

Long Plains, Savage River

**FLORA AND FAUNA HABITAT ASSESSMENT
AND CONSTRAINTS ANALYSIS.**

May 16th 2012

For Caloundra Consulting obo Grange Resources

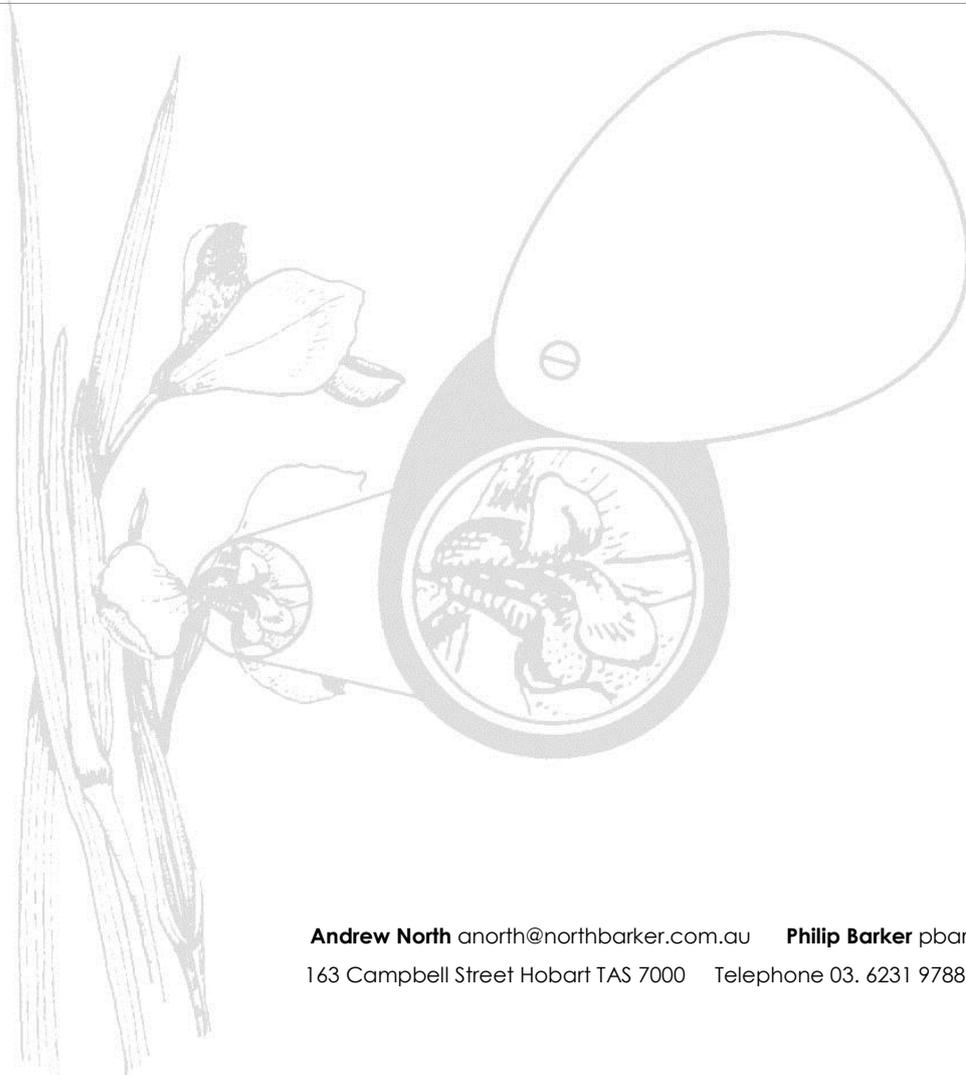


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Introduction

Grange Resources has commissioned *Caloundra Consulting* to undertake a scoping study for the proposed Long Plains project extension to Savage Mine. The area includes known magnetite deposits. This resource will extend the life of the Savage River Mine. The study area is located in the Tasmanian West Bioregion of Long Plains, an area of approximately 2000 ha which extends west of the Corinna Road south of the mining township of Savage River. The potential mining activities will include open cut mine, haulage routes, tailings dams and overburden dumps.

Caloundra Consulting has engaged *NorthBarker Ecosystem Services* to undertake a preliminary flora and fauna habitat assessment to assess the natural values of the study area and to use this information to complete a Constraints Analysis of the site. This information will then be used to determine the feasibility of the project and inform the location of infrastructure associated with the mine.

Aims

This report presents the findings of a site reconnaissance survey undertaken in mid January 2012 and desktop and GIS analysis. The study area has been assessed as to the likelihood of occurrence of significant biodiversity values. The aim of the assessment is to produce a significance map indicating the known and potential occurrence of significant biodiversity values ranked according to their importance. This constraints analysis in turn represents the highest constraints to development at the site.

Survey and Limitations

A survey was undertaken in January 2012. During this survey the following information was collected:

- The distribution of vegetation communities
- Flora species lists for all vegetation communities
- Potential location of threatened flora species
- Potential location of threatened fauna species and suitable habitat for these species
- Location of weeds and plant pathogens

Given that this survey is the basis of a risk assessment, the intention is to highlight the potential values of the study area. This approach is taken in light of the relatively large study area and the limitations for access to some parts of the area. Consequently the analysis is based on targeted inspections and visual examination of the vegetation from vantage points in the field, combined with aerial photo interpretation. All vegetation communities identified in the field had at least one vegetation survey plot and some have had a more thorough sampling than others. The species list for the study area is given in Appendix 2 and the vegetation community species lists are given in Appendix 3. The extent of coverage and locations of sample plots is shown in Appendix 4. Figure 1 below shows the location of the study area.

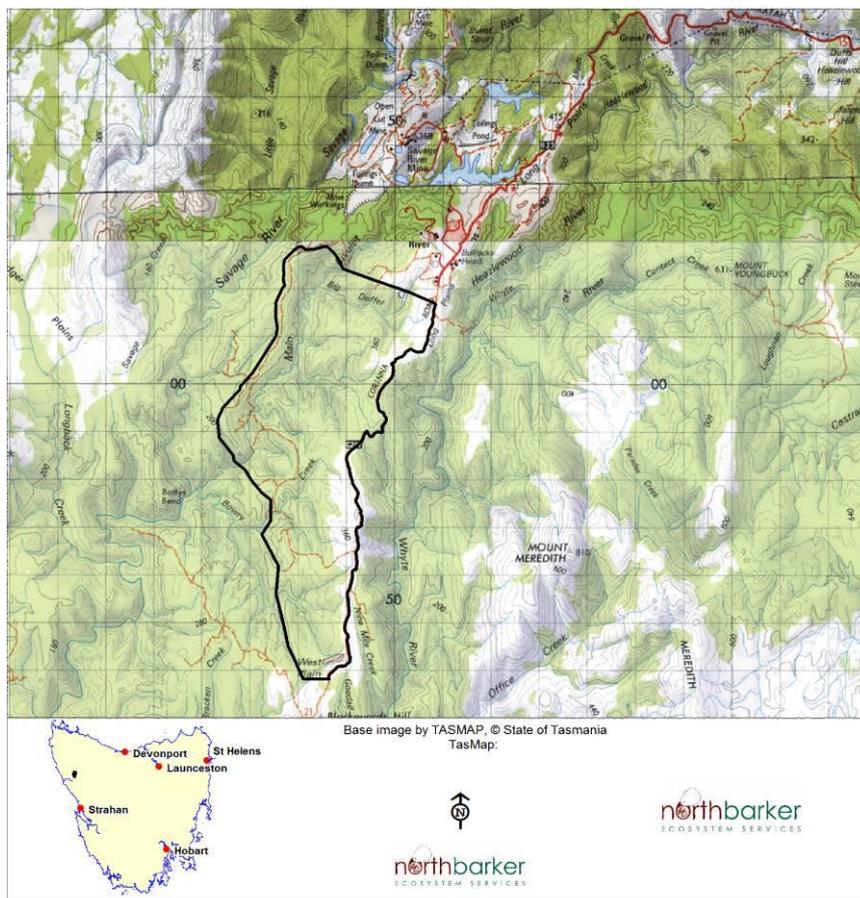


Figure 1. The location and extent of the study area.

Results

Vegetation Communities

Nine vegetation communities were recorded during the survey over the study area which covers nearly 2000 hectares. The vegetation mapping communities recorded are:

- *Acacia melanoxylon* on rises (NAR),
- *Notelaea-Pomaderris-Beyeria* forest (NNP),
- Buttongrass moorland with emergent shrubs (MBS),
- *Eucalyptus nitida* forest over *Leptospermum* (WNL),
- *Eucalyptus nitida* forest over rainforest (WNR),
- Western Wet Scrub (SWW),
- *Nothofagus - Atherosperma* rainforest (RMT),
- *Nothofagus / Phyllocladus* short rainforest (RMS), and
- *Eucalyptus obliqua* forest over broadleaf shrubs (WOB).

Of the vegetation communities surveyed and mapped, *Notelaea-Pomaderris-Beyeria* forest (NNP) is listed as threatened under the *Nature Conservation Act 2002*. This is most typically a northern and eastern Tasmanian community and this example does not represent the values which make this community significant. The description for this species observes that “a second group occurs in north-west and western Tasmania, within disturbed regenerating moist eucalypt forest”.¹ This community is essentially the same as the surrounding vegetation lacking key structural components. Although it is dominated by *Pomaderris apetala* (common dogwood) it does not support either of *Notelaea ligustrina* or *Beyeria viscosa* (the other two component species). It is therefore not justified as being considered of high conservation significance.

None of the other eight communities are listed and all are considered to be well conserved. Full species lists for each survey site and their associated vegetation communities are shown in Appendices 2 and 3.

Figure 2 illustrates the vegetation communities that were recorded in the study area. Mapping is derived from a compilation of ground truthing, aerial imagery interpretation and Tasveg 2.0 digital data.

¹ Harris & Kitchener 2005

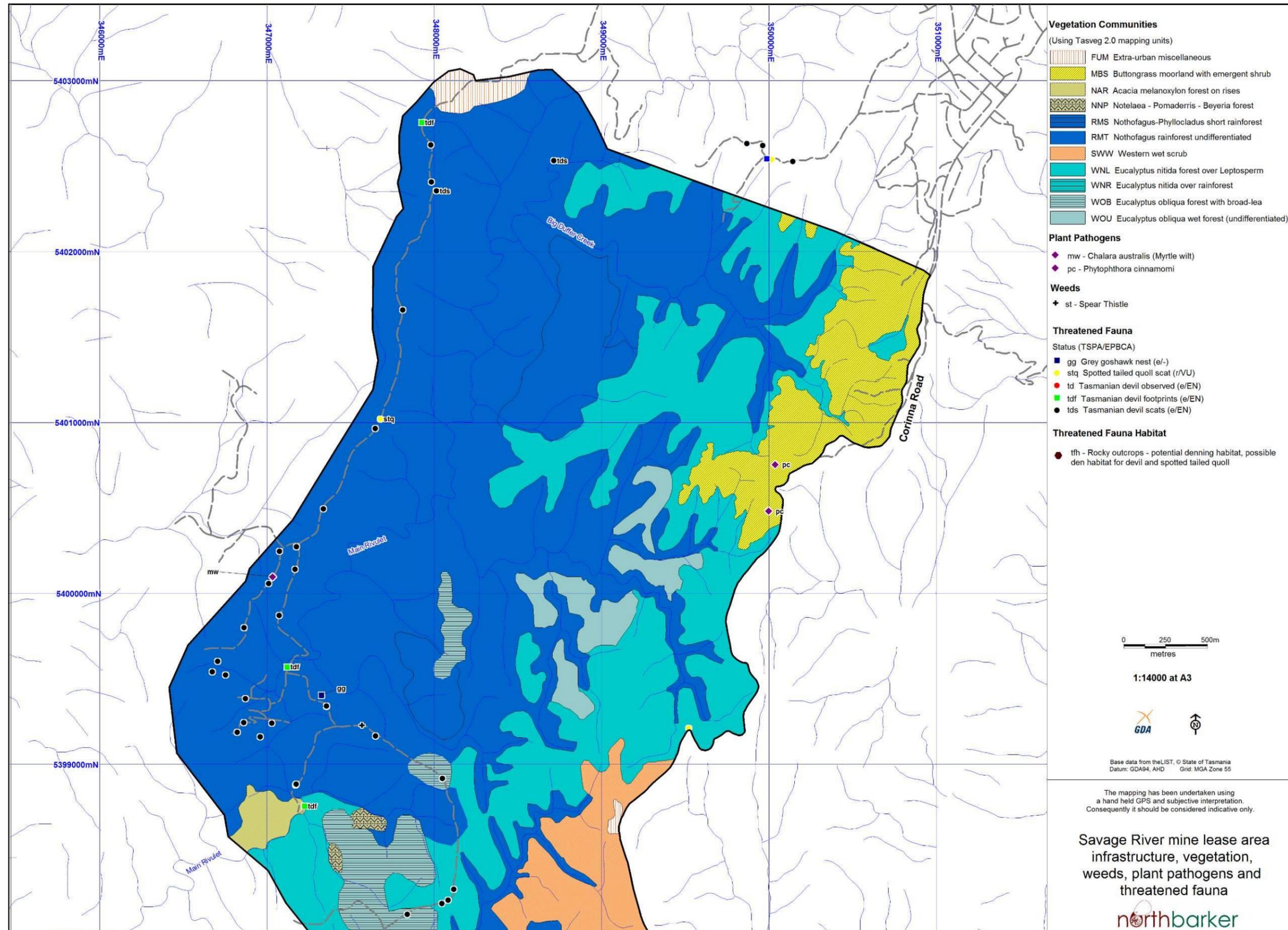


Figure 2A – Vegetation, weeds, plant pathogens and threatened fauna

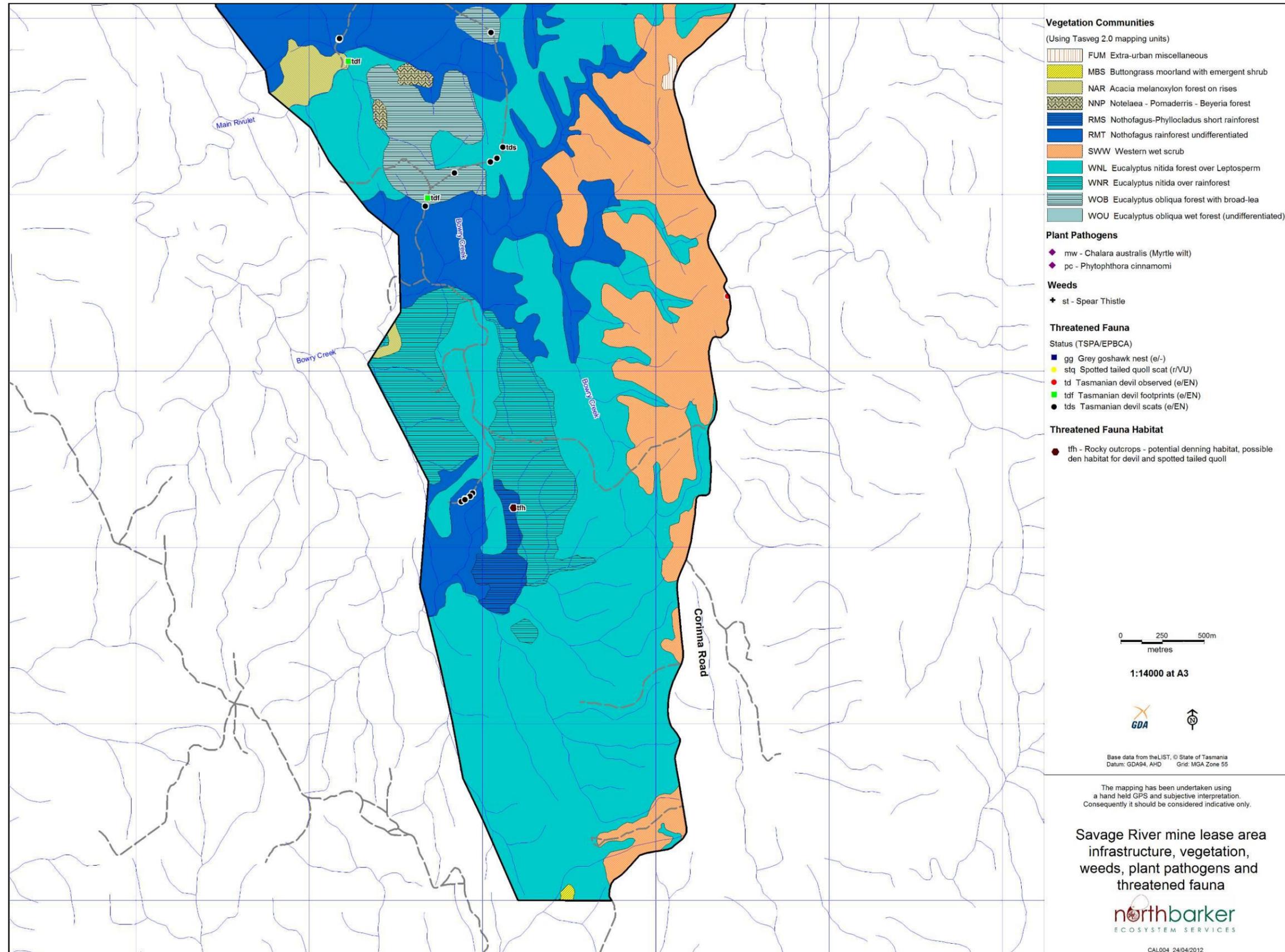


Figure 2b – Vegetation, weeds, plant pathogens and threatened fauna

Flora Species

The survey has captured 162 native plant species and only one introduced species within the study area. Twenty five species are endemic to Tasmania. Appendix 2 shows a complete species list for the whole study area.

Threatened Flora Species

A database search of the Tasmanian Natural Values Atlas² did not find any threatened flora species within 500m of the site and only 2 species within a 5 km radius of the site. A database search using the Commonwealth EPBCA Protected Matters Search Tool³ did not record any threatened flora species from within a five km radius of the site (see Table 1 below).

Table 1: Threatened Flora Species previously recorded in the vicinity (within 5km)

Species Name	Conservation Status ⁴		Previous records, preferred habitat and other observations. ⁵
	TSPA/ EPBC	Potential to occur	
<i>Persoonia muelleri</i> subsp. <i>angustifolia</i> (Mueller's geebung)	Rare/-	Moderate/ High	This erect shrub is found predominantly in the west of the state favouring the ecotone between dry scrub and rainforest where high light levels occur on the ground. It has been recorded as a single plant from a nearby survey just north of Savage River in similar habitat. Although not recorded during this survey is still likely that plants may be present in some of the less dense canopy communities.
<i>Senecio velleioides</i> (forest groundsel)	Rare/-	Low/ Moderate	This species is widespread and is found in moist places on hills particularly after disturbance by fire. One previous record exists within the study area just east of the Corinna Road, although its precision is low. This species is unlikely to be found in the study area in areas of mature, intact native vegetation, however it could be found in areas that have been recently disturbed by fire or other disturbance events such as vegetation clearance or along tracks. It is perhaps most likely to favour more fertile environments supporting eucalypt forest (especially <i>E. obliqua</i> dominated) where there is a history of past disturbance. It was not observed.

² Natural Values Atlas, report number 44149, 4th January 2012 (DPIPWE)

³ EPBC Protected Matters Report, 11th April 2012 (Commonwealth of Australia)

⁴ Tasmanian *Threatened Species Protection Act 1995* / Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999*.

⁵ Threatened Flora Notesheets DPIPWE

Weeds

There are no 'declared weeds' listed on the Tasmanian *Weed Management Act 2000* recorded from within the study area.

There are at least four declared weed species in the Savage River area adjacent to the study area. These are:

- English broom
- Spanish heath
- Gorse
- Pampas grass

The majority of the "declared" weeds are confined to the roadside corridor and/or around the Savage River township where past disturbance is evident. Pampas grass although outside the study area could easily impact on the study area as the seed is wind dispersed. All four species could easily be translocated in soil on machinery into the study area.

Plant pathogens

Dieback (*Phytophthora cinnamomi*)

Phytophthora cinnamomi commonly known as dieback (or PC) is a pathogen which affects a wide range of species, (notably those in the Epacridaceae and Proteaceae families). It is a soil borne fungal pathogen that invades the roots of plants and starves them of nutrients and water. Nearly 50 % of rainforest species which occur in the climatic range of PC are susceptible to infection. This soil borne fungus moves naturally through the soil, more rapidly with drainage, and more slowly upslope. It is transported long distances by animals and humans.

Phytophthora can be accidentally introduced through the transportation of soil on vehicles, construction machinery and walking boots. The establishment and spread of *Phytophthora* is favoured in areas that receive above 600 mm of rainfall per annum and are below about 800 m altitude. The project site falls within this climatic zone. Within this suitable climatic envelope some soil types are more conducive to the establishment and spread of *Phytophthora* than others. Conducive soils are generally the low nutrient types that support heathy communities. The combination of these biophysical factors results in patches of susceptible communities on conducive sites across the landscape.

Buttongrass communities are generally highly susceptible to *Phytophthora cinnamomi*. There is symptomatic evidence of *Phytophthora* within these communities along Corinna Road in the form of extensive plant deaths of *Agastachys odorata*, *Cenarrhenes nitida*, *Sprengelia incarnata* and *Dillwynia glaberrima*.

Rainforest and closed eucalypt forest are generally only susceptible to infection when severely disturbed so that the soil temperature can be raised by sun exposure to a temperature suitable to sustain *Phytophthora cinnamomi*.

Myrtle Wilt (*Chalara australis*)

Myrtle wilt occurs naturally in rainforest where myrtle (*Nothofagus cunninghamii*) is present. It is caused by wind borne fungi (*Chalara australis*). Where forest clearance is undertaken and trees are damaged, there is often an increase in the incidence of myrtle wilt. The fungus enters through wounds in the tree which can occur following attack by tree boring insects, storm damage or where limbs are broken. The increased level of sporing of the fungus causes a local knock on effect with many older or damaged trees

nearby becoming infected. The uninfected forest as a whole will not be threatened as myrtle wilt is natural and evidence suggests the rates of infection fall dramatically away from the source of disturbance.

Threatened Fauna Species

Threatened fauna species previously recorded within 5 km of the study area, or which may potentially occur there, are listed in Table 2 together with a description of their preferred habitat and an assessment of their likely occurrence in the study area.

Table 2: Fauna species of conservation significance previously recorded, or which may potentially occur, within 5 km of the property⁶.

Species	Status TSPA/EPBC A	Significance of habitat	Preferred Habitat ⁷ and Observations
BIRDS			
Azure kingfisher <i>Ceyx azurea diemenensis</i>	Endangered/ Endangered	Very low	Inhabits tree-lined waterways, lakes, ponds and other wetlands with dense streamside vegetation, in particular in western and north-western Tasmania ⁸ . It is historically also known from eastern Tasmania. There are records from the Donaldson, Pieman and Whyte Rivers with the nearest observation record from the latter 4km south of the study area. Suitable habitat in region confined to unpolluted major waterways. Creeks within study area too small and /or polluted to provide habitat.
Grey goshawk <i>Accipiter novaehollandiae</i>	Endangered/ -	High Nest present	Inhabits large tracts of wet forest with blackwood and requires old trees for nesting. An active nest was identified within the study area evidenced by distress call on two occasions in the immediate vicinity of a nest structure in a beech tree on slopes above Bowry Creek in forest supporting tall blackwoods. Suitable habitat for breeding was recorded on site, and the area is also suitable for foraging.
Swift Parrot <i>Lathamus discolor</i>	Endangered/ Endangered	Very Low	This migratory species is occasionally recorded on the west coast and is regularly recorded in the north west (e.g. Smithton) during the breeding season and post breeding foraging on flowers of planted <i>Eucalyptus globulus</i> (Tasmanian blue gum) and <i>Eucalyptus nitida</i> (Smithton peppermint). They have also been recorded from localised stands of <i>E. globulus</i> near Strahan to the south. The likelihood of this species occurring in the study area is negligible. The species requires tree hollows for nesting and feeds on nectar of blue gum (<i>E. globulus</i>) and black gum (<i>E. ovata</i>) flowers. Three records of this species have been recorded within 5km of the study area. The survey area is not considered suitable breeding habitat, but may on occasion be visited by migrating and non breeding dispersing..
Tasmanian wedge-tailed eagle <i>Aquila audax fleayi</i>	Endangered/ Endangered	Moderate for foraging Low for nesting	Requires large sheltered trees for nesting and is highly sensitive to disturbance during the breeding season. No evidence of large eucalypt trees in sufficiently sheltered locations to support nests. Use of myrtle beech for nesting is extremely rare.

⁶ Natural Values Atlas, report number 44149, 4th January 2012 (DPIPWE)

⁷ Bryant & Jackson (1999)

⁸ Wapstra et al (2010)

Species	Status TSPA/EPBC A	Significance of habitat	Preferred Habitat ⁷ and Observations
			The survey area is likely to be utilised for hunting and foraging but unlikely to be utilised for breeding. No records of this species have been recorded within 5km of the study area although local reports of occasional sightings from the Savage River area. A pair of birds were observed off the West Coast Link Road 6km to the west of the study area.
White-bellied Sea-eagle <i>Haliaeetus leucogaster</i>	Vulnerable / -	Low for foraging None for nesting	This species nests and forages mainly near the coast but will also live near large rivers and inland lakes, often moving on a seasonal basis. No records of this species have been recorded within 5km of the study area.
MAMMALS			
Spotted-tailed quoll <i>Dasyurus maculatus</i> <i>ssp. maculatus</i>	Rare / Vulnerable	Moderate-High Present	This naturally rare forest-dweller most commonly inhabits rainforest, wet forest and blackwood swamp forest. It forages and hunts on farmland and pasture, travelling up to 20 km at night, and shelters in logs, rocks or thick vegetation. Hair analysis on scats collected confirmed one hair from this species with another 4 samples also likely spotted-tailed quoll.
Tasmanian devil <i>Sarcophilus harrisii</i>	Endangered/ Endangered	Moderate-High Present	Many scats were recorded as were good observations of footprints. Hair analysis of scats collected confirmed the presence of this species. Inhabits a range of forest types, usually within extensive tracts of native vegetation or in areas of cleared and remnant vegetation. No currently active natal dens were observed, however a large number of suitable dens were recorded along the western track, largely in the form of mature myrtle trunks.
FISH			
Australian grayling <i>Prototroctes maraena</i>	Vulnerable/ Vulnerable	Low	Inhabits the middle and lower reaches of unpolluted rivers and streams that open to the sea. Although the species has been recorded as high as 1000 m altitude in Victoria ⁹ . A 15m waterfall on Main Rivulet downstream of the study area is an effective barrier. Water quality of Main Rivulet is affected by historic tailings and is unsuitable for fish species.
INVERTEBRATES			
Hydrobiid Snails <i>Beddomeia trochiformis</i> <i>Beddomeia bowryensis</i>	Rare/ - Rare/	Very High High	Hydrobiid snails live in sheltered habitats such as under rock slabs in streams, and each species has an extremely limited distribution often being found in only one stream ¹⁰ . Their distribution in Tasmania occurs in the northern and western parts of the state. There are known records of both species from a

⁹ Bryant & Jackson 1999

¹⁰ Forest Practices Authority (2002)

Species	Status TSPA/EPBC A	Significance of habitat	Preferred Habitat ⁷ and Observations
	-		<p>site on Bowry Creek within the study area.</p> <p>Potential habitat has been modelled for both species. The study area captures a significant proportion of both including virtually all of <i>B.trochiformis</i>.</p> <p>Historic tailings pollution of Main Rivulet severely compromises habitat suitability for many freshwater invertebrates including <i>Beddomeia</i>. Further survey would be required to confirm this species within the Bowry creek or unpolluted streams off Main rivulet.</p>

Burrowing Crayfish

Evidence (burrows and excavated soil) of a species of burrowing crayfish was found along the western track in the survey area, occurring particularly in rainforest vegetation. Several different species of burrowing crayfish occur in Tasmania, including five species of the *Engaeus* genus which are threatened. The distribution of these five burrowing crayfish occurs along the north coast of Tasmania and on Flinders Island so they are considered very unlikely to occur in the study area.

Based on this information and the assessment provided in Table 3, at least four species are present in the study area and it is probable that a further four of the above threatened fauna species utilise habitats within the study area, with two species likely to be occasional visitors.

Constraints Analysis

All of the information collected during the field survey has been collated with the most recent database records and information on threatened species and communities to produce a constraints analysis map.

From our analysis the main constraints based on the biodiversity values likely to be found in the study area are:

- Known locations of threatened fauna species listed under the *Tasmanian Threatened Species Protection Act 1995 (TSPA)*, in particular;
 - Hydrobiid snails (*Beddomeia trochiformis*, *B. bowryensis*) (Rare, *TSPA*)
 - nest location of Grey goshawk (*Accipiter novaehollandiae*) (Endangered, *TSPA*)

- Potential habitat of threatened fauna species listed under the *Commonwealth Environmental Protection and Biodiversity Conservation Act 1999 (EPBCA)*, in particular;
 - Spotted-tailed quoll (*Dasyurus maculatus* ssp. *maculatus*) (Vulnerable, *EPBCA*)
 - Tasmanian devil (*Sarcophilus harrisii*) (Endangered, *EPBCA*)
 - Azure kingfisher (*Ceyx azurea diemenensis*) (Endangered, *EPBCA*)

- Potential habitat of threatened fauna species listed under the *Tasmanian Threatened Species Protection Act 1995 (TSPA)*, in particular;
 - Grey goshawk (*Accipiter novaehollandiae*) (Endangered, *TSPA*)
 - Hydrobiid snails (*Beddomeia bowryensis*, *B. trochiformis*) (Rare, *TSPA*)

A brief description of the constraints levels follows, with a more detailed explanation on the following page. The highest level of constraint (Level 1) is reserved for species or communities listed under the *EPBCA 1999*. A high level of constraint (Level 2) is reserved for species or communities listed under the *TSPA 1999* and the *Tasmanian Nature Conservation Act 2002 (NCA 2002)*. The main criteria for a medium level of constraint (Level 3) is the occurrence of habitat that has the potential for species not already covered or specifically listed in the highest or high categories. All other native vegetation communities within the study area were given a low level of constraint (Level 4).

The spotted-tailed quoll and Tasmanian devil are both listed on the *EPBCA 1999*. Normally habitat of these species would be attributed to the highest level of constraint. However, because they range across widespread and abundant foraging habitat the focus for this study is on potential maternal denning habitat. Therefore all quoll/devil foraging habitat has been downgraded to a medium level of constraint. An area that was assessed as providing quality denning habitat has been mapped as high. If any natal den sites are recorded, then a buffer zone around confirmed sites

would need to be elevated to the highest level of constraint. Buffer zones around maternal den sites for these species would be 100m.

The management measures required to deal with any of the above constraints are varied and primarily depend on the species present and whether the sites are active breeding areas. Management prescriptions are likely to involve a combination of the following methods; total avoidance of the area, avoiding disturbance during breeding seasons, application of buffer zones, activity in an area only being allowed outside the breeding season and relocation of infrastructure and applying for permits to disturb threatened species (both at a state and federal level). As this project progresses further into the planning and implementation phases and development areas are more accurately known, more targeted surveys would be required to accurately identify these sites. At this stage a more detailed management plan would be required in order to adequately prescribe appropriate management strategies.

The ranked range of values and associated constraint levels are:

1. Highest

- Records of flora species listed on the *Commonwealth Environmental Protection and Biodiversity Conservation Act 1999 (EPBCA 1999)* – None identified during the survey or from records.
- Habitat of fauna species listed on the *EPBCA 1999*. This includes confirmed records, den sites or active nest sites – None identified during the survey or from records.
- Vegetation communities listed on the *EPBCA 1999* – None identified during the survey or from records.

2. High

- Records of flora species listed on the *Tasmanian Threatened Species Protection Act 1995 (TSPA 1995)* as vulnerable or endangered. – None identified.
- Habitat of fauna species listed on the *TSPA 1995*. This includes confirmed records, den sites or active nest sites and in this case includes
 - Grey Goshawk Nest Site
 - High quality den habitat for Tasmanian devil
 - Core Hydrobiid Snail habitat – Bowry Creek which includes the catchment of all streams/drainage lines that occur within this species core habitat range.¹¹
- Vegetation communities listed on the *Tasmanian Nature Conservation Act 2002 (NCA 2002)*.

3. Medium

- Records of flora species listed on the *TSPA 1995* as rare – there are none known from the study area. The *Senecio velleioides* record has a low accuracy of 4 km for is not necessarily from the study area. It is also possible that *Persoonia muelleri* subsp. *angustifolia* is present in the western wet scrub, buttongrass moorland or on the forest/non forest boundaries.
- Potential habitat of fauna species listed on the *EPBCA 1999* or the *TSPA 1995*. This includes:
 - The Tasmanian Devil and Spotted-tailed Quoll foraging habitat
 - Grey Goshawk Nest Site Habitat – blackwood forest and rainforest rich in blackwoods

¹¹ Karen Richards (Forest Practices Authority) for The Natural Values Atlas Habitat Mapping

4. Low

- Non-threatened Native vegetation communities.

Figure 3 shows the location of the different constraint levels, across the study area. See Appendix 1 for a description of the criteria used for each species to determine the constraint levels for different habitat types.

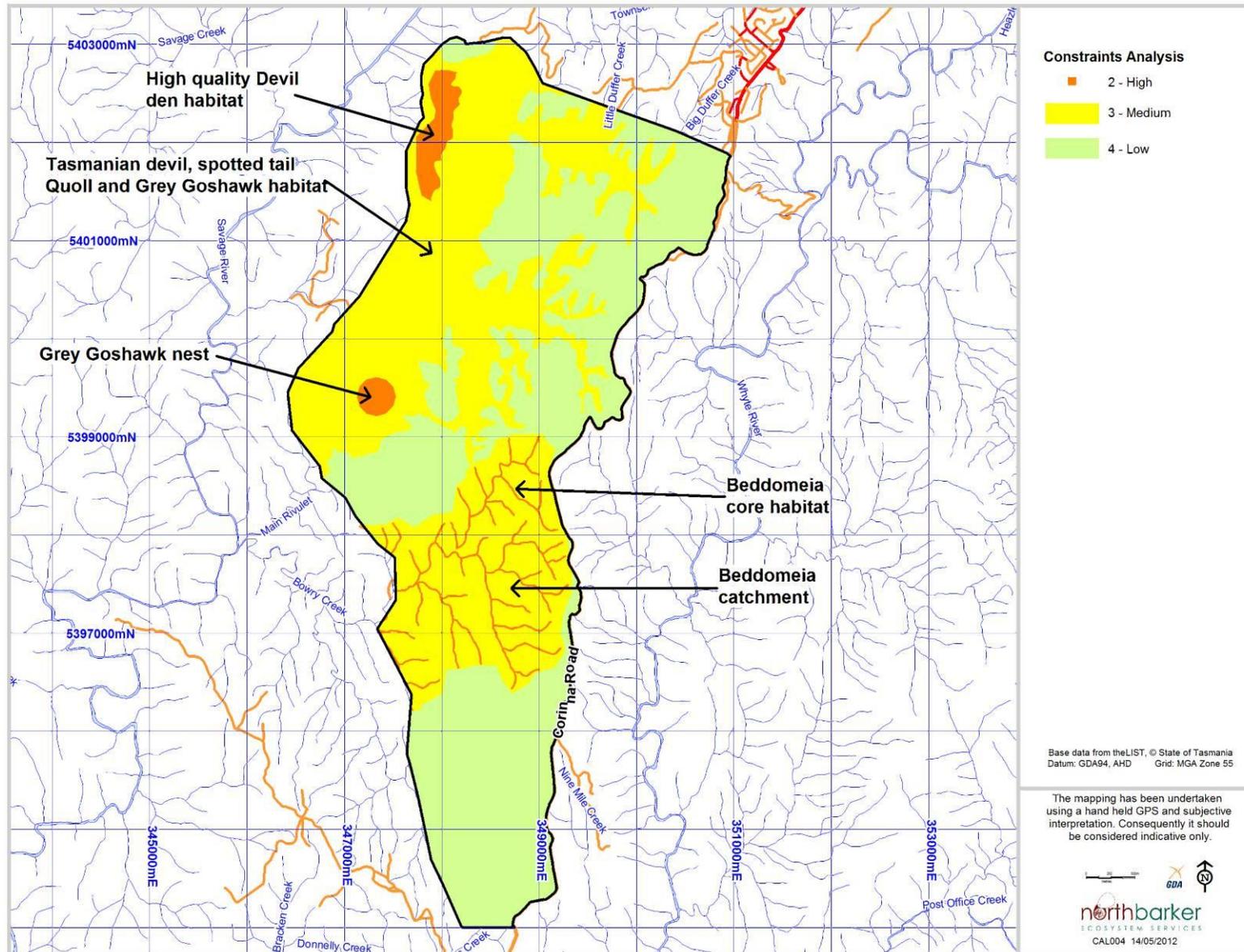


Figure 3 – Constraints Analysis

Discussion.

The Long Plains area is dominated by native vegetation which is typical of the Savage River area. The vegetation communities are generally types which are widespread in western Tasmania and well represented in the reserve system.

There is one localised expression of a community that is listed as threatened on the *Nature Conservation Act 2002*. The significance of this is dismissed because the facies found here is not consistent with the more typical example and is actually derived from previous disturbance.

No vegetation communities are listed under commonwealth legislation.

There are no threatened flora species listed under either state or commonwealth legislation.

There is habitat for five threatened fauna species (two of national significance).

The constraints analysis is a useful planning and risk assessment tool. The main biodiversity constraints that have been identified as a result of the survey occur in the area of fauna habitat.

Limitations on the site specific fauna values meant that much of this analysis is based on potential habitat.

In order to fully understand the distribution of threatened species on site, additional surveys will be necessary which target particular values. These are perhaps best undertaken once more information is forthcoming on the layout of mining infrastructure.

Where there is flexibility on a location, then options may need to be investigated to compare the relative impacts.

The key issues and likely constraints are outlined in Table 3. Further work to help resolve these issues is identified.

Table 3: Key constraints and their implications

Issue	Legislation	Significance	Further Work
Tasmanian devil <i>Sarcophilus harrisii</i>	EPBCA TSPA	Potentially High Optimal denning habitat should be avoided.	Further surveys of buffer zones around infrastructure may be required. Unsurveyed remote habitat may also require assessment
Spotted-tailed quoll <i>Dasyurus maculatus</i> ssp. <i>maculatus</i>	EPBCA TSPA	Moderate	Further surveys of buffer zones around infrastructure may be required. Unsurveyed remote habitat may also require assessment
Grey goshawk <i>Accipiter</i> <i>novaeollandiae</i>	TSPA	Moderate Known locality of nest is important and should be avoided where possible	Further monitoring of nest activity and targeted searches of suitable habitat to target additional nests
Hydrobiid snail <i>Beddomeia</i> spp	TSPA	Locally high	Key habitat of Bowry Creek catchment will require assessment to map habitat suitability. The retention of some habitat may be required. Extension surveys may be necessary as part of mitigation

Risk Assessment

If any of the above values are found to occur on site, additional constraints may be imposed upon the development of this project.

The following assessment is based on the current tenure. Changes to the classification of the area to National Heritage Listing could impact on this risk

- **Avoidance**

This is the preferred first choice in impact minimisation. Clearly the ore body is fixed.

None of the issues appear to be of such site specific significance in the vicinity of the ore bodies to preclude the project proceeding.

Constraints on the placement of associated infrastructure such as tailings dams, dumps, access roads etc may be required. These could potentially place added costs to the project. Values likely to impose these constraints include:

- Tasmanian devil and spotted tailed quoll natal dens
- Grey goshawk nest
- Creeks supporting rare *Beddomeia* spp. to maintain some habitat

- **Minimisation**

Where total avoidance of some value is not achieved then thorough assessment of the extent of the value is necessary to ensure options are taken that minimise the impact. These assessments also provide context to any losses,

For example if some of Bowry Creek catchment is to be impacted with potential losses to a rare Hydrobiid snail, targeted survey may be necessary to determine the full distribution . Water analysis may be necessary to map the full range of suitable habitat. The design of infrastructure can then be developed that is informed by the extent of impact.

- **Offsetting**

Any unavoidable impacts to threatened species (TSPA) or significant impacts to threatened species habitat (EPBCA) may require some form of offset. Offsets may require direct protection and management of habitat equivalent to those being impacted, potentially with some form of multiplier value. Eg 5 ha protected for every 1 ha lost.

Indirect offsets can also be included in part of an offset package. These could include research to further improve knowledge on the distribution of a species affected by the project.

Additional Issues

The issue of weeds while not considered part of the constraints analysis is considered to be a very important issue that needs addressing. A weed management plan would need to be written and implemented to address this management issue before weeds are spread throughout this relatively weed free area. The weed species observed adjacent to the study area are english broom, spanish heath, pampas grass and gorse all of which are listed as declared under the Tasmanian *Weed Management Act 1999*, which means that by law they are required to be controlled. It is understood that a weed control program is

now in place to control these species within the mine area and this should be extended to any future works.

Similarly, there is a need to ensure an effective die-back (Pc) management plan to prevent the further spread of the root rot fungus. Machinery and soil hygiene is necessary within the study area to stop the spread of plant pathogens and environmental weeds into the study area. This is particularly relevant to machinery moving between Savage River and the Long Plains site.

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Appendix 1 – Constraints Analysis Criteria

The constraints analysis mapping has been based on the following information and reasoning for each of the following species. Sources of information have been supplied where an external source of information has been used.

Spotted-tailed quoll (*Dasyurus maculatus* ssp. *maculatus*)

- High quality habitat is likely to occur in Nothofagus - Atherosperma rainforest (RMT), Nothofagus / Phyllocladus short rainforest (RMS), Eucalyptus nitida forest over Leptospermum (WNL), Eucalyptus nitida forest over rainforest (WNR), Eucalyptus obliqua forest over broadleaf shrubs (WOB) and Acacia melanoxylon forest on rises (NAR)

Tasmanian devil (*Sarcophilus harrisi*)

- High quality habitat is likely to occur in Nothofagus - Atherosperma rainforest (RMT), Nothofagus / Phyllocladus short rainforest (RMS), Eucalyptus nitida forest over Leptospermum (WNL), Eucalyptus nitida forest over rainforest (WNR), Eucalyptus obliqua forest over broadleaf shrubs (WOB) and Acacia melanoxylon forest on rises (NAR)
- An area of high quality denning habitat was recorded during field survey on the western track.

Grey goshawk (*Accipiter novaehollandiae*)

- High quality habitat occurs in mature *Acacia melanoxylon* in the vicinity of waterways. An active nest was recorded which has been buffered by 200m.
- There some mature forest containing this habitat type in the study area restricted to the older growth rainforest within the north western section of the study area.

Hydrobiid snails (*Beddomeia* sp.)

- All streams shown within the core habitat range of these two species are considered likely habitat apart from the Main rivulet which is polluted.
- The Forest Practices Authority provided core and potential habitat maps for these two species in which the streams within the core range have been mapped as high, the habitat within this range as medium.

Australian Grayling

- The mid reaches of Bowry and Big Duffy Creeks (not the Main Rivulet above the waterfall – due both to the pollution and the waterfall being a barrier to upstream movement.

Appendix 2 – Vascular Plant Species

Status codes:		
ORIGIN	NATIONAL SCHEDULE	STATE SCHEDULE
i - introduced	EPBC Act 1999	TSP Act 1995
d - declared weed WM Act	CR - critically endangered	e - endangered
en - endemic to Tasmania	EN - endangered	v - vulnerable
t - within Australia, occurs only in Tas.	VU - vulnerable	r - rare

Name	Common name	Status
DICOTYLEDONAE		
APIACEAE		
<i>Hydrocotyle hirta</i>	hairy pennywort	
<i>Hydrocotyle sibthorpioides</i>	shining pennywort	
APOCYNACEAE		
<i>Parsonsia brownii</i>	twining silkpod	
ASTERACEAE		
<i>Cassinia aculeata</i> subsp. <i>aculeata</i>	dollybush	
<i>Cotula alpina</i>	alpine buttons	
<i>Cotula</i> sp.	buttons	
<i>Euchiton collinus</i>	common cottonleaf	
<i>Hypochaeris radicata</i>	rough catsear	i
<i>Olearia argophylla</i>	musk daisybush	
<i>Olearia phlogopappa</i>	dusty daisy bush	
<i>Ozothamnus thyrsoides</i>	arching everlastingbush	
ATHEROSPERMATACEAE		
<i>Atherosperma moschatum</i> subsp. <i>moschatum</i>	sassafras	
CUNONIACEAE		
<i>Anodopetalum biglandulosum</i>	horizontal	en
<i>Bauera rubioides</i>	wiry bauera	
DILLENIACEAE		
<i>Hibbertia procumbens</i>	spreading guineaflower	
DROSERACEAE		
<i>Drosera binata</i>	forked sundew	
<i>Drosera peltata</i>	pale sundew	
<i>Drosera pygmaea</i>	dwarf sundew	
<i>Drosera spatulata</i>	rosy sundew	
ELAEOCARPACEAE		
<i>Aristotelia peduncularis</i>	heartberry	en
EPACRIDACEAE		
<i>Archeria eriocarpa</i>	hairy rainforest-heath	en
<i>Archeria hirtella</i>	smooth rainforest-heath	en
<i>Epacris corymbiflora</i>	buttongrass heath	en
<i>Leptecophylla juniperina</i>	pink or crimson berry	
<i>Monotoca glauca</i>	goldey wood	
<i>Richea sprengelioides</i>	rigid candleheath	en
<i>Sprengelia incarnata</i>	pink swampheath	
<i>Trochocarpa cunninghamii</i>	straggling purpleberry	en

<i>Trochocarpa gunnii</i>	fragrant purpleberry	en
ESCALLONIACEAE		
<i>Anopterus glandulosus</i>	tasmanian laurel	en
EUCRYPHIACEAE		
<i>Eucryphia lucida</i>	leatherwood	en
FABACEAE		
<i>Gompholobium huegelii</i>	common wedgepea	
<i>Oxylobium ellipticum</i>	golden shaggypea	
FAGACEAE		
<i>Nothofagus cunninghamii</i>	myrtle beech	
HALORAGACEAE		
<i>Gonocarpus micranthus subsp. micranthus</i>	creeping raspwort	
<i>Gonocarpus teucrioides</i>	forest raspwort	
LAMIACEAE		
<i>Prostanthera lasianthos var. lasianthos</i>	christmas mintbush	
LENTIBULARIACEAE		
<i>Utricularia dichotoma</i>	fairies aprons	
<i>Utricularia lateriflora</i>	tiny bladderwort	
MIMOSACEAE		
<i>Acacia dealbata subsp. dealbata</i>	silver wattle	
<i>Acacia leprosa var. graveolens</i>	varnish wattle	
<i>Acacia melanoxylon</i>	blackwood	
<i>Acacia mucronata</i>	variable sallow wattle	
<i>Acacia verticillata</i>	prickly mimosa	
MYRTACEAE		
<i>Eucalyptus nitida</i>	western peppermint	en
<i>Eucalyptus obliqua</i>	stringybark	
<i>Eucalyptus regnans</i>	giant ash	
<i>Leptospermum glaucescens</i>	smoky teatree	en
<i>Leptospermum lanigerum</i>	woolly teatree	
<i>Leptospermum nitidum</i>	shiny teatree	en
<i>Leptospermum scoparium</i>	common tea-tree	
<i>Melaleuca squamea</i>	swamp honeymyrtle	
<i>Melaleuca squarrosa</i>	scented paperbark	
OXALIDACEAE		
<i>Oxalis magellanica</i>	snowdrop woodsorrel	
PITTOSPORACEAE		
<i>Billardiera longiflora</i>	purple appleberry	en
<i>Pittosporum bicolor</i>	cheesewood	
POLYGALACEAE		
<i>Comesperma calymega</i>	bluespike milkwort	
<i>Comesperma retusum</i>	mountain milkwort	
PROTEACEAE		
<i>Agastachys odorata</i>	fragrant candlebush	en

<i>Banksia marginata</i>	silver banksia	
<i>Cenarrhenes nitida</i>	native plum	en
<i>Persoonia juniperina</i>	prickly geebung	
<i>Telopea truncata</i>	tasmanian waratah	en
RANUNCULACEAE		
<i>Clematis aristata</i>	mountain clematis	
RHAMNACEAE		
<i>Pomaderris apetala</i>	common dogwood	
ROSACEAE		
<i>Acaena novae-zelandiae</i>	common buzzy	
RUBIACEAE		
<i>Coprosma quadrifida</i>	native currant	
<i>Galium australe</i>	tangled bedstraw	
RUTACEAE		
<i>Boronia citriodora</i>	lemon boronia	
<i>Boronia nana var. nana</i>	splitleaf dwarf boronia	
<i>Nematolepis squamea</i>	satinwood	
<i>Philotheca virgata</i>	twiggy waxflower	
SANTALACEAE		
<i>Leptomeria glomerata</i>	creeping currantbush	en
STYLIDIACEAE		
<i>Stylidium graminifolium</i>	narrowleaf triggerplant	
THYMELAEACEAE		
<i>Pimelea cinerea</i>	grey riceflower	en
<i>Pimelea drupacea</i>	cherry riceflower	
<i>Pimelea linifolia subsp. linifolia</i>	slender riceflower	
<i>Pimelea linifolia subsp. linoides</i>	greater slender riceflower	
VIOLACEAE		
<i>Viola hederacea</i>	ivyleaf violet	
WINTERACEAE		
<i>Tasmania lanceolata</i>	mountain pepper	
GYMNOSPERMAE		
PHYLLOCLADACEAE		
<i>Phyllocladus aspleniifolius</i>	celerytop pine	en
MONOCOTYLEDONAE		
CENTROLEPIDACEAE		
<i>Centrolepis monogyna</i>	swamp cushion-bristlewort	en
<i>Centrolepis sp.</i>	bristlewort	
<i>Centrolepis strigosa</i>	hairy centrolepis, bristlewort	
CYPERACEAE		
<i>Gahnia grandis</i>	cutting grass	
<i>Gymnoschoenus sphaerocephalus</i>	buttongrass	
<i>Isolepis habra</i>	wispy clubsedge	r

<i>Isolepis</i> sp.	club rush	
<i>Lepidosperma filiforme</i>	common rapiersedge	
<i>Schoenus apogon</i>	common bogsedge	
<i>Schoenus lepidosperma</i> subsp. <i>lepidosperma</i>	slender bogsedge	
<i>Tetralaria capillaris</i>	hair sedge	
<i>Uncinia tenella</i>	delicate hooksedge	
IRIDACEAE		
<i>Libertia pulchella</i>	pretty grass-flag	
<i>Patersonia fragilis</i>	short purpleflag	
<i>Patersonia occidentalis</i>	long purpleflag	
JUNCACEAE		
<i>Juncus astreptus</i>	rigid rush	en
<i>Juncus bassianus</i>	forest rush	
<i>Juncus bufonius</i>	toad rush	
<i>Juncus pallidus</i>	pale rush	
<i>Juncus pauciflorus</i>	looseflower rush	
<i>Juncus planifolius</i>	broadleaf rush	
<i>Juncus sandwithii</i>	alpine jointleaf rush	
<i>Juncus</i> sp.	Rush	
LILIACEAE		
<i>Dianella tasmanica</i>	forest flaxlily	
ORCHIDACEAE		
<i>Acianthus</i> sp.	mosquito orchid	
<i>Calochilus paludosus</i>	strap beard-orchid	
<i>Chiloglottis</i> sp.	bird orchid	
<i>Corybas</i> sp.	helmet orchid	
<i>Thelymitra</i> sp.	sun-orchid	
POACEAE		
<i>Agrostis parviflora</i>	smallflower bent	
<i>Agrostis</i> sp.	blown grass	
<i>Agrostis thompsoniae</i>	hair bent	
<i>Austrodanthonia</i> sp.	wallabygrass	
<i>Deyeuxia monticola</i>	mountain bentgrass	
<i>Deyeuxia</i> sp.	bent grass	
<i>Ehrharta tasmanica</i>	tasmanian ricegrass	en
<i>Lachnagrostis filiformis</i>	common blowgrass	
RESTIONACEAE		
<i>Baloskion tetraphyllum</i> subsp. <i>tetraphyllum</i>	tassel cordrush	
<i>Calorophus elongatus</i>	long roperush	
<i>Chordifex hookeri</i>	woolly buttonrush	en
<i>Empodisma minus</i>	spreading roperush	
<i>Eurychorda complanata</i>	flat cordrush	
XYRIDACEAE		
<i>Xyris gracilis</i>	yelloweye	
<i>Xyris marginata</i>	alpine yelloweye	en
<i>Xyris operculata</i>	tall yelloweye	
PTERIDOPHYTA		
ASPIDACEAE		
<i>Lastreopsis hispida</i>	bristly shieldfern	

<i>Polystichum proliferum</i>	mother shieldfern
<i>Rumohra adiantiformis</i>	leathery shieldfern

ASPLENIACEAE

<i>Asplenium appendiculatum</i> subsp. <i>appendiculatum</i>	narrow spleenwort
<i>Asplenium bulbiferum</i> subsp. <i>gracillimum</i>	mother spleenwort

BLECHNACEAE

<i>Blechnum chambersii</i>	lance waterfern
<i>Blechnum fluviatile</i>	ray waterfern
<i>Blechnum minus</i>	soft waterfern
<i>Blechnum nudum</i>	fishbone waterfern
<i>Blechnum watsii</i>	hard waterfern

DENNSTAEDTIACEAE

<i>Histiopteris incisa</i>	batswing fern
<i>Hypolepis rugosula</i>	ruddy groundfern
<i>Pteridium esculentum</i>	bracken

DICKSONIACEAE

<i>Dicksonia antarctica</i>	soft treefern
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GLEICHENIACEAE

<i>Gleichenia dicarpa</i>	pouched coralfern
<i>Gleichenia microphylla</i>	scrambling coralfern
<i>Sticherus tener</i>	silky fanfern
<i>Sticherus urceolatus</i>	umbrella fanfern

GRAMMITIDACEAE

<i>Ctenopteris heterophylla</i>	gypsy fern
<i>Grammitis billardierei</i>	common fingerfern

HYMENOPHYLLACEAE

<i>Crepidomanes venosum</i>	bristle filmyfern
<i>Hymenophyllum australe</i>	southern filmyfern
<i>Hymenophyllum cupressiforme</i>	common filmyfern
<i>Hymenophyllum flabellatum</i>	shiny filmyfern
<i>Hymenophyllum peltatum</i>	alpine filmyfern
<i>Hymenophyllum rarum</i>	narrow filmyfern

LINDSAEACEAE

<i>Lindsaea linearis</i>	screw fern
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LYCOPODIACEAE

<i>Huperzia varia</i>	long clubmoss
<i>Lycopodiella lateralis</i>	slender clubmoss
<i>Lycopodium deuterodensum</i>	conifer clubmoss

OSMUNDACEAE

<i>Todea barbara</i>	southern kingfern
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POLYPODIACEAE

<i>Microsorium pustulatum</i> subsp. <i>pustulatum</i>	kangaroo fern
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SCHIZAEACEAE

<i>Schizaea asperula</i>	rough combfern
<i>Schizaea bifida</i>	forked combfern
<i>Schizaea fistulosa</i>	narrow combfern

SELAGINELLACEAE

Selaginella uliginosa swamp spikemoss

TMESIPTERIDACEAE

Tmesipteris obliqua common forkfern

Appendix 3 – Vegetation Communities

Sites: WNL Eucalyptus nitida forest over Leptospermum

Trees:	<i>Acacia melanoxylon</i> , <i>Atherosperma moschatum</i> subsp. <i>moschatum</i> , <i>Eucalyptus nitida</i> , <i>Eucryphia lucida</i> , <i>Nothofagus cunninghamii</i> , <i>Phyllocladus aspleniifolius</i>
Tall Shrubs:	<i>Acacia mucronata</i> , <i>Anodopetalum biglandulosum</i> , <i>Anopterus glandulosus</i> , <i>Banksia marginata</i> , <i>Leptospermum glaucescens</i> , <i>Leptospermum lanigerum</i> , <i>Leptospermum nitidum</i> , <i>Leptospermum scoparium</i> , <i>Melaleuca squarrosa</i> , <i>Monotoca glauca</i> , <i>Nematolepis squamea</i> , <i>Oxylobium ellipticum</i> , <i>Pittosporum bicolor</i> , <i>Pomaderris apetala</i> , <i>Telopea truncata</i>
Shrubs:	<i>Agastachys odorata</i> , <i>Aristotelia peduncularis</i> , <i>Bauera rubioides</i> , <i>Cassinia aculeata</i> subsp. <i>aculeata</i> , <i>Cenarrhenes nitida</i> , <i>Coprosma quadrifida</i> , <i>Epacris corymbiflora</i> , <i>Leptecophylla juniperina</i> , <i>Melaleuca squamea</i> , <i>Olearia phlogopappa</i> , <i>Philotheca virgata</i> , <i>Pimelea cinerea</i> , <i>Pimelea drupacea</i> , <i>Pimelea linifolia</i> subsp. <i>linifolia</i> , <i>Richea sprengelioides</i> , <i>Sprengelia incarnata</i> , <i>Tasmania lanceolata</i>
Low Shrubs:	<i>Leptomeria glomerata</i>
Herbs:	<i>Centrolepis</i> sp., <i>Centrolepis strigosa</i> , <i>Chiloglottis</i> sp., <i>Cotula alpina</i> , <i>Dianella tasmanica</i> , <i>Drosera peltata</i> , <i>Drosera pygmaea</i> , <i>Euchiton collinus</i> , <i>Gonocarpus micranthus</i> subsp. <i>micranthus</i> , <i>Gonocarpus teucroides</i> , <i>Hydrocotyle hirta</i> , <i>Hydrocotyle sibthorpioides</i> , <i>Thelymitra</i> sp., <i>Utricularia dichotoma</i> , <i>Viola hederacea</i>
Graminoids:	<i>Baloskion tetraphyllum</i> subsp. <i>tetraphyllum</i> , <i>Calorophus elongatus</i> , <i>Eurychorda complanata</i> , <i>Gahnia grandis</i> , <i>Gymnoschoenus sphaerocephalus</i> , <i>Juncus bassianus</i> , <i>Juncus bufonius</i> , <i>Juncus pauciflorus</i> , <i>Juncus planifolius</i> , <i>Patersonia fragilis</i> , <i>Uncinia tenella</i> , <i>Xyris operculata</i>
Grasses:	<i>Agrostis</i> sp., <i>Deyeuxia</i> sp., <i>Lachnagrostis filiformis</i>
Ferns:	<i>Blechnum watsii</i> , <i>Gleichenia dicarpa</i> , <i>Gleichenia microphylla</i> , <i>Histiopteris incisa</i> , <i>Huperzia varia</i> , <i>Hymenophyllum rarum</i> , <i>Lycopodium deuterodensum</i> , <i>Microsorium pustulatum</i> subsp. <i>pustulatum</i> , <i>Pteridium esculentum</i> , <i>Rumohra adiantiformis</i> , <i>Schizaea asperula</i> , <i>Sticherus tener</i> , <i>Tmesipteris obliqua</i>
Climbers:	<i>Billardiera longiflora</i> , <i>Clematis aristata</i>

Sites: MBS Buttongrass moorland with emergent shrubs

Trees:	<i>Eucalyptus nitida</i>
Tall Shrubs:	<i>Leptospermum nitidum</i> , <i>Melaleuca squarrosa</i>
Shrubs:	<i>Agastachys odorata</i> , <i>Bauera rubioides</i> , <i>Boronia citriodora</i> , <i>Boronia nana</i> var. <i>nana</i> , <i>Melaleuca squamea</i> , <i>Olearia phlogopappa</i> , <i>Persoonia juniperina</i> , <i>Philotheca virgata</i> , <i>Sprengelia incarnata</i>
Low Shrubs:	<i>Hibbertia procumbens</i>
Herbs:	<i>Comesperma calymega</i> , <i>Comesperma retusum</i> , <i>Drosera binata</i> , <i>Drosera pygmaea</i> , <i>Gompholobium huegelii</i> , <i>Stylidium graminifolium</i> , <i>Thelymitra</i> sp., <i>Utricularia dichotoma</i> , <i>Utricularia lateriflora</i>
Graminoids:	<i>Baloskion tetraphyllum</i> subsp. <i>tetraphyllum</i> , <i>Chordifex hookeri</i> , <i>Empodisma minus</i> , <i>Eurychorda complanata</i> , <i>Gahnia grandis</i> , <i>Gymnoschoenus sphaerocephalus</i> , <i>Juncus sandwithii</i> , <i>Lepidosperma filiforme</i> , <i>Patersonia fragilis</i> , <i>Patersonia occidentalis</i> , <i>Schoenus lepidosperma</i> subsp. <i>lepidosperma</i> , <i>Tetralix capillaris</i> , <i>Xyris gracilis</i> , <i>Xyris marginata</i>
Grasses:	<i>Agrostis</i> sp., <i>Austrodanthonia</i> sp.
Ferns:	<i>Gleichenia dicarpa</i> , <i>Lindsaea linearis</i> , <i>Lycopodiella lateralis</i> , <i>Pteridium esculentum</i> , <i>Schizaea bifida</i> , <i>Schizaea fistulosa</i> , <i>Selaginella uliginosa</i>
Weeds:	<i>Hypochaeris radicata</i>

Sites: NAR, NAR additional species in riparian areas,

Trees:	<i>Acacia melanoxylon</i> , <i>Atherosperma moschatum</i> subsp. <i>moschatum</i> , <i>Eucryphia lucida</i> , <i>Nothofagus cunninghamii</i>
Tall Shrubs:	<i>Acacia leprosa</i> var. <i>graveolens</i> , <i>Anodopetalum biglandulosum</i> , <i>Anopterus glandulosus</i> , <i>Leptospermum nitidum</i> , <i>Olearia argophylla</i> , <i>Pomaderris apetala</i> , <i>Prostanthera lasianthos</i> var. <i>lasianthos</i>
Shrubs:	<i>Archeria hirtella</i> , <i>Aristotelia peduncularis</i> , <i>Coprosma quadrifida</i>
Herbs:	<i>Acianthus</i> sp., <i>Oxalis magellanica</i> , <i>Prostanthera lasianthos</i> var. <i>lasianthos</i>
Graminoids:	<i>Baloskion tetraphyllum</i> subsp. <i>tetraphyllum</i> , <i>Gahnia grandis</i> , <i>Juncus bassianus</i> , <i>Juncus pallidus</i>
Ferns:	<i>Blechnum fluviatile</i> , <i>Blechnum nudum</i> , <i>Blechnum wattsii</i> , <i>Dicksonia antarctica</i> , <i>Grammitis billardierei</i> , <i>Hymenophyllum rarum</i> , <i>Lastreopsis hispida</i> , <i>Polystichum proliferum</i> , <i>Sticherus tener</i>
Climbers:	<i>Clematis aristata</i> , <i>Parsonsia brownii</i>

Sites: NNP

Trees:	<i>Acacia melanoxylon</i> , <i>Atherosperma moschatum</i> subsp. <i>moschatum</i> , <i>Eucalyptus obliqua</i> , <i>Nothofagus cunninghamii</i>
Tall Shrubs:	<i>Anodopetalum biglandulosum</i> , <i>Nematolepis squamea</i> , <i>Pomaderris apetala</i>
Shrubs:	<i>Coprosma quadrifida</i> , <i>Pimelea cinerea</i>
Graminoids:	<i>Gahnia grandis</i>
Ferns:	<i>Ctenopteris heterophylla</i> , <i>Dicksonia antarctica</i> , <i>Grammitis billardierei</i> , <i>Hymenophyllum flabellatum</i> , <i>Hymenophyllum rarum</i> , <i>Microsorium pustulatum</i> subsp. <i>pustulatum</i> , <i>Polystichum proliferum</i> , <i>Rumohra adiantiformis</i> , <i>Tmesipteris obliqua</i>
Climbers:	<i>Clematis aristata</i>

Sites: RMS thamnic, - additional species

Trees:	<i>Atherosperma moschatum</i> subsp. <i>moschatum</i> , <i>Eucryphia lucida</i> , <i>Nothofagus cunninghamii</i> , <i>Phyllocladus aspleniifolius</i>
Tall Shrubs:	<i>Anodopetalum biglandulosum</i> , <i>Anopterus glandulosus</i> , <i>Leptospermum nitidum</i> , <i>Monotoca glauca</i> , <i>Nematolepis squamea</i>
Shrubs:	<i>Aristotelia peduncularis</i> , <i>Cassinia aculeata</i> subsp. <i>aculeata</i> , <i>Cenarrhenes nitida</i> , <i>Coprosma quadrifida</i> , <i>Leptecophylla juniperina</i> , <i>Pimelea cinerea</i> , <i>Pimelea drupacea</i> , <i>Pimelea linifolia</i> subsp. <i>linoides</i> , <i>Tasmannia lanceolata</i> , <i>Trochocarpa gunnii</i>
Herbs:	<i>Drosera pygmaea</i> , <i>Hydrocotyle hirta</i>
Graminoids:	<i>Gahnia grandis</i>
Grasses:	<i>Agrostis parviflora</i>
Ferns:	<i>Blechnum wattsii</i> , <i>Dicksonia antarctica</i> , <i>Gleichenia microphylla</i> , <i>Grammitis billardierei</i> , <i>Histiopteris incisa</i> , <i>Hymenophyllum flabellatum</i> , <i>Hymenophyllum rarum</i> , <i>Lycopodium deuterodensum</i> , <i>Polystichum proliferum</i> , <i>Pteridium esculentum</i> , <i>Rumohra adiantiformis</i> , <i>Sticherus tener</i> , <i>Tmesipteris obliqua</i>
Climbers:	<i>Clematis aristata</i>

Sites: RMT Nothofagus-Atherosperma rainforest, RMT thamnic, RMT thamnic riparian additional species,

Trees:	<i>Acacia melanoxylon</i> , <i>Atherosperma moschatum</i> subsp. <i>moschatum</i> , <i>Eucalyptus regnans</i> , <i>Eucriphia lucida</i> , <i>Nothofagus cunninghamii</i> , <i>Phyllocladus aspleniifolius</i>
Tall Shrubs:	<i>Acacia dealbata</i> subsp. <i>dealbata</i> , <i>Acacia verticillata</i> , <i>Anodopetalum biglandulosum</i> , <i>Anopterus glandulosus</i> , <i>Leptospermum scoparium</i> , <i>Monotoca glauca</i> , <i>Nematolepis squamea</i> , <i>Ozothamnus thyrsoides</i> , <i>Pittosporum bicolor</i> , <i>Pomaderris apetala</i> , <i>Prostanthera lasianthos</i> var. <i>lasianthos</i>
Shrubs:	<i>Archeria eriocarpa</i> , <i>Archeria hirtella</i> , <i>Aristotelia peduncularis</i> , <i>Cassinia aculeata</i> subsp. <i>aculeata</i> , <i>Cenarrhenes nitida</i> , <i>Coprosma quadrifida</i> , <i>Leptecophylla juniperina</i> , <i>Pimelea cinerea</i> , <i>Pimelea drupacea</i> , <i>Tasmannia lanceolata</i> , <i>Trochocarpa cunninghamii</i>
Herbs:	<i>Acaena novae-zelandiae</i> , <i>Centrolepis monogyna</i> , <i>Chiloglottis</i> sp., <i>Corybas</i> sp., <i>Galium australe</i> , <i>Gonocarpus micranthus</i> subsp. <i>micranthus</i> , <i>Hydrocotyle hirta</i> , <i>Hydrocotyle sibthorpioides</i> , <i>Isolepis</i> sp., <i>Libertia pulchella</i> , <i>Oxalis magellanica</i> , <i>Viola hederacea</i>
Graminoids:	<i>Baloskion tetraphyllum</i> subsp. <i>tetraphyllum</i> , <i>Gahnia grandis</i> , <i>Isolepis limbata</i> , <i>Juncusastreptus</i> , <i>Juncus bassianus</i> , <i>Juncus pallidus</i> , <i>Juncus planifolius</i> , <i>Juncus</i> sp., <i>Schoenus apogon</i> , <i>Uncinia tenella</i>
Grasses:	<i>Agrostis</i> sp., <i>Agrostis thompsoniae</i> , <i>Ehrharta tasmanica</i>
Ferns:	<i>Asplenium appendiculatum</i> subsp. <i>appendiculatum</i> , <i>Asplenium bulbiferum</i> subsp. <i>gracillimum</i> , <i>Blechnum chambersii</i> , <i>Blechnum fluviatile</i> , <i>Blechnum minus</i> , <i>Blechnum nudum</i> , <i>Blechnum watsii</i> , <i>Crepidomanes venosum</i> , <i>Dicksonia antarctica</i> , <i>Gleichenia microphylla</i> , <i>Grammitis billardierei</i> , <i>Histiopteris incisa</i> , <i>Huperzia varia</i> , <i>Hymenophyllum australe</i> , <i>Hymenophyllum cupressiforme</i> , <i>Hymenophyllum flabellatum</i> , <i>Hymenophyllum rarum</i> , <i>Hypolepis rugosula</i> , <i>Lastreopsis hispida</i> , <i>Lycopodium deuterodensum</i> , <i>Microsorium pustulatum</i> subsp. <i>pustulatum</i> , <i>Polystichum proliferum</i> , <i>Pteridium esculentum</i> , <i>Rumohra adiantiformis</i> , <i>Sticherus tener</i> , <i>Sticherus urceolatus</i> , <i>Tmesipteris obliqua</i> , <i>Todea barbara</i>
Climbers:	<i>Billardiera longiflora</i> , <i>Clematis aristata</i>

Sites: SWW Western Wet Scrub,

Trees:	<i>Eucalyptus nitida</i>
Tall Shrubs:	<i>Acacia mucronata</i> , <i>Banksia marginata</i> , <i>Leptospermum glaucescens</i> , <i>Leptospermum nitidum</i> , <i>Melaleuca squarrosa</i> , <i>Telopea truncata</i>
Shrubs:	<i>Agastachys odorata</i> , <i>Bauera rubioides</i> , <i>Cenarrhenes nitida</i> , <i>Epacris corymbiflora</i> , <i>Melaleuca squamea</i> , <i>Persoonia juniperina</i> , <i>Philothea virgata</i> , <i>Sprengelia incarnata</i> , <i>Tasmannia lanceolata</i>
Low Shrubs:	<i>Leptomeria glomerata</i>
Herbs:	<i>Calochilus paludosus</i> , <i>Comesperma retusum</i> , <i>Drosera peltata</i> , <i>Drosera spatulata</i> , <i>Stylidium graminifolium</i> , <i>Thelymitra</i> sp.
Graminoids:	<i>Calorophus elongatus</i> , <i>Eurychorda complanata</i> , <i>Gahnia grandis</i> , <i>Gymnoschoenus sphaerocephalus</i> , <i>Patersonia occidentalis</i> , <i>Xyris gracilis</i> , <i>Xyris marginata</i>
Grasses:	<i>Deyeuxia monticola</i>
Ferns:	<i>Lindsaea linearis</i> , <i>Lycopodiella lateralis</i> , <i>Schizaea fistulosa</i>

Sites: WNR Eucalyptus nitida forest over rainforest,

Trees:	<i>Acacia melanoxyton</i> , <i>Atherosperma moschatum</i> subsp. <i>moschatum</i> , <i>Eucalyptus nitida</i> , <i>Eucryphia lucida</i> , <i>Nothofagus cunninghamii</i> , <i>Phyllocladus aspleniifolius</i>
Tall Shrubs:	<i>Acacia mucronata</i> , <i>Anodopetalum biglandulosum</i> , <i>Anopterus glandulosus</i> , <i>Leptospermum glaucescens</i> , <i>Leptospermum lanigerum</i> , <i>Leptospermum nitidum</i> , <i>Leptospermum scoparium</i> , <i>Melaleuca squarrosa</i> , <i>Monotoca glauca</i> , <i>Nematolepis squamea</i> , <i>Oxylobium ellipticum</i> , <i>Pittosporum bicolor</i> , <i>Pomaderris apetala</i>
Shrubs:	<i>Aristotelia peduncularis</i> , <i>Bauera rubioides</i> , <i>Cassinia aculeata</i> subsp. <i>aculeata</i> , <i>Cenarrhenes nitida</i> , <i>Coprosma quadrifida</i> , <i>Leptecophylla juniperina</i> , <i>Melaleuca squamea</i> , <i>Philotheca virgata</i> , <i>Pimelea cinerea</i> , <i>Pimelea drupacea</i> , <i>Pimelea linifolia</i> subsp. <i>linifolia</i> , <i>Trochocarpa gunnii</i>
Herbs:	<i>Cotula</i> sp., <i>Galium australe</i> , <i>Hydrocotyle hirta</i>
Graminoids:	<i>Baloskion tetraphyllum</i> subsp. <i>tetraphyllum</i> , <i>Gahnia grandis</i> , <i>Juncus</i> sp., <i>Uncinia tenella</i> , <i>Xyris operculata</i>
Ferns:	<i>Blechnum watsii</i> , <i>Dicksonia antarctica</i> , <i>Gleichenia microphylla</i> , <i>Grammitis billardierei</i> , <i>Histiopteris incisa</i> , <i>Hymenophyllum peltatum</i> , <i>Hymenophyllum rarum</i> , <i>Hypolepis rugosula</i> , <i>Polystichum proliferum</i> , <i>Pteridium esculentum</i> , <i>Sticherus tener</i>
Climbers:	<i>Clematis aristata</i>

Sites: WOB Eucalyptus obliqua over broad leaf shrubs

Trees:	<i>Acacia melanoxyton</i> , <i>Eucalyptus obliqua</i> , <i>Eucryphia lucida</i> , <i>Nothofagus cunninghamii</i> , <i>Phyllocladus aspleniifolius</i>
Tall Shrubs:	<i>Acacia verticillata</i> , <i>Monotoca glauca</i> , <i>Nematolepis squamea</i> , <i>Pomaderris apetala</i>
Shrubs:	<i>Cenarrhenes nitida</i> , <i>Coprosma quadrifida</i> , <i>Leptecophylla juniperina</i> , <i>Pimelea cinerea</i> , <i>Pimelea drupacea</i>
Herbs:	<i>Dianella tasmanica</i> , <i>Euchiton collinus</i> , <i>Hydrocotyle hirta</i> , <i>Viola hederacea</i>
Graminoids:	<i>Gahnia grandis</i> , <i>Uncinia tenella</i>
Grasses:	<i>Agrostis</i> sp.
Ferns:	<i>Grammitis billardierei</i> , <i>Histiopteris incisa</i> , <i>Hymenophyllum cupressiforme</i> , <i>Hymenophyllum rarum</i> , <i>Polystichum proliferum</i> , <i>Pteridium esculentum</i>
Climbers:	<i>Clematis aristata</i>

Appendix 4 – Extent of coverage of samples

