East Leppington Precinct Planning Study

Review of Liverpool ENV

Prepared for
NSW Department of Planning and Infrastructure
December 2012

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Abbreviations

ABBREVIATION	DESCRIPTION
AHCVV	Additional High Conservation Value Vegetation – vegetation meeting the requirements for ENV that was not mapped in the Growth Centres Conservation Plan
AW	Alluvial Woodland
CEEC	Critically Endangered Ecological Community
CPW	Cumberland Plain Woodland
DECCW	(Former) NSW Department of Environment, Climate Change and Water
DP & I	Department of Planning and Infrastructure
SEWPaC	Commonwealth Department of Sustainability, Environment, Water, Population and Communities
EEC	Endangered Ecological Community
ELA	Eco Logical Australia
ENV	Existing Native Vegetation
EPA Act	Environmental Planning and Assessment Act (1979)
EPBC	Commonwealth Environment Protection and Biodiversity Conservation Act (1999)
OEH	NSW Office of Environment and Heritage (formerly DECCW)
NES	Matters of National Environmental Significance
RC	Riparian Corridor
RBM	Relevant Biodiversity Measure (from the Growth Centres Biodiversity Certification Order)
SEPP	State Environmental Planning Policy
TSC	NSW Threatened Species Conservation Act (1995)

1 Introduction

1.1 DESCRIPTION OF PROJECT

Eco Logical Australia Pty Ltd (ELA) was engaged by the NSW Department of Planning and Infrastructure (DP & I) to undertake an assessment of Existing Native Vegetation (ENV) occurring within the Liverpool Local Government Area in the East Leppington Precinct (Figure 1). The East Leppington Precinct is part of the South-West Growth Centre and was released for detailed planning investigations in November 2011. It contains a mix of certified and non-certified lands. The area subject to this study has not been certified as it coincides with preliminary flood planning levels.

The landscape of the study area differs significantly from the rest of the East Leppington Precinct and consists of smaller rural residential allotments, market gardens, intensive chicken sheds, and other uses such as low intensity livestock grazing. As a result, much of the site has been cleared, with vegetation limited to small regrowth remnants generally <50years of age. Cattle grazing, introduction of exotic pasture and selective clearing have significantly disturbed the ground layer vegetation.

This assessment has been carried out post-exhibition to further assess the conservation significance of two patches on non-certified ENV occurring on lands within the Liverpool Council Local Government Area, north of Denham Court Road (Figure 2). Further assessment was required to determine if removal of this vegetation as part of an integrated approach to riparian restoration would result in a negative impact to the habitat values in the area. This assessment follows on from the original field survey undertaken during July and August 2011.

The specific objective of this project is to:

- Undertake biodiversity assessment to determine extent, condition recovery potential and conservation significance of ENV

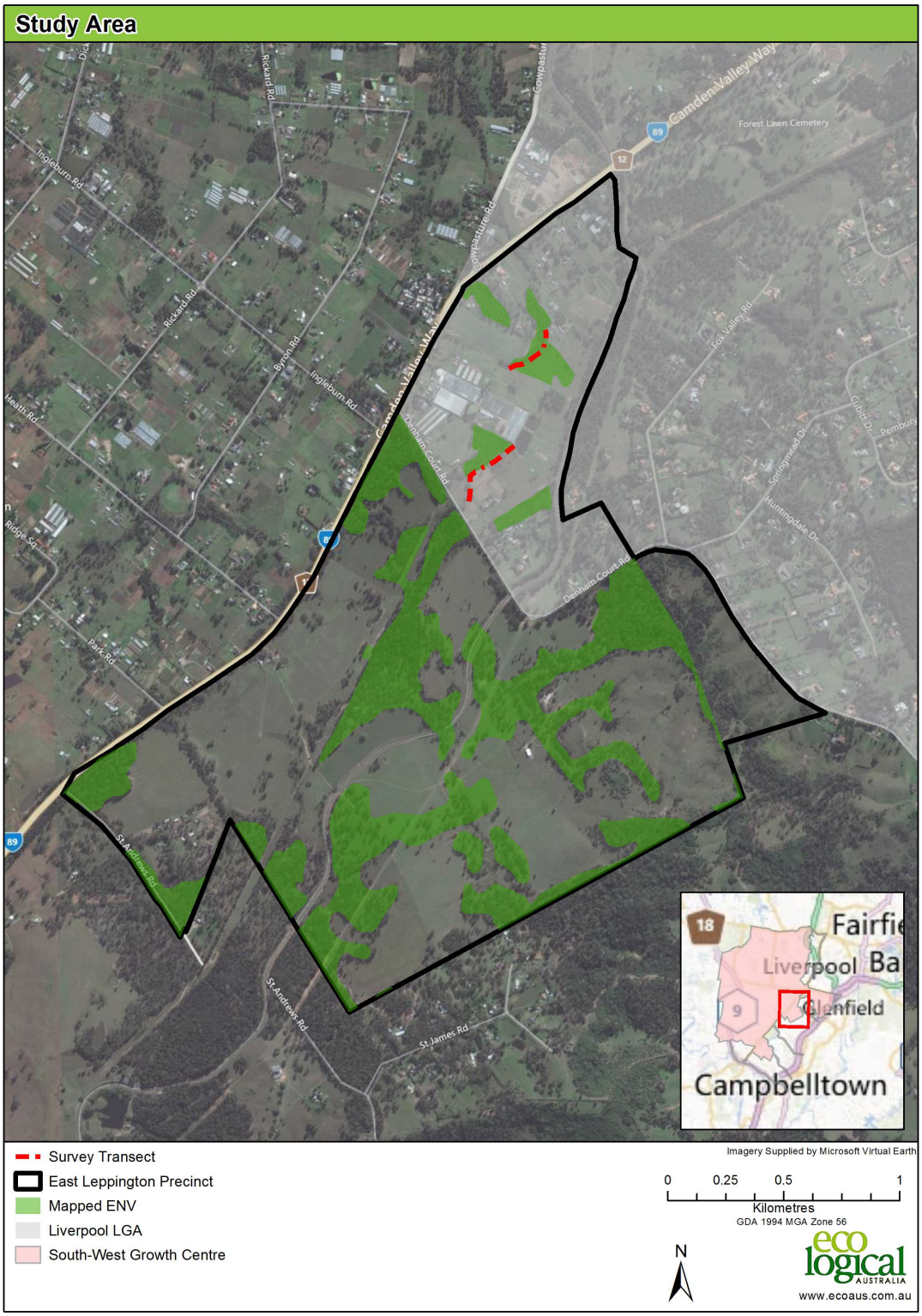

Figure 1: Study Area

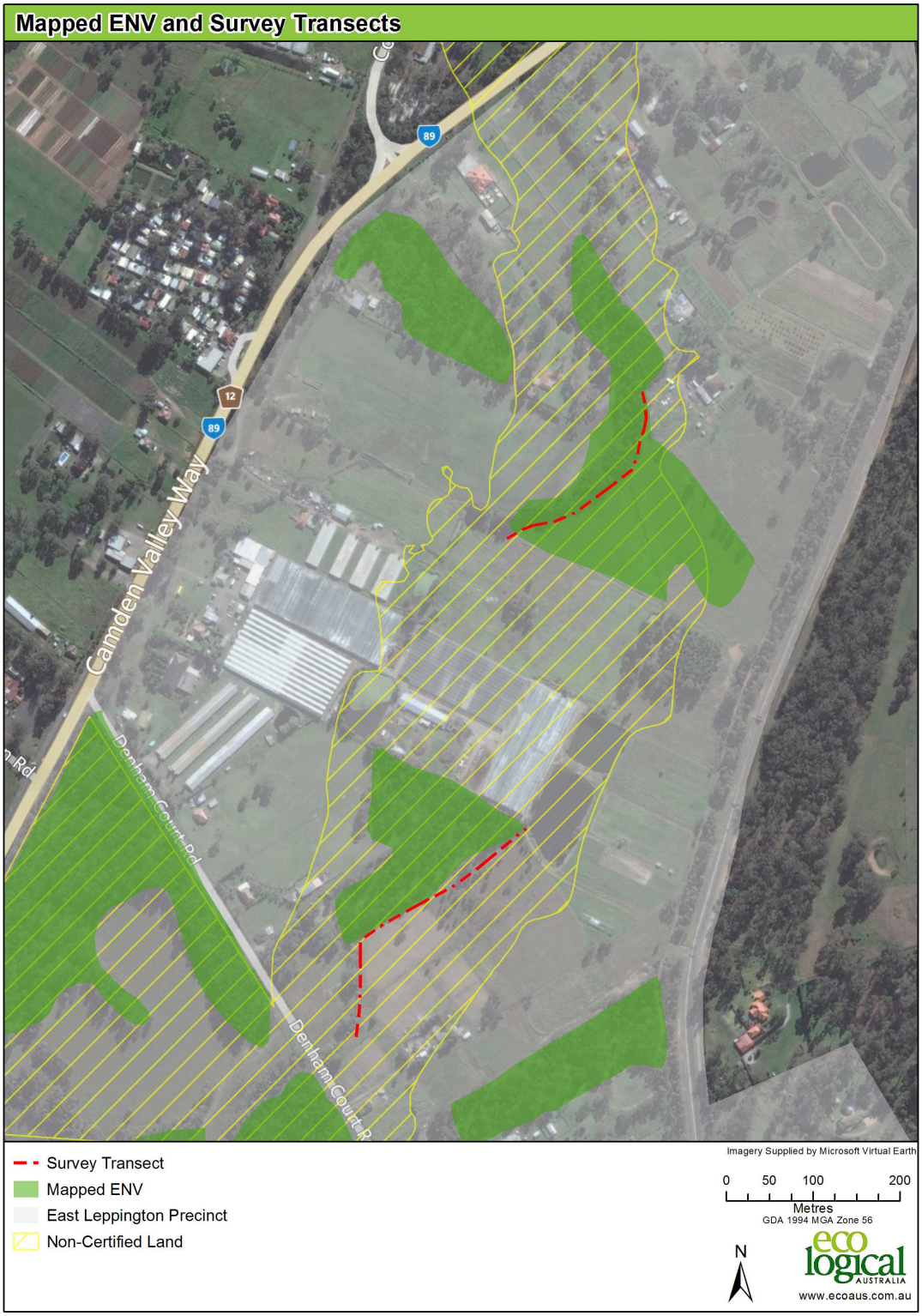

Figure 2: Mapped ENV, Non-Certified Lands and Field Survey Transects in the East Leppington Precinct

2 Methodology

2.1 DATA REVIEW

A desktop literature review was undertaken by ELA to determine the location and extent of previous field surveys and identify the known constraints within the study area. The following documentation and data was reviewed;

- Topographic maps, digital elevation models and aerial photography of the study area
- Database searches of NSW OEH Wildlife Atlas and EPBC online Protected Matters
- Western Sydney Vegetation Mapping (NPWS 2002a) and Western Sydney Condition and Conservation Significance Mapping (NPWS 2002b)

2.2 FIELD SURVEY AND VEGETATION MAPPING

The assessment followed on from the original field survey undertaken during July and August 2011. The assessment entailed desktop review of high resolution nearmap aerial photography to validate the size and extent of the ENV, followed by field assessment of the vegetation on the 17th October 2012. Field survey was undertaken for approximately 4 person hours and comprised walking through the vegetation and identifying the composition, structure, condition and recovery potential of the vegetation on site. Vegetation boundaries were marked on aerial photography and mapped using Geographic Information Systems (GIS). Field validation of vegetation remnants was undertaken to identify correlations with 'Existing Native Vegetation (ENV)' (as defined in the Biocertification Order for the 'Sydney Regions Growth Centres SEPP'), areas of 'Additional Native Vegetation (ANV)' (i.e. previously unmapped ENV), areas of Cumberland Plain Woodland that meet the criteria for the critically endangered ecological community listed under the EPBC Act, and areas of vegetation that have been cleared since aerial photos were taken. Detailed floristic quadrats and species lists were not prepared as this work had been completed as part of the 2011 survey program.

The weather during survey was clear and warm, with a minimum temperature of 11.2°C and maximum temperature of 23.3°C. No rainfall occurred during the survey.

2.3 ANALYSIS

Constraints analysis was completed on the data obtained from field survey for the two patches of ENV. These two patches were analysed separately and have been distinguished as the '*northern remnant'* and '*southern remnant'* (refer to Figure 3).

This analysis included several steps to determine the recovery potential and conservation significance of the two remnants, so this data could be combined with threatened species likelihood to determine overall ecological constraint value. To complete this analysis details of current and historic land use, disturbance level, soil condition, vegetation composition, patch size and connectivity were needed (Refer to Tables 1-4). This data was obtained from field observations and GIS analysis.

Table 1. Recovery potential matrix

Source: Eco Logical Australia (2003).

CURRENT CONDITION AND LAND USE	PAST LAND USE AND DISTURBANCE	SOIL CONDITION	VEGETATION	RECOVERY POTENTIAL
Cleared (no woodland canopy). Includes *Bursaria* thickets in grassland	Recently cleared (<2 years)	Unmodified or largely natural. Uncultivated.	Native dominated	High
			Exotic dominated	Moderate
		Modified. Heavily cultivated and/or pasture improved. Imported material.	Either	Low
	Historically cleared (>2 years) and consistently managed as cleared.	Unmodified or largely natural. Uncultivated.	Native dominated	Moderate
			Exotic dominated	Low
		Modified. Heavily cultivated and/or pasture improved. Imported material.	Either	Very Low
Wooded/Native Canopy present or regenerating	No recent clearing of understorey	Unmodified or largely natural. Uncultivated.	Native understorey relatively intact or in advanced state of regeneration. Native dominated.	High
			Native understorey significantly structurally modified, absent or largely absent. Includes areas dominated by African Olive.	Moderate
			Exotic dominated	*Low*
		Moderately modified by long term grazing or mowing.	*Native dominated*	*Low*

CURRENT CONDITION AND LAND USE	PAST LAND USE AND DISTURBANCE	SOIL CONDITION	VEGETATION	RECOVERY POTENTIAL
		Modified. Heavily cultivated and/or pasture improved. Imported material.	Native understorey significantly structurally modified, absent or largely absent. Includes areas dominated by African Olive.	Very Low
			Native understorey present. Heavily weed invaded.	Low
	Understorey patchily intact	*Disturbed*	*Native dominated*	*Moderate*
			Exotic dominated	*Low*
	Recent clearing of understorey and or native understorey significantly structurally modified due to existing land use (eg. Mowing, grazing)	Unmodified or largely natural. Uncultivated.	Native dominated. If no vegetation present, assume native dominated.	High
			Exotic dominated	Moderate
		Modified. Heavily cultivated and/or pasture improved. Imported material.	Native dominated	Low
			Exotic dominated	Very Low

Table 2. Conservation significance matrix

Source: NSW NPWS (2002)

COMMUNITY TYPE	CONDITION CODE*	PATCH SIZE	CONNECTIVITY	CODE	CONSERVATION SIGNIFICANCE
Endangered Ecological Community (Critically endangered) ("CEEC"	ABC, TX or Txr	Any	Any	C3	Core
	Txu	Any	Any	URT	Urban remnant trees (critically endangered communities)
Endangered Ecological Community ("EEC")	ABC (with Understorey in good or moderate condition)	> 10 ha	Any	C1	Core
		< 10 ha	Adjacent to C1 or CEC	C2	Core
			Adjacent to S1	S2	Support for core
			None	O	Other remnant vegetation
	TX or Txr, ABC (with poor Understorey condition)	Any	Adjacent to any Core	S1	Support for core
			None	O	Other remnant vegetation
	Txu	Any	Any	O	Other remnant vegetation

Table 3. Ecological constraint matrix step 1

Source: Eco Logical Australia (2003). This step combines the recovery potential and conservation significance maps.

	RECOVERY POTENTIAL				
CONSERVATION SIGNIFICANCE		**High**	**Moderate**	**Low**	**Very Low**
	Core	High	High	High	High
	Support for core	High	Moderate	Moderate	Low
	Other	Moderate	Moderate	Low	Low

Table 4. Ecological constraint matrix step 2

Source: Eco Logical Australia (2003). This step combines results from Table 3 with the threatened species layer to determine ecological constraint.

	COMBINED RECOVERY POTENTIAL AND CONSERVATION SIGNIFICANCE (result of Table 3 above)				
THREATENED SPECIES ASSESSMENT		**High**	**Moderate**	**Low**	**Very Low**
	Known (High)	High	High	High	High
	Likely (Moderate)	High	Moderate	Moderate	Moderate
	Nil (Low)	High	Moderate	Low	Very Low

3 Results

3.1 VEGETATION

ENV Validation

The subject site has a history of use for rural farming practices (chiefly cattle or horse grazing), along with peri-urban residential development and industrial landuses. Consequently, much of the site has been cleared with vegetation limited to small regrowth remnants generally <50 years of age. However, the field survey confirmed that the two patches of mapped ENV meet the definition of ENV as per the Growth Centres Biodiversity Certification Order:

> *"existing native vegetation" means areas of indigenous trees (including any sapling) that:*
>
> *(a) had 10% or greater over-storey canopy cover present,*
>
> *(b) were equal to or greater than 0.5 ha in area, and*
>
> *(c) were identified as "vegetation" on maps 4 and 5 of the draft Growth Centres Conservation Plan,*
>
> *at the time the biodiversity certification order took effect, subject to condition 13.*

The validated sizes of the two areas of ENV are 1.74 ha (northern remnant) and 3.05 ha (southern remnant), with Alluvial Woodland the prevailing vegetation type. A portion of the area originally mapped as ENV for the northern remnant was removed as a result of subsequent land clearance after this area was initially mapped. The area of the southern patch was increased as adjacent vegetation also met the definition of ENV (Figure 3).

Vegetation Community and Condition – Southern Remnant

The vegetation is dominated by Swamp Oak *(Casuarina glauca)* with occasional individuals of Prickly-leaved Paperbark *(Melaleuca styphelioides)* and Cabbage Gum *(Eucalyptus amplifolia)* being less common. The vegetation is consistent with the description of *Swamp oak floodplain forest of the NSW North Coast, Sydney Basin and South East Corner bioregions*. This community is listed as an endangered ecological community under the *NSW Threatened Species Conservation Act, 1995*.

The dense canopy of Swamp Oak limits the growth of understorey species. The majority of the vegetation exhibited little understorey and was generally in a highly modified state, with a variety of rural-residential uses prevalent. These uses included horse grazing, motorbike tracks, stockpiles, cubby-houses etc.

Overall the vegetation is considered to be in moderate condition, reflecting a fairly intact canopy but disturbed, exotic dominated ground cover (Refer to Figure 4).

The remnant is isolated and does not currently form part of a significant habitat corridor, but may occasionally provide refugia or stepping stone links (Figure 3). Given the small size, poor condition and lack of connectivity the overall conservation value of this remnant is considered to be low.

Vegetation Community and Condition – Northern Remnant

The northern remnant was in slightly better condition than the southern remnant, which had suffered a higher level of disturbance at the ground level. The Northern remnant had a greater diversity of canopy species including Cabbage Gum *(Eucalyptus amplifolia)* and Grey Box *(Eucalyptus molucanna)*, whereas the southern remnant is close to a monoculture of Swamp Oak.

The northern remnant has a dense shrub layer in-parts, however this is dominated by the noxious weeds African Olive *(Olea europaea ssp. cuspidata)* and African Boxthorn *(Lycium ferocissimum)*. The presence of an often dense layer of these species is reflective of the narrow nature of this remnant and greater exposure to edge effects (Refer to Figure 5).

The predominantly exotic ground layer is dominated by Kikuyu *(Pennisetum clandestinum)* with Paddys lucerne *(Sida rhombifolia)*, Fireweed *(Senecio madagascarensis)* and Purpletop *(Verbena bonariensis)* the dominant herbs.

The remnant is isolated and does not currently form part of a significant habitat corridor, but may occasionally provide refugia or stepping stone links (Figure 3). Given the small size, disturbed condition and lack of connectivity the overall conservation value of this remnant is considered to be moderate.

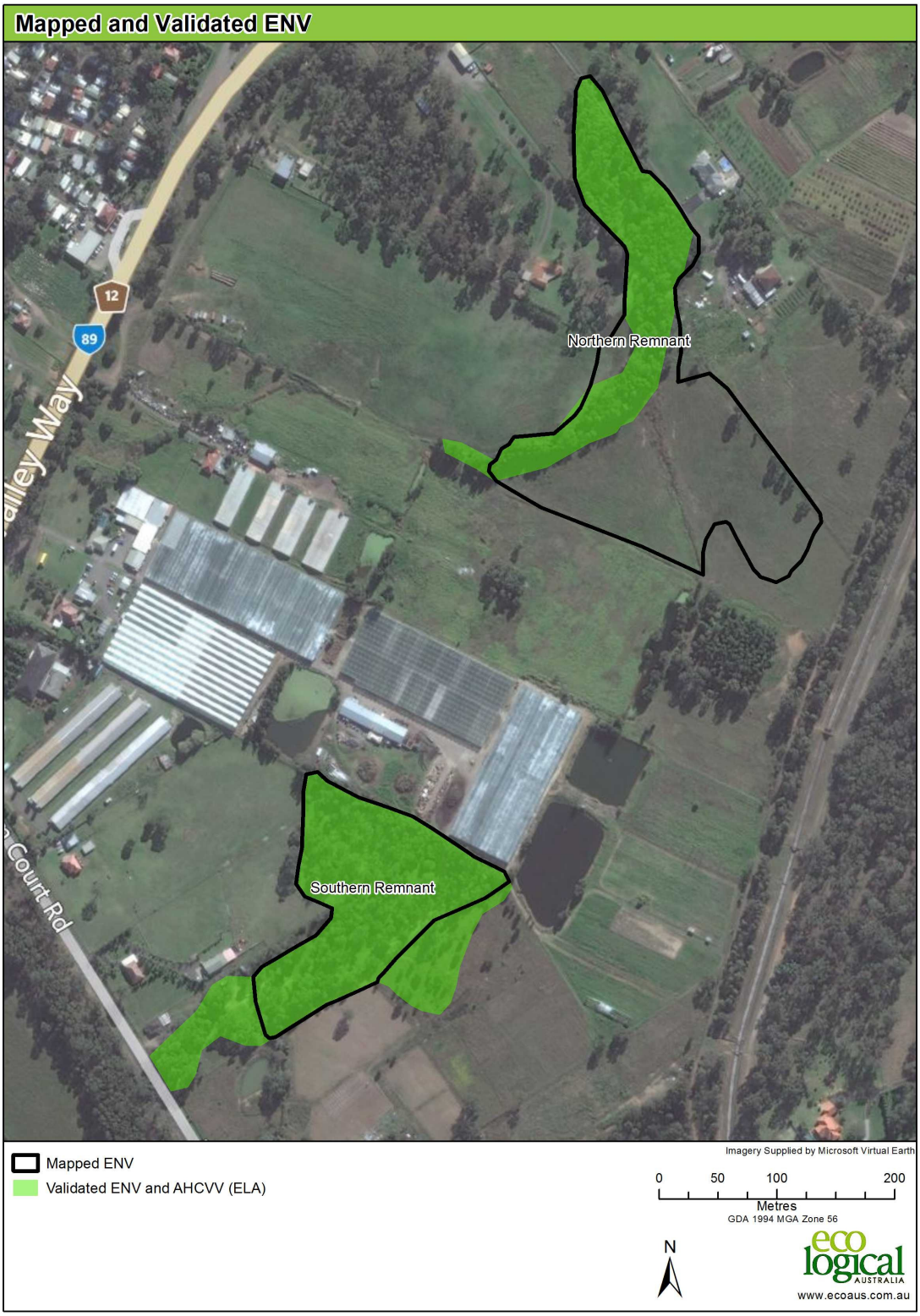

Figure 3. Mapped and Field Validated ENV

Figure 4. Southern remnant

Figure 5. Northern Remnant

3.2 CONSTRAINTS ANALYSIS

Both remnants were deemed to have a low recovery potential as the soil condition has been modified by long-term grazing, even though there is a wooded/native canopy present and there has been no recent clearing of the understorey.

The vegetation across the site is *Swamp oak floodplain forest of the NSW North Coast, Sydney Basin and South East Corner bioregions*, which is an endangered ecological community (EEC) and is condition ABC. All areas have a poor understorey. The remnants are relatively isolated with poor connectivity to other patches, so both are classed as Other Remnant Vegetation. Both patches have low conservation value and a value of *Low* for matrix step 1.

The southern remnant has no records of threatened species, while there is a chance that threatened species may occur in the northern remnant primarily due to the presence of eucalypts and a more diverse understorey. This has resulted in the southern remnant receiving an overall ecological value of *Low* and the northern remnant receiving a *Moderate* ranking (Figure 6).

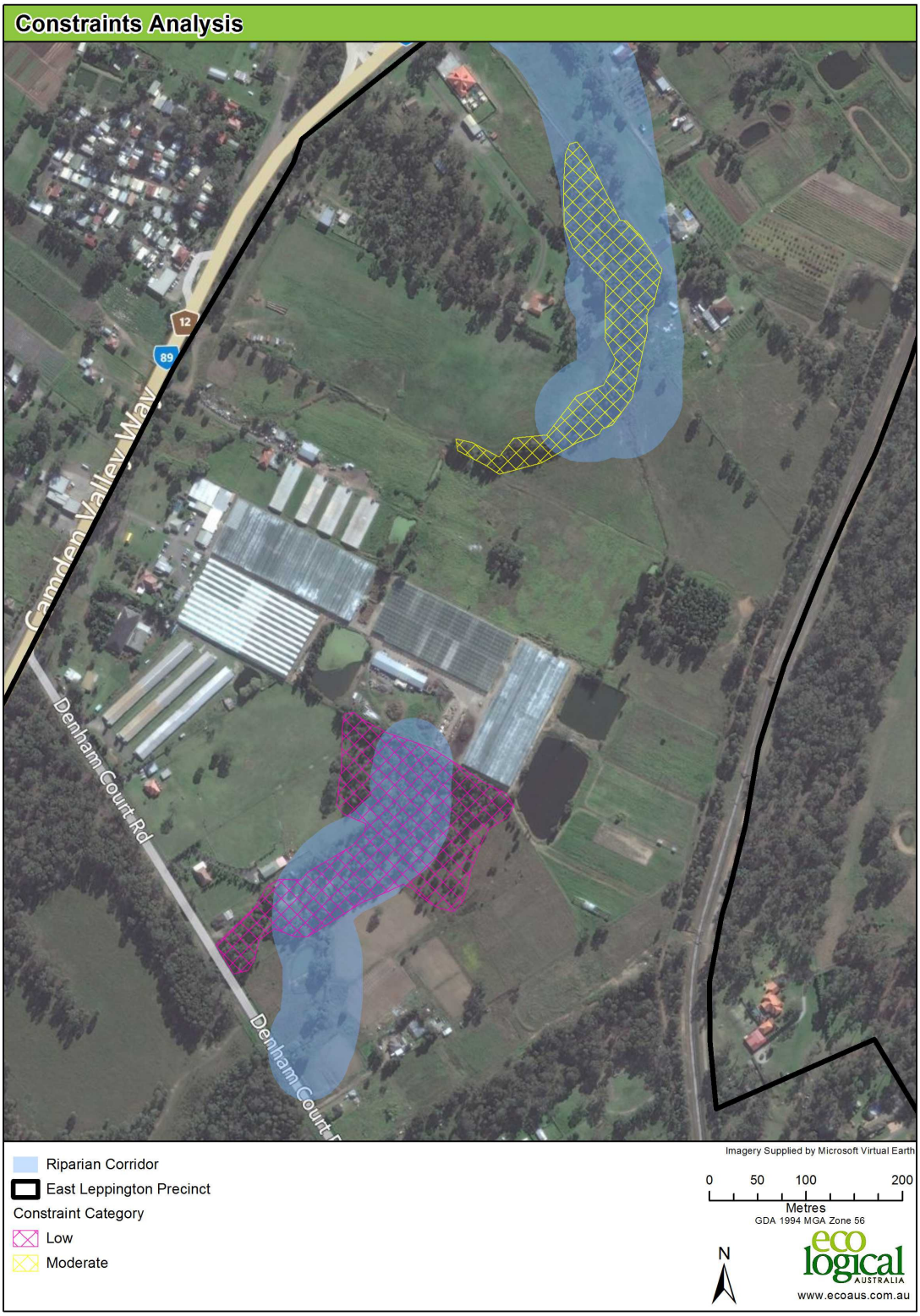

Figure 6. Constraints Analysis

4 Conclusion

In summary, due to the small size, history of disturbance and low recovery potential of the remnants they are considered to be of low to moderate ecological value. Whilst the northern remnant, being of slightly higher quality than the southern remnant, receives a moderate condition ranking due to being more diverse than the southern remnant, this methodology does not take into consideration the low ongoing viability due to the narrow linear shape of the remnant and high edge to area ratio.

Both remnants exhibit good canopy structure but poor quality lower stratums. In the case of the southern remnant the shrub layer is absent and the ground layer is dominated by exotic grasses. As a result of the good quality canopy, both remnants meet the criteria for mapping as ENV. However these remnants should also be considered in the context of their low-moderate conservation value and poor ongoing viability in an urbanised landscape

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