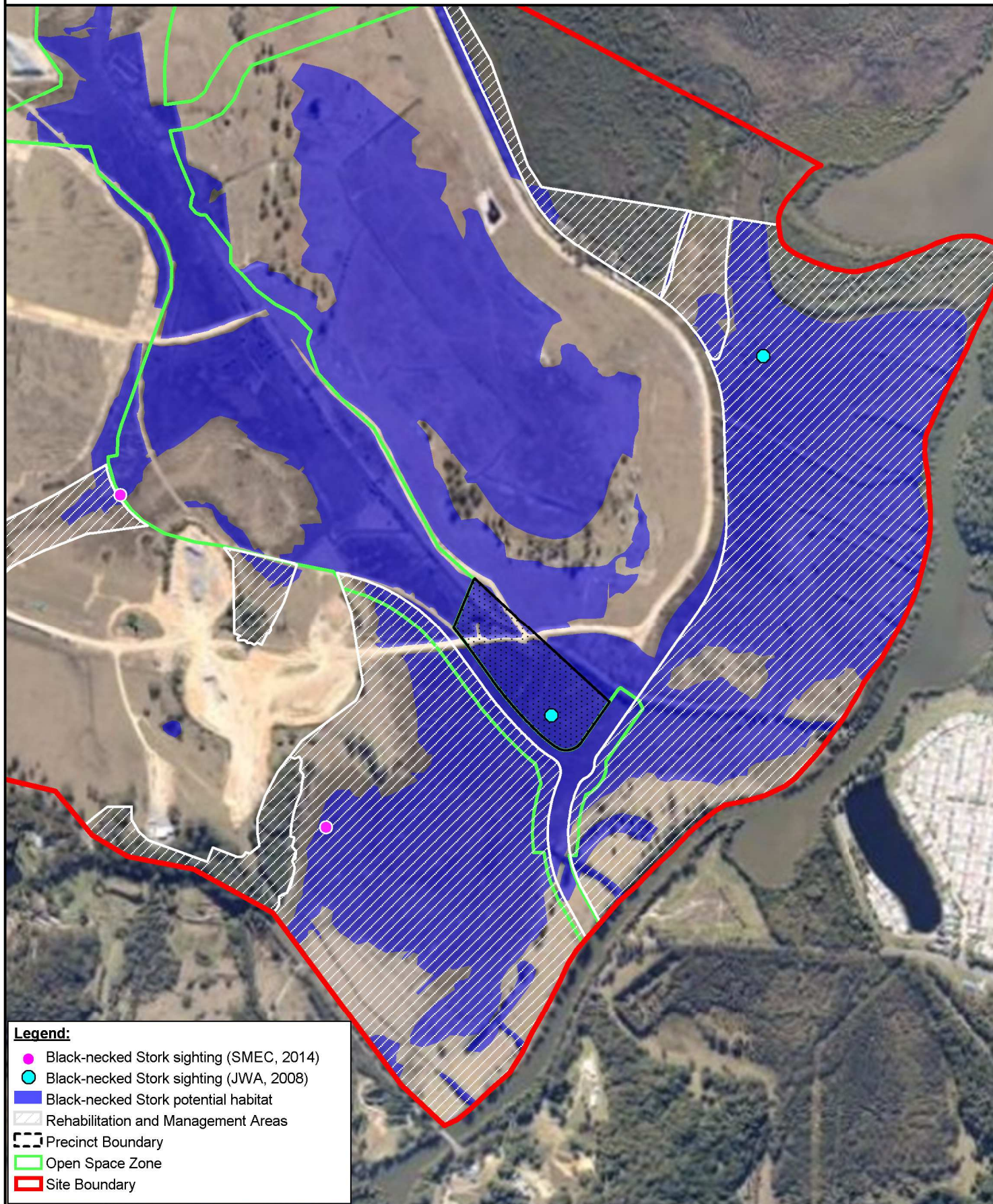



**Figure 4: Black-necked Stork Records and Potential Habitat**



<p><b>FIGURE</b> 4: Black-necked Stork Records and Potential Habitat</p> <p><b>CREATED BY</b> AM11482</p>	<p><b>REVISION</b> 0      <b>STATUS</b> FINAL</p> <p><b>DATE</b> 05/06/2014      <b>ISSUED FOR INFORMATION</b></p>	
<p><b>PROJECT NO.</b> 30031162</p> <p><b>PROJECT TITLE</b> Cobaki Estate Environmental Management Plans</p>	<p><b>COORDINATE SYSTEM</b> GDA 1994 MGA Zone 56</p> <p><b>SOURCE</b> The State of Queensland (Department of Environment and Resource Management), Copyright 2010 Species Records from James Warren &amp; Associates, 2010 Aerial Imagery by Nearmap Hyndtiles, Copyright 2011</p>	<p><b>CONSULTANT</b> SMEC Australia Copyright SMEC Australia Pty Ltd. All Rights Reserved.</p> <p><b>CLIENT</b> LEDA MANORSTEAD PTY LTD</p>

## 3.2 Native Vegetation

### 3.2.1 Vegetation Communities

Earthworks activities associated with construction of the SSPP will involve the removal of some native vegetation. Further, activities have the potential to indirectly affect adjacent native vegetation through the introduction of weeds, sediment flow and alteration of hydrology regimes.

Vegetation surveying (JWA, 2013) mapped twenty-two (22) vegetation communities on the Cobaki site. **Table 3** lists the vegetation communities recorded within the SSPP. The location of these Vegetation Communities is shown in **Figure 5**.

**Table 3 Vegetation Communities associated with the SSPP**

Vegetation Community	Area removed/ to be removed from site	Area to be removed from SSPP
Community 11 – Low closed grassland ( <i>Sporobolus virginicus</i> , <i>Triglochin striata</i> +/- <i>Casuarina glauca</i> )	9.69 (18%)	3.25 (6%)
Community 12 – rushland/sedgeland/grassland (mixed aquatic species)	24.12 (68%)	0.30 (0.8%)
Community 14 – Dams and drainage (mixed aquatic species)	0.77 ha (25%)	0.06 ha (1.9%)
Community 15 – Low open forest/woodland ( <i>Casuarina glauca</i> +/- Mixed species)	0.73 ha (16%)	0.17 (3.7%)
Community 16 – Slashed grassland/heathland/sedgeland (Mixed species)	43.52 ha (99.6%)	0.23 (0.5%)

#### **Community 11 - Low closed grassland (*Sporobolus virginicus*, *Triglochin striata* +/- *Casuarina glauca*)**

Community 11 occurs across a large portion of the SSPP, covering a total area of approximately 3.25 ha.

Community 11 is comprised of a mixture of saltmarsh species, including Saltwater couch (*Sporobolus virginicus*), Streaked arrow-grass (*Triglochin striata*), Sampire (*Sarcocornis quinqueflora*) and Fimbristylis (*Fimbristylis ferruginea*). Some stands of Swamp oak (*Casuarina glauca*) occur along drainage lines throughout this community, approximately three (3) to four (4) metres tall.

The conservation status of the low closed grassland community has been discussed in the Regional Forestry Agreement which describes the community as Forest Ecosystem 125 – Saltbush. The Tweed Vegetation Management Strategy classifies this community as Estuarine complexes – 603 Saltmarsh (JWA, 2013).

This vegetation community represents the Endangered Ecological Community (EEC) 'Coastal Saltmarsh in the North Coast Bio-region' (DECC 2007). EECs are considered to be of high conservation value.

#### **Community 12 - Rushland/sedgeland/grassland (Mixed aquatic species)**

Community 12 occurs in a small patch of approximately 0.3 ha within the SSPP and is comprised of aquatic and semi-aquatic vegetation such as Mangrove Fern, *Cyperus sp*, sedges and rushes.

The conservation status of Sedgeland/Rushland/Grassland communities has not been specifically discussed in the Regional Forestry Agreement document. The most appropriate analogue is NFE 141 Swamp (JWA, 2013). It is noted that Swamp ecosystems are Rare in the upper north east section of the NSW North Coast Bioregion.

This vegetation community is considered to represent the EEC 'Freshwater Wetland on Coastal Floodplains' (DECC 2008).

#### **Community 14 - Dams & Drainage Lines (Mixed aquatic species)**

Community 14 occurs along the western edge of the SSPP, occupying an area of approximately 0.06ha.

Community 14 is comprised of aquatic and semi-aquatic vegetation. The vegetation in the constructed dam includes, Water lilly and *Cyperus sp*. Several Drainage lines occur across the site, with several species of sedges and rushes commonly occurring.

The conservation status of this community has not been specifically discussed in the Regional Forestry Agreement document. The most appropriate analogue is NFE 141 Swamp. It is noted that Swamp ecosystems are Rare in the upper north east section of the NSW North Coast Bioregion.

The conservation value of this community is considered to be low.

With implementation of the actions contained within Section 4.2, the likelihood of significant impacts on adjacent native vegetation is considered low.

#### **Community 15 - Low open forest/woodland (*Casuarina glauca* +/- Mixed species)**

Community 15 occurs as a small patch of approximately 0.17 ha within the northern portion of the SSPP.

Community 15 comprises predominantly Swamp oak (*Casuarina glauca*). It occurs in low lying swamplands and along drainage lines within the project area that have few associated species. However, this is except the Grey mangrove, Tuckeroo, Umbrella Cheese Tree, Cottonwood and exotic species in the understorey.

The conservation status of this community is considered to be rare in the upper north-east section of the NSW North coast bioregion. This community is equivalent to the Forest Ecosystem 143 (Swamp she-oak) (NPWS, 1999).

The community is considered to represent the EEC 'Swamp oak floodplain forest of the NSW North Coast' which has high conservation value (JWA, 2013).

### **Community 16 - Slashed grassland/heathland/sedgeland (Mixed species)**

Community 16 is located in the northern portion of the SSPP and occupies an area of approximately 0.23 ha.

This vegetation community is regularly slashed and is comprised only of commonly regenerating species. The groundcover includes grass, heath, sedge and fern species between ten (10) and fifty (50) cm tall. Species include Swamp seliginella, Bracken fern, Curly sedge, Foxtails, Sawsedge, Coral fern, Whisky grass, Nut grass, Mat rushes and Flax lily.

Community 16 is not considered to be of conservation significance.

### **3.2.2 Threatened Flora Species**

Flora surveys undertaken by James Warren & Associates (2008) recorded the presence of one Threatened flora species, Fine-leaved tuckeroo (*Lepiderema pulchella*) within Rehabilitation and Management Area 8, approximately 400m west of the SSPP. There are no records of any stems within the SSPP. The proposed works will not have any impact on any threatened flora species.

The location of this threatened flora species is shown in **Figure 6**.

### **3.2.3 Endangered Ecological Communities (EEC's)**

Six (6) Endangered Ecological Communities (EEC) listed under Schedule 1 of the TSC Act have been recorded on the site, three (3) of which occur within the vicinity of the SSPP:

- Freshwater wetlands – occurring in the central and eastern portions of the site;
- Coastal saltmarsh in the NSW North Coast bioregion – occurring in the south-east of the site; and
- Swamp Oak Floodplain Forest - occurring in association with drainage lines in the south-eastern side of the site.

The area of impacts for each EEC is shown in **Table 4** below. The location of these Endangered Ecological Communities is shown in **Figure 7**.

**Table 4 Extent of impact of each Endangered Ecological Community**

Endangered Ecological Community	Area of Existing EEC (ha)	Area cleared/ to be cleared from Entire Site (ha)	Area cleared/ to be cleared from SSPP (ha)
Freshwater wetland	35.39	24.12 (68%)	0.30 (0.8%)
Swamp Oak Floodplain forest	4.52	0.73 (16%)	0.17 (3.7%)
Coastal saltmarsh	54.63	9.69 (17.7%)	3.25 (6%)

### **Freshwater Wetland**

The Freshwater Wetland EEC on the site is comprised of vegetation community 12 - rushland/ sedgeland/ grassland (mixed aquatic species) and covers a total area of approximately 35.39 hectares.

0.3 hectares (0.8%) of Freshwater Wetland occurs within the SSPP. These areas of Freshwater wetland have been heavily degraded due to historical and existing land use including drain construction and maintenance, grazing and slashing. As such the proposed works are not considered to significantly impact the regional distribution of this community.

### **Coastal Saltmarsh**

This EEC occurs adjacent to Cobaki Creek on the south-east side of the site and covers an area of approximately 54.63 hectares. This area is subject to tidal inundation. Cattle have previously had unimpeded access to this area which has also been subject to management through machine slashing. There is a minor incursion of introduced grasses and weeds. A total of 9.69 hectares of Coastal Saltmarsh is to be removed from the site, of which approximately 3.25 hectares is located in the southern portion of the SSPP.

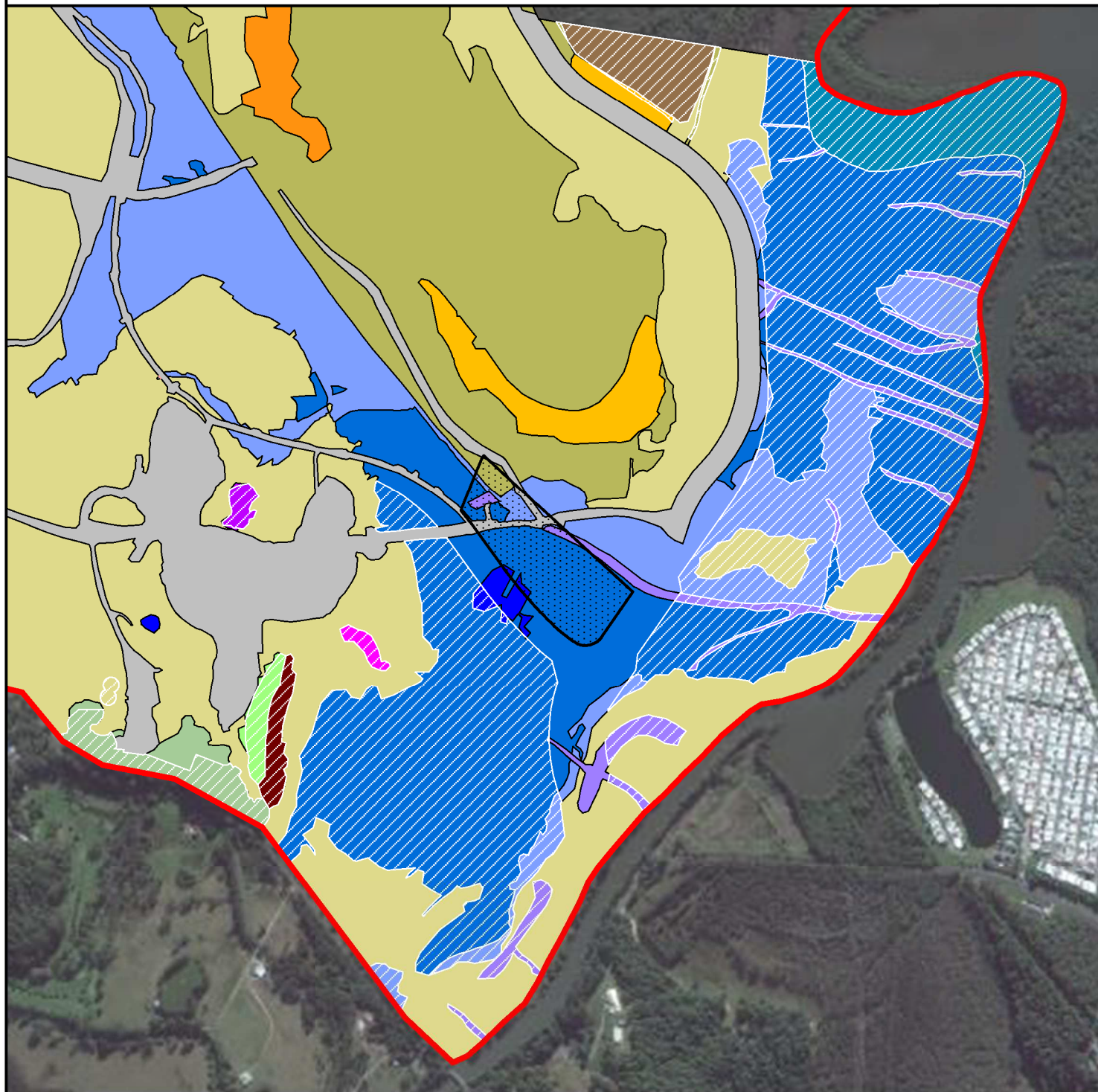
The area of impacts for each EEC is shown in **Table 4** above. These figures are based on baseline data (JWA, 2009) and may not be indicative of the current site, as some clearing has already occurred since 2010 under existing approvals. Therefore, the table describes the area of EEC that either has been cleared since 2010. The EEC areas to be cleared will be clearly delineated once accurate on-ground survey is complete.

### **Swamp Oak Floodplain Forest**

This EEC occurs in association with drainage lines that flow into Cobaki Creek on the south-eastern site boundary and covers an area of approximately 4.5 hectares. 0.17 hectares of Swamp oak floodplain forest EEC (3.7%) will be removed from within the SSPP. It is worth noting that this community occurs along the edges of constructed drains and the area was previously actively grazed by cattle, resulting in introduced grasses and agricultural weeds in some areas.

As previously reported (JWA, 2012), the removal of 16% of the Swamp oak floodplain forest across the whole site is not considered to represent a significant impact on this community.

**Figure 5: Vegetation Communities**



**LEGEND:**

Community 1 - Dry sclerophyll communities Community 1a - Very tall open/closed sclerophyll forest ( <i>Eucalyptus pilularis</i> +/- <i>E. microcorys</i> +/- <i>E. propinqua</i> +/- <i>Corymbia intermedia</i> )	Community 2c - Very tall closed forest ( <i>A. cunninghamii</i> )	Community 8 - Mid-high open woodland ( <i>E. siderophloia</i> )	Community 14 - Dams & drainage lines (Mixed aquatic species)
Community 1b - Tall open/closed sclerophyll forest ( <i>E. propinqua</i> )	Community 2d - Mid-high open/closed forest (Riparian species +/- Mixed species)	Community 9 - Low closed forest (Revegetation areas +/- Mixed <i>Eucalyptus</i> species)	Community 15 - Low open forest/woodland ( <i>Casuarina glauca</i> +/- Mixed species)
Community 1c - Tall open sclerophyll woodland ( <i>E. pilularis</i> )	Community 3 - Tall/very tall open/closed forest ( <i>L. confertus</i> +/- Mixed rainforest species)	Community 10 - Low closed grassland with scattered trees (Pastoral grasses +/- Mixed species)	Community 16 - Slashed grassland/heathland/sedgeland (Mixed Species)
Community 1d - Tall open sclerophyll forest ( <i>E. pilularis</i> +/- <i>E. siderophloia</i> +/- <i>E. tereticornis</i> )	Community 4 - Low closed forest (Heathland)	Community 11 - Low closed grassland ( <i>Sporobolus virginicus</i> , <i>Triglochin striata</i> +/- <i>Casuarina glauca</i> )	Unvegetated land
Community 2 - Rainforest communities Community 2a - Tall closed forest ( <i>Lophostemon confertus</i> +/- <i>Araucaria cunninghamii</i> )	Community 5 - Mid-high open woodland (Mixed rainforest species)	Community 12 - Rushland/sedgeland/grassland (Mixed aquatic species)	Precinct Boundary
Community 2b - Tall open forest ( <i>Archontophoenix cunninghamiana</i> )	Community 6 - Mid-high open woodland ( <i>E. robusta</i> )	Community 13 - Low to mid-high open mangrove forest ( <i>Avicennia marina</i> var <i>australasica</i> / <i>Aegiceras corniculatum</i> +/- <i>Casuarina glauca</i> )	Site Boundary
	Community 7 - Mid-high open woodland ( <i>E. racemosa</i> )		Retained Vegetation

**FIGURE** 5 - Vegetation Communities

**CREATED BY** AM11482

**PROJECT NO.** 30031162

**PROJECT TITLE**  
Cobaki Estate Management Plans

**REVISION** 0

**DATE** 05/06/2014

**COORDINATE SYSTEM**

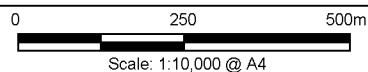
GDA 1994 MGA Zone 56

**SOURCE**

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Vegetation Communities from James Warren & Associates Pty Ltd

**STATUS** FINAL

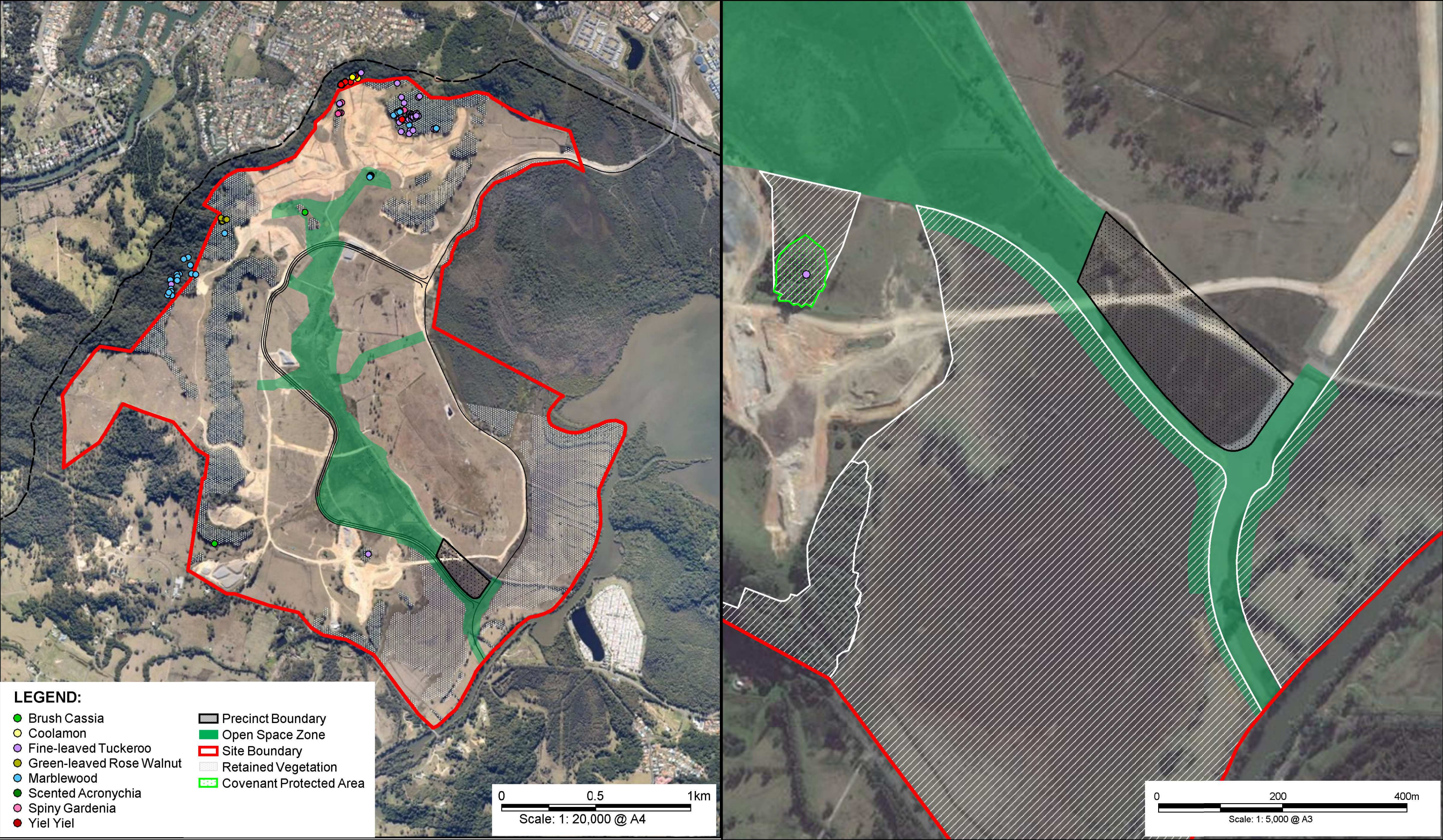
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LEDA MANORSTEAD Pty Ltd

Figure 6: Threatened Flora Records



<div>COORDINATE SYSTEM</div> <div>GDA 1994 MGA Zone 56</div>		<div><div>N</div><div></div></div>	<div>FIGURE 6: Threatened Flora Records</div>	<div>REVISION 0</div>	<div>STATUS FINAL</div>	<div>CLIENT</div> <div>LEDA MANORSTEAD Pty Ltd</div>	<div><div><div></div><div></div></div><div>SMEC</div></div> <div>CONSULTANT SMEC Australia</div>
			<div>CREATED BY AM11482</div>	<div>DATE 05/06/2014</div>	<div>ISSUE FOR INFORMATION</div>		
<div>PROJECT NO. 30031162</div>	<div>PROJECT TITLE Cobaki Estate Management Plans</div>	<div>SOURCE</div> <div>The State of Queensland (Department of Environment and Resource Management), Copyright 2010; Aerial Photography provided Microsoft Bing, copyright 2011 Flora records provided by James Warren &amp; Associates Pty Ltd, 2010</div>		<div>Copyright SMEC Australia Pty Ltd. All Rights Reserved.</div>			