

**ECOLOGICAL ASSESSMENT OF THE PROPOSED
COMSTOCK MINING LEASE AREA EXTENSION,
ZEEHAN, TASMANIA**



**Environmental Consulting Options Tasmania (ECOtas) for
Zeehan Zinc**

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Mark Wapstra
28 Suncrest Avenue
Lenah Valley, TAS 7008

ABN 83 464 107 291
email: mark@ecotas.com.au
web: www.ecotas.com.au

business ph.: (03) 62 513 212
personal ph.: (03) 62 283 220
mobile ph.: 0407 008 685

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AUTHORSHIP

Field Assessment: Brian French and Bec Dillon

Report Production: Bec Dillon

Vegetation Mapping: Brian French, Bec Dillon and Mark Wapstra

Base Data for Mapping and Aerial Photography: TasMap

Photography and Other Digital Imagery: Brian French



CONTENTS

SUMMARY	3
PURPOSE, SCOPE AND LIMITATIONS OF THE SURVEY	4
Purpose	4
Scope.....	4
Limitations	4
THE STUDY AREA	4
THE PROPOSAL	5
METHODS	5
Nomenclature	5
Preliminary investigation	5
Botanical survey	6
Zoological survey.....	6
RESULTS	6
Site characteristics.....	6
Vegetation types	6
Vegetation types recorded as part of the present study.....	6
Plant species.....	9
Species diversity.....	9
Priority species recorded from the study area	9
Priority flora recorded from databases.....	9
Priority fauna	10
Priority species recorded from databases	10
DISCUSSION (RECOMMENDATIONS)	11
Legislative and policy implications	11
REFERENCES	14
APPENDIX 1: Vascular plant species recorded in the Comstock mining lease area.	15
APPENDIX 2: Plant community structure	17

SUMMARY

General

An ecological assessment of an area being considered for incorporation into the existing Comstock mining lease area (2M/2005) near Zeehan was undertaken. The primary purpose of the assessment was to determine the ecological values present within the study area. Potentially the proposed extension will accommodate a co-disposal area or a tailings storage facility.

Vegetation Types

The study area supports six TASVEG vegetation communities, *Eucalyptus nitida* dry forest and woodland (DNI), *Eucalyptus obliqua* wet forest (undifferentiated) (WOU), *Eucalyptus nitida* forest over *Leptospermum* (WNL), *Nothofagus-Atherosperma* rainforest (RMT), *Nothofagus-Leptospermum* short rainforest (RML), buttongrass moorland with emergent shrubs (MBS) and western wet scrub (SSW).

None of these vegetation communities are classified as threatened under Schedule 3 of the *Nature Conservation Act 2002*.

Flora Species

No flora species, listed as threatened on the Tasmanian *Threatened Species Protection Act 1995* or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, were recorded from the study area.

Fauna Species

No fauna species, listed as threatened on the Tasmanian *Threatened Species Protection Act 1995* or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, were recorded from the study area. Potential habitat for the spotted-tailed quoll, grey goshawk, tasmanian devil and wedge tailed eagle is present within the study area.

Weed Species and Plant Disease

Weed species and plant disease are addressed in the accompanying report titled *Weed and Root Rot Fungus (Phytophthora cinnamomi) Management Plan for Zeehan Zinc Ltd Mining Lease Areas, Zeehan Tasmania* (ECOtas 2007).

Recommendations

The proposed extension of the existing mining lease area (for the potential construction of a co-disposal area or tailings storage facility) will result in the loss of up to 118.5 ha of native vegetation. The loss would not include any threatened vegetation types and is not considered likely to have any significant deleterious effects on threatened flora or fauna species.

PURPOSE, SCOPE AND LIMITATIONS OF THE SURVEY

Purpose

Zeehan Zinc (via Shane Bartel) engaged ECOtas to undertake an ecological assessment of an area that potentially may form an extension of the existing Comstock mining lease area (5M/2007).

The main aim of the assessment was to record any threatened flora and fauna species present (or potentially present) and to determine the extent and conservation status of the forest and non-forest vegetation communities in order to facilitate further planning of mining operations within the study area.

Scope

This report relates to:

- flora and fauna species of conservation significance, including a discussion of listed species potentially present, and other species of conservation significance/interest; and
- vegetation types (forest and non-forest) present, including a discussion of the distribution, condition, extent, composition and conservation significance of each community.

Plant disease and weed management issues for the study area are dealt with in a separate report (ECOtas 2007), and this report should be read in conjunction with that management plan.

This report follows, in a general sense, the government-produced *Brief for Consultants* (DPIWE 2004) in anticipation that the report (or extracts of it) may be used as part of various approval processes that may be required for the project. The report is also structured to allow easy use by a Forest Practices Officer in the event that a Forest Practices Plan is required for clearing activities under the provisions of the Tasmanian *Forest Practices Act 1985*.

Except where otherwise stated, the opinions and interpretations of legislation and policy expressed in this report are made by the authors and do not necessarily reflect those of the relevant agency. The client should confirm management prescriptions with the relevant agency before acting on the content of this report.

Limitations

The flora and fauna surveys were undertaken in early August 2007. Many plant species have ephemeral or seasonal growth or flowering habits, or patchy distributions (at varying scales), and it is possible that some species were not recorded for this reason (especially spring-summer flowering grasses, herbs and lilies). However, every effort was made to sample the range of habitats present in the study area to maximise the opportunity of recording the majority of species present (particular those of conservation significance). The survey was also limited to vascular species: species of mosses, lichens and liverworts were not recorded. However, a consideration is made of species (vascular and non-vascular) likely to be present (based on habitat information and database records) and reasons presented for their apparent absence.

THE STUDY AREA

The study area (Figure 1) is located approximately 4 km west of Zeehan.

Land tenure and other categorisations of the study area are as follows:

- State forest;
- West Coast Council municipality;
- West Bioregion (according to the IBRA 5 boundaries used by several government agencies);
- West and Southwest Bioregion (according to the IBRA 4 boundaries used by the Forest Practices Authority).

THE PROPOSAL

Zeehan Zinc is considering acquiring the study area (see Figure 1 as an extension of the existing adjacent mine lease area. In the absence of restrictive issues, the company will likely extend the mine lease in order to construct a co-disposal area or tailings storage facility (that is independent of waste rock).

This operation will result in the clearing of native vegetation.

METHODS

Nomenclature

All grid references in this report are in GDA94, except where otherwise stated. Vascular species nomenclature follows Buchanan (2005) for scientific names and Wapstra *et al.* (2005) for common names.

Preliminary investigation

Available sources of threatened flora and fauna records were interrogated such as DPIW's *Natural Values Atlas* (Report No. 18201_Comstock_130807) (DPIW 2007), the Forest Practices Authority's online *Threatened Fauna Manual* database (FPA 2007), and information in Bryant & Jackson (1999) *Tasmania's Threatened Fauna Handbook: What, Where and How to Protect Tasmania's Threatened Animals*. Additional information sources were checked, as indicated in the text and tables below. The TASVEG vegetation coverage was also examined prior to undertaking surveys.

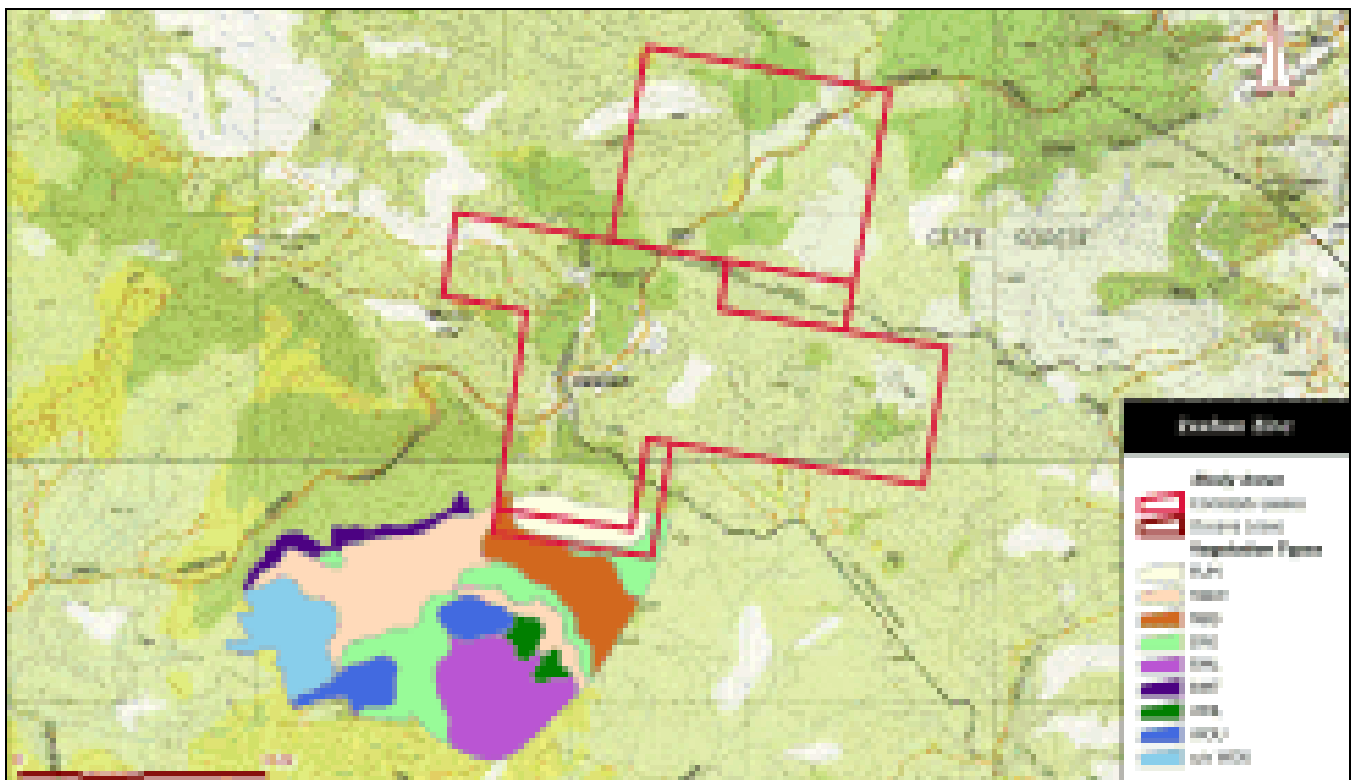


Figure 1. Map showing general location of the study area.

Botanical survey

Botanical assessment was undertaken on 7 August 2007 by Brian French and Bec Dillon.

The survey aimed to assess the range of habitat types present in the study area (at the broad scale e.g. vegetation types at different elevations and aspects, and at the finer scale e.g. microhabitats such as open grassy areas, disturbed sites, etc.). In this case, survey coverage was not limited by access restrictions because of the easy access via vehicle tracks and clearings.

Reference to topographic maps (Trial 3435 TASMAP 1: 25000 scale), aerial photography (as provided by Zeehan Zinc) and vegetation maps (TASVEG as per the cited *Natural Values Atlas* report) established the approximate range and distribution of topographic and habitat variation present in the study area.

Detailed plots recording all vascular species, vegetation structure and site characteristics were undertaken in representative vegetation types. Running species lists, and additional species associated with specific vegetation types were also recorded on the route through the study area. Plot data and species lists can be supplied on request.

Zoological survey

Potential habitat for threatened fauna (as listed in information sources cited above) was assessed by reference to the vegetation types and site characteristics present. Further information is provided below. Detailed surveys for vertebrates and other invertebrates were not undertaken.

RESULTS

Site characteristics

The study area is approximately 127 ha in area and occurs uniformly on Cambrian ultramafic and sedimentary sequences and Quaternary gravels (although this is based on the authors' field observations only and should be confirmed by reference to geology maps and the client's own information sources). The study area forms a broad relatively flat drainage system, surrounded by slightly higher ridges and knolls. Comstock creek flows through the centre with small tributaries joining it from the north and south. Parts of the study area that support forest have been subject to forestry operations. Altitude varies from approximately 180 m a.s.l to 210 m a.s.l.

Vegetation types

Vegetation types recorded as part of the present study

Vegetation types have been classified according to Harris and Kitchener (2005) *From Forest to Fjaeldmark: Descriptions of Tasmania's Vegetation*. Conservation priorities alluded to in Table 1 and discussed in the text below are taken from Schedule 3 of the *Nature Conservation Act 2002* (DPIW 2007). Appendix B provides ecological descriptions of the vegetation types recorded from the study area. Table 1 and Figure 2 provide information on the vegetation types identified from the study area and surrounding area.

***Eucalyptus nitida* dry forest and woodland (TASVEG code DNI, RFA code N)**

Eucalyptus nitida dry forest and woodland is common over the Comstock area. This community is found in patches through the study area, often bordering sedge or scrub communities. The community is dominated by *Eucalyptus nitida* with *Leptospermum nitidum*, *Acacia mucronata* and *Banksia marginata* present in the understorey.

This community is in good condition with no introduced or weed species recorded.

The TASVEG mapping unit '*Eucalyptus nitida* dry forest and woodland (DNI)' is not classified as threatened (DPIW 2007) because it is widespread and well reserved at both a regional and Statewide level.

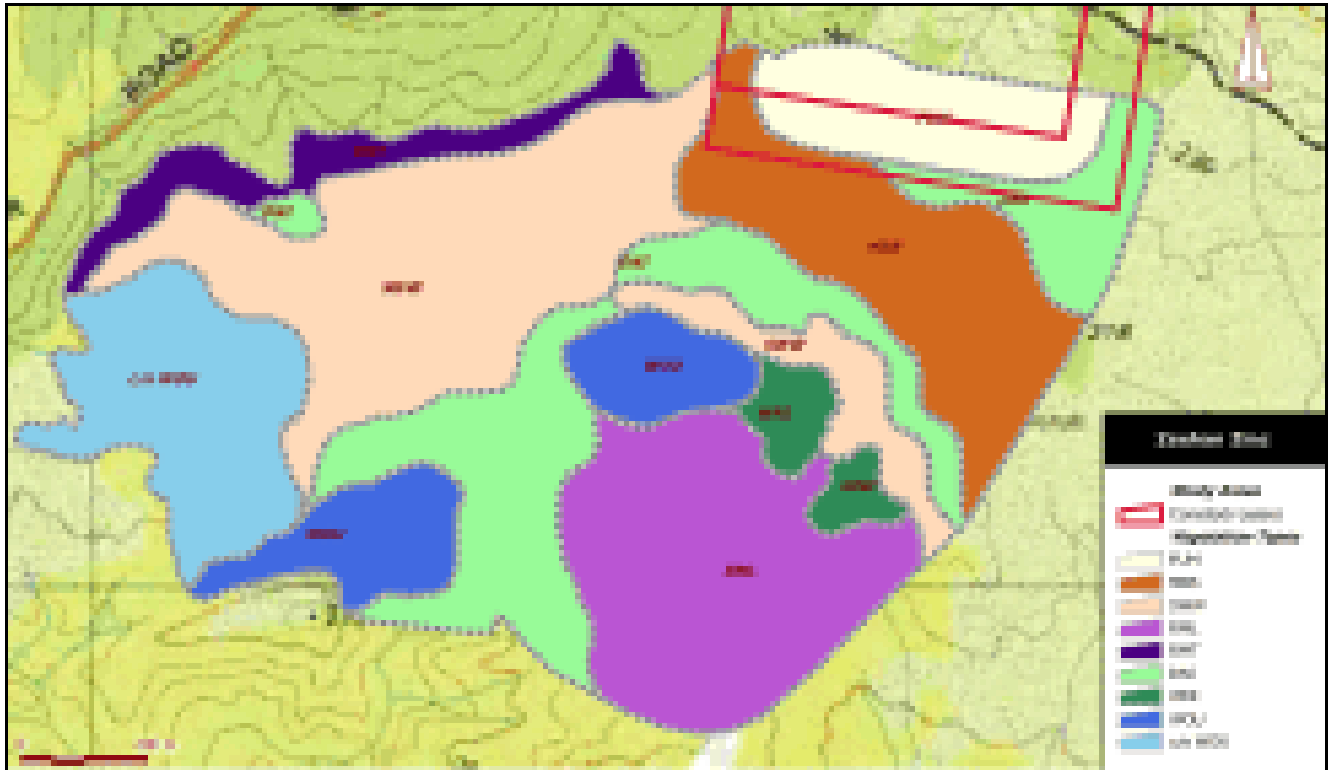


Figure 2. Vegetation mapping of the study area.

***Eucalyptus nitida* forest over *Leptospermum* (TASVEG code WNL, RFA code NT)**

Eucalyptus nitida wet forest over *Leptospermum* occurs as patches in the south eastern part of the study area. The community is dominated by *Eucalyptus nitida* with *Leptospermum nitidum*, *Acacia mucronata*, *A. melanoxylon*, *Pomaderris apetala* and *Nothofagus cunninghamii* present in the understorey. The community is situated between rainforest and scrubby communities and this is reflected in the species composition of the understorey, with scrub or rainforest species being variably dominant.

This community is in good condition with no introduced or weed species recorded.

The TASVEG mapping unit '*Eucalyptus nitida* forest over *Leptospermum* (WNL)' is not classified as threatened (DPIW 2007) because it is widespread and well reserved at both a regional and Statewide level.

***Eucalyptus obliqua* wet forest (undifferentiated) (TASVEG code WOU, RFA code OT)**

Eucalyptus obliqua wet forest (undifferentiated) is present on better drained sites within study area. The canopy is dominated by *Eucalyptus obliqua* over a tall shrub layer including *Melaleuca squarrosa*, *Pomaderris apetala*, *Nematolepis squamea*, *Leptospermum nitida*, *Pittosporum bicolor*, *Spyridium gunnii* and *Acacia mucronata*. The ground layer accommodates ferns and sedges. This community is best described as *Eucalyptus obliqua* wet forest (undifferentiated) due to the structure of this community having a mix of broad leaf shrubs and *Melaleuca/Leptospermum* species.

This community has been selectively logged in the western part of the study area, but is in relatively good condition with no introduced or weed species recorded. The logged area is characterised by a regrowth tree structure with post disturbance colonising species such

as bracken (*Pteridium esculentum*) and saw sedge (*Gahnia grandis*) dominating the understorey.

The TASVEG mapping unit '*Eucalyptus obliqua* wet forest (undifferentiated) (WOU)' is not classified as threatened (DPIW 2007) because it is widespread and well reserved at both a regional and Statewide level.

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

Nothofagus-Atherosperma rainforest occupies the steep slopes in the far north to northwest of the study area. This community is dominated by *Nothofagus cunninghamii* with *Eucryphia lucida* locally co-dominant.

This community is in good condition with no introduced or weed species recorded and myrtle wilt was not evident.

The TASVEG mapping unit '*Nothofagus-Atherosperma* rainforest (RMT)' is not classified as threatened (DPIW 2007) because it is widespread and well reserved at both a regional and Statewide level.

***Nothofagus-Leptospermum* short rainforest (RML)**

This community is present in the southern section of the study area. The canopy is dominated by *Nothofagus cunninghamii* and *Leptospermum nitidum*. The understorey contains species such as *Acacia melanoxylon*, *A. mucronata*, *Leptospermum nitida*, and *Banksia marginata*, and in some places is locally dominated by rainforest species.

This community is in good condition with no introduced or weed species recorded and myrtle wilt was not evident.

The TASVEG mapping unit '*Nothofagus-Leptospermum* short rainforest (RMT)' is not classified as threatened (DPIW 2007) because it is widespread and well reserved at both a regional and Statewide level.

Western wet scrub (TASVEG code SWW, RFA code L)

Western wet scrub dominates the broad, relatively flat drainage area, making up a large proportion of the study area. This community is dominated by a dense shrub layer including *Leptospermum nitidum* and *Melaleuca squarrosa*. Graminoids such as *Baloskion tetraphyllum* and *Gahnia grandis* are common and become very dense in wetter areas within the community.

This community is in good natural condition with no weed species recorded.

The TASVEG mapping unit 'western wet scrub (SWW)' is not classified as threatened (DPIW 2007) because it is widespread and well reserved at both a regional (mainly western) and Statewide level.

Buttongrass moorland with emergent shrubs (TASVEG code MBS)

This community is dominated by sedges including *Gymnoschoenus sphaerocephalus*, *Baloskion australe* and *Lepidosperma filiforme* with scattered or clumped emergent shrubs including *Leptospermum nitidum*, *L. scoparium* and *Banksia marginata*. The structure and composition of this community is the result of frequent fires and consequently this community is common in the Zeehan region. Fire frequency has been high in the past. This community dominated the poorly drained section in the eastern part of the study area.

The TASVEG mapping unit 'moorland and sedgeland with emergent shrubs (MBS)' is not classified as threatened (DPIW 2007) because it is widespread and well reserved at both a regional and Statewide level.

Table 1. Vegetation communities present in study area.

RFA Equivalent (Anon 1997)	TASVEG Equivalent (Harris & Kitchener 2005)	Conservation priority RFA (Anon 1997) TASVEG (DPIW 2007)	Area (ha)	Comments
Dry <i>E. nitida</i> forest (N)	<i>E. nitida</i> dry forest and woodland (DNI)	N Not threatened	23.05	See text for detailed description of community.
Tall <i>E. nitida</i> forest (N)	<i>E. nitida</i> forest over <i>Leptospermum</i> (WNL)	N Not threatened	3.26	See text for detailed description of community.
Tall <i>E. obliqua</i> forest (OT)	<i>Eucalyptus obliqua</i> wet forest (undifferentiated) (WOU)	N Not threatened	22.26	See text for detailed description of community.
Thamnic rainforest on less fertile sites (M-)	<i>Nothofagus- Atherosperma</i> rainforest (RMT)	N Not threatened	5.57	See text for detailed description of community
Thamnic rainforest on less fertile sites (M-)	<i>Nothofagus- Leptospermum</i> short rainforest (RML)	N Not threatened	19.32	See text for detailed description of community
<i>Leptospermum</i> sp. <i>Melaleuca squarrosa</i> swamp forest (L)	Western wet scrub (SWW)	N Not threatened	29.28	See text for detailed description of community.
No equivalent	Buttongrass moorland with emergent shrubs (MBS)	N Not threatened	15.73	See text for detailed description of community.

Plant species

Species diversity

Appendix A provides a list of vascular plant species recorded from the study area. Note that this list is relatively comprehensive but additional species may be recorded during further assessments (e.g. species that flower at a different time of year to the present survey, or ephemeral/opportunistic species from disturbed sites). Appendix B provides an indication of the more detailed distribution of vascular plant species within each of the vegetation types present.

A total of 104 species were recorded from the study area: 60 dicotyledons, 28 monocotyledons, 1 gymnosperm and 15 pteridophytes.

See separate report (ECotas 2007) for information on invasive exotic species.

Priority species recorded from the study area

No flora species, listed as threatened on the Tasmanian *Threatened Species Protection Act 1995* or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, were recorded from the study area.

Priority flora recorded from databases

Table 2 provides a listing of priority flora from within 500 m and 5000 m of the study area, with comments on whether potential habitat is present for the species, if the species was recorded and possible reasons why a species was not recorded.

Table 2. Priority flora records from within 500 m and 5000 m of boundary of study area.

Species listed below are listed as rare (r), vulnerable (v), endangered (e), or extinct (x) on the Tasmanian *Threatened Species Protection Act 1995* (TSPA); vulnerable (VU), endangered (EN), critically endangered (CR) or extinct (EX) on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC). Information below is sourced from the Department of Primary Industries and Water's *Natural Values Atlas* (DPIW 2007) and other sources where indicated. Habitat descriptions are taken from TSU (2003), except where otherwise indicated.

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Species	Status TSPA EPBC	Observations	Comments
Records within the study area			
None.			
Records within 500 m of study area			
None.			
Records within 5000 m of study area			
<i>Orthoceras strictum</i> (horned orchid) ORCHIDACEAE	r -	2 records	Potential habitat (buttongrass moorland, sedgy and scrubby heathland, sedgy eucalypt shrub land or open forest on poorly drained peaty, sandy and clay soils that are at least seasonally moist) is present within the study area. The species was not recorded during the survey; however the survey was conducted during August, well outside of the species flowering time (between December and February) and consequently may be easily overlooked.

Priority fauna

No fauna species, listed as threatened on the Tasmanian *Threatened Species Protection Act 1995* or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, were observed from the study area. Evidence of the tasmanian devil (in the form of scats) was recorded from the study area, indicating the presence of this species. There is potential foraging habitat present for the spotted-tailed quoll, grey goshawk Tasmanian devil and wedge tailed eagle.

Priority species recorded from databases

Table 4 provides a listing of priority fauna recorded from within 500 m and 5000 m of the study area, with comments on whether potential habitat is present for the species, if the species was recorded, and possible reasons why a species was not recorded.

Table 4. Priority fauna records from within 500 m and 5000 m of boundary of study area.

Species listed below are listed as rare (r), vulnerable (v), endangered (e), or extinct (x) on the Tasmanian *Threatened Species Protection Act 1995* (TSPA); vulnerable (VU), endangered (EN), critically endangered (CR) or extinct (EX) on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC). Information below is sourced from the DPIW's *Natural Values Atlas* (DPIW 2007), Bryant & Jackson (1999) and FPA (2007).

Species	Status TSPA EPBC	Observations	Comments
Records within the study area			
<i>Sarcophilus harrisii</i> (tasmanian devil)	v VU	No records in DPIW databases for this species.	Evidence that devils are present was observed. Fresh and older scats were found in the <i>E. obliqua</i> forest indicating the presence of this species.
Records within 500 m of study area			
None.			

Species	Status TSPA EPBC	Observations	Comments
Records within 5000 m of study area			
<i>Dasyurus maculatus</i> subsp. <i>maculatus</i> (spotted-tailed quoll)	r VU	4 records	The study area supports a mosaic of forest and non-forest communities with a diversity of structure, which is considered good habitat for the spotted-tailed quoll. No evidence of the species was recorded during the survey (e.g. distinctive scats), but it is possible that the study area forms part of the territory (or foraging range) of one or more individuals.
<i>Halobaena caerulea</i> (blue petrel)	v VU	1 record	Marine bird. No suitable habitat.
<i>Pachyptila turtur</i> subsp. <i>subantarctica</i> (fairy prion southern subspecies)	e VU	3 records	Marine bird. No suitable habitat.
Species potentially within 500 m or 5000 m based on estimated geographic range (if not discussed in sections above)			
<i>Accipiter novaehollandiae</i> (grey goshawk)	e -	Potential habitat (mature blackwood swamp forest, wet forest and mixed forest, primarily at lower altitudes) is present in within the study area, however no nests or the species were observed during the current assessment. It is possible that the study area forms part of home range of one or more individuals.	
<i>Aquila audax</i> subsp. <i>fleayi</i> (wedge-tailed eagle)	e EN	Potential habitat is described as "large tracts (more than 10 ha) of eucalypt or mixed forest" (FPA 2007). There are no nests known from within 500-1000 m of boundary of study area. Potential nesting and foraging habitat is present within the study area. No nests were located during the survey.	
<i>Haliaeetus leucogaster</i> (white-bellied sea-eagle)	v -	Potential habitat is described as "forest with significant old-growth eucalypt component within 5 km of the coast (nearest coast including shores, bays inlets and peninsulas, rivers, lakes or a complex of farm dams" (FPA 2007). There are no nests known from within 500-1000 m of boundary of study area. Potential nesting habitat is considered to be marginally available within the study area, and it is plausible that the area may be used for foraging.	
<i>Prototroctes maraena</i> (australian grayling)	v VU	Potential habitat is described as "coastal streams and rivers around the Tasmanian coast" (FPA 2007). Comstock Creek and its tributaries are present within the study area, however they currently receive acid mine drainage from abandoned mining operations. Consequently it is unlikely that this creek provides suitable habitat for this species. The species was not recorded.	

DISCUSSION (RECOMMENDATIONS)

Legislative and policy implications

The implications of the provisions and intents of key legislative and policy instruments are discussed below. Note that there may be other relevant instruments in addition to those discussed.

Tasmanian Threatened Species Protection Act 1995

No known sites for threatened species listed on this Act will be affected by the proposed development so a permit under Section 51 of the Act will not be required.

It is noted that the potential habitat for threatened species will be taken into account under the provisions of the *Forest Practices Code 2000*, if a Forest Practices Plan is prepared. These provisions ensure that the potential impacts of the proposed activities are considered by the

proponent in conjunction with the Forest Practices Authority, which may further consult with the Department of Primary Industries & Water.

Commonwealth Environment Protection and Biodiversity Conservation Act 1999

There is potential habitat for three species listed on this Act, namely *Dasyurus maculatus* subsp. *maculatus* (spotted-tailed quoll), tasmanian devil (*Sarcophilus harrisii*) and *Aquila audax* subsp. *fleayi* (wedge-tailed eagle).

The Commonwealth Department of Environment & Water Resources provides a *Significant Impact Guidelines* policy statement (CofA 2006) to determine if referral to the department is required.

The “significant impact criteria” for vulnerable species are listed below, with author comments in square brackets.

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

- **lead to a long-term decrease in the size of an important population of a species**

[Any populations of listed species present in the study area are likely to be part of a much larger population present in the wider area and as such are unlikely to be a “key source population for breeding or dispersal” or a “population necessary for maintaining genetic diversity”].

- **reduce the area of occupancy of an important population**

[See comments above – the construction of a mining operation will reduce the area of potential occupancy by c. 48 ha only but this reduction is very small, proportionately, to the amount of similar potential habitat in the wider area and Statewide].

- **fragment an existing important population into two or more populations**

[The development will not result in significant additional fragmentation].

- **adversely affect habitat critical to the survival of a species**

[The study area is unlikely to constitute “habitat critical to the survival of the species” because of its current disturbed status, its location in an area close to substantial areas of similar and higher quality habitat, and its contiguity with other habitat allowing genetic diversity to be maintained].

- **disrupt the breeding cycle of an important population**

[See first dot point].

- **modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline**

[See previous comments – the amount of potential habitat being removed is proportionately very small and is unlikely to resulting the decline of the species to a significant extent].

- **result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species’ habitat**

[The development will result in habitat modification but not such that the opportunity for harmful invasive species to become further established is substantially increased].

- **introduce disease that may cause the species to decline**

[No such diseases known].

- **interfere substantially with the recovery of the species**

[The proposal represents a minor proportion of the species’ ranges both locally (e.g. the wider Zeehan area) and Statewide so is unlikely to interfere with the recovery of the species].

Consequently, the potential impact is not considered significant within the guidelines provided by the Commonwealth Department of Environment and Water Resources (CofA 2006) and referral is not required.

Tasmanian Weed Management Act 1999

The management of weeds is covered by another report, ECOtas (2007) *Weed and Root Rot Fungus (Phytophthora cinnamomi) Management Plan for Zeehan Zinc Ltd Mining Lease Areas, Zeehan, Tasmania* and the implications under the Act are not repeated here.

Tasmanian Nature Conservation Act 2002

Schedule 3 of this Act lists vegetation types classified as threatened. These vegetation types have additional controls on clearing activities under this Act and the *Forest Practices Act 1985*. In this case, no threatened vegetation types have been identified from the study area. As such, clearing activities will be covered by the provisions of the *Forest Practices Act 1985* (see below).

The *Wildlife Regulations 1999* (under the *Nature Conservation Act 2002*) specify situations when a permit is required to “take” “protected wildlife” or “products of protected wildlife” (which include things such as nests, eggs, bones, etc.) as listed on schedules of the regulations. If a certified Forest Practices Plan is in place, an additional permit under the *Wildlife Regulations 1999* is not required.

Tasmanian Forest Practices Act 1985

The *Forest Practices Regulations* indicate in what circumstances a Forest Practices Plan (FPP) is required for “clearing” of native vegetation. The *Forest Practices Act 1985* (through its regulations) defines the term “clearing” to include “clearing, cutting, pushing or otherwise removing” or “destroying trees in any way” and defines “trees” as “any woody plants with a height or potential height of 5 metres or more, whether or not living, dead, standing or fallen, that are native to Tasmania”.

An FPP is needed for any circumstances where “vulnerable land” is present. In relation to flora and fauna values addressed by the present report, “vulnerable land” includes areas supporting threatened species (as listed on the *Threatened Species Protection Act 1995*) and threatened vegetation types (as listed on the *Nature Conservation Act 2002*). Neither of these are present in the study area.

In situations other than where vulnerable land is present, an FPP is required where clearing will exceed 1 ha or 100 tonnes of timber per property per year, whichever is the lesser.

Further advice on the requirements, or otherwise, for a Forest Practices Plan, can be sought from the Forest Practices Authority (or a Forest Practices Officer).

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APPENDIX 1: Vascular plant species recorded in the Comstock mining lease area.

Nomenclature follows Buchanan (2005).

e – Tasmanian endemic species/subspecies

DICOTYLEDONAE

APIACEAE

Hydrocotyle hirta

ASTERACEAE

Cassinia aculeata

Olearia stellulata

e *Olearia persoonioides*

e *Ozothamnus purpurascens*

CAMPANULACEAE

Lobelia anceps

CUNONIACEAE

e *Anodopetalum biglandulosum*

Bauera rubioides

DROSERACEAE

Drosera binata

Drosera peltata subsp. *peltata*

Drosera pygmaea

EPACRIDACEAE

Epacris impressa

Epacris lanuginosa

Epacris obtusifolia

Leptecophylla juniperina subsp. *juniperina*

Monotoca glauca

Sprengelia incarnata

e *Trochocarpa gunnii*

ESCALLONIACEAE

e *Anopterus glandulosus*

EUCRYPHIACEAE

e *Eucryphia lucida*

FABACEAE

Dillwynia glaberrima

FAGACEAE

Nothofagus cunninghamii

HALORAGACEAE

Gonocarpus teucrioides

LENTIBULARIACEAE

Utricularia dichotoma

MIMOSACEAE

Acacia melanoxylon

Acacia mucronata subsp. *mucronata*

Acacia verticillata subsp. *verticillata*

MYRTACEAE

e *Baeckea leptocaulis*

Eucalyptus brookeriana

e *Eucalyptus nitida*

Leptospermum glaucescens

Leptospermum lanigerum

e *Leptospermum nitidum*

Leptospermum scoparium var. *scoparium*

Melaleuca squamea

Melaleuca squarrosa

PITTOSPORACEAE

Billardiera macrantha

POLYGALACEAE

Comesperma retusum

POLYGONACEAE

Muehlenbeckia gunnii

PROTEACEAE

Banksia marginata

e *Cenarrhenes nitida*

e *Hakea epiglottis*

e *Orites diversifolia*

Persoonia juniperina subsp. *juniperina*

RANUNCULACEAE

Clematis aristata

RHAMNACEAE

Pomaderris apetala subsp. *apetala*

e *Spyridium gunnii*

ROSACEAE

Acaena novae-zelandiae

RUBIACEAE

Coprosma nitida

Coprosma quadrifida

RUTACEAE

Boronia nana

Nematolepis squamea subsp. *squamea*

Philotheca virgata

SANTALACEAE

Exocarpos strictus

STYLIDIACEAE

Stylidium graminifolium

THYMELAEACEAE

e *Pimelea cinerea*

Pimelea drupacea

Pimelea linifolia subsp. *linifolia*

VIOLACEAE

Viola hederacea subsp. *hederacea*

WINTERACEAE

Tasmannia lanceolata

GYMNOSPERMAE

PODOCARPACEAE

e *Phyllocladus aspleniifolius*

MONOCOTYLEDONAE

CENTROLEPIDACEAE

Centrolepis strigosa subsp. *strigosa*

CYPERACEAE

Gahnia grandis

Gymnoschoenus sphaerocephalus

Lepidosperma elatius

Lepidosperma filiforme

Schoenus apogon

IRIDACEAE

e *Diplarrena latifolia*

Libertia pulchella var. *pulchella*

Patersonia fragilis

JUNCACEAE

Juncus australis

Juncus pallidus

LILIACEAE

Dianella tasmanica

Drymophila cyanocarpa

ORCHIDACEAE

Thelymitra sp.

POACEAE

Agrostis sp.

Agrostis stolonifera

Austrodanthonia sp.

Deyeuxia quadriseta

Pentapogon quadrifidus

Poa tenera

RESTIONACEAE

Apodasmia brownii

Baloskion australe

Baloskion tetraphyllum

e *Chordifex hookeri*

Empodisma minus

Leptocarpus tenax

XYRIDACEAE

e *Xyris marginata*

PTERIDOPHYTA

BLECHNACEAE

Blechnum minus

Blechnum nudum

DENNSTAEDTIACEAE

Histiopteris incisa

Pteridium esculentum

DICKSONIACEAE

Dicksonia antarctica

DRYOPTERIDACEAE

Polystichum proliferum

Rumohra adiantiformis

GLEICHENIACEAE

Gleichenia dicarpa

Gleichenia microphylla

Sticherus tener

LINDSAEACEAE

Lindsaea linearis

LYCOPODIACEAE

Lycopodiella scariosum

Lycopodium deuterodensum

SCHIZAEACEAE

Schizaea fistulosa

SELAGINELLACEAE

Selaginella uliginosa

APPENDIX 2: Plant community structure

<i>Eucalyptus nitida</i> dry forest and woodland (TASVEG code DNI, RFA code NI)		
Stratum	Cover %	Species
Trees	20-30%	<i>Eucalyptus nitida</i>
Shrubs	75%	<i>Acacia mucronata</i>
		<i>Bauera rubioides</i>
		<i>Leptospermum scoparium</i>
		<i>Leptospermum nitidum</i>
		<i>Hakea epiglottis</i>
		<i>Melaleuca squarrosa</i>
		<i>Banksia marginata</i>
Low shrubs	10%	<i>Sprengelia incarnata</i>
		<i>Epacris impressa</i>
Graminoids	20%	<i>Gahnia grandis</i>
		<i>Baloskion tetraphyllum</i>
Ferns	60%	<i>Gleichenia dicarpa</i>

<i>Eucalyptus obliqua</i> forest (undifferentiated) (TASVEG code WOU, RFA code OT)		
Stratum	Cover %	Species
Trees	20%	<i>Eucalyptus obliqua</i>
Shrubs	35%	<i>Pomaderris apetala</i>
		<i>Acacia mucronata</i>
		<i>Monotoca glauca</i>
		<i>Nematolepis squamea</i>
		<i>Pittosporum bicolor</i>
		<i>Leptospermum nitidum</i>
		<i>Acacia verticillata</i>
		<i>Melaleuca squarrosa</i>
Graminoids	40%	<i>Gahnia grandis</i>
Ferns	10%	<i>Pteridium esculentum</i>

Western wet scrub (TASVEG code SWW, RFA code L)		
Stratum	Cover %	Species
Trees	<5%	<i>Eucalyptus nitida</i>
Tall shrubs	5%	<i>Acacia melanoxylon</i>
Shrubs	70%	<i>Bauera rubioides</i>
		<i>Melaleuca squarrosa</i>
		<i>Leptospermum nitidum</i>
		<i>Leptospermum glaucescens</i>
		<i>Acacia mucronata</i>
		<i>Banksia marginata</i>
Graminoids	35% (up to 80% in wet areas).	<i>Gahnia grandis</i>
		<i>Baloskion tetraphyllum</i>
Ferns	20%	<i>Gleichenia dicarpa</i>



Western wet scrub dominates the foreground with *Eucalyptus nitida* dry forest and woodland and *Nothofagus-Atherosperma* rainforest in the background. Note the gradational nature of the plant communities.

<i>Eucalyptus nitida</i> forest over <i>Leptospermum</i> (WNL) (TASVEG code WNU, RFA code NT)		
Stratum	Cover %	Species
Trees	20-30%	<i>Eucalyptus nitida</i>
Shrubs	75%	<i>Acacia mucronata</i>
		<i>Leptospermum scoparium</i>
		<i>Leptospermum nitidum</i>
		<i>Bauera rubioides</i>
		<i>Cenarrhenes nitida</i>
		<i>Anopterus glandulosus</i>
		<i>Philotheca virgata</i>
Ferns	20%	<i>Gleichenia microphylla</i>
Graminoids	20%	<i>Gahnia grandis</i>

<i>Nothofagus-Leptospermum</i> short rainforest (TASVEG code RML, RFA code)		
Stratum	Cover %	Species
Tall shrubs	70%	<i>Nothofagus cunninghamii</i>
		<i>Acacia melanoxylon</i>
		<i>Eucryphia lucida</i>
Shrubs	40%	<i>Leptospermum nitidum</i>
		<i>Acacia mucronata</i>
Graminoids	30%	<i>Gahnia grandis</i>
		<i>Empodisma minus</i>
Ferns	40%	<i>Gleichenia dicarpa</i>
		<i>Polystichum proliferum</i>
		<i>Dicksonia antarctica</i>

<i>Nothofagus-Atherosperma</i> rainforest (TASVEG code RMT, RFA code)		
Stratum	Cover %	Species
Trees	75%	<i>Nothofagus cunninghamii</i>
		<i>Eucryphia lucida</i>
		<i>Acacia melanoxylon</i>
		<i>Phyllocladus aspleniifolius</i>

Shrubs	50%	<i>Anodopetalum biglandulosum</i>
		<i>Cenarrhenes nitida</i>
		<i>Anopterus glandulosus</i>
Graminoids	5%	<i>Gahnia grandis</i>
Ferns	25%	<i>Dicksonia antarctica</i>
		<i>Histiopteris incisa</i>
		<i>Polystichum proliferum</i>

Buttongrass moorland with emergent shrubs (TASVEG code MBS)		
Stratum	Cover %	Species
Shrubs	20%	<i>Banksia marginata</i>
		<i>Leptospermum scoparium</i>
		<i>Leptospermum nitidum</i>
Low shrubs	5%	<i>Leptospermum scoparium</i>
		<i>Allocasuarina monilifera</i>
		<i>Epacris impressa</i>
		<i>Bauera rubioides</i>
		<i>Baeckea leptocaulis</i>
		<i>Sprengelia incarnata</i>
		<i>Melaleuca gibbosa</i>
		<i>Euryomyrtus ramosissima</i>
Graminoids	70%	<i>Baloskion australe</i>
		<i>Gahnia grandis</i>
		<i>Lepidosperma filiforme</i>
		<i>Acion hookeri</i>
		<i>Gymnoschoenus sphaerocephalus</i>
Herbs	10%	<i>Stylidium graminifolium</i>
Ferns	10%	<i>Gleichenia dicarpa</i>

