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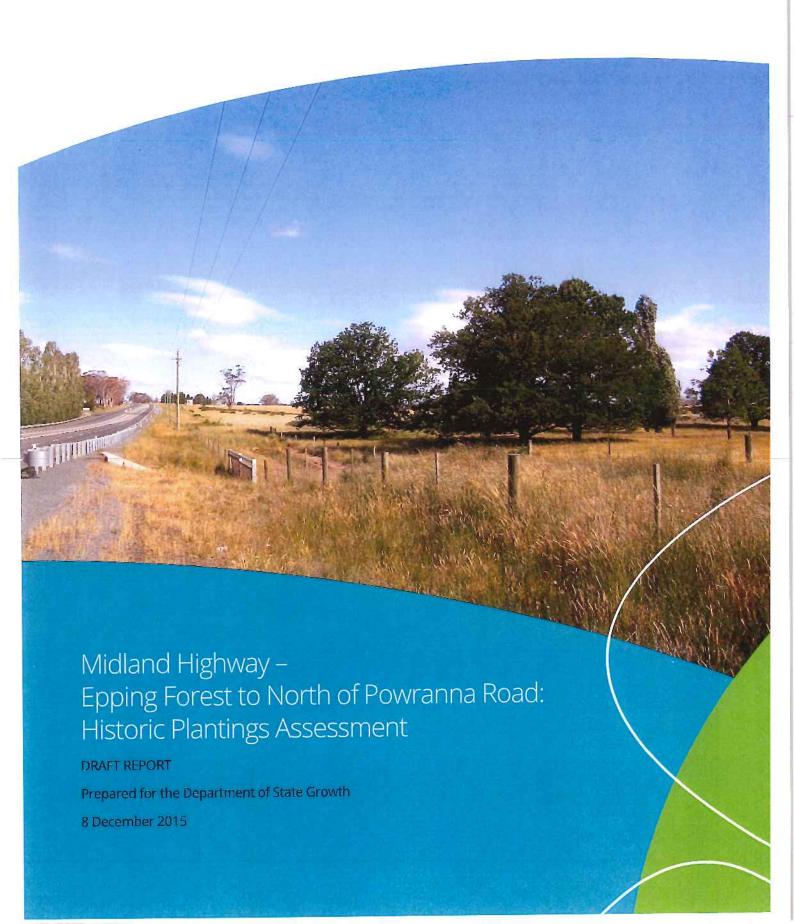












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- Kirsty Kay Senior Ecologist
- Lauren Harley GIS and Mapping.

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Glossary

CHL Commonwealth Heritage List

DGPS Differential Global Positioning System

DoE Department of the Environment

DPIPWE Department of Primary Industries, Parks, Water and Environment

EPBC Act Environment Protection and Biodiversity Conservation Act 1999

HCH Act Historic Cultural Heritage Act 1995

LGA Local Government Area

NHL National Heritage List

RNE Register of the National Estate

THR Tasmanian Heritage Register

Summary

Biosis Pty Ltd was commissioned by the Department of State Growth (State Growth) to undertake a heritage assessment of historic plantings on the Midland Highway from Epping Forest to north of Powranna Road. The assessment is not tied to a specific development, but has been undertaken to provide an overview of heritage values within the study area to assist with future planning.

The study area extends along a 15.5 kilometre section of the Midland Highway from Epping Forest to north of Powranna Road within a largely rural context. The topography consists of undulating plains and the highway crosses nine creek tributaries that connect to the South Esk River to the north. Heading north from Epping Forest, the first 7.5 kilometers either side of the Highway is characterised by a mix of native forest and agricultural land, with the remainder to the north being largely agricultural in nature.

A review of historical aerial photographs indicates that some clearing of native trees has occurred between 1947 and 1980 with few other agricultural plantings, such as windbreaks, being established. Extensive plantings in the 1980s were located to obscure views of feed lots near Powranna that have subsequently obscured earlier Pioneer Memorial Highway plantings in these areas. Formal plantings on property entranceways are relatively rare and post 1947 in age. Earlier examples of this near Powranna that were visible in the 1947 and 1980 aerials have since been removed. Windbreak and visual screening plantings present in the study area are largely functional and relatively recent in age. These entryway, screening and windbreak plantings are not linked to any known historical associations that would make them significant, either locally or at a State level.

There are 171 trees located in 13 formal planting arrangements that are associated with the Pioneer Memorial Highway, planted between 1935 and 1941. These plantings include linear and geometric formations aesthetically placed to highlight features in the landscape or to break up long straight stretches of highway. Trees used include a variety of native and exotic species, some of which have survived better than others. Few of the formations remain complete and some have been encroached by later windbreak or screening plantings. The surviving Pioneer Memorial Highway historic plantings in the study area are in a condition that is comparable to or better than other surviving plantings along the wider Pioneer Memorial Highway project.

The historic plantings of the Pioneer Memorial Highway meet State level significance under Tasmanian Heritage Register (THR) criterion (a), (b), (c), (e) and (g) as part of a beautification project whose scope and implementation is unique in Tasmania's history. These plantings are not currently listed on the THR or Northern Midlands Interim Planning Scheme 2013.

Whilst not formally listed on the THR, the surviving plantings should be conserved wherever possible and accounted for in any future highway upgrades works.

1 Introduction

1.1 Project Background

Biosis Pty Ltd has been commissioned by the Department of State Growth (State Growth) to undertake a heritage assessment of historic plantings on the Midland Highway between Epping Forest and just north of Powranna Road (Figure 1). The assessment is not tied to a specific development, but has been undertaken to provide an overview of heritage values in the study area.

1.2 Study Area

The study area is located along a 15.5 kilometre section of the Midland Highway from Epping Forest to north of Powranna Road, in the Northern Midlands Council Local Government Area. The study area width is 50 metres either side of the Midland Highway road verge and extends into private land. The study area also extends 100 metres along intersecting roads, including property access roads. Refer to Figure 2 for an aerial photograph of the study area and surrounds.

1.3 Report Methodology

This report was prepared in accordance with current heritage guidelines including Assessing Historic Heritage Significance (DPIPWE, 2011); the *Draft Works Guidelines for Historic Heritage Places* (Tasmanian Heritage Council, 2014) and the Burra Charter (ICOMOS, 2013).

This report provides a heritage assessment to identify whether historical plantings or other historic sites are present within the study area and to assess the significance of any historic plantings that may be present in accordance with Department of Primary Industries, Parks, Water and Environment (DPIPWE); Heritage Tasmania and Tasmanian Heritage Council guidelines.

1.3.1 Documentary Investigation

A desktop assessment was undertaken to establish a historical context for potential historical plantings in the study area. The desktop assessment included a review of primary documents including maps, plans, photographs and newspapers held by the National Library of Australia and LINC Tasmania to help inform timings and locations of historical plantings. Secondary sources such as published and unpublished consultant reports and academic journals have been used to provide the historical context in this report.

1.3.2 Site Investigation

The site inspection involved a pedestrian and vehicular surface survey of the study area, using systematic traverses. Any historic plantings and archaeological places identified were documented, photographically recorded and their position recorded with a DGPS unit.

1.3.3 Assessment Objectives

The following is a summary of the major objectives of the assessment:

Identify and assess for potential historic plantings in the study area. The study aims to achieve this objective by:

- Providing a brief summary of the principleshistorical influences that have contributed to creating
 the present day environment of the study area using recourses already available and some
 limited new research.
- Identifying plantings, sites and features within the study area.
- Preliminary identification of the cultural heritage significance of plantings, sites and features within the study area which are not recognised through statutory heritage listings.

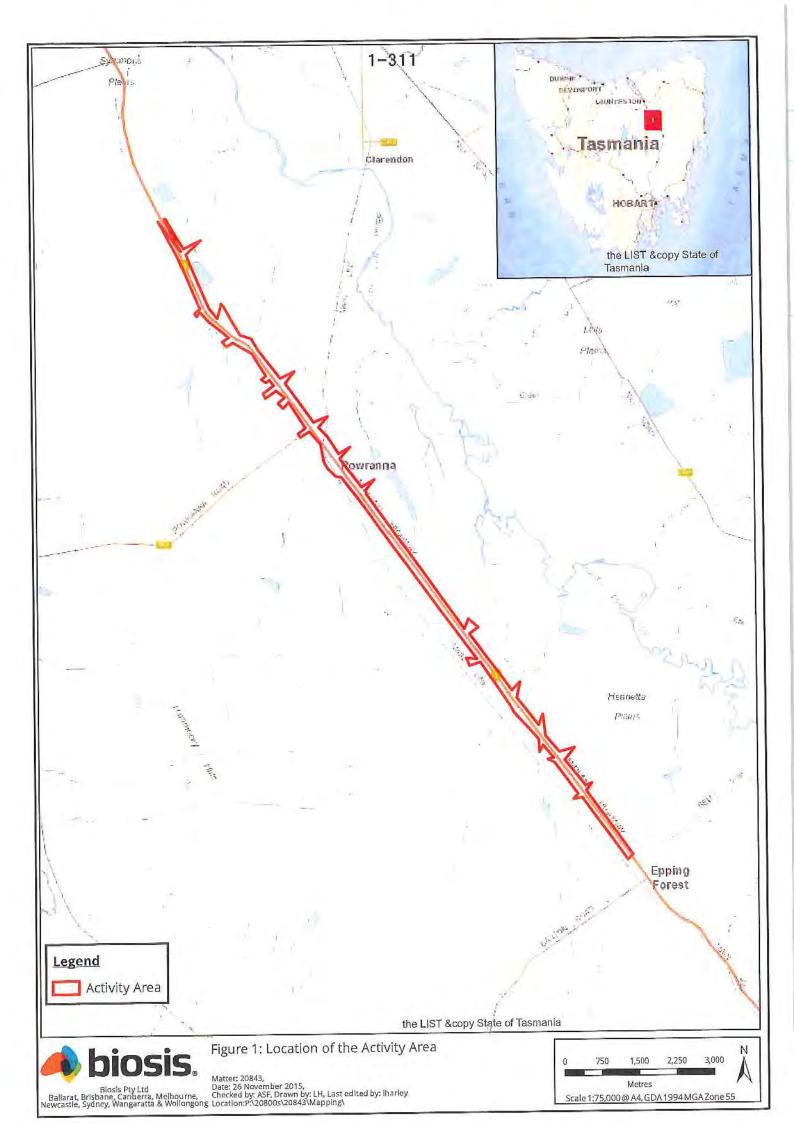
1.4 Investigators and Contributors

This report was prepared by Asher Ford, consultant archaeologist, with assistance from Kirsty Kay, senior ecologist at Biosis Pty Ltd. This report has been reviewed by Dr Ilya Berelov, Principal Heritage Advisor.

1.5 Limitations of the report

This report is based on historical research and field inspections. It is possible that further historical research or the emergence of new historical sources may support different interpretations of the evidence in this report.

This report is a heritage assessment only and has not assessed the impacts of potential developments against identified heritage values.





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Figure 2: Aerial photograph of the study area and surrounds

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Ballarat, Brisbane, Canberra, Melbourne, Sydney, Wangaratta & Wollongong bioSiS.

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2 Statutory Framework

This section identifies the statutory framework that is relevant to the study area.

2.1 Statutory Framework

2.1.1 Heritage management in Tasmania

In Tasmania, cultural heritage is managed through a three-tiered system: National, State and local legislative protection. Certain sites and items may require management under all three systems or only under one or two. The following discussion aims to outline the various levels of protection and approvals required to make any alterations to cultural heritage in the state.

2.1.2 Environment Protection and Biodiversity Conservation Act 1999

The Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) is the national Act protecting the natural and cultural environment and is administered by the Department Environment (DoE). The EPBC Act establishes two heritage lists for the management of the natural and cultural environment:

- The National Heritage List (NHL)
 Items listed on the NHL have been assessed to be of outstanding significance and define "critical moments in our development as a nation".¹
- The Commonwealth Heritage List (CHL)
 Items listed on the CHL are natural and cultural heritage places that are on Commonwealth land, in Commonwealth waters or are owned or managed by the Commonwealth. A place or item on the CHL has been assessed as possessing "significant" heritage value.²

A search of the NHL and CHL did not yield any results within the study area.

2.1.3 Historic Cultural Heritage Act 1995

Heritage in Tasmania is principally protected by the *Historic Cultural Heritage Act 1995* (HCH Act) which was passed for the purpose of conserving historical heritage places. The HCH Act provides mechanisms for the establishment of the Tasmanian Heritage Register (THR) and for protection of historical heritage places on the register. The HCH Act is administered by the Tasmanian Heritage Council (THC) and/or local planning authorities.

The Tasmanian Heritage Register

Protection of items of State significance is by nomination and listing on the THR created under Part 4 of the HCH Act. A Certificate of Exemption or a discretionary permit, as detailed under Part 6 of the HCH Act, is required for works on a site listed on the THR. An application to the THC is required for a Certificate of Exemption, which typically are only granted where works will have no or negligible impacts to heritage values. Discretionary permit applications are assessed through local planning authorities in conjunction with the THC.

http://www.environment.gov.au/heritage/about/commonwealth/criteria.html

^{1 &}quot;About National Heritage" http://www.environment.gov.au/heritage/about/national/index.html

² "Commonwealth Heritage List Criteria"



The THC may determine they have no interest in the determination of a discretionary permit application, in which case the local planning authority will be the determining body.

No items listed on the THR are present in the study area.

2.1.4 Northern Midlands Interim Planning Scheme 2013

The Northern Midlands Interim Planning Scheme 2013 contains a schedule of heritage items that are managed by the controls in the instrument. The Scheme includes a Local Historic Heritage Code (E13), which lists acceptable solutions and performance criteria against potential development works to heritage items. Works to heritage items listed on the heritage schedule may require a permit from Council.

No items listed on the Northern Midlands Interim Planning Scheme 2013 are present in the study area.

2.2 Non-Statutory Registers

2.2.1 National Trust of Australia

The National Trust of Australia is a community-based, non-government organisation, committed to promoting and conserving Australia's indigenous, natural and historic heritage through its advocacy work and its custodianship of heritage places and objects.

No items located within the study area are listed on the National Trust of Australia.

2.2.2 Register of National Estate

The Register of National Estate (RNE) was originally established under the *Australian Heritage Commission Act* 1975 (repealed). The RNE was closed in 2007 and is no longer a statutory list. All references to the RNE were removed from the EPBC Act on 19 February 2012. However, the list remains an archive and an item that was once listed on the RNE may have been transferred to the NHL or the CHL. Listing on the RNE is an indication that the site or item has significance.

No items located within the study area are listed on the RNE.

2.3 Summary

A summary of heritage listings for the study area is provided below in Table 1.

Table 1. Statutory and non-statutory heritage listings relevant to the study area

Statutory Listing	Sites present in the study area	
National Heritage List	None	
Commonwealth Heritage List	None	
Tasmanian Heritage Register	None	
Northern Midlands Interim Planning Scheme 2013	None	
National Trust Register	None	
Register of the National Estate	None	

3.1 Introduction

Historical research has been undertaken to identify the land use history of the study area, to isolate key phases in its history and to identify the location of any historic plantings within the study area. The historical research places the history of the study area into the broader context of the Northern Midlands region and specifically the Epping Forest area.

3.2 Topography & Resources

The Northern Midlands are a relatively flat area of low rolling hills and river flood plains located south of Launceston. The Northern Midlands are bounded to the west by Lake Country and to the east by hills and mountains, with the Midlands proper extending all the way south to Hobart. Major waterways include the North Esk, South Esk and Macquarie Rivers, which flow north into the Tamar River. The relatively easy accessibility, good waterage and grasslands of the Northern Midlands made this area attractive to early European settlers looking for good pasturage to raise stock.

3.3 Aboriginal past

The Northern Midlands were occupied by the North Midlands Nation whose country extended from Port Dalrymple in the north to St Peters Pass in the south, being bounded to the west by Lake Country and to the east by hills and mountains (Ryan, 2012, pp. 29-31). The North Midlands Nation had extensive contact with the surrounding North, North East, Big River, Ben Lomond and Oyster Bay Nations as the Midlands provided the most extensive kangaroo hunting ground in Tasmania as well as the easy travel route between nations. In the spring and summer months, the clans of the North Midlands Nation would remain on their inland or northern home grounds to target kangaroos. In autumn and winter months, clans would potentially travel to adjoining Ben Lomond or Oyster Bay nation areas for other or shell fish resources.

3.4 Regional Context

3.4.1 Exploration

Tasmania was first sighted by European explorers in 1642, during Abel Tasman's voyages of exploration for the Dutch East India Company. Following the first British settlement of the Australian mainland in 1788, French and British explorers begin surveying the Tasmanian and Australia coastlines, with notable expeditions by Bligh, d'Entrecasteaux, Hayes, Bass and Flinders between 1792 and 1798 (Robson, 1997, pp. 9-10). Concerned about French intentions, the British Colonial Office and Governor King moved to extend British settlement and sent Lieutenant John Bowen south to establish a small settlement on the Derwent River in 1803. Bowen was joined by Captain David Collins in 1804 after an aborted settlement attempt at Port Phillip. Collins moved the settlement to Sullivan's Cove and established Hobart Town. To further claims to Tasmania, King also sent Captain William Paterson establish a settlement on the Tamar River in 1804 (Robson, 1997, p. 10).

An inland route between the northern Tamar settlement and Hobart was established in 1807 by Lieutenant Thomas Laycock. After initially entering into the alpine region of the Central Highlands, Laycock identified an easier route to the east in the Midlands making good time to Hobart (Stancombe, 1967). Laycock's return



route became the basis for the 'Hobart Road' between $\frac{1-3}{100}$ and Port Dalrymple (later Launceston) and a primary route for settlers moving into the Midlands. The Midland Highway largely still follows this route with some variation.

3.4.2 Early European settlement

Between 1804 and 1807, European activities were largely limited to Hobart Town and Port Dalrymple, establishing reliable food stores being a priority. The situation changed in 1807 when colonists from Norfolk Island were transferred to Tasmania and began pushing out settlement on 4 to 40 hectare farms east and west of Launceston, establishing small scale agriculture in the progress (Ryan, 2012, p. 58). By 1817, the Australian economy had begun on a major trend towards establishing a pastoral economy, primarily based on wool. Interest in settling in Tasmania increased during this period due to a combination of its cooler climate and prime grazing areas in the Midlands.

Parish maps for Epping Forest indicate that land was granted for the area by at least 1827 to Edward Wedge (Plate 1). This was a particularly busy period for settlement in Tasmania with 175,704 hectares of land being granted in that 1823, the largest ever in Tasmanian history (Ryan, 2012, p. 74), and subsequently spurring immigrant numbers in the late 1820. The Midland areas were part of what became known as the Settled Districts and were largely occupied by Scottish immigrants.

Settler numbers continued to rapidly increase from the 1820s onwards, with most movement being into the Settled Districts. This increased pressure on Aboriginal Tasmanians as it took away valuable Kangaroo hunting grounds and lead to a period of increased conflict between settlers and Aborigines. Under political pressure from settlers, Governor Arthur increased a military presence in the Campbell Town and Launceston districts with the conflict largely concluding by 1832 (Ryan, 2012, p. 196).



Plate 1. 1827 Parish Map of Epping - Archives Office of Tasmania AF396-1-964

3.4.3 Midland Highway

Following Laycock's journey between Hobart and Port Dalrymple, Surveyor Grimes formally marked out a track in 1807 (Dowd, 1966). This route was referred to as the 'Main Road' or 'Hobart Road' until the 1930s when it became known as the Midland Highway. The road was largely a track until 1821 when construction of a formal macadamized road began under Major Bell and was not completed until 1850 (Alexander, 2006).



The road was sealed as two lane highway in the $19\overline{305}$, with modifications in the 1960s, 1980s and 2000s to accommodate increases in traffic.

Although located along this major travel route, European settlement patterns in the study area have remained largely rural to the present day. Epping Forest and Powranna appear to have largely formed as service centers to the coaching industry which was initially established along the route in 1834, before servicing motor traffic once automobiles were introduced into the region. A review of historical aerials indicates that most historical farmhouse complex's or manors appear to be set back from the Midland Highway to be in closer proximity to the South Esk River to the north of the study area. Manors near the study area, such as Fairfield (THR No. 4995), appear to be have been deliberately placed back from the Highway in order to create long formal driveways and privacy.

3.5 Pioneer Memorial Highway

3.5.1 Historical background

The Pioneer Memorial Highway was a highway beatification and memorial project for the Midland Highway that was enacted between 1935 and 1941. An earlier attempt was undertaken in 1927 as a memorial project by the Launceston Fifty Thousand League. However only four Poplar trees were planted and the project failed to gain traction (Walker, 2000, p. 87). The primary driving force behind the scheme was to become Alan Wardlaw, a member of the Legislative Council (MLC) and World War I veteran, who would harness these earlier energies as part of a grander beautification project.

Wardlaw had a strong appreciation for landscapes and was likely influenced by the social, religious and economic arguments of the earlier botanical garden movement he encountered in Europe during World War I (Walker, 2000, p. 84). The idea of creating Tasmania as a 'Garden of Eden' or 'Garden State' through deliberate cultivation of the landscape was seen as linking morality and nature and important for promoting a good society (Wardlaw, 1924). Such a project was seen by Wardlaw as being important in breaking Tasmania from its 'Gothic' past (i.e convict past that remained a deep source of shame at the time) and pushing towards social improvement.

A secondary outcome would be economic, with Wardlaw promoting the tourism benefits of such a scheme to make Tasmania a major tourism destination. Here, Wardlaw built on earlier arguments by ET Emmet that plantings of exotic trees could provide seasonal attractions for tourist in much the same way as the cherry blossom season in Japan and autumn season in parts of Europe and America (Austral, 2014a, p. V). During the 1920s Wardlaw made contact with Tasmanian horticulturists Frank and John Walker in Launceston and Louis Shoobridge in Hobart. John Walker and Shoobridge MLC were in alignment with Wardlaw having themselves been influenced by the landscape architecture movement in North America (Austral, 2014a, p. 16).

As part of his grander vision, Wardlaw enacted the State Horticultural Scheme in 1932 and then looked to embark on a beatification of the Midland Highway. This project was to establish a Pioneer Avenue from Launceston to Hobart in the form of discontinuous groupings of exotic, deciduous, coniferous and indigenous trees. As a pragmatist, Wardlaw sort to engage grass root support through the Launceston Fifty Thousand League to gain financial support for the project. As such memorial elements commemorating filial links to pioneers were incorporated into the project to gain public support and funding. Articles in the *Examiner* and *Mercury* invited public subscriptions with donors receiving small bronze plaques commemorating a pioneer ancestor to be place on a tree guard (Mercury, 1935) (Examiner, 1935).

The scheme was initiated in 1935 with both public and Government funding and with a Technical Committee overseen by John Walker and Shoobridge. Although the first year of planting was initially successful, the scope of project was found to be much larger than had been initially anticipated and short of the necessary



funding. Wardlaw approached the State Premier Albert $b_{\rm g}$ ilvie, who endorsed the project based on its beautification objectives (Walker, 2000, p. 89).

Planting continued through to 1941 with over 6,000 trees being planted. Planting was supervised from the northern end by John Walker and the southern end by Louis Shoobridge, until his death in 1939 at which stage John Walker took over responsibility for all plantings. Shoobridge's death was preceded by Wardlaw's in 1938 and followed by Ogilvie's also in 1939. The death of three of the main driving forces for the project was a heavy blow and although Walker was able to complete the project in 1941, subsequent support for maintenance and expansion of the scheme failed to materialize (Austral, 2014a, p. V). In 1978 a revival of the project was organized as part of the Midland Highway Corridor Plan, however this was not as extensive in scope as the original scheme and was discontinued in 1991 (Walker, 2000, pp. 90-91).

3.5.2 Technical background

The design of the Pioneer Memorial Avenue appears to have two main phases, the first being influenced by traditional memorial avenues and the second being landscape beautification. The first phase appears to be mainly influenced by efforts to fund and administer the scheme through public subscription during the early years of the scheme. Articles in the *Examiner* and *Mercury* invited public subscriptions with donors receiving small bronze plaques commemorating a pioneer ancestor to be place on a tree guard (Mercury, 1935) (Examiner, 1935). These initial plantings occurred near Hobart and Launceston and detailed plans for these sections noting individual and group donors were made (Austral, 2014a, p. 18), most likely to help match plaques with individual trees. Design of plantings for these sections appears to consist mostly of traditional parallel linear avenue plantings, as is typically encountered with World War I and other commemorative plantings of the era.

The transition from memorial to landscape beautification phase would appear to have largely occurred after the Ogilvie government took over funding for the scheme. John Walker appears to have been the driving force behind the design which focused on 'curating' the landscape, rather than simply creating planted avenues. Walker was more intent on sympathetic landscape plantings that drew attention to natural features, accentuated views and created seasonal effects. In a letter to Wardlaw (Walker J. , 1935), Walker outlined three different approaches to plantings on the highway:

- Sections suitable for plantings of avenues and single lines of trees;
- Exposed sections where deciduous trees were not recommended; and,
- Sections of highway in established native forest, where plantings were not required.

Walker was influenced by the landscape architect movement of his time, particularly in regards to highways, and described this break with traditional ideas of memorial planting in correspondence as follows:

No attempt should be made to plant the whole route, but wherever suitable conditions exist, it should be done, this would leave whole districts untouched, which eventually, would prove advantageous, as the approach to planted areas by the force of contrast, would appear infinitely more attractive, then would be the case, if all the distance were planted (Walker J., 1935).

Walker described the intended final outcome of this design for landscape beatification as:

No good views will be obscured on the Pioneer Avenue. In some parts there will be fairly long distances between plantings, whilst the longest planting will be only a few minutes to pass in a car travelling at the ordinary pace. Even when passing through a line of trees the mountains will still be visible but, instead of seeing them over a wire fence and across an uninteresting foreground and middle distance, they will appear through beautiful trees either green or in their lovely Autumn tint (Walker J., ca. 1934).



To achieve this outcome, Walker advised planting groups of approximately 40 plantations or key groupings of avenues over a distance of 1.2 kilometres. Trees would be not be planted with regularity, in order to prevent monotony, but would vary depending on terrain, habitat and species of tree used (Austral, 2014a, p. 19)

3.6 Historical Context Summary and Research Themes

Contextual analysis is undertaken to place the history of a particular site within relevant historical contexts in order to gauge how typical or unique the history of a particular site actually is. This is usually ascertained by gaining an understanding of the history of a site in relation to the broad historical themes characterizing Australia at the time. Such themes have been established by the THC and are outlined in synoptic form in Assessing Historic Heritage Significance (DPIPWE, 2011).

There are 14 key historical themes, which have been developed for Tasmania, as well as nine National Historical Themes. These broader themes are usually referred to when developing sub-themes for a local area to ensure they compliment the overall thematic framework for the broader region. A review of the contextual history in conjunction with the key historical themes in *Assessing Historic Heritage Significance* (DPIPWE, 2011) has identified three historical themes which relate to the history of the study area. These are summarised in Table 2 but relate primarily to the early exploration and survey of Hobart Road; rural industries associated with the study area; and the Pioneer Memorial Highway.

While the Midland Highway itself roughly aligns to those routes plotted by Laycock and Grimes, tangible heritage vales associated with these survey efforts, such as survey markers, would be very rare survivors and are unlikely to be present. Historical plantings or other historical sites from the early settlement period (1820s onwards) are likely and would likely include agricultural windbreaks or infrastructure. As noted in Section 3.4.2, a review of aerials indicates that homestead sites were set back from the highway so house sites are unlikely to be present, although ornamental entranceway plantings and infrastructure may be present. It is highly likely that Pioneer Memorial Highway historical plantings occur in the study area, but the nature of these plantings will depend on the design factors outlined by Walker in Section 3.5.2 above.

Table 2. Identified Historical Themes for Midland Highway

No.	Dates	Theme
(iv)	1807 to 1821	Exploration and survey
(vii)	1820s to current	Agricultural, orcharding and pastoral industries
(xii)	1927 to 1941	Memorialising the past, people and societies achievements

4 Site Investigation

4.1 Introduction

A field inspection of the study area was undertaken on 5 November 2015, attended by Asher Ford, consultant archaeologist and Kirsty Kay, senior ecologist of Biosis. The principal aims of the survey were to identify historic plantings and to identify any other previously unrecorded heritage items which may be present.

4.2 Site Setting

The study area extends along a 15.5 kilometre section of the Midland Highway from Epping Forest to north of Powranna Road in a rural context. The topography consists of undulating plains and the highway crosses nine creek tributaries connecting to the South Esk River to the north. Heading north from Epping Forest, the first 7.5 kilometers of the Highway is a mix of native forest and agricultural land (Plate 2, Figures 3.12 to 3.17). A review of aerials (see Annex A for 1947 and 1980s aerials) indicates that some vegetation clearing has occurred in this area between 1947 and 1980, but very few windbreaks or other typical agricultural plantings have been established. No plantings associated with the Pioneer Memorial Highway occur in this section, as during the 1930s it would have been intact remnant native forest. As per Walker's design strategy, the native forest would not have been modified in order to serve as a contrast for other formal plantings,

Although no historical plantings are located in this first section, just north of Epping Forest is a crash marker, indicating a road fatality. Flowers and other memorial items have been placed on the *Eucalyptus* next to this marker to memorialize the individual involved in this road fatality (Plate 3). This tree has been marked as C1-01 and is shown on Figure 3.17 (E528822 N5377310). Although not historically significant, this tree may have significance to family and friends of the individual involved in the crash, which may need to be considered as part of future road management activities.

North of the initial native forest area, the remainder of the study area is mainly rural agricultural in nature. Plantings in this section include formal decorative plantings associated with the Pioneer Memorial Highway (Plate 4, Figures 3.1 to 3.9), agricultural windbreaks (Plate 5, Figure 3.10) and formal plantings on entranceways to properties (Plate 6, Figure 3.4). This section of the study area includes 13 formal planting arrangements associated with the Pioneer Memorial Highway, which are discussed in more detail in Section 4.3. A review of aerial photographs and survey results indicates that the vast majority of agricultural windbreak plantings occurred after 1947. Extensive plantings in the 1980s were established to block views of feed lots near Powranna (see Figure 3.7 to 3.9) that have subsequently obscured earlier Pioneer Memorial Highway plantings in these areas. Formal plantings on property entranceways are relatively rare and post 1947 in age, with earlier examples near Powranna visible in 1947 and 1980 aerials having since been removed.

The 13 formal planting arrangements associated with the Pioneer Memorial Highway are the only historically significant plantings in the study area. Windbreak and visual obscuration plantings present in the study area are largely functional and relatively recent in age. Formal driveway plantings are also relatively recent in age and are not linked to any known historical associations that would make them significant, either locally or at a State level.

Other than plantings, no other historical features were identified.



Plate 2. Native forest and paddocks just north of Epping Forest



Plate 3. Native forest and paddocks just north of Epping Forest, with road fatality memorial tree in foreground



Plate 4. A linear row of Himalayan Cedar Pioneer Memorial Highway plantings



Plate 5. Radiata pine windbreak



Plate 6. Formal entranceway planting with Italian Cedar (post 1947 in age)

4.3 Historic Plantings

There are 171 trees located in 13 formal planting arrangements associated with the Pioneer Memorial Highway within the study area. While all of these plantings were likely to have been originally planted between 1935 and 1941, not all of the original trees have survived. In some instances attempts at replanting lost trees has occurred, most likely during the revival of the project between 1978 and 1991. However in most cases replanting of lost trees has not occurred and larger formations have been reduced. A discussion of each planting is provided below.

4.3.1 Historic Plantings 1 - Poplar plantings

Historic Plantings 1 - Poplar plantings

Location: Lot 1 Midland Highway Powranna 7300 (Figure 3.9)

Description: A complex arrangement of two arrow and five linear plantings of Lombardy Poplars was originally planted on the eastern and western sides of this creek crossing. While the complete formation is still visible in the 1980 aerials, subsequent road upgrades and expansion of stock yards has removed three of the linear formations and modified one of the arrow formations. A description of surviving formations is provided below.

An arrow formation of formation of six *Populus nigra* 'Italica' Lombardy Poplars is located in the western section of the creek line, with all original trees surviving.

A linear formation of formation of seven *Populus nigra* '*Italica*' Lombardy Poplars is located in the wstern section of the creek line, south of the arrow formation.

A linear of formation of four *Populus nigra 'Italica'*Lombardy Poplars is located in the eastern section of the creek line. This was originally an arrow formation but three plantings have since been removed and only the "base" of the arrow survives.

A linear formation of nine Lombardy Poplars is located in the creek line to the east of the Highway, north of the arrow formation. The majority of original plantings survive, however due to gaps in the row, it is possible up to six original plantings did not survive. White Poplars are suckering in this area.

Aerial photos indicated that three linear formations paralleled the highway but these have since been removed. White Poplars are suckering in this area.



Poplars in linear formation (west of Highway)



Poplars in arrow formation (west of Highway)

1 - 325

Historic Plantings 1 - Poplar plantings

The age of the trees indicates that they date to the 1930s Pioneer Memorial Avenue plantings, but have unlike many plantings have been actively maintained.



Surviving Poplar arrow formation (east of Highway)



Linear Poplar formation and surviving arrow formation Poplars (east of Highway)

Tree No.	Species	Easting	Northing	
P1-01	Populus nigra 'Italica'	524214	5383407	
P1-02	Populus nigra 'Italica'	524189	5383403	
P1-03	Populus nigra 'Italica'	524172	5383395	
P1-04	Populus nigra 'Italica'	524205	5383390	
P1-05	Populus nigra 'Italica'	524181	5383380	
P1-06	Populus nigra 'Italica'	524193	5383366	
P1-07	Populus nigra 'Italica'	524250	5383353	
P1-08	Populus nigra 'Italica'	524249	5383363	
P1-09	Populus nigra 'Italica'	524251	5383339	
P1-10	Populus nigra 'Italica'	524251	5383328	
P1-11	Populus nigra 'Italica'	524250	5383313	
P1-12	Populus nigra 'Italica'	524252	5383302	
P1-13	Populus nigra 'Italica'	524251	5383290	
P1-14	Populus nigra 'Italica'	524323	5383466	
P1-15	Populus nigra 'Italica'	524332	5383455	



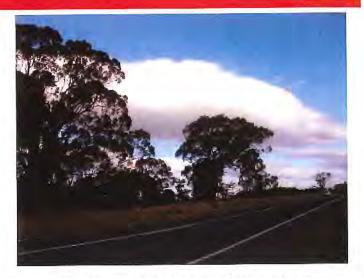
1-326				
Historic Plantin	igs 1 - Poplar plantings			
P1-16	Populus nigra 'Italica'	524338	5383448	
P1-17	Populus nigra 'Italica'	524345	5383441	
P1-18	Populus nigra 'Italica'	524306	5383472	
P1-19	Populus nigra 'Italica'	524327	5383488	
P1-20	Populus nigra 'Italica'	524339	5383495	
P1-21	Populus nigra 'Italica'	524347	5383500	
P1-22	Populus nigra 'Italica'	524356	5383509	
P1-23	Populus nigra 'Italica'	524375	5383523	
P1-24	Populus nigra 'Italica'	524416	5383552	
P1-25	Populus nigra 'Italica'	524427	5383558	
P1-26	Populus nigra 'Italica'	524438	5383565	

4.3.2 Historic Plantings 2 – Eucalyptus plantings

Historic Plantings 2 - Eucalyptus plantings

Location: Lot 1 Midland Highway Powranna 7300 (Figure 3.9)

Description: Located on the eastern side of the Highway, this planting originally include nine *Eucalyptus* trees in a linear formation. Only three of these trees have survived and are now surrounded by revegetation plantings. The age of the trees indicates that they date to the 1930s Pioneer Memorial Avenue plantings.



Linear Eucalyptus formation looking southeast

Tree No.	Species	Easting	Northing	
P2-01	Eucalyptus spp.	523991	5383830	
P2-02	Eucalyptus spp.	524015	5383803	
P2-03	Eucalyptus spp.	524037	5383771	



4.3.3 Historic Plantings 3 - Arizona Cypress plantings

Historic Plantings 3 - Arizona Cypress plantings

Location: Lot 1 Midland Highway Powranna 7300 (Figures 3.8 and 3.9)

Description: Located on the western side of the Highway, this planting originally included 15 *Cupressus arizonica* Arizona Cypress trees in a linear formation. Only 10 of the cypress trees have survived and are in varying conditions of health. The age of the trees indicates that they date to the 1930s Pioneer Memorial Avenue plantings.



Linear Arizona cypress formation looking northwest

Tree No.	Species	Easting	Northing	
P3-01	Cupressus arizonica	523869	5383927	
P3-02	Cupressus arizonica	523861	5383938	
P3-03	Cupressus arizonica	523852	5383950	
P3-04	Cupressus arizonica	523843	5383964	
P3-05	Cupressus arizonica	523835	5383975	
P3-06	Cupressus arizonica	523825	5383988	
P3-07	Cupressus arizonica	523816	5383998	
P3-08	Cupressus arizonica	523797	5384024	
P3-09	Cupressus arizonica	523761	5384073	
P3-10	Cupressus arizonica	523743	5384098	

4.3.4 Historic Plantings 4 - Poplar plantings 1-328

Historic Plantings 4 - Poplar plantings

Location: Lot 1 Midland Highway Powranna 7300 (Figure 3.8)

Description: Located on the eastern side of the Highway, this planting originally included nine *Populus trichocarpa* Black Cottonwood Poplars in an arrow formation. Only 4 of the Poplar trees have been identified as surviving, however other trees may have survived but are not visible due to dense revegetation plantings. The age of the trees indicates that they date to the 1930s Pioneer Memorial Avenue plantings.



Black Cottonwood Poplar formation looking northeast

Tree No.	Species	Easting	Northing	
P4-01	Populus trichocarpa	523833	5384047	
P4-02	Populus trichocarpa	523845	5384032	
P4-03	Populus trichocarpa	523807	5384078	
P4-04	Populus trichocarpa	523819	5384064	

4.3.5 Historic Plantings 5 - Poplar plantings 1-329

Historic Plantings 5 - Poplar plantings

Location: 14532 Midland Highway Powranna 7300 (Figure 3.8)

Description: Located on the western and eastern sides of the Highway. This planting originally included 12 *Populus nigra 'Italica'* Lombardy Poplars in a V formation on the western side and a linear planting of ten Poplars on the eastern side.

Of the western V formation, six Poplars are located on the north wing while four of the six original Poplars survive on the southern wing.

All of the linear plantings on the eastern side appear to have survived but have been encroached upon by new plantings blocking line of site to feed pens.

The age of the trees indicates that they date to the 1930s Pioneer Memorial Avenue plantings.



Poplar formation looking northwest (west of Highway)

Tree No.	Species	Easting	Northing	
P5-01	Populus nigra 'Italica'	523403	5384452	
P5-02	Populus nigra 'Italica'	523415	5384458	
P5-03	Populus nigra 'Italica'	523426	5384463	
P5-04	Populus nigra 'Italica'	523436	5384469	
P5-05	Populus nigra 'Italica'	523445	5384474	
P5-06	Populus nigra 'Italica'	523459	5384471	
P5-07	Populus nigra 'Italica'	523458	5384459	
P5-08	Populus nigra 'Italica'	523458	5384446	
P5-09	Populus nigra 'Italica'	523456	5384409	
P5-10	Populus nigra 'Italica'	523484	5384525	
P5-11	Populus nigra 'Italica'	523493	5384532	
P5-12	Populus nigra 'Italica'	523503	5384539	
P5-13	Populus nigra 'Italica'	523514	5384545	
P5-14	Populus nigra 'Italica'	523526	5384551	
P5-15	Populus nigra 'Italica'	523538	5384555	
P5-16	Populus nigra 'Italica'	523549	5384559	



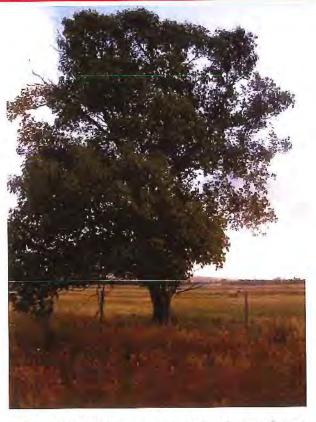
Historic Plantings 5 - Poplar plantings				
Populus nigra 'Italica'	523558	5384564		
Populus nigra 'Italica'	523569	5384570		
Populus nigra 'Italica'	523580	5384578		
Populus nigra 'Italica'	523457	5384482		
	Populus nigra 'Italica' Populus nigra 'Italica' Populus nigra 'Italica'	Populus nigra 'Italica' 523558 Populus nigra 'Italica' 523569 Populus nigra 'Italica' 523580		

4.3.6 Historic Plantings 6 - Poplar planting

Historic Plantings 6 - Poplar planting

Location: 14532 Midland Highway Powranna 7300 (Figure 3.7)

Description: Located on the western side of the highway, this Black Cottonwood Poplar is the sole survivor of the original linear planting in this section shown in the 1947 aerials. The age of this tree indicates that it dates to the 1930s Pioneer Memorial Avenue plantings.



A single Black Cottonwood Poplar looking northwest

Tree No.	Species	Easting	Northing	
P6-01	Populus trichocarpa	523142	5384916	

Historic Plantings 7 - Elms plantings

Location: 14532Midland Highway Perth 7300 (Figure 3.7)

Description: Four mature *Ulmus minor* or English Elms located on western verge of highway. These trees were originally arranged in a block formation of five trees but one has not survived. It is possible that additional trees were originally planted but have not survived. The age of the trees indicates that they date to the 1930s Pioneer Memorial Avenue plantings.



Elm plantings looking northeast

15 5385200
5385217
94 5385230
5385212
(

4.3.8 Historic Plantings 8 - Cleighdion plantings 332

Historic Plantings 8 - Cleighdion plantings

Location: 14638 Midland Highway Perth 7300 (Figure 3.6)

Description: These plantings located around the Cleighdion entranceway includes four complementary tree formations positioned around a semi-circular entrance way and located either side of the highway. The age of the trees indicates that they date to the 1930s Pioneer Memorial Avenue plantings, but unlike many plantings have been actively maintained on the eastern side.

An arrow formation of 13 Ulmus minor or English Elms is located on a small rise above the driveway. While a complete arrow formation is shown in the 1947 aerials, a number of trees in the western end of the formation did not survive to maturity. It appears that at least two attempted re-plantings have subsequently been undertaken to attempt to complete the formation, with only nine of the current elms dating to the original plantings.

Directly south of the Elm arrow formation is a single *Populus deltoides* Eastern Cottonwood Poplar, placed next to a small pond. Three Lombardy Poplars have been placed around the Eastern Cottonwood.

South of the Poplars a linear row of four *Cedrus deodara* Himalayan Cedar has been located parallel to the highway. Two remanent *Eucalyptus* trees are located behind this row and it is uncertain if the cedars were placed to take asthetic advantage of these trees.

Opposite the eastern linear Cedar planting on the western side of the highway are two surviving Himalayan Cedars. These two Cedars were part of larger linear planting that mirrored the eastern plantings, but are the only survivors.



Central Poplar plantings looking north



Elm formation looking northeast



Cedar linear planting looking southeast (east of Highway)



Two Cedars looking southeast (west of Highway)

Tree No.	Species	Easting	Northing
P8-01	Ulmus minor	522652	5385805
P8-02	Ulmus minor	522643	5385789
P8-03	Ulmus minor	522636	5385774
P8-04	Ulmus minor	522679	5385761
P8-05	Ulmus minor	522665	5385752
P8-06	Ulmus minor	522706	5385720
P8-07	Ulmus minor	522686	5385719
P8-08	Ulmus minor	522670	5385720
P8-09	Ulmus minor	522639	5385717
P8-10	Ulmus minor	522655	5385717
P8-11	Ulmus minor	522623	5385715
P8-12	Ulmus minor	522606	5385715
P8-13	Ulmus minor	522614	5385731
P8-14	Populus deltoides	522645	5385673
P8-15	Cedrus deodara	522678	5385625
P8-16	Cedrus deodara	522691	5385609
P8-17	Cedrus deodara	522700	5385596
P8-18	Cedrus deodara	522711	5385583
P8-19	Eucalyptus ovata	522694	5385583
P8-20	Cedrus deodara	522723	5385633
P8-21	Eucalyptus ovata	522725	5385590



8 - Cleighdion plantings	1-334	
Cedrus deodara	522707	5385590
Populus nigra 'Italica'	522622	5385673
Populus nigra 'Italica'	522636	5385692
Populus nigra 'Italica'	522654	5385690
Cedrus deodara	522699	5385497
	Cedrus deodara Populus nigra 'Italica' Populus nigra 'Italica' Populus nigra 'Italica'	Cedrus deodara 522707 Populus nigra 'Italica' 522622 Populus nigra 'Italica' 522636 Populus nigra 'Italica' 522654

4.3.9 Historic Plantings 9 - Mixed plantings

Historic Plantings 9 - Mixed plantings

Location: 14743 and Lot 1 Midland Highway Powranna 7300 (Figure 3.4 and 3.5)

Description: Located on the western side of the highway, this mixed linear planting extends for 1.3 kilometres along the highway. 32 trees survive in this planting including 17 mixed *Eucalyptus* species, eight *Fraxinus angustifolia* Ash trees, five *Populus alba* White Poplar trees, one Lombardy Poplar and one *Cupressus macrocarpa* Monterey Cypress.

For the majority of the route tree species are alternated between *Eucalyptus* and Ash trees, with five wider spaced central White Poplar trees then forming a break in the pattern.

Many of the Ash trees have not survived and it is possible that the currently present. Ash as well as the single Cypress appear to be later plantings trying to shore up the formation.

The age of the *Eucalyptus* trees and White Poplars indicates that the original plantings date to the 1930s Pioneer Memorial Avenue plantings. This formation is unusual in that it is much longer than linear plantings typically recommended by Walker in his design approaches.



Ash and *Eucalyptus* trees on south of formation looking south



Eucalyptus trees at northern end of formation looking north



Central White Poplars looking north

Tree No.	Species	Easting	Northing
P9-01	Fraxinus angustifolia	522130	5386280
P9-02	Corymbia maculata	522113	5386297
P9-03	Fraxinus angustifolia	522104	5386318
P9-04	Fraxinus angustifolia	522075	5386352
P9-05	Eucalyptus ovata	522058	5386372
P9-06	Eucalyptus spp	522032	5386407
P9-07	Eucalyptus spp.	522006	5386446
P9-08	Fraxinus angustifolia	521995	5386465
P9-09	Eucalyptus ovata	521978	5386482
P9-10	Fraxinus angustifolia	521966	5386503
P9-11	Fraxinus angustifolia	521938	5386540
P9-12	Eucalyptus spp.	521920	5386559
P9-13	Fraxinus angustifolia	521913	5386576
P9-14	Eucalyptus spp.	521890	5386594
P9-15	Populus alba	521882	5386613
P9-16	Populus alba	522173	5386323
P9-17	Populus alba	522189	5386303
P9-18	Populus alba	522204	5386282
P9-19	Populus alba	521821	5386695
P9-20	Populus alba	521772	5386758

Historic Plantings 9 - Mixed plantings				
P9-21	Eucalyptus spp.	521715	5386833	
P9-22	Eucalyptus spp.	521653	5386919	
P9-23	Eucalyptus spp.	521599	5386990	
P9-24	Eucalyptus spp.	521583	5387008	
P9-25	Eucalyptus spp.	521572	5387026	
P9-26	Eucalyptus ovata	521557	5387044	
P9-27	Populus nigra 'Italica'	521543	5387059	
P9-28	Eucalyptus spp.	521499	5387117	
P9-29	Eucalyptus spp.	521446	5387186	
P9-30	Eucalyptus spp.	521433	5387206	
P9-31	Eucalyptus spp.	521404	5387244	
P9-32	Cupressus arizonica	521357	5387298	

4.3.10 Historic Plantings 10 - Poplar plantings

Historic Plantings 10 - Poplar plantings

Location: 14872 Midland Highway Perth 7300 (Figure 3.3)

Description: Linear row of nine mature Lombardy Poplars located on eastern verge of highway. The age of the trees indicates that they date to the 1930s Pioneer Memorial Avenue plantings.



Lombardy Poplar plantings looking northeast (east of Highway)

Tree No.	Species	Easting	Northing
P10-01	Populus nigra 'Italica'	520656	5387886



Historic Plantings 10 - Poplar plantings				
P10-02	Populus nigra 'Italica'	520670	5387877	
P10-03	Populus nigra 'Italica'	520682	5387867	
P10-04	Populus nigra 'Italica'	520694	5387859	
P10-05	Populus nigra 'Italica'	520708	5387848	
P10-06	Populus nigra 'Italica'	520718	5387839	
P10-07	Populus nigra 'Italica'	520730	5387829	
P10-08	Populus nigra 'Italica'	520740	5387819	
P10-09	Populus nigra 'Italica'	520752	5387809	

4.3.11 Historic Plantings 11 - Mixed plantings

Historic Plantings 2 - Creekline Elms

Location: 14872 Midland Highway Perth 7300 (Figure 3.3)

Description: A mixture of Six mature *Quercus robur* or English Oak and three Lombardy Poplars located either side of a creek on the western side of the highway. These trees were originally arranged in two linear lines along a creekline. It is possible that additional trees were originally planted but have not survived. The age of the trees indicates that they date to the 1930s Pioneer Memorial Avenue plantings.



Oak and Poplar plantings looking southeast (west of Highway)

Tree No.	Species	Easting	Northing
P11-01	Quercus robur	520553	5387904
P11-02	Quercus robur	520554	5387890
P11-03	Quercus robur	520599	5387888
P11-04	Quercus robur	520546	5387838
P11-05	Quercus robur	520528	5387848
P11-06	Populus nigra 'Italica'	520586	5387873
P11-07	Quercus robur	520579	5387906



Historic Plantings 2 - Creekline Elms			
P11-08	Populus nigra 'Italica'	520572	5387860
P11-09	Populus nigra 'Italica'	520568	5387879

4.3.12 Historic Plantings 12 - Cork Oak plantings 339

Historic Plantings 12 - Cork oak plantings

Location: 15046 Midland Highway Perth 7300 (Figure 3.2)

Description: Four mature *Quercus suber* or Cork Oaks are located on the western side of the Highway. These trees were originally arranged in a V pattern, with each wing having four trees. Three trees in the southern wing visible in the 1980 aerial have not survived and one of the trees on the northern wing has also not survived. The age of the trees indicates that they date to the 1930s Pioneer Memorial Avenue plantings.



Cork Oaks looking southwest (west side of Highway)

Tree No.	Species	Easting	Northing
P12-01	Quercus suber	520656	5387886
P12-02	Quercus suber	520670	5387877
P12-03	Quercus suber	520682	5387867
P12-04	Quercus suber	520694	5387859

4.3.13 Historic Plantings 13 - Mixed plantings

Historic Plantings 13 - Mixed plantings

Location: 15046 Midland Highway Perth 7300 (Figure 3.1 and 3.2)

Description: Linear row of predominantly *Cupressus* arizonica Arizona Cypress trees (22 in total) with two *Fraxinus angustifolia* Ash trees intermixed. The planting is located on the eastern side of the highway and has been encroached upon by more recent Radiata pine windbreak plantings. More Ash may have been present but have not survived. The age of the trees indicates that they date to the 1930s Pioneer Memorial Avenue plantings.



Mixture of Himalayan Cypress and Ash linear planting looking northeast (east side of Highway)

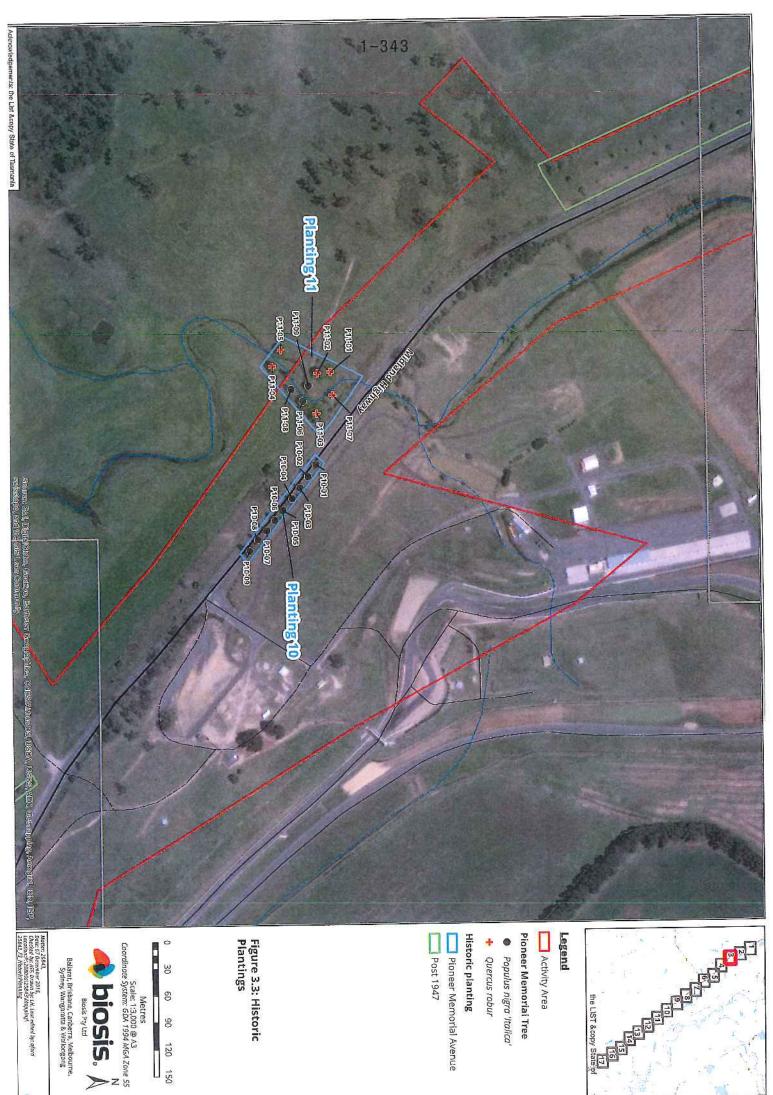
Tree No.	Species	Easting	Northing	
P13-01	Cupressus arizonica	519892	5389320	

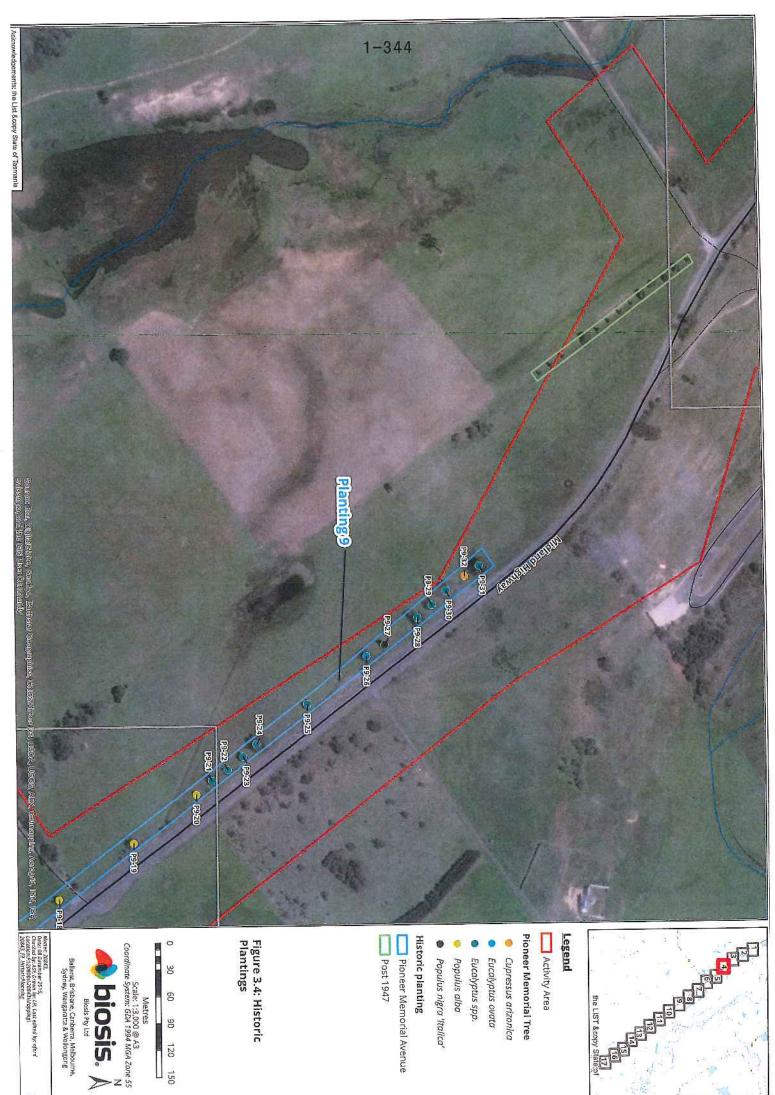


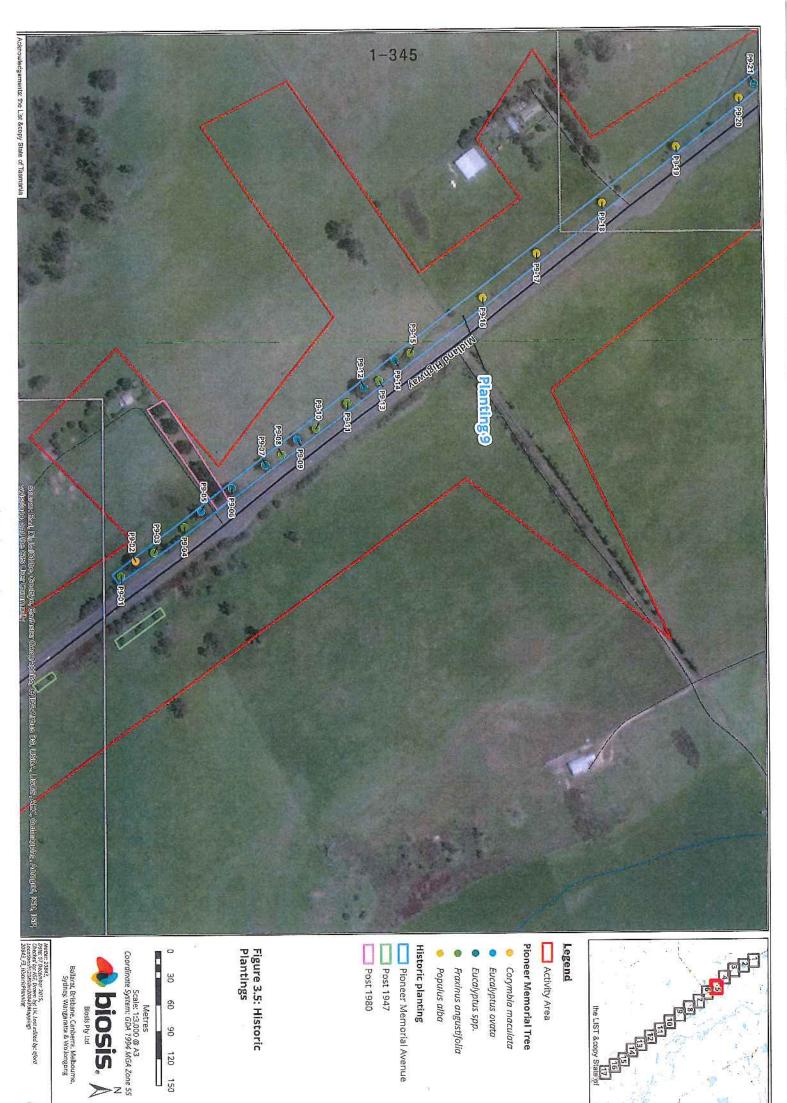
Historic Plantings	13 - Mixed plantings	1-340		
P13-02	Cupressus arizonica	519898	5389307	
P13-03	Cupressus arizonica	519904	5389293	
P13-04	Cupressus arizonica	519909	5389280	
P13-05	Cupressus arizonica	519916	5389265	
P13-06	Cupressus arizonica	519922	5389250	
P13-07	Cupressus arizonica	519945	5389198	
P13-08	Cupressus arizonica	519951	5389183	
P13-09	Fraxinus angustifolia	519958	5389173	
P13-10	Cupressus arizonica	519962	5389157	
P13-11	Cupressus arizonica	519969	5389142	
P13-12	Fraxinus angustifolia	519976	5389127	
P13-13	Cupressus arizonica	519982	5389113	
P13-14	Cupressus arizonica	519988	5389100	
P13-15	Cupressus arizonica	519993	5389087	
P13-16	Cupressus arizonica	520005	5389060	
P13-17	Cupressus arizonica	520000	5389073	
P13-18	Cupressus arizonica	520013	5389044	
P13-19	Cupressus arizonica	520018	5389029	
P13-20	Cupressus arizonica	520026	5389016	
P13-21	Cupressus arizonica	520029	5389002	
P13-22	Cupressus arizonica	520037	5388989	
P13-23	Cupressus arizonica	520043	5388976	
P13-24	Cupressus arizonica	520048	5388960	

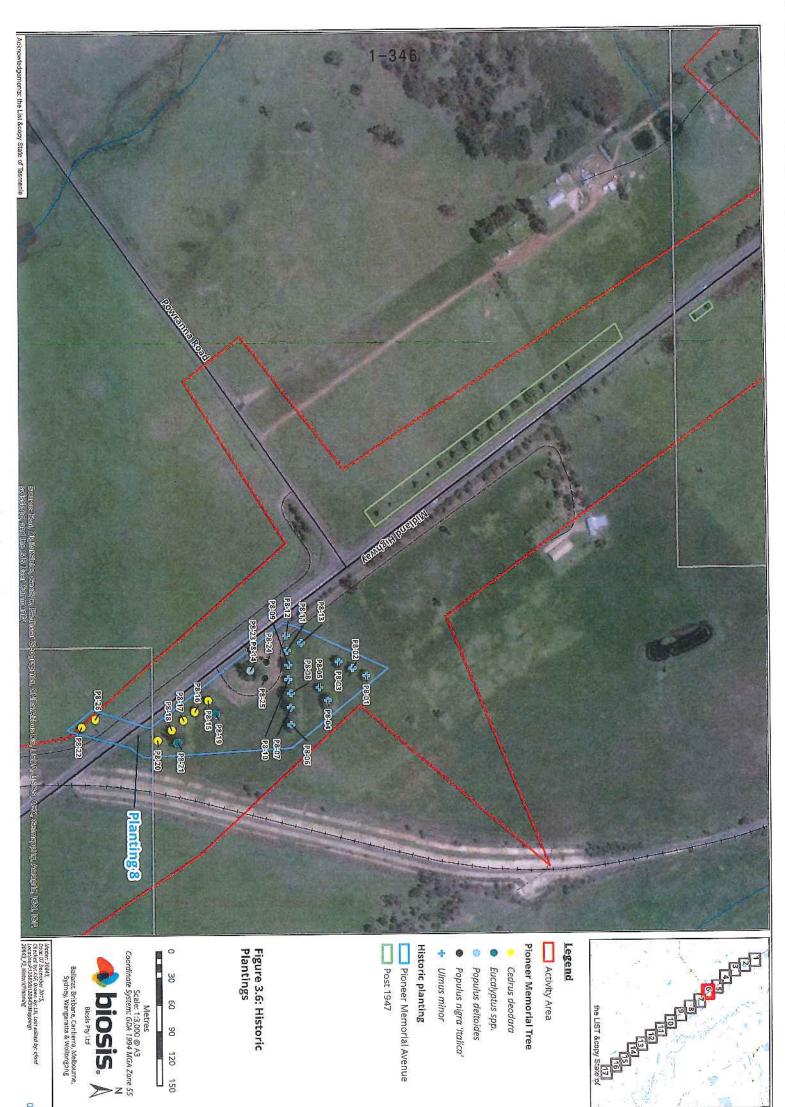




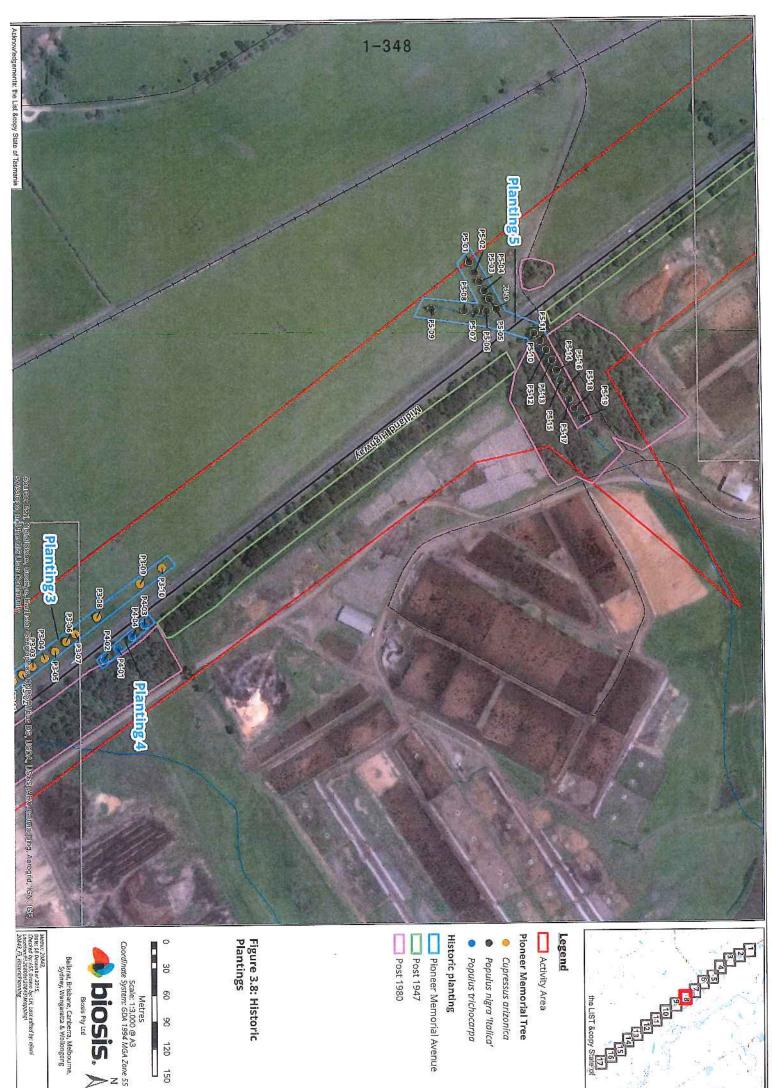


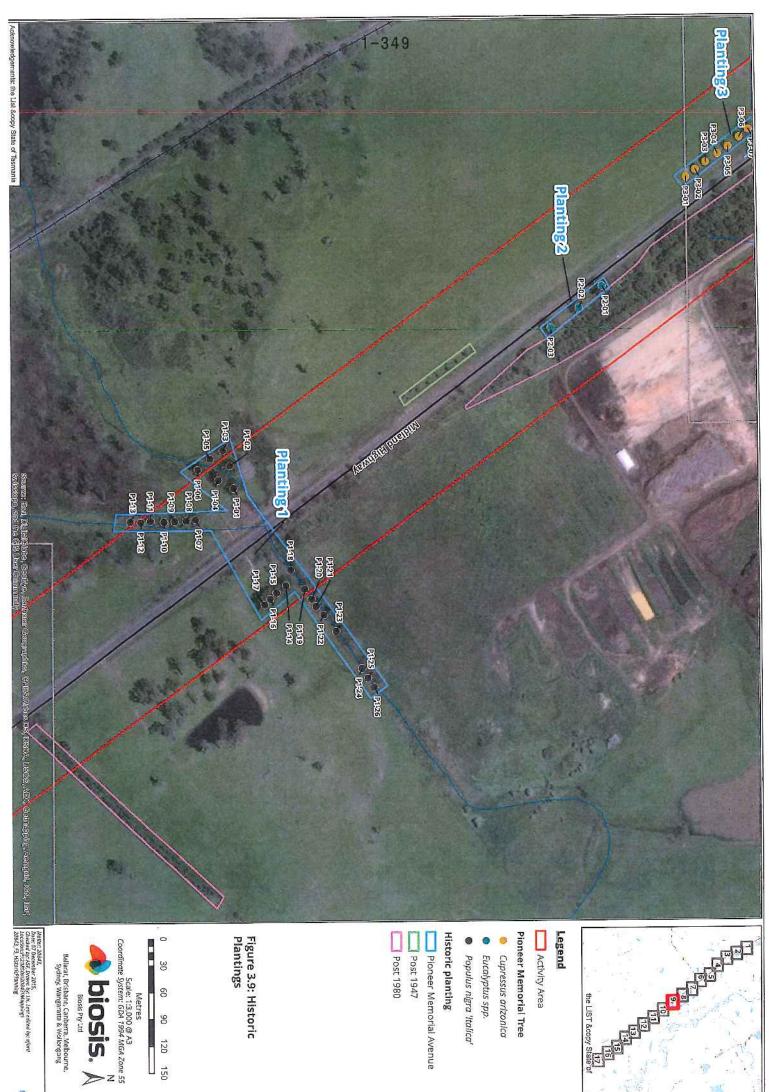


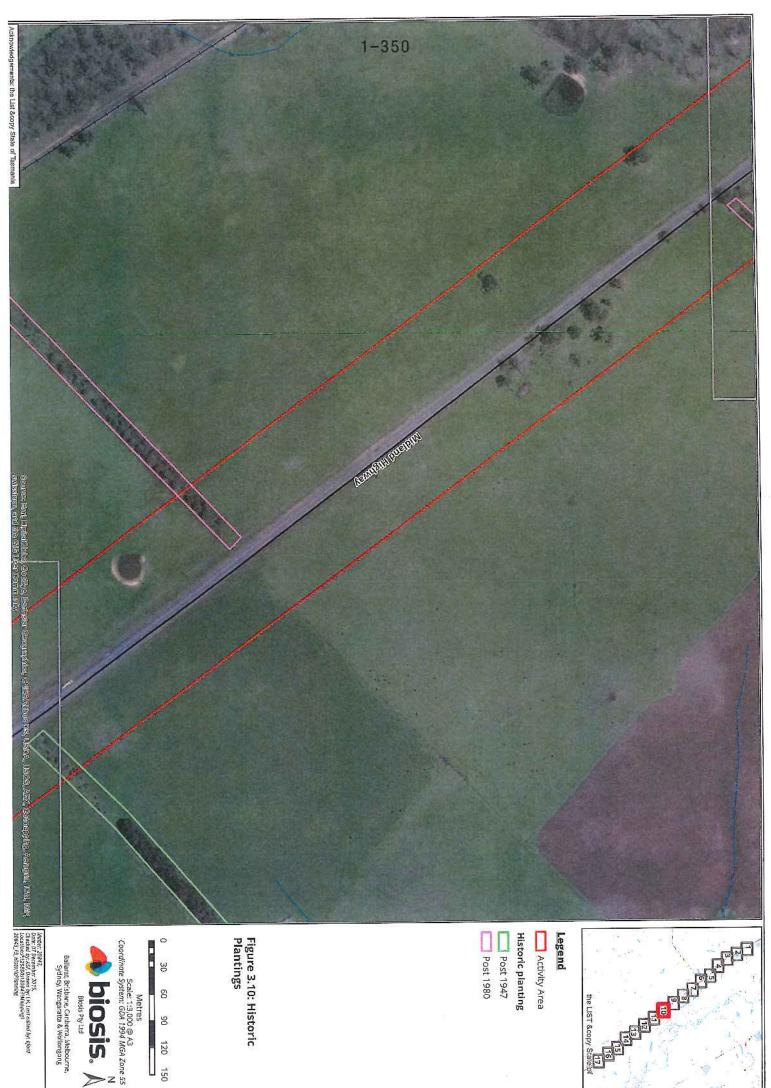


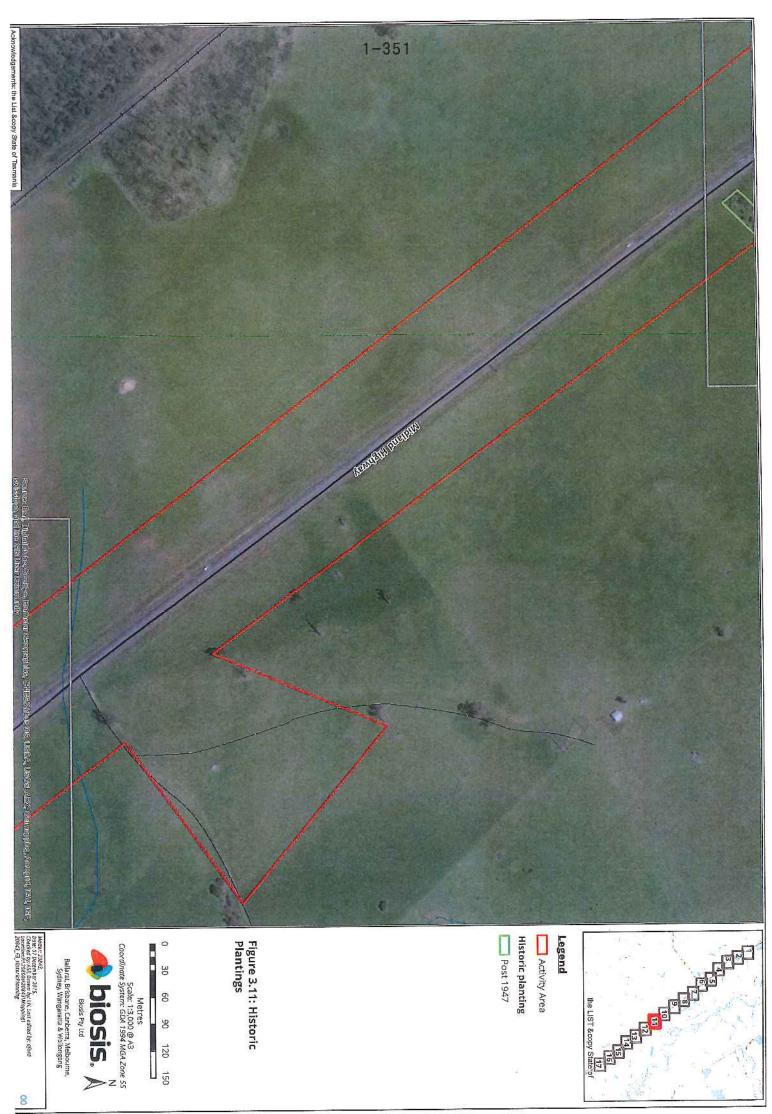










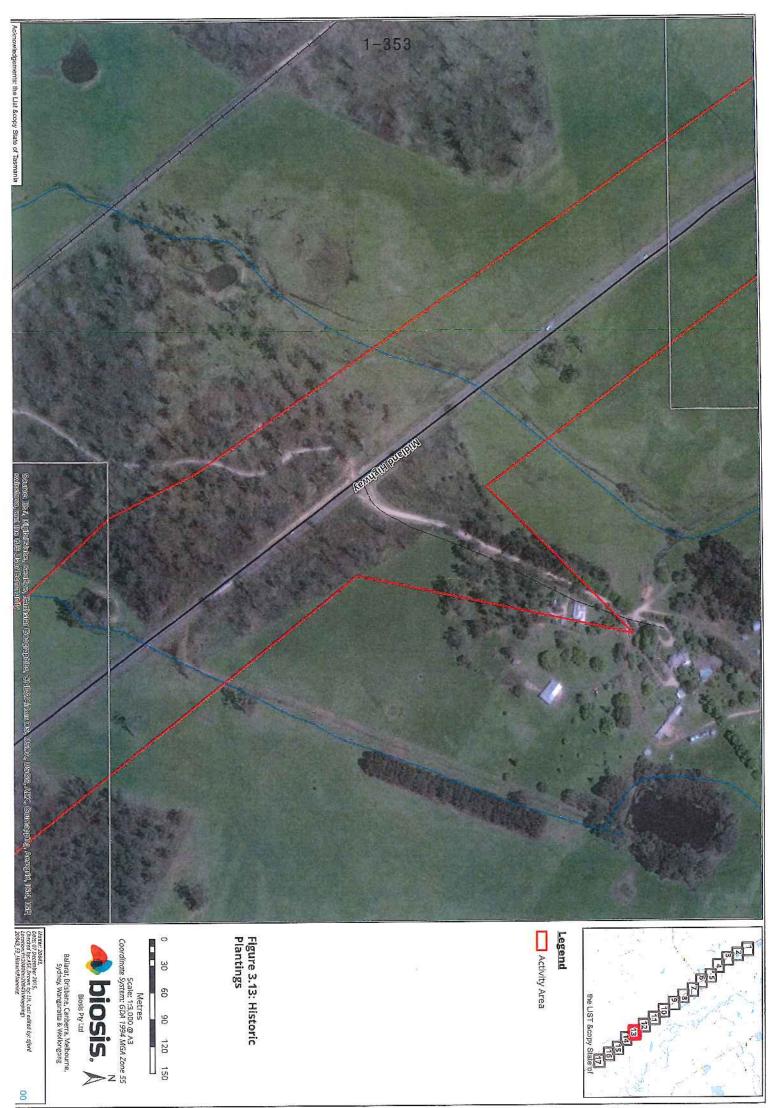




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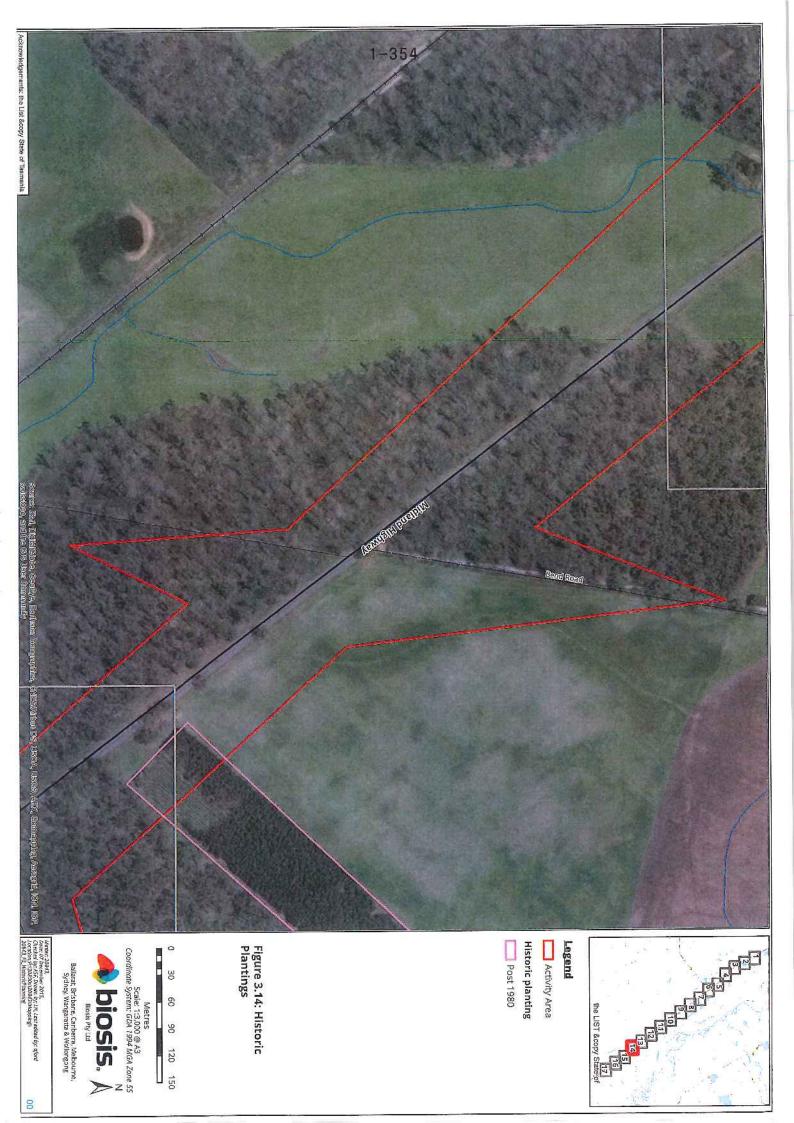
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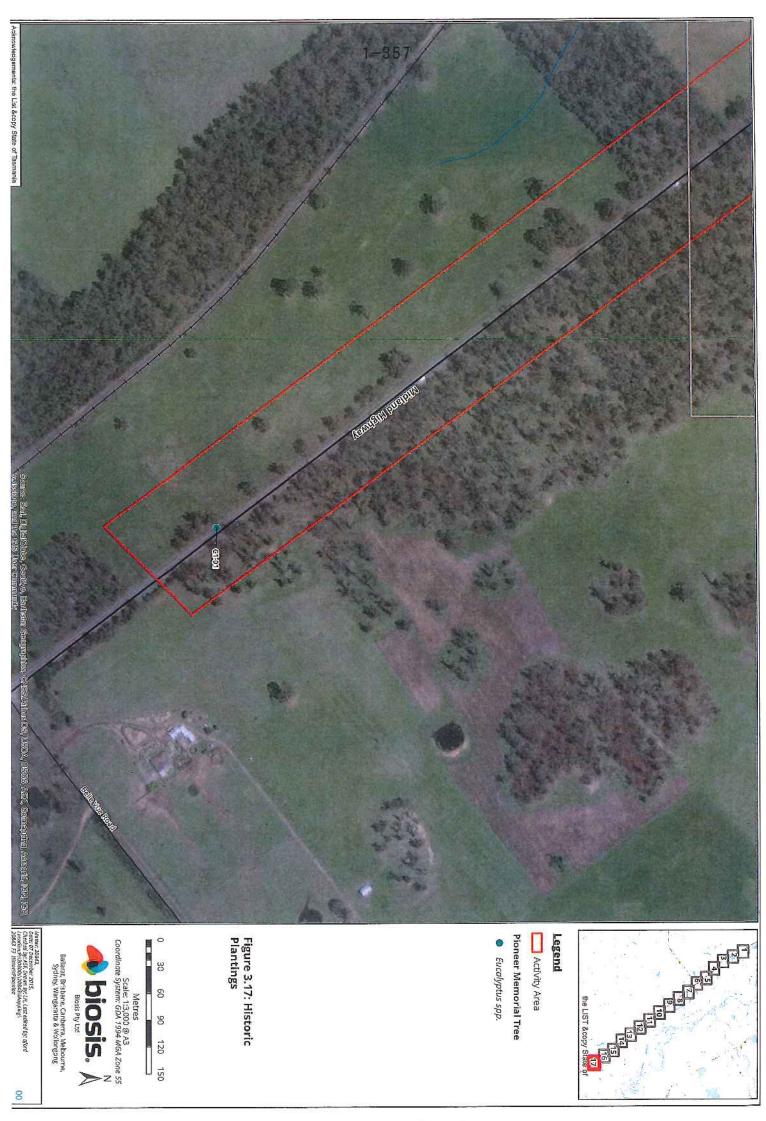
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5 Assessment of Significance 1-358

5.1 Background to assessing significance

An assessment of heritage significance encompasses a range of heritage criteria and values. DPIPWE have published a detailed set of assessment criteria to provide consistency with heritage agencies in other States and to avoid ambiguity and misinterpretation. These criteria are based on the International Council on Monuments and Sites (ICOMOS) Burra Charter. The Tasmanian heritage assessment criteria are detailed in Assessing Historic Heritage Significance (DPIPWE, 2011) and are as follows:

- Criterion (a) It is important in demonstrating the evolution or pattern of Tasmania's history.
- Criterion (b) It demonstrates rare, uncommon or endangered aspects of Tasmanian heritage.
- **Criterion (c)** It has potential to yield information that will contribute to an understanding of Tasmania's history.
- **Criterion (d)** It is important as a representative in demonstrating the characteristics of a broader class of cultural places.
- Criterion (e) It is important in demonstrating a high degree of creative or technical achievement.
- **Criterion (f)** It has strong or special meaning for any group or community because of social, cultural or spiritual associations.
- **Criterion (g)** It has a special association with the life or work of a person, a group or organisation that was important in Tasmania's history.

5.2 Levels of Heritage Significance

Items, places, buildings, works, relics, movable objects or precincts can be of either local or State heritage significance, or have both local and State heritage significance. Places can have different values to different people or groups.

5.2.1 Local heritage items

Local heritage items are those of significance to the local government area. In other words, they contribute to the individuality and streetscape, townscape, landscape or natural character of an area and are irreplaceable parts of its environmental heritage. They may have greater value to members of the local community, who regularly engage with these places and/or consider them to be an important part of their day-to-day life and their identity. Collectively, such items reflect the socio-economic and natural history of a local area. Items of local heritage significance form an integral part of the State's environmental heritage.

5.2.2 State heritage items

State heritage items, places, buildings, works, relics, movable objects or precincts of State heritage significance include those items of special interest in the State context. They form an irreplaceable part of the environmental heritage of Tasmania and must have some connection or association with the State in its widest sense.

The following evaluation attempts to identify the cultural significance of potential archaeological relics with the study area at Epping Forest and Powranna.

5.3 Comparative Analysis

A review of relevant consultancy reports and statutory and non-statutory listings has been undertaken in order to determine how rare the historical plantings in the study area are, or how representative.

There are 171 trees located in 13 formal planting arrangements associated with the Pioneer Memorial Highway within the study area. These plantings include linear and geometric formations aesthetically placed to highlight features in the landscape or to break up views of long straight stretches of highways. Trees used include a variety of native and exotic species, some of which have survived better than others. Few of the formations remain complete and some have been encroached by later windbreak or view screening plantings.

The historical plantings of the Pioneer Memorial Highway have not been subject to an overarching comprehensive assessment, but historic assessments have been undertaken of sections of plantings.

A number of assessments of Pioneer Memorial Highway historic plantings between Ross, Campbell Town, St Peters Pass and Tunbridge were undertaken by Austral in 2014. These studies identified 213 trees in 20 formal plantings arrangements between Campbell Town and Ross (Austral, 2014a), 144 trees in 19 plantings at St Peters (Austral, 2014b) and 11 trees at Tunbridge (Austral, 2014c). Tree species and conditions of these plantings between Campbell Town and Ross and St Peters are comparable to the plantings identified in the study area, while the majority of the plantings at Tunbridge have been removed. All assessments identified the Pioneer Memorial Highway as having State level significance under THR criterion (a), (b), (c), (e) and (g) was also noted its aesthetic and social values (Austral, 2014a, pp. 54-57). The Austral assessments have also identified the Pioneer Memorial Highway project as one unique to Tasmania and with scope to be considered as being rare nationally (Austral 2014a: 56).

Despite these findings of State level significance, it appears that few of the Pioneer Memorial Highway plantings have been nominated to the THR and only one section is currently listed on the THR, two Elm Trees in Perth (THR No. 8201, HO No. 444).

5.3.1 Discussion

The Pioneer Memorial Highway project is a rare example of such a large highway beatlfication project nationally and is unique in Tasmania. Comparatively, the surviving Pioneer Memorial Highway historic plantings in the study area are comparable to, or in better condition than, other surviving plantings of the wider Pioneer Memorial Highway project.

5.4 Evaluation

The following assessment of significance identifies the significance of the project area based upon the criteria above.

Criterion (a) It is important in demonstrating the evolution or pattern of Tasmania's history.

The surviving Pioneer Memorial Highway historic plantings in the study area are part of the wider Pioneer Memorial Highway project. The Pioneer Memorial Highway occurred as part of a wider horticultural movement occurring in Tasmania during the interwar period and is an important physical demonstration of evolving landscape architect design philosophies and ideologies being pursued at the time. The plantings are also an important demonstration of landscape beatification and tourism programs pursued by the State Government and other political actors during the interwar period that then largely lapsed post World War Two.

The Pioneer Memorial Highway historic plantings in the study area meet this criterion at the State level.



Criterion (b) It demonstrates rare, uncommon 364 dangered aspects of Tasmanian heritage.

The Pioneer Memorial Highway project is a rare example of such a large highway beatification project nationally and is unique in Tasmania. The surviving Pioneer Memorial Highway historic plantings in the study area are comparable to or in better condition than other surviving plantings of the wider Pioneer Memorial Highway project.

The Pioneer Memorial Highway historic plantings in the study area meet this criterion at the State level.

Criterion (c) It has potential to yield information that will contribute to an understanding of Tasmania's history.

The Pioneer Memorial Highway project has research potential for understanding the layout of the scheme in its entirety, landscape architecture approaches of the interwar period and botanical species used in the plantings. Documentary records for the Pioneer Memorial Highway project are incomplete and surviving plantings offer a research opportunity to fill some of these gaps.

The Pioneer Memorial Highway historic plantings in the study area meet this criterion at the State level.

Criterion (d) It is important as a representative in demonstrating the characteristics of a broader class of cultural places.

The surviving Pioneer Memorial Highway historic plantings in the study area are comparable to or in better condition than other surviving plantings of the wider Pioneer Memorial Highway project but are not a particularly fine, intact or pivotal example in comparison to other surviving examples.

The Pioneer Memorial Highway historic plantings in the study area do not meet this criterion.

Criterion (e) It is important in demonstrating a high degree of creative or technical achievement.

The surviving Pioneer Memorial Highway historic plantings in the study area are part of the wider Pioneer Memorial Highway project. The Pioneer Memorial Highway occurred as part of a horticultural movement occurring in Tasmania during the interwar period and is an important physical demonstration of evolving landscape architect designs and techniques being used at the time. The scope of the plantings is unique in Tasmania and it is a significant creative achievement.

The Pioneer Memorial Highway historic plantings in the study area meet this criterion at the State level.

Criterion (f) It has strong or special meaning for any group or community because of social, cultural or spiritual associations.

The surviving Pioneer Memorial Highway historic plantings in the study area are not known to have specific values to the community but are likely to be appreciated for their aesthetic values. Unlike Pioneer Memorial Highway plantings near major population centers of Hobart, Launceston and Campbell Town, individual trees are unlikely to have been used to memorialize individual pioneers.

The Pioneer Memorial Highway historic plantings in the study area do not meet this criterion.

Criterion (g) It has a special association with the life or work of a person, a group or organisation that was important in Tasmania's history.

The Pioneer Memorial Highway project is strongly associated with Alan Wardlaw (MLC), John Walker, Louis Shoobridge (MLC) and State Premier Albert Ogilvie who were the key personalities involved in implementing



the project. The study area plantings were most likely and ertaken by John Walker and are specifically associated with his designs and philosophies towards landscape architecture.

The Pioneer Memorial Highway historic plantings in the study area meet this criterion at the State level.

5.5 Statement of Significance

Based upon the evaluation criteria outlined above the following statement of significance has been formulated for the Project Area:

The surviving Pioneer Memorial Highway historic plantings in the study area are of State level significance and are part of the wider Pioneer Memorial Highway project. The Pioneer Memorial Highway is a unique undertaking in Tasmania's history due to the extent of its scope and is an outstanding creative achievement in its entirety. The Pioneer Memorial Highway occurred as part of a wider horticultural movement occurring in Tasmania during the interwar period and the surviving plantings are an important physical demonstration of evolving landscape architect design philosophies, ideologies and technical implementations being pursued at this time. The Pioneer Memorial Highway project is strongly associated with Alan Wardlaw (MLC), John Walker, Louis Shoobridge (MLC) and State Premier Albert Ogilvie who where the key personalities involved in implementing the project. The study area plantings were most likely undertaken by John Walker and are specifically associated with his designs and philosophies towards landscape architecture.

6 Conclusion

6.1 Conclusions

This assessment has reviewed the values along a 15.5 kilometre section of the Midland Highway from Epping Forest to north of Powranna Road for historic plantings and other historic sites. A total of 13 formal planting arrangements associated with the Pioneer Memorial Highway were identified and are the only historically significant plantings in the study area. Windbreak and visual obscuration plantings present in the study area are largely functional and relatively recent in age. Formal driveway plantings are also relatively recent in age and are not linked to any known historical associations that would make them significant, either locally or at a State level. Other than plantings, no other historical features were identified.

The Pioneer Memorial Highway includes 171 trees located in 13 formal planting arrangements. These plantings include linear and geometric formations aesthetically placed to highlight landscape features or to break up long straight stretches of highways. Trees used include a variety of native and exotic species, some of which have survived better than others. Few of the formations remain complete and some have been encroached by later windbreak or view screening plantings. The surviving Pioneer Memorial Highway historic plantings in the study area are comparable to or in better condition than other surviving plantings of the wider Pioneer Memorial Highway project.

The historic plantings of the Pioneer Memorial Highway meet State level significance under THR criterion (a), (b), (c), (e) and (g) as part of a beautification project whose scope and implementation is unique in Tasmanla's history. These plantings are not currently listed on the THR or *Northern Midlands Interim Planning Scheme* 2013.

Whilst not formally listed on the THR, the surviving plantings should be conserved wherever possible and accounted for in any future highway upgrade works.

7 Bibliography

- Alexander, A. (2006). MIDLAND HIGHWAY. Retrieved November 2015, 2015, from The Companion to Tasmanian History:

 http://www.utas.edu.au/library/companion_to_tasmanian_history/M/Midland%20Highway.htm
- Austral, (2014a). Midland Highway, Ross to Campbell Town: Historic Plantings Assessment. Unpublished report to Department of State Growth.
- Austral. (2014b). St Peters Pass, Midland Highway: Historic Plantings Assessment. Hobart: Unpublished report to Pitt & Sherry.
- Austral. (2014c). *Tunbridge to north of Mona Vale Road; Historic Plantings Heritage Assessment.* Hobart: Unpublished report to Department of State Growth.
- Dowd, B. (1966). *Grimes, Charles (1772–1858*). Retrieved November 26, 2015, from Australian Dictionary of Biograpphy: http://adb.anu.edu.au/biography/grimes-charles-2129
- DPIPWE. (2011). Assessing Historic Heritage Significance: for application with the Historic Cultural Heritage Act 1995. Hobart: Department of Primary Industries, Parks, Water and Environment.
- Examiner. (1935, April 12). Not of Distant Future. Examiner, p. 6.
- Mercury. (1935, May 1). Pioneer Avenue. Mercury, p. 8.
- Robson, L. (1997). A Short History of Tasmania. Melbourne: Oxford University Press.
- Ryan, L. (2012). Tasmanian Aborigines. Sydney: Allen & Unwin.
- Stancombe, G. (1967). *Laycock, Thomas (1786–1823)*. Retrieved November 26, 2015, from Australian Dictionary of Biograpphy: http://adb.anu.edu.au/biography/laycock-thomas-2340/text2905, published first in hardcopy 1967, accessed online 26 November 2015.
- Tasmanian Heritage Council. (2014). *Draft Works Guidelines for Historic Heritage Places*. Hobart: Tasmanian Heritage Council.
- Walker, J. (1935, May 9). John Walker to Alan Wardlaw. Personal Correspondence TAHO FC4/1/32.
- Walker, J. (ca. 1934). Memorandum by J. A. Walker in support of a State Policy for the Beautification of the Countryside by Planting. Held by Walker Family: Unpublished papers.
- Walker, M. (2000). The Road to Eden: the Pioneer Avenue between Launceston and Hobart. *Tasmanian Historical Studies*, 81-93.
- Wardlaw, A. (1924). Municipality of Ringarooma; A District of Great Promise. Hobart: Government Printer.



Midland Highway – Epping Forest to Powranna Rd A0087 Link 80 CH 0.45 to CH 11.20

FLORA AND FAUNA HABITAT SURVEY

For Department of State Growth
2nd July 2015

IER022

FINAL



SUMMARY

The Department of State Growth commissioned environmental investigations at the Epping Forest to Powranna Rd section of the Midland Highway. To assist with this planning, North Barker Ecosystem Services (NBES) have been engaged by the Department of State Growth to undertoke a flora and fauna habitat survey along this section of the Midland Highway.

Midland Highway A0087 Link 80 Ch 0.45 to end of Link 80

Vegetation

The majority of the vegetation in the road reserve within the study area is dominated by introduced species however there is a large level of native bushland on private land. The native bushland confirms to the community <u>Eucalyptus amygdalina inland</u> forest and woodland on Cainozoic deposits (<u>DAZ</u>).

DAZ is listed as threatened under the Tasmanian Nature Conservation Act 2002.

Threatened Flora

Three state listed (Threatened Species Protection Act 1995 - TSPA) flora recorded and include:

- Arthropodium strictum (chocolate lily) rare (12,500 plants estimated) up for delisting
- Caesia calliantha (blue grass fily) rare (25 plants)
- Scleranthus fasciculatus (spreading knawel) vulnerable (6 plants)

No flora species listed on the EPBCA were recorded.

Chainage locations of threatened flora are provided in section 3.2.

A, strictum is up for delisting and awaiting approval by the Minister.

Threatened Fauna

The majority of habitat values present are restricted to foraging values for a number of threatened fauna however the study area contains a number of mature trees with hollows that are potential habitat for the nationally vulnerable masked owl and spotted-tailed qual. Following a targeted tree assessment survey, no evidence of occupation by either of these species was recorded.

<u>Weeds</u>

Six species of 'declared weeds' listed on the Tasmanian Weed Management Act 1999 are present across the study areas. The most widespread and abundant of these is gorse and blackberry.

Impacts

Two state listed rare (Arthropodium strictum and Caesia calliantha) and one state listed vulnerable (Scleranthus fasciculatus) flora species recorded from this site. The population of A. strictum is not likely to be deemed significant given it is up for delisting and offsets olso unlikely for this reason. Offset requirements however possible for S. fasciculatus, although maximum impact is to 6 plants.

A final count of numbers impacted would be beneficial post design to finalise actual impact and application for Permit under the TSPA.

Habitat for the nationally vulnerable masked owl and spotted-tailed quoil is present in the form of hollows in mature trees. An additional survey to determine the presence/absence of the masked owl (and quoil) was undertaken with no evidence of current occupation found for either species. Two mature trees were found to offer hollows that may potentially be used at some time with a number of additional trees

that have habitat value however considering the large amount of suitable habitat in the surrounding landscape; road upgrades are unlikely to have any meaningful impact on these species. Impact to identified habitat trees however is recommended to be minimised.

ACKNOWLEDGMENTS

Fieldwork: Dave Sayers and Grant Daniels, NBES

Report preparation: Dave Sayers, NBES

Mapping: Dave Sayers and Sue Jungalwalla, NBES Photographs: Dave Sayers and Grant Daniels, NBES

Draft review and comments: Selena Dixon, State Growth



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1 INTRODUCTION

1.1 BACKGROUND

The Department of State Growth commissioned environmental investigations at the Epping Forest to Powranna Rd section of the Midland Highway. To assist with this planning, North Barker Ecosystem Services (NBES) have been engaged by the Department of State Growth to undertake a flora and fauna habitat survey along this section of the Midland Highway.

This report documents the results of the assessment.

1.2 THE STUDY AREA

Midland Highway A0087

Link 80 Ch 0.45 to end of Link 80

The study orea begins just north of Bell Vue Rd at Epping Forest and heads north for approximately 10.7 km finishing at the junction of Powranna Rd (Figure 1). The study area is dominated by gently undulating rises on a straight stretch of the Midland Highway. The study area contains large amounts of native bushland with the main land use being agricultural.

The altitude is situated at around 170 to 190 m above sea level (asl). The site is situated within the 500 - 600 mm annual rainfall zone¹ and within the dry sub-humid warm climatic zone. The geology is predominately Tertiary ironstone gravels and other deposits of this era. The study area is within the municipality of the Northern Midlands Council and the Tasmanian Northern Midlands Bioregion².

The site surveyed is characterised by weedy roadside vegetation with adjoining paddocks of pasture containing a few if any native grass species as well as native vegetation (largely Eucalyptus amygdalina inland forest and woodland on Cainozoic deposits DAZ) in various levels of condition. Occasionally roadside vegetation contains higher proportions of native grasses and has been classified as lowland grassland complex (GCL).

The study area does not include any Conservation Sites managed by State Growth for their flora conservation values.

¹ Closest weather station data is Cressy

² IBRA 5 Peters & Thackway 1998

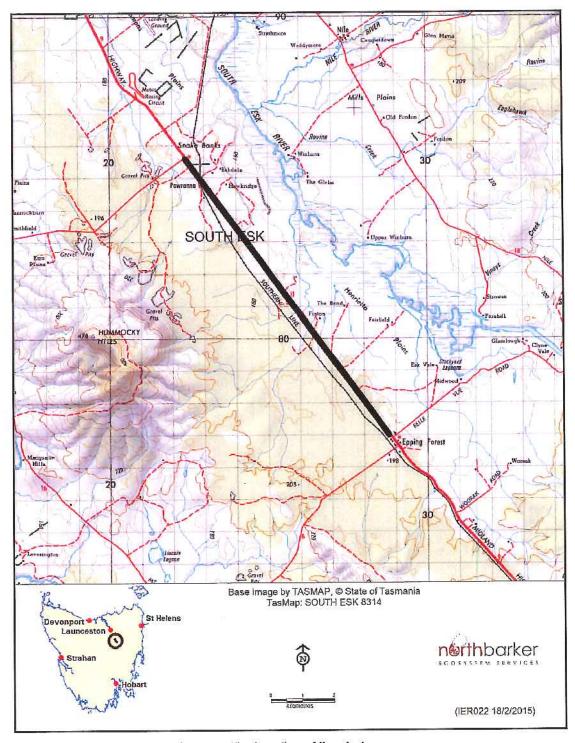


Figure 1 – The location of the study area

2. ROTANICAL SURVEY AND FAUNA HABITAT

2.1 BACKGROUND RESEARCH

The following sources were used for biological records for the region:

- Notural Values Atlas all threatened plant records within 5 km of the study area. Threatened fauna considered likely to occur in suitable habitat
- RIMS database (Dept State Growth)
- NBES (2006), Proposed irrigation dams: vegetation and fauna habitat assessment: for Tasfeed Lots Pty Ltd, unpublished
- North, A (1994), Midland Highway stock underpasses (Forton, Symmons Plains and Woodhall) – botanical survey for Dept of Transpart and Works, unpublished
- North, A (1995), Midland Highway Junctions: Botanical survey (incl Barton Road, Epping Forest and Powranna Rd Junction) – for Johnstane McGee and Gandy Pty Ltd., unpublished

2.2 BOTANICAL AND VEGETATION SURVEY

The survey was undertaken on the 18th and 19th November 2014. An additional survey of some of the better quality native habitats was undertaken on January 29th to survey for summer flowering orchids. All vascular plant species observed were recorded along the route. Botanical nomenclature follows the current census of Tasmanian plants³.

The botanical survey was undertaken on foot. The survey was over both sides of the road corridor and of land observed immediately adjacent (shown as 25m either side of the road centre line however native elements outside this width were also recorded up to 40 m from the road centreline). Where landholder permission was not given, only observations from the road reserve were undertaken. Figure 4 and Figure 5 indicate land that was not inspected.

All perceivable habitats were covered. All areas containing at least some native vegetation were investigated and any variations within these were examined. Native species encountered were recorded. All native and introduced species that have naturalised were recorded. All environmental and 'declared' weeds were considered. Mapping of declared weeds is indicative only.

2.3 FAUNA HABITAT ASSESSMENT & SURVEY

Remnant frees were assessed for their fauna habitat potential. Other potential fauna habitat was also considered. A survey to inspect habitat frees for masked owl/spotted tailed quoll values was undertaken on the 20th April 2015. Trees with some habitat value (age/hollows/potential for hollows) within land where permission given to access was inspected. Trees with visible hollows or potential for hollows were recorded with a GPS and the diameter at breast height was measured. Trees recorded as a habitat tree contained one or more of the following:

- Presence of dead limbs or more open branching structure
- Hollows present
- Potential for hollow development given dead branches or obvious signs of hollow development

³ Baker & deSalas 2014

⁴ Tasmanian Weed Management Act 1999

Large dbh with combination of the above

Where tree hollows were recorded, an estimate was made as to whether the hollow was >10 cm wide.

2.4 ASSESSMENT OF CONSERVATION SIGNIFICANCE

Vegetation types are classified according to TASVEG⁵. The State and Federal Governments are committed to achieving a Comprehensive Adequote and Representative (CAR) Reserve System based on TASVEG mapping.

The reservation target of a vegetation type relates to its current extent compared with the modelled extent prior to European settlement. This comparison provides an estimate of the proportion lost due to land clearing. Those vegetation types that are rare (generally less than 1000 ha), or have suffered considerable loss (approaching 70% for vulnerable and 90% for endangered) qualify for listing as "threatened" on the Nature Conservation Act 2002⁶.

For forests, reservation targets were set using the nationally agreed JANIS criteria as part of the Tasmanian Regional Forest Agreement (RFA). These aim to achieve a 15% reservation level of area extent prior to European settlement (often referred to as pre 1750). The reservation targets reflect the extent of loss with "threatened" vegetation types having higher targets. The JANIS principles also include the consideration of the bioregional representation of each vegetation type within the CAR reserve system.

The reservation at state and bioregional level has been calculated for all TASVEG 2 communities. This does not include ony modelling of pre 1750 levels, but is based on a tenure analysis of what is currently mapped.

The most recent bioregional and state analysis reservation against JANIS criteria was completed for the Independent Verification Group for the Tasmanian Forests Intergovernmental Agreement⁸. This analysis calculated areas required to achieve a CAR Reserve system based on the RFA modelling. No similar modelling has been undertaken for the TASVEG2 or TASVEG 3 non forest communities, although native grassland communities have been assessed at the State level⁹.

Vegetation Matters of National Environmental Significance (MNES) are listed on the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBCA). Lowland Native Grassland of Tasmania includes two such communities for which defining criteria must be met in order for a patch of grassland to qualify as a MNES.

The conservation significance of species is determined at a State and national level by the Tasmanian *Threatened Species Protection Act 1995* and Commonwealth EPBCA (Appendix 1), the implications of which are considered in light of the relevant legislation (Appendix 2).

2.5 LIMITATIONS / DISCLAIMER

No botanical survey can guarantee that all vascular plants will be recorded due to the limitations of the sampling technique, seasonal and annual variation in abundance and the possible absence of fertile material for identification. Additional species are likely to occur that may be recorded by repeated visits over several years and at different seasons.

⁵ Harris & Kitchener 2005, DPIPWE 2013

⁶ Schedule 3a NCA 2002

⁷ DPIPWE 2010

⁸ Knight 2012

⁹ Lowland Grassland Review Expert Group 2008

The survey was undertaken in late Spring. The majority of native grasses contained enough fertile material to identify specimens to species level.

Fauna assessment is limited to the identification of habitat of significant fauna species known from the area. No targeted fauna surveys were conducted.

3. THE BIOLOGICAL VALUES

3.1 THE VEGETATION

The study area is depicted by TASVEG v 3.0 as being largely dominated by the human altered land use unit of <u>agricultural Land (FAG)</u> along with large tracts of dry <u>Eucalyptus amyadalina inland forest and woodland on Calnozoic deposits (DAZ)</u>. Other communities mapped within the study area include dry Eucalyptus pauciflora forest and woodland not on dolerite (DPO) and weed infestations (FWU)¹⁰.

Field surveys confirmed the presence of these communities apart from DPO which has been mapped os DAZ even the E. pauciflora is locally dominant within a small section. Other changes are largely to the boundaries. Roadside vegetation containing a higher proportion of native grasses (Austrostipa sp. and Rytidosperma sp.) has been mapped as the disturbance induced <u>lowland grassland complex</u> (GCL).

Table 1 indicates the extent and reservation status for vegetation communities in the study area. The following section describes each vegetation community found within the study areo, described under its relevant TASVEG mapping unit. A full species list is given in Appendix 3.

Lowland grassland complex (GCL) and Agricultural Land (FAG)

Large sections of the study area are dominated by introduced species either adjacent to agricultural land or native bushland (Plate 1). Where the road reserve is adjacent to native bushland there is a higher percentage of native species present however the majority of these sections are still dominated by plants of exotic origin. Where the native grass component dominates, these sections have been mapped as the human induced lowland grassland complex (GCL). Often GCL occurs in narrow bands only metres long and where this occurs they are subsumed into FAG. The more common native species observed within GCL include Austrostipa mollis (soft speargrass), Austrostipa pubinadis (tall speargrass), Austrostipa stuposa (corkscrew speargrass), Rytidosperma spp. (wallaby grass), Lomandra longifolia (sagg), Poa labillardierei (silver tussockgrass), Themeda triandra (kangaroo grass), Arthropodium strictum (chacolate lily), Chrysocephalum apiculatum (common everlasting), Senecio auadridentatus (cotton fireweed), Eucalyptus amygdalina (black peppermint) and Eucalyptus viminalis (white gum). Exotic grasses are numerous but the more prevalent include Dactylis glomerata (cocksfoot), Anthoxanthum odoratum (sweet vernal grass), Lolium sp. (ryegrasses), Vulpia bromoldes (squirreltail fescue), Bromus sp. (brome), Aira caryophyllea (silvery hairgrass) and Holcus lanatus (Yorkshire fog).

These are non-natural vegetation assemblages and not listed as threatened under the Tasmanian Nature Conservation Act 2002.

¹⁰ DPIPWE 2013



Plate 1 - Typical view of the exotic vegetation with some retained roadside trees

Eucalyptus amygdalina inland forest and woodland on Cainozoic deposits (DAZ)

DAZ is common within the study area on private land and the broader landscape. Remnants vary from poor to good condition throughout however the declared weed Ulex europaeus (gorse) is often a common component of the understorey (Plate 2). The canopy is dominated by Eucalyptus amygdalina (black peppermint) as well as Eucalyptus viminalis (white gum). Both Eucalyptus ovata (black gum) and Eucalyptus pauciflora (cabbage gum) are infrequent species however E. pauciflora is locally dominant in one short section. Where the understorey is not dominated by gorse, the more common shrub species include Bossiaea prostrata (creeping bossiaea), Lomandra longiflora (sagg), Daviesia latifolia (hop bitterpea), Platylobium triangulare (arrow flatpea), Dillwynia glaberrima (smooth parrotpea), Goodenia ovata (hop native primrose), Pimelea glauca (smooth riceflower), Astroloma humifusum (native cranberry) and Epacris impressa (common heath) (Plate 3). The more common herbs and graminoids include Arthropodium strictum (chocolate lily), Asperula conferta woodruff), Chrysocephalum apiculatum (common everlasting), Leptorhynchos squamatus (scaly buttons), Oxalis spp. (woodsorrel), Stylidium araminifolium (narrowleaf triggerplant), Austrostipa stuposa (corkscrew spear grass), Austrostipa mollis (soft spear grass), Austrostipa sp. (spear grasses), Rytidosperma sp. (wallaby grass) and Dianella revoluta (spreading flaxlily). Occasionally the understorey is also dominated by Allocasuarina littoralis (black sheoak).

Eucalyptus pauciflora (cabbage gum) is locally dominant on both sides of the road near Link 80 Ch 4.54. Cabbage gum may be locally common within DAZ on Cainozoic deposits and has therefore been mapped as DAZ rather than DPO (Plate 4).

The majority of private land containing DAZ is under privately managed conservation covenants (Figure 9). This community is listed as **threatened** under the Tasmanian Nature Conservation Act 2002.



Plate 2 - DAZ with a gorse understorey



Plate 3 - DAZ where gorse is not as frequent within the understorey



Plate 4 - This section of DAZ contains E. pauciflora as locally dominant

Table 1: Native vegetation communities in study area

TASVEG Community ¹¹ and extent in study area	Pre 1750 / current ha	Reservation ha / %	Pre 1750 / current ha	Reservation ha / %	Status (JANIS)
Region	TAS	TAS	Northern Midlands	Northern Midlands	
Eucalyptus amygdalina inland forest and woodland on Cainozoic deposits (DAZ)	87,200/ 25,400	6,400 7.3%	76,500/ 21,300	5,600 7.4%	Under reserved (TAS & SE) Threatened NCA
Lowland grassland complex (GCL)	-/ 71,700	2,500 3.5% (current)	-/ 20, 300	1,000 / 5% (current)	Not threatened

¹¹ Harris & Kitchener 2005

FLORA OF CONSERVATION SIGNIFICANCE 3.2

A total of 149 vascular plant species have been recorded. These include 52 introduced species, 3 threatened species and 6 declared weeds. A full species list is given in Appendix 3.

Other surveys within 5 km of the sites have previously identified several species of threatened flora variously listed under the EPBCA or the TSPA¹². All of these species are listed in Table 2 together with a description of their preferred habitat and an assessment of the likelihood of their occurrence on site (and potential for being overlooked, given they have not currently been observed). All locations of threatened flora are shown in Figure 4 and Figure 5 on page 33 and 33).

Table 2: Flora species of conservation significance previously recorded within a 5 km radius of the sites13

Species	Status TSPA/ EPBCA	Potential to Occur*	Observations and Preferred Habitat
	Knov	wn from within	1 500 m
Amphibromus macrorhinus longnosed swampgrass	Endangered / -	None	Occurs in wetland habitat. No sultable habitat present.
<i>Aphelia gracilis</i> slender fanwort	Rare /	Low to Moderate	Occurs in seasonally wet grassland. Suitable habitat present but due to dry conditions at time of survey the species was not recorded. Potential to be present
Anthropodium strictum ehocolate fily	Rare /	PRESENT	A late spring flowering lily occurring in open forest, dry hillsides and grasslands. This species is present in large numbers across a large portion of the study area, especially those areas adjacent to DAZ bushland. This species is up for delisting and awaiting the Ministers approval.
<i>Brunonia australis</i> blue pincushion	Rare / -	Low	Occurs in grassy forests on fertile soils. Suitable habitat present but distinctive species not observed.
Caesia calliantha blue grass lily	Hare /	PRESENT	Occurs in native grassland and roadside remnants with a native grassland element on moist fertile soils. Recorded at one location however unusually not within the DAZ bushland. Due to the dry spring there appeared to be less flowering at other locations.

¹² Natural Values Report # 61967 (11th February 2015) - DPTPWE 2015

¹³ Natural Values Report # 61967 (11th February 2015) - DPIPWE 2015

Species	Status TSPA/ EPBCA	Potential to Occur*	Observations and Preferred Habitat
Carex longebrachiata dropping sedge	Rare /	Low	Habitat present but species not recorded. Often confused with <i>C. lynx</i> .
<i>Glycine latrobeana</i> clover glycine	Vulnerable / VULNERABLE	Low	A spring flowering herb occurring in dry sclerophyll forest, woodland and native grassland usually on flat sites with loose sandy soil. This plant is easily overlooked however not observed.
<i>Haloragis heterophylla</i> variable raspwort	Rare /	Moderate	Species unlikely to have been overlooked unless in small numbers within dense grassy culverts. Habitat is present within the study area and can occur in the moist depressions amongst grasses.
Hypoxis vaginata sheathing yellow star	Rare / -	Hìgh	Occurs in seasonally wet grassland. Numerous records within 5km and sultable habitat is present however survey occurred time of species flowering
<i>Juncus fockei</i> slender jointleaf rush	Rare /	Low	Occurs in moist sites. Limited habitat present and distinctive species not observed.
Leucochrysum albicans var. tricolor grassland paperdalsy	Endangered / ENDANGERED	None	Occurs in grassy habitat on basalt soils. No suitable habitat present and distinctive species not likely to have been overlooked.
<i>Pilularia novae- hollandiae</i> austral pillwort	Rare /	Low	This species was originally recorded within the study area at one location in 1990. This site has been altered by drain works and the species was unable to be re-located and was not observed at other locations. Habitat is limited to seasonally inundated creeks. Potential to have been overlooked as often obscured by grasses and sedges.
Pimelea curviflora var. gracilis slender curved riceflower	Rare / -	None	Prefers wet scierophyll forest in the north. One record (Rodway 1918) within 5 km
Pterostylis squamata ruddy greenhood	Rare / -	Low to moderate	There is one record of this summer flowering orchid with low accuracy close to the study area. A summer survey did not locate this species however is known to occur over 1km to the south. Habitat suitable but not recorded in flower.

Species	Status TSPA/ EPBCA	Potential to Occur*	Observations and Preferred Habitat
Pultenaea humilis dwarf bushpea	Vuìnerable / -	Low	Occurs in <i>E. amygdalina</i> grassy forest on gravels. Habitat potentially suitable, but distinctive species not observed.
	Kno	wn from withi	n 5 km
Aphelia pumilio dwarf fanwort	Rare /	Low to moderate	Found in the northern Midlands and Tamar region growing in damp conditions, dry open grassland and dry sclerophyll forest. Flowers between October and November. Study corridor provides marginal habitat in the vicinity from low-lying habitat. Dry season may have precluded observation at time of survey.
Austrostipa nodosa knotty speargrass	Rare /	Low	Species not recorded however resilient to road maintenance and survives annual roadside weed spraying. This species is up for delisting and awaiting the Ministers approval
Brachyscome perpusilla tiny dalsy	Rare /	Low	Known population 3.9 km west in Tom Gibson Nature Reserve. Prefers shallow soils with unsuitable habitat within study area. Given the tiny nature of the species there is a chance it is overlooked however habitat is not ideal.
Caladenia anthracina blacktip spider orchid	Endangered / CRITICALLY ENDANGERED	Low	record within 5 km (Garnett 2012). Thought to be confined to a 27 km2 area in the Midlands, occupying a total of about 2 ha in total. Occurs in grassy woodland with silver wattle and bracken on well-drained sandy soil. Study area provides marginal potential habitat to this rare ephemeral species.
Caladenia filamentosa daddy longlegs	Rare / -	Low	1 known location within 5 km. Occurs on dry sandy soils with sedgy or ferny ground cover. Habitat in study area generally grassy forest of marginal suitability.
Caladenia pallida rosy spider orchid	Endangered/ CRITICALLY ENDANGERED	Very low	Occurs in dry open forest on light soils. Rare within the vicinity. One record within 5 km (Cameron, 1979). Little known about the ecology and distribution of the species.
Caladenia pusilla tiny fingers	Rare/ -	Very Low	Two records (Garnett, 2012) from Powranna Nature Reserve. Occurs mostly in coastal and near-coastal areas up to 200 m elevation in heathland, shrubland, woodland and open eucalypt forest on sandy loam, sandy peat, granite gravel and rocky ground.

Species	Status TSPA/ EPBCA	Potential to Occur*	Observations and Preferred Habitat
Calandrinia granulifera pygmy pursiane	Rare / -	None	Generally coastal species with an outlier known from Epping Forest. Grows on shallow rockplate soils where it occurs in the Midlands. No suitable habitat present.
<i>Dianella amoena</i> grassland flaxlily	Rare / ENDANGERED	Low	Occurs in grassy habitat on fertile soils. One record within 5 km and not recorded within the study area.
<i>Gratiola pubescens</i> hairy brooklime	Vulnerable /	Very Low	Prefers damp to swampy ground and wetland margins. No sultable habitat present.
Hyalosperma demissum moss sunray	Endangered / -	None	Grows on rock pavements or shallow sandy soils in dry regions mostly on dolerite. No habitat present
lsoetes drummondii ssp. drummondii plain quillwort	Rare / -	Very Low	Occurs in aquatic riparian habitat. Known from Powranna and Tom Gibson Nature Reserve but limited suitable habitat present.
Lachnagrostis punicea bristle Blown Grass	Rare /	Very Low	Not recorded. Known from open woodland in the Midlands. Potentially could have been overlooked.
Leucopogon virgatus var. brevifolius shortleaf beardheath	Rare /	Very low	Occurs in dry forest. Suitable habitat present but not observed. Similar L. virgatus var. virgatus was recorded.
Liparophyllum exaltatum erect marshflower	Rare /	None	An aquatic species. No habitat present
Myriophyllum integrifolium tiny watermilfoil	Vulnerable /	None	Occurs in saline swamps and marsh margins. No suitable habitat present.
Phyllangium distylis tiny mitreworl	Rare / -	Very low	Occurs in moist open sites. Majority of habitat present is heavily altered.
Poa mollis soft Poa	Rare /	None	Occurs on dry shallow soils on dolerite – no suitable habitat present
Pultenaea prostrata prostrate Bush Pea	Vulnerable / -	None	Not recorded and unlikely to have been overlooked. This is a species of fertile sites in the Midlands

Species	Status TSPA/ EPBCA	Potential to Occur*	Observations and Preferred Habitat
Ranunculus pumilio var. pumilio ferny buttercup	Rare / -	Low	Associated with wet soaks, this is a tiny annual. Limited potential habitat although may have been overlooked from drainage lines.
Ranunculus sessiliflorus var. sessiliflorus	Rare /	Low	Occurs in grassland and grassy woodland. 2 previous records within 5 km. Suitable habitat is present but this small annual herb may have easily been overlooked in previous studies of the area and during the current survey.
rockplate buttercup			This species is up for delisting and awaiting the Ministers approval
Rytidosperma indutum tall wallaby grass	Rare / -	Low	Habitat present but not recorded
<i>Schenkia australis</i> spike centaury	Rare /	Low	Found in cleared forest pasture, rainforest/wet scierophyll forest and heathland in the east and north of the State. Species possibly introduced to Tasmania. Limited suitable habitat and species not observed.
Scleranthus fascioulatus spreading knawel	Vulnerable <i>i</i>	PRESENT	Usually occurs in silver tussock grassland/grassy woodland. Species was recorded at 1 location (6 plants). Closest known record is 11 km to the south east.
Schoenus latelaminatus Medusa bog sedge	Endangered / -	Low	Occurs along creeks, soaks and wet pasture – suitable habitat present but species not observed.
Siloxerus multiflorus small wrinklewort	Rare / -	Low	Occurs in inland dry forest – suitable habitat present but not recorded. Known from Powranna and Tom Gibson Nature Reserve. Potential to have been overlooked if in small numbers.
Spyridium vexilliferum winged Spyridium	Rare / -	Very Low	Occurs in open forest and heath on stony, gravelly or sandy soils. Distinctive species not observed.
Stackhousia subterranea grassland candles	Endangered /	Very Low	Generally prefers reddish-brown clay-loam soils of dolerite or basalt. Habitat present not generally favourable and was seen flowering at other locations during survey.
Stenanthemum pimeleoides propeller plant	Vulnerable/ VULNERABLE	Very low	Occurs in open forest native grassland on gravelly soils. Distinctive species not observed and known from Tom Gibson Nature Reserve.
Stenopetalum lineare narrow threadpetal	Endangered /	None	One historical record (Rodway 1900) along South Esk River??? Species unlikely to occur but would be easily overlooked.

Species	Status TSPA/ EPBCA	Potential to Occur*	Observations and Preferred Habitat
Stylidium despectum small triggerplant	Rare / -	Very low	Occurs in sandy heathlands and moist habitat such as wet-soaks (often with peat soil), muddy flats and saline swamps along the coast in the north of the State. Habitat not suitable.
Stylidium perpusillum tiny triggerplant	Rare / -	Very low	Similar to S. despectum
<i>Tricoryne elatior</i> yellow rushl il y	Vulnerable / -	Very Low	Found in grasslands, heaths and open woodland near the coast and inland to approx. 1000 m altitude in the north-east, the Midlands and the East Coast. Species not recorded during survey but known along Esk Main Rdwell over 5km from study area.
Triptilodiscus pygmaeus common sunray	Vulnerable / —	Very Low	Occurs in grassland and dry forest, especially where the substrate is basalt or dolerite – limited suitable habitat present.
<i>Trithuria submersa</i> Trithuria	Rare /	Low	Occurs in marshy habitat — possibility of occurring on margins of dams and drainage lines and being overlooked. Known along creeks to the west
Xanthoparmella mannumensis lichen	Vulnerable / -	N one	One record within 5 km. Very uncommon where it grows on very dry sandstone and basalt outcrops, rough pasture and dry sclerophyll woodland

Three threatened flora species were confirmed from the study area and are discussed further below. An additional two species are considered to have a moderate or high chance to occur within the study orea however was not confirmed either due to survey timing or the species being present in low numbers and undetected:

Haloragis heterophylla (variable raspwort) Rare/-

Hypoxis vaginata (sheathing yellowstar) Rare/-

Threatened flora recorded in study area:

Arthropodium strictum (chocolate lily) TSPA/EPBCA: Rare/-

Arthropodium strictum is an attractive lily with chocolate scented purple flowers, flowering in spring, usually between October and December (Plate 5 and Plote 6). It grows in open forest, dry hillsides, grassy woodlands and grasslands, and occurs predominantly in the eastern half of Tasmania - in the Hobart area, and the central and northern Midlands.

This species is common in the general area, with hundreds of observations being recorded from within 5km on the Natural Values Atlas. A. strictum has been recommended for delisting by the Tasmanian Threatened Species Scientific Advisory Committee, however this is not yet official and a decision from the Minister is still pending. Until this is officially gazetted, any disturbance of this species will still need to be recognised in a formal permit opplication.

A total of approximately 12,500 plants were record across the study area.

Locations:

The species is very common along the study area (particularly in close proximity to native vegetation communities) and the following table is indicative only. Refer to Figure 4 and Figure 5 for detailed mapping.

Location	Numbers	Chainage	Distance to bitumen
LHS	20	Link 80 Ch 0.42 .	10 m
LHS	5	Link 80 Ch 0,46	12 m
LHS	6	Link 80 Ch 0,48	12 m
RHS	Арргох. 11000	Link 80 Ch 0.5 to 2.25 Numerous locations	5 to 6 m
LHS	3	Link 80 Ch 1.44	5 m
1HS	16	Link 80 Ch 1.55 to 1.62	4 to 6 m
LHS	Approx. 100	Link 80 Ch 1,67 to 1.70	3 to 4 m
LHS	1	Link 80 Ch 1.82	4 m
LHS	1	Link 80 Ch 1.94	4 m
RHS	Арргох, 110	Link 80 Ch 3.11 to 3.21	10 to 20 m
RHS	2	Link 80 Ch 3.25	2 m
LHS	3	Link 80 Ch 3.63	5 m
RHS	Approx. 1000	Link 80 Ch 3.64 to 3.85	4 to 10 m
LHS	6	Link 80 Ch 3.77	13 m
LHS	1	Link 80 Ch 3.81	13 m
Both sides (more prevalent on RHS)	80	Link 80 Ch 4.28 to 4.45	7 to 15 m
LHS	4	Link 80 Ch 4.53 to 4.56	7 m
RHS	4	Link 80 Ch 5.06	7 m
RHS	5	Link 80 Ch 7.35	6 m
RHS	2	Link 80 Ch 7.74	6 to 7 m



Plate 5 – floral detail of Arthropodium strictum



Plate 6 – while not easy to detect, the photo shows numerous chocolate lilies (Yellow circles provide some assistance in some of the locations)

Caesia calliantha (blue grasslily) TSPA: Rare

When not in flower this species is an inconspicuous lily of grasslands. When in flower, the lilac blue to deep blue-purple flowers are obvious. The species can resemble the non-threatened Caesia parviflora var. vittata but the cigar shaped anthers are diagnostic ¹⁴. Blue grass lily is predominately found throughout the Midlands in grassland and grassy woodland habitat as well as grassy roadsides. The species was seen within DAZ communities in the area but not within the study area. The only observation was within the disturbed road reserve to the north surrounded by numerous exotic grasses (Plate 7 and Plate 8).

One location of 25 plants recorded within study area. Was observed at a number of locations well over 100m from the study area within DAZ communities.

Locations:

Location	Numbers	Chainage	Distance to bitumen
RHS	25	Link 80 Ch 7.3	5 to 6 m

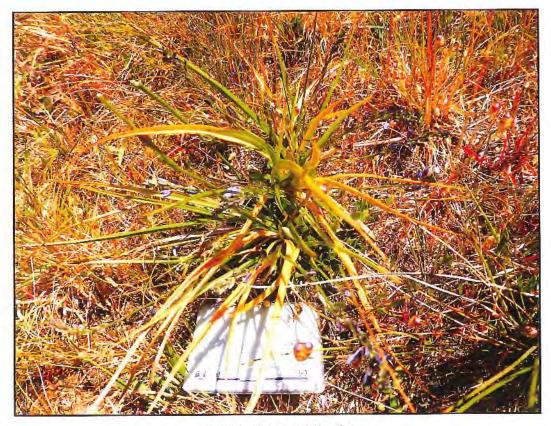


Plate 7 – Caesia calliantha

¹⁴ Migeul de Salas (pers comm)



Plate 8 - floral detail of Caesia calliantha

Scleranthus fasciculatus (spreading knawel) TSPA: Vulnerable

S. fasciculatus is found in silver tussock grassland/grassy woodland in a few locations in the Midlands and south-east. It is a straggling, prostrate plant with insignificant looking flowers. It benefits from disturbance that creates open patches and over time is outcompeted by introduced grasses that form dense colonies.

6 plants from one location recorded.

Locations:

Location	Numbers	Chainage	Distance to bitumen
LHS	6	Link 80 Ch 4.5	20 to 23 m



Plate 9 – Scleranthus fasciculatus

3.3 WEEDS

Six weed species listed as 'declared weeds' on the Weed Management Act 1999 were recorded from the study area. Table 3 lists these declared weeds. Indicative locations of weeds are shown in Figure 7 on page 35. Other common environmental weeds (excluding grasses) observed include Cyperus eragrostis (drain flatsedge), Cotoneaster glaucophyllus (largeleaf cotoneaster), Rosa rubiginosa (sweet briar), Sanguisorba minor (salad burnet), Crataegus monogyna (hawthorn), Pinus radiata (radiata pine) and Potentilla anglica (trailing cinquefoil).

Table 3: Declared weeds within study area

Study area	Comment	Zone within Northern Midlands	
Blackberry Rubus fruticosus	Common across the study area (Plate 10). Species is a WONS	Zone B containment	
canary/montpellier broom Genista monspessulana	Scattered across study area (Plate 11), WONS	Zone B containment	
English Broom Cytisus scoparius	Scattered across study area. WONS	Zone B containment	
gorse Ulex europaeus	Numerous heavy infestations across much of the study area, particularly in association with native bushland (Plate 12). WONS	Zone B containment	
St John's wort Hypericum perforatum	Small number of occurrences in the road reserve	Zone A eradication	
Spanish heath Erica lusitanica	Observed from 2 locations (Plate 13)	Zone A eradication	

WONS - Weed of National Significance



Plate 10 - blackberry



Plate 11 – canary/montpellier broom



Plate 12 – gorse infestations are common within native bushland



Plate 13 – Spanish heath

3.4 FAUNA OF CONSERVATION SIGNIFICANCE

Fauna habitat values that are present within the study area is limited to foraging habitat for the majority of known threatened fauna with some potential nesting sites in hollows within mature trees. A brief review of these values is provided for in Table 4.

Table 4: Threatened fauna species of conservation significance previously recorded, or which may potentially occur, within the locality of the study areas 15.

Species	Status TSPA/EPBCA	Significance of habitat	Observations and Preferred Habitat ¹⁶			
	MAMMALS					
Dasyurus maculatus maculatus spotted-tailed quoll	Rare / VULNERABLE	Breeding: Low Foraging: Moderate	Quoils may frequent the roadside to exploit the available food resource of animal carcases also putting themselves at risk. They are also known to use tree hollows for denning. A number of habitat trees were recorded within the study area, however during a tree assessment no hollows were evident within the survey area of sufficient size for a quoil. The project presents limited additional risk			
Perameles gunnii eastern-barred bandicoot	- / VULNERABLE	Low	There are two records along the Midland Highway within 500m however no additional risk is present from possible road works.			
Sarcophilus harrisii Tasmanian devil	Endangered / ENDANGERED	Breeding: None Foraging: Moderate	There are a number of records, many of roadkill. Devils may frequent the roadside to exploit the available food resource of animal carcases also putting themselves at risk. No potential den structures or evidence of devils was noted.			
		BIRI)S			
Accipiter novaehollandiae grey goshawk	Endangered / -	Nesting: None Foraging: Very Low	No suitable habitat for nesting. Dispersing non- breeding birds may occur infrequently.			
Aquila audax fleayi wedge-tailed eagle	Endangered / ENDANGERED	Nesting: None Foraging: Moderate	The study area is likely to intersect with the territory of eagles. The closest reliable nest record is approx. 3.2 km west in Tom Gibson Nature Reserve. Eagles are likely to forage nearby to scavenge for road kill putting themselves at risk to collision with passing vehicles. However the project presents no additional risk as the road is currently in use.			
Botaurus poiciloptilus Australasian bittern	- / ENDANGERED	None	Typically inhabits shallow, well-vegetated, permanent wetlands. Site habitat unsuitable.			
Haliaeetus leucogaster white-bellied sea- eagle	Vulnerable/ MIGRATORY	Nesting: None Foraging: Low	No known nests within 5 km. There are two records of one sighting close to the study area. A coastal species but may casually forage in the study area.			

¹⁵ Natural Values Report # 61967 (11th Pobruary 2015) - DPIPWE 2015

¹⁶ Bryant & Jackson 1999

Species	Status TSPA/EPBCA	Significance of habitat	Observations and Preferred Habitat ¹⁶
Tyto novaehollandiae castanops Tasmanian masked owl	Endangered / VULNERABLE	Nesting: Moderate Foraging: Moderate	Requires large old-growth hollow-bearing trees for nesting. Potential nesting trees in the surrounding landscape and birds are likely to forage in the vicinity. Diurnal searching for regurgitated pellets at base of potential habitat trees yielded no evidence of usage during a targeted tree survey. One tree was recorded with a hollow width >10 cm but no evidence of usage was recorded. The project would present limited additional risk given the availability of bushland within the surrounding landscape. Effort should be made to minimise impact to habitat trees.
REPTILES			
Pseudemoia pagenstecheri tussock skink	Vuinerable / -	Low	Limited habitat is present in native grassland, in particular those areas supporting tussocks including <i>Poa</i> and <i>Themeda</i> . Only limited habitat present.
AMPHIBIANS			
Litoria raniformis green and gold frog	Vulnerable/ VULNERABLE	None	Occurs in heavily vegetated wetlands. Limited habitat within study area and no known records within 5km.
FISH			
Prototroctes marina australian grayling	Vulnerable/ VULNERABLE	None	Occurs in un-polluted streams with large pools. No suitable habitat present.
Galaxias fontanus swan galaxias	Endangered/ ENDANGERED	None	Site is located within a core habitat region, but limited suitable habitat is present for aquatic species. No records within 5 km.
INVERTEBRATES			
Catadromus lacordairei green-lined ground beetle	Vulnerable/ -	Very Low	Has only been recorded from a small number of locations in the northern/central Midlands. Appears to be found within a hundred metres of permanent water such as dams or wetlands. Limited suitable habitat within study area.

Fauna of National Significance

Tasmanian devil (Sarcophilus harrisii). The Tasmanian devil became a threatened species as a consequence of the devastating effects of devil facial tumour disease (DFTD) and is now nationally listed as endangered. Tasmania has experienced 80 % depletion in numbers¹⁷. Animals are often only surviving long enough to breed for one year before succumbing to the fatal effects of the disease. Although DFTD is the primary cause of decline, with a depleted population, factors that adversely impact on the breeding success of the species are considered significant. Direct disturbance to breeding or maternal dens are a key issue of concern.

No evidence of active dens or devil activity was recorded in this study.

Spotted-tailed quall (Dasyurus maculatus). The spotted-tailed quall occurs throughout Tasmania and also in eastern Australia. Populations on the Australian mainland have declined to the extent that Tasmania is now their stronghold. Within Tasmania, the core range for the spotted-tailed quall is lowland forested areas of the north, bounded by Wynyard, Gladstone and the central and north-eastern highlands. Lower densities of animals occur elsewhere in suitable habitat. Optimal habitat for the spotted-tailed auoll is thought to be fertile, extensive (and unfragmented), lowland, wet forest vegetation. The species is most abundant in areas containing rainforest, wet forest and blackwood swamp forest18. Individuals are mostly solitary with home ranges that vary between 100 ha and 5000 ha, with females tending to have smaller, largely exclusive ranges, and males having ranges that overlap with those of several females19.

The present study site is located within what is considered to be one of eight important population areas for this species (Eastern Tiers/Northern Midlands)²⁰ (Figure 2). The presence of tree hollows and occasional hollow logs (both of which can be used for denning and shelter²¹, and an abundance of suitable prey²² suggests that the study area and surrounds could be a regularly used part of a territory. The study area contains a small number of hollow bearing trees however the majority of these do not appear to be of sufficient size for this species, with better habitat available elsewhere in the surrounding landscape (particularly Tom Gibson Nature Reserve). No direct evidence of spotted-tailed quall usage was recorded.

Eastern barred bandicoot (Perameles gunnii). The eastern barred bandicoot is nationally listed as vulnerable. It is considered to "require monitoring" in Tasmania²³. Although locally common in areas of south-eastern and northern Tasmania, this species is now absent from most of its original range in the Midlands due to land clearance. It occurs predominantly in native grasslands, grassy woodland and on cleared grazing land where there is some cover (eg. remnant bushland, rank grass, gorse) where it feeds on worms, cockchafer larvae and other earth-dwelling larvae dug from the soil in open grasslands. There are a number of roadkill records from the Midland Highway. Road upgrades would present limited additional risk to this species than is already present.

Wedge-tailed eagle (Aquila audax fleayi). The Tasmanian sub species of the wedgetailed eagle is listed as endangered. The wooded hills within the surrounding

¹⁷ Save The Tasmanian Devil websitc. www.Tassiedevil.com.au

¹⁸ Bryant & Jackson, 1999

¹⁹ Long & Nelson 2010 cited in the spotted-tailed quall (Tasmanian population) Species Profile and Threats Database http://www.environment.gov.au,

²⁰ Natural Values Report 61967 (11th February 2015) - DPIPWE 2015

²¹ Belcher and Darrant, 2006; Glen and Dickman, 2006a

²² Glen and Dickmand, 2006b

²³ Vertebrate Advisory Committee 1994

landscape (particularly to the west in Tom Gibson Nature Reserve) are known to support at least one breeding range and there are a number of nest records within 5 km from the study area. There is however no suitable nesting habitat within the immediate vicinity of the study area. Consequently the impact to this species is considered very limited.

Masked owl (Tyto novaehollandiae castanops). The Tasmanian masked owl occurs across Tasmania aport from the southwest. It has been recorded from wet eucalypt forest, non-eucalypt dominated forest, scrub, and urban fringe environments²⁴; however, most records of the species are from lowland, dry sclerophyll forest in the southeast and central north²⁵. Masked owls feed mostly on small to medium-sized mammals including introduced rodents and rabbits²⁶.

The masked owl nests in large hollows in large, old trees in dry forest, woodland and paddocks. Daytime roost sites are usually in trees (among dense foliage or in tree hollows), cliffs (overhangs, potholes and caves) and occasionally farm sheds and out-buildings²⁷.

A free assessment was undertaken during April 2015. One tree was recorded within the survey area (only land were landholder permission was granted was assessed) with a hollow of sufficient size (>10 cm width) for a masked owl. No direct evidence of usage was made of any trees inspected. Habitat trees are shown in Figure 4 and Figure 5.

Overall, two trees were identified as providing potentially suitable hollows, with one tree containing a hollow estimated at over 10cm width while the other tree had a number of small hollows. Both trees were around 110 cm dbh. The balance of habitat trees recorded contain potential for good hollow development in the coming years. Hollows are noted to form less easily in *Eucalyptus amygdalina* (black peppermint)²⁸. Hollows greater than 10cm also typically take longer to form and as found during the tree assessment are much less common within the survey areo than trees containing small hollows.

The majority of trees recorded ore 90 cm to 120 cm dbh and are therefore in the early stage of hollow formation. The majority of area surveyed is also cut over likely for firewood. Overall, the survey area provides some limited habitat for breeding masked owls, with the sight more likely used for foraging given the availability of habitat within the surrounding landscape.

It should be noted that ground based assessments of hollow availability and suitability inevitably ore moderated by variables that are costly, difficult or impossible to contral or measure. Observers on the ground may not be able to view all hollows present and some apparently suitable entrances may lead to hollows too small to provide shelter. Based on these limitations, trees which may provide some value have been recorded even if they may seem to not be present (le: trees withage and signs of hollow development from broken limbs or open canopy with signs of senescence).

²⁴ Bell and Mooney, 2002

²⁵ Bell and Mooney, 1997

²⁶ Todd, 2012

²⁷ Bell et al. 1997

²⁸ Bell et al 1997

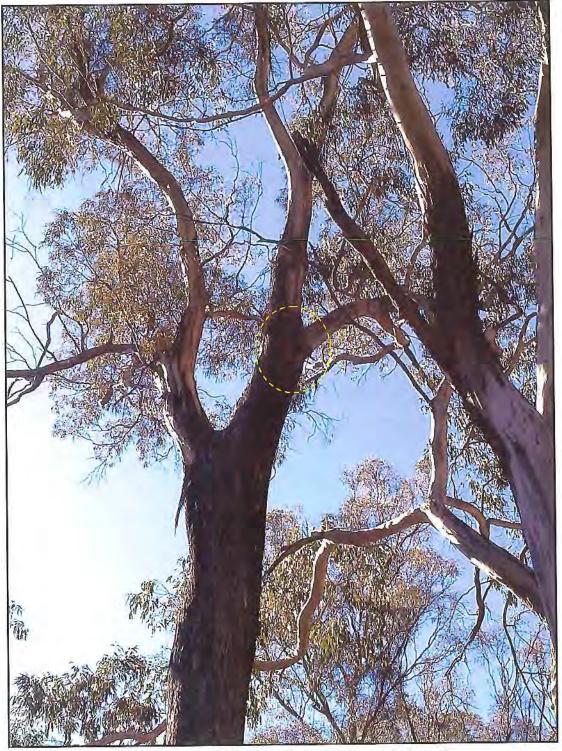


Plate 14- hollow within a black peppermint on private land

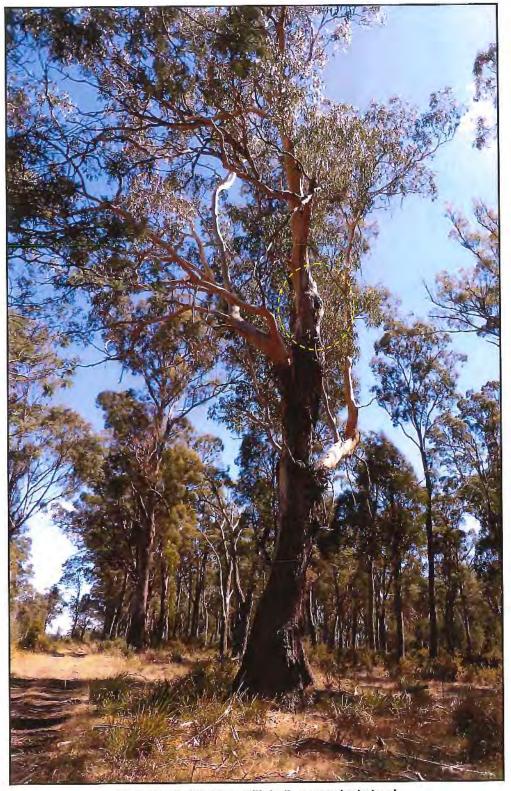


Plate 15 - habitat tree with hollow on private land

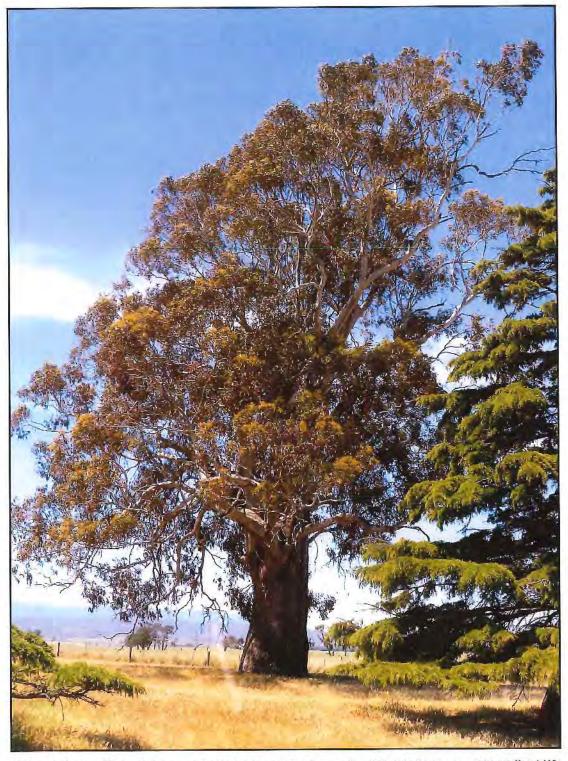


Plate 16- two mature white gums have been retained near the "Cleighdion" property on the RHS at the northern end of the study

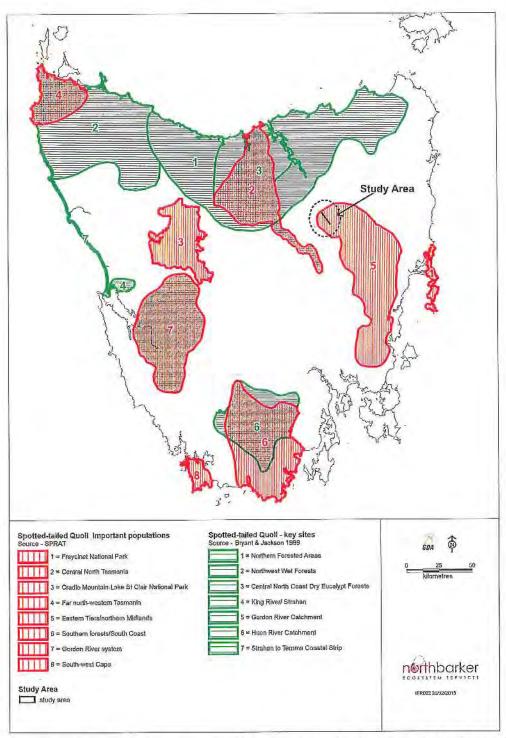


Figure 2 - Extent of important populations and key sites for the spotted-tailed quall.