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Minerals and Metals Group
Report for Exploration tracks
and drill pads at Trial Harbour,
Melba Flats and Lake Rosebery

Botanical survey and fauna
habitat assessment

August 2011



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Executive Summary

GHD Pty Ltd (GHD) has been engaged by Minerals and Metals Group (MMG) to undertake a botanical survey and fauna habitat assessment for the proposed exploration tracks and drill pads at Trial Harbour, Melba Flats and Lake Rosebery.

A GHD Senior Botanist and a GHD Ecologist conducted a botanical survey and fauna habitat assessment of the study sites on the 6th, 7th and 20th of July 2011. This work identified:

Trial Harbour sites:

- No threatened flora species.
- No declared weed species.
- Two vegetation communities not listed as threatened under *Nature Conservation Act 2002*.
- Good foraging habitat for listed fauna species, particularly in the Coastal Heathland (SCH), for the wedge-tailed eagle (*Aquila audax subsp. fleayi*) and the white-bellied sea-eagle (*Haliaeetus leucogaster*).

Melba Flats:

- One threatened plant species *Pomaderris intermedia* listed as rare under *Nature Conservation Act 2002*.
- Three vegetation communities not listed as threatened under *Nature Conservation Act 2002*.
- One declared weed species gorse (*Ulex europaeus*) in two locations.
- Good quality habitat for several threatened fauna species including a fresh Tasmanian devil scat.
- Good quality foraging and nesting habitat for listed bird species, the grey goshawk (*Accipiter novaehollandiae*) and the masked owl (Tasmanian) (*Tyto novaehollandiae subsp. castanops*) within the open understorey of the *Nothofagus-Atherosperma* rainforest (RMT).

Lake Rosebery:

- No threatened flora species.
- No declared weed species.
- Three vegetation communities not listed as threatened under *Nature Conservation Act 2002*.
- High quality arboreal habitat (hollow bearing trees) for both bird and mammal species.

The above recommendations are based on current plans for the proposed exploration tracks and drill pads at Trial Harbour, Melba Flats and Lake Rosebery and may need to be revised if the plans change.



1. Introduction

1.1 Background

GHD has been engaged by MMG to undertake a botanical survey and fauna habitat assessment for the proposed exploration tracks and drill pads in three locations; Trial Harbour, Melba Flats and Lake Rosebery. This botanical survey and fauna habitat assessment forms part of the environmental assessments required to obtain approval for these projects.

1.2 Study Area

The proposed exploration tracks and drill pads are situated at the following locations in Western Tasmania as shown in Figure 1:

- Trial Harbour site 1, which is located approximately 700m east of the Trial Harbour residential area;
- Trial Harbour site 2, which is located approximately 250m north of Trial Harbour site 1;
- Lake Rosebery; and
- Melba Flats.

For each site the study area encompassed a:

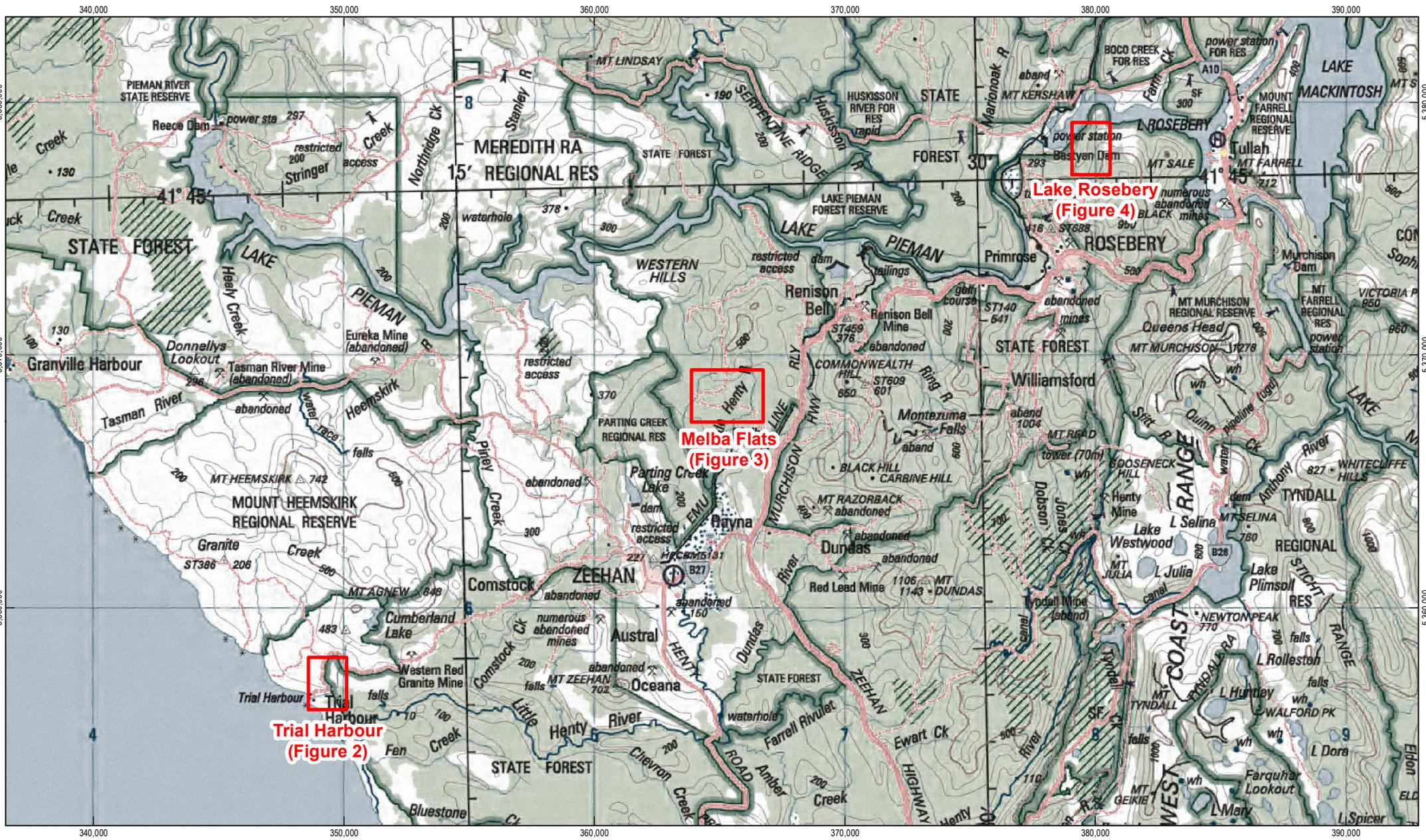
- 10m wide corridor along the proposed access track, which is anticipated to be the maximum width of disturbance during the track construction;
- 20m by 20m area for each of the proposed drill pad sites; total access track distances of 250m for Trial Harbour site 1; 1km for option 1 and 250m for option 2 at Trial Harbour site 2; 3.25 km for Melba Flats; and 1.25 km for Lake Rosebery

Flora and fauna values immediately outside these zones were also noted if deemed to be significant.

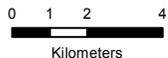
1.3 Purpose of the Study

The purpose of this study was to:

- Describe the flora and fauna of the study area;
- Identify threatened ecological values within the study area;
- Evaluate the proposed exploration tracks and drill pads in three locations; Trial Harbour, Melba Flats and Lake Rosebery against relevant environmental legislation and policy;
- Outline potential impacts of the proposed exploration tracks and drill pads in three locations; Trial Harbour, Melba Flats and Lake Rosebery on ecological values;
- Outline mitigation measures to minimise potential impacts; and
- Provide recommendations on permits or processes required.



Paper Size A4



Kilometers

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55



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MMG
July 2011 Flora & Fauna Survey

Job Number 32-16026
Revision A
Date 01 Aug 2011

Vegetation Survey
Site Overview

Figure 1



2. Methodology

2.1 Background Research

The primary data sources accessed during the background research include:

- Natural Values Atlas (BCB 2011) - which provides a natural values report that identifies threatened fauna and flora records within 500 m and 5000 m of the centre of the study area;
- *Tasmania's Threatened Fauna Handbook* (Bryant & Jackson 1999) - which was consulted for threatened species recorded from the Dundas sheet (Tasmap 3636, Tasmania 1:25,000 series) and the Trial sheet (Tasmap 3435, Tasmania 1:25,000 series);
- The *Environment Protection and Biodiversity Conservation Act 1999* (EPBCA) 'Protected Matters Search Tool' (Commonwealth Government 2011) – which provides a report that identifies any matters listed under the EPBCA within a 5km buffer around the study area; and
- The LIST information database (Service Tasmania 2011) - which provides information on the location of vegetation communities according to the TASVEG 2005 and NRM Coastal Values Project 2006 mapping data, including the location of threatened vegetation.

2.2 Field Assessment

A GHD Senior Botanist and a GHD Ecologist conducted botanical surveys and fauna habitat assessments of the proposed exploration routes on 6th, 7th and 20th of July 2011.

The study area was surveyed on foot, noting and collecting plant species as needed, for confirmation and final identification at the Tasmanian Herbarium. All species observed were recorded along with fauna habitat values, native vegetation communities and weed infestations.

Statement of Compliance

Plant species were collected in accordance with the Department of Primary Industries, Parks, Water and Environment's Plant Collection Permit Number TFL 11119 (expiry: 30/06/2012).]

Declared weeds were collected, stored and transported in accordance with an exemption from provisions of the Weed Management Act 1999 issued by the Department of Primary Industries, Park, Water and Environment for the period January 1st 2011 until December 31st 2011.

2.3 Nomenclature and Assessment of Significance

All plants were identified in accordance with the *Census of Vascular Plants of Tasmania* (Baker and Duretto 2011). Flora and fauna conservation significance was determined in accordance with the *Tasmanian Threatened Species Protection Act 1995* (TSPA) and the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBCA). Weeds of significance were identified using the weeds index (DPIPWE) and *Weeds of the South East: An Identification Guide for Australia* (Richardson *et al.* 2007). Conservation significance of vegetation communities was assessed in accordance with the TASVEG 2005 and Regional Forestry Agreement (RFA) classification and associated criteria.



3. Biological Values

3.1 Native Flora

3.1.1 Potential threatened flora identified by desktop research

One threatened plant species *Orthoceras strictum* (horned orchid) has previously been recorded within 500 meters of the Trial Harbour study area, according to the Natural Values Atlas Report produced using the Natural Values Atlas¹.

No threatened plant species have previously been recorded within 500 metres of the Melba Flats study area, according to the Natural Values Atlas Report produced using the Natural Values Atlas².

No threatened plant species have previously been recorded within 500 metres of the Lake Rosebery study area, according to the Natural Values Atlas Report produced using the Natural Values Atlas³.

Additional plant species listed under the TSPA and the EPBCA have also been recorded, or are predicted to occur, within 5 km of the study areas according to the Natural Values Report and the EPBCA Protected Matters Report. These species and their likelihood of occurrence are listed in **Table 1** for the Trial Harbour sites, **Table 2** for the Melba Flats sites and **Table 3** for the Lake Rosebery site.

Table 1 Threatened flora previously recorded in, or predicted to occur within 5 km, of the two study areas at Trial Harbour

Species	Tasmanian TSPA Status	Commonwealth EPBCA Status	Brief habitat description & Likelihood of occurrence within study area
<i>Amphibromus neesii</i> Southern swampgrass	Rare	Not Listed	In Tasmania <i>Amphibromus neesii</i> is found in damp ground around marshes, lagoons, river flats, pools and streams. It is known from the East Coast, North-East, Midlands and West Coast of Tasmania. Highly unlikely, survey area not located in wetland habitat.
<i>Baumea gunnii</i> Slender twigsedge	Rare	Not Listed	In Tasmania, <i>Baumea gunnii</i> inhabits wet moors, creeks and riverbanks throughout the State. Possible, some suitable habitat in the wetter moorland areas of the site. Not recorded during the survey.
<i>Bunodophoron notatum</i> Lichen	Endangered	Not Listed	In Tasmania, <i>Bunodophoron notatum</i> is found in callidendrous rainforests or in mature mixed forest with a callidendrous rainforest understorey, on the mature, shaded tree trunks of <i>Nothofagus cunninghamii</i> . Unlikely, no suitable habitat.
<i>Deyeuxia minor</i> small bentgrass	Rare	Not Listed	Inhabits open eucalypt forests or the margins of wet sclerophyll forest, in the south-west, south and north-east of the State. Unlikely, habitat not wet eucalypt forest, not recorded during the survey.

¹ Biodiversity Conservation Branch, DPIPWE, accessed 4th July 2011

² Biodiversity Conservation Branch, DPIPWE, accessed 4th July 2011

³ Biodiversity Conservation Branch, DPIPWE, accessed 4th July 2011



Species	Tasmanian TSPA Status	Commonwealth EPBCA Status	Brief habitat description & Likelihood of occurrence within study area
<i>Lachnagrostis scabra</i> subsp. <i>scabra</i> rough blowgrass	Rare	Not listed	The species occurs in coastal habitats in the Bass Strait islands and the western part of the State, where it grows in damp ground, including seepage slopes, stream banks and swamps. Possible, some suitable habitat, not recorded during the survey.
<i>Orthoceras strictum</i> horned orchid	Rare	Not Listed	This uncommon and localised orchid occurs in coastal and near coastal areas in buttongrass moorland, sedgy and scrubby heathland, sedgy eucalypt shrubland and open forest across the State (Jones <i>et al.</i> 1999). Possible, some suitable habitat, not recorded during the survey.
<i>Pterostylis ziegeleri</i> grassland greenhood	Vulnerable	Vulnerable	In coastal areas it is found on the slopes of low stabilised sand dunes and in grassy dune swales, while in the Midlands it grows in native grassland or grassy woodland on well-drained clay loams derived from basalt. Unlikely, unsuitable habitat.
<i>Ranunculus acaulis</i> Dune buttercup	Rare	Not listed	Within Tasmania the species is restricted to the west and northwest coast, where it grows in seepage areas on the seaward sides of dunes. Unlikely, study area not located on coastal dune systems.
<i>Veronica novae-hollandiae</i> Coast speedwell	Vulnerable	Not Listed	Endemic to Tasmania. The species has been recorded along the State's west and southwest coasts between the Italian River and Cockle Creek, where it grows in sandy littoral banks and herbfields. Unlikely, no suitable habitat, not recorded during the survey.

Table 2 Threatened flora previously recorded in, or predicted to occur within 5 km, of the study area Melba Flats

Species	Tasmanian TSPA Status	Commonwealth EPBCA Status	Brief habitat description & Likelihood of occurrence within study area
<i>Epacris glabella</i> smooth heath	Endangered	Endangered	Occurs near Savage River and Renison Bell in the northwest within heath, open scrub or dry <i>Eucalyptus nitida</i> woodland on Cambrian serpentine in hilly terrain. An outlying population also occurs along the upper reaches of the Gordon River on sparsely vegetated Precambrian quartzite outcrops that are prone to flooding. Highly unlikely, no suitable habitat, not recorded during the survey.
<i>Micrantheum serpentinum</i> western tridentbush	Rare	Not Listed	Apparently restricted to Cambrian serpentine substrate, typically on rocky hillsides at approximately 170-480 metres above sea level, this species occurs in heathy shrubland, shrubby <i>Eucalyptus nitida</i> woodland, and moist, shaded gullies or creek banks in western Tasmania. Highly unlikely, no suitable habitat, not recorded during the survey.



Species	Tasmanian TSPA Status	Commonwealth EPBCA Status	Brief habitat description & Likelihood of occurrence within study area
<i>Orthoceras strictum</i> horned orchid	Rare	Not Listed	This uncommon and localised orchid occurs in coastal and near coastal areas in buttongrass moorland, sedgy and scrubby heathland, sedgy eucalypt shrubland and open forest across the State (Jones <i>et al.</i> 1999). Unlikely, no suitable habitat.
<i>Persoonia muelleri</i> subsp. <i>angustifolia</i> narrowleaf geebung	Rare	Not Listed	This species grows in rainforest to dense scrub, and perhaps within sub-alpine heath, in a variety of sedimentary and metamorphic substrata, predominantly within 50 metres of the west coast of Tasmania. Highly unlikely, no suitable habitat.

Table 3 Threatened flora previously recorded in, or predicted to occur within 5 km, of the Lake Rosebery study area

Species	Tasmanian TSPA Status	Commonwealth EPBCA Status	Brief habitat description & Likelihood of occurrence within study area
<i>Deyeuxia densa</i> heath bentgrass	Rare	Endangered	In Tasmania this species is widespread and occurs in open to lightly shaded situations, heaths, sedgeland and stream banks. Highly unlikely, no suitable habitat.
<i>Barbarea australis</i> riverbed wintercress	Endangered	Critically Endangered	Found near river margins, creek beds and along flood channels adjacent to the river. It occurs in shallow alluvial silt deposited on rock slabs or rocky ledges, or between large cobbles on sites frequently disturbed by fluvial processes. Highly unlikely, no suitable habitat.

Note: Likelihood of occurrence of threatened flora is assessed on a 4-tier scale:

Present - individuals recorded within the study area during the field assessment or any previous assessment within the boundaries of study area;

Possible - suitable habitat occurs within the study area;

Unlikely - suitable habitat unlikely to occur within the study area, or suitable habitat substantially modified, or suitable habitat present but species not recorded for over 50 years within 5 km of the site;

Highly unlikely - no suitable habitat present within the study area, and individuals not recorded within the study area during current or any previous assessment.

3.1.2 Threatened flora recorded within the study area

Trail Harbour site 1 and 2 No threatened plant species were found in either of the study areas during the field survey.

Melba Flats

One threatened plant species *Pomaderris intermedia* (lemon dogwood) was found in the study area during the field survey. One individual was recorded within a small population of *Pomaderris apetala* on the edge of the existing access track within the *Acacia melanoxylon* forest on rises (NAR). The previous known Tasmanian distribution was the north-east, east coast and Bass Strait Islands. The specimen has been lodged with the Tasmanian Herbarium as it is a west coast extension of range for the species.

Lake Rosebery



No threatened plant species were found in the study area during the field survey.

The survey was undertaken in July which is considered a suboptimal time of year for conducting a survey for herbaceous annuals and grasses. Due to the vegetation types recorded it is considered highly unlikely that either of the threatened species *Deyeuxia densa* (heath bentgrass) or *Barbarea australis* (riverbed wintercress) identified through the Natural Values Atlas report or the Protected Matters Search Tool have been overlooked.

3.2 Introduced Plants

No declared weed species were recorded within the Trail Harbour or Lake Rosebery study sites.

One species, *Ulex europaeus* (gorse), was recorded within the Melba Flats study area and is listed as a declared weed under the Tasmanian *Weed Management Act 1999*. The location is detailed in Table 4:

Table 4 Declared weed recorded within the Melba Flats study area

Species	Common Name	Approx. Area Covered	Easting (GDA94)	Northing (GDA94)
<i>Ulex europaeus</i>	gorse	20m ²	364327	5368557
<i>Ulex europaeus</i>	gorse	30m ²	364355	5368556

3.3 Vegetation Communities and Condition

The general vegetation community descriptions listed within the three study areas are taken from the document, *From Forest to Fjaeldmark: Descriptions of Tasmania's Vegetation* (Harris & Kitchener 2005). Vegetation descriptions at the sites were compiled from field notes.

3.3.1 Trial Harbour site 1

Two native vegetation communities were identified and mapped within the study area (refer Figure 2).

***Eucalyptus nitida* dry forest and woodland (DNI)**

This community is generally dominated by *Eucalyptus nitida* (western peppermint) over a dense and typically diverse heathy/sedge understorey. Trees in the coastal form of this community are generally of mallee form and less than 10 metres in height, over an understorey of heath and sedges. A sparse intermediate layer of *Leptospermum* (teatree) species and *Banksia marginata* (silver banksia) may also occur. Inland ridges usually carry taller trees, clearly defined from an understorey of low heathland or tall, even-textured shrubs that do not exceed 4 metres in height.

Within the study area this community was dominated by stunted mature *E. nitida*, up to 2m in height, with a moderately dense canopy and an understorey shrub layer dominated by *Pultenaea juniperina*, *Allocasuarina zephyrea* and *Banksia marginata*. Other species present were *Pteridium esculentum*, *Acacia myrtifolia*, *Epacris lanuginosa*, *Epacris impressa*, *Gleichenia dicarpa*, *Diplarrena latifolia* and *Lepidosperma concavum*. This community is considered to be in pristine condition as there were no weeds recorded. This community is considered to be an intermediate between DNI and western wet scrub (SWW),



Plate 1 Stunted *Eucalyptus nitida* dry forest and woodland (DNI) Trial Harbour site 1

Coastal Heathland (SCH)

This community generally occurs on sand sheets and acid sandy soils on the coast. Coastal heathlands are typically floristically diverse. The most diverse families are *Orchidaceae*, *Cyperaceae*, *Restionaceae*, *Asteraceae*, *Myrtaceae*, *Fabaceae*, *Proteaceae* and *Epacridaceae*. Some scattered emergent, including eucalypt species, *Banksia marginata*, *Leucopogon parviflorus* or *Allocasuarina* species, may be present. The ground layer may be sparse and include *Lindsaea linearis*, *Selaginella uliginosa*, *Ehrharta distichophylla*, orchids, *Drosera* species and *Lepidosperma concavum*. The litter layer usually provides close to 100% cover.

Within the study area this community was dominated by low shrubs (height <1m) of *Acacia suaveolens*, *Banksia marginata*, *Leptospermum scoparium*, *Allocasuarina zephyrea* and *Hakea epiglottis*. The heath component included *Epacris lanuginosa*, *Leucopogon collinus*, *Sprengelia incarnata*, and *Styphelia adscendens*. The community also had a strong component of sedges and graminoids including *Lepidosperma filiforme*, *Lepidosperma laterale*, *Lepidosperma concavum*, *Patersonia fragilis* and *Diplarrena latifolia*. No weed species were recorded.



Plate 2 Coastal Heathland (SCH) at site 1 Trial Harbour showing the track to be subject to minor upgrading

3.3.2 Trial Harbour site 2

Two native vegetation communities were identified and mapped within the study area (refer Figure 2).

Buttongrass moorland (undifferentiated) (MBU)

Generally this vegetation type is distinguished from heathland and grassland mapping units by the presence of *Gymnoschoenus sphaerocephalus* and other graminoids, particularly sedges and cord rushes. The lack of large or abundant trees distinguished it from forest or woodland units, and the low height of shrubs distinguishes it from scrub units. *Gymnoschoenus sphaerocephalus* is the dominant species. MBU can range from pure *G. sphaerocephalus* communities to moorlands with a mixture of *G. sphaerocephalus* and low shrub species as well as numerous sedge species. It can be very open to dense, but most plants occur within a single layer or with an emergent layer of shrubs less than 2 meters tall.

Within the study area this community was dominated by *Leptospermum nitidum*, *L. scoparium*, *Lepidosperma laterale* up to a height of 1m with *Gymnoschoenus sphaerocephalus* also being present. There were also individuals of *Banksia marginata* and *Allocasuarina zephyrea*. The ground layer was considerably dense with *Gleichenia dicarpa*, *Leptocarpus tenax*, *Leucopogon collinus*, *Lycopodium deuterodensum*, *Pimelea linifolia* and *Sprengelia incarnata*.



Plate 3 Buttongrass moorland (undifferentiated) (MBU) at Trial Harbour site 2

***Eucalyptus nitida* dry forest and woodland (DNI)**

Generally this community is dominated by *Eucalyptus nitida* (western peppermint) over a dense and typically diverse heathy/sedgey understorey. Trees in the coastal form of this community are generally of mallee form and less than 10 metres in height, over an understorey of heath and sedges. A sparse intermediate layer of *Leptospermum* (teatree) species and *Banksia marginata* (silver banksia) may also occur. Inland ridges usually carry taller trees, clearly defined from an understorey of low heathland or tall, even-textured shrubs that do not exceed 4 metres in height.

Within the study area this community was characterised by a canopy of *Eucalyptus nitida* up to a height of 4m with a dense understorey shrub layer dominated by *Leptospermum scoparium*, *Melaleuca squarrosa*, *Zieria arborescens*, *Acacia verticillata*, *Pultenaea daphnoides* and *Lomatia tinctoria*. Other species present were *Pteridium esculentum*, *Gahnia grandis* and *Lepidosperma laterale*.



Plate 4 *Eucalyptus nitida* dry forest and woodland (DNI) located at the proposed drill pad Trial Harbour site 2

3.3.3 Melba Flats study area

Three vegetation communities were identified and mapped during the field assessment (refer Figure 3) of the Melba Flats study area. These are not listed as threatened under Schedule 3A of the *Nature Conservation Act 2002*.

***Acacia melanoxylon* forest on rises (NAR)**

Regrowth *Acacia melanoxylon* (blackwood) trees of even height generally dominate this community, typically forming a closed forest over a diversity of understorey species ranging from relatively open to dense. Characterised by the almost complete dominance of even aged *Acacia melanoxylon* following fire in rainforests and mixed forests, this community may also be co-dominated by eucalypts such as *Eucalyptus obliqua* (stringybark) or *Eucalyptus nitida* (western peppermint). Rainforest or wet sclerophyll species such as *Nematolepis squamea* (satinwood), *Pomaderris apetala* (common dogwood), *Nothofagus cunninghamii* (myrtle), *Atherosperma moschatum* (sassafras), *Eucryphia lucida* (leatherwood) and *Leptospermum* species may be present, over a fern-dominated ground layer. Occurring on slopes with soils of moderate to high fertility this community may be structurally and floristically similar to *Acacia melanoxylon* swamp forest (NAF), and intergrades with and is replaced by *Acacia dealbata* forest (NAD) on fertile substrates.

This community mapped within the study area was dominated by *Acacia melanoxylon* up to 20m in height with an understory component comprising rainforest species such as *Nothofagus cunninghamii*, *Atherosperma moschatum*, *Eucryphia lucida*, *Leptospermum scoparium* and *L. lanigerum*. *Dicksonia antarctica* was common throughout the understory with a ground layer component comprising *Blechnum nudum*, *Pteridium esculentum* and *Carex appressa*.



Plate 5 *Acacia melanoxylon* forest on rises (NAR) Melba Flats

***Leptospermum* with rainforest scrub (RLS)**

Leptospermum with rainforest scrub (RLS) is generally a 2-5 (sometimes to 8) m, scrub with an uneven canopy dominated by *Leptospermum* species (often *L. lanigerum*), with small rainforest trees in the understory. These include *Nothofagus cunninghamii*, *Eucryphia lucida*, *Anopterus glandulosus*, *Phyllocladus aspleniifolius* and *Anodopetalum biglandulosum*. It is typically rich in *Bauera rubioides* and may have shrubby heath species. There may be scattered emergent *Eucalyptus nitida* or, on the margins of tall wet forest, *E. obliqua* or *E. delegatensis*. Rainforest regrowth after fire is included in RLS in world Heritage Area mapping, as is rainforest (of various forms) closely combined with *Melaleuca* or *Leptospermum* species scrub. Other shrubs may include *Orites diversifolia*, *Telopea truncata*, *Pittosporum bicolor*, *Nematolepis squamea*, *Cenarrhenes nitida*, *Pomaderris* species, *Acacia* species, *Lomatia* species, *Coprosma nitida*, *Hakea lissosperma* and *Tasmannia lanceolata*.

Within the study area *Leptospermum scoparium* was the dominant canopy species up to 6m in height with *Acacia melanoxylon* as the sub-dominant with scattered *Eucalyptus nitida* throughout. Rainforest species in the secondary stratum included *Nothofagus cunninghamii*, *Eucryphia lucida*, *Anopterus glandulosus*, *Phyllocladus aspleniifolius* and *Anodopetalum biglandulosum*. The ground layer component included *Gahnia grandis* and *Pteridium esculentum*.



Plate 6 *Leptospermum* with rainforest scrub (RLS) at the proposed drill site, Melba Flats. This is a historical drill site location.

***Nothofagus-Atherosperma* rainforest (RMT)**

This rainforest community is generally tall (> 25 m) and dominated by *Nothofagus cunninghamii* (myrtle) on relatively fertile soils. *Atherosperma moschatum* (sassafras) can sometimes dominate, and *Eucryphia lucida* (leatherwood) may co-dominate. This latter species may also dominate with *Acacia melanoxylon* (blackwood), *Anodopetalum biglandulosum* (horizontal) and *Phyllocladus aspleniifolius* (celerytop pine) on less fertile sites, sometimes associated with *Richea pandanifolia* (pandani), and occurring over broad-leaf and spindly shrubs such as *Anopterus glandulosus* (Tasmania laurel), *Cenarrhenes nitida* (native plum) or *Telopea truncata* (Tasmanian waratah) or fine-leaved species such as *Aristotelia peduncularis* (heartberry), *Pimelea drupacea* (cherry riceflower), *Pittosporum bicolor* (cheesewood), *Coprosma quadrifida* (native currant) and *Trochocarpa* (purpleberry) species. However, the greatest species diversity of vascular plants is generally represented by ferns, with *Dicksonia antarctica* (soft treefern) commonly occurring in the mid-storey, and epiphytic ferns such as *Hymenophyllum* (filmyfern) and *Grammitis* (fingerfern) species frequently occurring on tree trunks and logs.

Within the study area *Nothofagus cunninghamii* and *Atherosperma moschatum* were dominant species within the canopy reaching heights greater than 30m. The understorey was typically callidendrous with a high cover of moss and ferns including *Dicksonia antarctica*, *Hymenophyllum rarum*, *Hypolepis rugosula*, *Blechnum watsii* and *Blechnum nudum*. *Ulex europaeus* (declared weed) was also recorded near the proposed drill pad site.



Plate 7 *Nothofagus-Atherosperma* rainforest (RMT) Melba Flats

***Nothofagus* – *Phyllocladus* short rainforest (RMS)**

Typically between only 8 to 20 metres in height, this community is often implicate rainforest vegetation with moderate to high floristic diversity, occupying low to moderately fertile sites in western Tasmania. It is distinguished from most other rainforest communities by the absence or low cover of the conifer genera and *Leptospermum* (teatree) species, and by the presence of the endemic species *Anodopetalum biglandulosum* (horizontal), *Eucryphia lucida* (leatherwood), and *Phyllocladus aspleniifolius* (celerytop pine). The latter two of these species generally co-dominates in the canopy with *Nothofagus cunninghamii* (myrtle), with shrubs and small trees dominating the understorey. *Eucalyptus nitida* (western peppermint) is an occasional emergent.

Within the study area this community was characterised by *Nothofagus cunninghamii* up to a height of 15m with a relatively high cover large *Phyllocladus aspleniifolius* and *Eucryphia lucida*. The understorey was thamnisc in nature with high densities of *Anodopetalum biglandulosum* and smaller individuals of *Phyllocladus aspleniifolius*, *Eucryphia lucida* and *Trochocarpa gunnii*.



Plate 8 *Nothofagus* – *Phyllocladus* short rainforest (RMS) beside the overgrown existing track proposed to be upgraded at Melba Flats

3.3.4 Lake Rosebery study area

Three vegetation communities were identified and mapped during the field assessment (refer Figure 4) of the Lake Rosebery study area. These are not listed as threatened under Schedule 3A of the Nature Conservation Act 2002.

***Eucalyptus nitida* forest over *Leptospermum* (WNL)**

This community is a tall wet eucalypt forest dominated by *Eucalyptus nitida*, with a dense understorey dominated by one or more species of *Melaleuca* and/or *Leptospermum*. It is floristically and structurally similar to *E. obliqua* over *Leptospermum* (WOL). The understorey maybe sparse, but is more commonly dense, with *Gahnia grandis*, *Gleichenia microphylla* and *Bauera rubioides* common, together with rainforest shrubs such as *Anopterus glandulosus*.

Within the study site the community consisted of *Eucalyptus nitida* to 30m and very old *Eucalyptus obliqua* to 40 m in height, these old growth trees are considered to provide quality habitat and nesting opportunities for hollow dependant mammals and birds, particularly raptors. The understorey component consists of *Leptospermum scoparium*, *Melaleuca squarrosa* and *Bauera rubioides*. The community was mostly located on the northern end of the survey area where it then merged into *Nothofagus-Atherosperma* rainforest (RMT).



Plate 9 *Eucalyptus nitida* forest over *Leptospermum* (WNL) at northern end of the study site near Lake Rosebery

Nothofagus-Leptospermum short rainforest (RML)

Rainforest in which 15-50% of the canopy is mature *Leptospermum* species is mapped as this community, and is generally thamnisc with moderate floristic diversity. *Nothofagus cunninghamii* (myrtle) tends to co-dominate with *Phyllocladus aspleniifolius* (celerytop pine), *Eucryphia* species (leatherwood), *Atherosperma moschatum* (sassafras), *Anodopetalum biglandulosum* (horizontal), and sometimes *Acacia melanoxylon* (blackwood). This community may also include *Eucalyptus nitida* (western peppermint).

Within the study area this vegetation type occurred in the central part of the study area with *Leptospermum scoparium* dominating the canopy with a general sub dominance of *Nothofagus cunninghamii*. *Eucalyptus obliqua* emergents were also noted and are considered to provide quality habitat hollows and nesting opportunities for hollow dependant raptors and arboreal mammals. The understory was thamnisc in nature with a dense cover of *Eucryphia lucida*, *Melaleuca squarrosa*, *Nematolepis squamea*, *Pittosporum bicolor*, and *Phyllocladus aspleniifolius*.



Plate 10 *Nothofagus-Leptospermum* short rainforest (RML) in the mid-section of the Lake Rosebery study site

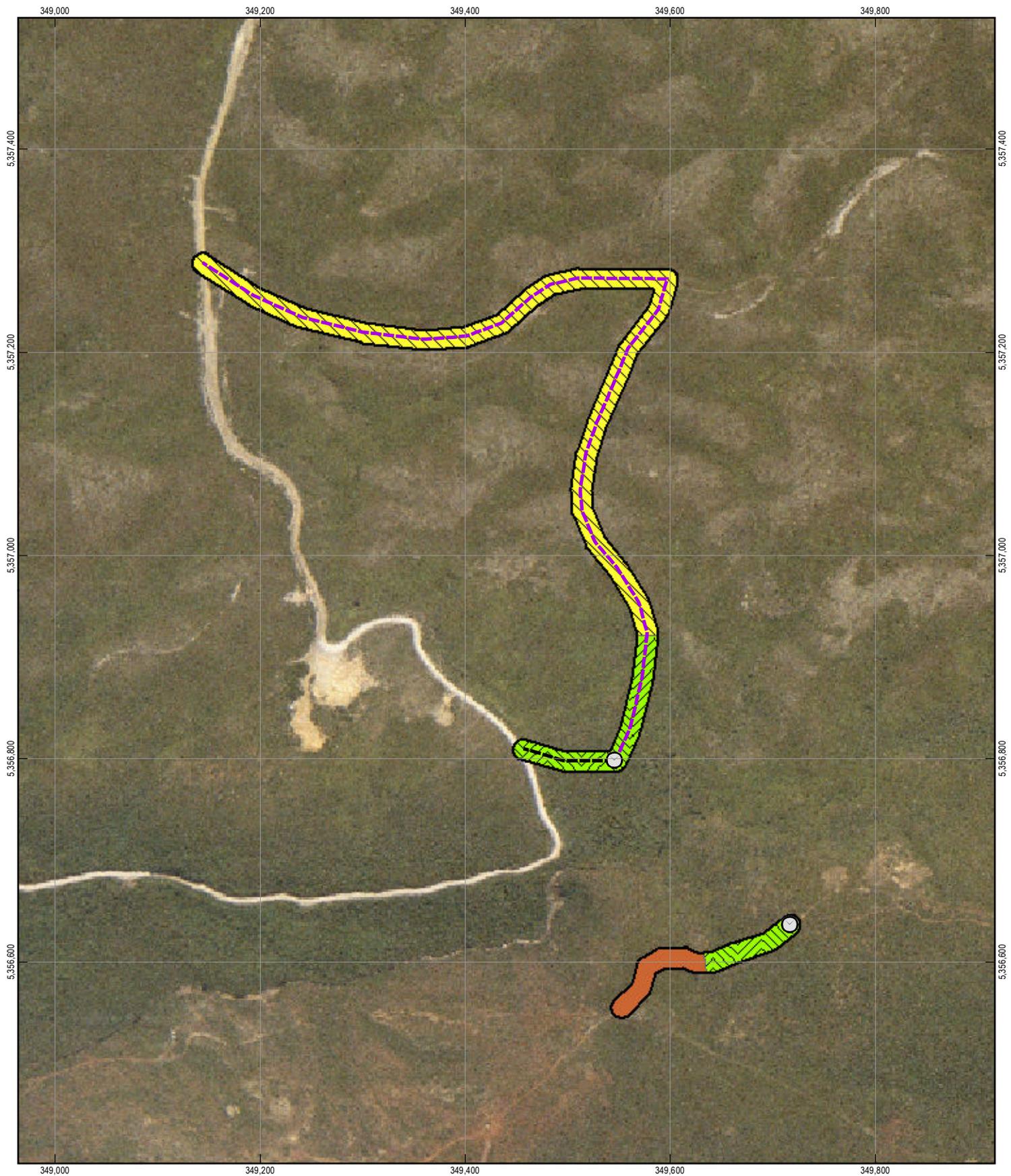
***Nothofagus* – *Phyllocladus* short rainforest (RMS)**

Typically between only 8 to 20 metres in height, this community is often implicate rainforest vegetation with moderate to high floristic diversity, occupying low to moderately fertile sites in western Tasmania. It is distinguished from most other rainforest communities by the absence or low cover of the conifer genera and *Leptospermum* (teatree) species, and by the presence of the endemic species *Anodopetalum biglandulosum* (horizontal), *Eucryphia lucida* (leatherwood), and *Phyllocladus aspleniifolius* (celerytop pine). The latter two of these species generally co-dominates in the canopy with *Nothofagus cunninghamii* (myrtle), with shrubs and small trees dominating the understorey. *Eucalyptus nitida* (western peppermint) is an occasional emergent.

Within the study area this community occurs in the southern section of the survey area and was characterised by *Nothofagus cunninghamii* and *Atherosperma moschatum* with an occasional occurrence of *Phyllocladus aspleniifolius* within the canopy. The understorey structure was composed of *Eucryphia lucida*, *Anodopetalum biglandulosum*, *Pittosporum bicolor* and *Trochocarpa gunnii*.



Nothofagus – Phyllocladus short rainforest (RMS) southern end of the Lake Rosebery study area

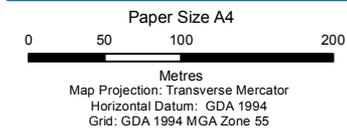


LEGEND

- MMG Drill Pad Proposed
- Proposed Track Option 1
- Proposed Track Option 2

- Study Area
- Dry Eucalypt Forest and Woodland**
- DNI *Eucalyptus nitida* dry forest and woodland

- Scrub, heathland and coastal complexes**
- SCH *Coastal heathland*
- Moorland, Sedgeland, Rushland and Peatland**
- MBU *Buttongrass moorland (undifferentiated)*



MMG
July 2011 Flora & Fauna Survey

Job Number | 32-16026
Revision | A
Date | 01 Aug 2011

**Vegetation Survey
Trial Harbour**

Figure 2

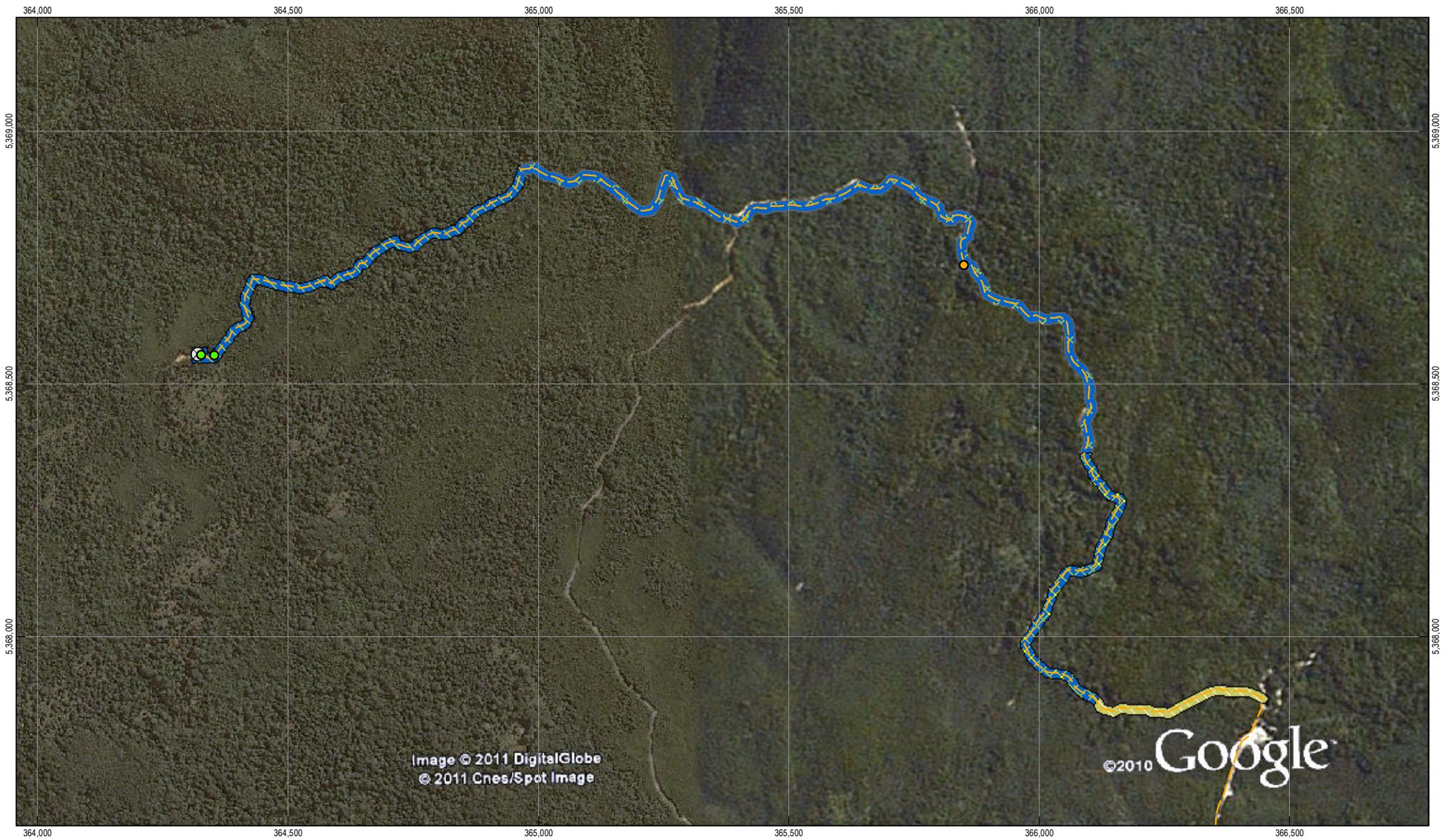


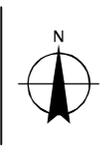
Image © 2011 DigitalGlobe
© 2011 Cnes/Spot Image

©2010 Google

Paper Size A4

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55



LEGEND

- ⊗ MMG Drill Pad Proposed
- *Ulex europaeus* (gorse)
- *Pomaderris intermedia*
- Track Location

Rainforest and related scrub

- RMS *Nothofagus* / *Phyllocladus* short rainforest
- RMT *Nothofagus* - *Atherosperma* rainforest
- RLS *Leptospermum* with rainforest scrub
- Non-Eucalypt Forest and Woodland
- NAR *Acacia melanoxylon* forest on rises



MMG
July 2011 Flora & Fauna Survey

Job Number | 32-16026
Revision | A
Date | 04 Aug 2011

**Vegetation Survey
Melba Flats**

Figure 3

Lake Rosebery

5,378,500

5,378,500

5,378,000

5,378,000

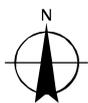
5,377,500

5,377,500

LEGEND

- *Cirsium vulgare*
- *Eucalyptus obliqua* (hollow bearing)
- Existing Track
- Proposed Track
- Wet Eucalypt forest and woodland**
- WNL *Eucalyptus nitida* forest over *Leptospermum*
- Rainforest and related scrub**
- RML *Nothofagus* - *Leptospermum* short rainforest
- RMS *Nothofagus* - *Phyllocladus* short rainforest

Paper Size A4
 0 50 100 200
 Metres
 Map Projection: Transverse Mercator
 Horizontal Datum: GDA 1994
 Grid: GDA 1994 MGA Zone 55



CLIENTS|PEOPLE|PERFORMANCE



MMG
 July 2011 Flora & Fauna Survey

Job Number | 32-16026
 Revision | A
 Date | 01 Aug 2011

Vegetation Survey
 Lake Rosebery

Figure 4



3.4 Fauna Habitat Values

3.4.1 Potential threatened fauna identified by desktop research

Trial Harbour

According to the Natural Values Atlas Report⁴, three threatened fauna have previously been recorded within 500 m of the Trial Harbour study areas.

- Wedge-tailed eagle (*Aquila audax* sbsp. *fleayi*) sight observation
- Spotted tailed quoll (*Dasyurus maculatus* subsp. *maculatus*) sight observation
- White bellied sea-eagle (*Haliaeetus leucogaster*) sight observation

Melba Flats

According to the Natural Values Atlas Report, no threatened fauna have previously been recorded within 500 m of the Melba Flats study area. Four species have the potential to occur within 500 m of the study area based on habitat values.

- Wedge-tailed eagle (*Aquila audax* sbsp. *fleayi*)
- Swift parrot (*Lathamus discolor*)
- Masked owl (*Tyto novaehollandiae*)
- Grey goshawk (*Accipiter novaehollandiae*)

Lake Rosebery

According to the Natural Values Atlas Report, no threatened fauna have previously been recorded within 500 m of the Lake Rosebery study area. However, six species have the potential to occur within 500 m of the study area based on habitat values.

- Wedge-tailed eagle (*Aquila audax* sbsp. *fleayi*)
- White bellied sea-eagle (*Haliaeetus leucogaster*)
- Grey goshawk (*Accipiter novaehollandiae*)
- Masked owl (*Tyto novaehollandiae*)
- Swift parrot (*Lathamus discolor*)
- Azure kingfisher (*Alcedo azurea* subsp. *diemenensis*)

Additional species have been recorded, or are predicted to occur based on habitat mapping, within 5 km of the site according to the Natural Values Atlas Report and the EPBCA Protected Matters Search Tool. These species (except listed marine species) and their likelihood for occurrence within the study sites are shown in Tables 5, 6, and 7 for the three study areas.



Table 5 Threatened fauna known to occur or predicted to occur within 5 km of the Trial Harbour study area

Species	Tasmanian TSPA Status	Commonwealth EPBCA Status	Brief habitat description & Likelihood of occurrence within study area
Mammals			
<i>Dasyurus maculatus</i> subsp. <i>maculatus</i> spotted-tailed quoll	Rare	Vulnerable	Most commonly inhabit cool temperate rainforest, wet sclerophyll forest, and coastal scrub. Possible, some suitable coastal scrub habitat.
<i>Sarcophilus harrisii</i> Tasmanian devil	Endangered	Endangered	May occur in a variety of forest types including coastal heath, open dry sclerophyll forest, and mixed sclerophyll rainforest. Possible, some suitable coastal heath and scrub habitat.
Birds			
<i>Accipiter novaehollandiae</i> grey goshawk	Endangered	Not Listed	Occurs in closed forests, with high priority nesting habitat along water courses with blackwoods. May otherwise nest in melaleuca, myrtle, teatree and eucalypt species, occasionally up to 100 metres from a watercourse. Unlikely, no suitable water course within 100 meters of the study site.
<i>Aquila audax</i> subsp. <i>fleayi</i> wedge-tailed eagle	Endangered	Endangered	Nest in old growth trees, and common in areas with a mosaic of forest, farmland and waterways. Unlikely, no old growth large trees, however, may utilize the area for foraging.
<i>Ceyx azureus</i> subsp. <i>diemenensis</i> azure kingfisher	Endangered	Endangered	Inhabits thick vegetation surrounding freshwater rivers, lakes, billabongs and swamps. Unlikely, no suitable habitat.
<i>Haliaeetus leucogaster</i> white-bellied sea-eagle	Vulnerable	Migratory	Generally nest and forage near the coast; however, also occur near large rivers and inland lakes. Require old growth trees for nesting. Possible, study area is located within 700 meters of the coast.
<i>Hirundapus caudacutus</i> white-throated needletail	Not Listed	Migratory	In Australia this species is almost entirely aerial. Occurs most often above wooded areas and heathland, but can occur over farmland and remnant vegetation at the edge of paddocks. Possible, area contains suitable coastal heathland.
<i>Lathamus discolor</i> swift parrot	Endangered	Endangered	Feed on the nectar of <i>Eucalyptus globulus</i> and <i>E. ovata</i> . Nest in tree hollows in eastern Tasmania, usually near the coast in dry forests. Highly unlikely, no suitable habitat.
<i>Neophema chrysogaster</i> orange-bellied parrot	Endangered	Critically Endangered	This migratory bird breeds only in coastal south-west Tasmania, spending winter in coastal Victoria and South Australia. Nesting in hollows in nearby eucalypt trees, the species generally feeds in sedgelands on the seeds of several heath plants and sedges. Its diet also includes seeds from buttongrass, <i>Helichrysum pumilum</i> and three <i>Boronia</i> species. Unlikely, generally only found further south in Tasmania.



Species	Tasmanian TSPA Status	Commonwealth EPBCA Status	Brief habitat description & Likelihood of occurrence within study area
<i>Tyto novaehollandiae</i> subsp. <i>castanops</i> masked owl (Tasmanian)	Endangered	Vulnerable	Usually found in lowland dry sclerophyll forest; however, can occur in wet sclerophyll forest, non-eucalypt dominated forest, scrub and urban environments. Possible, some suitable habitat.
Fish and Amphibians			
<i>Prototroctes maraena</i> Australian grayling	Vulnerable	Vulnerable	Occurs in middle to lower reaches of rivers and streams. Highly unlikely, no suitable habitat.

Table 6 Threatened fauna known to occur or predicted to occur within 5 km of the Melba Flats study area

Species	Tasmanian TSPA Status	Commonwealth EPBCA Status	Brief habitat description & Likelihood of occurrence within study area
Mammals			
<i>Dasyurus maculatus</i> subsp. <i>maculatus</i> spotted-tailed quoll	Rare	Vulnerable	Most commonly inhabit cool temperate rainforest, wet sclerophyll forest, and coastal scrub. Possible, suitable habitat.
<i>Sarcophilus harrisi</i> Tasmanian devil	Endangered	Endangered	May occur in a variety of forest types including coastal heath, open dry sclerophyll forest, and mixed sclerophyll rainforest. Present, observation of scat.
Birds			
<i>Accipiter novaehollandiae</i> grey goshawk	Endangered	Not Listed	Occurs in closed forests, with high priority nesting habitat along watercourses with blackwoods. May otherwise nest in melaleuca, myrtle, teatree and eucalypt species, occasionally up to 100 metres from a watercourse. Possible, some suitable habitat.
<i>Aquila audax</i> subsp. <i>fleayi</i> wedge-tailed eagle	Endangered	Endangered	Nest in old growth trees, and common in areas with a mosaic of forest, farmland and waterways. Possible, some suitable habitat. Several old growth eucalypts recorded during the survey.
<i>Ceyx azureus</i> subsp. <i>diemenensis</i> azure kingfisher	Endangered	Endangered	Inhabits thick vegetation surrounding freshwater rivers, lakes, billabongs and swamps. Unlikely, due to the absence of suitable streams and watercourses.
<i>Haliaeetus leucogaster</i> white-bellied sea-eagle	Vulnerable	Migratory	Generally nest and forage near the coast; however, also occur near large rivers and inland lakes. Require old growth trees for nesting. Possible, some suitable habitat.
<i>Hirundapus caudacutus</i> white-throated needletail	Not Listed	Migratory	In Australia this species is almost entirely aerial. Occurs most often above wooded areas and heathland, but can occur over farmland and remnant vegetation at the edge of paddocks. Unlikely, no suitable habitat.



Species	Tasmanian TSPA Status	Commonwealth EPBCA Status	Brief habitat description & Likelihood of occurrence within study area
<i>Lathamus discolor</i> swift parrot	Endangered	Endangered	Feed on the nectar of <i>Eucalyptus globulus</i> and <i>E. ovata</i> . Nest in tree hollows in eastern Tasmania, usually near the coast in dry forests. Highly unlikely, no suitable habitat.
<i>Tyto novaehollandiae</i> subsp. <i>castanops</i> masked owl (Tasmanian)	Endangered	Vulnerable	Usually found in lowland dry sclerophyll forest; however, can occur in wet sclerophyll forest, non-eucalypt dominated forest, scrub and urban environments. Possible, some suitable habitat.
Fish and Amphibians			
<i>Prototroctes maraena</i> Australian grayling	Vulnerable	Vulnerable	Occurs in middle to lower reaches of rivers and streams. Highly unlikely, no suitable habitat.

Table 7 Threatened fauna known to occur or predicted to occur within 5 km of the Lake Rosebery study area

Species	Tasmanian TSPA Status	Commonwealth EPBCA Status	Brief habitat description & Likelihood of occurrence within study area
Mammals			
<i>Dasyurus maculatus</i> subsp. <i>maculatus</i> spotted-tailed quoll	Rare	Vulnerable	Most commonly inhabit cool temperate rainforest, wet sclerophyll forest, and coastal scrub. Possible, suitable habitat.
<i>Sarcophilus harrisii</i> Tasmanian devil	Endangered	Endangered	May occur in a variety of forest types including coastal heath, open dry sclerophyll forest, and mixed sclerophyll rainforest. Possible, some suitable habitat.
Birds			
<i>Accipiter novaehollandiae</i> grey goshawk	Endangered	Not Listed	Occurs in closed forests, with high priority nesting habitat along watercourses with blackwoods. May otherwise nest in melaleuca, myrtle, teatree and eucalypt species, occasionally up to 100 metres from a watercourse. Possible, some suitable habitat.
<i>Aquila audax</i> subsp. <i>fleayi</i> wedge-tailed eagle	Endangered	Endangered	Nest in old growth trees, and common in areas with a mosaic of forest, farmland and waterways. Possible, some suitable habitat.
<i>Ceyx azureus</i> subsp. <i>diemenensis</i> azure kingfisher	Endangered	Endangered	Inhabits thick vegetation surrounding freshwater rivers, lakes, billabongs and swamps. Unlikely, due to the absence of suitable streams and watercourses.
<i>Haliaeetus leucogaster</i> white-bellied sea-eagle	Vulnerable	Migratory	Generally nest and forage near the coast; however, also occur near large rivers and inland lakes. Require old growth trees for nesting. Possible, some suitable habitat.
<i>Lathamus discolor</i>	Endangered	Endangered	Feed on the nectar of <i>Eucalyptus globulus</i>



Species	Tasmanian TSPA Status	Commonwealth EPBCA Status	Brief habitat description & Likelihood of occurrence within study area
swift parrot			and <i>E. ovata</i> . Nest in tree hollows in eastern Tasmania, usually near the coast in dry forests. Highly unlikely, no suitable habitat.
<i>Tyto novaehollandiae</i> subsp. <i>castanops</i>	Endangered	Vulnerable	Usually found in lowland dry sclerophyll forest; however, can occur in wet sclerophyll forest, non-eucalypt dominated forest, scrub and urban environments. Unlikely, due to the lack of suitable foraging habitat.
masked owl (Tasmanian)			

Note: Likelihood of occurrence of threatened flora is assessed on a 4-tier scale:

Present - individuals recorded within the study area during the field assessment or any previous assessment within the boundaries of study area;

Possible - suitable habitat occurs within the study area;

Unlikely - suitable habitat unlikely to occur within the study area, or suitable habitat substantially modified, or suitable habitat present but species not recorded for over 50 years within 5 km of the site;

Highly unlikely - no suitable habitat present within the study area, and individuals not recorded within the study area during current or any previous assessment.

The EPBCA Protected Matters Search Tool also identified a number of other migratory marine and coastal bird species as matters of national significance that may overfly the area. The present survey was confined to the terrestrial and freshwater aquatic habitats for vertebrate species within the study area, and as such overfly species were not considered in detail.

3.4.2 Fauna recorded within the study area

Trial Harbour Sites

No fauna species were observed/heard during the survey at the Trial Harbour.

Melba Flats

During the survey, evidence of the Tasmanian devil (*Sarcophilus harrisi*) utilising the area was apparent due to the observation of a fresh devil scat. Multiple fresh water crayfish burrows were also noted in several locations along the survey area. These burrows occur well outside the known habitat range of any threatened crayfish species in Tasmania. The common froglet (*Crinia signifera*) was also heard during the survey.

Lake Rosebery

One bird species was observed during the survey, the grey shrike-thrush (*Colluricincla harmonica*). Evidence of a common ring tailed possum (*Pseudocheirus peregrinus*) nest (drey) was also noted during the assessment located in a mature *Banksia marginata* approximately 5 meters above ground level.



3.4.3 Fauna habitat recorded within the study area

General Habitat Values

Trial Harbour

The study sites at Trial Harbour in general contain some potential foraging habitat for bird and mammal species. There have been positive sightings of the wedge tailed eagle and white bellied sea eagle in the Trial harbour area as identified by the Natural values atlas database and these species may forage within the vegetation types mapped within this area. Threatened mammal species such as the Tasmanian devil and the spotted tailed quoll may also utilise the study sites for foraging opportunities.

Melba Flats

The study site in general contains some good quality habitat for birds and mammals. The *Leptospermum* with rainforest scrub (RLS) and the *Acacia melanoxylon* forest on rises (NAR) provides good foraging, shelter and nesting habitat for several bird species including and not limited to raptors and owls, and may also provide habitat for more common mammals such as wallabies, possums, bandicoots. There was evidence that the Tasmanian devil (*Sarcophilus harrisi*) is currently utilising the area with observation of fresh devil scats within the study area. Threatened species such as the spotted-tailed quoll (*Dasyurus maculatus* subsp. *Maculatus*) may also utilise the site.

Lake Rosebery

The Lake Rosebery site contains some good quality habitat for both birds and mammals. The *Eucalyptus obliqua* forest over rainforest (WOR), *Nothofagus-Leptospermum* short rainforest (RML) and the Western wet scrub (SWW) provide suitable habitat values for several bird and mammal species.

Old growth *Nothofagus cunninghamii* and *Eucalyptus obliqua* individuals may also be providing foraging and/or nesting habitat for small and large birds and arboreal mammals. Large hollow bearing trees were recorded within all drill pad sites as well as along the northern section of the proposed access track route.

The threatened mammal species listed above in Table 7 (the spotted-tailed quoll and Tasmanian devil) may occur within the study area, but it is considered unlikely this would be critical habitat due to the relatively small size of the area to be impacted, as well as the close proximity to disturbance and human activities, specifically mining and current exploration activities. No dens were noted during the site inspection.

Threatened Fauna Habitat

Trial Harbour

Five threatened fauna species listed in Table 5 have been identified as potentially occurring on site based on habitat values:

1. Spotted-tailed quoll (*Dasyurus maculatus* subsp. *maculatus*) may forage and den within the study site particularly in the western wet scrub (SWW).
2. Tasmanian devil (*Sarcophilus harrisi*) may also utilise the western wet scrub for foraging and denning opportunities.
3. White-bellied sea-eagle (*Haliaeetus leucogaster*) is considered likely to forage and overfly the area due to the study sites proximity to the coast. The species frequently inhabits the coastal areas of Tasmania.



4. White-throated needletail (*Hirundapus caudacutus*) often forage in areas of updraughts, such as ridges, cliffs or sand-dunes above a wide variety of vegetation types including dense forest, scrub, cleared land and heathland mosaics, all of which occur within the study site.
5. Masked owl (Tasmanian) (*Tyto novaehollandiae* subsp. *castanops*) inhabits a diverse range of forests and woodlands including agricultural and forest mosaics. Forests with relatively open understoreys are particularly favoured when these habitats adjoin areas of open or cleared land. The area of coastal heathland (SCH) and western wet scrub (SWW) may provide potential foraging habitat.

Melba Flats

Six threatened fauna species listed in Table 6 have been identified as potentially occurring on site based on habitat values:

1. Spotted-tailed quoll (*Dasyurus maculatus* subsp. *maculatus*) is considered likely to forage and den within the study site, preferring forest types with consistent high annual rainfall.
2. Tasmanian devil (*Sarcophilus harrisi*) is expected to occur as evidence of this species was recorded during the recent survey with observation of a fresh scat. The forest types mapped during the survey provide habitat and foraging opportunities for the species.
3. Grey goshawk (*Accipiter novaehollandiae*) occurs in mature blackwood swamp forest, wet forest and mixed forest, primarily at lower altitudes. The study site includes *Nothofagus-Atherosperma* rainforest (RMT) and *Acacia melanoxyton* forest on rises (NAR) which provide quality habitat for this species.
4. Wedge-tailed eagle (*Aquila audax* subsp. *fleayi*) is considered likely to forage in the area, however, nesting opportunities maybe limited due to the lack of very large mature Eucalypt trees within the study site.
5. White-bellied sea-eagle (*Haliaeetus leucogaster*) may occasionally forage within the study area, however, it more frequently inhabits coastal areas and larger river and stream systems.
6. Masked owl (Tasmanian) (*Tyto novaehollandiae* subsp. *Castanops*) inhabits a diverse range of forests and woodlands including agricultural and forest mosaics. Forests with relatively open understoreys are particularly favoured when these habitats adjoin areas of open or cleared land. The semi open understory within the *Nothofagus-Atherosperma* rainforest (RMT) may provide some foraging and nesting opportunities.

Lake Rosebery

Five threatened fauna species listed in Table 7 have been identified as potentially occurring on site based on habitat values:

1. Spotted-tailed quoll (*Dasyurus maculatus* subsp. *maculatus*) is considered likely to forage and den within the study site, preferring forest types with consistent high annual rainfall.
2. Tasmanian devil (*Sarcophilus harrisi*) may utilise the western wet scrub for foraging and denning opportunities.
3. Grey goshawk (*Accipiter novaehollandiae*) occurs in mature blackwood swamp forest, wet forest and mixed forest, primarily at lower altitudes. The study site includes *Eucalyptus obliqua* forest over rainforest (WOR) and Western wet scrub (SWW) of which both provide suitable habitat.
4. Wedge-tailed eagle (*Aquila audax* subsp. *Fleayi*), has good quality nesting opportunities within the *Eucalyptus obliqua* forest over rainforest (WOR) and *Eucalyptus obliqua* wet forest (undifferentiated) (WOU) both of which contained many hollow bearing large old growth trees.
5. White-bellied sea-eagle (*Haliaeetus leucogaster*) may occasionally forage within the study area, however, it more frequently inhabits coastal areas and larger river and stream systems.



4. Potential Impacts and Recommendations

4.1 Significant Flora

One threatened flora species was found on the Melba Flats access track, *Pomaderris intermedia*. This is a new record for the distribution of the species which has only previously been recorded in the north, north east and east of the State. Only one individual was recorded during the survey. It is considered likely the individual recorded could be avoided during the upgrade/construction of the access track to the proposed drill pad location. The individual has been flagged to make it obvious for the construction crew. If it is determined that this plant cannot be avoided during the construction phase a permit under the Tasmanian Threatened Species Protection Act 1995 would be required for removal of a listed threatened species.

No threatened flora was found on the Trial Harbour or Lake Rosebery sites.

The following recommendations are made to minimise impacts to listed flora:

- Avoid the removal of the listed threatened species *Pomaderris intermedia*; and
- Avoid accidental impact by machinery operators and compression of the root systems of the *Pomaderris intermedia* individual by erecting a temporary fence before construction.

With these recommendations in place permits and approvals are unlikely to be required for threatened flora. If the *Pomaderris intermedia* cannot be retained approval is likely to be required under the TSPA 1995.

4.2 Native Vegetation

A large proportion of the proposed access tracks and drill pads at Trial Harbour site 1, Melba Flats and Lake Rosebery are to be located on pre-existing access tracks and will require minimal vegetation removal. Trial harbour site 2 has been surveyed for two access track options. It is recommended that the short track option (vegetation removal less than 200m²) is utilised for this site as the amount of vegetation to be removed is considerably smaller than the longer option (vegetation to be removed approximately 1000m²), however, the short track option crosses a small creek and appropriate culverts will need to be utilised and then removed after the completion of the exploration activities.

The eight vegetation types recorded during the survey are not listed as threatened communities. However the Lake Rosebery and Melba Flats sites both contain many large eucalypt and rainforest species which provide quality fauna habitat values and where possible the removal of large trees at these sites should be avoided. If avoidance is not possible, removal of these trees may require a permit/s under the Tasmanian *Threatened Species Protection Act 1995*.

To minimise impacts to vegetation communities only vegetation within the direct impact of the access tracks and drill pads should be cleared and all other native vegetation and indigenous trees, particularly hollow bearing old growth trees, retained where possible. Assuming vegetation clearance can be minimised and mature trees providing threatened fauna habitat can be retained, approval under the TSPA 1995 and EPBCA 1999 is unlikely to be required.



4.3 Fauna Habitat

The Trial Harbour study site provides some decent quality foraging habitat for the wedge tailed eagle and white bellied sea eagle. These species have been previously recorded in the area. The proposed access track at site 1 is located on an existing access track and will require minimal vegetation removal. Site 2 has two access track options and it is recommended that the short option be utilised to minimise the amount of vegetation to be removed.

The vegetation recorded and mapped at the Melba flats study site provides denning and foraging habitat for threatened mammal species such as the spotted tail quoll and the Tasmanian devil. The area also provides good quality foraging and nesting habitat for listed bird species, the grey goshawk (*Accipiter novaehollandiae*) and the masked owl (Tasmanian) (*Tyto novaehollandiae* subsp. *castanops*) within the open understorey of the *Nothofagus-Atherosperma* rainforest (RMT). If the proposed minor access track upgrade and drill pad clearing proceed; it is considered that this project should have a negligible impact on these threatened species.

The Lake Rosebery study area provides some high quality arboreal habitat for both bird and mammal species as a number of large hollow bearing trees were recorded. It is recommended that these trees are avoided where possible during construction of the access track and drill pads. Should the removal of a number of these trees be required a permit/s maybe required under Tasmania's *Threatened Species Protection Act 1995*.

4.4 Introduced Plants, Pests and Pathogens

One declared weed species was found on the study site at Melba Flats, *Ulex europaeus* (gorse). The proposed project may have the potential to distribute existing weeds to other parts of the study site or to areas outside of the proposed works, via vehicles, soil, machinery or human traffic. In addition, the works have the potential to result in the introduction of new weeds into the study site.

It is recommended that the localised gorse infestations be dealt with on location via cut and paste method of weed control and the burial of the plant waste on site to prevent the spread of seeds to other areas of the site.

It is recommended that weed, disease and pest control be considered in the detailed project planning either through incorporation of control measures in a site specific Construction Environmental Management Plan (CEMP) or preparation of a Weed Management/Hygiene Plan. This documentation should include control of weeds prior to construction where appropriate;

- Washdown and/or inspection of vehicles, machinery and boots before leaving/entering the site to ensure no viable plant materials or large clods of soil are transported;
- Washdown to be conducted in accordance with the *Tasmanian Washdown Guidelines For Weed and Disease Control* (DPIPWE 2004); and
- Control of material brought onto the site, such as clean fill, to ensure it is free from weed seeds or diseases.

The above recommendations are based on current plans for the proposed works and may need to be revised if the proposal plans change.

4.5 Further Studies

No further studies are proposed.



5. Limitations

This Botanical survey and fauna assessment (Report) considering the proposed exploration tracks at Trial Harbour, Melba Flats and Lake Rosebery of MMG:

- has been prepared by GHD Pty Ltd (GHD) pursuant to a contract with MMG;
- has been prepared based on information provided up to 25th July 2011;
- may only be used and relied on by MMG;
- must not be copied to, used by, or relied on by any person other than MMG without the prior written consent of GHD; and
- may only be used for the purpose of understanding the ecological attributes applicable to the site (and must not be used for any other purpose).

GHD and its servants, employees and officers otherwise expressly disclaim responsibility to any person other than MMG arising from or in connection with this Report.

To the maximum extent permitted by law, all implied warranties and conditions in relation to the services provided by GHD and the Report are excluded unless they are expressly stated to apply in this Report.

The services undertaken by GHD in connection with preparing this Report:

- were limited to those specifically detailed in Section 1.2 of this Report;
- were limited to an ecological assessment of vascular plant species (ferns, conifers and flowering plants), terrestrial and migratory vertebrate fauna;
- did not include non-vascular flora (e.g. mosses, liverworts, lichens, and fungi), marine fauna habitat and invertebrate habitat, which were not formally surveyed as part of this assessment;
- included a field assessment during winter, which is considered a suboptimal time of year for assessing herbaceous annuals and grass species. Furthermore, threatened orchids that were identified as potentially occurring on site have their peak flowering period/s during October to November. Therefore, it is considered unlikely that threatened plant species were overlooked during the survey; and
- did not include a detailed fauna field survey (i.e. trapping) at the study area. The fauna investigation instead focussed on fauna habitat, and evidence of animals (e.g. scats, tracks, feathers).

Subject to the paragraphs in this section of the Report, the opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the time of preparation. GHD has not updated, and accepts no responsibility or obligation to update, this Report to account for events or changes occurring subsequent to the date that the Report was signed.



6. References

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7. Flora Species List

Job Number	3216026
Project	Exploration tracks and drill pads
Client	Minerals and Metals Group (MMG)
Site	Trial Harbour, Melba Flats and Lake Rosebery
Grid Reference	Midpoint of the study areas at approximately Trial Harbour GDA94 E 0349530 N5356700 Melba Flats GDA94 E0365500 N5368800 Lake Rosebery GDA94 E0379850 N5378000
Surveyed By	John Davies, Senior Botanist GHD Hobart; and James Hill, Ecologist GHD, Hobart
Date of Survey	6 th , 7 th and 20 th July 2011
Plant Collection Permit No.	TFL 11119 Expiry date: 30 th June 2012 Exemption to collect, store and transport declared weeds applies from: 01/01/11 to 31/12/11

Key:

STATE LEGISLATION

r	rare – Tasmanian TSPA
v	vulnerable – Tasmanian TSPA
e	endangered – Tasmanian TSPA

COMMONWEALTH LEGISLATION

VU	vulnerable – Commonwealth EPBCA
EN	endangered – Commonwealth EPBCA
CR	critically endangered – Commonwealth EPBCA

Introduced Species

i	introduced
P	planted
D	declared weed – Tasmanian <i>Weed Management Act 1999</i>



Vascular Flora Recorded Within the Study Area at Trial Harbour Site 1

Status	Species Name	Common Name
Indigenous Species		
	<i>Acacia myrtifolia</i>	redstem wattle
	<i>Acacia suaveolens</i>	sweet wattle
	<i>Allocasuarina zephyrea</i>	western sheoak
	<i>Banksia marginata</i>	silver banksia
	<i>Cassytha pubescens</i>	downy dodderlaurel
	<i>Chordifex hookeri</i>	woolly buttonrush
	<i>Dillwynia glaberrima</i>	smooth parrotpea
	<i>Diplarrena latifolia</i>	western flag-iris
	<i>Epacris obtusifolia</i>	bluntleaf heath
	<i>Epacris impressa</i>	common heath
	<i>Eucalyptus nitida</i>	western peppermint
	<i>Leucopogon collinus</i>	white beardheath
	<i>Gahnia grandis</i>	cutting grass
	<i>Gleichenia dicarpa</i>	pouched coralfern
	<i>Hakea epiglottis</i>	beaked needlebush
	<i>Helichrysum pumilum</i>	everlasting
	<i>Lepidosperma filiforme</i>	common rapiersedge
	<i>Lepidosperma laterale</i>	variable swordsedge
	<i>Lepidosperma concavum</i>	sand swordsedge
	<i>Leptospermum scoparium</i>	common teatree
	<i>Lindsaea linearis</i>	screw fern
	<i>Lomatia tinctoria</i>	guitarplant
	<i>Lycopodium deuterodensum</i>	conifer clubmoss
	<i>Melaleuca squarrosa</i>	scented paperbark
	<i>Patersonia fragilis</i>	short purpleflag
	<i>Pultenaea daphnoides var. obcordata</i>	heartleaf bushpea
	<i>Pultenaea juniperina</i>	prickly beauty
	<i>Pteridium esculentum</i>	bracken



Status	Species Name	Common Name
	<i>Sprengelia incarnata</i>	pink swampheath
	<i>Selaginella uliginosa</i>	swamp spikemoss
	<i>Styphelia adscendens</i>	golden heath

Vascular Flora Recorded Within the Study Area at Trial Harbour Site 2

Status	Species Name	Common Name
Indigenous Species		
	<i>Acacia verticillata</i>	prickly moses
	<i>Acacia suaveolens</i>	sweet wattle
	<i>Allocasuarina zephyrea</i>	western sheoak
	<i>Banksia marginata</i>	silver banksia
	<i>Blechnum wattsii</i>	hard waterfern
	<i>Calorophus elongatus</i>	long roperush
	<i>Chordifex monocephalus</i>	smooth buttonrush
	<i>Dianella tasmanica</i>	forest flaxlily
	<i>Epacris impressa</i>	common heath
	<i>Epacris obtusifolia</i>	bluntleaf heath
	<i>Eucalyptus nitida</i>	western peppermint
	<i>Gahnia grandis</i>	cutting grass
	<i>Gleichenia dicarpa</i>	pouched coralfern
	<i>Gleichenia microphylla</i>	scrambling coralfern
	<i>Goodenia ovata</i>	hop native-primrose
	<i>Gymnoschoenus sphaerocephalus</i>	buttongrass
	<i>Hakea epiglottis</i>	beaked needlebush
	<i>Leptocarpus tenax</i>	slender twinerush
	<i>Lepidosperma laterale</i>	variable swordsege
	<i>Leptospermum nitidum</i>	shiny teatree
	<i>Leptospermum scoparium</i>	common teatree
	<i>Leucopogon collinus</i>	white beardheath



Status	Species Name	Common Name
	<i>Lomatia tinctoria</i>	guitarplant
	<i>Lycopodium deuterodensum</i>	conifer clubmoss
	<i>Melaleuca squarrosa</i>	scented paperbark
	<i>Pimelea linifolia</i>	slender riceflower
	<i>Philotheca virgata</i>	twiggy waxflower
	<i>Pomaderris elliptica</i> var. <i>diemenica</i>	tasmanian yellow dogwood
	<i>Pteridium esculentum</i>	bracken
	<i>Pultenaea juniperina</i>	prickly beauty
	<i>Pultenaea daphnoides</i> var. <i>obcordata</i>	heartleaf bushpea
	<i>Sprengelia incarnata</i>	pink swampheath
	<i>Zieria arborescens</i> subsp. <i>arborescens</i>	stinkwood

Vascular Flora Recorded Within the Study Area at Melba Flats

Status	Species Name	Common Name
Indigenous Species		
	<i>Acacia melanoxylon</i>	blackwood
	<i>Acacia mucronata</i>	caterpillar wattle
	<i>Acacia verticillata</i>	prickly moses
	<i>Agastachys odorata</i>	fragrant candlebush
	<i>Agrostis muelleriana</i>	muellers bent
	<i>Anodopetalum biglandulosum</i>	horizontal
	<i>Anopterus glandulosus</i>	tasmanian laurel
	<i>Atherosperma moschatum</i> subsp. <i>moschatum</i>	sassafras
	<i>Baloskion tetraphyllum</i> subsp. <i>tetraphyllum</i>	tassel cordrush
	<i>Bauera rubioides</i>	wiry bauera
	<i>Blechnum nudum</i>	fishbone waterfern



Status	Species Name	Common Name
	<i>Blechnum watsii</i>	hard waterfern
	<i>Cassytha glabella</i>	slender dodderlaurel
	<i>Carex appressa</i>	tall sedge
	<i>Coprosma quadrifida</i>	native currant
	<i>Leptecophylla juniperina</i>	pinkberry
	<i>Deyeuxia sp.</i>	bentgrass
	<i>Dianella tasmanica</i>	forest flaxlily
	<i>Dicksonia antarctica</i>	soft treefern
	<i>Eleocharis gracilis</i>	slender spikesedge
	<i>Epacris impressa</i>	common heath
	<i>Eucalyptus nitida</i>	western peppermint
	<i>Eucalyptus ovata var. ovata</i>	black gum
	<i>Eucryphia lucida</i>	leatherwood
	<i>Gahnia grandis</i>	cutting grass
	<i>Gleichenia microphylla</i>	scrambling coralfern
	<i>Histiopteris incisa</i>	batswing fern
	<i>Hydrocotyle hirta</i>	hairy pennywort
	<i>Hymenophyllum rarum</i>	narrow filmyfern
	<i>Hypolepis rugosula</i>	ruddy groundfern
	<i>Juncus pallidus</i>	pale rush
	<i>Juncus planifolius</i>	broadleaf rush
	<i>Leptospermum scoparium</i>	common teatree
	<i>Leptospermum lanigerum</i>	woolly teatree
	<i>Leptospermum nitidum</i>	shiny teatree
	<i>Lycopodium deuterodensum</i>	conifer clubmoss
	<i>Melaleuca squarrosa</i>	scented paperbark
	<i>Microsorium pustulatum subsp. pustulatum</i>	kangaroo fern



Status	Species Name	Common Name
	<i>Monotoca glauca</i>	goldey wood
	<i>Monotoca scoparia</i>	prickly broomheath
	<i>Nematolepis squamea</i>	satinwood
	<i>Nothofagus cunninghamii</i>	myrtle beech
	<i>Olearia persoonioides</i>	geebung daisybush
	<i>Pimelea drupacea</i>	cherry riceflower
	<i>Pimelea linifolia</i>	slender riceflower
	<i>Phyllocladus aspleniifolius</i>	celerytop pine
	<i>Polystichum proliferum</i>	mother shieldfern
r	<i>Pomaderris intermedia</i>	lemon dogwood
	<i>Pteridium esculentum</i>	bracken
	<i>Sprengelia incarnata</i>	pink swampheath
	<i>Sticherus tener</i>	silky fanfern
	<i>Trochocarpa gunnii</i>	fragrant purpleberry
	<i>Tasmannia lanceolata</i>	mountain pepper

Introduced Species

I, D	<i>Ulex europaeus</i>	gorse
i	<i>Juncus bulbosus</i>	bulbous rush
i	<i>Juncus capitatus</i>	capitate rush

Vascular Flora Recorded Within the Study Area at Lake Rosebery

Status	Species Name	Common Name
Indigenous Species		
	<i>Acacia melanoxylon</i>	blackwood
	<i>Acacia mucronata</i>	caterpillar wattle



Status	Species Name	Common Name
	<i>Acacia melanoxylon</i>	blackwood
	<i>Agastachys odorata</i>	fragrant candlebush
	<i>Anodopetalum biglandulosum</i>	horizontal
	<i>Anopterus glandulosus</i>	tasmanian laurel
	<i>Atherosperma moschatum</i> subsp. <i>moschatum</i>	sassafras
	<i>Bossiaea cinerea</i>	showy bossia
	<i>Banksia marginata</i>	silver banksia
	<i>Bauera rubioides</i>	wiry bauera
	<i>Blechnum wattsii</i>	hard waterfern
	<i>Bossiaea cinerea</i>	showy bossia
	<i>Calorophus elongatus</i>	long roperush
	<i>Dianella tasmanica</i>	forest flaxlily
	<i>Dicksonia antarctica</i>	soft treefern
	<i>Eucalyptus nitida</i>	western peppermint
	<i>Eucalyptus obliqua</i>	stringy bark
	<i>Eucryphia lucida</i>	leatherwood
	<i>Gahnia grandis</i>	cutting grass
	<i>Gleichenia dicarpa</i>	pouched coralfern
	<i>Histiopteris incisa</i>	batswing fern
	<i>Hymenophyllum rarum</i>	narrow filmyfern
	<i>Leptospermum scoparium</i>	common teatree
	<i>Leptecophylla juniperina</i>	pinkberry
	<i>Melaleuca squarrosa</i>	scented paperbark
	<i>Microsorium pustulatum</i> subsp. <i>pustulatum</i>	kangaroo fern
	<i>Monotoca submutica</i>	broomheath
	<i>Nematolepis squamea</i>	satinwood



Status	Species Name	Common Name
	<i>Nothofagus cunninghamii</i>	myrtle beech
	<i>Pittosporum bicolor</i>	cheesewood
	<i>Philotheca virgata</i>	twiggy waxflower
	<i>Phyllocladus aspleniifolius</i>	celerytop pine
	<i>Pteridium esculentum</i>	bracken
	<i>Rumohra adiantiformis</i>	leathery shieldfern
	<i>Trochocarpa gunnii</i>	fragrant purpleberry

Introduced Species

i	<i>Cirsium vulgare</i>	spear thistle
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8. Legislation Summary

Legislative Implications

Activities that may impact upon threatened species or vegetation communities are regulated under both State and Federal legislation. The control of declared invasive species is also mandatory under State legislation. This includes but is not limited to:

- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBCA);
- Tasmanian *Threatened Species Protection Act 1995* (TSPA);
- Tasmanian *Weed Management Act 1999*;
- Tasmanian *Regional Forestry Agreement 1997*; and
- Tasmanian *Nature Conservation Act 2002*.

Commonwealth Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBCA) applies to developments and associated activities that have the potential to significantly impact on matters protected under the Act. The Act also applies to environmental impact on Commonwealth Land or activities undertaken by the Commonwealth on other lands. The Australian Government Department of the Environment, Water, Heritage and the Arts administers the EPBCA.

Under the Act, unless exempt, actions require approval from the Commonwealth Minister for Environment and Heritage if they have, may have, or are likely to have a significant impact on a 'matter of national environmental significance'. There are seven matters of national significance:

- World Heritage sites;
- National heritage places;
- Nationally listed threatened species and ecological communities;
- Listed migratory species;
- Ramsar wetlands of international significance;
- Commonwealth marine areas; and
- Nuclear actions (including uranium mining).

Listed threatened species and ecological communities are recognised as matters of national environmental significance. Consequently, any action that may be likely to have a significant impact on listed species and ecological communities under the EPBCA must be referred to the Minister for determination on whether EPBCA approval is required. The referral process generally takes 20 business days to process, after which the Minister makes a determination on the need or otherwise for EPBCA assessment and approval. If approval is deemed to be necessary a formal assessment and approval process commences.

Tasmanian Threatened Species Protection Act 1995

The *Threatened Species Protection Act 1995* (TSPA) is used to protect Tasmania's threatened flora and fauna. The Act classifies and lists threatened flora and fauna in Tasmania according to their level of risk as rare, vulnerable, endangered or extinct.



The objective of the TSPA is to identify, classify and protect threatened flora and fauna species in Tasmania. According to the Act it is an offence to knowingly disturb listed flora or fauna without a permit from the Threatened Species Unit of DPIPWE.

If a development involves direct impact to an individual of a listed flora or fauna species a permit is required under the TSPA (pending some exemptions). This applies to flora and fauna but does not include habitat for listed species, which is protected through the Forest Practices Legislation.

Tasmanian Weed Management Act 1999

The *Weed Management Act 1999* is the central legislation controlling eradication of significant weeds in Tasmania. The Act aims to minimise the deleterious effect of weeds on productive capacity and natural values, promote strategic and sustainable eradication approaches, encourage community involvement and promote sharing of the responsibility for weed eradication.

Under the Act and associated Weed Management Plans, landowners and managers must take all reasonable measures to control the impact and spread of a declared weed.

Declared weeds are listed on the Department of Primary Industries, Parks, Water and Environment (DPIPWE) website (<http://www.dpiw.tas.gov.au>).

Forest Practices Act 1985

The *Forest Practices Act 1985* and associated documentation control land clearing on both public and private land in Tasmania. The Act applies to forest vegetation and threatened non-forest vegetation communities. Forest vegetation is described as native trees or other woody plants, including any seedlings that have the potential to grow to a height of 5 meters or more. There are no controls under the *Forest Practices Act* on clearing of non-forest vegetation that is not threatened.

A certified forest practices plan is required to authorize land clearing (clearing trees or clearing and converting threatened native vegetation) where the clearance is greater than 1 ha or involves vulnerable land (with some exemptions).

Clearance and conversion of threatened native vegetation communities is generally not permitted unless exceptional circumstances (as defined under the *Forest Practices Act 1985*) exist. The *Forest Practices Regulations 2007* provide some exemptions from the requirement to have a Forest Practices Plan to authorize land clearing. These include:

- Small scale clearing provided the land is less than 1 ha, the landowner has given consent, vegetation is not listed as 'vulnerable land', and timber volumes cleared do not exceed 100 tonnes;
- Clearing necessary to provide a reasonable buffer for existing infrastructure or for public safety;
- Clearing native vegetation regrowth (containing no more than 20 eucalypts more than 2 metres tall within a 0.5 hectare) on previously cleared land and converted land;
- Clearing associated with:
 - Dam works authorised by a dam permit
 - Easements for the construction and maintenance of electricity infrastructure and associated access tracks, where in accordance with an environmental management system endorsed by the Forest Practices Authority; and
 - Construction and maintenance of gas pipelines and public roads.



- Clearing in accordance with a conservation covenant, vegetation management agreement, or fire management program of a kind approved by the Forest Practices Authority;
- Clearing carried out for mining or mineral exploration activities that are authorised under a permit under the *Land Use Planning and Approvals Act 1993* or a licence or lease under the *Mineral Resources Development Act 1995*;
- Clearing carried out for the purposes of constructing buildings or associated developments, but only where they have been authorised under a permit issued under the *Land Use Planning and Approvals Act 1993*; and
- Clearing for railways within the meaning of the *Rail Infrastructure Act 2007*.

Vulnerable land is defined as land that:

- Is within a 10 metre buffer of a stream bank or 40 metres from a river; or
- Slopes steeper than 11-19 degrees (depending on rock type); or
- Is within a high or very high soil erodibility class; or
- Contains a threatened community; or
- Is inhabited by a threatened species; or
- Contains vulnerable karst soils; or
- Contains an area of trees reserved from harvesting or clearing under an expired Forest Practices Plan.

Nature Conservation Act 2002

The *Nature Conservation Act 2002* makes provisions with respect to the conservation and protection of the fauna, flora and geological diversity of Tasmania and provides the declaration of national parks and other reserved within the State.

The *Nature Conservation Act 2002* lists native vegetation communities. The status of these communities are established through scientific assessment against the criteria for 'rare' (a total range of less than 1,000 hectares), 'vulnerable' (70% of original area cleared) and 'endangered' (90% of original area cleared). The communities listed under this Act are protected under the *Forest Practices Act 1985*. The Act also defines the covenants under which offset areas are protected.

Wildlife Regulations Act 1999

The *Wildlife Regulations Act 1999* also protects many native animal species. Under this Act the taking, buying, selling or possession of specially protected wildlife is prohibited without a permit. Protected wildlife includes most native vertebrate fauna.



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