

A PRELIMINARY LANDSCAPE ASSESSMENT OF THE BIG PUNCHBOWL EXTENSION AREA, TASMANIAN LAND CONSERVANCY, FREYCINET PENINSULA

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INTRODUCTION

The authors were requested by the Tasmanian Land Conservancy to undertake an overview of the landscape qualities of the newly-purchased Extension block to the Big Punchbowl property in 2018. We had previously reported on the geology and geomorphology of the Big Punchbowl- Long Point area in 2015 (Corbett, 2015). Field work at the new area, in the form of walking traverses, was conducted over three days in late November 2018.

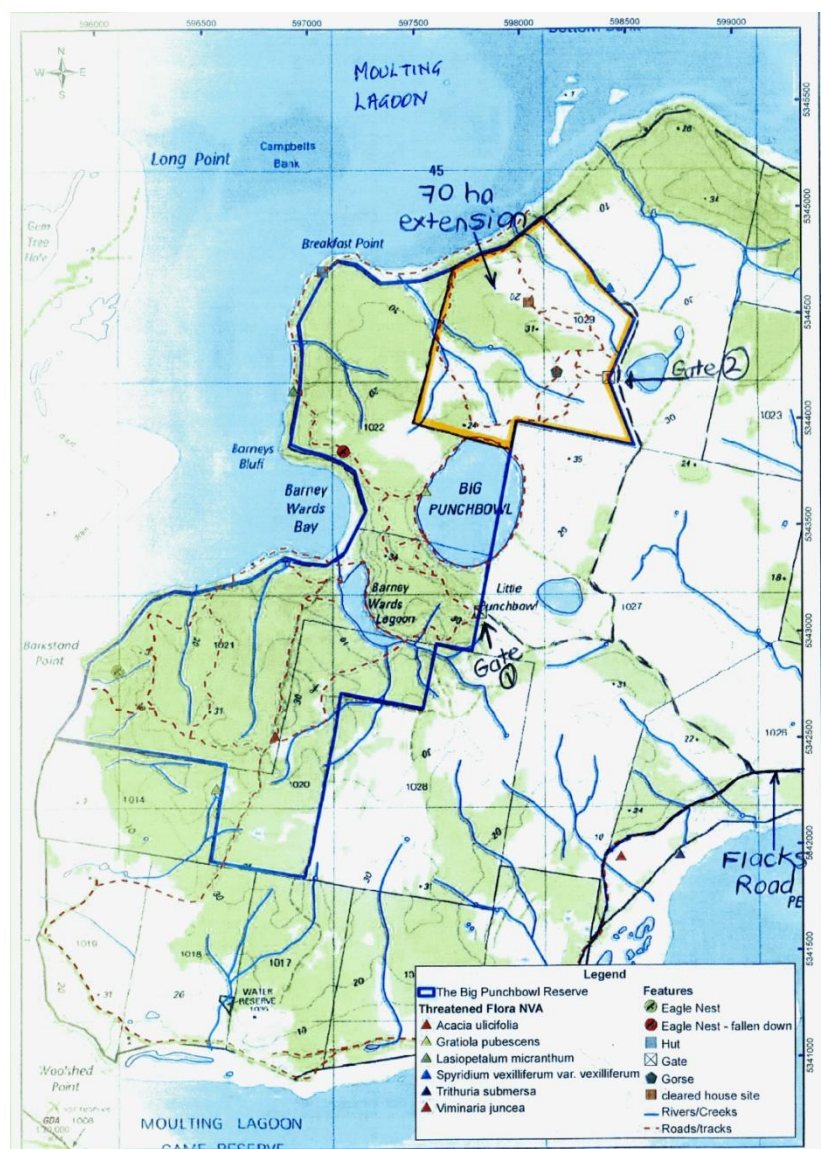
GENERAL DESCRIPTION

The 70 ha extension block is located on the north side of the Big Punchbowl lagoon (Figure 1). Its southern boundary takes in a small sliver of the lagoon, and its northern boundary is just inland from the coast of Moulting Lagoon, a large wetland on the western side of Freycinet Peninsula.

Access to the block is via Flacks Road from Coles Bay Road, and the sandy 2wd 'Wallaroo Track' which runs along the eastern side of the block and out to the coast. Within the block, a bulldozed track runs roughly around the perimeter, serving partly as a fire-break on the southern side. There is also a track to a cleared house site, with something of a view over Moulting Lagoon, on the northern side of a low NW-SE ridge. The block is sparsely to thickly vegetated, with open forest, woodland, scrub and heath of native species. There is a central man-made waterhole, and evidence of extensive previous clearing.

Observation points made during the survey are shown on Figure 2.

Figure 1. Locality map for Big Punchbowl Extension area



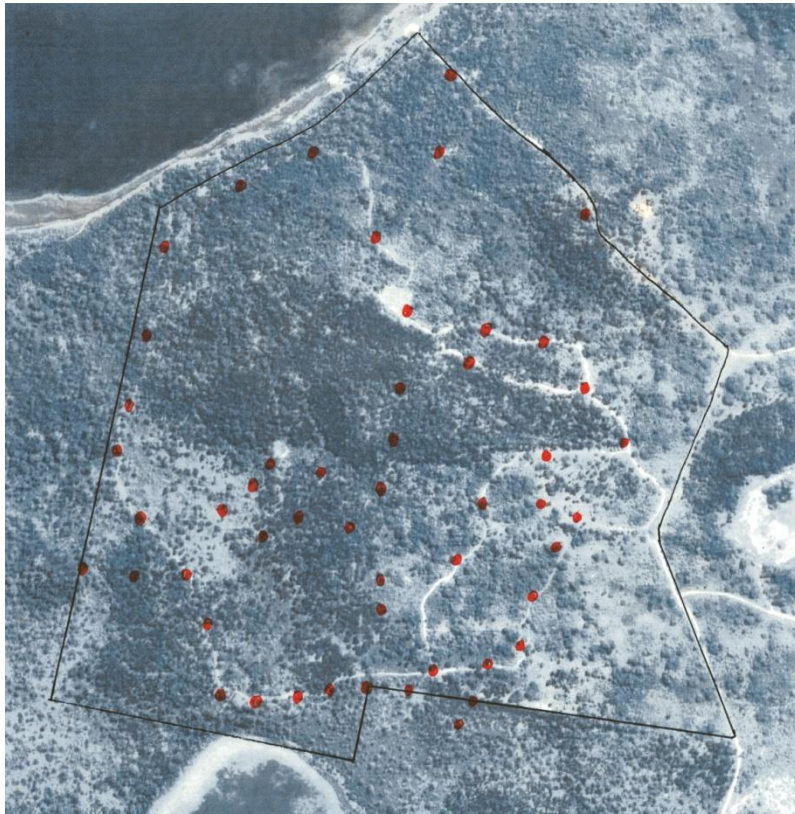


Figure 2. Google image of the Extension area showing tracks and observation points. Note cleared house site and central waterhole.

GEOLOGY AND GEOMORPHOLOGY

The block is part of an undulating, lightly dissected plateau 25-35 m above sea level, which covers this peninsula immediately south of Moulting Lagoon. In this area there is a gentle slope down to the shore of the lagoon to the north. Several small creeks, dry most of the time, drain north-westwards across the block. A low rounded ridge, to just over 30 m height, runs NW through the central part of the block, and a slightly higher ridge lies just off the SE boundary.

Sparse rock exposures, scattered float and gritty-sandy soil indicate that the whole block is underlain by the same Tertiary (Cenozoic, Cainozoic) sandstone-grit sequence which underlies the main Big Punchbowl block. These fluvial-type sediments, of possible Eocene age, were derived from the granitic rocks to the east and deposited in the down-faulted basin or graben known as the Oyster Bay Graben. They are probably of the order of 300 m thick, resting on Jurassic dolerite (Corbett, 2015). The sediments are rich in quartz grains, and are strongly iron-stained and impregnated with iron oxides in places. Patches of ironstone or lateritic gravel indicate a period of lateritisation on the original plateau surface some time during the Tertiary.

Wind-blown sand covers much of the flattish area in the SW quarter of the block, and is an extension of the sand bordering the northern shore of Big Punchbowl lagoon. This sand may be a metre or so deep, but can be difficult to distinguish from the normal sandy soil derived from the underlying sediments. The waterhole in the centre of the block is excavated to about 5 m depth in deep sandy-gritty soil, which may be largely alluvium related to the small creek (Figure 3). The small amount of standing water present was the only fresh water on the property at the time, and was obviously important to the local animal life.



Figure 3. Excavated waterhole in central part of Extension block.

VEGETATION OF THE BIG PUNCHBOWL AND PUNCHBOWL EXTENSION AREAS

This summary of the vegetation over both the main Punchbowl block and the Extension block combines observations made by Sib Corbett during the 2015 geology survey of the main block and recently at the Extension block, with some further air photo interpretation.

Vegetation on the Extension block includes moderately dense she-oak-dominated forest, eucalypt-dominated woodland/forest, heathy woodland with many flowering species, and dense to open *Kunzea*-dominated scrub. The latter represents regenerating vegetation on land which was previously cleared by bulldozer, perhaps 40-50 years ago, across most of the eastern half of the block. Such clearing and revegetation do not appear to have happened on the main block.

The main Punchbowl block has been mapped in TASVEG and has not been re-mapped. The Extension block has been mapped using 1:42,000 colour air photos (taken in 2010), using the best approximations to TASVEG. The classification of vegetation communities resulting from these surveys differs in a number of respects from that arrived at by the original TASVEG mapping, which may not have included ground observations. Vegetation unit boundaries are drawn on a Google Earth image of the Extension block area (Figure 4), without topographic controls.

The main block consists largely of a low plateau ~35 m above sea level and covered by eucalypt forest/woodland with an understorey of *Allocasuarina* at varying densities. Ageing of Banksias provides fairly uniform ages around 25 years. Older trees are a feature of the scarps leading down to samphire platforms close to sea level. By contrast, the Extension block has suffered more recent disturbances (logging and apparently clearing for agriculture), and the regenerating vegetation is mapped into a number of units. In particular, the eastern part of the block is dominated by *Kunzea ambigua* following clearing. The salt marshes along the southern shore of Moulting Lagoon are not

included in either block, but they add significantly to the natural values of the area and are briefly described.

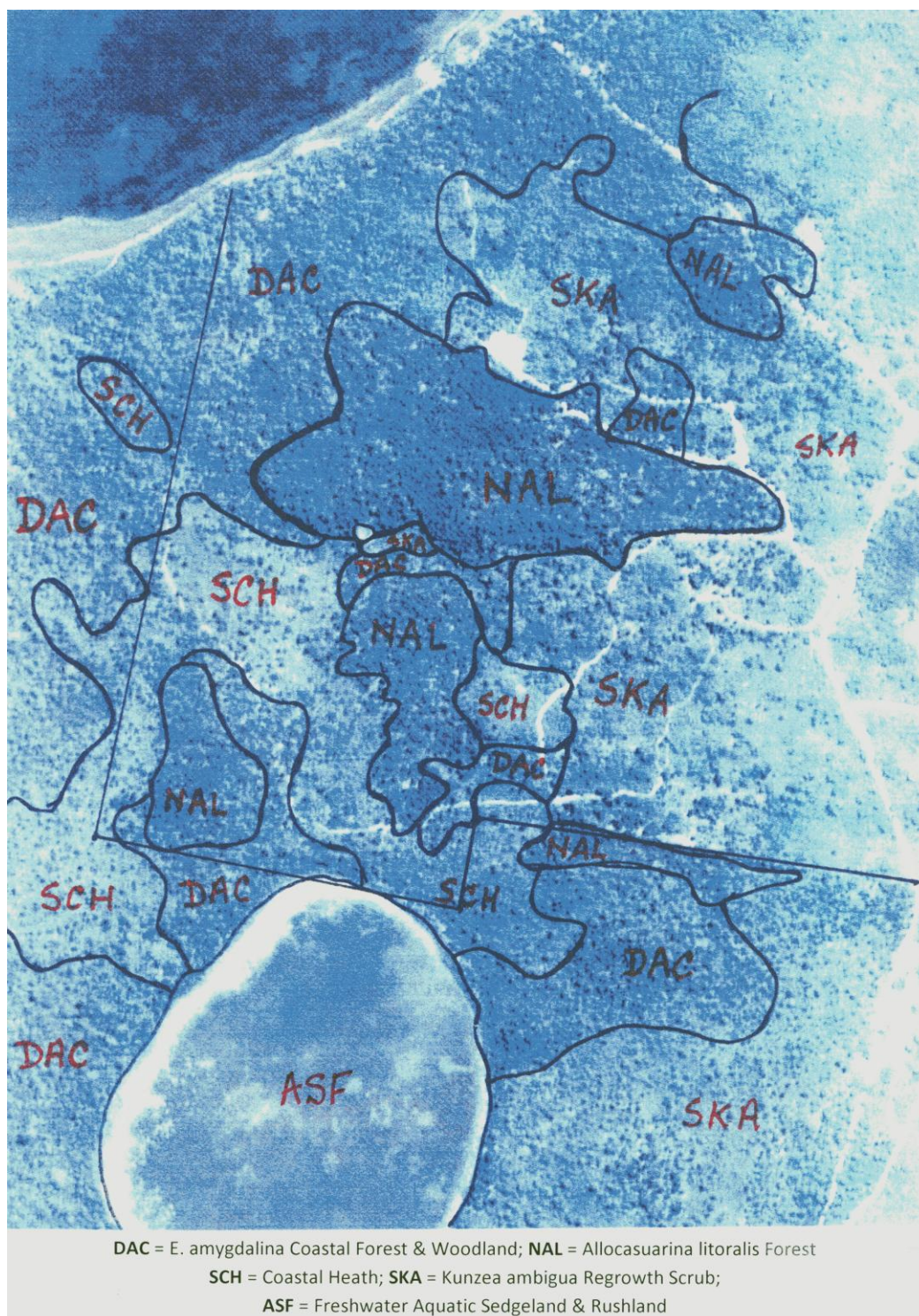


Figure 4. Map of vegetation types on the Extension block and nearby areas

Vegetation Communities

1. Wetlands

1a. Succulent Saline Herbland ASS

The samphire platforms along the shorelines grow on a 10-15 cm layer of fibrous peat overlying coarse sand, and probably suffer periodic saltwater inundation. They are dominated by Beaded Glasswort (*Sarcocornia quinqueflora*) with patches of *Disphema crassifolium* and small grassy areas. Scattered shrubs of *Sclerostegia arbuscula* occur near the water's edge, and there may be scattered *Juncus kraussii* swards.



Figure 5. Samphire platform dominated by beaded glasswort (*Sarcocornia quinqueflora*) west of Big Punchbowl.

The bases of the slopes behind the samphire platforms are generally damp, and support *Melaleuca ericifolia* shrubberies, *Solanum lanceolatum*, *Tetragonia implexicoma* and bracken. In the wettest areas are a few manferns (*Dicksonia antarctica*), coral ferns (*Gleichenia dicarpa*) and *Blechnum nudum*. Drier slopes have trees of *Eucalyptus amygdalina*, *Euc. viminalis*, *Acacia dealbata*, *Allocasuarina verticillata* and *A. littoralis*, and Banksias more than 30 years old.

1b. Saline Aquatic Herbland AHS

Barneys Wards Lagoon is an inlet south of Big Punchbowl, periodically holding brackish water. It is vegetated with a mosaic of herbfields, many of which are dominated by *Selliera radicans*. The lagoon is cut off from the sea by a low sand ridge colonised by *Kunzea ambigua*, *Leptospermum scoparium* and *Acacia verticillata* over drifts of *Ficinia nodosa*.

Figure 6. Barney Wards Lagoon area, looking east, in March 2015, showing carpet of *Selliera radicans* and former duck hides.



1c. Freshwater Aquatic Sedgeland and Rushland ASF

Big Punchbowl is a striking example of this community. It occupies a gentle depression in the Cenozoic gravelly sands, with a sparse and patchy ground covering of organic soil. The Punchbowl generally has a cover of shallow fresh water in winter, but is reduced to small pools on the north-east side in summer. The central part of the bowl has a uniform cover of rushes (*Baumea arthropphylla?*), with almost no other species present. This vegetated centre is surrounded in summer by a rim of bare sand and gritty gravel, with scattered low mounds of organic soil. Small plants of *Ornduffia reniformis* wait until winter to flourish, and there are patches of *Selliera radicans* and a few adventitious *Banksia marginata* and *Euc. viminalis* seedlings.

The raised edges of the Punchbowl are mostly sandy, although lacking dune structures. Southern and western parts carry mature *Euc. viminalis*, *Allocasuarina verticillata* and *littoralis*, *Monotoca glauca* and *Banksia marginata* aged 26-27 years. Around the NE edge the shore is invaded by *Leptospermum scoparium*, *Melaleuca ericifolia* and *Kunzea ambigua*, and some *Leptocarpos tenax* in places.



Figure 7. Big Punchbowl, north end, in March 2015, showing bare sandy area surrounding central sedgeland. Former duck hide in distance.

To the east of the main block and the Extension block are several small punchbowl-like depressions, such as Little Punchbowl, which have been modified to make waterholes or to grow crops. These are now reverting to native vegetation.

2. Heath and Scrub

2a. Coastal Heath SCH

This is a shrubby open community with a scattered canopy of *Euc. amygdalina* and *E. viminalis*, occurring on the granite-derived gravelly sand which underlies most of the blocks. It differs slightly from the usual coastal heath which occurs on wind-blown sand and has a closed texture, but SCH seems to be the best fit. It is seen to the north and west of the Big Punchbowl, with a patch within forest SW of Barneys Lagoon.

This is the most diverse and attractive community on the TLC land. *Ricinocarpos pinifolius* and *Xanthorrhoea australis* are the abundant signature species for heaths in the Extension block, but both are restricted on the main block. The two species dominate an open, uneven main storey, with *Aotus ericoides*, *Platylobium triangulare*, *Hibbertia sericea*, *Acacia terminalis*, *Dillwynia glaberrima*, *Gompholobium huegelli*, *Persoonia juniperina*, *Allocasuarina littoralis*, *Banksia marginata* and *Monotoca submutica*, beneath scattered *E. amygdalina* and/or *E. viminalis*. *Leptospermum scoparium* has patchy distribution, generally concentrated along water courses, where it may be associated *Gleichenia dicarpa*. Dry open areas have a groundcover of bracken and /or short sedges, including *Leptocarpos*, *Lepyrodia*, *Lepidosperma* (*L. laterale* and *L. concavum*), as well as *Astroloma humifusum* and *Leucopogon virgatus*.

Figure 8. Coastal heath with abundant flowering *Ricinocarpos*, SW of waterhole.



Kunzea ambigua is scarce or absent from this heath, which appears to represent a community which has not been disturbed recently. Some of the heaths north of Big Punchbowl appear to have been burnt 10-15 years ago (*Banksia* ages), but form a close mosaic with unburnt (?) heaths carrying big, old *Xanthorrhoeas*. The heaths with mature *Xanthorrhoeas* are the most spectacular vegetation type seen in the area.

2b. *Kunzea ambigua* Regrowth Scrub SKA

The most recent TASVEG 3.0 map shows the eastern side of the Extension block to be dominated by *Kunzea ambigua* Regrowth Scrub SKA, but this unit is not described in the catalogue *From Forest to Fjeldmark* (Harris & Kitchener, 2005), where *K. ambigua scrub* is listed as a facies of Coastal Scrub SDU. Even without a description, SKA is clearly a legitimate and useful class.

SKA occupies about half of the Extension block, and is also present around Little Punchbowl, but may not be represented on the main block.

SKA occurs on land partially cleared at various times over the last 50 years, with one or two generations of *K. ambigua* scrub below a sparse canopy of *Euc. viminalis*, *Euc. amygdalina*, *Allocasuarina littoralis*, *Acacia mearnsii*, *Monotoca elliptica* and a few *Acacia longifolia subsp. sophorae*. The ground is either bare or has short *Hibbertia sericea* (?), bracken or *Lepidosperma concavum*. *Ricinocarpos pinifolius* may be present where bracken is most abundant. Near the eastern side of the Extension block, *Lomatia tinctoria* appears as suckers on recently cleared ground, but there appear to be no adult plants.

Figure 9. *Kunzea ambigua* regrowth scrub, with large *Acacia mearnsii* tree behind, SE part of Extension block.



South of the main entrance to the Big Punchbowl block, air photos indicate that land just outside the block was cleared to windrows before 2010, but regrowth had obscured these in 2018. Original trees include banksias over 25 years old and smaller ones aged 20-25 years, and there are also big *Euc. amygdalina* trees. Between the trees is dense 2m *Kunzea ambigua* and *Monotoca glauca* regrowth, indicating the speed with which regeneration may have occurred on the eastern part of the Extension block.

3. *Allocasuarina littoralis* Forest NAL

NAL forest is generally clearly defined on the Extension block, but has a more pronounced eucalypt overstorey on the original block, where it has mostly been included in DAC, as mapped in TASVEG 3.0.

In its purest form NAL forest has a closed *Allocasuarina littoralis* canopy with generally sparse emergent eucalypts (*Eucalyptus amygdalina* or *E. viminalis*). South of Big Punchbowl, *Monotoca glauca* forms small trees within the forest. The ground may be bare or have drifts of *Lepidosperma concavum*, bracken or a few small epacrid species. *Allocasuarina littoralis* seems to favour dry ridges where coarse sand has been consolidated into sandstone enriched in iron. In these areas there is almost no understorey.



Figure 10. *Allocasuarina littoralis* forest on central ridge of Extension block.

Near the centre of the Extension block, SE of the waterhole, logging activity targeting eucalypts in NAL forest (evidenced by piles of burnt logs) may pre-date the *Allocasuarinas*, which appear to be close to 50 years old (as suggested by trees of *Acacia mearnsii* approaching senescence in the eastern part of the block). A few large *Eucalyptus viminalis* must have started life before

that harvesting. Access roads are not preserved within the forest or near the overdeepened waterhole on the western edge of the NAL forest, and evidence of mechanical disturbance seems to have been lost as *Allocasuarina* regeneration commenced soon after logging. Large eucalypts in *Allocasuarina* forests along the western boundary of the Extension block suggest elements of this forest are much older than 50 years. Less dense NAL forests occur over much of the Big Punchbowl block, where none of it appears to have been recently disturbed.

4 *Eucalyptus amygdalina* Coastal Forest and Woodland DAC

The original TASVEG map shows most of these forests in the TLC area as DAC, but has some areas of DAZ – *Eucalyptus amygdalina* forest on Cainozoic sediments. This distinction seems to have been removed in the later TASVEG 3.0. Even though **all** of these forests are actually on a Cainozoic substrate (the Tertiary granitic sediments), DAC seems a better fit, since there is poor correlation between these East Coast forests and the typically highly diverse DAZ woodlands (on Cainozoic ironstone gravels) in the northern midlands, type area for DAZ.

Eucalyptus amygdalina and *E. viminalis* form open broken canopies in these DAC forests, which may have a mid-storey dominated by *Allocasuarina littoralis* or be more varied, with *Monotoca* and *Banksias* or shorter heathy vegetation. Southwest of Barney's Lagoon the forest contains a few *Callitris rhomboidea*, but none of these have been seen on the Extension block. At the base of the plateau, near the sea, large trees of *Eucalyptus viminalis*, *Allocasuarina littoralis*, *A. verticillata* and species such as *Pomaderris elliptica*, *Exocarpos humifusus* and *Banksia marginata* all appear bigger and older than the trees on the plateau, possibly due to their better water supply or protection from fire. *Banksia* ages could not be determined accurately, but most are more than 30 years old.

Figure 11. *Eucalyptus amygdalina* forest beside track near western margin of Extension block. Some *Euc. viminalis* also present.



Ground cover is generally sparse where she-oaks dominate the mid-storey, or there may be species such as *Acrotriche serrulata*, *Astroloma humifusum* and *Kennedyia prostrata*. There is much greater diversity where the groundcover is heathy and there is a transition into SCH, as occurs just north of the Big Punchbowl.

5. Special Species - orchids

Observation of orchids is very much a matter of luck, with mid to late spring offering the best chances. In 2015 a few *Eriochilis* were seen along the tracks south of the Big Punchbowl, but no concerted effort was made to survey orchids. In 2018 we were lucky enough to discover a large population (about 35 plants) of small duck orchids (*Calaena minor*) on the track just southeast of the cleared house site on the Extension block at 598155E, 52444470N. These tiny orchids grow on the edge of she-oak forest, on the track or in openings in bracken and heath.

VEGETATION AND FIRE HISTORY

The Extension block has been subject to multiple fires and disturbances over the last half century. Input from previous owners would be a great advantage – without that the following is an attempt to order the main events as we deduce them.

- (1) Mature trees around the Moulting Lagoon shoreline represent the oldest vegetation on the properties. Possibly their position offered protection from fire.
- (2) Coastal forests/woodlands (DAC) represent the oldest community on the plateau. *Allocasuarina* stands have been overtopped by eucalypts which are probably more than 50 years old.
- (3) Clearing and burning occurred in the central part of the Extension block perhaps 50 years ago, as evidenced by stumps and piles of cut and burnt logs. There is little sign of the tracks which must have served these operations, and in making the waterhole, suggesting significant time has elapsed. The presence of near-senescent *Acacia mearnsii* reinforces the idea that much of the Extension was burnt about 50 years ago.
- (4) It seems likely the area now occupied by nearly pure she-oak forest (NAL) was burnt at the time when the eucalypts were harvested, and that the *Allocasuarina* regenerated soon after this fire. The provision of a waterhole may indicate some grazing was attempted at that time.
- (5) Ages for *Banksia* trees at around 25 years over much of the properties suggest a major fire in the early 1990's. A number of eucalypts survived that fire, resulting in multi-aged forest. Post-1990 is also the probable age of most of the heathlands.
- (6) *Banksia* ages of 10 to 25 years have been measured in the area immediately north of Big Punchbowl. Margins of the bowl are being recolonised by *Melaleuca*, *Kunzea* and *Leptospermum scoparium*, probably as the result of at least one fire about 10 years ago. In

the same fire it seems the rushes within the bowl were severely burnt, as suggested by the shallow and patchy nature of the organic soil layer. Such destruction probably facilitated sand blowing from the denuded surface – some of the observed windblown sand on this part of the plateau may thus be quite recent.

- (7) The eastern part of the Extension block mapped as SKA has suffered frequent burning and mechanical disturbance, with one or two generations of *Kunzea* recolonising between trees of various ages. This regeneration has been remarkably rapid, as evidenced by windrows on the northern part of the Extension and on the land adjacent to the Big Punchbowl block formed during clearing before 2010 being now barely distinguishable on the ground. All this clearing was apparently done to facilitate grazing, but low fertility and low rainfall has made this a losing battle – and therefore probably a waste of money. There is no evidence to indicate any successful agriculture on these gritty siliceous soils – as a contrast to the clayey dolerite soils on the operating farm just to the south of the main block. Given time, the reserved area should now revert to native vegetation.

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