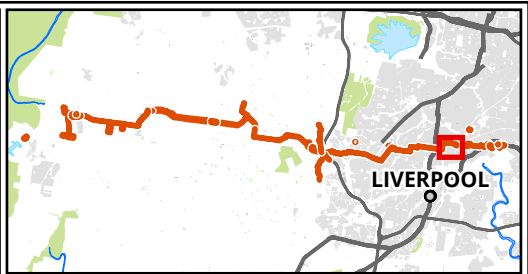
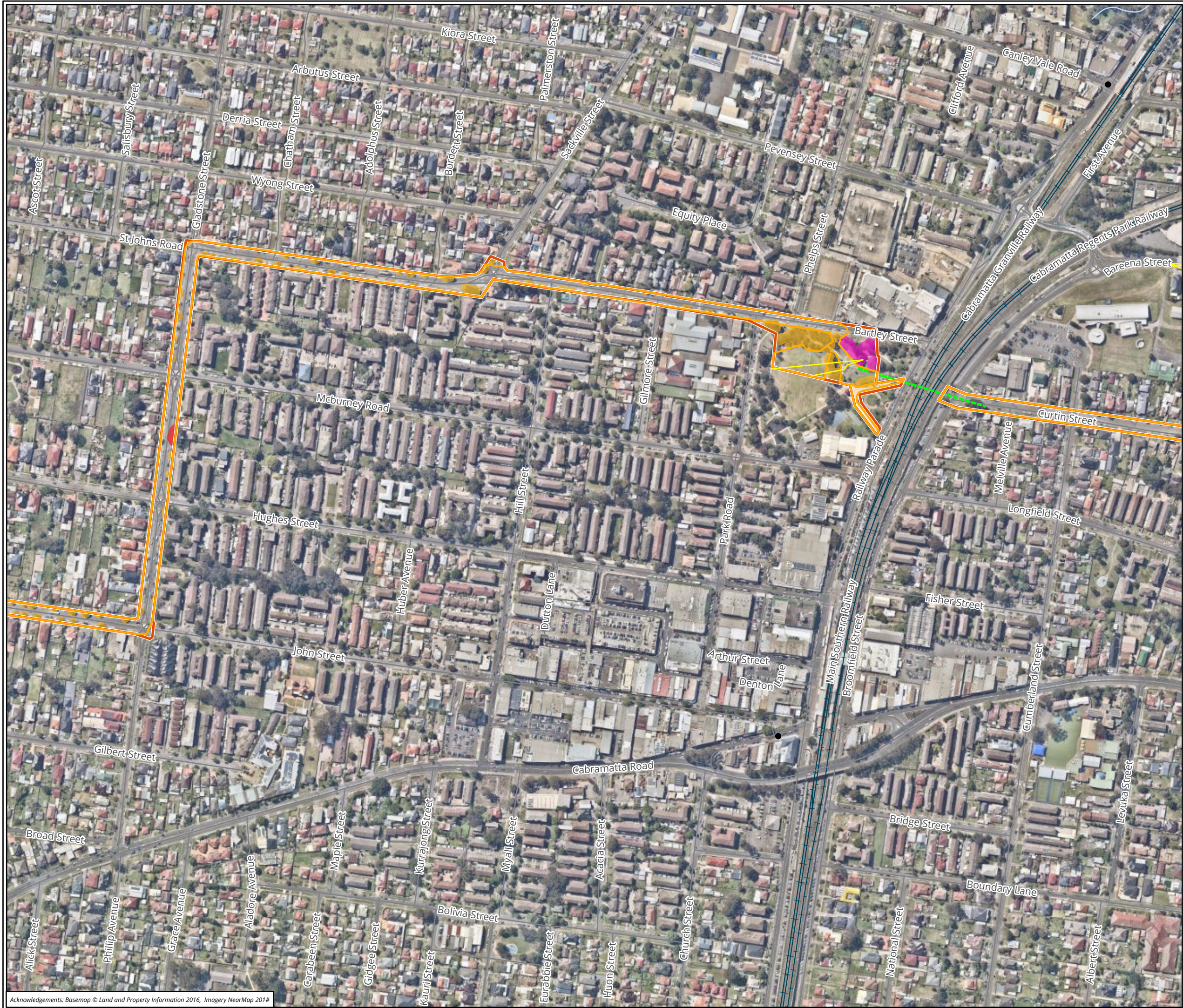
Figure 9.3 Threatened species surveys and results

0 40 80 120 160 200 Metres

Scale: 1:5,000 @ A3
Coordinate System: GDA 1994 MGA Zone 56

biosis

Matter: 31617,
Date: 23 September 2021,
Prepared for: CW, Prepared by: LW, Last edited by: lwilson
Location: P:\31600s\31617\Mapping\31617_Working\31617_BDAR2020_LW



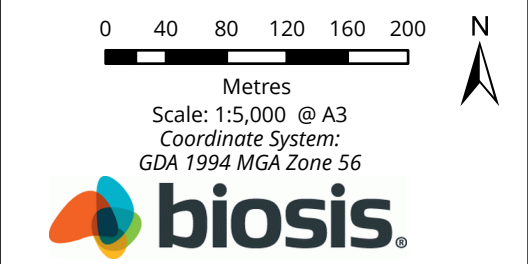
Legend

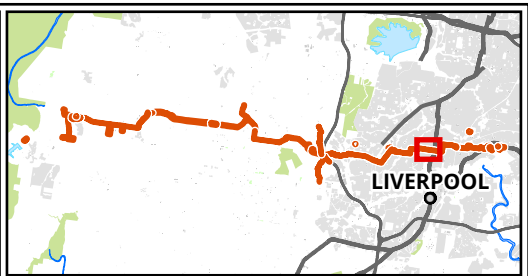
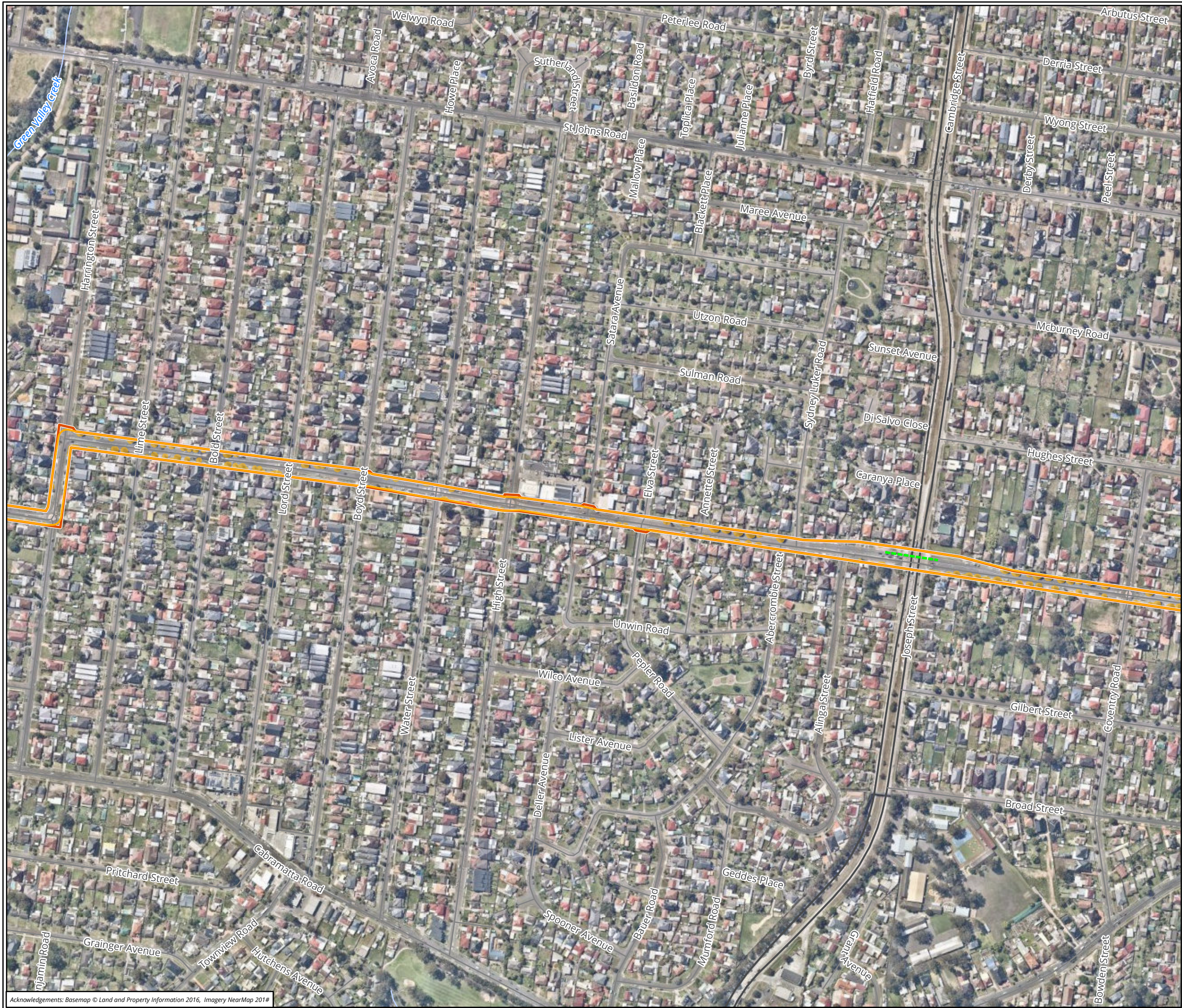
- Impact assessment area
- Impact area
- Underbore
- Targeted flora surveys

Vegetation zones

- Urban Native/Exotic
- PCT 724 - Broad-leaved Ironbark - Grey Box - Melaleuca decora grassy open forest on clay/gravel soils of the Cumberland Plain, Sydney Basin Bioregion - Thinned
- PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned

Figure 9.4 Threatened species surveys and results





Legend

- Impact assessment area
- Impact area
- Underbore

Vegetation zones

- Urban Native/Exotic
- PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned

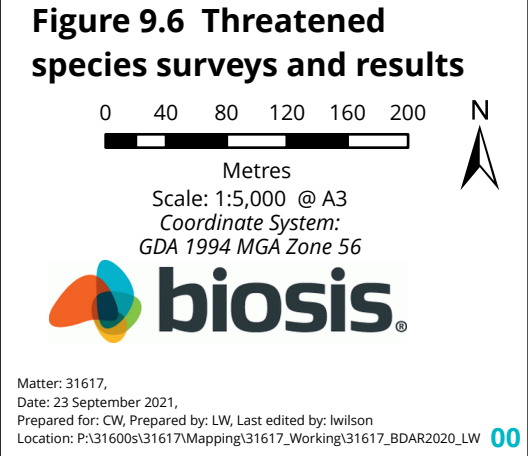
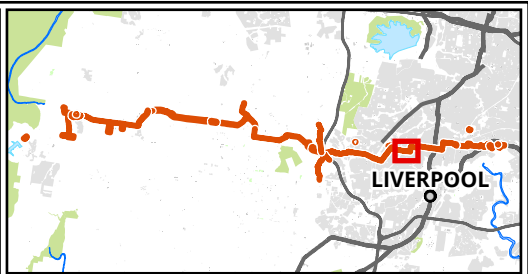
Figure 9.5 Threatened species surveys and results

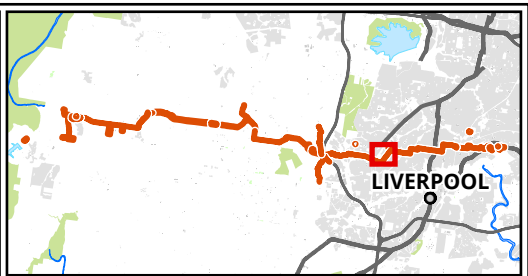
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Metres

Scale: 1:5,000 @ A3
Coordinate System:
GDA 1994 MGA Zone 56

biosis

Matter: 31617,
Date: 23 September 2021,
Prepared for: CW, Prepared by: LW, Last edited by: lwilson
Location: P:\31600s\31617\Mapping\31617_Working\31617_BDAR2020_LW





Legend

- Impact assessment area
- Impact area
- Underbore
- Targeted flora surveys

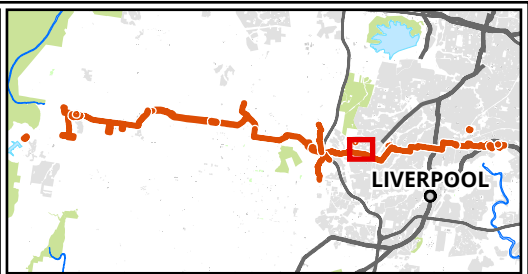
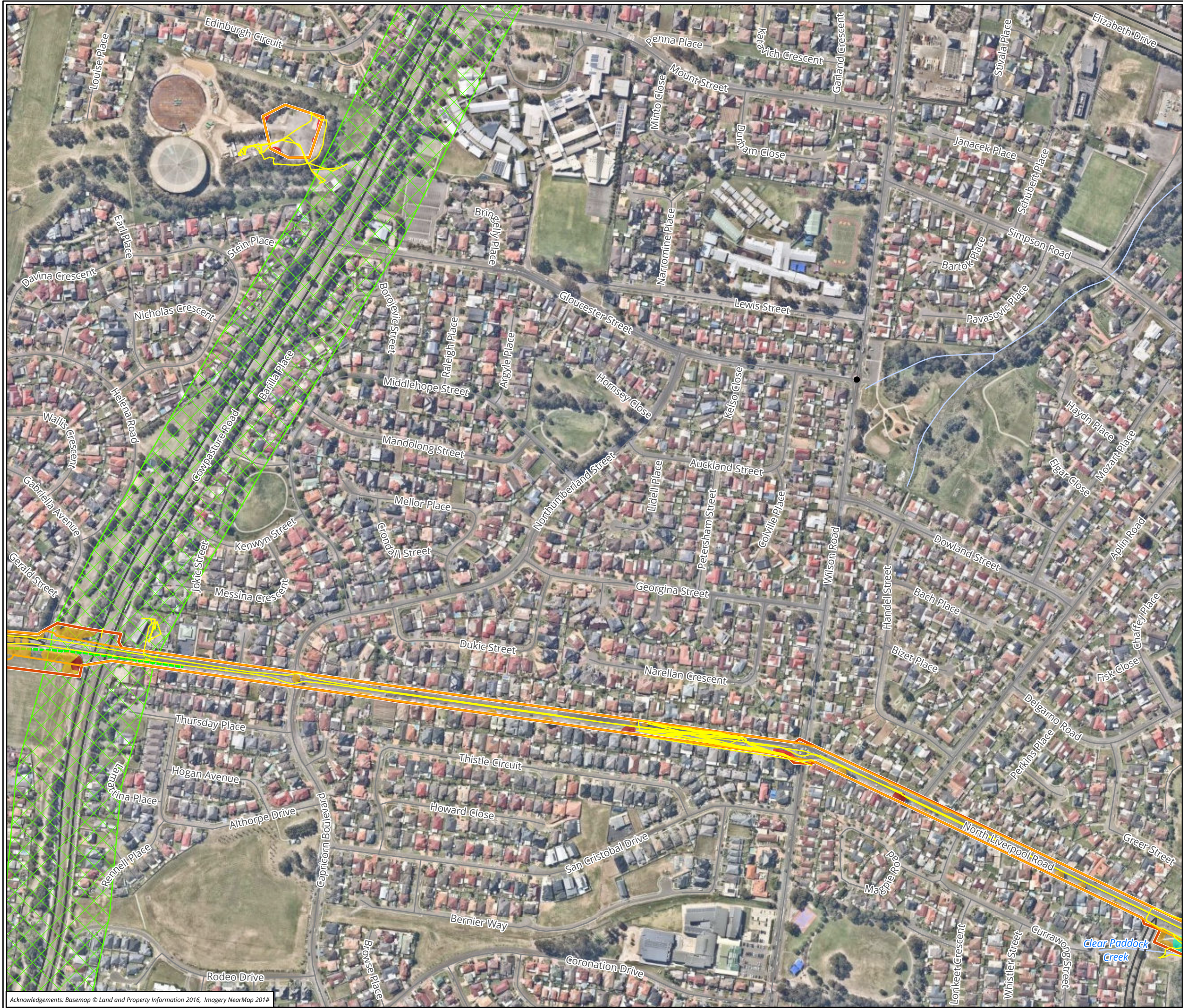
Vegetation zones

- Urban Native/Exotic
- PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Intact
- PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
- PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees
- PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
- PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees
- PCT 1800 - Swamp Oak open forest on riverflats of the Cumberland Plain and Hunter valley -Thinned

Figure 9.7 Threatened species surveys and results

0 40 80 120 160 200
Metres
Scale: 1:5,000 @ A3
Coordinate System:
GDA 1994 MGA Zone 56

biosis



Legend

- Impact assessment area
- Impact area
- Underbore
- Targeted flora surveys

Biocertification

- Existing Certified

Vegetation zones

- Urban Native/Exotic
- PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Intact
- PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
- PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
- PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees

Figure 9.8 Threatened species surveys and results

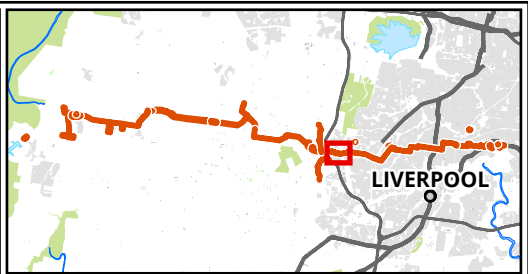
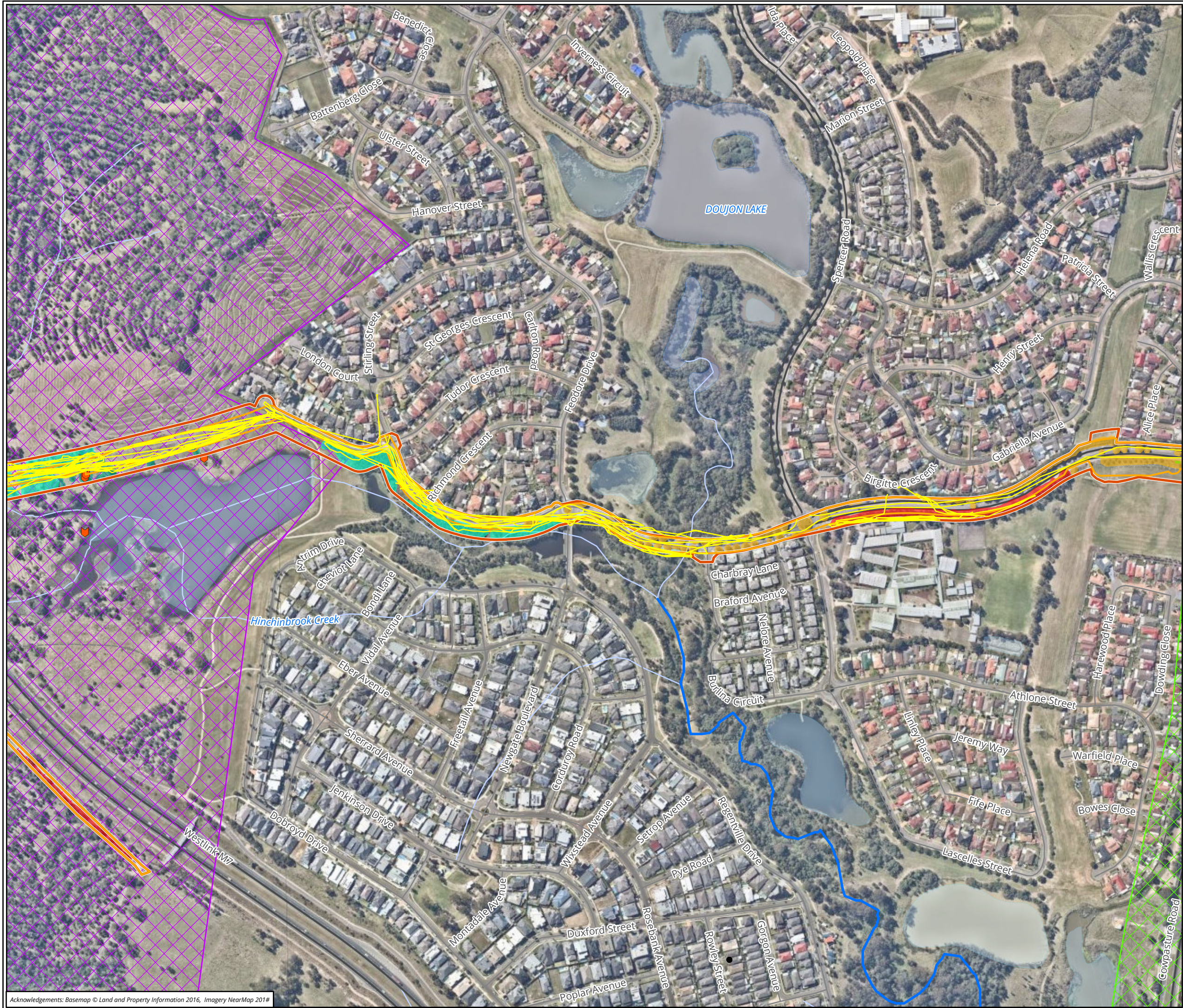
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Metres

Scale: 1:5,000 @ A3
Coordinate System:
GDA 1994 MGA Zone 56

biosis

Matter: 31617,
Date: 23 September 2021,
Prepared for: CW, Prepared by: LW, Last edited by: lwilson
Location: P:\31600s\31617\Mapping\31617_Working\31617_BDAR2020_LW

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Legend

- Impact assessment area
- Impact area
- Underbore
- Targeted flora surveys
- Hollow bearing tree

Biocertification

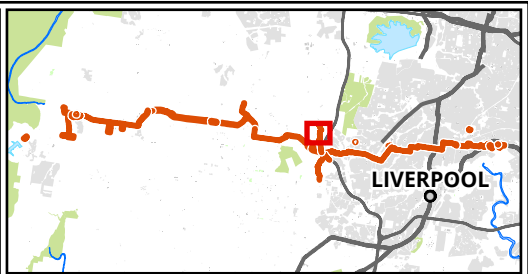
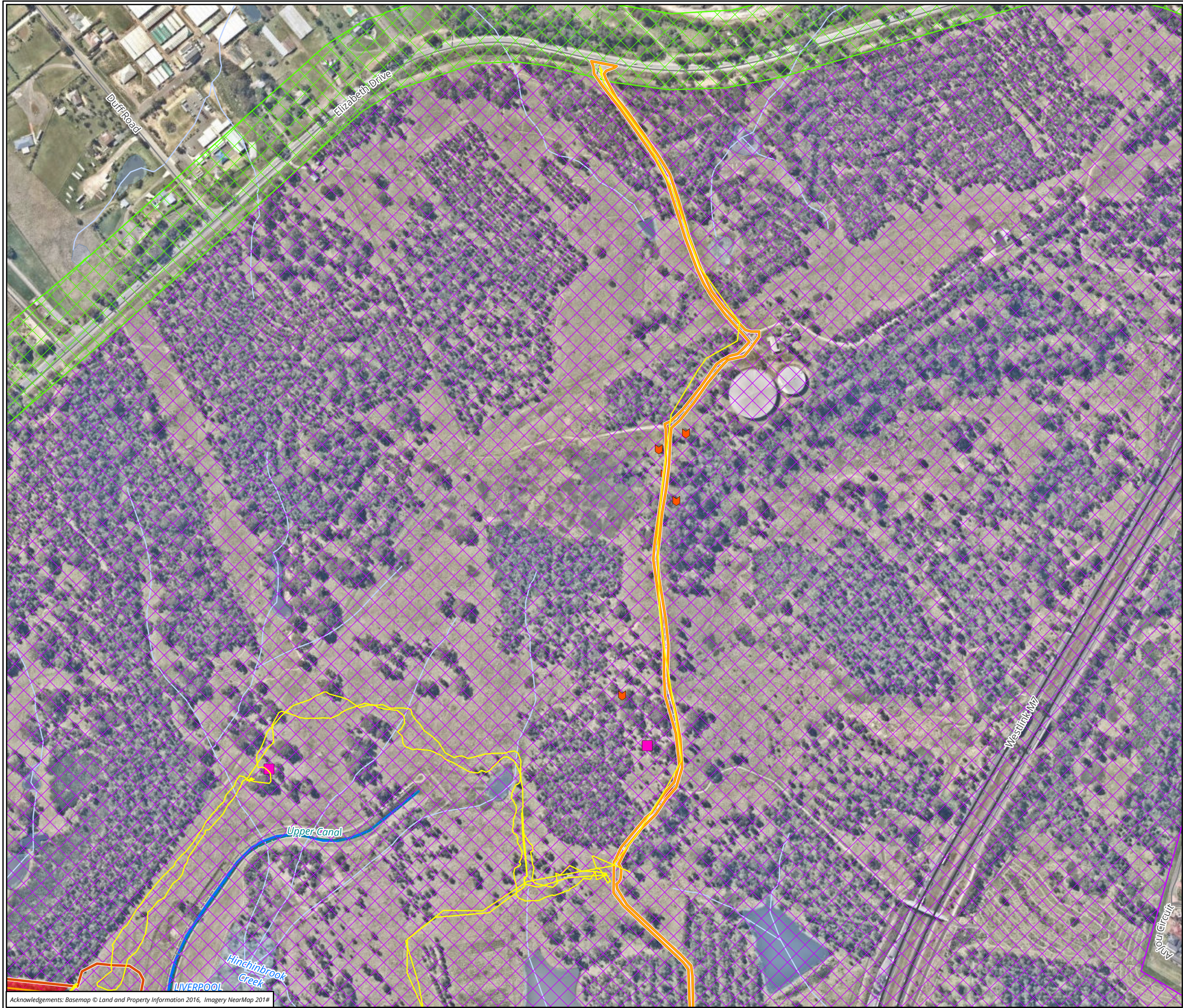
- Existing Certified
- Existing Non Certified

Vegetation zones

- Urban Native/Exotic
- PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Intact
- PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
- PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees
- PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
- PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees

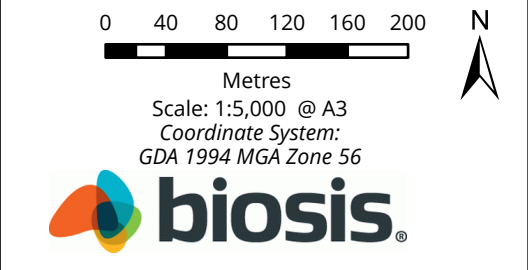
Figure 9.9 Threatened species surveys and results

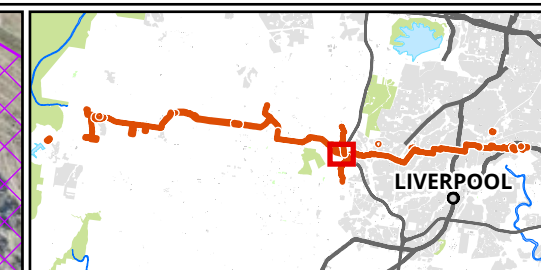
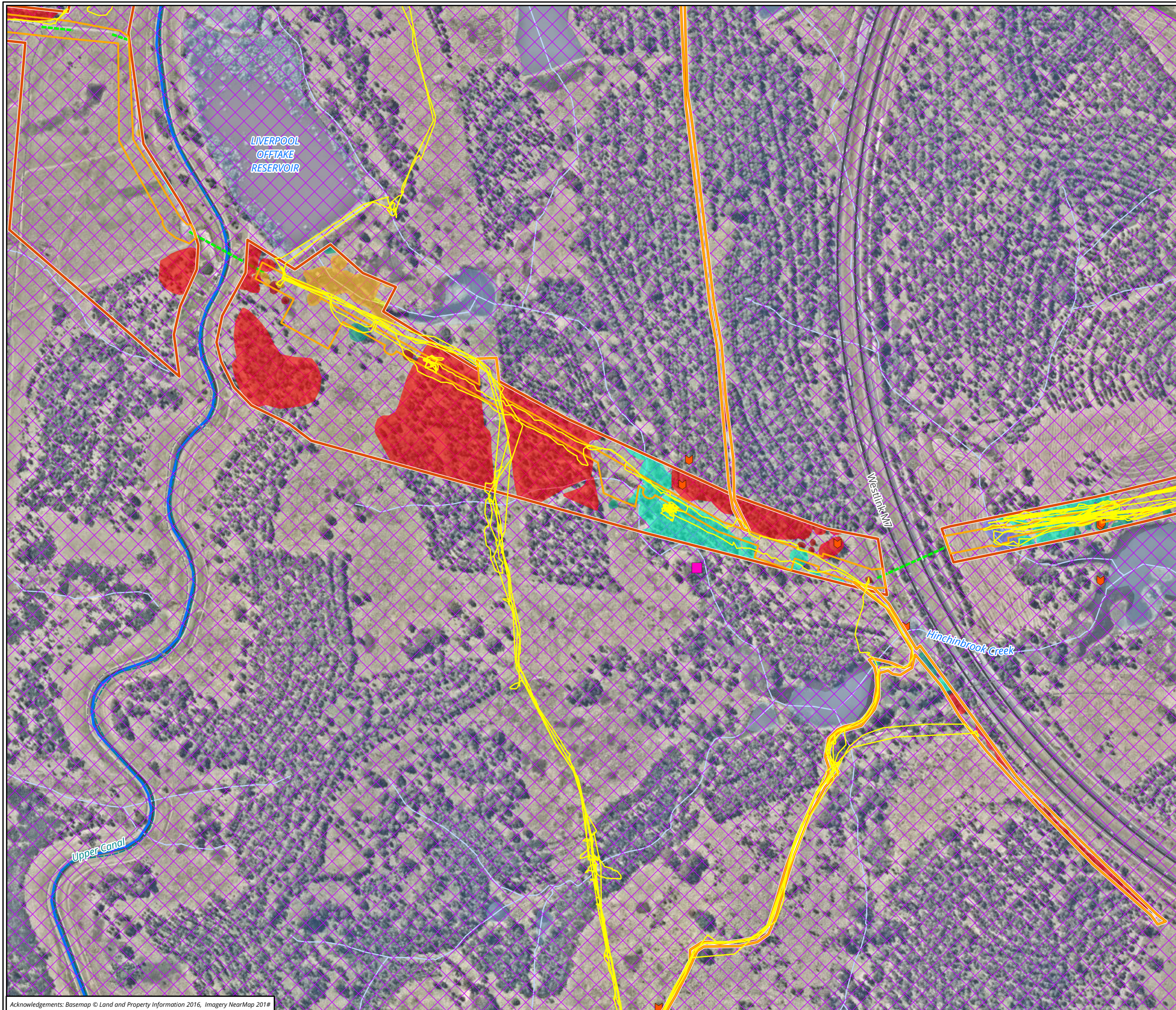
0 40 80 120 160 200
Metres
Scale: 1:5,000 @ A3
Coordinate System:
GDA 1994 MGA Zone 56



- Legend**
- Impact assessment area
 - Impact area
 - Underbore
 - Targeted flora surveys
 - Hollow bearing tree
 - Koala SAT surveys
- Biocertification**
- Existing Certified
 - Existing Non Certified
- Vegetation zones**
- PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
 - PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees

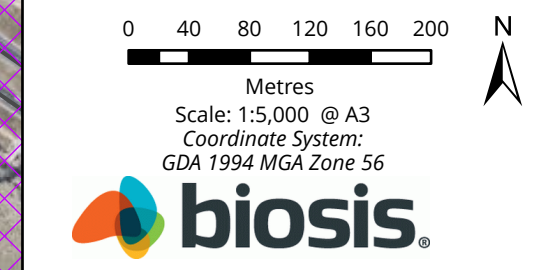
Figure 9.10 Threatened species surveys and results

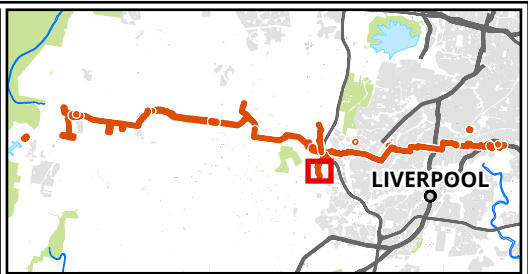




- Legend**
- Impact assessment area
 - Impact area
 - Underbore
 - Targeted flora surveys
 - Hollow bearing tree
 - Koala SAT surveys
- Biocertification**
- Existing Non Certified
- Vegetation zones**
- Urban Native/Exotic
 - PCT 781 - Coastal freshwater lagoons of the Sydney Basin Bioregion and South East Corner Bioregion - Thinned
 - PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
 - PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees
 - PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
 - PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees
 - PCT 1800 - Swamp Oak open forest on riverflats of the Cumberland Plain and Hunter valley -Thinned

Figure 9.11 Threatened species surveys and results





Legend

- Impact assessment area
- Impact area
- Targeted flora surveys
- Hollow bearing tree
- Koala SAT surveys

Threatened flora records

- Grevillea juniperina* subsp. *juniperina* - Juniper-leaved Grevillea

Biocertification

- Existing Certified
- Existing Non Certified

Vegetation zones

- PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
- PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees

Figure 9.12 Threatened species surveys and results

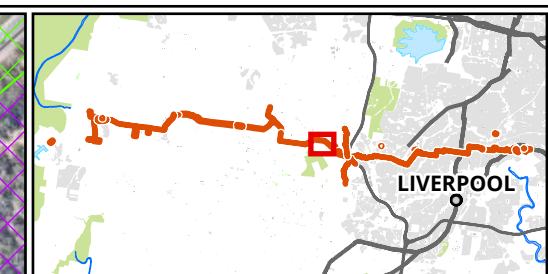
0 40 80 120 160 200 Metres

Scale: 1:5,000 @ A3
Coordinate System: GDA 1994 MGA Zone 56

biosis

Matter: 31617,
Date: 23 September 2021,
Prepared for: CW, Prepared by: LW, Last edited by: lwilson
Location: P:\31600s\31617\Mapping\31617_Working\31617_BDAR2020_LW

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Legend

- Impact assessment area
- Impact area
- Underbore
- Targeted flora surveys
- Hollow bearing tree
- Threatened fauna record**
 - ▲ Cumberland Plain Land Snail
- Biocertification**
 - Existing Certified
 - Existing Non Certified
- Vegetation zones**
 - Urban Native/Exotic
 - PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
 - PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees
 - PCT 1800 - Swamp Oak open forest on riverflats of the Cumberland Plain and Hunter valley -Thinned

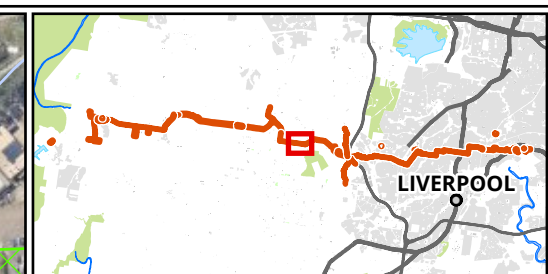
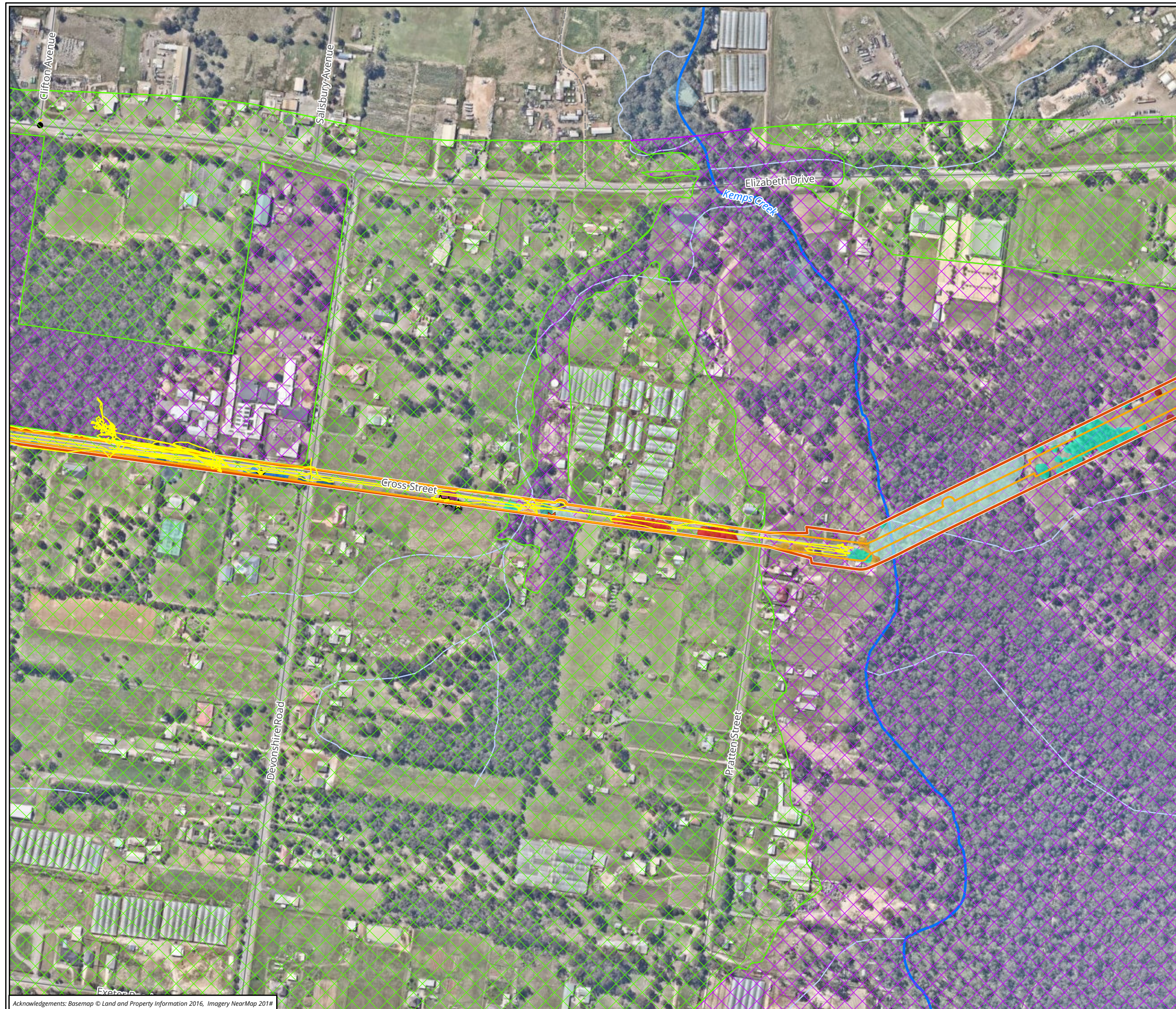
Figure 9.13 Threatened species surveys and results

0 40 80 120 160 200

Metres

Scale: 1:5,000 @ A3
Coordinate System:
GDA 1994 MGA Zone 56

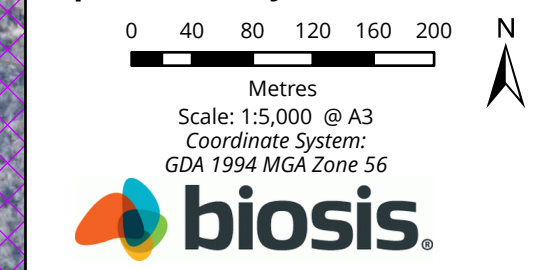


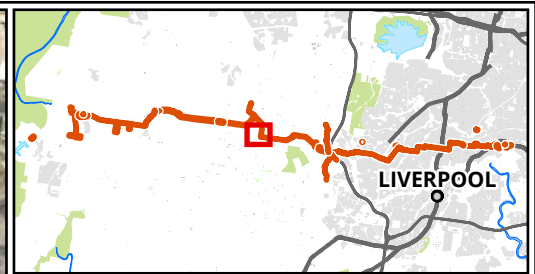
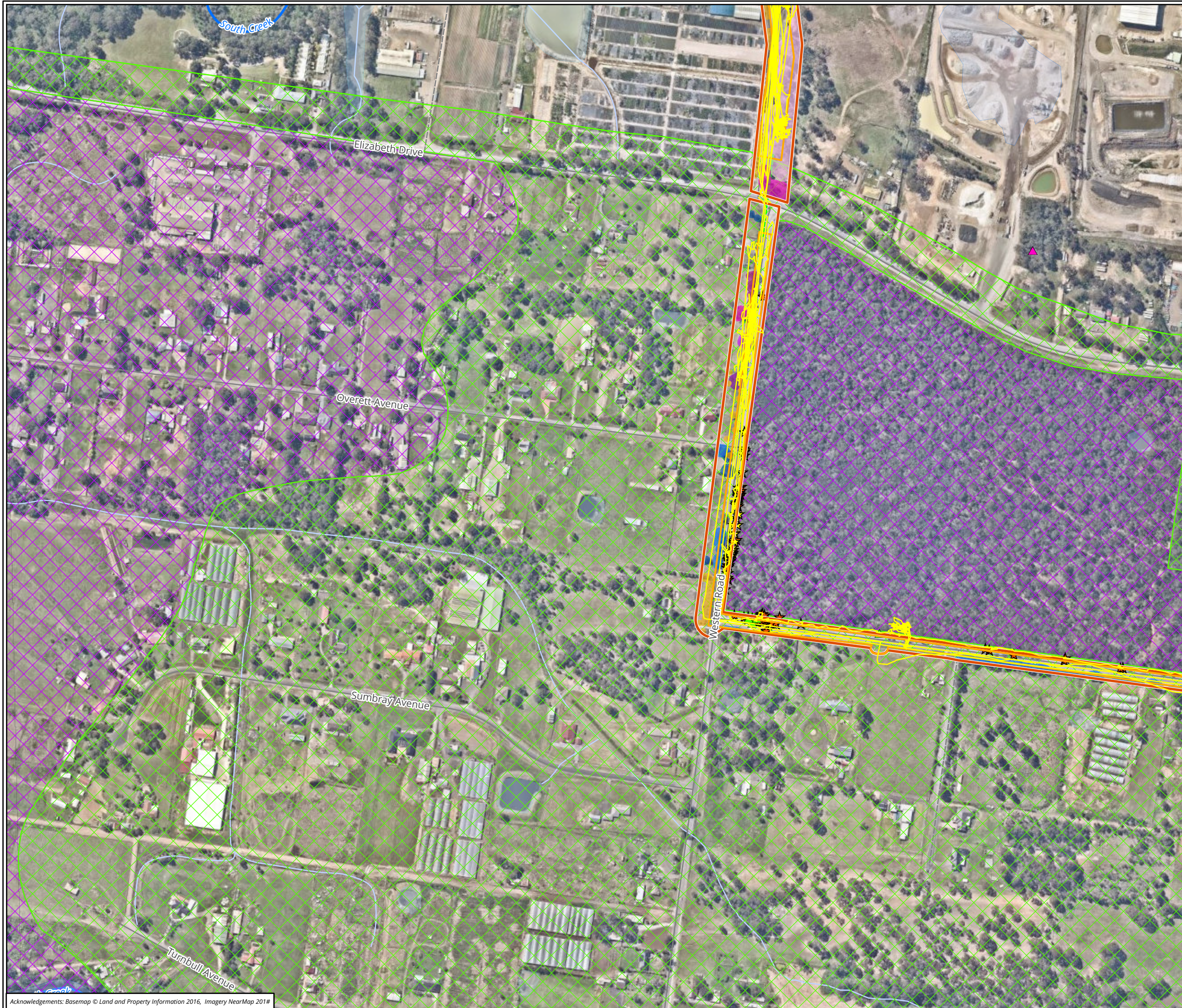


Legend

- Impact assessment area
- Impact area
- Targeted flora surveys
- Hollow bearing tree
- Threatened flora records**
 - Pultenaea parviflora*
- Biocertification**
 - Existing Certified
 - Existing Non Certified
- Vegetation zones**
 - Urban Native/Exotic
 - PCT 724 - Broad-leaved Ironbark - Grey Box - Melaleuca decora grassy open forest on clay/gravel soils of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees
 - PCT 725 - Broad-leaved Ironbark - Melaleuca decora shrubby open forest on clay soils of the Cumberland Plain, Sydney Basin Bioregion - Intact
 - PCT 725 - Broad-leaved Ironbark - Melaleuca decora shrubby open forest on clay soils of the Cumberland Plain, Sydney Basin Bioregion - Thinned
 - PCT 725 - Broad-leaved Ironbark - Melaleuca decora shrubby open forest on clay soils of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees
 - PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Intact
 - PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
 - PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees
 - PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
 - PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees
 - PCT 883 - Hard-leaved Scribbly Gum - Parramatta Red Gum heathy woodland of the Cumberland Plain, Sydney Basin Bioregion - Intact

Figure 9.14 Threatened species surveys and results





Legend

- Impact assessment area
- Impact area
- Underbore
- Targeted flora surveys

Threatened flora records

- Dillwynia tenuifolia*
- Pultenaea parviflora*

Threatened fauna record

- Cumberland Plain Land Snail
- Large Bent-winged Bat

Biocertification

- Existing Certified
- Existing Non Certified

Vegetation zones

- Urban Native/Exotic
- PCT 724 - Broad-leaved Ironbark - Grey Box - Melaleuca decora grassy open forest on clay/gravel soils of the Cumberland Plain, Sydney Basin Bioregion - Intact
- PCT 724 - Broad-leaved Ironbark - Grey Box - Melaleuca decora grassy open forest on clay/gravel soils of the Cumberland Plain, Sydney Basin Bioregion - Thinned
- PCT 724 - Broad-leaved Ironbark - Grey Box - Melaleuca decora grassy open forest on clay/gravel soils of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees
- PCT 725 - Broad-leaved Ironbark - Melaleuca decora shrubby open forest on clay soils of the Cumberland Plain, Sydney Basin Bioregion - Intact
- PCT 725 - Broad-leaved Ironbark - Melaleuca decora shrubby open forest on clay soils of the Cumberland Plain, Sydney Basin Bioregion - Thinned
- PCT 725 - Broad-leaved Ironbark - Melaleuca decora shrubby open forest on clay soils of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees
- PCT 883 - Hard-leaved Scribbly Gum - Parramatta Red Gum heathy woodland of the Cumberland Plain, Sydney Basin Bioregion - Intact
- PCT 883 - Hard-leaved Scribbly Gum - Parramatta Red Gum heathy woodland of the Cumberland Plain, Sydney Basin Bioregion - Thinned

Figure 9.15 Threatened species surveys and results

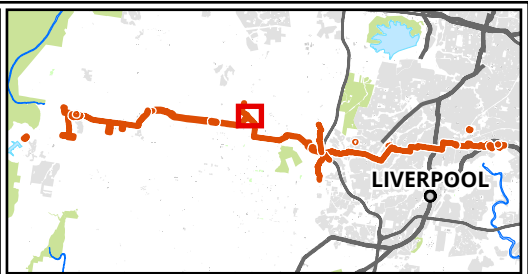
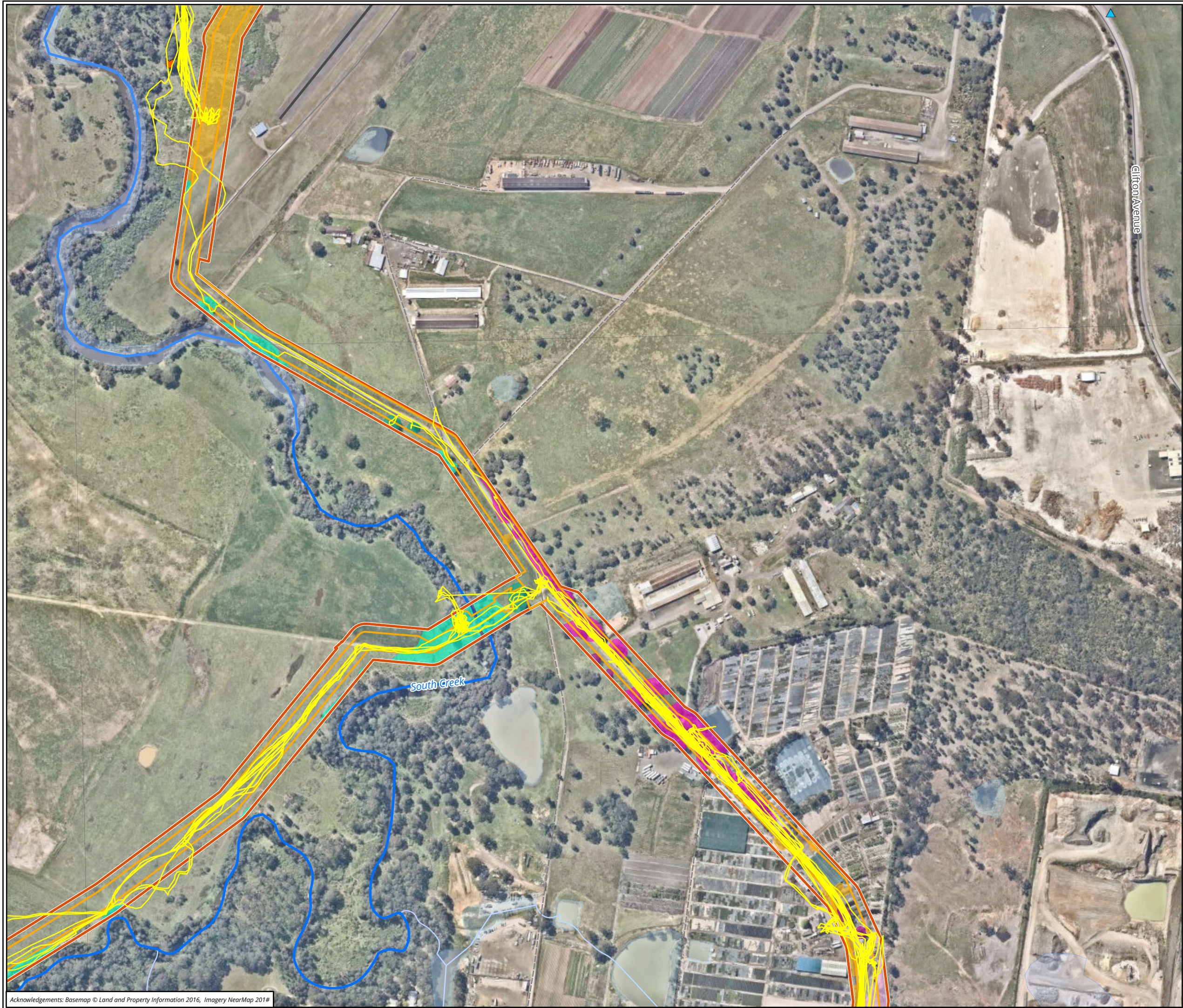
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Metres

Scale: 1:5,000 @ A3
Coordinate System:
GDA 1994 MGA Zone 56

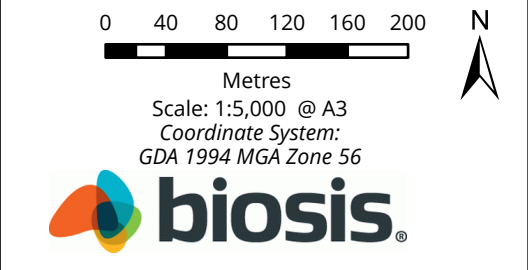


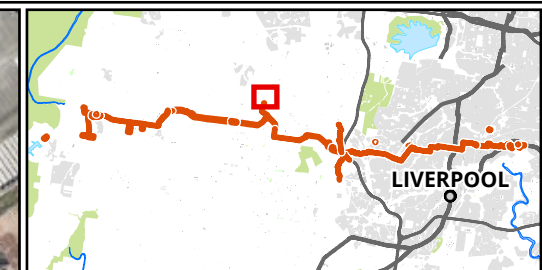
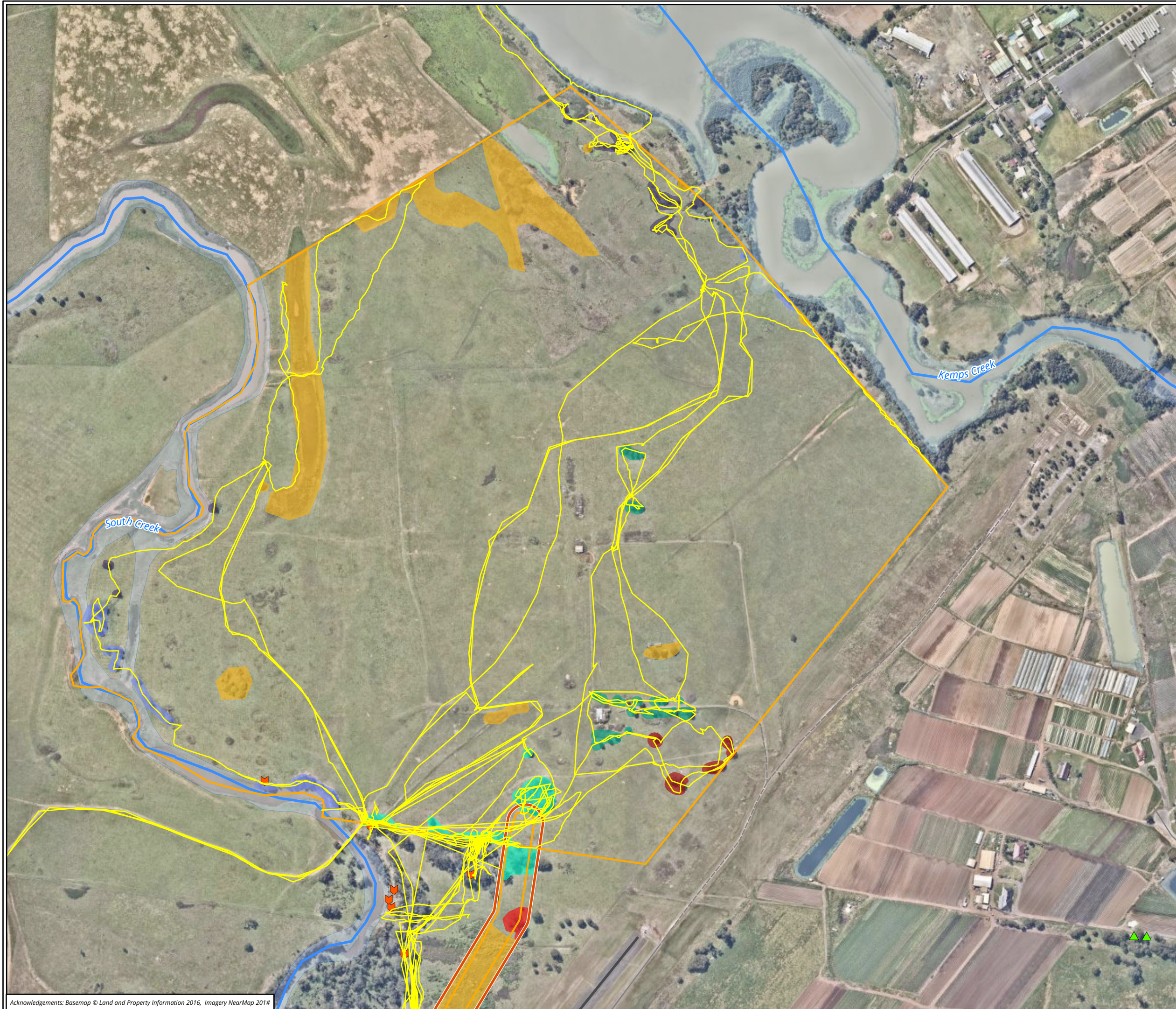
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Date: 23 September 2021,
Prepared for: CW, Prepared by: LW, Last edited by: lwilson
Location: P:\31600s\31617\Mapping\31617_Working\31617_BDAR2020_LW



- Legend**
- Impact assessment area
 - Impact area
 - Targeted flora surveys
 - Hollow bearing tree
 - Threatened fauna record**
 - Square-tailed Kite
 - Biocertification**
 - Existing Certified
 - Vegetation zones**
 - Urban Native/Exotic
 - PCT 724 - Broad-leaved Ironbark - Grey Box - Melaleuca decora grassy open forest on clay/gravel soils of the Cumberland Plain, Sydney Basin Bioregion - Intact
 - PCT 724 - Broad-leaved Ironbark - Grey Box - Melaleuca decora grassy open forest on clay/gravel soils of the Cumberland Plain, Sydney Basin Bioregion - Thinned
 - PCT 724 - Broad-leaved Ironbark - Grey Box - Melaleuca decora grassy open forest on clay/gravel soils of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees
 - PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
 - PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees
 - PCT 1800 - Swamp Oak open forest on riverflats of the Cumberland Plain and Hunter valley -Thinned
 - PCT 1800 - Swamp Oak open forest on riverflats of the Cumberland Plain and Hunter valley - Scattered Trees

Figure 9.16 Threatened species surveys and results

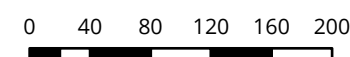




Legend

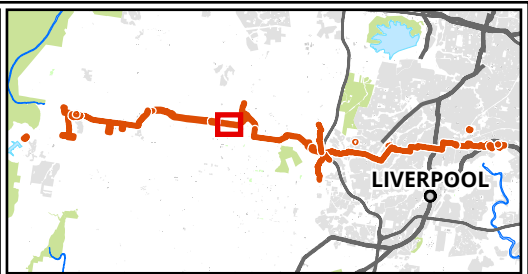
- Impact assessment area
- Impact area
- Targeted flora surveys
- Hollow bearing tree
- Threatened fauna record**
 - Cumberland Plain Land Snail
- Vegetation zones**
 - Urban Native/Exotic
 - PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
 - PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees
 - PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
 - PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees
 - PCT 1800 - Swamp Oak open forest on riverflats of the Cumberland Plain and Hunter valley -Thinned
 - PCT 1800 - Swamp Oak open forest on riverflats of the Cumberland Plain and Hunter valley - Scattered Trees

Figure 9.17 Threatened species surveys and results



Metres
Scale: 1:5,000 @ A3
Coordinate System:
GDA 1994 MGA Zone 56





Legend

- Impact assessment area
- Impact area
- Underbore
- Targeted flora surveys
- Hollow bearing tree

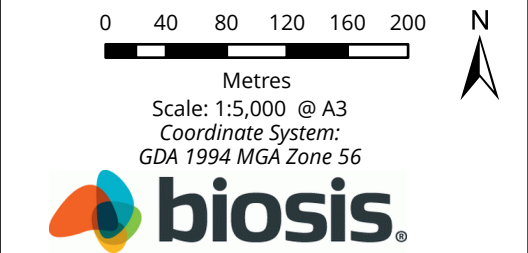
Biocertification

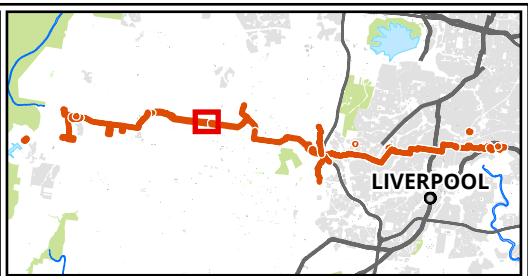
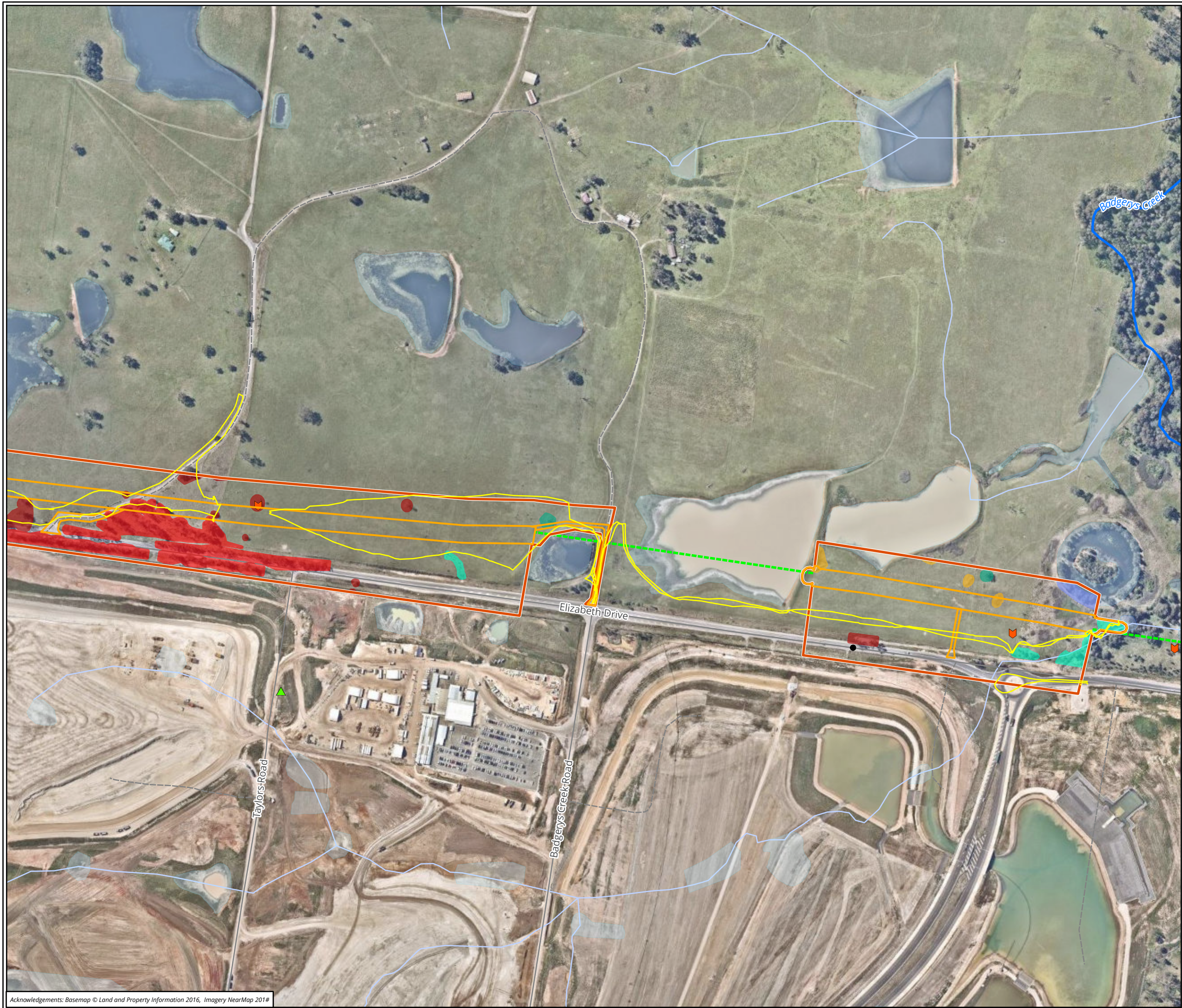
- Existing Certified
- Existing Non Certified

Vegetation zones

- Urban Native/Exotic
- PCT 724 - Broad-leaved Ironbark - Grey Box - Melaleuca decora grassy open forest on clay/gravel soils of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees
- PCT 725 - Broad-leaved Ironbark - Melaleuca decora shrubby open forest on clay soils of the Cumberland Plain, Sydney Basin Bioregion - Intact
- PCT 725 - Broad-leaved Ironbark - Melaleuca decora shrubby open forest on clay soils of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees
- PCT 781 - Coastal freshwater lagoons of the Sydney Basin Bioregion and South East Corner Bioregion - Thinned
- PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Intact
- PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
- PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
- PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees

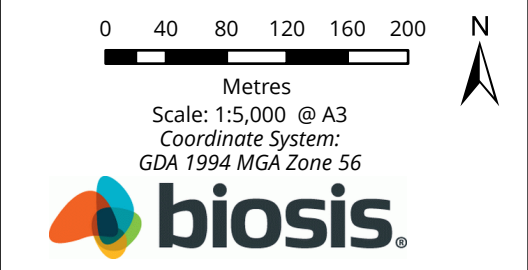
Figure 9.18 Threatened species surveys and results

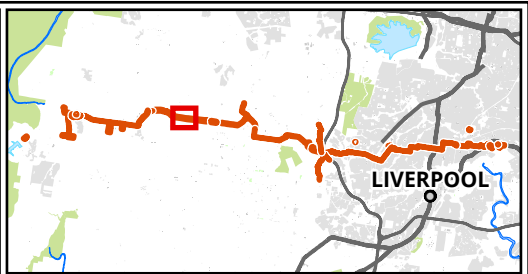
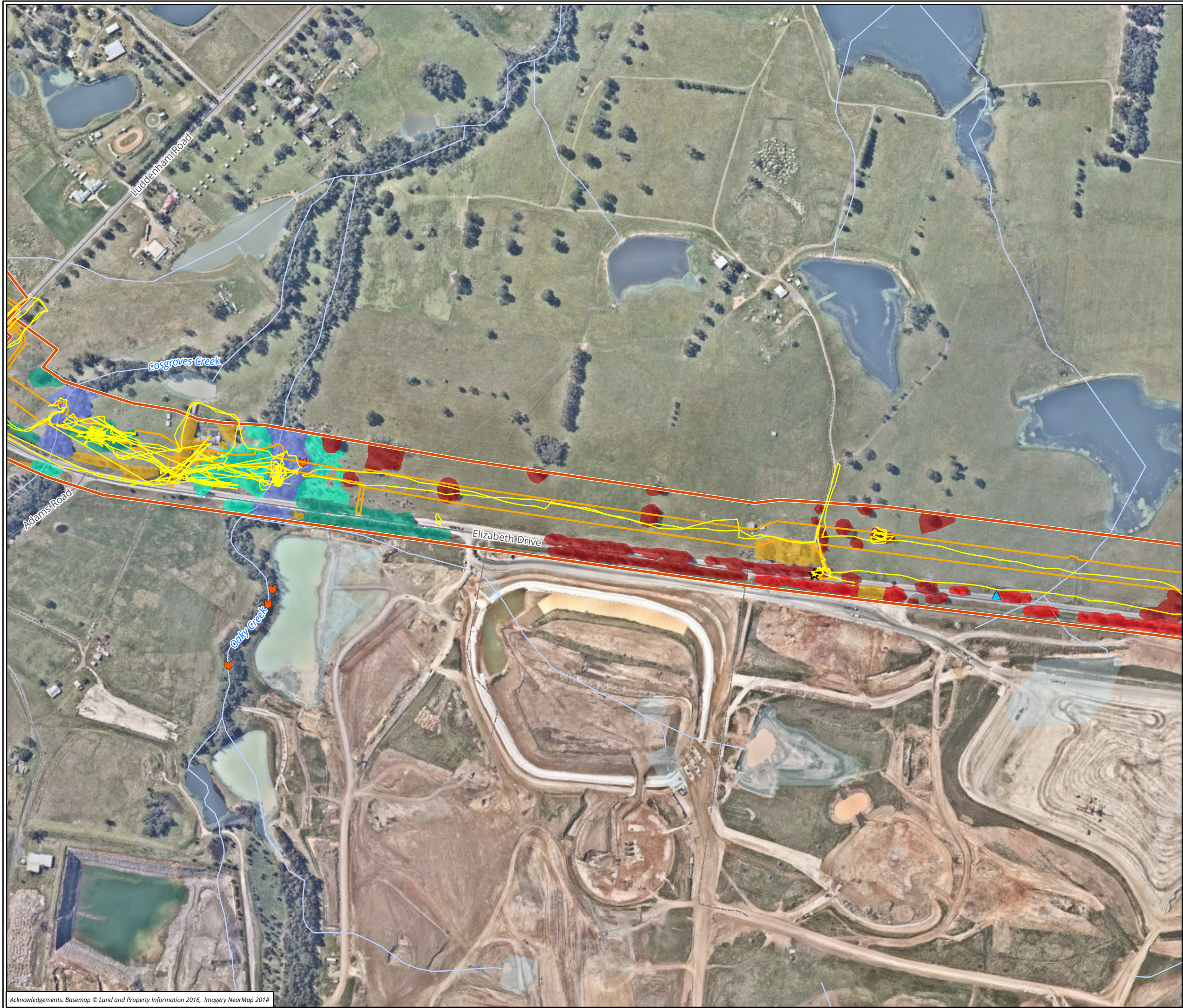




- Legend**
- Impact assessment area
 - Impact area
 - Underbore
 - Targeted flora surveys
 - Hollow bearing tree
- Threatened fauna record**
- Cumberland Plain Land Snail
- Vegetation zones**
- Urban Native/Exotic
 - PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
 - PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees
 - PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
 - PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees
 - PCT 1800 - Swamp Oak open forest on riverflats of the Cumberland Plain and Hunter valley -Thinned

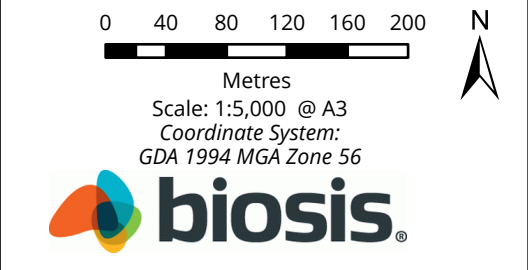
Figure 9.19 Threatened species surveys and results

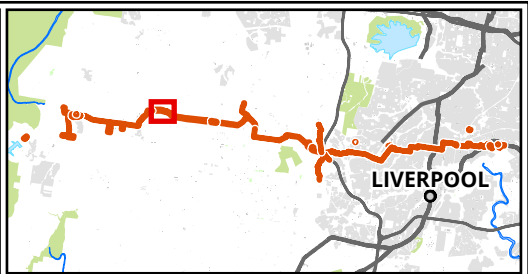




- Legend**
- Impact assessment area
 - Impact area
 - Targeted flora surveys
 - Hollow bearing tree
 - Threatened flora records**
 - Pultenaea parviflora*
 - Threatened fauna record**
 - Square-tailed Kite
 - Vegetation zones**
 - Urban Native/Exotic
 - PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
 - PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees
 - PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
 - PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees
 - PCT 1800 - Swamp Oak open forest on riverflats of the Cumberland Plain and Hunter valley -Thinned

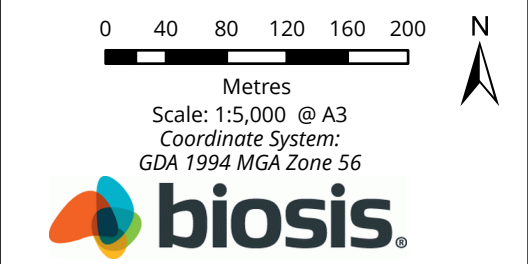
Figure 9.20 Threatened species surveys and results

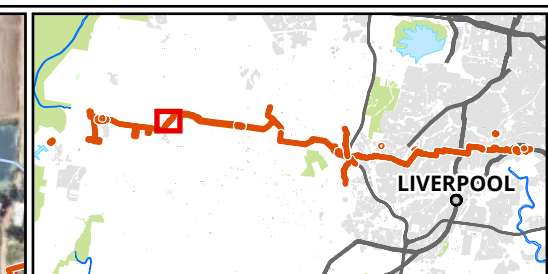




- Legend**
- Impact assessment area
 - Impact area
 - Underbore
 - Targeted flora surveys
- Vegetation zones**
- Urban Native/Exotic
 - PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
 - PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees
 - PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees
 - PCT 1800 - Swamp Oak open forest on riverflats of the Cumberland Plain and Hunter valley -Thinned

Figure 9.21 Threatened species surveys and results

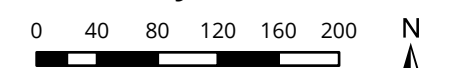




Legend

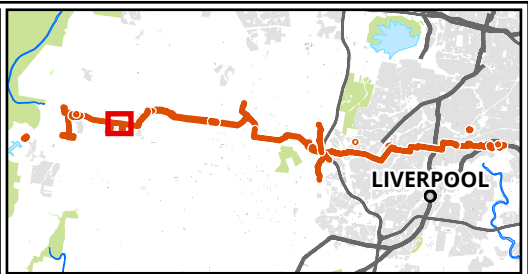
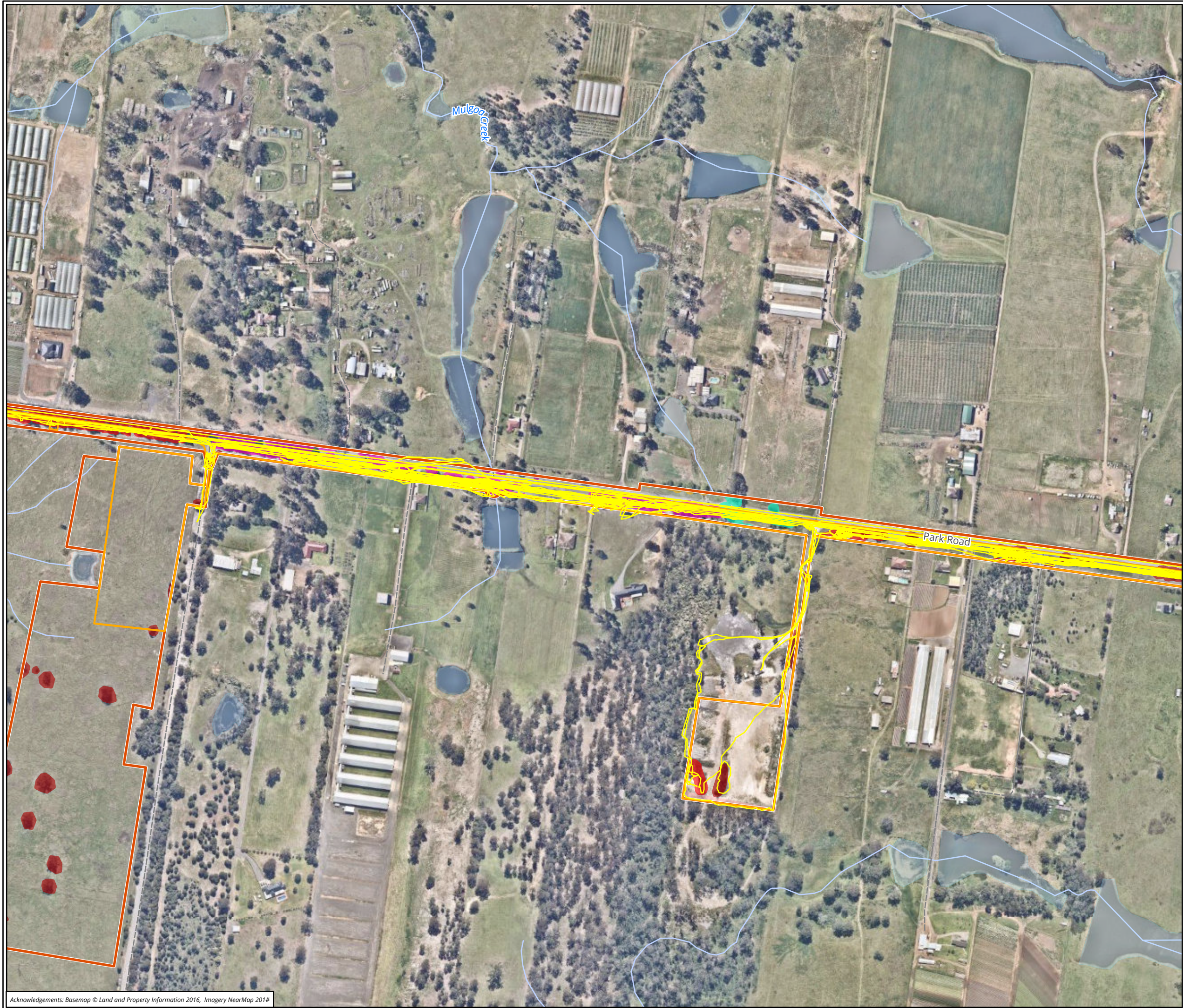
- Impact assessment area
 - Impact area
 - Underbore
 - Targeted flora surveys
- Vegetation zones**
- Urban Native/Exotic
 - PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
 - PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees

Figure 9.22 Threatened species surveys and results



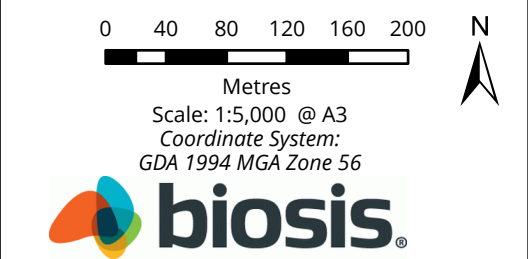
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GDA 1994 MGA Zone 56

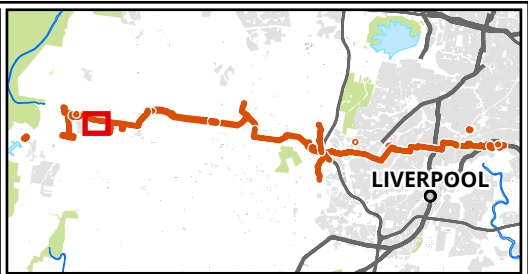




- Legend**
- Impact assessment area
 - Impact area
 - Targeted flora surveys
- Vegetation zones**
- Urban Native/Exotic
 - PCT 724 - Broad-leaved Ironbark - Grey Box - Melaleuca decora grassy open forest on clay/gravel soils of the Cumberland Plain, Sydney Basin Bioregion - Thinned
 - PCT 724 - Broad-leaved Ironbark - Grey Box - Melaleuca decora grassy open forest on clay/gravel soils of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees
 - PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
 - PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Intact
 - PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
 - PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees

Figure 9.23 Threatened species surveys and results





Legend

- Impact assessment area
- Impact area
- Targeted flora surveys

Threatened flora records

- ★ *Marsdenia viridiflora* subsp. *viridiflora* - Native Pear

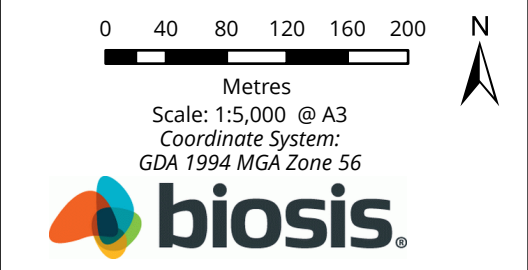
Threatened fauna record

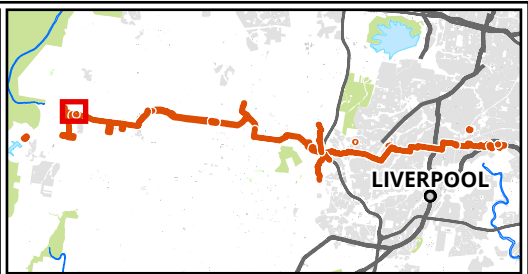
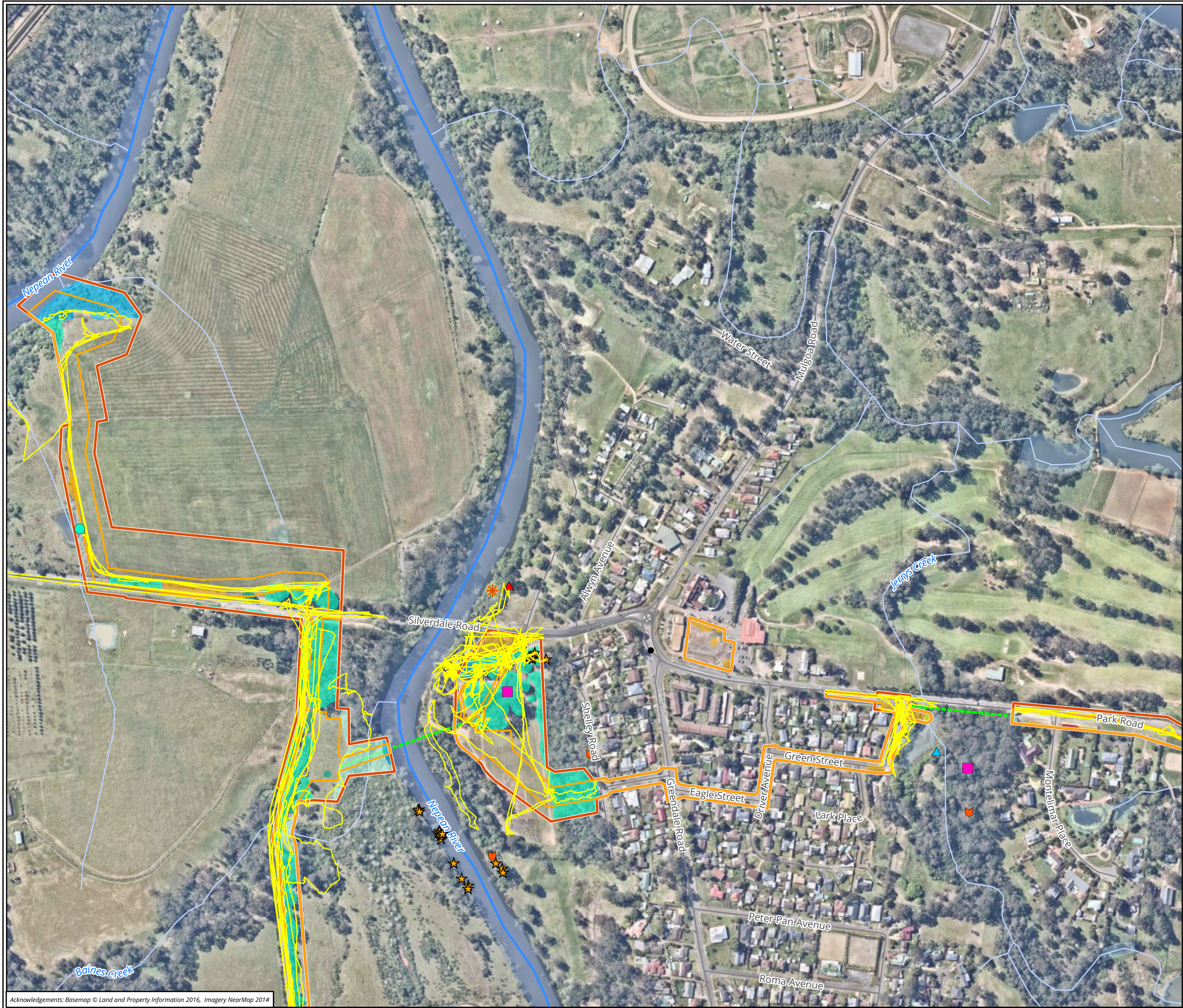
- ▲ Square-tailed Kite

Vegetation zones

- Urban Native/Exotic
- PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Intact
- PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
- PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees
- PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Intact
- PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
- PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees

Figure 9.24 Threatened species surveys and results





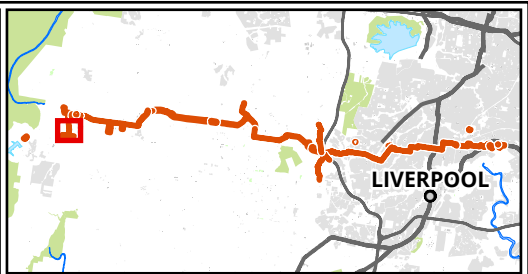
- Legend**
- Impact assessment area
 - Impact area
 - Underbore
 - Targeted flora surveys
 - Hollow bearing tree
 - Grey-headed Flying-fox camp
 - Call playback
 - Koala SAT surveys
- Threatened flora records**
- ★ *Eucalyptus benthamii* - Camden White Gum
- Threatened fauna record**
- ▲ Grey-headed Flying-fox
 - ▲ Square-tailed Kite
- Vegetation zones**
- Urban Native/Exotic
 - PCT 781 - Coastal freshwater lagoons of the Sydney Basin Bioregion and South East Corner Bioregion - Thinned
 - PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Intact
 - PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
 - PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees
 - PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees
 - PCT 1105 - River Oak open forest of major streams, Sydney Basin Bioregion and South East Corner Bioregion - Thinned

Figure 9.25 Threatened species surveys and results

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Metres
Scale: 1:5,000 @ A3
Coordinate System:
GDA 1994 MGA Zone 56

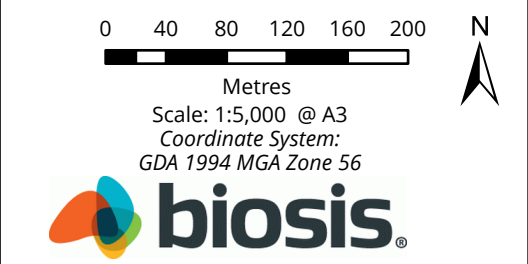
biosis

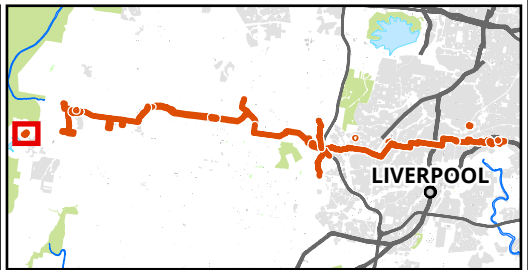
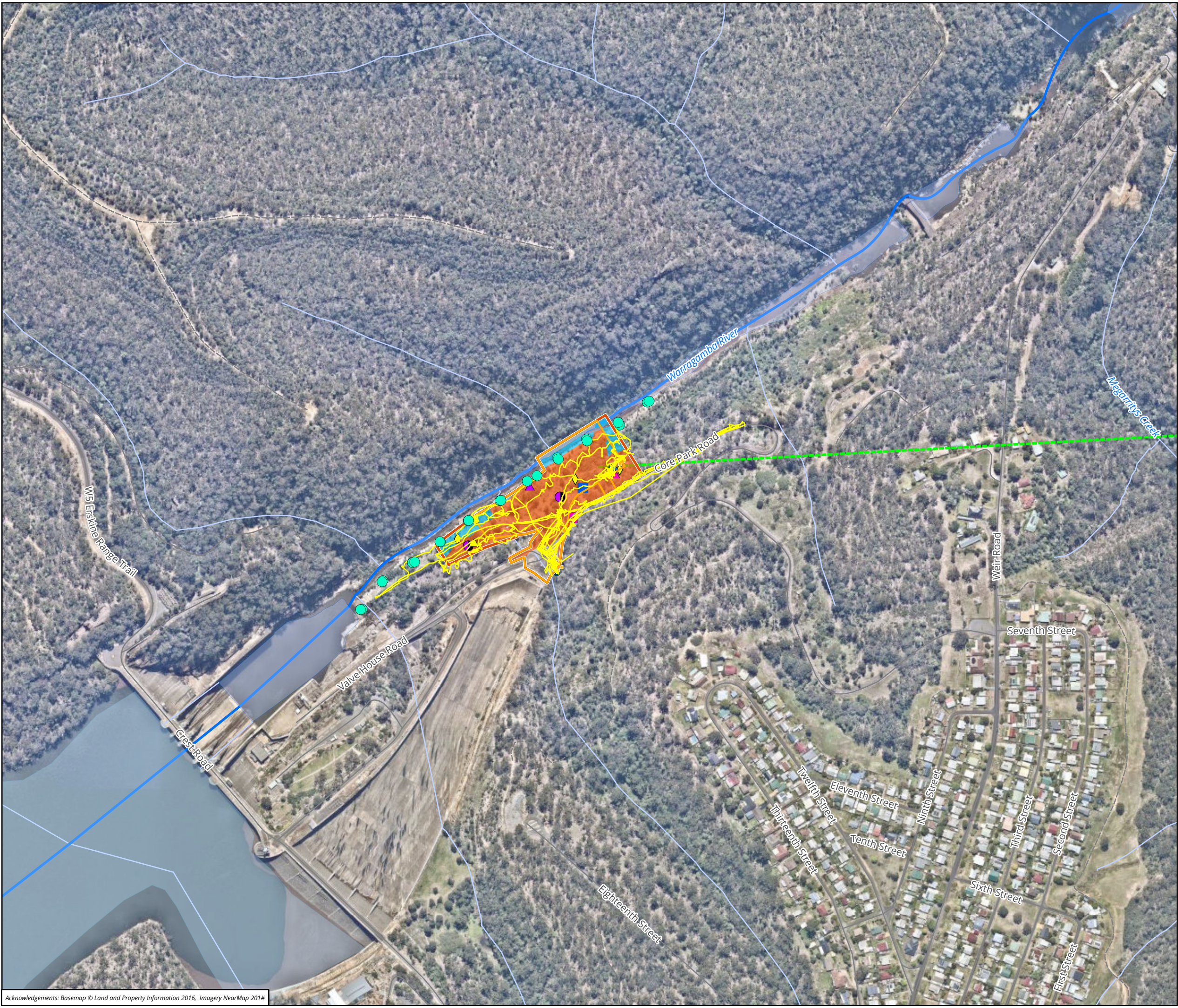
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Date: 23 September 2021,
Prepared for: CW, Prepared by: LW, Last edited by: lwilson
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- Legend**
- Impact assessment area
 - Impact area
 - Underbore
 - Targeted flora surveys
 - Koala SAT surveys
- Vegetation zones**
- Urban Native/Exotic
 - PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Thinned
 - PCT 835 - Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion - Scattered Trees
 - PCT 1105 - River Oak open forest of major streams, Sydney Basin Bioregion and South East Corner Bioregion - Thinned
 - PCT 1181 - Smooth-barked Apple - Red Bloodwood - Sydney Peppermint heathy open forest on slopes of dry sandstone gullies of western and southern Sydney, Sydney Basin Bioregion - Intact

Figure 9.26 Threatened species surveys and results





Legend

- Impact assessment area
- Impact area
- Underbore
- Targeted flora surveys
- Stag watch
- Broad-headed Snake survey
- Call playback
- Koala SAT surveys
- Potential microbat habitat
- Microbat detector
- Camera trap

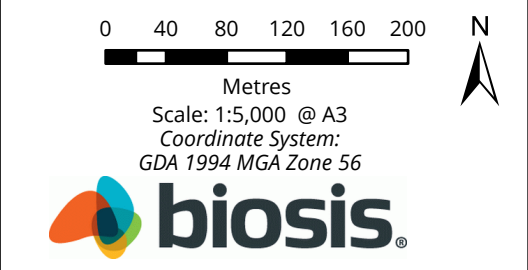
Threatened fauna record

- Large Bent-winged Bat
- Large-eared Pied Bat
- Little Bent-winged Bat
- White-bellied Sea-Eagle

Vegetation zones

- PCT 1083 - Red Bloodwood - scribbly gum heathy woodland on sandstone plateaux of the Sydney Basin Bioregion - Thinned
- PCT 1105 - River Oak open forest of major streams, Sydney Basin Bioregion and South East Corner Bioregion - Thinned
- PCT 1181 - Smooth-barked Apple - Red Bloodwood - Sydney Peppermint heathy open forest on slopes of dry sandstone gullies of western and southern Sydney, Sydney Basin Bioregion - Intact

Figure 9.27 Threatened species surveys and results



8.3 Threatened species expert reports

As outlined in Section 5.3.2 species experts were used to assess the presence of, and potential impact to, the following four species as a result of the project:

- Spiked Rice-flower (Norris 2021)
- Cumberland Plain Land Snail (Clark 2021a)
- Dural Land Snail (Clark 2021b)
- Green and Golden Bell Frog (Lemckert 2021)

Table 37 provides a summary of the findings of the expert reports, including the areas of habitat considered likely to be impacted by the project. Each expert report is included in its entirety in Appendix 7.

Table 37 Threatened species expert report summary

Threatened species	Key findings	Species habitat mapped
Spiked Rice-flower (Norris 2021)	<ul style="list-style-type: none"> • Spiked Rice-flower has never been recorded with the project's impact area or impact assessment area, however numerous records of the species exist within Lansdowne Reserve and in the vicinity of the eastern extent of the alignment. • PCTs considered to support potential habitat for the species within the impact area and impact assessment area include PCT 849 and PCT 835. • All vegetation condition classes mapped for the project are likely to provide potential habitat for the species (when associated with PCTs 849 and 835). Although the species can tolerate degraded sites, small and isolated mapped polygons were excluded, given that many occur adjacent to road pavements and in urbanised areas. Further, areas that were once over cleared landscapes that now support native plantation vegetation, such as at Cecil Hills Park, west of the M7 have also been excluded. • With the exception of Lansdowne Reserve, potential habitat has not been identified east of the M7 where the impact assessment area follows the road infrastructure network through urbanised areas and where scattered trees in a modified urbanised landscape are found. 	<p>Impact area</p> <ul style="list-style-type: none"> • 2.99 ha <p>Impact assessment area</p> <ul style="list-style-type: none"> • 6.28 ha
Cumberland Plain Land Snail (Clark 2021a)	<ul style="list-style-type: none"> • Cumberland Plain Land Snail has previously been recorded from several locations close to and just within the project's impact assessment area (Clark, 2009, Bionet, 2020, Clark, personal observations from 1998-2021, Biosis observations 2020-2021). • The species has been recorded from the following PCTs, which are found within the project's impact area; PCT 724, PCT 725, PCT 835, PCT 849. • The species will potentially be found in any remaining intact or relatively intact remnants / patches of suitable habitat, especially if there is a well-developed leaf litter layer, plenty of woody debris on the ground, mixture of native grasses and few exotic/invasive species. <ul style="list-style-type: none"> ○ For the current assessment this includes those vegetation zones mapped in Intact and Thinned condition states. • There is potential for the species to be found in areas of suitable habitat within the project's impact area and impact assessment area not subject to targeted survey, or that have been surveyed but conditions were not conducive to detecting the species at the time of the survey, especially if there is plenty of leaf litter and woody debris. 	<p>Impact area</p> <ul style="list-style-type: none"> • 8.96 ha <p>Impact assessment area</p> <ul style="list-style-type: none"> • 17.71 ha

Threatened species	Key findings	Species habitat mapped
	<ul style="list-style-type: none"> The species polygons are based on a combination of the vegetation communities where the species has been found during previous surveys and the assumption that where suitable habitat is present the species is likely to be present, but due to a variety reasons (such as access issues and weather conditions) the species has not been detected. 	
Dural Land Snail (Clark 2021b)	<ul style="list-style-type: none"> Dural Land Snail has previously been recorded from several locations across the Sydney Basin but to date has not been recorded from within the project's impact assessment area (Clark, 2009; Bionet, 2020; ALA, 2020; Clark, personal observations from 1998-2019). The species has been recorded from the following PCTs, which are found within the project's impact area; PCT 1083 and PCT 1181. The species will potentially be found in any remaining intact or relatively intact remnants / patches of suitable habitat, especially if there is a well-developed leaf litter layer, plenty of woody debris on the ground, mixture of native grasses and few exotic/invasive species. It can also be found at the boundaries of plant communities that do provide suitable habitat and those that typically do not, such as where Shale Sandstone Transition Forest adjoins Cumberland Plain Woodland. <ul style="list-style-type: none"> For the current assessment this includes those vegetation zones mapped in Intact and Thinned condition states. There is potential for the species to be found in areas of suitable habitat within the project's impact area and impact assessment area not subject to targeted survey, or that have been surveyed but conditions were not conducive to detecting the species at the time of the survey, especially if there is plenty of leaf litter and woody debris. The species polygons are based on a combination of the vegetation communities where the species has been found during previous surveys and the assumption that where suitable habitat is present the species is likely to be present, but due to a variety reasons (such as access issues and weather conditions) the species has not been detected. 	<p>Impact area</p> <ul style="list-style-type: none"> 1.45 ha <p>Impact assessment area</p> <ul style="list-style-type: none"> 0.43 ha
Green and Golden Bell Frog (Lemckert 2021).	<ul style="list-style-type: none"> A total of 13,146 records for Green and Golden Bell Frog are available on the Cumberland Subregion (based on NSW BioNet records), however this is highly skewed by the records from Sydney Olympic Park, and the majority (>95 %) come from the eastern third of the subregion. The very limited number of records in the western half of the subregion suggests that the species may never have been common or widespread across the region. Notably, most of these relatively few records were from before 1990. Nearly all currently known populations within Australia are located within 10 kilometre of coastal locations (Mahony et. al. 2013). This is considered most likely as a result of saline influences from groundwater or sea spray producing conditions unsuitable for the growth of the amphibian chytrid fungus, but still leaving conditions that Green and Golden Bell Frog can survive and breed in. A number of records since 1990 occur around Riverstone, which appear to come from individual frogs that migrate from a property where a private landholder has set up what can be described as a Green and Golden Bell Frog sanctuary. Whilst this semi-managed population appears to be self-sustaining, the species appears to be unable to persist outside of this property. This is important as the ongoing records could otherwise suggest that there is a significant naturally occurring population present in western 	Nil

Threatened species	Key findings	Species habitat mapped
	<p>Sydney. However, such a natural self-sustaining population is highly unlikely to exist and the occasional records would be expected to cease if the landholder stopped assisting the population on the property.</p> <ul style="list-style-type: none"> There is one record from within 1 kilometre of the boundary of the proposed corridor along Elizabeth Drive, which is located just to the northeast of the junction with Park Road at Luddenham. The record point is not on a water body, but is in close proximity to several larger human created dams located on cleared rural lands. This is a post-1990 record (from 2019), but the lack of any other records from nearby to this location indicates that there is no persistent presence of the species in the local area. The frog is most likely to have been a dispersing individual. The AWRC facility will likely impact on areas of ephemeral floodplain at Kemps Creek, but there is significant similar habitat all around that location and that floodplain which represent already poor breeding habitat due to the presence of the Plague Minnow. As no current population of Green and Golden Bell Frog, or their habitat, is present within the impact assessment area no species polygons are required as an offset for the development. 	

8.4 Threatened species polygons

Table 38 outlines the attributes that comprise the threatened species polygons for threatened species impacted by the project, and includes an assessment of the condition of the habitats impacted.

Table 38 Threatened species polygons within the impact area and impact assessment area

Threatened species	Habitat in the Impact area (Ha)	Habitat in the Impact assessment area (Ha)	Polygon attributes	Habitat condition
Flora				
<i>Dillwynia tenuifolia</i>	0.05	0.05	<ul style="list-style-type: none"> PCT 849 vegetation present within unsurveyed section of the impact area and impact assessment area at Kemps Creek. 	<ul style="list-style-type: none"> Intact, Thinned, Scattered Trees
Downy Wattle <i>Acacia pubescens</i>	0.16	0.23	<ul style="list-style-type: none"> All vegetation zones surrounding 7 individuals in impact area, and 12 individuals in impact assessment area at Lansdowne Reserve. 	<ul style="list-style-type: none"> Intact, Thinned
Juniper-leaved Grevillea <i>Grevillea juniperina</i> subsp. <i>juniperina</i>	0.05	0.05	<ul style="list-style-type: none"> PCT 849 vegetation present within unsurveyed section of the impact area and impact assessment area at Kemps Creek. 	<ul style="list-style-type: none"> Intact, Thinned, Scattered Trees
Marsdenia viridiflora subsp. <i>viridiflora</i> - endangered population	0.54	1.02	<ul style="list-style-type: none"> All vegetation zones surrounding 3 individuals in impact assessment area at Lansdowne Reserve, and 1 individual in impact assessment area on Park Road. PCT 835 and PCT 849 vegetation present within unsurveyed section of the impact area and impact assessment area at Kemps Creek. 	<ul style="list-style-type: none"> Intact, Thinned, Scattered Trees
Netted Bottle Brush <i>Callistemon linearifolius</i>	0.46	0.86	<ul style="list-style-type: none"> PCT 835 vegetation present within unsurveyed section of the impact area and impact assessment area at Kemps Creek. 	<ul style="list-style-type: none"> Intact, Thinned, Scattered Trees
Spiked Rice-flower <i>Pimelea spicata</i>	2.99	6.28	<ul style="list-style-type: none"> PCT 835 and PCT 849 within the impact area and impact assessment area. 	<ul style="list-style-type: none"> Intact, Thinned, Scattered Trees
Sydney Bush-pea <i>Pultenaea parviflora</i>	0.01	0.04	<ul style="list-style-type: none"> All vegetation zones surrounding 4 individuals in impact assessment area on Elizabeth Drive. 	<ul style="list-style-type: none"> Scattered Trees
Matted Bush-pea <i>Pultenaea pedunculata</i>	0.05	0.05	<ul style="list-style-type: none"> PCT 849 vegetation present within unsurveyed section of the impact area and impact assessment area at Kemps Creek. 	<ul style="list-style-type: none"> Intact, Thinned, Scattered Trees

Threatened species	Habitat in the Impact area (Ha)	Habitat in the Impact assessment area (Ha)	Polygon attributes	Habitat condition
Fauna				
Cumberland Plain Land Snail <i>Meridolum corneovirens</i>	8.96	17.71	<ul style="list-style-type: none"> PCT 724, PCT 835 and PCT 849 within the impact area and impact assessment area. 	<ul style="list-style-type: none"> Intact, Thinned
Dural Land Snail <i>Pommerhelix duralensis</i>	1.45	0.43	<ul style="list-style-type: none"> PCT 1083 and PCT 1181 within the impact area and impact assessment area. 	<ul style="list-style-type: none"> Intact, Thinned
Large Bent-winged Bat <i>Miniopterus orianae oceanensis</i>	1.56	0.60	<ul style="list-style-type: none"> PCT 1083, PCT 1105 and PCT 1181 within 100 m of potential breeding habitat (rocky cliffines and vertical (vent) shaft) at Warragamba environmental flows outlet. 	<ul style="list-style-type: none"> Thinned
Large-eared Pied Bat <i>Chalinolobus dwyeri</i>	3.48	2.54	<ul style="list-style-type: none"> PCT 835, PCT 849, PCT 1083, PCT 1105 and PCT 1181 within 2 kilometre of potential breeding habitat (rocky cliffines and vertical (vent) shaft) at Warragamba environmental flows outlet, downstream along the Warragamaba, and upstream along the Nepean River. 	<ul style="list-style-type: none"> Intact, Thinned, Scattered Trees
Southern Myotis <i>Myotis macropus</i>	7.62	18.03	<ul style="list-style-type: none"> PCT 724, PCT 725, PCT 781, PCT 835, PCT 849, PCT 1105 and PCT 1800 within 200 m of waterbodies, with 3 m or wider stretches, suitable for species' foraging activities. 	<ul style="list-style-type: none"> Intact, Thinned, Scattered Trees