FLORA AND VEGETATION SURVEY OF THE KWINANA TO BULLSBROOK GAS PIPELINE INFRASTRUCTURE CORRIDOR

Prepared for:

Department of Industry and Resources

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August 2003

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1. SUMMARY

Mattiske Consulting Pty Ltd was commissioned by the Department of Industry and Resources Gas Pipeline Working Group to review the vegetation of the gas pipeline infrastructure corridor from Kwinana to Bullsbrook. The pipeline traversed some 74.3 kilometres. The area surveyed is located within the Darling Botanical District of the Southwest Botanical Province (Beard 1990).

The survey of flora and vegetation values were based on aerial photograph interpretation and on field studies carried out on the ground, as required. A total of 43 families, 122 genera and 167 plant taxa (including varieties and subspecies) were recorded within the survey area. Species representation was greatest amongst families Myrtaceae and Proteaceae, a flora composition typical of the Darling Botanical District.

One species listed as Declared Rare Flora under the Wildlife Conservation Act (1950) was located during the survey, *Conospermum undulatum* (R). This species is also listed as Vulnerable, under the EPBC Act (1999); no plant species listed as Threatened, Endangered or Critically Endangered were located during the survey.

Three Priority three species were found along the pipeline route. *Lambertia multiflora* var. *darlingensis, Isopogon drummondii* and *Jacksonia* ?*sericea* were each found at one location within the pipeline corridor. It is recommended that further fieldwork be undertaken to confirm the identification of Jacksonia ?*sericea* as at the time of the survey fertile plant material was not available.

A total of thirty-two introduced species were observed within the pipeline route (Appendix A). Of these species none were Declared Plants under Section 37 of the Agriculture and Related Resources Protection Act (1976).

A total of twenty seven vegetation communities were recorded along the pipeline route.

Two vegetation communities, B2 and C4, are defined as locally significant. The locally significant communities are associated with the presence of Priority Flora.

Vegetation Community C4 is equivalent to Community 3a as defined by Gibson *et al*. (1994); *Corymbia calophylla – Kingia australis* woodlands on heavy soils of the Swan Coastal Plain. This is listed as a 'Threatened Ecological Community' (TEC) by English and Blyth (1997, 1999) and is also listed at the Federal level under the Environmental Protection Biodiversity Conservation Act (1999). This TEC has been categorised as Endangered. Three areas of this community were located during the survey. At one location (the most southern) the C4 community was very degraded and only occasional *Corymbia calophylla* or *Kingia australis* plants were present. However, immediately east of the pipeline the vegetation was in good to very good condition. At the other two recorded locations of the C4 communities the vegetation condition was good to very good condition, and consequently care should be taken to avoid further disturbance in these areas.

2. INTRODUCTION

2.1 Location

Mattiske Consulting Pty Ltd was commissioned by the Department of Industry and Resources Gas Pipeline Working Group to review the flora and vegetation of the gas pipeline infrastructure corridor from Kwinana to Bullsbrook. The pipeline corridor traversed over 74.3 kilometres. The area surveyed is located within the Darling Botanical District of the Southwest Botanical Province (Beard, 1990).

2.3 Climate

The Darling Botanical District experiences a Dry Mediterranean climate with 5-6 dry months each year. The Dry Mediterranean climate falls in the relatively humid zone of the southwest (Beard 1990).

2.3 Vegetation

The survey area lies within the Darling Botanical District of the Southwest Botanical Province (Beard 1990) and thus exhibits characteristics of this province.

Dominant plant families within the Drummond Botanical Sub-district of the Darling Botanical District include Proteaceae (*Grevillea*, *Banksia*), Myrtaceae (*Eucalyptus*, *Melaleuca*) and Mimosaceae (*Acacia*). The Drummond Botanical Sub-district is characterised by *Banksia* woodland on leached sands with *Melaleuca* swamps where ill-drained; woodland of tuart (*Eucalyptus gomphocephala*), jarrah (*Eucalyptus marginata*) and marri (*Corymbia calophylla*) on less leached soils (Beard, 1990).

2.4 Declared Rare and Priority Flora

The Department of Conservation and Land Management assign conservation status to flora that are restricted geographically or threatened by local processes. Regulations aim to protect populations and conserve species.

Species of flora and fauna are defined as rare or priority conservation status where their populations are restricted geographically or threatened by local processes. The Department of Conservation and Land Management recognises these threats of extinction and consequently applies regulations towards population and species protection.

Declared Rare Flora species are gazetted under section 2 of section 23F of the Wildlife Conservation Act (1950) and therefore it is an offence to "take" or damage rare flora without Ministerial approval. Section 23F of the Wildlife Conservation Act (1950) defines "to take" as "… to gather, pick, cut, pull up, destroy, dig up, remove or injure the flora to cause or permit the same to be done by any means". Those species listed as Declared Rare Flora may not be taken without the specific written approval of the Minister for the Environment. This prohibition applies equally to both Crown and private land; to licensed and unlicensed persons; and to the owners and occupiers of land on which rare flora is found (Department of Conservation and Land Management 2003).

Table 1: Definition of Rare and Priority Flora Species (Department of Conservation and Land Management 2003)

Conservation Code	Category
R	**Declared Rare Flora – Extant Taxa** "Taxa which have been adequately searched for and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection and have been gazetted as such."
P1	**Priority One – Poorly Known Taxa** "Taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey."
P2	**Priority Two – Poorly Known Taxa** "Taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but urgently need further survey."
P3	**Priority Three – Poorly Known Taxa** "Taxa which are known from several populations, and the taxa are not believed to be under immediate threat (i.e. not currently endangered), either due to the number of known populations (generally >5), or known populations being large, and either widespread or protected. Such taxa are under consideration for declaration as 'rare flora' but need further survey."
P4	**Priority Four – Rare Taxa** "Taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5-10 years."

Threatened species are a matter of national environmental significance under the Environmental Protection and Biodiversity Conservation Act (1999). A person must not take an action that has, will have, or is likely to have a significant impact on a listed threatened species or ecological community, without approval from the Commonwealth Minister for the Environment and Heritage. Table 2 presents the definitions of the categories of threatened species under the EPBC Act (1999).

Table 2: Categories of Threatened Flora Species (Environmental Protection and Biodiversity Conservation Act 1999)

Category Code	Category
Ex	**Extinct** Taxa which at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.
ExW	**Extinct in the Wild** Taxa which is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
CE	**Critically Endangered** Taxa which at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
E	**Endangered** Taxa which is not critically endangered and it is facing a very high risk of extinction in the wild in the immediate or near future, as determined in accordance with the prescribed criteria.
V	**Vulnerable** Taxa which is not critically endangered or endangered and is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
CD	**Conservation Dependent** Taxa which at a particular time if, at that time, the species is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.

2.5 Local and Regional Significance

Vegetation communities are referred to as Locally Significant where the presence of Priority Flora species has been recorded, where they provide a range extension of particular taxa from previously recorded locations, or where they are very restricted to one or two locations or occur as small isolated communities. In addition, communities that exhibit unusually high structural and species diversity are also of Local Significance (Mattiske, pers. comm.).

Vegetation communities are referred to as Regionally Significant where they are limited to specific landform types, are uncommon or restricted vegetation community types within the regional context, or support populations of Declared Rare Flora significance (Mattiske, pers. comm.).

2.6 Threatened Ecological Communities

Communities are described as 'Threatened Ecological Communities' (TEC's) if they have been defined by the Western Australian Threatened Ecological Communities' Scientific Advisory Committee and found to be Presumed Totally Destroyed (PD), Critically Endangered (CR), Endangered (EN) or Vulnerable (VU). For definitions of TEC categories and criteria refer to English and Blyth (1997, 1999).

Selected vegetation communities have also been listed as "Threatened Ecological Communities" under the EPBC Act (1999). The TEC's at the national level are defined on the Environment Australia website (www.ea.gov.au).

3. OBJECTIVES

The general objective of this project was to describe and define the botanical values associated with the gas pipeline corridor from Kwinana to Bullsbrook for the Department of Industry and Resources Development Gas Pipeline Working Group. The specific objectives of the flora and vegetation survey were to:

- collect and identify the vascular plant species present in the field survey area,
- search for any rare, endangered or significant flora species,
- review the conservation status of the vascular plant species by reference to current literature and current listings by the Department of Conservation and Land Management (2003) and plant collections held at the State Herbarium and current listings associated with the Environmental Protection Biodiversity Conservation Act (1999),
- identify any weed species present,
- define and map the plant communities present,
- review the local and regional significance of the plant communities recorded,
- assess relative conservation values of the pipeline routes, and
- prepare a report that summarises the findings.

4. METHODS

The vegetation of the Kwinana to Bullsbrook infrastructure corridor was surveyed following the pipeline alignment by all accessible tracks and where time permitted, traversing areas on foot. Field surveys were conducted in August 2003 by botanists from Mattiske Consulting Pty Ltd.

The recording sites were selected in areas that supported native species. Detailed recordings were undertaken to identify baseline structure of communities and further sites were recorded where local variation occurred. Aerial photography was then used to extrapolate the distribution of the vegetation and the community boundaries.

4.1 Flora

A database search was undertaken of records held by the Department of Conservation and Land Management for Declared Rare and Priority Flora species likely to occur in the vicinity of the project area. Relevant species were examined at the Western Australian State Herbarium prior to the field survey being undertaken.

The flora of the survey area was described and collected systematically at each survey site. All plant specimens collected during the field survey were dried and fumigated in accordance with the requirements of the Western Australian Herbarium. The plant species were identified and then compared with pressed specimens housed at the Western Australian Herbarium. Where appropriate, plant taxonomists with specialist skills were consulted. Nomenclature of the species recorded follows the Western Australian Herbarium (2003) database.

4.2 Vegetation

The vegetation communities occurring along the survey corridor were described in detail. The use of a standard data collection form ensured the data was collected in a systematic and consistent manner. At each site the following records were made: topography, percentage litter cover, soil type, percentage of bare ground, outcropping rocks and their type and time since fire. For each species recorded, the average height and percent foliage cover of species both alive and dead was noted.

Aerial photography was used to extrapolate and map plant communities in combination with running notes made during the course of the survey. The vegetation maps and descriptions provided in this report include all vegetation communities occurring within the infrastructure corridor.

5. RESULTS

5.1 Flora

A total of 43 families, 122 genera and 167 plant taxa (including varieties and subspecies) have been recorded along the Kwinana to Bullsbrook gas pipeline corridor (Appendix A). Within the families, the genera *Eucalyptus, Corymbia* and *Banksia* are predominant in the Woodland communities and *Pericalymma* is predominant in the Heath communities. Among the perennial plant population, the Myrtaceae and Proteaceae contained the greatest number of taxa and typify the remnant *Eucalyptus* Woodlands.

A total of thirty-two introduced species were observed within the pipeline route (Appendix A). Of these species none were Declared Plants under Section 37 of the Agriculture and Related Resources Protection Act (1976). The distribution of the species as recorded in the respective vegetation community is listed in Appendix B.

5.2 Conservation Status of the Flora

One species listed as Declared Rare Flora under the Wildlife Conservation Act (1950) was located at two sites during the survey, *Conospermum undulatum* (R). This species is also listed as Vulnerable, under the EPBC Act (1999). No plant species listed as Threatened, Endangered or Critically Endangered were located during the survey.

Three Priority three species were found along the pipeline route. *Lambertia multiflora* var. *darlingensis, Isopogon drummondii* and *Jacksonia* ?*sericea* were each found at one location within the pipeline corridor. It is recommended that further fieldwork be undertaken to confirm the identification of Jacksonia ?*sericea* as at the time of the survey fertile plant material was not available.

The recorded locations of the Priority species are summarised below in Table 3.

Table 3: Summary of Location of Rare and Priority Species along the alignment of the Kwinana to Bullsbrook Pipeline Route

Priority Species	Conservation Status	MGA mE	MGA mN
Conospermum undulatum	R	405 260	645 9292
		405 130	645 9466
Isopogon drummondii	P3	405 130	645 9466
Jacksonia ? *sericea*	P3	405 383	645 8470
Lambertia multiflora var. darlingensis	P3	405 260	645 9292

5.3 Vegetation

A total of 27 vegetation communities were recorded along the pipeline route from Kwinana to Bullsbrook. The vegetation communities recorded on the alignment have been grouped into six structural groups for the project area (Table 4).

Table 4: The Total Number of Vegetation Communities along the Kwinana to Bullsbrook Infrastructure Corridor

Group	Total Communities
Banksia Woodlands	4
Corymbia calophylla Woodlands	5
Eucalyptus Woodlands	11
Closed Heath	3
Melaleuca Woodlands	2
Shrublands	1
TOTAL	**27**

***Eucalyptus* Woodlands**

E1: Disturbed Open Woodland of *Eucalyptus gomphocephala - Eucalyptus marginata - Banksia attenuata* over *Xanthorrhoea preissii* and *Macrozamia riedlei* with various introduced species.

E2: Open Woodland of *Eucalyptus marginata - Allocasuarina fraseriana - Banksia attenuata - Banksia menziesii - Banksia grandis - Banksia ilicifolia* over *Jacksonia furcellata*, *Hibbertia hypericoides*, *Acacia pulchella, Jacksonia sternbergiana* and *Baeckea camphorosmae*.

E3: Disturbed Open Woodland of *Eucalyptus gomphocephala - Allocasuarina fraseriana - Banksia menziesii - Banksia grandis* over various weed species.

E4: Woodland of *Eucalyptus rudis - Eucalyptus gomphocephala - Allocasuarina fraseriana - Banksia attenuata - Banksia menziesii* over *Calytrix angulata, Lechenaultia floribunda, Kunzea ericifolia* subsp. *ericifolia, Jacksonia furcellata* and *Lyginia imberbis.*

E5: Disturbed Open Woodland of *Eucalyptus gomphocephala - Banksia attenuata - Xylomelum occidentale* over *Jacksonia furcellata*, *Acacia pulchella* and *Macrozamia riedlei* with various introduced species.

E6: Woodland of *Eucalyptus marginata - Banksia attenuata - Banksia menziesii* over *Brachyloma preissii, Scholtzia involucrata, Stirlingia latifolia, Synaphea spinulosa, Gompholobium tomentosum, Allocasuarina humilis* and *Eremaea pauciflora.*

E7: Low Open Woodland of *Eucalyptus rudis - Allocasuarina fraseriana - Nuytsia floribunda - Banksia attenuata - Banksia ilicifolia* over thicket of *Kunzea ericifolia* subsp. *ericifolia, Melaleuca thymoides, Xanthorrhoea preissii, Hypocalymma angustifolium, Scholtzia involucrata* and *Dasypogon bromeliifolius.*

E8: Disturbed Woodland of *Eucalyptus rudis - Melelauca rhaphiophylla* over introduced species.

E9: Disturbed Woodland of *Eucalyptus rudis - Eucalyptus wandoo* over *Trymalium floribundum* subsp. *floribundum, Grevillea diversifolia, Acacia pulchella, Viminaria juncea* and *Thomasia macrocarpa* with various introduced species.

E10: Open Woodland of *Eucalyptus todtiana - Banksia menziesii* over *Astroloma xerophyllum*, *Adenanthos cygnorum, Regelia inops, Bossiaea eriocarpa, Alexgeorgea nitens, Phlebocarya ciliata, Beaufortia elegans* and *Hibbertia hypericoides.*

E11: Disturbed Woodland of *Eucalyptus marginata - Banksia menziesii - Banksia attenuata - Banksia grandis - Banksia ilicifolia - Allocasuarina fraseriana* over *Acacia saligna, Patersonia occidentalis, Scholtzia involucrata* and *Xanthorrhoea preissii.*

***Corymbia calophylla* Woodlands**

C1: Disturbed Open Woodland of *Corymbia calophylla - Xylomelum occidentale* over **Leptospermum laevigatum* and *Adenanthos cygnorum* with various introduced species.

C2: Disturbed Open Woodland of *Corymbia calophylla - Allocasuarina fraseriana* over *Xanthorrhoea preissii, Verticordia densiflora* var. *densiflora* and *Mesomelaena tetragona* with various introduced species.

C3: Disturbed Open Woodland of *Corymbia calophylla - Melaleuca rhaphiophylla - Melaleuca preissiana* over introduced species.

C4: Woodland of *Corymbia calophylla - Allocasuarina fraseriana - Banksia menziesii - Nuytsia floribunda* over *Kingia australis, Xanthorrhoea preissii, Dryandra lindleyana, Adenanthos cygnorum, Mesomelaena pseudostygia, Mesomelaena tetragona, Tetraria octandra* and *Cyathochaeta avenacea.*

C5*:* Open Woodland of *Corymbia calophylla - Melaleuca preissiana – Banksia ilicifolia* over *Taxandria linearifolia* (ms), *Hypocalymma angustifolium, Astartea* ?*scoparia, Acacia saligna, Jacksonia sternbergiana* and *Acacia pulchella.*

***Banksia* Woodlands**

B1: Disturbed Low Open Woodland of *Banksia attenuata - Banksia menziesii - Eucalyptus todtiana* with introduced **Pinus pinaster* over **Leptospermum laevigatum, Adenanthos cygnorum, Leucopogon conostephioides, Daviesia preissii, Gompholobium tomentosum* and *Scholtzia involucrata.*

B2: Low Open Woodland of *Banksia menziesii - Eucalyptus todtiana - Banksia ilicifolia - Allocasuarina fraseriana* over *Jacksonia floribunda, Adenanthos cygnorum, Patersonia occidentalis, Hibbertia hypericoides* and *Dasypogon bromeliifolius.*

B3: Low Woodland of *Banksia menziesii - Banksia attenuata - Banksia ilicifolia - Nuytsia floribunda* over *Scholtzia involucrata, Patersonia occidentalis, Leucopogon polymorphus, Xanthorrhoea preissii, Hypocalymma robustum* and *Beaufortia elegans.*

B4: Disturbed Low Open Woodland of *Banksia grandis - Banksia menziesii* over *Acacia saligna*, *Scholtzia involucrata* and *Xanthorrhoea preissii*.

***Melaleuca* Woodlands**

M1: Low Open Woodland of *Melaleuca preissiana* over *Regelia ciliata, Kunzea ericifolia* subsp. *ericifolia, Adenanthos cygnorum, Acacia pulchella* and *Patersonia occidentalis* with various introduced species.

M2: Disturbed Open Woodland of *Melaleuca rhaphiophylla* over introduced species.

Heath Communities

H1: Closed Heath of *Pericalymma ellipticum, Banksia telmatiaea, Hakea varia, Hypocalymma angustifolium, Beaufortia elegans, Adenanthos cygnorum, Calothmanus lateralis* and *Mesomelaena tetragona.*

H2: Closed Heath of *Pericalymma ellipticum, Melaleuca pauciflora, Hypocalymma angustifolium, Hypolaena exsulca, Cyathochaeta avenacea, Mesomelaena tetragona, Meeboldina cana* and *Stirlingia latifolia* with emergent *Actinostrobus pyramidalis* and *Kingia australis.*

H3: Closed Heath of *Pericalymma ellipticum, Hakea sulcata, Hypolaena exsulca, Hypocalymma angustifolium, Verticordia densiflora* var. *densiflora, Dasypogon bromeliifolius, Phlebocarya ciliata* with scattered emergent *Kingia australis* and *Nuytsia floribunda.*

H4: Closed Heath of *Xanthorrhoea preissii* with scattered emergent *Corymbia calophylla - Banksia attenuata.*

Shrublands

S1*:* Low Shrubland of *Xanthorrhoea preissii, Dasypogon bromeliifolius*, *Patersonia occidentalis, Eremaea pauciflora, Hypolaena exsulca, Scholtzia involucrata, Lyginia imberbis* with emergent *Banksia attenuata, Banksia menziesii* and *Banksia ilicifolia.*

Disturbed Areas

D: Disturbed, drains, plantations, pasture, roads and buildings.

5.4 Significant Vegetation Communities

Vegetation Community B2 is regarded as Locally Significant due to the presence of *Conospermum undulatum* (R) and Isopogon drummondii (P3), and Vegetation Community C4 is regarded as Locally Significant to the presence of *Conospermum undulatum* (R), *Lambertia multiflora* var. *darlingensis* (P3) and *Jacksonia* ?*sericea* (P3).

Vegetation Community C4 is equivalent to Community 3a as defined by Gibson *et al*. (1994); *Corymbia calophylla – Kingia australis* woodlands on heavy soils of the Swan Coastal Plain. This is listed as a 'Threatened Ecological Community' (TEC) by English and Blyth (1997, 1999) and is also listed at the Federal level under the Environmental Protection Biodiversity Conservation Act (1999). This TEC has been categorised as Endangered. Three areas of this community were located during the survey. These were centered at:

405383 mE 6458470 mN
405260 mE 6459292 mN
405169 mE 6459435 mN

At one location (the most southern) the C4 community was very degraded and only occasional *Corymbia calophylla* or *Kingia australis* plants were present. However, immediately east of the pipeline the vegetation was in good to very good condition. At the other two recorded locations of the C4 communities the vegetation condition was good to very good condition, and consequently care should be taken to avoid further disturbance in these areas.

6. DISCUSSION

6.1 Flora

The flora and vegetation assessment undertaken on the Kwinana to Bullsbrook Pipeline corridor recorded 43 families, 122 genera and 167 plant taxa, including subspecies and varieties (Appendix A). The low number of taxa recorded during a survey of such relatively large size reflects the high degree of disturbance and the large area of cleared land. The major families recorded reflect the predominant types of vegetation communities recorded. In view of the seasonal conditions and particular period of drought, it is predicted that additional species would be recorded if further survey work were undertaken during other seasons or in more favourable rainfall periods.

One species listed as Declared Rare Flora under the Wildlife Conservation Act (1950) was located at two sites during the survey, *Conospermum undulatum* (R). This species is also listed as Vulnerable, under the EPBC Act (1999), no plant species listed as Threatened, Endangered or Critically Endangered were located during the survey.

Three Priority three species were found along the pipeline route. *Lambertia multiflora* var. *darlingensis, Isopogon drummondii* and *Jacksonia* ?*sericea* were each found at one location within the pipeline corridor. It is recommended that further fieldwork be undertaken to confirm the identification of *Jacksonia* ?*sericea* as at the time of the survey fertile plant material was not available.

A high number of weeds are found to occur within the proposed pipeline infrastructure corridors. The abundance of weeds far exceeds the diversity of weed species recorded. This is because a small number of introduced species are common pasture weeds and occur in dense numbers in grazing paddocks and urban areas. A total of 32 introduced species were identified within the infrastructure corridor. No recorded weed species are listed as declared plants under Section 37 of the Agriculture and Related Resources Protection Act (1976). Declared Plants are weeds that already are or have the potential to become pest weeds.

6.2 Vegetation

6.2.1 Communities and Disturbance

A total of 27 vegetation communities were located and mapped within the pipeline corridor. The vegetation communities recorded along the Kwinana to Bullsbrook infrastructure corridor were not particularly diverse, despite the high number of communities recorded. The high number of communities recorded during this survey reflects the large area surveyed and to some degree the diversity of landforms within the survey area. Many of the vegetation communities differ only slightly from one another and the contrasts are more than likely due to a loss of structure and diversity due to degradation from urban development throughout much of the survey area.

The predominant plant communities were *Eucalyptus* Woodlands over various other tree and shrub species. There were also many *Corymbia* Woodlands, *Melaleuca* Woodlands and *Banksia* Woodlands, while less common were Heaths and Shrublands. Vast areas of pastures and housing developments were very common along the pipeline route.

The condition of the vegetation throughout the survey area ranged from Very Good (3) to Degraded (5), in accordance with the condition scale, adapted from *Keighery* (1994) and used for the Perth Metropolitan area in Bush Forever publications (Department of Environmental Protection, 2000). Evidence of disturbance was largely associated with roads, railway lines, powerlines, housing developments and variable grazing pressures.

6.2.2 Significance of Vegetation

Two of the communities recorded in the Kwinana to Australind infrastructure corridor survey area are regarded as significant as they support Rare and Priority Flora taxa (Appendix B – communities B2 and C4). Three Priority Flora species have been located at three separate locations within the survey area. Disturbance of these communities should be avoided whenever possible.

Vegetation communities are referred to as Regionally Significant where they are limited to specific landform types, are uncommon or restricted community types within the regional context, or are recognized as a threatened ecological community or supports Declared Rare Flora.

Vegetation Community C4 is equivalent to Community 3a as defined by Gibson *et al*. (1994); *Corymbia calophylla – Kingia australis* woodlands on heavy soils of the Swan Coastal Plain. This is listed as a 'Threatened Ecological Community' (TEC) by English and Blyth (1997, 1999) and is also listed at the Federal level under the Environmental Protection Biodiversity Conservation Act (1999). This TEC has been categorised as Endangered. Three areas of this community were located during the survey. At one location (the most southern) the C4 community was very degraded and only occasional *Corymbia calophylla* or *Kingia australis* plants were present. However, at the other two recorded locations of the C4 communities the vegetation condition was good to very good condition. Therefore, Vegetation Community C4 is regarded as Regionally Significant and consequently care should be taken to avoid further disturbance to these areas.

8. LIST OF PARTICIPANTS

The following personnel of Mattiske Consulting Pty Ltd were involved in this project:

Principle Ecologist:
- Dr. E. Mattiske

Senior Botanist:
- Mrs. B. Koch

Botanists:
- -
- Ms. N. Whittington
- Ms. S. Thomson

9. ACKNOWLEDGEMENTS

In addition, the authors would like to particularly thank Mr Allan White and staff of CAD Resources for assistance with the map production phase.

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