

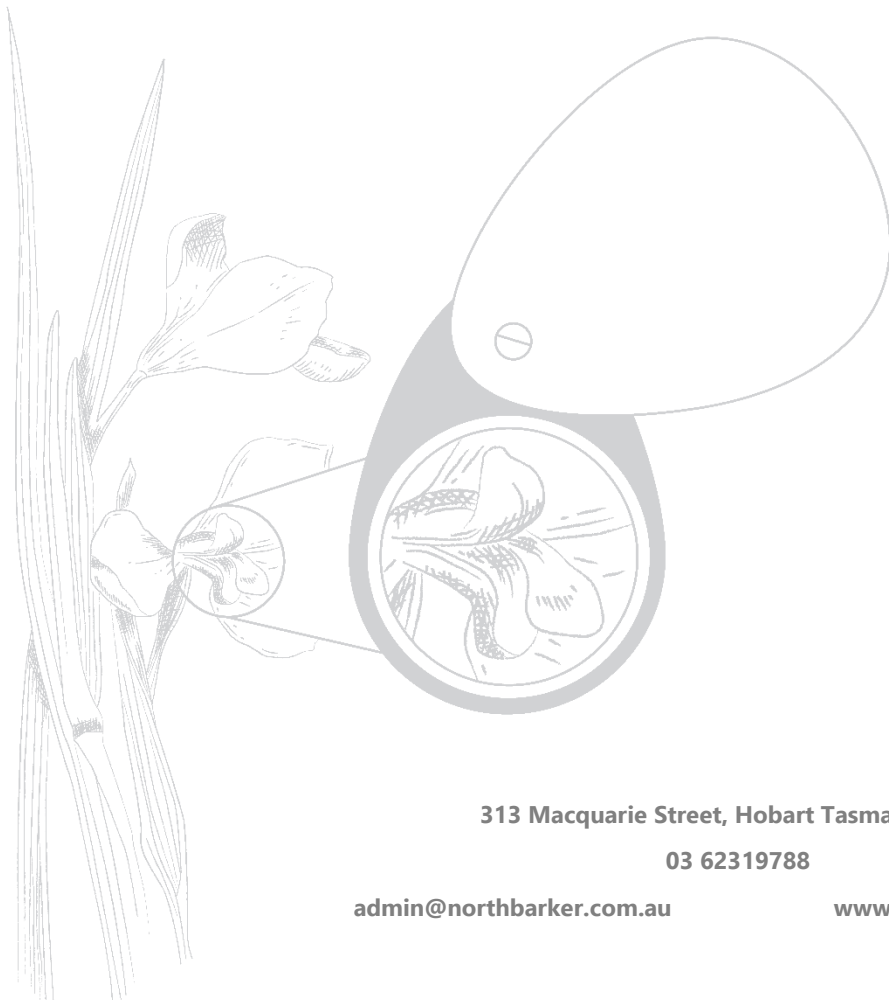


Samuel St/Sorell St Rezoning, Bridgewater
NATURAL VALUES CONSIDERATIONS

16th February 2024

For Brighton Council

BCC001



313 Macquarie Street, Hobart Tasmania, 7000

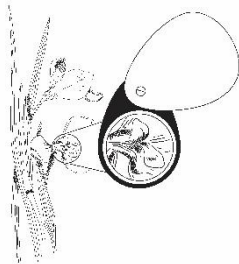
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1. PROJECT DETAILS

1.1. BACKGROUND

Brighton Council (the Council) is investigating potential options to rezone an area approximately 30 ha in size, around Samuel Street and Sorell Street in Bridgewater (Figure 1).

The project area, the area defined by the Council to be rezoned, is currently zoned entirely as Rural Living (Zone 11) under the Tasmanian Planning Scheme (Figure 2). The project area consists of a mixture of rural-living blocks and agricultural land. The agricultural land runs through the middle of the project area and is presently used for livestock (sheep) grazing. The project area is intersected by Ashburton Creek, for which the Council is also investigating options to rezone it separately to the rest of the project area.

The Council is considering two options with regards to the potential rezoning of the project area:

1. Rezone the entirety of the area to General Residential (Zone 8); or
2. Rezone the area as a mixture of General Residential (Zone 8) and Low Density Residential (Zone 10).

Council have indicated that Ashburton Creek will be rezoned as Open Space (Zone 29) due to the high level of catchment flows which can occur along the creek. Rezoning the creek as Open Space will prevent future unsuitable development, such as residential dwellings, within the creek corridor.

Brighton Council have engaged North Barker Ecosystem Services (NBES) as part of the planning process to provide information on any constraints associated with existing natural values in the area and the implications any changes to the zoning would have if the area around Samuel and Sorell streets, Bridgewater, were to be rezoned. As part of this process, NBES has completed a natural values assessment (NVA) of the project area (Figure 1) to inform the Council of existing values and potential implications of the rezoning.

1.2. METHODS

The assessment was informed by the *Guidelines for Natural Values Surveys*¹. Field surveys were undertaken by NBES on the 18th of December, 2023.

Native and non-native vegetation (including modified land) was mapped in accordance with units defined in TASVEG 4.0². The site was surveyed using a meandering area search technique³. All location data was recorded with a handheld GPS and/or GPS mobile app (± 5 m accuracy).

Additional survey effort was applied to habitats suitable for threatened species and/or vegetation communities (listed under the Tasmanian *Threatened Species Protection Act 1995* [TSPA], the Tasmanian *Nature Conservation Act 2002* [NCA], and/or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* [EPBCA]), and to 'declared' weeds listed under the Tasmanian *Biosecurity Act 2019* (BA) and associated *Biosecurity Regulations 2022*, and Weeds of National Significance (WoNS) under the *Australian Weed Strategy 2017–2027*.

Botanical nomenclature follows the current census of Tasmanian plants⁴.

The Natural Values Atlas (NVA) database was consulted for records of threatened species and vegetation types within a 5 km radius. The possibility of the project area supporting threatened natural values known from within this radius has been considered in the interpretation of results and discussion.

¹ DPIPWE (2015)

² Kitchener and Harris (2013)

³ Goff *et al.* (1982)

⁴ de Salas and Baker (2023)



1.3. LIMITATIONS

The field survey was undertaken in early summer. Values that are seasonal or require specific germination triggers may have been absent or undetectable. Fauna habitat, including the presence of hollows and nests, was assessed from ground level only.

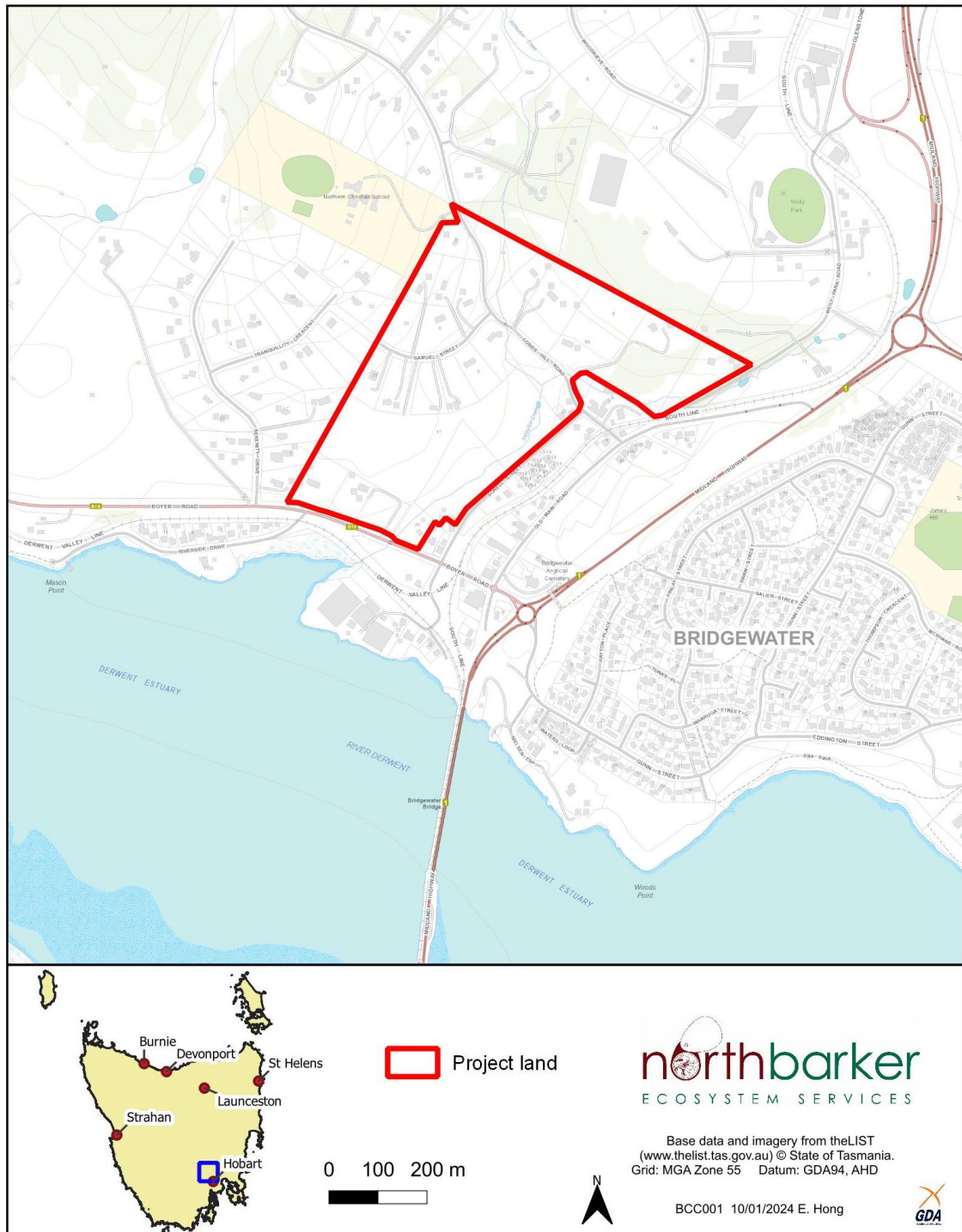


Figure 1: Locality of the project area

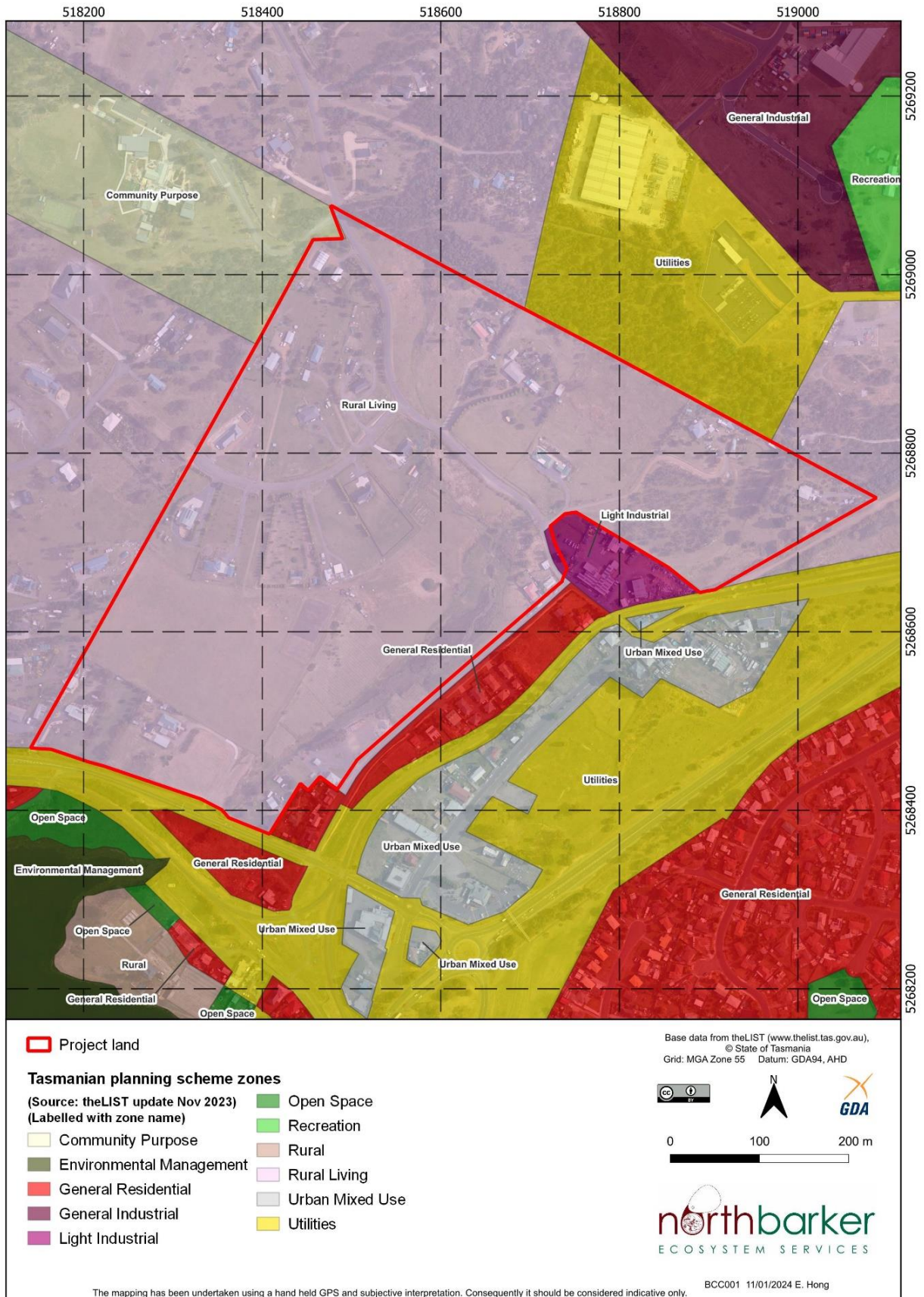


Figure 2: Current zoning of the project area

2. SITE VALUES

2.1. VEGETATION COMMUNITIES

The project area comprises mostly modified land, with some areas of remnant native vegetation in poor condition. One NCA listed threatened ecological community, 'wetlands', is present in the project area. No EPBCA listed communities are present in the project area. The distribution of vegetation is displayed in Figure 3.

2.1.1. Freshwater aquatic sedgeland and rushland (ASF)

This native vegetation community is present along Ashburton Creek in two separate locations, covering a total of 1.45 ha (5 % of the project area). The community is characterised by the dominance of sedges, such as *Schoenoplectus pungens*, and rushes, such as *Juncus kraussii* (Plate 1). Both species are abundant in the community. Cover of floating aquatic species, such as *Lemna disperma*, was low at the time of survey due to the low water level with the exception of a few standing pools.

The larger area of ASF mapped to the west of Sorell Street is freely accessible to livestock and, as such, is in poor condition (Plate 2). There is evidence of grazing and trampling of vegetation by livestock across the entire patch. Weeds, such as spear thistle (*Cirsium vulgare*), and the BA declared weed, slender thistle (*Carduus pycnocephalus*), are widespread and encroaching into this community from adjacent paddock areas.

The small area of ASF to the east of Cobbs Hill Road, whilst currently not being accessible to livestock, is in similarly poor condition, with weeds, such as wild teasel (*Dipsacus fullonum*), abundant (Plate 3).

Despite the poor condition, mapped areas of this community meet the criteria established under Schedule 3A of the NCA, to be classified as the threatened ecological community "Wetlands" (Appendix A). These patches satisfy the criteria as the "*vegetation is dominated by native sedges, rushes and occasionally tussock grasses in an area inundated by fresh (not brackish and never highly saline) water for some or most of the year*"⁵.

Beyond the mapped areas of ASF, the riparian corridor of Ashburton Creek has been modified to an extent that it is no longer definable as a native vegetation community⁶. The creek line has been modified into different forms, such as culverts and lawns (Plate 4).



Plate 1: ASF wetlands present along the Ashburton Creek, to the west of Sorell Street

⁵ Department of Natural Resources and Environment (2022)

⁶ Kitchener and Harris (2013)



Plate 2: The ASF wetland (dark green and brown in the middle of the paddock) is freely accessible to stock and shows signs of grazing, trampling and weed infestations throughout



Plate 3: Weeds, such as wild teasel (brown plants on the edge of the pool), are common around the edges of the ASF



Plate 4: Part of Ashburton Creek which has been entirely modified

2.1.2. *Bursaria–Acacia* woodland and scrub (NBA)

This native vegetation community is found at one location, covering 0.92 ha (3.2 % of the project area), in the north-east corner of the project area, north of the Council Depot on Cobbs Hill Road (Figure 3).

The community is dominated by *Bursaria spinosa* in the shrub and tree layer, with a mixture of native and exotic grasses and herbs in the understorey (Plate 5). Native grasses, such as *Themeda triandra*, *Rytidosperma caespitosum* and *Austrostipa stiposa*, and native herbs, such as *Oxalis perennans* and *Convolvulus angustissimus* subsp. *angustissimus* are widespread ground covers; however, introduced grasses, such as *Dactylis glomerata* and *Holcus lanatus*, and introduced herbs, such as *Linum trigynum* and *Centaureum erythraea*, are equally widespread and more dominant in some parts of the community.

The overall condition of this community is generally poor to moderate with several slashed tracks present through the patch (Plate 6) and the woody weed, sweet briar (*Rosa rubiginosa*) also widespread in the understorey.

This community can form part of an EPBCA listed critically endangered ecological community if certain criteria are satisfied⁷. However, the patch of NBA present in the project area does not satisfy these criteria⁸ as:

- it does not have sufficient diversity of wildflower species;
- more than 20 % of the plant species present are introduced; and
- it has more than 30 % solid crown cover of *Bursaria spinosa* (Plate 7).



Plate 5: Typical composition of the NBA

⁷ NBA can form part of the EPBCA-listed community “Lowland Grasslands of Tasmania” if condition criteria are met; Department of the Environment, Water, Heritage and the Arts (2010)

⁸ Department of the Environment, Water, Heritage and the Arts (2010)



Plate 6: One of the slashed tracks through the NBA



Plate 7: Cover of *Bursaria spinosa* is ~60 % in the NBA patch

2.1.3. Modified land (FUR, FAG & FWU)

The project area comprises mostly modified land, with approximately 26.48 ha (92 % of the project area) mapped as rural living blocks (FUR), agricultural land (FAG) and weed infestation (FWU) (Figure 3). These mapping units are described below.

Urban areas (FUR)

There are multiple lots within the project area that are currently occupied by private residences. These lots contain a mixture of built infrastructure, such as sheds and houses, and planted gardens/lawns (Plate 8).

The roadsides in these areas are dominated by introduced grasses, such as *Dactylis glomerata* and *Panicum capillare*, and introduced herbs, such as *Helminthotheca echioides* and *Malva sylvestris*. Many declared weeds are present in these areas as well, including blackberry, fennel, and gorse, which were often found to be mown on the roadside (Plate 9).



Plate 8: Private residences on Samuel Street



Plate 9: Mown gorse was found on the roadside of Samuel Street

Agricultural Land (FAG)

The central part of the project area between Samuel Street and Sorell Street is currently used as agricultural land and consists of cleared paddocks (Plate 10). Livestock (sheep) grazing was the main land use observed in the area mapped as FAG (Plate 11).

The area is heavily modified with vegetation intensively grazed, with only weeds with defensive spines, such as African boxthorn (BA declared), slender thistle (BA declared) and sweet briar, and those that are unpalatable, such as espartillo (*Amelichloa caudata*) (BA declared), forming larger plants (Plate 12).

The composition of the vegetation is dominated by introduced pasture grasses, such as *Avena* sp., *Hordeum* sp., *Dactylis glomerata* and *Cynosurus* spp., and agricultural weeds, such as capeweed (*Arctotheca calendula*), spear thistle (*Cirsium vulgare*) and sweet briar.

Although some native species are present, including *Convolvulus angustissimus* subsp. *angustissimus* and *Dodonaea viscosa*, they are present in low abundance and make a negligible contribution to the vegetation cover. Native species in the FAG area occur in greatest numbers around the edges of the ASF wetland, where the ASF transitions to FAG.



Plate 10: Typical composition of the FAG



Plate 11: Sheep are the main livestock grazing in the FAG areas



Plate 12: Plant species with defensive thorns or spines, such as sweet briar and African boxthorn (pictured), remain ungrazed

Weed Infestation (FWU)

Weed species are widespread and abundant across the project area. One small patch around Ashburton Creek, to the north of Boyer Road, is dominated by declared weeds to such an extent that it is categorised as a weed infestation (FWU;⁹ Plate 13). This infestation covers 0.06 ha and comprises the declared weeds African boxthorn, blackberry, fennel, white weed and prickly pear. Prickly pear (*Opuntia stricta*; Plate 14) (BA Declared) is not found anywhere else in the project area.



Plate 13: View of the FWU from Boyer Road



Plate 14: Prickly pear and white weed in the FWU

⁹ Kitchener and Harris (2013)

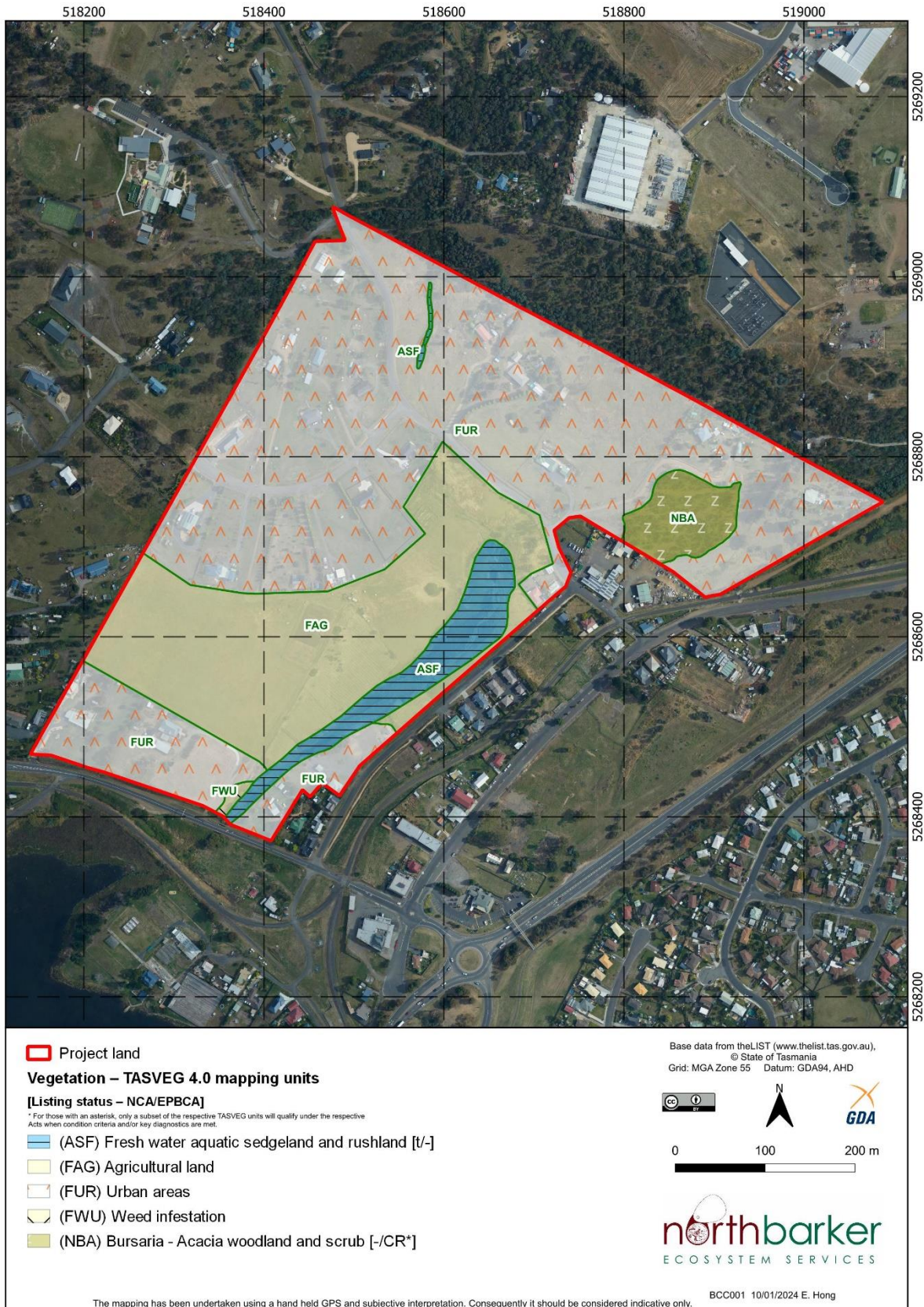


Figure 3: Vegetation mapped by NBES and classified using TASVEG 4.0 units within the project area

2.2. THREATENED FLORA

No flora species listed under either the TSPA or EPBCA were observed during the survey or have been recorded in the project area in the past, according to the Natural Values Atlas¹⁰.

Due to the modified nature of much of the project area and its small size, it is unlikely that any threatened flora species were overlooked at the time of survey.

2.2.1. Threatened flora recorded within 500 m of the project area

Vittadinia gracilis and *Austrostipa bigeniculata*, both species listed as rare under the TSPA, are threatened flora species with the closest reliable records¹¹ to the project area (refer to Figure 4). These two species have been recorded most frequently, compared to other threatened flora species, within 500 m of the project area (Table 1). Previous records occur grassy roadside reserves in the nearby area (Figure 4). Similar habitat to this, and other suitable habitat, was extensively searched within the project area but no plants of either species were recorded.

Eleven additional threatened species have been recorded within 500 m of the project area, none of which are listed under the EPBCA (Table 1). None of these species were observed and all are highly unlikely to occur in the project area as suitable habitat is not widely available.

Table 1: Verified threatened flora records from within 500 m of the project area. Sourced from the Natural Values Atlas (Department of Natural Resources and Environment, 2023)

Species	Common Name	SS	NS	Bio	Observation Count	Last Recorded
<i>Asperula scoparia</i> subsp. <i>scoparia</i>	prickly woodruff	r		n	1	30-Nov-2000
<i>Austrostipa bigeniculata</i>	doublejointed speargrass	r		n	10	27-May-2020
<i>Calocephalus citreus</i>	lemon beautyheads	r		n	1	05-Mar-1945
<i>Calocephalus lacteus</i>	milky beautyheads	r		n	1	05-Mar-1945
<i>Carex gunniana</i>	mountain sedge	r		n	1	01-Jan-1912
<i>Haloragis aspera</i>	rough raspwort	v		n	1	05-Mar-1945
<i>Haloragis heterophylla</i>	variable raspwort	r		n	1	05-Mar-1945
<i>Schoenoplectus tabernaemontani</i>	river clubsedge	r		n	1	08-Apr-2020
<i>Stuckenia pectinata</i>	fennel pondweed	r		n	1	01-Dec-1891
<i>Triptilodiscus pygmaeus</i>	dwarf sunray	v		n	1	25-Oct-1972
<i>Vittadinia burbridgeae</i>	smooth new-holland-daisy	r		e	1	14-Sep-1988
<i>Vittadinia gracilis</i>	woolly new-holland-daisy	r		n	9	04-Nov-2020
<i>Vittadinia muelleri</i>	narrowleaf new-holland-daisy	r		n	1	08-Apr-2020
<i>Vittadinia muelleri</i> (broad sense)	narrow leaf new holland daisy	p		n	1	01-Sep-1992

2.2.2. Threatened flora recorded within 5 km of the project area

Forty-nine threatened flora species listed under the TSPA (with nine also listed under the EPBCA) have previously been recorded within 5 km of the project area¹⁰ (Table 2). None of these species were observed and all are unlikely to occur in the project area.

¹⁰ Department of Natural Resources and Environment (2023) Report generated: nvr_3_18-Dec-2023.pdf

¹¹ *Haloragis heterophylla* is the closest threatened flora species to be recorded to the project area; however, the location of this record is not reliable as it has an accuracy of 2.5 km and was recorded in 1945.

Table 2: Verified threatened flora records from within 5 km of the project area. Sourced from the Natural Values Atlas (Department of Natural Resources and Environment, 2023)

Species	Common Name	SS	NS	Bio	Observation Count	Last Recorded
<i>Aphelia gracilis</i>	slender fanwort	r		n	1	01-Jan-1993
<i>Asperula scoparia</i> subsp. <i>scoparia</i>	prickly woodruff	r		n	5	27-Jul-2016
<i>Austrostipa bigeniculata</i>	doublejointed speargrass	r		n	132	11-Feb-2022
<i>Austrostipa blackii</i>	crested speargrass	r		n	2	07-Jan-2004
<i>Bolboschoenus caldwellii</i>	sea clubsedge	r		n	24	01-Jun-2017
<i>Brachyscome rigidula</i>	cutleaf daisy	v		n	3	31-Mar-1995
<i>Caladenia anthracina</i>	blacktip spider-orchid	e	CR	e	2	01-Sep-1920
<i>Caladenia caudata</i>	tailed spider-orchid	v	VU	e	16	29-Sep-2011
<i>Caladenia filamentosa</i>	daddy longlegs	r		n	1	22-Oct-1947
<i>Calocephalus citreus</i>	lemon beautyheads	r		n	42	10-Feb-2020
<i>Calocephalus lacteus</i>	milky beautyheads	r		n	6	01-Dec-1992
<i>Carex gunniana</i>	mountain sedge	r		n	1	01-Jan-1912
<i>Colobanthus curtisiae</i>	grassland cupflower	r	VU	n	1	01-Jan-1877
<i>Coronidium gunnianum</i>	swamp everlasting	?e		n	1	01-Jan-1900
<i>Dianella amoena</i>	grassland flaxlily	r	EN	n	307	24-Feb-2022
<i>Diuris palustris</i>	swamp doubletail	e		n	1	01-Oct-1977
<i>Eryngium ovinum</i>	blue devil	v		n	1	06-Dec-2004
<i>Eucalyptus risdonii</i>	risdon peppermint	r		e	63	10-Apr-2015
<i>Glycine latrobeana</i>	clover glycine	v	VU	n	3	21-Nov-2008
<i>Gratiola pubescens</i>	hairy brooklime	r		n	1	01-Feb-1892
<i>Haloragis aspera</i>	rough raspwort	v		n	1	05-Mar-1945
<i>Haloragis heterophylla</i>	variable raspwort	r		n	36	23-Nov-2021
<i>Hibbertia basaltica</i>	basalt guineaflower	e	EN	e	97	12-Jan-2022
<i>Isoetopsis graminifolia</i>	grass cushion	v		n	121	13-Jan-2022
<i>Lachnagrostis robusta</i>	tall blowgrass	r		n	1	23-Dec-1943
<i>Lepidium hyssopifolium</i>	soft peppergrass	e	EN	n	9	01-Jun-2006
<i>Lepilaena patentifolia</i>	spreading watermat	r		n	1	27-Feb-1976
<i>Lythrum salicaria</i>	purple loosestrife	v		n	1	01-Mar-1894
<i>Pellaea calidirupium</i>	hotrock fern	r		n	4	12-Jan-2022
<i>Pterostylis ziegeleri</i>	grassland greenhood	v	VU	e	20	04-Nov-2016
<i>Pultenaea prostrata</i>	silky bushpea	v		n	1	11-Nov-2004
<i>Ranunculus pumilio</i> var. <i>pumilio</i>	ferry buttercup	r		n	1	27-Sep-1993
<i>Ruppia megacarpa</i>	largefruit seatassel	r		n	12	10-Mar-2021
<i>Schoenoplectus tabernaemontani</i>	river clubsedge	r		n	2	08-Apr-2020
<i>Scleranthus fasciculatus</i>	spreading knawel	v		n	7	20-Jan-2023
<i>Senecio squarrosus</i>	leafy fireweed	r		n	21	26-Jun-2023
<i>Stackhousia subterranea</i>	grassland candles	e		n	7	02-Nov-2021
<i>Stuckenia pectinata</i>	fennel pondweed	r		n	1	01-Dec-1891
<i>Thesium australe</i>	southern toadflax	x	VU	n	1	01-Jan-1804
<i>Triptilodiscus pygmaeus</i>	dwarf sunray	v		n	59	09-Nov-2021
<i>Vallisneria australis</i>	river ribbons	r		n	2	01-Mar-1894
<i>Velleia paradoxa</i>	spur velleia	v		n	6	15-Oct-2004
<i>Vittadinia burbridgeae</i>	smooth new-holland-daisy	r		e	2	01-Oct-2008
<i>Vittadinia cuneata</i> var. <i>cuneata</i>	fuzzy new-holland-daisy	r		n	2	05-Jan-1991
<i>Vittadinia gracilis</i>	woolly new-holland-daisy	r		n	74	04-Nov-2020
<i>Vittadinia muelleri</i>	narrowleaf new-holland-daisy	r		n	305	01-Feb-2022
<i>Vittadinia muelleri</i> (broad sense)	narrow leaf new holland daisy	p		n	36	05-Jan-2005
<i>Xanthoparmelia amphixantha</i>		e		n	5	01-Oct-2008
<i>Xanthoparmelia vicariella</i>		r		e	3	02-Dec-2021

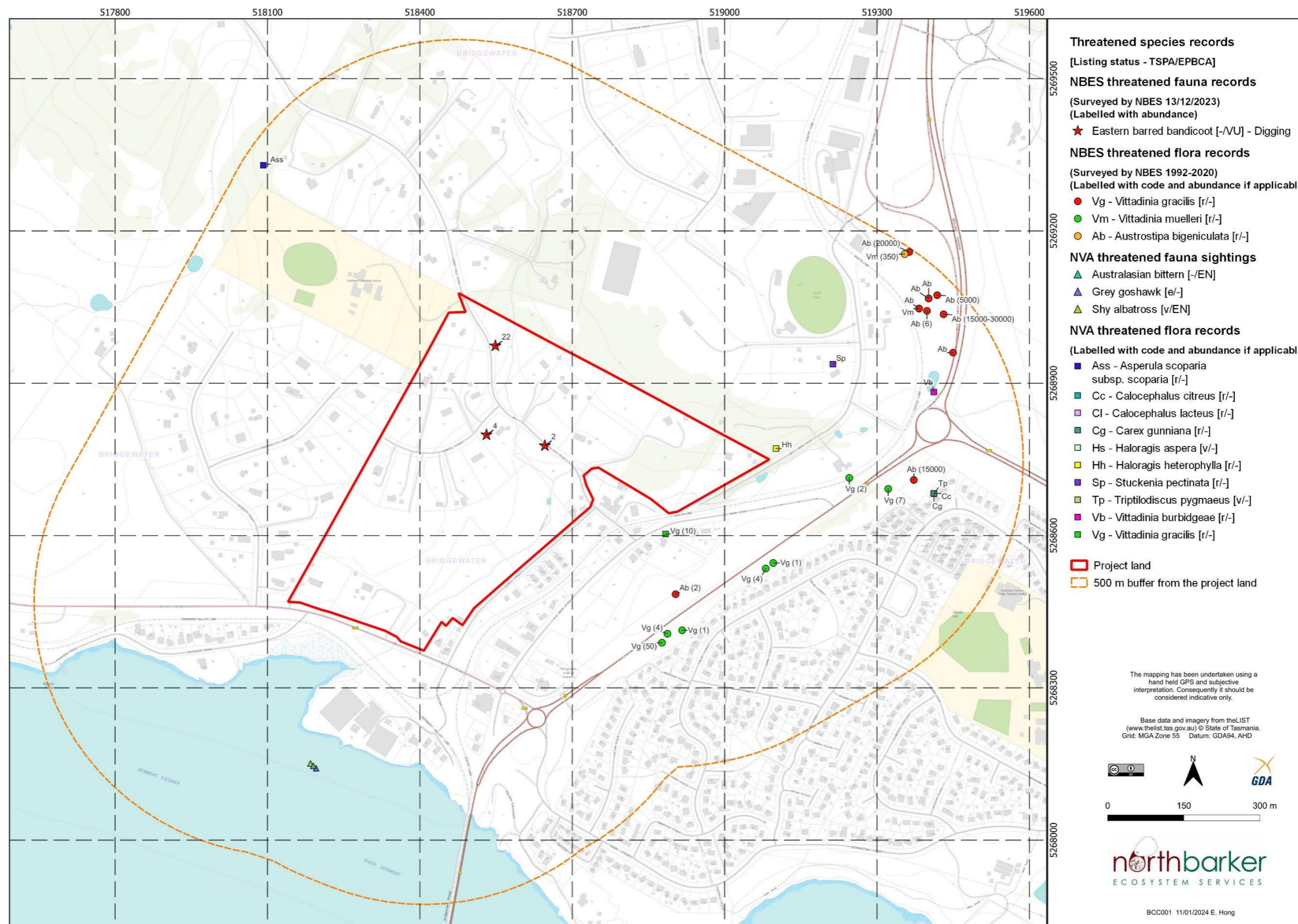


Figure 4: Threatened fauna signs observed in the project area, and previously recorded¹² threatened flora and fauna species within 500 m of the project area.

¹² Previously recorded by North Barker Ecosystem Services or the Natural Values Atlas of Tasmania

2.3. THREATENED FAUNA AND THREATENED FAUNA HABITAT

Potential signs of one threatened fauna species, eastern barred bandicoot (*Perameles gunnii*), were observed within the project area. No other signs characteristic of threatened fauna, such as scats, prints, dens or diggings were observed.

Foraging habitat exists for the eastern barred bandicoot with the project area, as well as marginal foraging habitat for other species discussed below.

2.3.1. Eastern barred bandicoot (*Perameles gunnii*)

Small conical diggings that are characteristic for bandicoot species¹³ were encountered occasionally across the project area (Plate 15) (Figure 4). The diggings were mostly associated with the grassy roadside edges, where cover, such as fence-line shrubs, is present. These diggings can be attributed to either the EPBCA listed vulnerable eastern barred bandicoot (*Perameles gunnii*) or the non-threatened southern brown bandicoot (*Isoodon obesulus*). Further investigations would be needed to reliably determine which species are present in the project area.

Given that the paddock areas have been grazed heavily (removing cover and nesting habitat; Plate 16), it is likely that these areas provide only foraging habitat for the species¹³. Within the mapped area of NBA, there is sufficient vegetation cover of native tussocks and sedges (Plate 5), to provide suitable nesting habitat for the species.



Plate 15: One of the small conical bandicoot diggings observed

¹³ Department of the Environment, Water, Heritage and the Arts (2008)



Plate 16: Heavily grazed paddocks with no vegetation cover for native fauna to shelter

2.3.2. Threatened fauna recorded within 500 m of the project area

According to the Natural Values Atlas¹⁴, three threatened fauna species have been recorded within 500 m of the project area, including:

- grey goshawk – *Accipiter novaehollandiae* (TSPA Endangered): recorded once in 1911
- Australasian bittern – *Botaurus poiciloptilus* (EPBCA Endangered): recorded once in 1981
- shy albatross – *Thalassarche cauta* (TSPA Vulnerable /EPBCA Endangered): recorded once in 1884

Aside from the historical nature of these records, they also have high spatial inaccuracy (5 km)¹⁴ and as such may have never occurred within 500 m of the project area (Figure 4). There is no suitable habitat present for the grey goshawk or the shy albatross within the project area, thus there is no chance of their occurrence. Wetland areas¹⁵ mapped as ASF provide marginal foraging habitat for the Australasian bittern however, given the poor condition of these areas this species is considered unlikely to occur within the project area.

2.3.3. Threatened fauna recorded within 5 km of the project area

Within 5 km of the project area, 19 listed threatened fauna species have previously been recorded (Table 3). Of these additional species, the blue-winged parrot (*Neophema chrysostoma*) (-/VU) and the green and gold frog (*Litoria raniformis*) (v/VU) are considered to have suitable habitat available in the project area (as well as eastern barred bandicoot, as discussed in Section 2.3.1).

For most of the other threatened species listed in Table 3, there is no suitable habitat present onsite and limited likelihood of them occurring. Some of the threatened species, specifically the eastern quoll (*Dasyurus viverrinus*), spotted-tail quoll (*Dasyurus maculatus*), Tasmanian devil (*Sarcophilus harrisii*), great crested grebe (*Podiceps cristatus*), wedge-tailed eagle (*Aquila audax fleayi*), white-bellied sea-eagle (*Haliaeetus leucogaster*) and the Tasmanian masked owl (*Tyto novaehollandiae castanops*) are likely to be transient foraging visitors only to the area as there is no suitable nesting or denning habitat present.

¹⁴ Department of Natural Resources and Environment (2023) Report generated: nvr_3_18-Dec-2023.pdf

¹⁵ Threatened Species Section (2024)

Blue-winged parrot (*Neophema chrysostoma*) (-/VU)

This species was listed as a vulnerable species under the EPBCA in March 2023¹⁶. Suitable foraging habitat for this species is present, as it is known to forage in paddocks to feed on seeds of native and introduced grasses, herbs, and shrubs¹⁶. No suitable nesting habitat for this species was observed in the project area.

Green and gold frog (*Litoria raniformis*) (v/VU)

This frog species is found in lowland areas, primarily near the coast¹⁷. The species require permanent or temporary waterbodies for survival and tend to inhabit those containing emergent plants such as *Triglochin procerum* or species of *Juncus* or sedge¹⁷. Areas of Ashburton Creek mapped as ASF provide marginal habitat for the species although it is considered highly unlikely to occur at this location given there is only one historical record of this species from within 5 km of the project area.

Table 3: Verified threatened fauna records from within 5 km of the project area. Sourced from the Natural Values Atlas (Department of Natural Resources and Environment, 2023)

Species	Common Name	SS	NS	Bio	Observation Count	Last Recorded
<i>Accipiter novaehollandiae</i>	grey goshawk	e		n	12	09-Mar-2019
<i>Alcedo azurea</i> subsp. <i>diemenensis</i>	azure kingfisher or azure kingfisher (tasmanian)	e	EN	e	1	01-Jan-1900
<i>Aquila audax</i>	wedge-tailed eagle	pe	PEN	n	17	20-Sep-2019
<i>Aquila audax</i> subsp. <i>fleayi</i>	tasmanian wedge-tailed eagle	e	EN	e	3	31-Mar-2023
<i>Botaurus poiciloptilus</i>	australasian bittern		EN	n	9	09-Jun-2017
<i>Dasyurus maculatus</i>	spotted-tailed quoll	r	VU	n	3	12-Feb-2023
<i>Dasyurus viverrinus</i>	eastern quoll		EN	n	8	09-Dec-2019
Eagle sp.	Eagle	e	EN	n	2	07-May-2020
<i>Haliaeetus leucogaster</i>	white-bellied sea-eagle	v		n	25	14-Jan-2021
<i>Hirundapus caudacutus</i>	white-throated needletail		VU	n	2	31-Dec-1980
<i>Lathamus discolor</i>	swift parrot	e	CR	mbe	17	04-Oct-2022
<i>Litoria raniformis</i>	green and gold frog	v	VU	n	1	14-Dec-1970
<i>Neophema chrysostoma</i>	blue-winged parrot		VU	n	7	09-Feb-2019
<i>Pardalotus quadragintus</i>	forty-spotted pardalote	e	EN	e	3	14-Oct-1920
<i>Perameles gunnii</i>	eastern barred bandicoot		VU	n	34	16-Nov-2022
<i>Perameles gunnii</i> subsp. <i>gunnii</i>	eastern barred bandicoot		VU		6	20-Aug-2021
<i>Podiceps cristatus</i>	great crested grebe	v		n	11	30-Nov-2020
<i>Poliiocephalus cristatus</i> subsp. <i>australis</i>	great crested grebe	pv			1	07-Dec-1981
<i>Prototroctes maraena</i>	australian grayling	v	VU	ae	4	28-Oct-1987
<i>Sarcophilus harrisii</i>	tasmanian devil	e	EN	e	24	27-Dec-2022
<i>Sterna striata</i>	white-fronted tern	v		n	1	04-Mar-2013
<i>Thalassarche cauta</i>	shy albatross	v	EN	ae	1	23-Nov-1884
<i>Tyto novaehollandiae</i>	masked owl	pe	PVU	n	9	13-Feb-2019

2.4. INTRODUCED FLORA

Introduced flora species were ubiquitous across the project area with declared, WoNS and environmental weeds being widespread and abundant. Of the 100 recorded species, 74 species (or 74 %) are introduced (Appendix B).

2.4.1. Declared Weeds

Nine species listed as 'declared' under the BA were recorded in the project area at the time of the survey. Five of these species are additionally listed as a Weed of National Significance (WoNS). Many of these declared weeds occur as moderate infestations across the project area (Figure 5). Declared weeds and WoNS observed, and their general extent within the project area, are summarised in Table 4.

¹⁶ Department of Climate Change, Energy, the Environment and Water (2023)

¹⁷ Habitat descriptions are informed by threatened species note sheets available at the Threatened Species Link (<https://www.threatenedspecieslink.tas.gov.au/Pages/default.aspx>)

Of the declared weeds, six are classified as Class B weeds in Brighton Council, whilst three are classified as Class A weeds. The Statutory Weed Management Plan for the prickly pear was not available at the time of this report, therefore the weed will be treated as a Class A species.

According to the provisions of the Tasmanian *Biosecurity Regulations 2022*, administered under the Tasmanian *Biosecurity Act 2019*, Class A localities are areas in which eradication is deemed feasible (generally due to the existence of a targeted management plan) and is the responsibility of the landowner or land manager, or in the case of disturbance the development proponent.

Class B municipalities are those which host moderate or large infestations of the declared weed that are not deemed eradicable because the feasibility of effective management is low at this time. Therefore, the objective is containment of infestations. This includes preventing spread of the declared weed from the municipality or into properties currently free of the weed, or for which a locally integrated weed management plan for that species has been developed or is being implemented. There is also a requirement to prevent spread of the weeds to properties containing sites for significant flora, fauna, and vegetation communities.

Table 4: Extent of declared and WoNS species found within the project area

Species	WoNS Status	BA Class	Extent
African boxthorn <i>Lycium ferocissimum</i>	YES	B	Abundant and forms thick patches in the agricultural paddocks and along fence lines.
blackberry <i>Rubus fruticosus</i> aggregate	YES	B	Abundant and forms thick patches along the roadside edges.
boneseed <i>Chrysanthemoides monilifera</i> subsp. <i>monilifera</i>	YES	A	A few plants and clusters of plants are present in the NBA behind the Council Depot.
espartillo <i>Amelichloa caudata</i>	-	A	Numerous plants occur in three different locations across the project area. Plants were found to be mature and bearing seed (Plate 17).
fennel <i>Foeniculum vulgare</i>	-	B	Widespread across the roadside edges and occasionally found in the paddocks.
gorse <i>Ulex europaeus</i>	YES	B	Occurs as isolated plants and clusters of plants in the roadside and along fence lines.
prickly pear <i>Opuntia stricta</i>	YES	A	One large plant is present along the edge of Ashburton Creek in the south of the project area in FWU.
white weed <i>Lepidium draba</i>	-	B	Occurs as patches of plants across the project area.
slender thistle <i>Carduus pycnocephalus</i>	-	B	Widespread across the project area and occurs in large patches, with 100s of plants within a patch. Most abundant in agricultural areas.



Plate 17: Espartillo, one of the declared weeds and WoNS recorded in the project area

2.4.2. Non-declared Weeds

Additionally, many species classified as 'environmental weeds'¹⁸ were observed across the project area (Appendix B). Environmental weeds with low abundance, such as cotoneaster, hawthorn and blue periwinkle (Plate 18), had their locations recorded (Figure 5). The individual locations of other weeds, such as sweet briar, spear thistle, capeweed and dock, which were widespread and abundant, were not recorded, though their presence in an area was noted (Plate 19).

Environmental weeds observed within the project area include:

- agapanthus (*Agapanthus praecox* subsp. *orientalis*)
- blue periwinkle (*Vinca major*)
- cotoneaster (*Cotoneaster glaucophyllus* var. *serotinus* and *Cotoneaster pannosus*)
- great mullein (*Verbascum thapsus* subsp. *thapsus*)
- hawthorn (*Crataegus monogyna*)
- radiata pine (*Pinus radiata*)
- sweet briar (*Rosa rubiginosa*)
- variegated thistle (*Silybum marianum*)

¹⁸ Department of Natural Resources and Environment (2024)



Plate 18: Blue periwinkle occurs as one large patch on the edge of the NBA community



Plate 19: Typical weedy composition of fence lines with declared weeds (fennel and blackberry pictured) and non-declared weeds (sweet briar and hawthorn pictured)

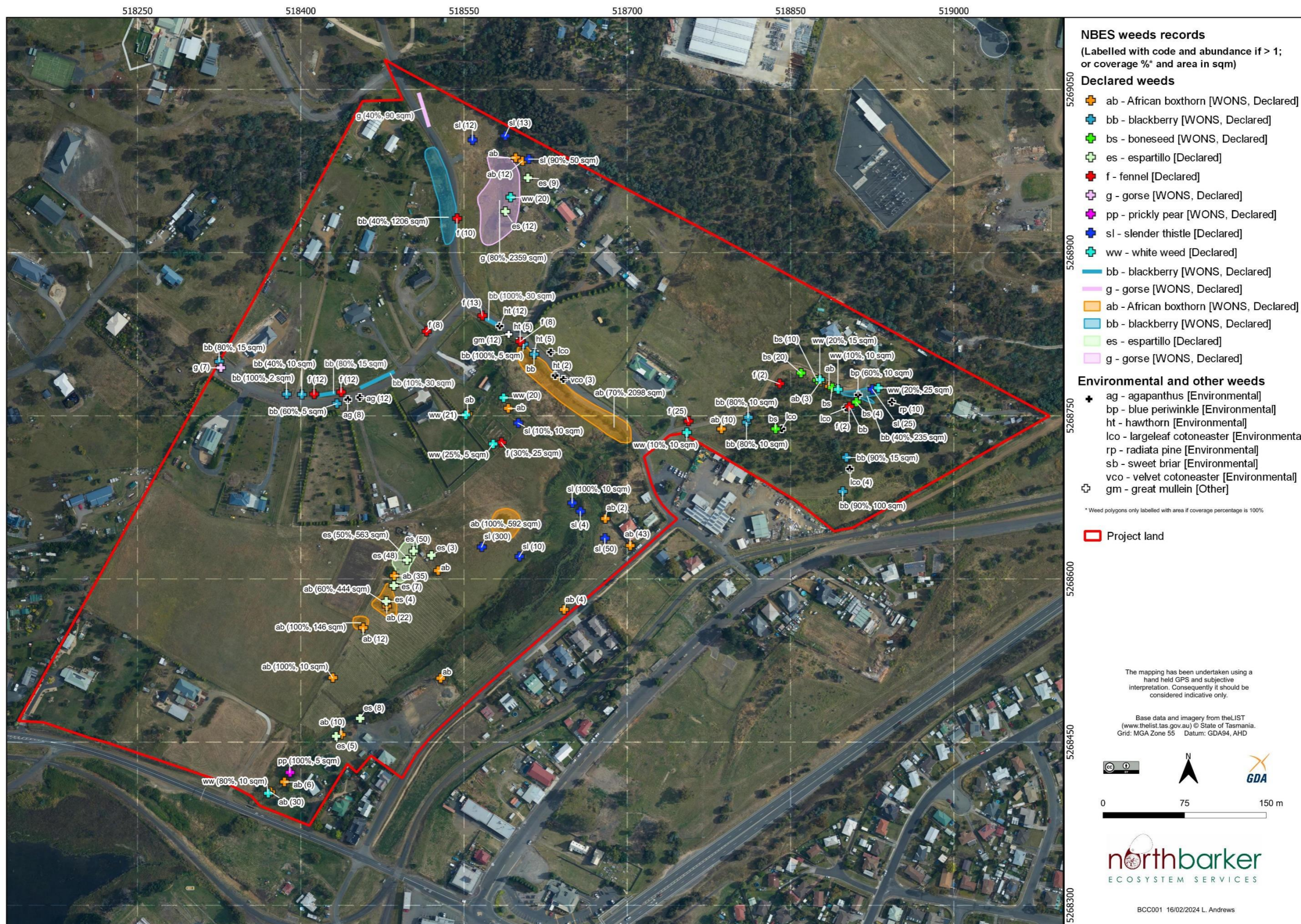


Figure 5: Declared and environmental weeds within the project area.

3. POTENTIAL IMPLICATIONS OF PROPOSED REZONING ON NATURAL VALUES

The impact of any particular development on natural values observed within the project area has not been assessed in this report. This report provides a comprehensive summary of natural values present. It also provides an indication of the potential constraints these natural values may present on any future development associated with the rezoning options proposed by Brighton Council.

The natural values constraints and the implications of rezoning on the natural values present are discussed in Table 5 and are summarised below.

Rezoning of Ashburton Creek to Open Space (Zone 11):

- This would assist with conserving the NCA listed threatened vegetation community, Wetlands (ASF) by preventing existing inappropriate uses (i.e. grazing) that are currently degrading the community and averting future development of the area.
- Potential marginal habitat for the threatened green and gold frog would be protected and conserved.
- High catchment flow events will be able to occur unimpeded by inappropriate uses of the creek.

It is recommended that Council consider alternative zoning options for the Ashburton Creek riparian corridor that would place stricter planning regulations on this area to better reflect the natural values of the creek .

- The Landscape Conservation Zone (Zone 22) and the Environmental Management Zone (Zone 23) are two appropriate alternative zoning options. The purposes of these zones are "protection, conservation and management of the values of the land"¹⁹. Thus, the threatened vegetation community and threatened fauna habitat that Ashburton Creek supports will be protected. Future restoration and revegetation of the riparian corridor would also serve to link foreshore areas with bushland to the north of the project area. This would also assist with managing erosion associated with high catchment flows in the future.

Future rezoning of Ashburton Creek should incorporate the areas of ASF mapped in Figure 3 and consider the extent of the waterway and coastal protection area overlay along the creek.

Rezoning of the project area (excluding Ashburton Creek²⁰) as General Residential (Zone 8) (Option 1) or a mixture of General Residential (Zone 8) and Low Density Residential (Zone 10) (Option 2):

- No federally listed threatened vegetation communities occur in the project area. One NCA listed threatened vegetation community, Wetlands, occurs in two locations along Ashburton Creek. Assuming these areas are encapsulated within the rezoning of the creek line (as discussed above), any future rezoning (and development) of the remaining project area would not have any direct impact on this threatened vegetation community. However, any future residential development of areas adjacent to the creek have the potential to indirectly impact upon areas of wetland through erosion and sedimentation as well as stormwater runoff etc. Any such impacts would need to be managed through the implementation of appropriate mitigation measures associated with any development proposal.
- One native vegetation community (NBA) may be impacted by the proposed rezoning. The 0.92 ha patch is in poor-moderate condition with a high proportion of weeds and previous clearing

¹⁹ Zone purpose 22.1.1 and 23.1.2 a; Tasmanian Planning Scheme (2023)

²⁰ Ashburton Creek to be separately zoned; as per communications with Jo Blackwell (2023)

for tracks. While this community is not listed under the EPBCA or the NCA it is considered to be under reserved in the state and the bioregion despite it being widespread²¹.

- There is no potential for any listed threatened flora species to be impacted by the proposed zoning changes as none are present or considered likely to occur.
- The EPBCA listed eastern barred bandicoot may have suitable foraging and nesting habitat reduced by the proposed zoning changes. However, as the species has not been definitively identified as being present in the project area, and alternative habitat is abundant in the surrounding area, any potential impacts to the species' habitat caused by changes to zoning are unlikely to warrant referral under the EPBCA.²² This species is known to occur in peri-urban environments and is likely to still utilise areas of the site despite any future rezoning for residential purposes.
- Additional threatened fauna species that were previously recorded in the broader area are unlikely to be impacted by any developments facilitated by the proposed zoning changes, to an extent that warrants referral under the EPBCA or a permit to take under the TSPA, as the habitat present provides only marginal foraging habitat to transient visitors. No nesting or denning habitat for any threatened fauna species was observed during the survey.
- Given the abundance of declared and environmental weeds in the project area, there is a high risk that any future development works facilitated by the proposed rezoning will spread weeds locally or further away from the project area. Therefore, a Weed Hygiene Management Plan must be created for each development proposal to ensure compliance with the legislation and to prevent the spreading of weeds.

²¹ 6% of NBA reserved in the South East IBRA and 9% of NBA reserved in state reserves. Forest types with less than 15% of its pre European extent reserved are considered to be under reserved.

²² This may change into the future, and any future developments should consider impacts to the eastern barred bandicoot.

Table 5: Summary of potential implications on natural values from the proposed rezoning

Natural value	Potential constraint	Context & potential implications of rezoning on natural values ²³
EPBCA threatened ecological communities		
None present	No constraints anticipated	<p>The community NBA can form part of an EPBCA critically endangered ecological community if certain criteria are satisfied²⁴. The patch of NBA present in the project area does not satisfy these criteria²⁵ because:</p> <ul style="list-style-type: none"> • it does not have sufficient diversity of wildflower species, • more than 20% of the plant species present are introduced, and • it has more than 30% solid crown cover of <i>Bursaria spinosa</i>
NCA threatened ecological communities		
Wetlands ASF – Freshwater aquatic sedgeland and rushland	<p>No constraints anticipated (assuming mapped areas of ASF are excluded from residential rezoning).</p> <p>1.45 ha present Ashburton Creek</p>	<p>There are two sections along Ashburton Creek that classify as the state-listed (NCA) threatened 'Wetlands' ecological community (Figure 3).</p> <p>Council have indicated that they are considering rezoning Ashburton Creek to Open Space (Zone 29) due to high catchment flows which can occur along the creek. One of the purposes of the Open Space Zone is "to provide land for open space purposes including for passive recreation and natural or landscape amenity"²⁶.</p> <p>If the Council rezones Ashburton Creek, it would prevent future incompatible uses (such as residential development) which could directly impact the wetlands. Therefore, rezoning to Open Space will improve planning protections of the threatened ecological community. Future residential development of adjacent land may have indirect impacts on this community. Further recommendations are outlined in Section 3.1.</p>

²³ Includes statements from Department of Natural Resources and Environment's Threatened Species Link summaries and note sheets.

²⁴ NBA can form part of the EPBCA-listed community "Lowland Grasslands of Tasmania" if specific criteria are met; Department of the Environment, Water, Heritage and the Arts (2010)

²⁵ Department of the Environment, Water, Heritage and the Arts (2010)

²⁶ Zone Purpose 29.1.1; Tasmanian Planning Scheme (2023)

Natural value	Potential constraint	Context & potential implications of rezoning on natural values ²³
Native vegetation communities (TASVEG 4.0 units)		
<p>NBA – <i>Bursaria–Acacia woodland and scrub</i></p>	<p>No constraints anticipated 0.92 ha present</p>	<p>There is one patch of NBA north of the Council Depot on Cobbs Hill Road. This community is not listed under state or federal government legislation.</p> <p><u>Rezoning Options</u></p> <p>1. Rezone the entirety of the area to General Residential (Zone 8)</p> <p>Under the General Residential Zone, uses and associated developments such as residential dwelling and subdivisions are permitted²⁷. If other planning provisions are satisfied, such as setbacks and building envelopes, then development within this native vegetation community is acceptable.</p> <p>Therefore, if rezoning occurs, there is potential that the entirety of the vegetation community will be cleared as there are no planning provisions preventing this action.</p> <p>2. Rezone the area as a mixture of General Residential (Zone 8) and Low Density Residential (Zone 10)</p> <p>If the area is zoned as a mixture of General Residential and Low Density Residential, the planning scheme allowances for the conversion of this native vegetation patch are similar to that of option 1.</p> <p>If the NBA patch is zoned as Low Density Residential, uses such as building development are permitted²⁸, though one of the purposes of the Low Density Residential zone includes consideration of “environmental constraints”²⁹. Therefore, any potential developments would need to consider the existing native vegetation community. However, potentially the entirety of the vegetation community could be cleared as there is no direct planning provisions preventing such action.</p>

²⁷ Use Table 8.2; Tasmanian Planning Scheme (2023)

²⁸ Use Table 10.2; Tasmanian Planning Scheme (2023)

²⁹ Zone Purpose 10.1.1; Tasmanian Planning Scheme (2023)

Natural value	Potential constraint	Context & potential implications of rezoning on natural values ²³
Modified vegetation communities (TASVEG 4.0 units)		
<p>FAG – Agricultural land FUR – Urban areas FWU – Weed infestations</p>	<p>No constraints anticipated 26.48 ha (in total) present</p>	<p>These modified land areas cover most of the project area (Figure 3) and have a very low number of natural values present. As such, any potential changes to zoning will not lead to direct impacts on observed natural values.</p> <p>Rezoning Options</p> <ol style="list-style-type: none"> 1. Rezone the entirety of the area to General Residential (Zone 8) Under the General Residential Zone, the amount of land that could be developed, such as through the construction of subdivisions and dwellings, will increase. The planning permissions under the General Residential Zone allow for higher density of living when compared to the Rural Living Zone (the current zoning of the area)³⁰. 2. Rezone the area as a mixture of General Residential (Zone 8) and Low Density Residential (Zone 10). Regardless of which area was zoned as General Residential or Low Density Residential, the new planning provisions would allow for an increase in the density of developments, such as residential dwellings, compared to what is currently allowed within the Rural Living Zone³⁰. Any areas that are zoned as Low Density Residential will have planning constraints applied to them that will decrease the density of development opportunities, when compared to those zoned as General Residential.
EPBCA and/or TSPA listed threatened flora		
<p>None present</p>	<p>No constraints anticipated 0 known plants</p>	<p>At the time of surveying, no threatened flora species were observed in the project area or are likely to have been overlooked. Therefore, there is no potential for impact to occur to threatened flora from a change in zoning,</p>

³⁰ Tasmanian Planning Scheme (2023)

Natural value	Potential constraint	Context & potential implications of rezoning on natural values ²³
		regardless of which proposed option is selected, as none are present or considered likely to occur.
Threatened fauna and threatened fauna habitat		
<p style="text-align: center;"><i>Perameles gunnii</i> Eastern barred bandicoot EPBCA: VULNERABLE TSPA: not listed</p>	<p style="text-align: center;">No constraints anticipated Minimal impact to foraging and nesting habitat</p>	<p>This species is widespread in Tasmania and resilient to disturbance³¹. Suitable habitat for this species, as well as potential signs of this species (conical diggings), were observed within the project area. Further investigations would be needed to reliably determine the presence of the species in the project area.</p> <p>There is potential for a larger amount of suitable habitat to be converted with the General Residential zoning compared to the Low Density Residential zoning, as the General Residential zone allows for a higher density of development³². However, it is considered unlikely that either of the proposed rezoning options would reduce the carrying capacity of the habitat at all given that this species is known to be successful in peri urban environments and the extent of suitable habitat in the broader area.</p> <p>There is some potential for indirect impacts associated with future occupation of the residential homes and the introduction of cats and dogs. Given the presence of rural residences these threats are likely already present in the project area. As stated above the species is also known to be successful in peri urban environments. Also, the retention of habitats along the creek line would provide protection and cover for this species.</p> <p>Regardless of which zoning option is selected, it is unlikely that any future development would warrant referral under the EPBCA based on potential impacts to this species.</p>

³¹ Department of the Environment, Water, Heritage and the Arts (2008)

³² Tasmanian Planning Scheme (2023)

Natural value	Potential constraint	Context & potential implications of rezoning on natural values ²³
<p><i>Neophema chrysostoma</i> Blue-winged parrot EPBCA: VULNERABLE TSPA: not listed</p>	<p>No constraints anticipated Minimal impact to foraging habitat</p>	<p>Suitable foraging habitat for this species is present, as it is known to forage in paddocks to feed on seeds of native and introduced grasses, herbs and shrubs³³.</p> <p>Any future developments that could potentially arise from changes to the zoning, do not have the potential to lead to a decline in the species population, as there is abundant alternative foraging habitat in the immediate surrounds for this highly mobile species.</p> <p>Regardless of which zoning option is selected, it is unlikely that any future development would warrant referral under the EPBCA based on potential impacts to this species.</p>
<p><i>Litoria raniformis</i> Green and gold frog EPBCA: VULNERABLE TSPA: vulnerable</p>	<p>No constraints anticipated</p>	<p>The ASF wetland, mapped along Ashburton Creek, provides marginal suitable habitat for this species although it is considered highly unlikely to occur at this location given the lack of records.</p> <p>Assuming mapped areas of ASF are rezoned as Open Space (Zone 29), all suitable habitat for this species would remain.</p> <p>Rezoning of areas mapped as ASF would reduce habitat for this species although this is considered unlikely to be significant given the very low likelihood of occurrence at the site.</p> <p>Rezoning of adjacent areas for residential purposes has the potential to indirectly impact wetland habitats through erosion and sedimentation as well as stormwater runoff etc. Any such impacts would need to be managed through the implementation of appropriate mitigation measures associated with any development proposal.</p> <p>Regardless of which zoning option is selected, it is unlikely that any future development would warrant referral under the EPBCA based on potential impacts to this species.</p>

³³ Department of Climate Change, Energy, the Environment and Water (2023)

Natural value	Potential constraint	Context & potential implications of rezoning on natural values ²³
Introduced flora		
<p>Declared, WoNS and Environmental weed species</p> <p><i>See section 2.4 and Appendix B for details of weed species present</i></p>	<p>Spread of weed species and contamination of nearby private land and other areas through the spreading of propagules.</p>	<p>Three Class A declared weeds and six Class B declared weeds³⁴ were observed in the project area.</p> <p>The proposed zoning changes will not change the legislative requirement to manage declared weed species.</p> <p>Any future developments associated with changes to the zoning are likely to increase the risk of spreading weeds locally (or further) through creating new disturbance niches in the project area or spreading propagules through contaminated soil, equipment and/or machinery.</p> <p>Any future planning permits should ensure best-practice guidelines for weed and hygiene management are undertaken to manage existing weed infestations and to prevent the establishment of any new infestations in the project area:</p> <ul style="list-style-type: none"> • <i>Keeping it clean - A Tasmanian field hygiene manual to prevent the spread of freshwater pests and pathogens</i> (Allen and Gartenstein, 2010) • <i>Weed and Disease Planning and Hygiene Guidelines - Preventing the spread of weeds and diseases in Tasmania</i> (DPIPWE, Stewart and Askey-Doran, 2015)

³⁴ In Brighton Council, according to the relevant Statutory Weed Management Strategies accessed via the Department of Natural Resources and Environment website.

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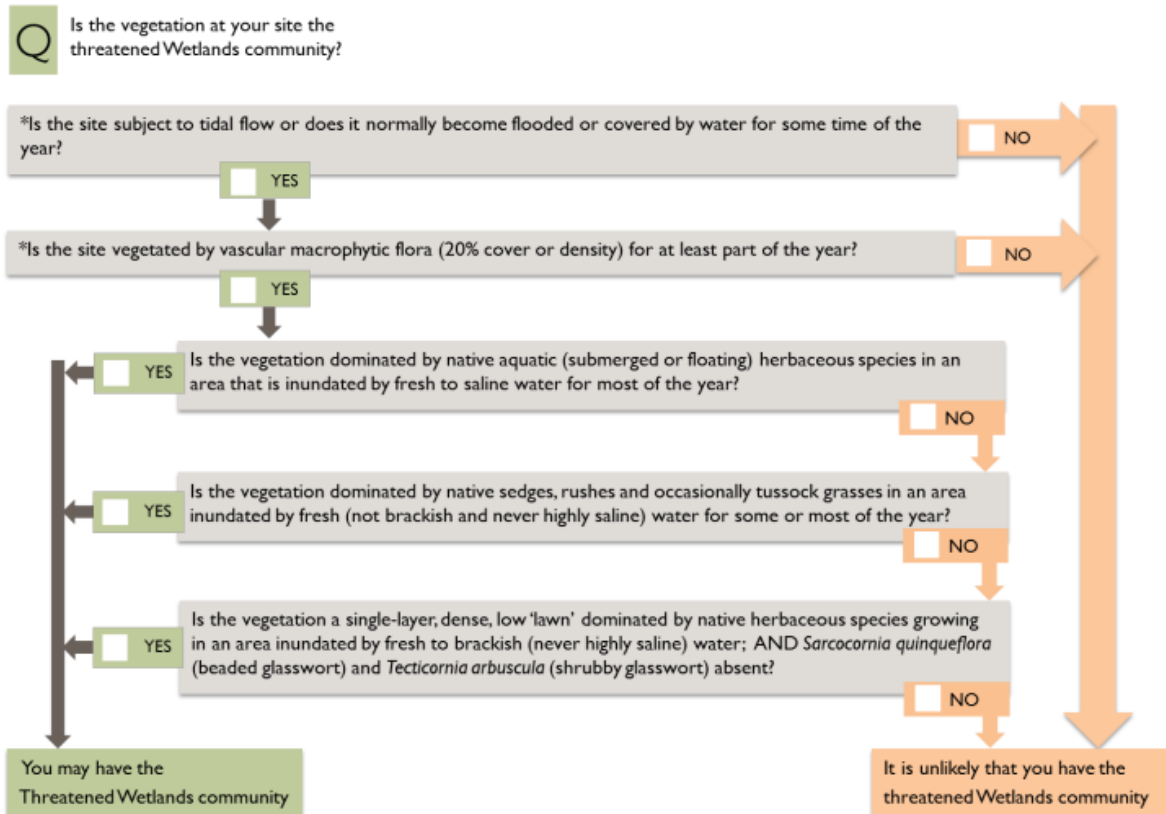
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APPENDIX A – DETERMINING THE PRESENCE OF THE THREATENED ECOLOGICAL COMMUNITY: WETLANDS³⁵

Is Wetlands present at your site?



*You may need to take account of climatic conditions (seasonal variations and drought) or time since disturbance (e.g., grazing).

Note

- ❖ Where typically sparse vegetation dominated by sedges or herbs is growing on alkaline (pH 5.0 to 8.5) dolomite or limestone-derived gravels or sands in shallow pans, it may be advisable to refer to the information provided for **1 Alkaline pans**.
- ❖ Where *Sphagnum* moss covers more than 30% of the ground, it may be advisable to refer to the information provided for **36 Sphagnum peatland**.

³⁵ As determined under Schedule 3A of the *Nature Conservation Act 2002*, Department of Natural Resources and Environment Tasmania (2022)

APPENDIX B – VASCULAR FLORA SPECIES LIST

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

Sites:

1	ASF - Ashburton Creek - E518611, N5268587	18/12/2023	Ian Jenkinson
2	NBA - E518839, N5268764	18/12/2023	Ian Jenkinson
3	FUR - E518457, N5268769	18/12/2023	Ian Jenkinson
4	FAG - E518512, N5268582	18/12/2023	Ian Jenkinson

Site	Name	Common name	Status
	DICOTYLEDONAE		
	APIACEAE		
2 3	<i>Foeniculum vulgare</i>	fennel	d
	APOCYNACEAE		
2	<i>Vinca major</i>	blue periwinkle	i
	ASTERACEAE		
3 4	<i>Arctotheca calendula</i>	capeweed	i
4	<i>Bellis perennis</i>	English daisy	i
4	<i>Calendula arvensis</i>	field marigold	i
1 4	<i>Carduus pycnocephalus</i>	slender thistle	d
2	<i>Chrysanthemoides monilifera</i> subsp. <i>monilifera</i>	boneseed	d
1 2 3 4	<i>Cirsium vulgare</i>	spear thistle	i
3	<i>Conyza bonariensis</i>	flaxleaf fleabane	i
2	<i>Dimorphotheca fruticosa</i>	trailing daisy	i
2	<i>Euchiton japonicus</i>	common cottonleaf	
3 4	<i>Helminthotheca echioides</i>	bristly oxtongue	i
1 2 3 4	<i>Hypochaeris radicata</i>	rough catsear	i
3 4	<i>Lactuca serriola</i> f. <i>serriola</i>	prickly lettuce	i
4	<i>Olearia ramulosa</i>	twiggy daisybush	
2	<i>Senecio</i> sp.	groundsel	
4	<i>Silybum marianum</i>	variegated thistle	i
1 4	<i>Sonchus asper</i>	prickly sowthistle	i
4	<i>Taraxacum officinale</i>	common dandelion	i

2	<i>Tragopogon porrifolius subsp. porrifolius</i>	salsify	i
BRASSICACEAE			
3 4	<i>Brassicaceae sp.</i>		i
2 3 4	<i>Hirschfeldia incana</i>	hoary mustard	i
4	<i>Lepidium draba</i>	hoary cress	d
CACTACEAE			
4	<i>Opuntia stricta</i>	prickly pear	d
CARYOPHYLLACEAE			
4	<i>Stellaria media</i>	garden chickweed	i
CHENOPODIACEAE			
1	<i>Atriplex prostrata</i>	creeping orache	i
3	<i>Einadia nutans subsp. nutans</i>	climbing saltbush	
CONVOLVULACEAE			
2 4	<i>Convolvulus angustissimus subsp. angustissimus</i>	blushing bindweed	
DIPSACACEAE			
1 4	<i>Dipsacus fullonum</i>	wild teasel	i
ERICACEAE			
2	<i>Lissanthe strigosa subsp. subulata</i>	peachberry heath	
2	<i>Styphelia humifusa</i>	native cranberry	
EUPHORBIACEAE			
4	<i>Euphorbia peplus</i>	petty spurge	i
FABACEAE			
2	<i>Acacia baileyana</i>	Cootamundra wattle	i
2	<i>Acacia dealbata subsp. dealbata</i>	silver wattle	
3 4	<i>Acacia mearnsii</i>	black wattle	
2	<i>Acacia provincialis</i>	wattle	i
2 3 4	<i>Medicago sativa</i>	lucerne	i
1 4	<i>Trifolium repens</i>	white clover	i
4	<i>Trifolium subterraneum</i>	subterranean clover	i
3	<i>Ulex europaeus</i>	gorse	d
FUMARIACEAE			
1 3	<i>Fumaria bastardii</i>	bastard's fumitory	i
GENTIANACEAE			
2 4	<i>Centaurium erythraea</i>	common centaury	i
GERANIACEAE			
4	<i>Erodium moschatum</i>	musky heronsbill	i
LINACEAE			
2	<i>Linum trigynum</i>	French flax	i
MALVACEAE			

3	<i>Malva sylvestris</i>	tall mallow	i
MYRTACEAE			
4	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Tasmanian blue gum	
2	<i>Eucalyptus viminalis</i> subsp. <i>viminalis</i>	white gum	
OXALIDACEAE			
2	<i>Oxalis perennans</i>	grassland woodsorrel	
PITTOSPORACEAE			
2 4	<i>Bursaria spinosa</i> subsp. <i>spinosa</i>	prickly box	
PLANTAGINACEAE			
1 2 4	<i>Plantago coronopus</i>	buckshorn plantain	i
1 2 4	<i>Plantago lanceolata</i>	ribwort plantain	i
POLYGONACEAE			
4	<i>Acetosella vulgaris</i>	sheep sorrel	i
4	<i>Polygonum aviculare</i>	creeping wireweed	i
1 3 4	<i>Rumex crispus</i>	curled dock	i
1 4	<i>Rumex</i> sp.	dock	
PRIMULACEAE			
4	<i>Lysimachia arvensis</i>	scarlet pimpernel	i
RESEDACEAE			
4	<i>Reseda luteola</i>	weld	i
ROSACEAE			
2 3	<i>Cotoneaster glaucophyllus</i> var. <i>serotinus</i>	largeleaf cotoneaster	i
3	<i>Cotoneaster pannosus</i>	velvet cotoneaster	i
2 3	<i>Crataegus monogyna</i>	hawthorn	i
3	<i>Malus domestica</i>	apple	i
1 2 3	<i>Rosa rubiginosa</i>	sweet briar	i
2 3	<i>Rubus fruticosus</i>	blackberry	d
2 3	<i>Sanguisorba minor</i>	salad burnet	i
RUBIACEAE			
3	<i>Galium australe</i>	tangled bedstraw	
SAPINDACEAE			
3 4	<i>Dodonaea viscosa</i> subsp. <i>spatulata</i>	broadleaf hopbush	
SCROPHULARIACEAE			
3	<i>Verbascum thapsus</i>	great mullein	i
SOLANACEAE			
1 2 3	<i>Lycium ferocissimum</i>	African boxthorn	d
4	<i>Solanum laciniatum</i>	kangaroo apple	
GYMNOSPERMAE			
PINACEAE			
2	<i>Pinus radiata</i>	radiata pine	i

MONOCOTYLEDONAE			
AGAPANTHACEAE			
3	<i>Agapanthus praecox</i> subsp. <i>orientalis</i>	agapanthus	i
CYPERACEAE			
1 3 4	<i>Schoenoplectus pungens</i>	sharp clubsedge	
JUNCACEAE			
1 4	<i>Juncus kraussii</i> subsp. <i>australiensis</i>	sea rush	
LEMNACEAE			
1	<i>Lemna disperma</i>	common duckweed	
POACEAE			
3 4	<i>Amelichloa caudata</i>	espartillo	d
1	<i>Anthoxanthum odoratum</i>	sweet vernalgrass	i
4	<i>Austrostipa nodosa</i>	knotty speargrass	
4	<i>Austrostipa pubinodis</i>	tall speargrass	
2 4	<i>Austrostipa stupos</i>	corkscrew speargrass	
4	<i>Avena</i> sp.	oat	i
4	<i>Bromus catharticus</i>	prairie grass	i
3	<i>Bromus hordeaceus</i>	soft brome	i
1 4	<i>Cenchrus clandestinus</i>	kikuyu grass	i
3	<i>Cynosurus cristatus</i>	crested dogstail	i
1	<i>Cynosurus echinatus</i>	rough dogstail	i
1 2 3 4	<i>Dactylis glomerata</i>	cocksfoot	i
1 3 4	<i>Digitaria sanguinalis</i>	summergrass	i
4	<i>Ehrharta erecta</i>	panic veldtgrass	i
1	<i>Eleusine tristachya</i>	crowsfoot grass	i
3	<i>Festuca arundinacea</i>	tall fescue	i
1 2 3 4	<i>Holcus lanatus</i>	Yorkshire fog	i
1 3 4	<i>Hordeum</i> sp.	barley, barley grass	i
1 2 3	<i>Lolium perenne</i>	perennial ryegrass	i
1 3	<i>Panicum capillare</i>	common witchgrass	i
1 3 4	<i>Paspalum dilatatum</i>	paspalum	i
4	<i>Phalaris aquatica</i>	Toowoomba canarygrass	i
2 3 4	<i>Poa labillardierei</i>	silver tussockgrass	
2 4	<i>Rytidosperma caespitosum</i>	common wallabygrass	
2 4	<i>Themeda triandra</i>	kangaroo grass	
1 3 4	<i>Vulpia bromoides</i>	squirreltail fescue	i