Spring Survey at Lot 650 Thomas Rd Casuarina



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INDEX

| 1. | | BACKGROUND | I |
|----|----|-------------------------------|---|
| | | SCOPE OF WORK | |
| | | METHODS | |
| | | | |
| | | RESULTS | |
| | 4. | Threatened and Priority Flora | 1 |
| | | | |
| | 4 | Species 1 | 0 |
| 5 | | DISCUSSION1 | 1 |
| | | REFERENCES | |
| 6. | | REFERENCES | • |

1. BACKGROUND

The consulting firm GHD (2012) undertook a flora and fauna survey of this lot in autumn. It was recommended that an additional survey be undertaken in spring to increase the number of species recorded from the site and to search for threatened and priority flora. The original report covers all the background information and this report will only cover additional information recorded as a result of the spring survey.

2. SCOPE OF WORK

The requirements for this project were to:

- Record additional taxa at each of the quadrats established by GHD (2012); and
- ii. Search for and record all threatened and priority species at the site.

3. METHODS

Prior to undertaking the field work the MGA zones for each quadrat were entered into the handheld GPS. The species records for each quadrat were printed for checking in the field.

The spring survey was undertaken on October 17th 2012. Tracks were driven and transects were walked through the remnant bushland to locate the quadrats and to search for any threatened or priority flora. Two species were identified by GHD as potentially being located at the site. These were *Caladenia huegelii* and *Diuris purdiei* both threatened flora.

Caladenia huegelii has been recorded from Woodland of Banksia attenuata and Banksia menziesii; Woodland of Eucalyptus marginata and Banksia species; Low Open Woodland of Melaleuca preissiana over Melaleuca thymoides. Woodland of Banksia attenuata and Banksia menziesii occurs at the site but no plants of this taxon were recorded.

Diuris purdiei has been recorded from winter wet swamps. The winter wet swamps at the site were a Woodland of Melaleuca rhaphiophylla and Thicket of Kunzea glabrescens. Detailed searches were undertaken in these vegetation units without locating this taxon.

A detailed search of all the remnant vegetation was undertaken but the emphasis was on the vegetation units described.

4. RESULTS

4.1 Threatened and Priority Flora

No threatened or priority flora were recorded during the survey.

4.2 Quadrats

All quadrats were located using a hand held GPS, data sheets and photographs prepared by GHD (2012). Species names have been updated where they could not be named during the original survey. Additional species have been added to the quadrat and outside of the quadrat (opportunistic species). The format used by GHD has been followed.

| Quadrat 1. Banksia and Allocas | uarina Woodla | nd over Shrubland | l |
|-----------------------------------|---------------|-------------------|-------------------------|
| Species | Cover (%) | Height (m). | |
| Acacia pulchella var. glabrescens | 30-70 | <1 | |
| Allocasuarina fraseriana | 2-10 | <10 | |
| Arnocrinum preissii | <2 | Sedge | |
| Banksia attenuata | 2-10 | <10 | |
| Banksia menziesii | 10-30 | >2 | |
| *Briza maxima | <2 | Grass | |
| Burchardia congesta | 2-10 | Herb | |
| Calytrix flavescens | <2 | <1 | |
| Calytrix fraseri | <2 | <1 | |
| *Carpobrotus edulis | 30-70 | Herb | |
| Conostephium pendulum | 2-10 | <1 | |
| Conostylis aculeata | 2-10 | Sedge | |
| Dasypogon bromeliifolius | <2 | Sedge | |
| Dianella revoluta | <2 | <1 | |
| *Ehrharta calycina | 30-70 | Grass | |
| Gompholobium tomentosum | 2-10 | <1 | |
| Hibbertia hypericoides | <2 | <1 | |
| Hovea pungens | <2 | <1 | |
| Hypolaena exsulca | <2 | Sedge | |
| Jacksonia furcellata | <2 | 1.5 | |
| Lepidosperma pubisquameum | 2-10 | Sedge | |
| Leucopogon conostephioides | 30-70 | <1 | |
| Lyginia imberbis | <2 | Sedge | |
| Petrophile linearis | <2 | <1 | |
| Phlebocarya ciliata | 2-10 | Sedge | |
| *Ursinia anthemoides | <2 | Herb | |
| *Vulpia bromoides | 20 | Grass | |
| OPPORTUNISTIC SPECIES | | | |
| *Arctotheca calendula | *Euphorbia te | erracina | Patersonia occidentalis |
| *Briza minor | *Hypochaeris | glabra | *Pelargonium capitatum |
| *Bromus diandrus | Kennedia pro. | strata | Pimelea rosea |
| Drosera menziesii | Macarthuria d | australis | *Sonchus oleraceus |
| *Euphorbia peplus | Macrozamia i | riedlei | *Trachyandra divaricata |

NOTE: There were a lot of *Banksia* species deaths about 50m to the west of the quadrat. The quadrat as described was small in area. Some of the trees within the quadrat were not healthy.



Deaths could be due to long summers but more likely dieback

Quadrat 2. Banksia Woodland over Shrubland

| Species | Cover (%) | Height (m) |
|-----------------------------|-----------|------------|
| Acacia huegelii | 2-10 | <1 |
| Adenanthos cygnorum | | <1 |
| Banksia attenuata | 30-70 | 10-30 |
| Banksia menziesii | 30-70 | <10 |
| Bossiaea eriocarpa | <2 | <1 |
| *Briza maxima | 10-30 | Grass |
| Burchardia congesta | 2-10 | Herb |
| Caladenia flava | <1 | 30 |
| Calytrix flavescens | <2 | <1 |
| Calytrix fraseri | <2 | <1 |
| *Carpobrotus edulis | <2 | Herb |
| Dasypogon bromeliifolius | 30-70 | |
| *Ehrharta?calycina | 30-70 | Grass |
| *Gladiolus caryophyllaceus | <2 | Herb |
| Hibbertia subvaginata | 30-70 | <1 |
| Hovea pungens | <1 | <1 |
| Leucopogon conostephioides` | <2 | <1 |
| Mesomelaena pseudostygia | <1 | <1 |
| Petrophile linearis | <2 | <1 |
| Phlebocarya ciliata | 10-30 | Sedge |
| Platysace filiformis | 2-10 | Herb |
| Schoenus curvifolius | 2-10 | Sedge |
| *Ursinia anthemoides | 10-30 | Herb |

OPPORTUNISTIC SPECIES

| *Echium plantagineum (Declared P1)+ | Lyginia imberbis |
|---------------------------------------|---|
| Eucalyptus marginata subsp. marginata | *Lysmachia arvensis |
| *Euphorbia terracina | Macrozamia riedlei |
| Gompholobium tomentosum | Patersonia occidentalis |
| Hardenbergia comptoniana | *Petrorhagia dubia |
| Hibbertia hypericoides | Pimelea rosea |
| *Hypochaeris glabra | Romulea rosea |
| Jacksonia furcellata | *Senecio pinnatifolius |
| *Lagurus ovatus | Solanum symonii |
| Lomandra hermaphrodita | *Sonchus oleraceus |
| | Eucalyptus marginata subsp. marginata *Euphorbia terracina Gompholobium tomentosum Hardenbergia comptoniana Hibbertia hypericoides *Hypochaeris glabra Jacksonia furcellata |

NOTE: Quadrat in very good to good condition but the surrounding area is good to degraded

⁺ See GHD (2012).

Quadrat 3. Melaleuca rhaphiophylla and Eucalyptus rudis subsp. rudis Woodland

| Species | Cover (%) | Height (m) |
|-------------------------------|-----------|------------|
| *Bromus diandrus | 50 | <1 |
| Eucalyptus rudis subsp. rudis | 30-70 | 10-30 |
| *Gomphocarpus fruticosus | <2 | <1 |
| Juncus kraussii | 2 | 1-2 |
| Melaleuca rhaphiophylla | 30-70 | 10-30 |
| Melaleuca sp. | 2-10 | |
| *Phalaris paradoxa | 30-70 | |
| *Poaceae sp. | 30-70 | |
| *Rumex crispus | 1 | <1 |
| Solanum symonii | 2-10 | 1-2 |

OPPORTUNISTIC SPECIES

| Acacia saligna | *Euphorbia terracina | *Marrubium vulgare |
|----------------------|-----------------------|--------------------------|
| *Avena barbata | Exocarpus sparteus | *Pennisetum clandestinum |
| *Conyza sp. | *Geranium molle | Pteridium esculentum |
| *Echium plantagineum | Geranium solanderi | *Solanum nigrum |
| *Ehrharta calycina | *Lolium rigidum | *Sonchus asper |
| *Ehrharta longiflora | *Lythrum hyssopifolia | *Sonchus oleraceus |

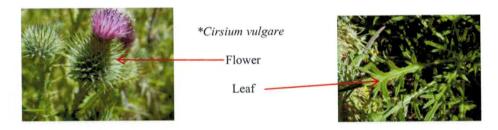
Quadrat 4. Dampland of Melaleuca species

| Species | Cover (%) | Height (m) |
|------------------------------|-------------------------|------------|
| *?Brassicaceae sp. | 30-70 | |
| *Carpobrotus edulis | 30-70 | |
| *Cynara cardunculus this sho | uld be *Cirsium vulgare | |
| (Declared P1, P3) ADJ | | |
| Melaleuca rhaphiophylla. | 30-70 | <1 |
| Melaleuca teretifolia | <2 | |

OPPORTUNISTIC SPECIES

- *Avena barbata
- *Cortaderia selloana
- *Ehrharta longiflora
- *Phytolacca octandra
- *Romulea rosea
- Solanum symonii

NOTE: Area regenerating after fire about 2-3 years previously. *Carpobrotus edulis under the dense regenerating Melaleucas has died with the dense shade. Cover of regenerating Melaleucas is about 95%



Quadrat 5. Sedgeland

| Species | Cover (%) | Height (m) |
|--------------------------|-----------|------------|
| *?Brassicaceae sp. | 10-30 | Herb |
| *Bromus diandrus | 20 | <1 |
| *Cirsium vulgare | 5 | <1 |
| *Cynodon dactylon | 10-30 | Grass |
| *Gomphocarpus fruticosus | 30-70 | 1-2 |
| *Holcus lanatus | 50 | <1 |
| Juncus kraussii | 15 | 1-2 |
| *Phytolacca octandra | 2-10 | Herb |
| *Rumex crispus | 15 | <1 |

OPPORTUNISTIC SPECIES

*Avena barbata

Cycnogeton lineare

Eucalyptus rudis subsp. rudis

Geranium solanderi

*Marrubium vulgare

Melaleuca preissiana

*Pennisetum clandestinum

Quadrat 6. Sedgeland. Astartea scoparia adjacent to quadrat

| Species | Cover (%) | Height (m) |
|--------------------------------------|-----------|------------|
| *?Brassicaceae sp. | 2-10 | Herb |
| *Carpobrotus edulis | 30-70 | Herb |
| Juncus kraussii subsp. australiensis | 30-70 | Sedge |
| *Phalaris paradoxa | 2-10 | Sedge |
| *Poaceae sp. | 10-30 | Grass |

OPPORTUNISTIC SPECIES

Hypocalymma angustifolium

| *Avena barbata | Kunzea glabrescens | |
|--------------------|----------------------|--|
| *Bromus diandrus | *Lotus subbiflorus | |
| Eutaxia virgata | Melaleuca preissiana | |
| Exocarpus sparteus | Schoenus rigens | |
| *Holcus lanatus | $*Vulpia\ bromoides$ | |

Adjacent to this quadrat on the northern side was a Dense Shrubland of *Kunzea glabrescens*. On the south side was a Shrubland of *Astartea scoparia*.

^{*}Phalaris paradoxa

Quadrat 7. Eucalyptus rudis subsp. rudis Woodland over Melaleuca Shrubland

| Species | Cover % | Height (m) |
|-------------------------------|---------|------------|
| Astartea scoparia | 3 | 1-2 |
| *Bromus diandrus | 3 | <1 |
| *Carpobrotus edulis | 30 | <1 |
| *Ehrharta longiflora | 6 | <1 |
| Eucalyptus rudis subsp. rudis | 2 | 18 |
| *Lolium rigidum | 2 | <1 |
| *Lotus subbiflorus | 60 | <1 |
| *Moraea flaccida | 2 | <1 |
| *Romulea rosea | 10 | <1 |

OPPORTUNISTIC SPECIES

Melaleuca preissiana

Note: Further into the remnant vegetation there were a lot of regrowing *Eucalyptus rudis* subsp. *rudis* and *Melaleuca rhaphiophylla* forming a dense thicket.

Quadrat 8. Kunzea thicket.

| Cover (%) | Height (m) |
|-----------|---|
| 2 | Herb |
| 5 | Grass |
| <2 | Herb |
| 5 | Herb |
| 5 | Herb |
| 5 | Herb |
| 30-70 | Herb |
| >70 | >2 |
| 25 | Grass |
| | 2 5 <2 5 5 5 30-70 >70 |

OPPORTUNISTIC SPECIES

| Acacia saligna | *Lactuca serriola |
|--------------------|-----------------------|
| Banksia ilicifolia | Melaleuca teretifolia |
| Caladenia flava | Pterostylis sp. |
| Dianella revoluta | *Sonchus oleraceus |
| *Galium murale | Xanthorrhoea preissii |

^{*}Bromus hordeaceus

^{*}Disa bracteata

^{*}Sonchus oleraceus

^{*}Trifolium subterraneum

Quadrat 9. Kunzea thicket. More correctly Kunzea glabrescens Thicket over Very Open Shrubland of Xanthorrhoea preissii

| Species | Cover (%) | Height (m) |
|-----------------------|-----------|------------|
| *Arctotheca calendula | <1 | Herb |
| *Hypochaeris glabra | 25 | Herb |
| *Isolepis marginatus. | 10-30 | Herb |
| Kunzea glabrescens | >70 | |
| *Ornithopus pinnatus | <1 | Herb |
| *Ursinia anthemoides | | Herb |
| *Vulpia bromoides | 60 | Grass |

OPPORTUNISTIC SPECIES

*Aira caryophyllea

Austrostipa compressa

*Carpobrotus edulis

*Ehrharta calycina

*Erodium botrys

Melaleuca preissiana

Xanthorrhoea preissii

In addition to the 9 quadrats established by GHD there were 2 other vegetation units which they did not describe. These are provided below as Quadrat 10 and Quadrat 11.

Quadrat 10

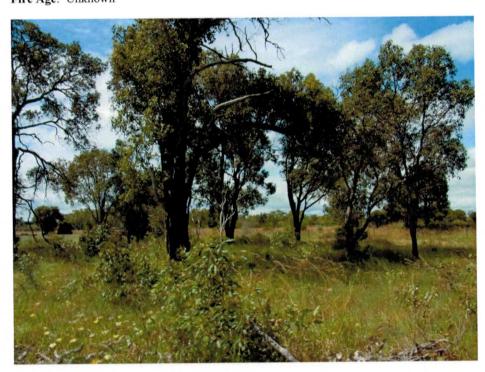
GPS: (50) 392494E; 6433033N

Date: 16th October 2012 Habitat: Flat plain Soil: Light grey sand Rock Type: None

Vegetation: Open Woodland of Corymbia calophylla over Open Low Woodland A of Melaleuca

preissiana over weeds (Muir, 1977)

Veg. Condition: Degraded Fire Age: Unknown



| Species | Cover % | Height (m) |
|----------------------|---------|------------|
| *Avena barbata | 20 | <1 |
| *Bromus diandrus | 10 | <1 |
| *Carpobrotus edulis | 20 | <1 |
| Corymbia calophylla | 10 | 16 |
| *Ehrharta calycina | 50 | 1.2 |
| Melaleuca preissiana | 2 | 8 |

OPPORTUNISTIC SPECIES

Kunzea glabrescens

^{*}Lotus subbiflorus

^{*}Ornithopus pinnatus

^{*}Trifolium subterraneum

Quadrat 11 GPS: (50) 392856E; 6433291N Date: 16th October 2012 Habitat: Flat plain

Soil: Light grey sand Rock Type: None

Vegetation: Low Scrub A to Heath A of Xanthorrhoea preissii over weeds (Muir, 1977)

Veg. Condition: Degraded

Fire Age: 2-3 years



| Species | Cover % | Height (m) |
|-----------------------|---------|------------|
| *Aira caryophyllea | <1 | <1 |
| *Arctotheca calendula | 1 | <1 |
| Austrostipa compressa | 5-20 | <1 |
| Burchardia congesta | <1 | <1 |
| *Crassula colorata | 5 | <1 |
| *Ehrharta calycina | 25 | <1 |
| *Hypochaeris glabra | 25 | <1 |
| *Vulpia bromoides | 25 | <1 |
| Xanthorrhoea preissii | 25 | 1.5 |

OPPORTUNISTIC SPECIES

*Ehrharta longiflora Banksia ilicifolia Lomandra hermaphrodita *Carpobrotus edulis *Ursinia anthemoides Conyza sp.

4.3 Species

An additional 42 species were recorded in October bringing the total number of taxa recorded to 133. Of the 42 extra taxa, 14 were endemic species and 28 were weeds.

| VASCULAR PLANT FAMILY AIZOACEAE ASPARAGACEAE ASTERACEAE | **Carpobrotus edulis Lomandra hermaphrodita **Cynara cardunculus **Hypochaeris glabra **Lactuca serriola Senecio pinnatifolius **Sonchus asper |
|--|--|
| CARYOPHYLLACEAE | *Cerastium glomeratum |
| COMMELINACEAE | Cartonema philydroides |
| CRASSULACEAE | *Crassula colorata |
| CYPERACEAE | Schoenus rigens |
| DROSERACEAE | Drosera menziesii |
| EUPHORBIACEAE | *Euphorbia peplus |
| | *Euphorbia terracina |
| FABACEAE | Eutaxia virgata |
| | *Lotus subbiflorus |
| | *Ornithopus pinnatus |
| | *Trifolium subterraneum |
| GERANIACEAE | *Erodium botrys |
| | *Geranium molle |
| | Geranium solandri |
| IRIDACEAE | Patersonia occidentalis |
| JUNCAGINACEAE | Cycnogeton lineare |
| LYTHRACEAE | *Lythrum hyssopifolia |
| MYRTACEAE | Hypocalymma angustifolium |
| ORCHIDACEAE | Caladenia flava *Disa bracteata |
| | |
| POACEAE | Pterostylis sp. |
| POACEAE | *Aira caryophyllea |
| | Austrostipa compressa *Avena barbata |
| | *Bromus diandrus |
| | *Bromus hordeaceus |
| | *Cortaderia selloana |
| | *Ehrharta longiflora |
| | *Holcus lanatus |
| | *Lagurus ovatus |
| | *Lolium rigidum |
| | *Pennisetum clandestinum |
| | *Vulpia bromoides |
| RUBIACEAE | *Galium murale |
| THYMELIACEAE | Pimelea rosea |

5. DISCUSSION

The spring survey resulted in an additional 42 taxa being recorded from the site. None of these were threatened or priority flora.

Two additional vegetation units were described for the site. These are:

- Open Woodland of Corymbia calophylla over Open Low Woodland A of Melaleuca preissiana
 over weeds, recorded from the southern boundary and the north east boundary; and
- Low Scrub A to Heath A of Xanthorrhoea preissii over weeds which was common in the site to
 the east of Bombay Boulevard but did extend into the western side of Bombay Boulevard.

6. REFERENCES

GHD (2012). Report for Lot 650 Thomas Road, Casuarina. Unpublished report for H and M Bombara

Muir, B.G. (1977). Biological Survey of the Western Australian Wheatbelt. Part II: Vegetation and habitat of Bendering Reserve. Records of the Western Australian Museum, Supplement No. 3

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