

Survey of rare mallee *Eucalyptus dissita* in Gibraltar Range National Park, NSW Northern Tablelands

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Abstract: Remote sensing of pattern, texture and colour using high resolution ADS40 aerial photograph imagery identified 30 known and potential polygons of the listed Vulnerable mallee eucalypt *Eucalyptus dissita* (Myrtaceae) in Gibraltar Range National Park in the NSW New England Tablelands Bioregion. Targeted field surveys confirmed *Eucalyptus dissita* in 14 mapped polygons, covering a mapped extent of 7.6 hectares, with an estimated population of 2400–4600 mallee/ tree stems, including two new populations in remote locations along tributaries of Dandahra Creek and proposed as newly named management sites (Dragonfly Swamp and Valley of the Mallees) under the NSW Saving our Species Program.

Populations of *Eucalyptus dissita* were burnt in a November 2014 hazard reduction burn, and again in the extensive December 2019 wildfire. After the 2014 fire, basal resprouting was observed and minimal mortality of pre-fire plants recorded, but no seedling recruitment observed. In May 2019, 4.5 years post-fire, five of 20 tagged individuals at Surveyors Creek were forming floral buds but are likely to require another year to seed production. All of these individuals were burnt again in the December 2019 fire.

Full floristic data analysis using hierarchical agglomerative clustering revealed that *Eucalyptus dissita* forms a quantitatively distinct vegetation assemblage that groups with the vegetation of swamps and rocky riparian areas, adjoining granite hills.

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Introduction

Eucalyptus dissita K.D. Hill (family Myrtaceae) is a slender, smooth-barked mallee up to 4–8 m tall, known only from Gibraltar Range National Park between Grafton and Glen Innes in the New South Wales New England Tablelands Bioregion. The species was first collected by J. B. Williams of the University of New England in 1974 and formally described by Hill (1997), naming it *Eucalyptus dissita*; the epithet means ‘lying apart’, in reference to its wide geographic separation from the closely-related *Eucalyptus moorei*, that occurs in the Blue Mountains west of Sydney, the Southern Highlands and Budawang Ranges, and *Eucalyptus moorei* subsp. *serpenticola* which is restricted to near Curricabark north of the Barrington Tops. *Eucalyptus dissita* can be distinguished from other closely related species by its lanceolate to broad-lanceolate juvenile and adult leaves and longer petioles. Hill (1997) observed that leaves in living material of *Eucalyptus dissita* are held stiff and erect in comparison to the lax foliage of closely related species *E. moorei* subsp. *moorei* and *Eucalyptus moorei* subsp. *serpenticola*.

Eucalyptus dissita has been listed as a Vulnerable species under the *New South Wales Biodiversity Conservation Act 2016*, because of its limited occurrence, and is a funded, site-managed species under the New South Wales Government Saving our Species (SoS) program. Management actions implemented under the SoS species project include; survey, monitoring and seed collection of the species.

This study aimed to define the extent and population size of the species and identify any new populations using aerial photograph interpretation (API) with high resolution ADS40 imagery and field traverse to check predicted occurrences. Targeted site sampling and data analysis aimed to test the floristic relationships of *Eucalyptus dissita*, and to better describe the associated species. Remote sensing methods, particularly API, have been used for rare species including the shrub *Boronia deanei* (Fletcher & Erskine 2012), and the mallees *Eucalyptus luehmanniana* in Garigal National Park (Sheringham & Sanders 1993) and *Eucalyptus approximans* in New England National Park (Clarke *et al.* 2000).

Eucalyptus dissita location and habitat

Eucalyptus dissita is only known from Gibraltar Range National Park, 95 km west of Grafton and 60 km east of Glen Innes occurring between 870–990 m altitude. The cool and wet climate is influenced by its location on the edge of the Great Escarpment. The average annual rainfall increases with altitude along the edge (1200–1300 mm) to the plateau (>2000 mm) and then decreases to the west. Mean annual temperature is 12–13°C on the plateau with mean maximum temperatures of 26–29°C and mean minimum temperatures of 0–5°C.

Eucalyptus dissita occurs on unconsolidated sediments forming sandy/ organic soils along gently undulating valleys derived from weathering of adjoining Dandahra granite hills. The species is noted as being locally dominant in small patches

around the edges of swamps associated with the Surveyors Creek soil landscape, on gritty sandy soils over granite just above the level of water of permanent groundwater.

Associated vegetation can be described as a low mallee woodland / heathland with a dense layer of shrubs, sedges, rushes, grasses and forbs in the ground layer. The canopy layer can be quite dense and is dominated by *Eucalyptus dissita*, although taller trees of *Eucalyptus ligustrina* and *Eucalyptus williamsiana* may also occur in the mallee stands. Shrubs are common and include *Leptospermum arachnoides*, *Boronia microphylla*, *Leptospermum trinervium* and *Petrophile canescens*. In the dense ground layer are moisture-loving species *Baloskion stenocoleum*, *Entolasia stricta* and *Tetrarrhena turfosa*.

OEH (2012b) described *Eucalyptus dissita*-dominated vegetation as Plant Community Type *PCT 2014 – Eucalyptus dissita layered mallee woodland/heathland of swampy open depressions on granite, New England Tablelands Bioregion*, though this PCT was identified with limited sampling before the larger mallee stands were located during this study in 2017.

Conservation status and threats

Hill (1997) assessed the conservation status of *Eucalyptus dissita* as 2RC, based on the criteria of Briggs and Leigh (1996) indicating a rare taxon with a geographic range less than 100km, no identifiable threats, and an occurrence in a conservation reserve but population size unknown. In 2000 the NSW Scientific Committee made a Final Determination to list *Eucalyptus dissita* as a Vulnerable Species on Schedule 2 of the *NSW Threatened Species Conservation Act 1995*. The Determination states that the species “*is restricted to three locations in Gibraltar Range National Park, where it occurs on gentle slopes or shelves around the edge of swamps or near small creeks. All known locations are close together and the largest occupies approximately 1 ha.*” Threats to *Eucalyptus dissita* were identified as the impacts of adjacent tracks, and the interaction between fire and competitive impacts of other swamp species on survival and recruitment. Due to the small population size the species was seen to be susceptible to catastrophic events and localised extinction (NSW Scientific Committee 2000). *Eucalyptus dissita* is now listed as Vulnerable under the *NSW Biodiversity Conservation Act (2016)*. However occurrence in a National Park does not protect against climate change and for a ‘high elevation’ species, global warming and altered rainfall may be an existential threat.

The *Eucalyptus dissita* floristic assemblage forms part of the Montane Peatlands and Swamps of New England Tablelands, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands, Australian Alps Bioregions Endangered Ecological Community listed on the *NSW Biodiversity Conservation Act 2016*.

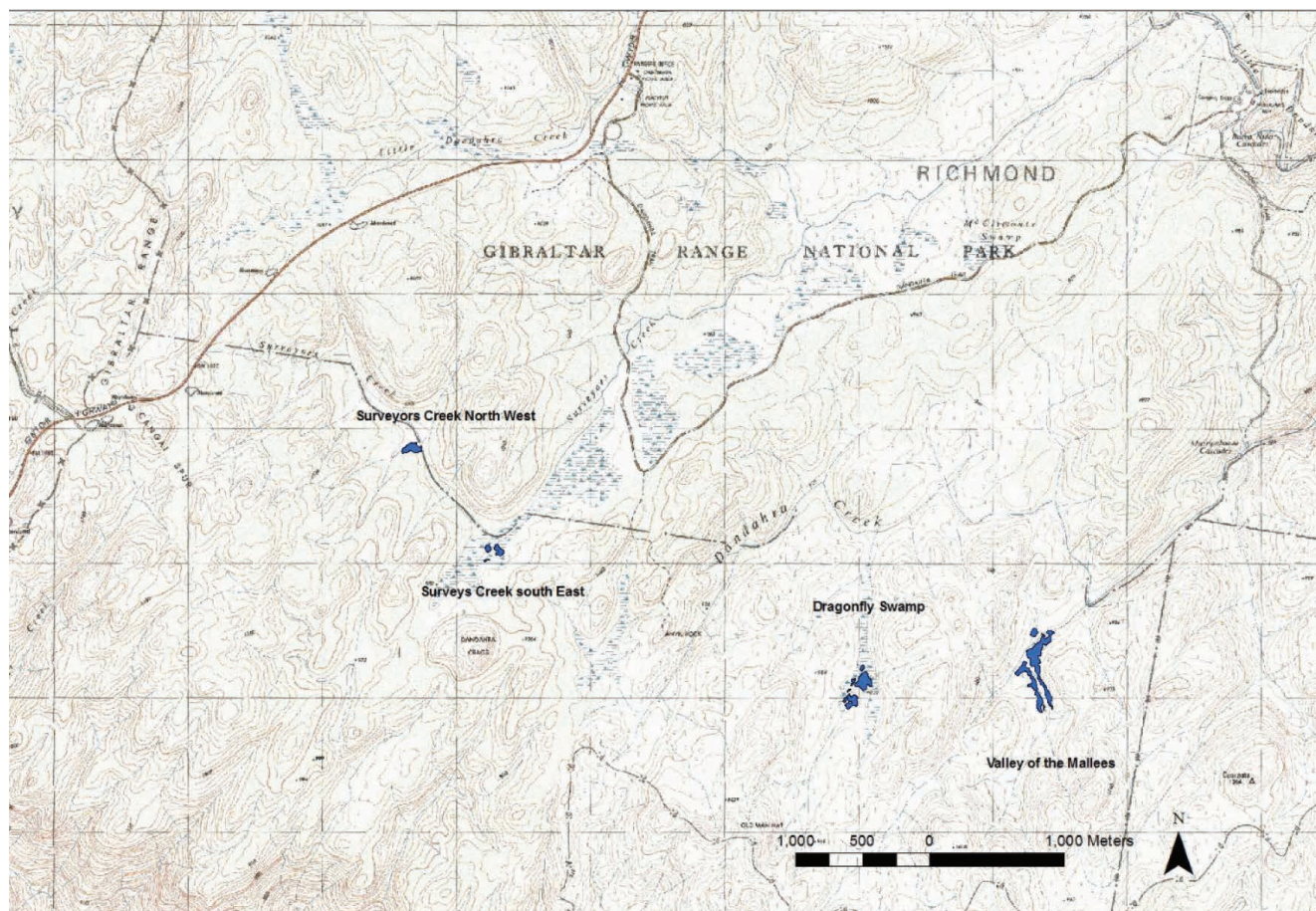


Figure 1. Location of main *Eucalyptus dissita* populations in Gibraltar Range National Park as identified in this study.

Methods

Remote sensing and field verification

Potential habitat of *Eucalyptus dissita* was mapped using ADS40 imagery on a 3D stereo planar, extrapolating from patterns, texture and colour of the species' occurrence at known locations typically in and on the edge of swamps. 30 predicted polygons were mapped for field verification (Figure 2).

Field traverse surveys in known *Eucalyptus dissita* locations and predicted occurrences were undertaken in 2017 (January 16–19), 2018 (June), and 2019 (May). At each site, the presence/absence of *Eucalyptus dissita* and location of individual stems were recorded with a GPS; health, reproductive condition, height and stem numbers of individual plants was recorded; and dominant tree and associated shrub and groundcover species recorded.

In areas burnt in the November 2014 fire, 40 *Eucalyptus dissita* plants were tagged to monitor post-fire response. 3, 10 × 20 metres squared quadrats were established in the Surveyors Creek population post December 2019 fire. 20 mallees were tagged in the Valley of the Mallee and Dragonfly Swamp population in June 2020.

Full floristic survey

Floristic survey sites were established to collect quantitative data to better delineate the assemblage of species that occurs with *Eucalyptus dissita*, and to determine if this assemblage is a quantitatively distinct vegetation type. In November 2010 three full floristic 20 x 20 m survey sites were recorded in the Surveyors Creek South East population and in June 2018, three more full floristic sites were recorded at Surveyors Creek, Valley of the Mallees, and Dragonfly Swamp. The location of the north east corner of each site was recorded with a GPS while each of the four corners were marked with flagging tape. Cover abundance was recorded for all species using a Braun-Blanquet (Poore, 1955) cover abundance score.

The site data were entered into the data analysis module of the NSW BioNet database and added to an existing data set of 107 sites for the Gibraltar Range National Park (Sheringham & Hunter, 2008). The combined sites were then analysed in PATN using hierarchical agglomerative clustering option with a default beta of -0.1, and the Bray-Curtis association measure.

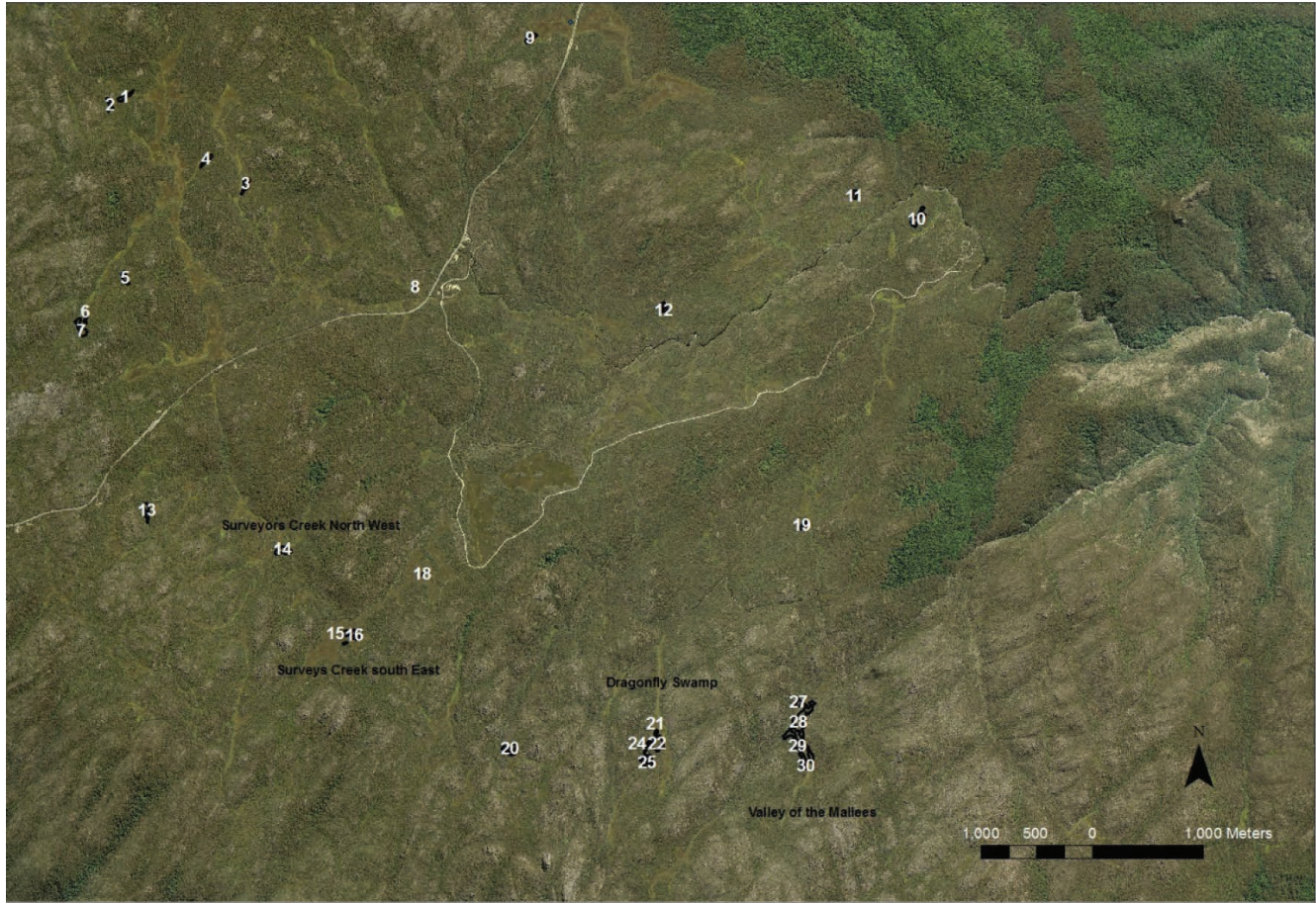


Figure 2. The 30 known and API predicted locations of *Eucalyptus dissita* before field checking.

Results

API mapping and field verification

Of the 30 polygons initially identified as potential occurrences of *Eucalyptus dissita* (Figure 2) our field surveys found that 16 polygons were dominated by mallee tree forms of species other than *Eucalyptus dissita*, viz. *Eucalyptus ligustrina*, *Eucalyptus radiata subsp. sejuncta*, and *Eucalyptus williamsiana*, or tall shrubs of *Hakea laevipes subsp. graniticola*, *Baeckea omissa*, *Leptospermum arachnoides*, *Leptospermum gregarium*, *Leptospermum trinervium* and *Allocasuarina rigida subsp. rigida*, and, after review of imagery, were excluded, leaving 14 polygons as confirmed localities for *Eucalyptus dissita*; these occupied a total area of approximately 7.6 hectares (Table 1). Several smaller additional mallee stands not predicted from API were located during field traverse along Valley of the Mallees and Dragonfly Swamp, and added to the map as polygons or waypoints. Figure 1 shows the location of confirmed *Eucalyptus dissita* polygons.

Table 1. Location and area of the 14 *Eucalyptus dissita* polygons confirmed by fieldwork (out of 30 originally identified in Figure 2). All sites were described as *Eucalyptus dissita* layered mallee PCT community.

| Number | Mallee site | Area (ha) |
|------------|----------------------------|-----------|
| 15 | Surveyors Creek north west | 0.74 |
| 16 | Surveyors Creek south east | 0.17 |
| 17 | Surveyors Creek south east | 0.36 |
| 18 | Surveyors Creek south east | 0.04 |
| 21 | Dragonfly Swamp | 1.01 |
| 23 | Dragonfly Swamp | 0.09 |
| 23 | Dragonfly Swamp | 0.03 |
| 24 | Dragonfly Swamp | 0.61 |
| 25 | Dragonfly Swamp | 0.23 |
| 26 | Dragonfly Swamp | 0.07 |
| 27 | Valley of the Mallees | 0.23 |
| 28 | Valley of the Mallees | 2.67 |
| 29 | Valley of the Mallees | 1.43 |
| 30 | Valley of the Mallees | 0.04 |
| Total area | | 7.57 |

Surveyors Creek North West population

Surveyors Creek North West is the highest altitude *Eucalyptus dissita* population (990 m), covering 0.75 ha, with individuals resprouting after the November 2014 fire (Figures 3, 4), and burnt again in December 2019. Prior to the 2014 fire some mallees were up to 8 m tall (Johnson and Orme pers. obs.). The height of ten tagged mallees ranged from 2.2–3.1 m, the number of stems over 5cm diameter at breast height (dbh) varied from 1–5 per plant (Table 2). The population is estimated to be at least 300–500 stems. All mallees were observed to resprout post-fire with minimal mortality recorded, but no post-fire seedling recruitment observed.

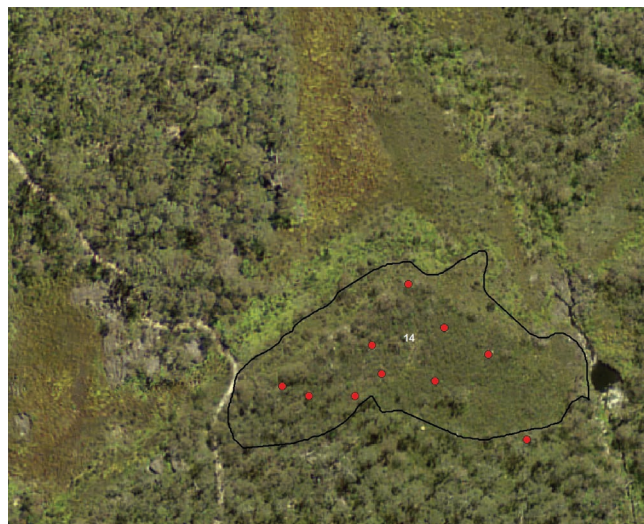


Figure 3. Surveyors Creek North West showing mapped polygon and location of 10 measured *Eucalyptus dissita* plants.

Table 2. Location, population size and area of the major *Eucalyptus dissita* populations and dimensions of selected plants (n=10).

| Site Location | Description | Area (ha) | Polygons | Elevation (m) | Secondary juvenile period | Population Size | Height (m) | Number of stems/ plant |
|----------------------------|---|-----------|----------|---------------|---------------------------|-----------------|------------|------------------------|
| Surveyors Creek North West | 2.1km south of Gwydir Highway on Surveyors Creek Trail | 0.75 | 1 | 970 | Not known | 300–500 | 2.2–3.1 | 1–5 |
| Surveyors Creek South East | 1.4km south west of Mulligans Drive on Dandahra Crags Walking Track | 0.58 | 3 | 970 | 4.5 years | 200–400 | 1–2.8 | 0–5 |
| Dragonfly Swamp | 1.7 – 2.7km south of Mulligans Drive | 1.89 | 6 | 930 | Not known | 1000–2000 | 2.2–8 | 0–13 |
| Valley of the Mallees | 2.0 km south east of Murumbooee Cascades along Dandahra Creek | 4.35 | 4 | 870 | Not Known | 1000–2000 | 4.–8 | 3–17 |



Figure 4. Surveyors Creek North West showing *Eucalyptus dissita* plants. December 2016

Surveyors Creek East population

The population at Surveyors Creek South East at 970 m altitude is estimated to be 100 stems covering 0.58 ha, comprising three small polygons all burnt during the November 2014 fire, and again in December 2019 (Figure 5). The mallees were small resprouting individuals with thin stems. The height of ten tagged mallees ranged from 1–2.8 metres, the number of stems over 5cm (dbh) varied from 0–5 (Table 2).



Figure 5. Surveyors Creek South East showing mapped polygons and location of 10 measured *Eucalyptus dissita* plants.



Figure 6. Dragonfly Swamp showing mapped polygons and location of 10 measured *Eucalyptus dissita* plants.

Dragonfly Swamp population

Dragonfly Swamp is a new population located 1.7–2.7 km south of Mulligans Drive and discovered during the January 2017 survey. The main population occurs at the head of two creeks at 930 m altitude. This is the second largest stand of mallee in the park, consisting of 1.89 ha in six separate polygons and several smaller patches, which were too small to map using API photography and denoted as waypoints (Figure 6, 7 and 8). The northern section had been burnt in November 2014. The southern section consisted of taller unburnt mallee in 2017, which was subsequently burnt in December 2019. The height of ten tagged mallees varied from 2.2– 8 m, the number of stems above 5cm (dbh) varied from 0–13 stems. The total population at Dragonfly Swamp is estimated to be 1000–2000 stems (Table 2).



Figure 7. *Eucalyptus dissita* mallee stand in Dragonfly Swamp January 2017

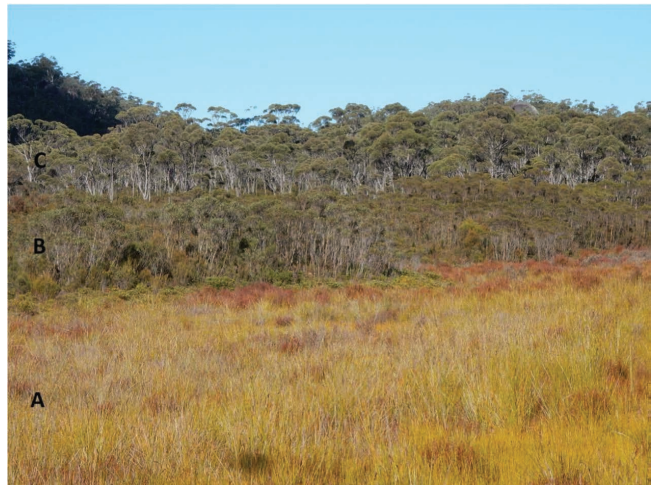


Figure 8. Dragonfly Swamp showing vegetation zonation. **A-** Montane Fen **B-** *Eucalyptus dissita* shrubland **C-** Dry Open Forest

Valley of the Mallees population

The largest mallee stand at 4.35 hectares in four polygons (Figures 9, 10), discovered in the January 2017 survey at 870 m altitude. The population contained mature mallee stands that were burnt in December 2019. The height of ten tagged mallees varied from 4–8 m, the number of stems above 5cm (dbh) ranged from 3–17 per plant (Table 2). The population at Valley of the Mallees is estimated to be 1000–2000 individuals. Flowering of some mallees was observed in January 2017.

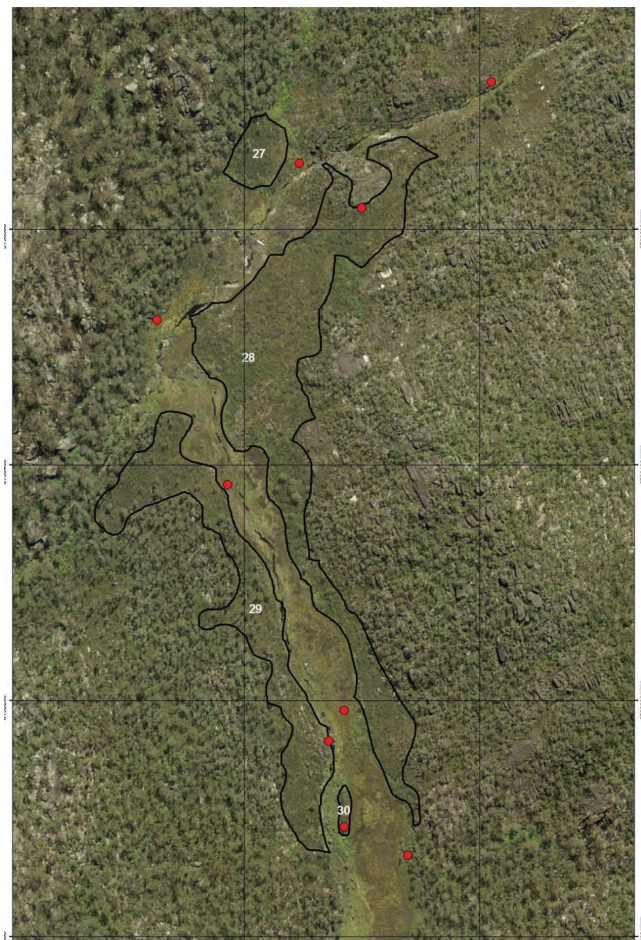


Figure 9. Valley of the Mallees showing mapped polygons and location of 10 measured *Eucalyptus dissita* plants.

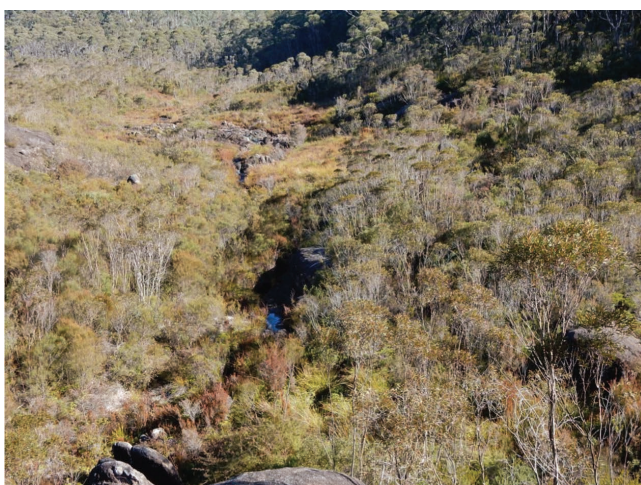


Figure 10. Valley of the mallees.

Floristic analysis

Some mallee eucalypt-dominated vegetation has not been found to be floristically different from adjoining vegetation when full floristic data was analysed numerically. These species group with the cover abundant shrub and sedge species in adjoining vegetation assemblages. Examples include *Eucalyptus leuhmanniana* (Sheringham & Sanders, 1993), *Eucalyptus codonocarpa* (Eco Logical Australia,

2015), *Eucalyptus camphora* subsp. *relicta* (Hunter, 2001), and *Eucalyptus aquatica* (Shepherd & Keyzer, 2014).

Other mallee communities on low nutrient rhyolite and serpentinite geologies form their own floristic community as well as mapping unit. For example, *Eucalyptus moorei* subsp. *serpentinicola* forms PCT 1599- *Eucalyptus serpentinicola*-*Allocasuarina ophiolitica*/Spinifex grass low mallee woodland on serpentinite of the lower North Coast (Sivertsen *et al*, 2011), and *Eucalyptus approximans* formed its own vegetation community In New England National Park (Clarke *et al*, 2000).

The *Eucalyptus dissita* floristic assemblage has an open to closed shrubland to woodland structure ranging from 1–8 metres high with *Eucalyptus dissita* dominant and *Eucalyptus acaciiformis*, *Eucalyptus williamsiana* and *Eucalyptus olida* sometimes present. Taller mid layer shrubs include *Allocasuarina rigida* subsp. *rigida*, *Leptospermum novae-angliae* and *Leptospermum arachnoides*. In the lower mid layer, the shrubs *Banksia marginata*, *Leptospermum brevipes* and *Baeckea omissa* are frequent. Sedges such as *Lepyrodia leptocaulis*, *Caustis flexouosa*, *Lepidosperma limicola*; grasses *Entolasia stricta*, *Tetrarrhena juncea*; and forbs *Goodenia bellidifolia* occur commonly in the ground layer. The rare shrubs *Grevillea acanthifolia* subsp. *stenomera*, *Persoonia rufa* and *Grevillea acerata* occur frequently in this community. Other shrubs from adjoining drier granite areas also occur occasionally such as *Boronia microphylla*, *Leptospermum trinervium*, *Mirbelia speciosa* and *Prostanthera sp aff. phyllicoides*

The three *Eucalyptus dissita* sites (BioNet site Labels LCDISS1, LCDISS2, LCDISS3) clustered together at a dissimilarity value of about 0.95 (Figure 11). The sites grouped with shrublands and woodlands typical of riparian and swampy areas. 1) *Lepidosperma limicola* sedgeland. (Site labels- GIBDG008, GIBQS002, GIBQS003, GIBDG015, GIBQS006, GIBPS040, GIBPS028); 2) *Leptospermum polygalifolium*–*Allocasuarina rigida*–*Callistemon pallidus*-*Callistemon sieberi* riparian shrublands. (Site Labels- GIBDG067, GIBDG054, GIBDG030); and 3) *Eucalyptus oreades* riparian woodlands (GIBDG054, GIBPS022). A full list of species fidelity list for this assemblage is included in Appendix 1.

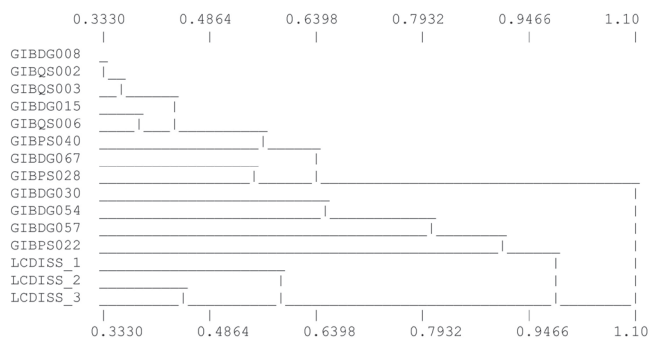


Figure 11. Dendrogram of *Eucalyptus dissita* sites (BioNet site Labels LCDISS1, LCDISS2, LCDISS3).

Discussion

Our survey extends the known distribution of the *Eucalyptus dissita* floristic assemblage in the Gibraltar Range National Park, from a known extent of about 1 ha at the time it was listed (NSW Scientific Committee, 2000), to a total extent of 7.6 ha with this study. Aerial photograph interpretation of fine scale ADS40 imagery was helpful in identifying large stands, but field work was needed to ground truth polygons and refine the extent of mallee stands. Field work confirmed one polygon and located two small mallee clumps too small to detect using API map at Surveyors Creek North West, and confirmed 2 polygons, found one new polygon, and two locations of mallee clumps too small to detect using API at the Surveyors Creek South East site. At Dragonfly Swamp site four polygons were confirmed, and two new smaller polygons, and five mallee stands too small to map were found. At the Valley of the Mallees, four polygons were confirmed, and one new polygon was found. Difficulty was encountered delineating between shrubland and mallee tree forms of vegetation in recently burnt areas. The *Eucalyptus dissita* floristic assemblage has conservation significance; representing it on vegetation maps should be prioritised to assist land managers with species conservation and strategic fire management planning.

Mallee habitats

In the current study full floristic data from *Eucalyptus dissita* stands formed a distinct floristic assemblage related to sedgeland, heathland, shrubland/ vegetation of adjoining swamps and rocky riparian areas.

Many coastal and tableland mallee species are associated with rock outcroppings on low nutrient sandstone, granite, and acid volcanic geology. For example, *Eucalyptus codonocarpa* occurs on granite rock outcrops of the Gibraltar Range, though areas where this species dominates were not considered floristically distinct from the broader Tall Dry Heaths of Rocky Outcrops in Eastern Washpool National Park (Eco Logical Australia, 2015). In the McPherson Range *Eucalyptus microcodon* is restricted to rhyolite outcrops in Border Ranges National Park and Mount Lindesay State Forest in Queensland. Closely related to *Eucalyptus dissita*, *Eucalyptus moorei* subsp. *serpentinicola* is endemic to serpentinite outcrops of the mid north coast and is characteristic of the *Eucalyptus serpentinicola*-*Allocasuarina ophiolitica*/Spinifex grass low mallee woodland on serpentinite of the lower North Coast (Greater Hunter Vegetation Mapping Version 4 - PCT 1599 2012a).

While few eucalypt species are associated with very moist sites, there are a number of mallee species that are, and these are often very restricted species. The closely related *Eucalyptus moorei* subsp. *moorei* is represented by disjunct populations in hanging swamps in low nutrient sandstone soils in the Blue Mountains between Wentworth Falls, the Narrow Neck Peninsula, and near the Newnes Plateau (Keith, 1988). *Eucalyptus approximans* is listed for the Montane Peatlands and Swamps Endangered Ecological Community (NSW Scientific Committee, 2004); though Clarke *et al*

(2000) and Eco Logical (2017b) describe it as occurring in dry heath and mallee woodlands on rhyolite and granite outcrops in New England and Cathedral Rock National Parks. *Eucalyptus camphora* subsp. *relicta* mallee stands grouped floristically with *Baeckea omissa* and *Leptospermum gregarium* closed wet heaths and Sphagnum Bogs in Warra National Park (Hunter, 2001). *Eucalyptus camphora* subsp. *camphora* occurs in swamps in the upper Cudgegong River near Rylstone (Baird & Benson, 2018), while *Eucalyptus aquatica* occurs with *Gymnoschoenus sphaerocephalus* in similar swamps in Penrose State Forest (Shephard & Keyzer 2014). Sheringham and Sanders (1993) included *Eucalyptus luehmanniana* in its own mapping unit, which grouped floristically with sandstone heathlands, shrublands and low woodlands mapped as Unit 21g- Coastal Sandstone Heath by Benson and Howell (1994) and is typical of sandstone areas with impeded drainage.

Fire ecology

Eucalyptus dissita resprouts extensively from lignotubers, but no post-fire seedling recruitment has been recorded. Further studies are required to investigate lignotuber size, seedling recruitment and any likely clonality. The fire regime in the study area is potentially detrimental to *Eucalyptus dissita*. The population at Surveyors Creek, and half the Dragonfly Swamp site was burnt during a hazard reduction burn in November 2014. These populations, which had just begun flowering, were burnt again in a December 2019 wildfire, the second fire in five years. A fire-free period of at least five or more years is recommended to enable resprouts to begin flowering again, another year for fruits to mature, and longer than fifteen years to maintain the vigour of burnt mallees, subject to further study of fire response. Even the vigour of fire tolerant species can be diminished with too frequent fire (Enright *et al*, 2006). Monitoring of *Eucalyptus dissita* individuals and populations will continue to record the abundance, health and post-fire recovery of the mallee stands.

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Appendix 1. Species fidelity *Eucalyptus dissita* Plant Community Type 2015

| Species | Group score | Group freq | Non-group score | Non-group freq | Fidelity class |
|---|-------------|------------|-----------------|----------------|----------------|
| <i>Banksia marginata</i> | 2 | 1.00 | 3 | 0.5833 | constant |
| <i>Boronia microphylla</i> | 1 | 1.00 | 0 | 0 | positive |
| <i>Dampiera stricta</i> | 1 | 1.00 | 1 | 0.25 | uninformative |
| <i>Dillwynia phyllicoides</i> | 1 | 1.00 | 0 | 0 | positive |
| <i>Eucalyptus dissita</i> | 3 | 1.00 | 0 | 0 | positive |
| <i>Grevillea acerata</i> | 1 | 1.00 | 1 | 0.08333 | uninformative |
| <i>Hakea laevipes</i> subsp. <i>graniticola</i> | 1 | 1.00 | 0 | 0 | positive |
| <i>Leptospermum novae-angliae</i> | 2 | 1.00 | 0 | 0 | positive |
| <i>Persoonia rufa</i> | 1 | 1.00 | 1 | 0.08333 | uninformative |
| <i>Petrophile canescens</i> | 1 | 1.00 | 1 | 0.08333 | uninformative |
| <i>Allocasuarina rigida</i> subsp. <i>rigida</i> | 2 | 0.67 | 1 | 0.25 | positive |
| <i>Baeckea omissa</i> | 1 | 0.67 | 3 | 0.8333 | negative |
| <i>Caustis flexouosa</i> | 2 | 0.67 | 2 | 0.08333 | positive |
| <i>Entolasia stricta</i> | 2 | 0.67 | 1 | 0.6667 | positive |
| <i>Epacris microphylla</i> | 2 | 0.67 | 1 | 0.6667 | positive |
| <i>Glechienia dicarpa</i> | 4 | 0.67 | 4 | 0.3333 | positive |
| <i>Goodenia bellidifolia</i> | 2 | 0.67 | 2 | 0.5 | constant |
| <i>Grevillea acanthifolia</i> subsp. <i>stenomera</i> | 1 | 0.67 | 1 | 0.1667 | uninformative |
| <i>Leptospermum arachnoides</i> | 2 | 0.67 | 3 | 0.5 | constant |
| <i>Leptospermum brevipes</i> | 1 | 0.67 | 0 | 0 | positive |
| <i>Lepyrodia leptocaulis</i> | 3 | 0.67 | 0 | 0 | positive |
| <i>Leucopogon microphyllus</i> | 1 | 0.67 | 0 | 0 | positive |
| <i>Melichrus procumbens</i> | 1 | 0.67 | 1 | 0.08333 | uninformative |
| <i>Monotoca scoparia</i> | 1 | 0.67 | 0 | 0 | positive |
| <i>Platysace ericoides</i> | 1 | 0.67 | 0 | 0 | positive |
| <i>Tetrarrhena juncea</i> | 2 | 0.67 | 0 | 0 | positive |
| <i>Aotus subglauca</i> | 1 | 0.33 | 0 | 0 | positive |
| <i>Austrostipa rudis</i> | 1 | 0.33 | 0 | 0 | positive |
| <i>Baloskion stenocoleum</i> | 2 | 0.33 | 0 | 0 | positive |
| <i>Bauera rubioides</i> | 2 | 0.33 | 1 | 0.5 | uninformative |
| <i>Bossiaea buxifolia</i> | 1 | 0.33 | 0 | 0 | positive |
| <i>Conospermum taxifolium</i> | 1 | 0.33 | 0 | 0 | positive |
| <i>Entolasia marginata</i> | 3 | 0.33 | 0 | 0 | positive |
| <i>Epacris brevifolia</i> | 1 | 0.33 | 0 | 0 | positive |
| <i>Eucalyptus acaciiformis</i> | 1 | 0.33 | 0 | 0 | positive |
| <i>Eucalyptus olida</i> | 1 | 0.33 | 0 | 0 | positive |
| <i>Haemodorum planifolium</i> | 1 | 0.33 | 0 | 0 | positive |
| <i>Lepidosperma limicola</i> | 1 | 0.33 | 4 | 0.6667 | negative |
| <i>Lepidosperma tortuosum</i> | 1 | 0.33 | 0 | 0 | positive |
| <i>Leptospermum trinervium</i> | 1 | 0.33 | 2 | 0.1667 | uninformative |
| <i>Lomandra filiformis</i> | 2 | 0.33 | 0 | 0 | positive |
| <i>Lomandra multiflora</i> | 1 | 0.33 | 0 | 0 | positive |
| <i>Mirbelia rubifolia</i> | 1 | 0.33 | 1 | 0.1667 | uninformative |
| <i>Mirbelia speciosa</i> | 1 | 0.33 | 1 | 0.08333 | uninformative |
| <i>Pimelea linifolia</i> | 1 | 0.33 | 0 | 0 | positive |
| <i>Prostanthera scutellarioides</i> | 1 | 0.33 | 2 | 0.08333 | uninformative |
| <i>Pseudanthus pauciflorus</i> | 1 | 0.33 | 0 | 0 | positive |
| <i>Ptilothrix deusta</i> | 1 | 0.33 | 0 | 0 | positive |
| <i>Schoenus melanostachys</i> | 2 | 0.33 | 3 | 0.1667 | uninformative |
| <i>Drosera spathulata</i> | 0 | 0.00 | 2 | 0.8333 | negative |
| <i>Epacris obtusifolia</i> | 0 | 0.00 | 2 | 0.6667 | negative |
| <i>Gonocarpus micranthus</i> | 0 | 0.00 | 2 | 0.5 | negative |
| <i>Leptrodia scariosa</i> | 0 | 0.00 | 2 | 0.5833 | negative |
| <i>Xyris operculata</i> | 0 | 0.00 | 2 | 0.5 | negative |