Wetland flora survey

Murray Drainage and Water Management Plan and Associated Studies

This report was prepared for the Department of Water

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1. Introduction

1.1 Background

1.2 Aim of Study

GHD has been commissioned by the Department of Water (DoW) to prepare a Drainage and Water Management Plan (DWMP) for the Murray area. This plan will provide guidance to the Department of Planning, the Shire of Murray, land owners and potential developers to inform future land use planning processes in the area.

A scientific understanding of surface and groundwater regimes and the Ecological Water Requirements (EWR's) of wetland biosystems in the study area is required as part of the planning process. The purpose of this investigation was to undertake baseline monitoring of the vegetation and flora along transects within the wetlands surveyed. The purpose of undertaking the vegetation monitoring along a transect (as opposed to quadrats within each identified vegetation type within a wetland) was to identify how the vegetation and flora relates to the ground water gradient.

1.3 Location

The Murray Drainage and Water Management Plan study area (Figure 1) lies within the Murray Catchment which encompasses an area from Keysbrook in the north to Mandurah in the west and Pinjarra in the south.

1.3.1 Wetland Selection

Wetlands surveyed as part of this investigation were were selected by a process of elimination in consultation with the landowners, DoW and the Department of Environment and Conservation (DEC).

A desktop analysis of the following data sets was undertaken as part of the initial selection process:

- Recent aerial photography;
- Geomorphic Wetlands of the Swan Coastal Plain data set; and
- Aboriginal sites of significance.

This desktop assessment identified a series of wetlands that met the following criteria:

- conservation category wetland;
- representative of a range of wetland types, not influenced hydrologically by the Peel Harvey Estuary (this eliminated all of the riparian and estuarine wetland sites);
- geographically located across the entire catchment;
- wetlands with "good" or better vegetation condition that had a vegetated buffer; and
- wetlands not located within an Aboriginal site of significance.

Landowners of wetlands identified from the desktop assessment were contacted and permission was obtained to undertake the following:

- surveying a transect,
- base line monitoring of the vegetation along the transect, and
- installing monitoring bores within proximity of the wetland.

Wetlands where permission to undertake monitoring was denied were removed from the list of potential study sites.

Wetlands where permission was obtained to undertake the monitoring were then ground-truthed and assessed for suitability. During the ground-truthing phase, wetlands that were highly altered or degraded were eliminated. These wetlands have beenn included in a separate desktop assessment report.

After this process of elimination, the final selection of wetlands for detailed assessment of the vegetation was made. These wetlands are listed in Table 1 and their respective locations are shown in Figure 1.

Table 1 Wetlands in the Murray Catchment selected for flora and vegetation assessment

Wetland UFI	Property Reference	Management Category	Wetland Type
3945	Lot name 2978 (Reserve R35077) Pinjarra Rd, Furnissdale (Department of Planning, State Land Services)	Conservation	Sumpland
5724 west	Lot name 243, (lot number 2), Benden Rd, Nambeelup (Lot 243 Pty Ltd)	Conservation	Sumpland
5724 east	Lot name 246 (lot number 221) Benden Rd, Nambeelup (Twin Ocean Nambeelup Pty Ltd)	Conservation	Sumpland
5180 east	Lot name 246 (lot number 221) Benden Rd, Nambeelup (Twin Ocean Nambeelup Pty Ltd)	Resource Enhancement	Sumpland
7046	Lot number 899 Elliott Rd, Keysbrook	Conservation	Sumpland
7029	Lot number 999 Elliott Rd Keysbrook	Conservation	Palusplain
4835 north	Lot number 1019 Lakes Rd, Nambeelup (Hawkview Holdings Pty Ltd)	Conservation	Sumpland
4835 south	Lot name 221 Lakes Rd, Nambeelup (Twin Ocean Nambeelup Pty Ltd)	Conservation	Sumpland
5032	Lot number 98 Nambeelup Rd, Nambeelup (Passio Pty Ltd)	Conservation	Sumpland
5056 south	Lot number 323 Moores Rd and Lot number 348 Pinjarra Rd, Pinjarra (Shire	Conservation	Palusplain

Wetland UFI	Property Reference	Management Category	Wetland Type
	of Murray Reserve)		
5056 north	Lot number 384 Pinjarra Rd, Pinjarra (Department of Planning, State Land Services)	Conservation	Dampland

1.3.2 Wetland transects

Monitoring transects were set up across each of the wetlands. The transects were established across the widest portion of the wetland along the ground water gradient. Each of the monitoring transects were surveyed and the surface heights (mHD) recorded along the transect. The surveyor's information was used to determine the location of the vegetation monitoring quadrats along the transects.

1.4 Existing Natural Environment

1.4.1 Bioregional Context

Western Australia supports 53 biogeographical subregions. The study area is located in the Perth Subregion of the Swan Coastal Plain. The Swan Coastal Plain Bioregion is a low-lying coastal plain, mainly covered with woodlands. It is dominated by Banksia (*Banksia* sp.) or Tuart (*Eucalyptus gomphocephala*) on sandy soils, Swamp Sheoak (*Casuarina obesa*) on outwash plains and Paperbark (*Melaleuca* sp.) in swampy areas.

The Perth Subregion includes a complex series of seasonal wetlands and also includes the many islands found offshore from Perth (McKenzie *et al.*, 2002).

1.4.2 Beard Mapping

According to Beard (1979), the vegetation of the study area is located within the Drummond Botanical Subdistrict of the Swan Coastal Plain Subregion. All of the selected wetlands of the project area occur within Beard's Vegetation complex 1000 which is described as a swampy plain with a mosaic of *Eucalyptus marginata*, *Corymbia calophylla* woodland, *Banksia attenuata* , *Banksia menziesii* low woodland and a low forest of *Melaleuca rhaphiophylla* or *M. cuticularis*.

1.5 Vegetation

1.5.1 Vegetation Complexes

According to mapping by Heddle *et al.* (1980), the vegetation complex of the all but one of the selected wetlands (i.e. UFI 5718) and surrounding areas is considered to be Bassendean Complex Central and South. This vegetation complex is characterised by: Woodland of *E. marginata - C. calophylla* with well defined second storey of *Allocasuarina fraseriana* and *Banksia grandis* on the deeper soils and a closed scrub

on the moister sites. The understorey species reflect similarities with adjacent vegetation complexes.

UFI 5718 occurs within the Southern River Complex. This vegetation complex is characterised by: Open woodland of *Corymbia calophylla – Eucalyptus marginata – Banksia* species with fringing woodland of *Eucalyptus rudis – Melaleuca rhaphiophylla* along creek beds.

1.5.2 Threatened Ecological Communities

Ecological communities are defined as 'naturally occurring biological assemblages that occur in a particular type of habitat' (English and Blythe, 1997). TECs are ecological communities that have been assessed and assigned to one of four categories related to the status of the threat to the community, i.e. Presumed Totally Destroyed, Critically Endangered, Endangered, and Vulnerable.

Some TECs are protected under the EPBC Act (DEWHA, 2010). Although TECs are not formally protected under the State *Wildlife Conservation Act 1950,* the loss of, or disturbance to, some TECs triggers the EPBC Act. The Environmental Protection Authority's (EPA's) position on TECs states that proposals that result in the direct loss of TECs are likely to require formal assessment.

Possible TECs that do not meet survey criteria are added to the DEC's Priority Ecological Community (PEC) Lists under Priorities 1, 2 and 3. These are ecological communities that are adequately known; are rare but not threatened, or meet criteria for Near Threatened. PECs that have been recently removed from the threatened list are placed in Priority 4. These ecological communities require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5.

A search of the DEC's Threatened and Priority Ecological Communities database was conducted for the Project Area prior to undertaking the field survey. One of the wetlands was identified as having an occurrence of a TEC. UFI 5056 has an occurrence of SCP 9 which is "*dense shrublands on clay flats*". This TEC is listed as vulnerable by the WA State Government.

1.6 Environmentally Sensitive Areas

All conservation category wetlands are mapped with a buffer and are classified as environmentally sensitive areas (ESA's). ESA's also apply to areas where there are known occurrences of threatened ecological communities, declared rare flora and other significant environmental values.

With the exception of one resource enhancement wetland, all of the wetlands in the study area are conservation category wetlands and therefore covered by an ESA. The resource enhancement wetland UFI 5180 also has an ESA associated with it. A portion of this wetland is an Environmental Protection Policy (EPP) Lake. EPP Lakes are also ESA's.

1.7 Flora

1.7.1 Significant Flora

Commonwealth Legislation

Species of significant flora are protected under both State and Commonwealth Acts. Any activities that are deemed to have a significant impact on species that are recognised by the EPBC *Act* and the *Wildlife Conservation Act 1950* can trigger referral to the DEWHA and/or the EPA.

A description of Conservation Categories delineated under the EPBC Act is detailed in Table 15, Appendix B. These are applicable to threatened flora and fauna species.

A search of the EPBC Act Protected Matters Search Tool (DEWHA, 2010) identified 10 Commonwealth protected flora species. These are listed in Table 2:

Table 2 EPBC Listed Protected Flora that may occur in the project area.

Species	EPBC Status	Occurrence
Anthocercis gracilis Slender Tailflower	Vulnerable	Species or species habitat likely to occur within area
Caladenia huegelii King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid	Endangered	Species or species habitat likely to occur within area
Darwinia sp. Muchea (B.J.Keighery 2458) Muchea Bell	Critically Endangered	Species or species habitat likely to occur within area
Drakaea elastica Glossy-leaved Hammer-orchid, Praying Virgin	Endangered	Species or species habitat likely to occur within area
Drakaea micrantha Hopper & A.P.Brown nom. inval. Dwarf Hammer-orchid	Vulnerable	Species or species habitat likely to occur within area
Lasiopetalum pterocarpum Wing-fruited Lasiopetalum	Endangered	Species or species habitat likely to occur within area
Lepidosperma rostratum Beaked Lepidosperma	Endangered	Species or species habitat likely to occur within area
Synaphea sp. Fairbridge Farm (D.Papenfus 696) Selena's Synaphea	Critically Endangered	Species or species habitat known to occur within area
Synaphea sp. Pinjarra (R.Davis 6578) Club-leafed Synaphea	Critically Endangered	Species or species habitat known to occur within area
Synaphea stenoloba Dwellingup Synaphea	Endangered	Species or species habitat known to occur within area

The wetlands of the Murray Flood Study Project Area contain suitable habitat for most species listed in Table 2.

State Legislation

In addition to the EPBC Act, significant flora in Western Australia is protected by the *Wildlife Conservation Act 1950*. This *Act*, which is administered by the DEC, protects DRF species. The DEC also maintains a list of priority listed flora species. Conservation codes for flora species are assigned by the DEC to define the level of conservation significance.

Priority listed flora are not currently protected under the *Wildlife Conservation Act 1950*. Priority listed flora may be rare or threatened, but cannot be considered for declaration as rare flora until adequate surveys have been undertaken of known sites and the degree of threat to these populations clarified. Special consideration is often given to sites that contain priority listed flora, despite them not having formal legislative protection. A description of the DEC's Conservation Codes that relate to flora species is provided in Table 16, Appendix B.

Prior to conducting the field survey, a NatureMap search of each of the wetlands (1km search radius) was undertaken to ascertain if there were any Declared Rare or Priority Listed Flora present. NatureMap searches were undertaken using the following databases:

- The Department's *'Declared Rare and Priority Flora List'*, which contains species that are Declared Rare (Conservation Code R or X for those presumed to be extinct), poorly known (Conservation Codes 1, 2 or 3), or require monitoring (Conservation Code 4); and
- the *'Western Australian Herbarium Specimen'* database.

The DEC Database searches revealed a range of Declared Rare Flora and Priority flora species that may potentially occur in the area.

The results of the Rare and Priority Flora identified from the NatureMap search are presented in Table 3.

Table 3 Priority Flora identified from NatureMap as occurring within the vicinity of selected wetlands for the Murray Flood study area

Species	Conservation Code	Wetland UFI
Acacia benthamii	P2	5056
Acacia lasiocarpa var *bracteolate* long peduncle variant	P1	5032
Anthonium junciforme	P4	5056
Dillwynia dillwynoides	P3	3945, 5056
Diuris purdiei Purdies Donkey Orchid	DRF	5056
Drosera occidentalis subsp	P4	5056

Species	Conservation Code	Wetland UFI
occidentalis		
Caladenis speciosa	P4	5032
Grevillea bipinnatifida subsp *pagna*	P4	5056
Jacksonia sericea	P4	3945
Johnsonia pubescens subsp *cygnorum*	P2	4835, 5032
Microtis quadrata	P4	5056
Stylidium longitubum	P3	7046, 5056
Synaphea stenoloba	DRF	5056
Rhodanthe pyrethrum	P3	5056
Schoenus benthamii	P3	5056
Schoenus pennisetis	P1	5056
Triptococcus paniculatus	P1	5056

1.8 Methodology

1.8.1 Flora

A spring flora survey was undertaken by GHD botanists, Georgina Nielssen, Gaynor Owen, and Christine Best, all of whom have experience in conducting surveys of wetlands on the Swan Coastal Plain. The spring flora survey was undertaken with reference to Guidance Statement 51, *Guidelines for Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia* (EPA, 2004).

Data collected during the vegetation and flora surveys was initially proposed to be undertaken by assessing 10 x 10m plots along a transect every 0.1m change in the surface height. However, this method was determined not to be practical in the field due to the presence of standing water in some wetlands and thick understorey vegetation in others.

The transects were surveyed and spot heights determined prior to the flora and vegetation assessments. The location of the quadrats was plotted on the transects to determine the exact surface height where the quadrats were located. In addition to the surface height values, the boundary of each community type was identified and located using a GPS.

The vegetation condition within the quadrats was assessed using the vegetation condition rating scale developed by Keighery (1994) that recognises the intactness of vegetation, which is defined by the following:

- Completeness of structural levels;
- Extent of weed invasion;
- Historical disturbance from tracks and other clearing or dumping; and
- The potential for natural or assisted regeneration.

The methodology used to undertake the flora survey and vegetation mapping and assessment was follows:

Desktop Assessment

- Review of all existing data, including a search of the Western Australian Herbarium Specimen database for priority listed species and DEC's Declared Rare and Priority Flora List, and DEC's Threatened Ecological Community database;
- Aerial photo interpretation prior to the field surveys to ensure the transect(s) are representative of thorough coverage of all vegetation units on the site;
- All ecological data collected along the transects was geo referenced with a handheld GPS;
- Collect and identify species present on the site;
- Confirm species identification with resources at the WA Herbarium; and
- GIS mapping using aerial photography and captured GPS waypoints to delineate vegetation units, vegetation condition, water courses and all other relevant information.

1.8.2 Limitations

A table of the limitations and constraints of the flora and vegetation assessment is provided in Table 4.

Table 4 Limitations and constraints associated with the Murray wetlands flora and vegetion assessment.

Variable	Impact on Survey Outcomes
Access Problems	Access across the surveyed transects within some of the wetlands was limited by high water levels when surveys were undertaken in October and November 2009. The wet sections of these wetlands were revisited in Dec 2009.
Experience levels	The botanists who executed these surveys were practitioners suitably qualified in their respective fields. Coordinating Botanist: Georgina Nielssen (Senior Ecologist); Field Staff: Georgina Nielssen, Gaynor Owen (Ecologist), Chrisitne Best (Ecologist); Taxonomy: Georgina Nielssen (Senior Ecologist) and Gaynor Owen (Ecologist); Data Interpretation: Georgina Nielssen (Senior Ecologist)

Variable	Impact on Survey Outcomes
Timing[1], weather, season.	The surveys were undertaken in spring 2009. The area had received 952.5 millimetres of rainfall in the between May and October 2009 this was slightly lower than the long term average recorded at the Karnet (983.4 mm) for the same period (Bureau of Meteorology 2010). Flora composition changes over time, with flora species having specific growing periods, especially annuals and ephemerals (some plants lasting for a markedly brief time, some only a day or two). Therefore the results of future botanical surveys in this location may differ from the results of this survey.
Completeness	As the survey was conducted only once rather than several times over the course of a year some annual, ephemeral condition specific species may be present that were not recorded in the survey. Species that were insufficiently mature or dead were identified in the field to Genus or Family level only (where possible).
Determination	This survey makes inferences about vegetation types that have the potential to be TECs. However, a decision as to the presence or absence of TECs at the site remains the responsibility of the DEC's Species & Communities Branch. The taxonomy and conservation status of the Western Australian flora are dynamic. This report was prepared in reliance on taxonomy and conservation current at the time, but it should be noted this may change.

[1] EPA Guidance Statement 51 (2004) stipulates that flora and vegetation surveys should be undertaken following the season that contributes the greatest rainfall in the region. In the Northern Province, this is after summer. In the Eremaean Province, rainfall is sporadic, and in the South-west Province the main rain is in winter, requiring surveys to be undertaken in spring. Short-term variances in normal weather patterns (e.g. drought) may necessitate supplementary survey work at other times of year or in later years to take into account temporal changes in diversity.

2. Results

2.1 Vegetation

2.1.1 Vegetation Condition

The vegetation condition of the site was assessed using the vegetation condition rating scale developed by Keighery (1994) that recognises the intactness of vegetation, which is defined by the following:

- Completeness of structural levels;
- Extent of weed invasion;
- Historical disturbance from tracks and other clearing or dumping; and
- The potential for natural or assisted regeneration.

Applying the Bush Forever condition rating scale, (Government of Western Australia, 2000), the majority of the vegetation within the wetlands varied from 1 (pristine) to 6 (completely degraded). In general the bushland condition of the wetlands improved towards the centre of the wetlands where disturbances are minimised due to access being restricted by either high water levels or thick vegetation. The vegetation around the periphery was more likely to have been impacted by multiple disturbances such as land clearing, weeds, grazing, uncontrolled access and altered hydrological regimes.

2.1.2 Vegetation Types

The vegetation types observed within the surveyed wetlands are listed in Tables 5-15. Generally, the wetland vegetation consisted of an upland zone supporting Banksia woodland with Tuart, Jarrah and Marri. This vegetation unit, to a large extent, has been significantly altered by land clearing, grazing and weed encroachment. This is evident in the vegetation community descriptions that identify weeds as the dominant herb layer in the upland vegetation of most of the wetlands. The wetland vegetation is predominantly *Melaleuca preissiana*, *Melaleuca rhaphiophylla* or *Melaleuca cuticualris* with a shrublayer of *Kunzea glabrescens* and *Astartea scorpia* over *Lepidosperma longitudinale* and mixed herbs. A number of the wetlands had open water bodies with floating and submergent aquatic plants.

The vegetation types along the surveyed transects of the wetlands are shown in Figure 3, Appendix A)

Table 5 Vegetation types present along the survey transect of UFI 3945

Vegetation community Name		Vegetation Community Description	Elevational Range (mHD)	Bushland Condition	Quadrat
*Ec *Rr		Closed grassland of **Ehrharta calycina, *Romulea rosea, *Bromus diandrus* and weed spp	1.7-1.7	6	Q4
Eg Mi		Open forest of *Eucalyptus gomphocephala* over tall shrubland of *Melaleuca incana* subsp *incana* over closed grassland of **Bromus diandrus*	0.9-1.7	5-6	Q5

Vegetation community Name		Vegetation Community Description	Elevational Range (mHD)	Bushland Condition	Quadrat
Mr *Psp		Open forest of *Melaleuca rhaphiophylla* over sedgeland, grassland of **Polypogon* sp. and scattered herbs of **Cotula coronopifolia*	0.5-0.9	4-5	Q6
Mr *Cd		Low open forest of *Melaleuca rhaphiophylla* over grassland of **Cynodon dactylon*	0.5-0.7	4-5	Q7
OW		Open water	0.0-0.5	-	

Vegetation community Name		Vegetation Community Description	Elevational Range (mHD)	Bushland Condition	Quadrat
Mc		Low woodland of *Melaleuca rhaphiophylla*, *Melaleuca incana* subsp *incana* and planted tree spp. over mowed grassland of weed sp.	1.8-2.7	5-6	Q1, Q2, Q3

Table 6 Vegetation types present along the survey transect of UFI 5724

Vegetation community Name		Vegetation Community Description	Elevation Range (mHD)	Bushland Condition	Quadrat
Em Ba		Low open forest of *Eucalyptus marginata* and *Banksia attenuata* over tall open scrub of *Melelaueca incana* subsp *incana* over sedgeland and grassland	15.5 15.6	4	Q1

Vegetation community Name		Vegetation Community Description	Elevation Range (mHD)	Bushland Condition	Quadrat
Mp Kg		Open forest of *Melaleuca preissiana* over open shrubland of *Kunzea glabrescens* over open sedgeland with *Baumea articulata* and *Baumea pressii*	15.3- 15.5	2-3	Q2, Q3
Mp Kg Ba		Low open forest of *Melaleuca preissiana* over tall open scrub of *Kunzea glabrescens* over open sedgeland with *Baumea articulata* and *Baumea pressii*	13.5 -15.3	2	Q4

Vegetation community Name		Vegetation Community Description	Elevation Range (mHD)	Bushland Condition	Quadrat
Mp Cp		Closed tall scrub of *Melaleuca preissiana* over herbland of *Cassytha* sp. over isolated sedges	13.5 – 12.9	1-3	Q6, Q7
Bm Ba		Low open woodland of *Banksia menziesii, Banksia attenuata* and *Eucalyptus marginata* over tall open shrubland of *Kunzea ericifolia* over grassland	14.5 -15.5	6	Q5

Table 7 Vegetation types present along the survey transect of UFI 5180

Vegetation community Name		Vegetation Community Description	Elevation Range (mHD)	Bushland Condition	Quadrat
Mr Cr		Low open forest of *Melaleuca rhaphiohylla* with *Cassytha racemosa.*	10.8 -11.5	1-5	Q8, Q9, Q10, Q11, Q12
Mr La		Closed forest of *Melaleuca rhaphiohylla* over open heath with *Leucopogon australis* over closed sedgeland with *Meeboldina scariosa*	11.3 – 12.5	1	Q13, Q14

Vegetation community Name		Vegetation Community Description	Elevation Range (mHD)	Bushland Condition	Quadrat
Em Kg		Open woodland of *Eucalyptus marginata* over tall open scrub of *Kunzea glabrescens* over herbland of *Dasypogon bromeliifolius* over grassland	12.5 -15.0	3-6	Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q15

Table 8 Vegetation types present along the survey transect of UFI 7046

Vegetation community Name		Vegetation Community Description	Elevation Range (mHD)	Bushland Condition	Quadrat
Ke Mt		Tall open scrub of Kunzea *ericifolia* and *Melaleuca thymoides* closed herbland and grassland	20.0 – 20.7	No	Q14, Q15

Vegetation community Name		Vegetation Community Description	Elevation Range (mHD)	Bushland Condition	Quadrat
Ke Mt Af		Tall open scrub of *Melaleuca rhapiophylla* over very open herbland of aquatic *Azolla filiculoides* and *Lemna* sp.	20.3 - 20.8	No	Q6, Q7, Q8, Q9, Q10, Q11, Q12, Q13,
Mp Mr		Low open forest of *Melaleuca preissiana* and *Melaleuca rhaphiophylla* s over open heath of *Melaleuca osullivanii*. over herbland of *Cotula coronopifolia** and *Rumex* sp.	20.8 – 21.9	No	Q5,

Vegetation community Name		Vegetation Community Description	Elevation Range (mHD)	Bushland Condition	Quadrat
*W		Herbland and open grassland of weeds	21.9 – 22.1	No	Q2, Q3, Q4
Bm Bi		Low woodland of *Banksia menziesii* and *Banksia ilicifolia* over herbland of *Desmocladus flexuosus* and *Ursinia anthemoides**	22.1 – 22.4	No	Q1,

Table 9 Vegetation types present along the survey transect of UFI 7029

Vegetation community Name		Vegetation Community Description	Elevation Range (mHD)	Bushland Condition	Quadrat
Bm Ba		Low open forest of *Banksia menzeisii* *Banksia attenuata* and *Banksia ilicifolia* over herbland of *Desmocladus flexuosus* and mixed herbs	22.3 – 23.7	2	Q1, Q2
Bm Ah		Isolated trees of *Banksia menziesii* and *Allocasuarina humilis* over open heath of *Regelia ciliata* over open herbland with *Desmocladus flexuosus* and *Dasypogon bromeliifolius* and grassland	21.5 - 22.3	4-5	Q3, Q4

Vegetation community Name		Vegetation Community Description	Elevation Range (mHD)	Bushland Condition	Quadrat
As Rc		Open heath of *Astartea scoparia, Regelia ciliata* and *Hypocalymma angustifolium* subsp *Swan Coastal* over very open herbland and grassland	21.0 -21.5	2	Q5
Mp As		Open woodland of *Melaleuca preissiana* over tall scrub of *Astartea scoparia and Kunzea ericifolia* over open herbland and grassland.	21.1 -21.5	2-3	Q6, Q7, Q8, Q9,

Vegetation community Name		Vegetation Community Description	Elevation Range (mHD)	Bushland Condition	Quadrat
As		Shrubland of *Astartea scoparia* over grassland of weeds and herbland of weeds.	21.5 – 21.7	4-6	Q10, Q11, Q12, Q13, Q14

Table 10 Vegetation types present along the survey transect of UFI 4835 (north)

Vegetation community Name		Vegetation community Description	Elevation Range (mHD)	Bushland Condition	Quadrat
*Pc*Pm		**Pennisetum clandestinum* and **Phlaris minor* grassland over very open herbland of weed species	8.9 -10.5	2-6	Q12, Q13, Q20, Q11, Q22, Q10, Q23, Q9
*Pc*Pe	No Photo Available	**Pennisetum clandestinum* closed grassland and open herbland with **Pteridium esculentum*	8.3 – 9.2	2-6	Q12, Q13, Q20, Q11, Q22, Q10, Q23, Q9

Vegetation community Name		Vegetation community Description	Elevation Range (mHD)	Bushland Condition	Quadrat
Mp Mr		Low open forest of *Melaleuca preissiana* and *Melaleuca rhaphiophylla* over open shrubland of *Melaleuca lateritia* and *Astartea scoparia* over closed sedgeland of *Lepidosperma longitudinale* and *Juncus pallidus*	9.0 – 10.5	4	Q24
Mp Mr Ml		Low open woodland of *Melaleuca preissiana* and *Melaleuca rhaphiophylla* over open shrubland of *Melaleuca lateritia* and *Astartea scoparia* over closed sedgeland of *Lepidosperma longitudinale* and *Juncus pallidus*	14.9 -10.5	3-5	Q8, Q7

Table 11 Vegetation types present along the survey transect of UFI 4835 (South)

Vegetation community Name		Vegetation Community Description	Elevation Range (mHD)	Bushland Condition	Quadrat
Ca		Open herbland of *Conostylis aculeata* and weeds	10.8 -11.3	6	Q1
As Js		Open heath of *Astartea scorparia* and *Jacksonia sternbergiana* and weeds	9.7 -10.1	5-6	Q2

Vegetation community Name		Vegetation Community Description	Elevation Range (mHD)	Bushland Condition	Quadrat
Kg Ll		Tall open scrub of *Kunzea glabrescens* over sedgeland with *Lepidosperma longitudinale* and *Microlaena stipoides*	9.2 – 9.7	4-5	Q3, Q16
Mr As		Low open forest of *Melaleuca rhaphiophylla* over open shrubland of *Astartea scoparia Melaleuca laterita* over closed sedgeland with *Lepidosperma longitudinale*	8.7 – 9.2	2	Q17

Vegetation community Name		Vegetation Community Description	Elevation Range (mHD)	Bushland Condition	Quadrat
As Ml		Open heath of *Astartea scoparia Melaleuca laterita* over sedgeland with *Lepidosperma longitudinale*	8.7 – 9.6	3-4	Q6
Mp As		Closed tall scrub of *Melaleuca preissiana, Astartea scoparia* and *Hypocalymma angustifolium* sp. over closed sedgeland with *Meeboldia scariosa and Hypolaena exsulca*	9.7- 12.5	2-3	Q4, Q5,

Table 12 Vegetation types present along the survey transect of UFI 5032

Vegetation community Name		Vegetation community Description	Elevation Range (mHD)	Bushland Condition	Quadrat
Xp Kg		Tall open scrub of *Xanthorrhorea preissii* and *Kunzea glabrescens* over closed heath of *Dasypogon bromeliifolius* and *Laxmannia ramosa* with *Hypolaena exsulca, Phlebocarya ciliata* and *Lyginia barbarta* sedgeland	16.6 -16.9	1	Q2, Q1
Mp Kg		Low open forest of *Melaleuca preissiana* over open scrub *Kunzea glabrescens* and *adenanthos meisneri* of heath of *Dasypogon bromeliifolius* and *Laxmannia ramosa* with *Hypolaena exsulca, Phlebocarya ciliata* and *Lyginia barbarta* sedgeland	16.4-16.6	1	Q4, Q5, Q11, Q3

Vegetation community Name		Vegetation community Description	Elevation Range (mHD)	Bushland Condition	Quadrat
Kg Ha		Closed tall scrub of *Kunzea glabescens* over closed heath of *Hypocalymma angustifolium, Pericalymma ellipticum* var *ellipticum* and *Euchilopis linearis* over sedgeland with *Hypolaena exsulca* and *Carex inversa*	16.0 – 16.5	1	Q6
Kg Ml		Tall open scrub with *Kunzea glabrescens* and open heath with *Melaleuca lateritia*, *Calothamnus lateralis* and *Astartea scorparia* over open sedgeland with *Leipdosperma pubisquameum* and *Meeboldia scariosa*	16.5-16.8	1	Q7, Q12, Q13, Q14, Q15

Vegetation community Name		Vegetation community Description	Elevation Range (mHD)	Bushland Condition	Quadrat
Ml Mb		Closed tall scrub of *Melaleuca lateritia, Melaleuca brevifolia* and *Astartea scorpia* over an open sedgeland of *Lepidosperma longitudinale* and *Meeboldina scariosa*	16.8-17.3	2	Q18
Mp Bsp		Open woodland of *Melaleuca preissiana* and Banksia sp. and tall open shrubland of *Kunzea glabescens* and *Astartea scoparia* over closed low heath with *Hypocalymma angustifolium* and sedgeland with *Hypolaean exsulca*	17.3-17.6	1-2	Q16, Q17

Vegetation community Name		Vegetation community Description	Elevation Range (mHD)	Bushland Condition	Quadrat
Kg		*Kunzea glabescens* shrubland	17.6 – 17.9	1	Q8
Bsp	No photo available	Low open forest of Banksia spp.	17.9 -18.2	5	Q10

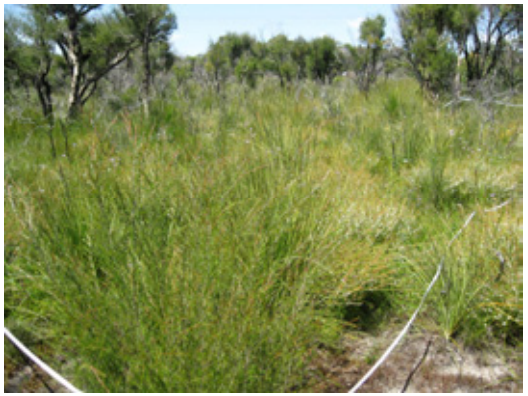
Table 13 Vegetation types present along the survey transect of UFI 5056

Vegetation community Name		Vegetation Community Description	Elevation Range (mHD)	Bushland Condition	Quadrat
Cc Mp		Open woodland *Corymbia calophylla, Melaleuca preissiana , Xanthorrhoea preissii, Hypocalymma angustifolium* and mixed herbs	8.3-8.5	3-5	Q17, Q18, Q19, Q20, Q21
Er Mp		Open woodland *Eucalyptus rudis, Melaleuca preissiana* and *Melaleuca rhaphiophylla* over *Lepidosperma longitudinale* and weeds	8.0-8.3	3-4	Q15, Q16, Q22

Vegetation community Name		Vegetation Community Description	Elevation Range (mHD)	Bushland Condition	Quadrat
Cc Mp		Open woodland *Corymbia calophylla, Melaleuca preissiana, Xanthorrhoea preissii, Hypocalymma angustifolium* and mixed herbs	8.0-8.5	3	Q13, Q14
Af Ap		Open woodland *Allocasuarina fraseriana, Acacia pulchella* over mixed sedges and herbs	8.5-8.6	3	Q12

Vegetation community Name		Vegetation Community Description	Elevation Range (mHD)	Bushland Condition	Quadrat
Cc Mp		Open woodland *Corymbia calophylla, Melaleuca preissiana , Xanthorrhoea preissii, Hypocalymma angustifolium* and mixed herbs	8.6-8.7	3	Q11
Af Ap		Open woodland *Allocasuarina fraseriana, Acacia pulchella* over mixed sedges and herbs	8.65-8.7	3	Q10

Vegetation community Name		Vegetation Community Description	Elevation Range (mHD)	Bushland Condition	Quadrat
Cc Mp		Open woodland *Corymbia calophylla, Melaleuca preissiana , Xanthorrhoea preissii, Hypocalymma angustifolium* and mixed herbs	7.9-8.65	3-4	Q7, Q8, Q9
Mp Ll		Open woodland *Melaleuca preissiana* over *Lepidosperma longitudinale* and mixed herbs	7.9-8.0	3-5	Q4, Q5, Q6

Vegetation community Name		Vegetation Community Description	Elevation Range (mHD)	Bushland Condition	Quadrat
Cc Mp		Open woodland *Corymbia calophylla, Melaleuca preissiana , Xanthorrhoea preissii, Hypocalymma angustifolium* and mixed herbs	8.3- 8.0	5	Q3
*PW		Paddock weeds	8.3-9.1	6	Q1, Q2

2.2 Flora

2.2.1 Flora Species

It should be noted that the flora species identified during this study were only those that occurred within quadrats along the transects. The vegetation of the entire wetland was not surveyed or searched for all species that occur within the wetland. The results have been reported on a wetland by wetland basis.

UFI 3945

A total of 47 plant taxa (including subspecies and varieties) representing 17 families and 37 plant genera were recorded in the survey area (Table 17, Appendix B). This total is comprised of 15 native species and 32 introduced (exotic) species.

Dominant families recorded from UFI 3945 included:

- Poaceae (grasses) 12 taxa
- Asteraceae (daisies) 7 taxa
- Myrtaceae (myrtles) 6 taxa

No flora of conservation significance was identified as occurring within the surveyed quadrats.

UFI 5724

A total of 66 plant taxa (including subspecies and varieties) representing 24 families and 50 plant genera were recorded in the survey area (Table 18, Appendix B). This total is comprised of 52 native species and 14 introduced (exotic) species.

Dominant families recorded from UFI 5724 included:

- Myrtaceae (myrtles) 9 taxa
- Asteraceae (daisies) 9 taxa
- Poaceae (grasses) 8 taxa
- Fabaceae (peas) 5 taxa

One species of conservation significance *Stylidium striatum* a priority 4 species was identified as occurring within the quadrats along the surveyed transect.

UFI 5180

A total of 69 plant taxa (including subspecies and varieties) representing 22 families and 53 plant genera were recorded in the survey area (Table 19, Appendix B). This total is comprised of 55 native species and 14 introduced (exotic) species.

Dominant families recorded from UFI 5180 included:

- Fabaceae (peas) 12 taxa
- Poaceae (grasses) 11 taxa
- Myrtaceae (myrtles) 8 taxa
- Orchidaceae (orchids) 6 taxa

No flora of conservation significance was identified as occurring within the surveyed quadrats.

UFI 7046

A total of 54 plant taxa (including subspecies and varieties) representing 20 families and 37 plant families were recorded in the survey area (Table 20, Appendix B). This total is comprised of 38 native species and 16 introduced (exotic) species.

Dominant families recorded from UFI 7046 included:

- Myrtaceae (myrtles) 13 taxa
- Poaceae (grasses) 8 taxa
- Orchidaceae (orchids) 3 taxa

No flora of conservation significance was identified as occurring within the surveyed quadrats.

UFI 7029

A total of 80 plant taxa (including subspecies and varieties) representing 28 genera and 65 plant families were recorded in the survey area (Table 21, Appendix B). This total is comprised of 58 native species and 22 introduced (exotic) species.

Dominant families recorded from UFI 7029 included:

- Poaceae (grasses) 12 taxa
- Myrtaceae (myrtles) 10 taxa
- Fabaceae (peas) 7 taxa
- Orchidaceae (orchids) 6 taxa

No flora of conservation significance was identified as occurring within the surveyed quadrats.

UFI 4835 North

A total of 38 plant taxa (including subspecies and varieties) representing 11 families and 32 plant genera were recorded in the survey area (Table 22, Appendix B). This total is comprised of 18 native species and 20 introduced (exotic) species.

Dominant families recorded from the UFI 4835 North included:

- Poaceae (grasses) 15 taxa
- Asteraceae (daisies) 6 taxa
- Myrtaceae (myrtles) 6 taxa

No flora of conservation significance was identified as occurring within the surveyed quadrats.

UFI 4835 South

A total of 69 plant taxa (including subspecies and varieties) representing 21 families and 55 plant genera were recorded in the survey area (Table 23, Appendix B). This total is comprised of 44 native species and 25 introduced (exotic) species.

Dominant families recorded from the UFI 4835 South included:

- Poaceae (grasses) 10 taxa
- Myrtaceae (myrtles) 9 taxa
- Fabaceae (peas) 6 taxa
- Cyperaceae (sedges) 6 taxa

No flora of conservation significance was identified as occurring within the surveyed quadrats.

UFI 5032

A total of 89 plant taxa (including subspecies and varieties) representing 26 families and 75 plant genera were recorded in the survey area (Table 24, Appendix B). This total is comprised of 85 native species and 4 introduced (exotic) species.

Dominant families recorded from the UFI 5032 included:

- Myrtaceae (myrtles) 15 taxa
- Fabaceae (peas) 9 taxa
- Proteaceae (proteas) 7 Taxa
- Cyperaceae (sedges) 6 taxa
- Asparagaceae (lilies) 5 taxa

Two flora species of conservation significance, *Stylidium brunonianum* and *Stylidium striatum* both of which are priority 4 species were identified as occurring within the quadrats along the surveyed transect.

UFI 5056

A total of 146 plant taxa (including subspecies and varieties) representing 39 families and 117 plant families were recorded in the survey area (Table 25, Appendix B). This total is comprised of 116 native species and 32 introduced (exotic) species.

Dominant families recorded from the Project Area included:

- Poaceae 27 taxa
- Asteraceae 24 taxa
- Mimosaceae 23 taxa

Two flora species of conservation significance, *Schoenus benthamii* a priority 3 and *Stylidium brunonianum,* a priority 4 species were identified as occurring within the quadrats along the surveyed transect.

The NatureMap search for this site identifed 13 species of conservation significance as occurring within this reserve; however, due to the methodology employed during this study (i.e. representative quadrats were located along an established transect), the entire site was not searched or sampled during this survey.

2.2.2 Conservation Significant of Flora

Declared Rare Flora

No Declared Rare Flora (DRF) species listed by the DEC (2009b) or species of national conservation significance listed under the *EPBC Act 1999* were recorded during this survey; however, the desktop assessment did identify one species of DRF *Diuris purdiei* as occurring in the wetlands vegetation associated with UFI 5056 (Phillips Rd) (refer Table 3).

Priority Flora

A total of three priority flora species were identifed as occurring within the quadrats of three of the wetlands (Table 14).

Table 14 Priority Flora identifed as occuring within the wetland quadrats

Wetland	Species	Conservation Code
5056	*Schoenus benthamii*	P3
5056	*Stylidium brunonianum*	P4
5724, 5032	*Stylidium striatum*	P4

The two priority species of *Stylidium* have not been previously recorded as occurring at any of the wetland sites.

2.2.3 Weeds

A total of 67 exotic (weed) species were identified as occurring within the wetland sites surveyed for flora and vegetation. The number of weed species present identified as occurring within the surveyed wetlands varied from four within UFI 5032 and 32 at UFI 3946 and UFI 5056. The majority of the weed species were grasses, peas/clovers and daisies. These weeds are typically present in pastures, reflecting the dominant agricultural landuse of the area. None of the weeds identified during this survey are declared plants.

3. Report Limitations

This report presents the results of a Flora and Vegetation Assessment prepared for the purpose of this commission. The data and advice provided herein relate only to the project and structures described herein and must be reviewed by a competent scientist/botanist before being used for any other purpose. GHD accepts no responsibility for other use of the data.

Where previous reports, flora surveys and similar work have been performed and recorded by others the data is included and used in the form provided by others. The responsibility for the accuracy of such data remains with the issuing authority, not with GHD.

An understanding of site conditions depends on the integration of many pieces of information, some regional, some site specific, some structure specific and some experience based. Hence, this report should not be altered, amended or abbreviated, issued in part or incomplete in any way without prior checking and approval by GHD. GHD accepts no responsibility for any circumstances that arise from the issue of the report that has been modified in any way as outlined above.

4. References

Beard, J.S. (1979). Vegetation Survey of Western Australia, 1:250,000 Series. The Vegetation of the Pinjarra Area. Vegmap Publications, Applecross.

English, V and Blythe, J. (1997). Identifying and Conserving Threatened Ecological Communities in the South West Botanical Province. Unpublished report for the Department of Conservation and Land Management to Environment Australia.

Environmental Protection Authority (EPA) (2004) Guidance Statement 51, Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia.

Department of Environment Water Heritage and the Arts (2010) Protected Matters Search Tool http://www.environment.gov.au/erin/ert/epbc/index.html

Department of Environement Water Heritage and the Arts (2010) Environement Protection and Biodiversity Conservaion Act 1999. Current – C2010C00241.

Government of WA, 2000. Bush Forever Volume 1. Policies, Principles, Processes. Department of Environmental Protection, Perth, Western Australia.

Heddle, E.M., Loneragan. O.W. and J.J. Havel (1980). Vegetation Complexes of the Darling System, Western Australia. In: Atlas of Natural Resources, Darling System Western Australia. Department of Conservation and Environment. WA.

Keighery, B.J., (1994). Bushland Plant Survey: A Guide to Plant Community Survey for the Community, Wildflower Society of WA (Inc.), Nedlands, Western Australia.

McKenzie, N.L., May, J.E. and McKenna, S. (2002) Bioregional Summary of the 2002 Biodiversity Audit for Western Australia, Department of Conservation and Land Management, Perth.

Appendix A

Figures

Figure 1 Murray DWMP Study Area

Figure 2 Environmental Constraints

Figure 3 Wetland Transect Locations and Vegetation Types

390,000

400,000

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6,400,000

6,390,000

Locality Map

MUNDIJONG

SERPENTINE

GOLDEN BAY-SINGLETON

INDIAN OCEAN

MANDURAH

YUNDERUP

PINJARRA

DWELLINGUP

UFI 7046

UFI 7029

UFI 5032

UFI 4835

UFI 5724

UFI 5180

UFI 3945

KWINANA FWY

UFI 5056, 5055, 5200, 5195, 5196, 5198

FORREST HWY

LEGEND

Study Area

Geomorphic Wetlands

Conservation

Resource Enhancement

Multiple Use

Not Assessed

Not Applicable

1:100,000 (at A3)

0 0.5 1 2 3 4 5

Kilometers

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 50

N

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Department of Water

Department of Water
Murray Drainage and
Water Management Study

Aerial Overview of Wetland Locations

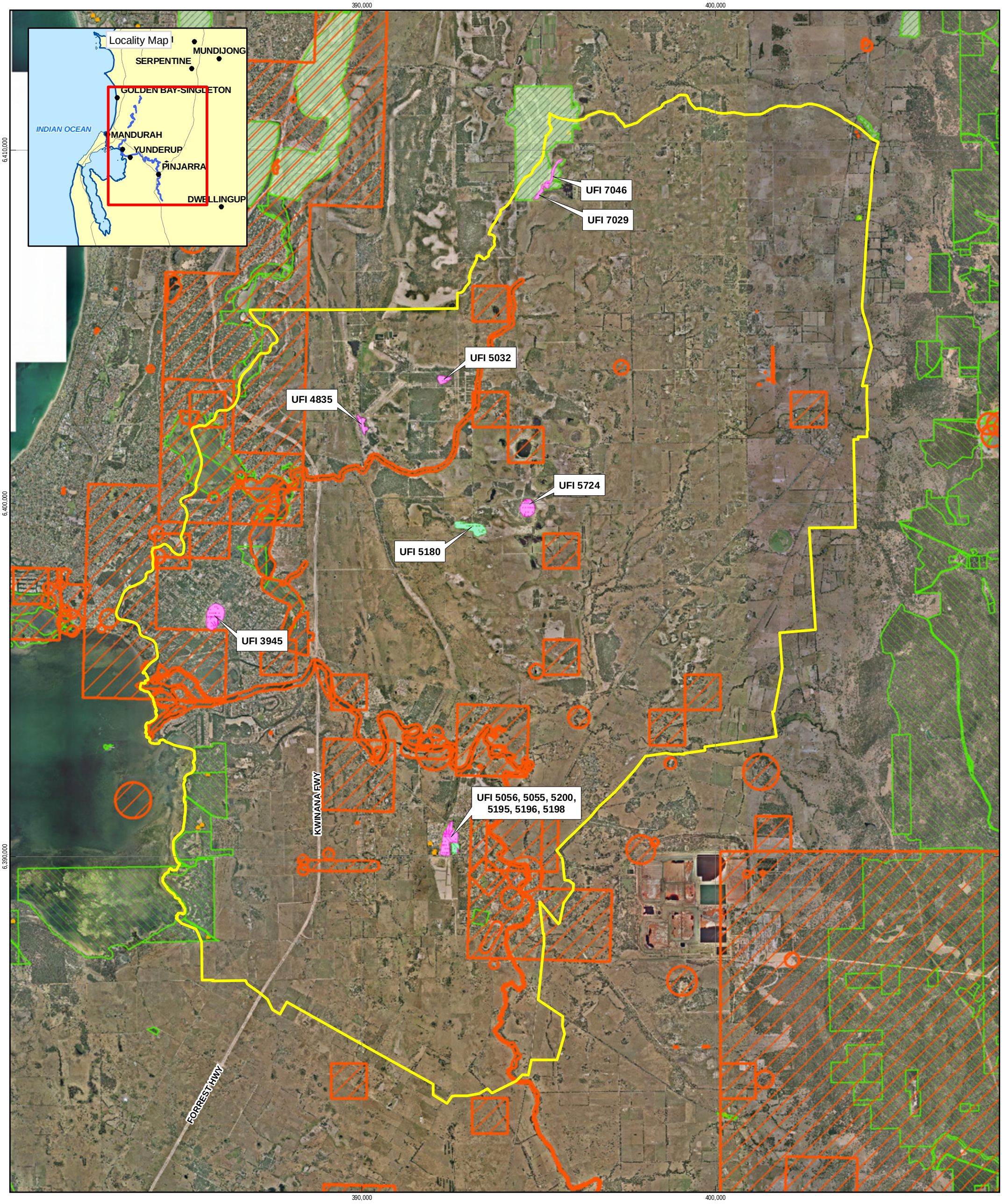
Job Number 61-2393704
Revision A
Date 22 JUN 2010

Figure 1

G:\61\2393706\GIS\mxds\612393704-G003 Figure 1.mxd

GHD House, 239 Adelaide Terrace Perth WA 6004 **T** 61 8 6222 8222 **F** 61 8 6222 8555 **E** permail@ghd.com.au **W** www.ghd.com.au

Data Source: DOW: Study Area - 20081202; Landgate (SLIP): Metro South 2009 Mosaic - SLIP 20090627; DEC: Geomorphic Wetlands, Swan Coastal Plain - 20070319. Created by: Nik Fadhil, xntan, kdiralu, jhchen



LEGEND

- Threatened Ecological Communities Points
- Study Area
- Geomorphic Wetlands
  - Conservation
  - Resource Enhancement
- Multiple Use
- Not Assessed
- Not Applicable
- Aboriginal Heritage Sites
- Bush Forever
- DEC Estate

1:100,000 (at A3)

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Kilometers

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 50

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Department of Water
Murray Drainage and
Water Management Study

Environmental Constraints

Job Number 61-2393704
Revision A
Date 22 JUN 2010

Figure 2

G:\61\2393706\GIS\mxds\612393704-G003 Figure 1.mxd

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Data Source: DOW: Study Area - 20081202; Landgate (SLIP): Metro South 2009 Mosaic - SLIP 20090627; DEC: Geomorphic Wetlands, Swan Coastal Plain - 20070319. Created by: Nik Fadhil, xntan, kdiralu, jhchen

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FURNISSDALE RD

JANNALI RD

DAVIS RD

PINJARRA RD

GOODOOGA RD

EGAN PL

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HS087-1B

HS087-2

HS087-3

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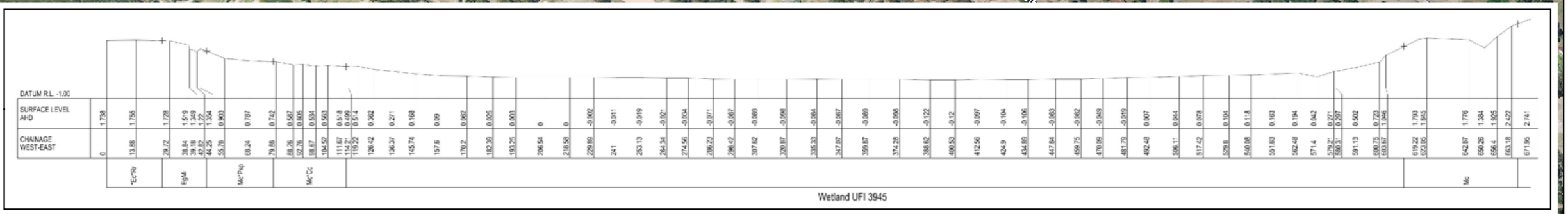

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Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 50

N

LEGEND

- Vegetation Type Boundaries
- Frog and Fish Assessment Points
- Borehole
- mAHD Lowest Surveyed Point
- Approximate Transect Line
- Roads

Geomorphic Wetlands

- Conservation
- Resource Enhancement
- Multiple Use
- Not Assessed
- Not Applicable

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Government of Western Australia Department of Water

Department of Water
Murray Drainage and
Water Management Study

Wetland UFI 3945
Barragup Swamp

Job Number	61-2393704
Revision	A
Date	09 JUN 2010

Figure 3 Sheet 1

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HS099-1B

Q1

Q2

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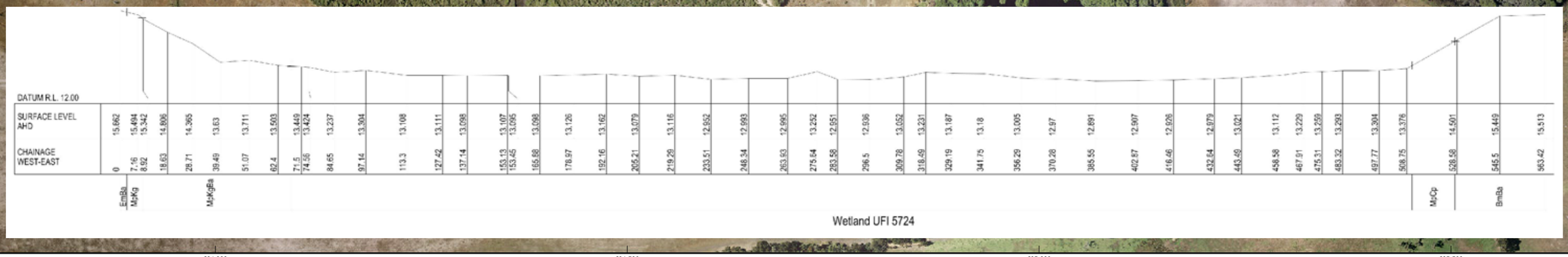

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Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 50

N

LEGEND

- Vegetation Type Boundary
- Frog and Fish Assessment Points
- Borehole
- mAHD Lowest Surveyed Point
- Approximate Transect Line
- Roads

Geomorphic Wetlands

- Conservation
- Resource Enhancement
- Multiple Use
- Not Assessed
- Not Applicable

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Department of Water
Murray Drainage and Water Management Study

Wetland UFI 5724
Benden Road Wetland

Job Number	61-2393704
Revision	A
Date	17 JUN 2010

Figure 3 Sheet 2

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Data Source: DEC: Geomorphic Wetlands, Swan Coastal Plain - 20070319; GHD: Approximate Transect Lines - 20090624; Landgate: Metro South 2009 Mosaic - 20090627; Landgate: Roads - 20090625; GHD: Murray Wetland Boreholes - 20100119, Lowest Surveyed Points - 20100330; GHD: Frog and Fish Assessment Points - 20090821, Murray Wetland Boreholes - 20100119, Lowest Surveyed Points - 20100330. Created by: kdiralu, jhchen

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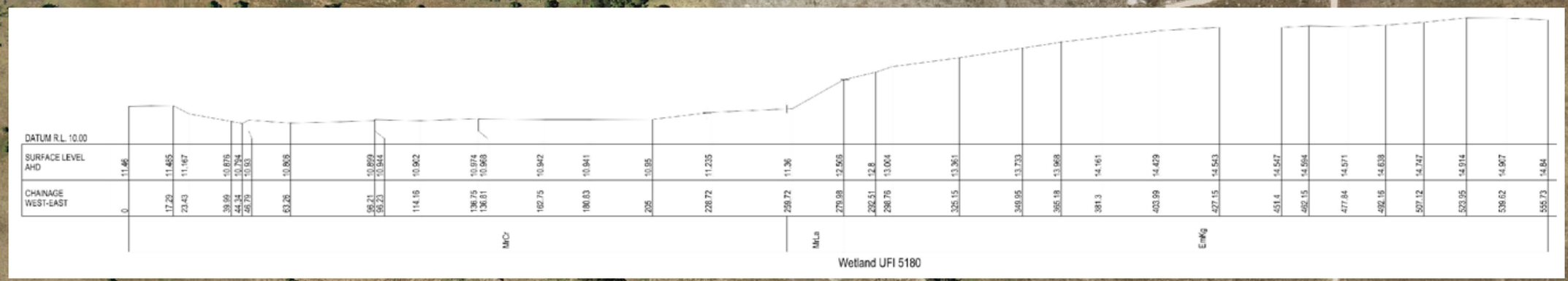

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Metres

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Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 50

N

LEGEND

- Vegetation Type Boundary
- Approximate Transect Line
- Roads
- Frog and Fish Assessment Points
- Borehole
- mAHD Lowest Surveyed Point

Geomorphic Wetlands

- Conservation
- Resource Enhancement
- Multiple Use
- Not Assessed
- Not Applicable

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Department of Water
Murray Drainage and Water Management Study

Wetland UFI 5180
Scott Road Wetland

Job Number 61-2393704
Revision A
Date 17 JUN 2010

Figure 3 Sheet 3

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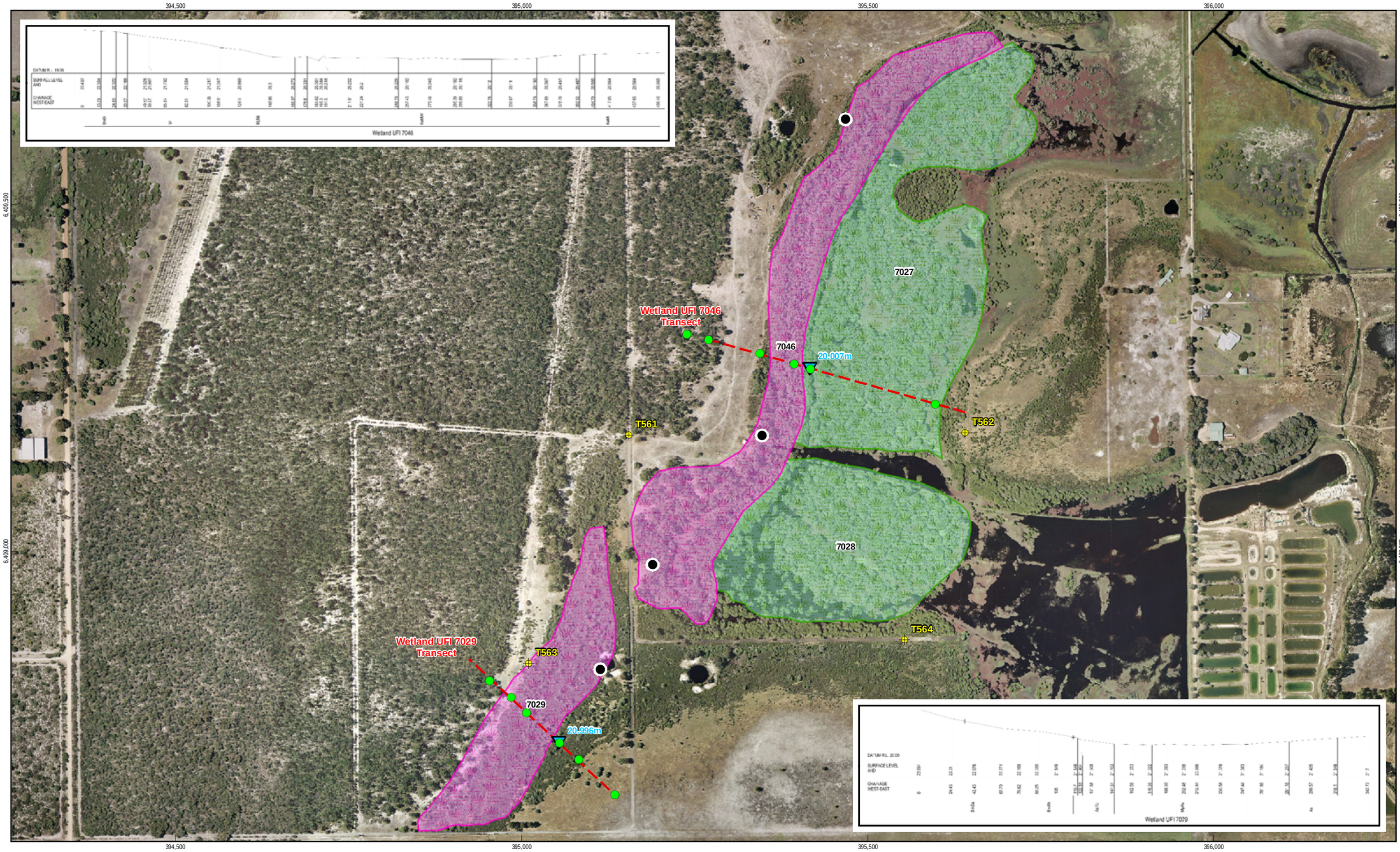

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Metres

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Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 50

N

LEGEND

- Vegetation Type Boundary
- Frog and Fish Assessment Points
- Borehole
- mAHD Lowest Surveyed Point
- Approximate Transect Line
- Roads

Geomorphic Wetlands

- Conservation
- Resource Enhancement
- Multiple Use
- Not Assessed
- Not Applicable

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Murray Drainage and
Water Management Study

Wetlands UFI 7046 And UFI 7029 Elliott Road: North & South Wetlands

Job Number 61-2393704
Revision A
Date 17 JUN 2010

Figure 3
Sheet 4

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Data Source: DEC: Geomorphic Wetlands, Swan Coastal Plain - 20070319; GHD: Approximate Transect Lines - 20090624; Landgate: Metro South 2009 Mosaic - 20090627; Landgate: Roads - 20090625; GHD: Murray Wetland Boreholes - 20100119, Lowest Surveyed Points - 20100330. Created by: kdiralu, jhchen

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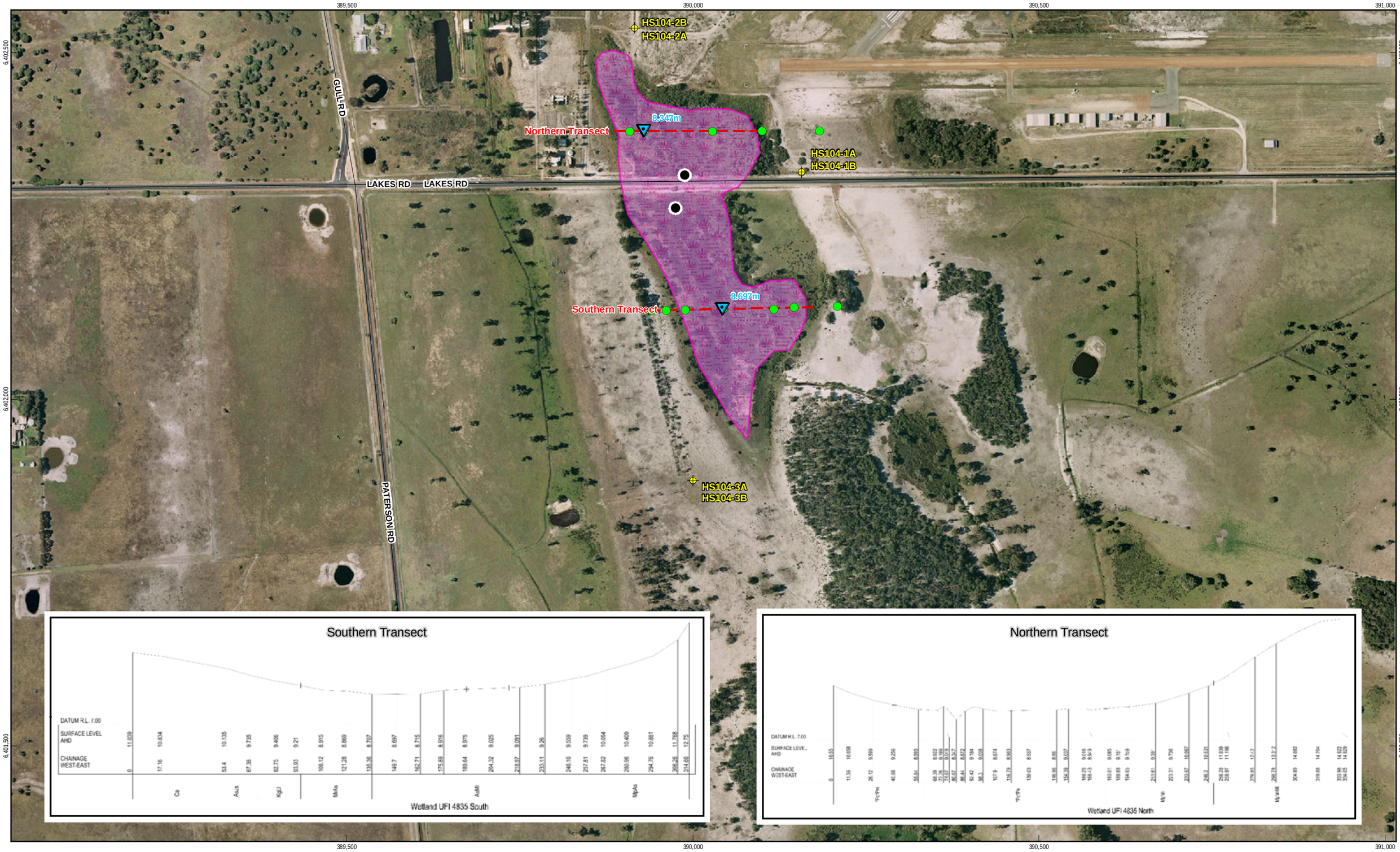

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Grid: Map Grid of Australia 1994, Zone 50

N

LEGEND

- Vegetation Type Boundaries
- Frog and Fish Assessment Points
- Borehole
- mAHD Lowest Surveyed Point
- Approximate Transect Line
- Roads

Geomorphic Wetlands

- Conservation
- Resource Enhancement
- Multiple Use
- Not Assessed
- Not Applicable

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Murray Drainage and
Water Management Study

Wetland UFI 4835
Airfield North and
South Wetland

Job Number	61-2393704
Revision	A
Date	17 JUN 2010

Figure 3 Sheet 5

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Data Source: DEC: Geomorphic Wetlands, Swan Coastal Plain - 20070319; GHD: Approximate Transect Lines - 20090624; Landgate: Metro South 2009 Mosaic - 20090627; Landgate: Roads - 20090625; GHD: Vegetation Type Boundaries - 20100327; GHD: Murray Wetlands - 20100205, Murray Wetland Boreholes - 20100119, Lowest Surveyed Points - 20100330. Created by: kdiralu, jhchen

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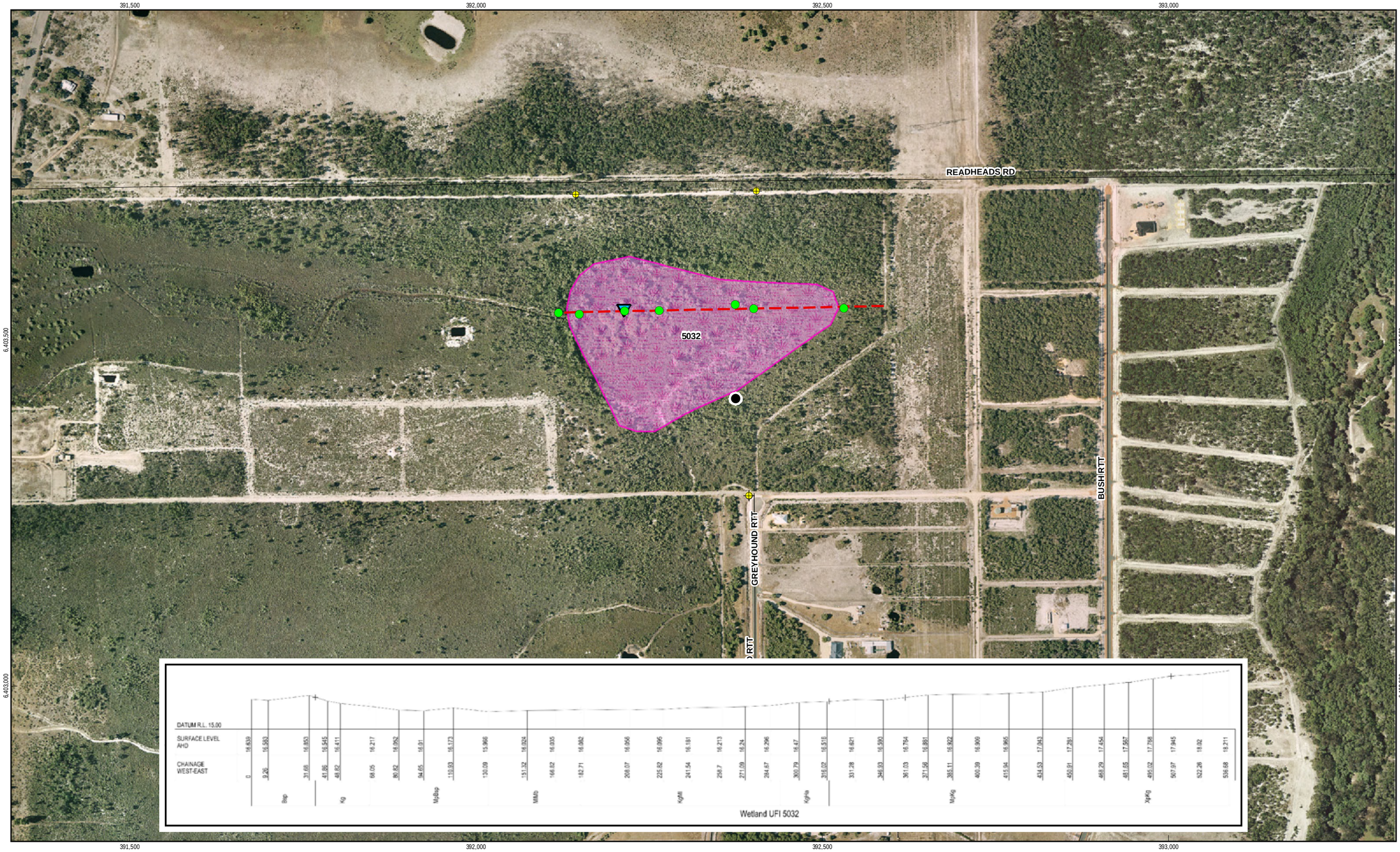

1:5,000 (at A3)

0 25 50 100 150 200 250

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 50

N

LEGEND

- Vegetation Type Boundary
- Frog and Fish Assessment Points
- Borehole
- mAHD Lowest Surveyed Point
- Approximate Transect Line
- Roads

Geomorphic Wetlands

- Conservation
- Resource Enhancement
- Multiple Use
- Not Assessed
- Not Applicable

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Department of Water
Murray Drainage and
Water Management Study

Job Number 61-2393704
Revision A
Date 22 JUN 2010

Wetland UFI 5032
Greyhound Road Wetland

Figure 3 Sheet 6

G:\61\2393706\GIS\mxds\612393704-G006 Figure 3 Sheet 6.mxd

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391,500 392,000 392,500 393,000

6,390,500

HS080-1
HS080-2A
HS080-2B
HS080-3

PHILLIPS RD
PINJARRA RD
HARRIES WAY
BAKER ST
COX ST
BUTLER ST
FIELDS ST
MOORES RD
TUCKEY ST

5055
5056
5195
5196
5198
5200
7.582m

6,390,000

391,500 392,000 392,500 393,000

1:5,000 (at A3)

0 25 50 100 150 200 250

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 50

N

LEGEND

- Vegetation Type Boundary
- Frog and Fish Assessment Points
- Borehole
- mAHD Lowest Surveyed Point
- Approximate Transect Line
- Roads

Geomorphic Wetlands

- Conservation
- Resource Enhancement
- Multiple Use
- Not Assessed
- Not Applicable

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Department of Water
Murray Drainage and
Water Management Study

Job Number 61-2393704
Revision A
Date 17 JUN 2010

Wetland UFI 5056
Phillips Road Wetland

Figure 3 Sheet 7

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Data Source: DEC: Geomorphic Wetlands, Swan Coastal Plain - 20070319; GHD: Approximate Transect Lines - 20090624; Landgate: Metro South 2009 Mosaic - 20090627; Landgate: Roads - 20090625; GHD: Vegetation Type Boundaries - 20100327; GHD: Murray Wetland Boreholes - 20100119, Lowest Surveyed Points - 20100330, Frog and Fish Assessment Points - 20090821. Created by: kdiralu, jhchen

Appendix B

Flora

Table 15 Conservation Categories and Definitions for EPBC Act Listed Flora and Fauna Species

Conservation Category	Definition
Extinct	Taxa not definitely located in the wild during the past 50 years
Extinct in the Wild	Taxa known to survive only in captivity
Critically Endangered	Taxa facing an extremely high risk of extinction in the wild in the immediate future
Endangered	Taxa facing a very high risk of extinction in the wild in the near future
Vulnerable	Taxa facing a high risk of extinction in the wild in the medium-term
Near Threatened	Taxa that risk becoming Vulnerable in the wild
Conservation Dependent	Taxa whose survival depends upon ongoing conservation measures. Without these measures, a conservation dependent taxon would be classified as Vulnerable or more severely threatened.
Data Deficient (Insufficiently Known)	Taxa suspected of being Rare, Vulnerable or Endangered, but whose true status cannot be determined without more information.
Least Concern	Taxa that are not considered Threatened

Table 16 Conservation Codes and Descriptions for DEC Declared Rare and Priority Flora Species

Conservation Code	Description
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, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals etc. May include taxa with threatened populations on protected lands. 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 are in urgent need of 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 are in need of further survey.
P4: Priority Four – Taxa in need of monitoring	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.

Table 17 Flora identified as being present in the quadrats along the transect of UFI 3945

Family	Genus	Species	Status
Aizoaceae	*Carpobrotus*	*aequilaterus*	*
Anancardiaceae	*Schinus*	*terebinthifolius*	*
Asteraceae	*Arctotheca*	*calendula*	*
Asteraceae	*Cotula*	*coronopifolia*	*
Asteraceae	*Hypochaeris*	sp. (insufficient material)	*
Asteraceae	*Hypochaeris*	*glabra*	*
Asteraceae	*Sonchus*	*oleraceus*	*
Asteraceae	*Sonchus*	*asper*	*
Asteraceae	*Ursinia*	*anthemoides*	
Casuarinaceae	*Casuarina*	*obesa*	
Chenopodiaceae	*Tecticornia*	*lepidosperma*	
Cyperaceae	*Baumea*	*juncea*	
Fabaceae	*Lotus*	*angustissimus*	*
Fabaceae	*Lupinus*	*angustifolius*	*
Fabaceae	*Trifolium*	*campestre*	*
Fabaceae	*Ornithopus*	*compressus*	*
Fabaceae	*Ornithopus*	*pinnatus*	*
Fabaceae	*Ornithopus*	*sativus*	*
Geraniaceae	*Erodium*	*cicutarium*	*
Goodeniaceae	*Goodenia*	*coerulea*	
Iridaceae	*Romulea*	*rosea*	*
Iridaceae	*Watsonia*	*meriana* var *bulbillifera*	*
Juncaceae	*Juncus*	*kraussii* subsp. *australiensis*	
Myrtaceae	*Eucalyptus*	*gomphocephala*	
Myrtaceae	*Kunzea*	*glabrescens*	
Myrtaceae	*Melaleuca*	*preissiana*	
Myrtaceae	*Melaleuca*	*argentea*	
Myrtaceae	*Melaleuca*	*incana* subsp. *incana*	

Family	Genus	Species	Status
Myrtaceae	*Melaleuca*	*lateritia*	
Myrtaceae	*Melaleuca*	*rhaphiophylla*	
Orchidaceae	*Microtis*	*media*	
Poaceae	*Avena*	*barbata*	*
Poaceae	*Briza*	*mazima*	*
Poaceae	*Briza*	*minor*	*
Poaceae	*Bromus*	*diandrus*	*
Poaceae	*Cynodon*	*dactylon*	*
Poaceae	*Ehrharta*	*calycina*	*
Poaceae	*Ehrharta*	*longiflora*	*
Poaceae	*Eragrostis*	*curvula*	*
Poaceae	*Lolium*	*perenne*	*
Poaceae	*Microlaena*	*stipoides*	
Poaceae	*Polypogon*	*maritimus*	*
Poaceae	*Pennisetum*	*clandestinum*	*
Polygonaceae	*Rumex*	*brownii*	*
Polygonaceae	*Rumex*	*crispus*	*
Polygonaceae	*Rumex*	sp. (insufficient material)	*
Ruppiaceae	*Ruppia*	*maritima*	
Solonaceae	*Solanum*	*nigrum*	*

Table 18 Flora identified as being present in the quadrats along the transect of UFI 5724

Family	Genus	Species	Status
Anarthriaceae	*Lyginia*	*barbata*	
Apiaceae	*Pentapeltis*	*peltigera*	
Apiaceae	*Xanthosia*	*ciliata*	
Araliaceae	*Trachymene*	*ornata*	
Araliaceae	*Trachymene*	*pilosa*	

Family	Genus	Species	Status
Asparagaceae	*Lomandra*	*sericea*	
Asparagaceae	*Lomandra*	sp. (insufficient material)	
Asparagaceae	*Thysanotus*	sp. (insufficient material)	
Asteraceae	*Hypochaeris*	*radicata*	*
Asteraceae	*Hypochaeris*	*glabra*	*
Asteraceae	*Hypochaeris*	sp. (insufficient material)	*
Asteraceae	*Ixiolaena*	*viscosa*	
Asteraceae	*Sonchus*	*asper*	*
Asteraceae	*Sonchus*	*oleraceus*	*
Asteraceae	*Taraxacum*	*officinale*	*
Asteraceae	*Trichocline*	*spathulata*	
Asteraceae	*Ursinia*	*anthemoides*	*
Billardiera	*Billardiera*	*heterophylla*	
Campanulaceae	*Lobelia*	sp.	
Colchicaceae	*Burchardia*	*congesta*	
Cyperaceae	*Baumea*	*articulata*	
Cyperaceae	*Baumea*	*preissii*	
Cyperaceae	*Lepidosperma*	*squamatum*	
Cyperaceae	*Lepidosperma*	*longitudinale*	
Dasypogonaceae	*Dasypogon*	*bromeliifolius*	
Fabaceae	*Aotus*	*gracillima*	
Fabaceae	*Bossiaea*	*eriocarpa*	
Fabaceae	*Hovea*	*trisperma*	
Fabaceae	*Lotus*	*angustissimus*	*
Fabaceae	*Ornithopus*	*compressus*	
Haemodoraceae	*Phlebocarya*	*ciliata*	
Hemerocallidaceae	*Dianella*	revoluta	
Hemerocallidaceae	*Tricoryne*	*elatior*	
Juncaceae	*Juncus*	*pallidus*	

Family	Genus	Species	Status
Lauraceae	*Cassytha*	sp. (insufficient material)	
Moraceae	*Ficus*	*carica*	*
Myrtaceae	*Astartea*	*scoparia*	
Myrtaceae	*Eucalyptus*	*marginata*	
Myrtaceae	*Eucalyptus*	sp. (insufficient material)	
Myrtaceae	*Hypocalymma*	*angustifolium* subsp. *Swan Coastal Plain*	
Myrtaceae	*Kunzea*	*ericifolia*	
Myrtaceae	*Kunzea*	*glabrescens*	
Myrtaceae	*Melaleuca*	*preissiana*	
Myrtaceae	*Melaleuca*	*incana*	
Myrtaceae	*Melaleuca*	*teretifolia*	
Orchidaceae	*Caladenia*	sp. (insufficient material)	
Orchidaceae	*Microtis* sp.	sp. (insufficient material)	
Orchidaceae	*Pterostylis*	sp. (insufficient material)	
Orchidaceae	*Thelymitra*	*pauciflora*	
Poaceae	*Briza*	*maxima*	*
Poaceae	*Briza*	*minor*	*
Poaceae	*Bromus*	*diandrus*	
Poaceae	*Ehrharta*	*calycina*	*
Poaceae	*Ehrharta*	*longiflora*	*
Poaceae	*Eriachne*	sp. (insufficient material)	
Poaceae	*Lolium*	*rigidum*	*
Poaceae	*Microlaena*	*stipoides*	
Proteaceae	*Banksia*	*attenuata*	
Proteaceae	*Banksia*	*ilicifolia*	
Proteaceae	*Banksia*	*menziesii*	
Rubiaceae	*Opercularia*	sp. (insufficient material)	
Rutaceae	*Philotheca*	*spicata*	

Family	Genus	Species	Status
Salviniaceae	*Azolla*	*pinnata*	
Stylidiaceae	*Stylidium*	*striatum*	P4
Xanthorrhoeaceae	*Xanthorrhoea*	*brunonis*	

Table 19 Flora identified as being present in the quadrats along the transect of UFI 5180

Family	Genus	Species	Status
Anarthriaceae	*Lyginia*	*barbata*	
Anarthriaceae	*Lyginia*	*imberbis*	
Araliaceae	*Trachymene*	*pilosa*	
Asparagaceae	*Lomandra*	sp. (insufficient material)	
Asparagaceae	*Lomandra*	*caespitosa*	
Asteraceae	*Arctotheca*	*calendula*	*
Asteraceae	*Hypochaeris*	sp. (insufficient material)	*
Asteraceae	*Trichocline*	*spathulata*	
Asteraceae	*Ursinia*	*anthemoides*	*
Casuarinaceae	*Allocasuarina*	*fraseriana*	
Colchicaceae	*Burchardia*	*congesta*	
Cyperaceae	*Isolepis*	*marginata*	
Cyperaceae	*Lepidosperma*	*longitudinale*	
Cyperaceae	*Lepidosperma*	sp. (insufficient material)	
Cyperaceae	*Schoenus*	*efoliatus*	
Dasypogonaceae	*Dasypogon*	*bromeliifolius*	
Droseraceae	*Drosera*	*erthrorhiza*	
Droseraceae	*Drosera* sp.	sp. (insufficient material)	
Ericaceae	*Leucopogon*	*australis*	
Fabaceae	*Acacia*	*stenoptera*	

Family	Genus	Species	Status
Fabaceae	*Acaia*	*huegelii*	
Fabaceae	*Aotus*	*gracillima*	
Fabaceae	*Bossiaea*	*eriocarpa*	
Fabaceae	*Gastrolobium*	*capitatum*	
Fabaceae	*Gompholobium*	*tomentosum*	
Fabaceae	*Hovea*	*trisperma*	
Fabaceae	*Jacksonia*	*furcellata*	
Fabaceae	*Kennedia*	*prostrata*	
Fabaceae	*Lotus*	*subbiflorus*	*
Fabaceae	*Ornithopus*	*sativus*	*
Fabaceae	*Melilotus*	*officinalis*	
Geraniaceae	*Erodium*	*cicutarium*	*
Haemodoraceae	*Conostylis*	*juncea*	
Iridaceae	*Patersonia*	*occidentalis*	
Lauraceae	*Cassytha*	*racemosa*	
Myrtaceae	*Astartea*	*scoparia*	
Myrtaceae	*Eucalyptus*	*marginata*	
Myrtaceae	*Eucalyptus*	sp. (insufficient material)	
Myrtaceae	*Kunzea*	*ericifolia*	
Myrtaceae	*Kunzea*	*glabrescens*	
Myrtaceae	*Melaleuca*	*rhaphiophylla*	
Myrtaceae	*Melaleuca*	*teretifolia*	
Myrtaceae	*Melaleuca*	*thymoides*	
Orchidaceae	*Caladenia*	*flava*	
Orchidaceae	*Caladenia*	sp. (insufficient material)	
Orchidaceae	*Disa*	*bracteata*	*
Orchidaceae	*Microtis*	*media*	
Orchidaceae	*Microtis*	sp. (insufficient material)	
Orchidaceae	*Pterostylis*	sp. (insufficient material)	
Poaceae	*Anthoxanthum*	*odoratum*	*

Family	Genus	Species	Status
Poaceae	*Aristida*	sp. (insufficient material)	
Poaceae	*Austrostipa*	*flavescens*	
Poaceae	*Briza*	*maxima*	*
Poaceae	*Bromus*	*diandrus*	*
Poaceae	*Ehrharta*	*calycina*	*
Poaceae	*Ehrharta*	*longiflora*	*
Poaceae	*Enneapogon*	sp. (insufficient material)	
Poaceae	*Lolium*	*perenne*	*
Poaceae	*Lolium*	*rigidum*	*
Poaceae	*Microlaena*	*stipoides*	
Restionaceae	*Desmocladus*	*asper*	
Restionaceae	*Desmocladus*	*flexuosus*	
Restionaceae	*Hypolaena*	*exsulca*	
Restionaceae	*Meeboldina*	*scariosa*	
Ruppiaceae	*Ruppia*	*maritima*	
Xanthorrhoeaceae	*Xanthorrhoea*	*preissii*	
Zamiaceae	*Macrozamia*	*riedlei*	

Table 20 Flora identified as being present in the quadrats along the transect of UFI 7046

Family	Genus	Species	Status
Amaranthaceae	*Alternanthera*	*nodiflora*	
Apiaceae	*Pentapeltis*	*peltigera*	
Araliaceae	*Trachymene*	*pilosa*	
Asparagaceae	*Lomandra*	sp. (insufficient material)	
Asteraceae	*Cotula*	*coronopifolia*	*
Asteraceae	*Hypochaeris*	sp. (insufficient material)	*

Family	Genus	Species	Status
Asteraceae	*Podolepis*	*gracilis*	
Asteraceae	*Ursinia*	*anthemoides*	*
Campanulaceae	*Monopsis*	*debilis*	*
Colchicaceae	*Burchardia*	*congesta*	
Crassulaceae	*Crassula*	*? decumbens*	
Crassulaceae	*Crassula*	sp. (insufficient material)	
Cyperaceae	*Isolepis*	*cernua* var. *setiformis*	
Cyperaceae	*Isolepis*	*stellata*	
Fabaceae	*Jacksonia*	*furcellata*	
Fabaceae	*Ornithopus*	*compressus*	*
Geraniaceae	*Erodium*	*cicutarium*	*
Iridaceae	*Romulea*	*rosea*	*
Juncaceae	*Juncus*	*pallidus*	
Loganiaceae	*Phyllangium*	*paradoxum*	
Lythraceae	*Lythrum*	*hyssopifolia*	*
Myrtaceae	*Astartea*	*scoparia*	
Myrtaceae	*Calytrix*	*flavescens*	
Myrtaceae	*Hypocalymma*	*angustifolium*	
Myrtaceae	*Kunzea*	*ericifolia*	
Myrtaceae	*Melaleuca*	*?lanceolata*	
Myrtaceae	*Melaleuca*	*lateriflora* subsp. *acutifolia*	
Myrtaceae	*Melaleuca*	*osullivanii*	
Myrtaceae	*Melaleuca*	*preissiana*	
Myrtaceae	*Melaleuca*	*rhaphiophylla*	
Myrtaceae	*Melaleuca*	*incana*	
Myrtaceae	*Melaleuca*	*teretifolia*	
Myrtaceae	*Melaleuca*	*thymoides*	
Myrtaceae	*Taxandria*	*linearifolia*	
Orchidaceae	*Disa*	*bracteata*	*
Orchidaceae	*Microtis*	*media*	

Family	Genus	Species	Status
Orchidaceae	*Pterostylis*	*pyramidalis*	
Orobanchaceae	*Orobanche*	*minor*	*
Poaceae	*Aira*	*caryophyllea*	*
Poaceae	*Amphibromus*	*nervosus*	
Poaceae	*Austrostipa*	*compressa*	
Poaceae	*Digitaria*	*sanguinalis*	*
Poaceae	*Ehrharta*	*longiflora*	*
Poaceae	*Lachnagrostis*	*filiformis*	
Poaceae	*Microlaena*	*stipoides*	
Poaceae	*Phalaris*	*canariensis*	*
Polygonaceae	*Rumex*	*crispus*	*
Proteaceae	*Banksia*	*ilicifolia*	
Proteaceae	*Banksia*	*menziesii*	
Restionaceae	*Desmocladus*	*flexuosus*	
Restionaceae	*Hypolaena*	*exsulca*	
Salviniaceae	*Azolla*	*filiculoides*	
Salviniaceae	*Azolla*	*pinnata*	
Solanaceae	*Solanum*	*nigrum*	*

Table 21 Flora identified as being present in the quadrats along the transect of UFI 7029

Family	Genus	Species	Status
Anarthriaceae	*Lyginia*	*barbata*	
Araliaceae	*Trachymene*	*pilosa*	
Asparagaceae	*Lomandra*	*hermaphrodita*	
Asparagaceae	*Lomandra*	sp. (insufficient material)	
Asparagaceae	*Thysanotus*	*sp. (insufficient material)*	
Asteraceae	*Arctotheca*	*calendula*	

Family	Genus	Species	Status
Asteraceae	*Hypochaeris*	sp. (insufficient material)	*
Asteraceae	*Hypochaeris*	*radicata*	*
Asteraceae	*Podotheca*	*angustifolia*	
Asteraceae	*Sonchus*	*asper*	*
Asteraceae	*Ursinia*	*anthemoides*	*
Casuarinaceae	*Allocasuarina*	*humilis*	
Centrolepidaceae	*Aphelia*	*cyperoides*	
Colchicaceae	*Burchardia*	*congesta*	
Crassulaceae	*Crassula*	*decumbens*	
Cyperaceae	*Isolepis*	*cernua* var. *setiformis*	
Cyperaceae	*Isolepis*	*stellata*	
Cyperaceae	*Schoenus*	*efoliatus*	
Dasypogonaceae	*Dasypogon*	*bromeliifolius*	
Droseraceae	*Drosera*	*erythrorhiza*	
Droseraceae	*Drosera*	*menziesii* subsp. *penicillaris*	
Droseraceae	*Drosera*	sp. (insufficient material)	
Fabaceae	*Bossiaea*	*eriocarpa*	
Fabaceae	*Gastrolobium*	*capitatum*	
Fabaceae	*Hovea*	*trisperma*	
Fabaceae	*Jacksonia*	*sternbergiana*	
Fabaceae	*Lotus*	*angustissimus*	*
Fabaceae	*Ornithopus*	*compressus*	*
Fabaceae	*Ornithopus*	*sativus*	
Goodeniaceae	*Dampiera*	*linearis*	
Haemodoraceae	*Haemodorum*	sp. (insufficient material)	
Hemerocallidaceae	*Stypandra*	*glauca*	
Hemerocallidaceae	*Tricoryne*	*elatior*	
Iridaceae	*Patersonia*	*occidentalis*	
Iridaceae	*Romulea*	*rosea*	*
Juncaceae	*Juncus*	*bufonius*	*

Family	Genus	Species	Status
Juncaceae	*Juncus*	*oxycarpus*	*
Loganiaceae	*Phyllangium*	*paradoxum*	
Myrtaceae	*Astartea*	*scoparia*	
Myrtaceae	*Calytrix*	*flavescens*	
Myrtaceae	*Hypocalymma*	*angustifolium* subsp. *Swan Coastal Plain*	
Myrtaceae	*Kunzea*	*ericifolia*	
Myrtaceae	*Melaleuca*	*preissiana*	
Myrtaceae	*Melaleuca*	*incana* subsp. *incana*	
Myrtaceae	*Melaleuca*	*thymoides*	
Myrtaceae	*Pericalymma*	*ellipticum* var. *ellipticum*	
Myrtaceae	*Regelia*	*ciliata*	
Myrtaceae	*Scholtzia*	*involucrata*	
Orchidaceae	*Caladenia*	*sp. (insufficient material)*	
Orchidaceae	*Disa*	*bracteata*	*
Orchidaceae	*Microtis*	*media*	
Orchidaceae	*Pterostylis*	sp. (insufficient material)	
Orchidaceae	*Thelymitra*	*pauciflora*	
Orchidaceae	*Thelymitra*	sp. (insufficient material)	
Orobanchaceae	*Orobanche*	*minor*	*
Poaceae	*Aira*	*caryophyllea*	*
Poaceae	*Anthoxanthum*	*odoratum*	*
Poaceae	*Briza*	*maxima*	*
Poaceae	*Briza*	*minor*	*
Poaceae	*Bromus*	*diandrus*	*
Poaceae	*Digitaria*	*sanguinalis*	*
Poaceae	*Enneapogon*	sp. (insufficient material)	
Poaceae	*Eriachne*	sp. (insufficient material)	
Poaceae	*Hordeum*	*glaucum*	*
Poaceae	*Lolium*	*perenne*	*
Poaceae	*Lolium*	*rigidum*	*

Family	Genus	Species	Status
Poaceae	*Microlaena*	*stipoides*	
Polygonaceae	*Acetosella*	*vulgaris*	*
Polygonaceae	*Rumex* sp.	sp. (insufficient material)	
Proteaceae	*Banksia*	*attenuata*	
Proteaceae	*Banksia*	*ilicifolia*	
Proteaceae	*Banksia*	*menziesii*	
Restionaceae	*Desmocladus*	*flexuosus*	
Restionaceae	*Dielsia*	*stenostachya*	
Restionaceae	*Hypolaena*	*exsulca*	
Rubiaceae	*Galium*	*divaricatum*	*
Stylidiaceae	*Levenhookia*	*stipitata*	
Stylidiaceae	*Stylidium*	*brunonianum*	
Stylidiaceae	*Stylidium*	*divaricatum*	
Xanthorrhoeaceae	*Xanthorrhoea*	*brunonis*	

Table 22 Flora identified as being present in the quadrats along the transect of UFI 4835 North

Family	Genus	Species	Status
Amaranthaceae	*Alternanthera*	*nodiflora*	
Amaranthaceae	*Amaranthus*	*viridus*	*
Asteraceae	*Cotula*	*coronopifolia*	*
Asteraceae	*Hypochaeris*	*radicata*	*
Asteraceae	*Hypochaeris*	sp. (insufficient material)	*
Asteraceae	*Senecio*	sp. (insufficient material)	
Asteraceae	*Senecio*	*diaschides*	*
Asteraceae	*Sonchus*	*asper*	*
Cyperaceae	*Cyperus*	*eragrostis*	*
Cyperaceae	*Fimbristylis*	*velata*	
Cyperaceae	*Lepidosperma*	*longitudinale*	
Fabaceae	*Lotus*	*angustissimus*	*

Family	Genus	Species	Status
Juncaceae	*Juncus*	*pallidus*	
Myrtaceae	*Astartea*	*scoparia*	
Myrtaceae	*Kunzea*	*ericifolia*	
Myrtaceae	*Kunzea*	*glabrescens*	
Myrtaceae	*Melaleuca*	*rhaphiophylla*	
Myrtaceae	*Melaleuca*	*lateritia*	
Myrtaceae	*Melaleuca*	*preissiana*	
Orchidaceae	*Microtis*	*media*	
Poaceae	*Amphibromus*	*nervosus*	
Poaceae	*Anthoxanthum*	*odoratum*	*
Poaceae	*Avena*	*barbata*	*
Poaceae	*Bromus*	*diandrus*	*
Poaceae	*Cynodon*	*dactylon*	*
Poaceae	*Ehrharta*	*calycina*	*
Poaceae	*Eragrostis*	*curvula*	*
Poaceae	*Eragrostis*	*elongata*	
Poaceae	*Eriachne*	sp. (insufficient material)	
Poaceae	*Lachnagrostis*	*filiformis*	
Poaceae	*Lolium*	*perenne*	*
Poaceae	*Paspalum*	*distichum*	*
Poaceae	*Paspalum*	*dilatatum*	*
Poaceae	*Pennisetum*	*clandestinum*	*
Poaceae	*Phalaris*	*minor*	*
Polygonaceae	*Rumex*	*conglomeratus*	*
Restionaceae	*Meeboldina*	*scariosa*	
Xanthorrhoeaceae	*Xanthorrhoea*	*preissii*	

Table 23 Flora identified as being present in the quadrats along the transect of UFI 4835 South

Family	Genus	Species	Status
Amaranthaceae	*Alternanthera*	*nodiflora*	
Amaranthaceae	*Alternanthera*	*nodiflora*	
Asparagaceae	*Lomandra*	*hermaphrodita*	
Asparagaceae	*Thysanotus*	*patersonii*	
Asteraceae	*Arctotheca*	*calendula*	*
Asteraceae	*Cotula*	*coronopifolia*	*
Asteraceae	*Hypochaeris*	*radicata*	*
Asteraceae	*Hypochaeris*	sp. (insufficient material)	*
Asteraceae	*Taraxacum*	*officinale*	*
Asteraceae	*Ursinia*	*anthemoides*	*
Campanulaceae	*Lobelia*	*anceps*	
Campanulaceae	*Monopsis*	*debilis*	*
Colchicaceae	*Burchardia*	*congesta*	
Cyperaceae	*Cyperus*	*tenellus*	*
Cyperaceae	*Eleocharis*	*acuta*	
Cyperaceae	*Fimbristylis*	*velata*	
Cyperaceae	*Isoepis*	*cernua* var. *setiformis*	
Cyperaceae	*Lepidosperma*	*longitudinale*	
Cyperaceae	*Schoenus*	*pedicellatus*	
Droseraceae	*Drosera*	*erythrorhiza*	
Droseraceae	*Drosera*	*pallida*	
Fabaceae	*Acacia*	*stenoptera*	
Fabaceae	*Eutaxia*	*virgata*	
Fabaceae	*Jacksonia*	*sternbergiana*	
Fabaceae	*Lolium*	*rigidum*	*
Fabaceae	*Lotus*	*angustissimus*	*
Fabaceae	*Ornithopus*	*compressus*	*
Geraniaceae	*Erodium*	*botrys*	*

Family	Genus	Species	Status
Haemodoraceae	*Conostylis*	*aculeata*	
Iridaceae	*Patersonia*	*occidentalis*	
Iridaceae	*Romulea*	*rosea*	*
Juncaceae	*Juncus*	*oxycarpus*	*
Juncaceae	*Juncus*	*pallidus*	
Juncaceae	*Juncus*	*bufonius*	*
Lauraceae	*Cassytha*	*racemosa*	
Menyanthaceae	*Liparophyllum*	*violifolia*	
Myrtaceae	*Astartea*	*scoparia*	
Myrtaceae	*Hypocalymma*	*angustifolium*	
Myrtaceae	*Kunzea*	*glabrescens*	
Myrtaceae	*Leptospermum*	*erubescens*	
Myrtaceae	*Melaleuca*	*rhaphiophylla*	
Myrtaceae	*Melaleuca*	*lateritia*	
Myrtaceae	*Melaleuca*	*preissiana*	
Myrtaceae	*Melaleuca*	*teretifolia*	
Myrtaceae	*Taxandria*	*linearifolia*	
Orchidaceae	*Microtis*	*atrata*	
Orchidaceae	*Prasophyllum*	*drummondii*	
Orchidaceae	*Thelymitra*	*flexuosa*	
Orchidaceae	*Thelymitra*	*pauciflora*	
Orobanchaceae	*Orobanche*	*minor*	*
Poaceae	*Amphibromus*	*nervosus*	
Poaceae	*Anthoxanthum*	*odoratum*	*
Poaceae	*Briza*	*maxima*	*
Poaceae	*Cynodon*	*dactylon*	*
Poaceae	*Ehrharta*	*calycina*	*
Poaceae	*Microlaena*	*stipoides*	
Poaceae	*Paspalum*	sp. (insufficient material)	
Poaceae	*Pennisetum*	*clandestinum*	*

Family	Genus	Species	Status
Polygonaceae	*Persicaria*	*prostrata*	
Polygonaceae	*Rumex*	*brownii*	*
Polygonaceae	*Rumex*	*crispus*	*
Potamogetonaceae	*Potamogeton*	*drummondii*	
Restionaceae	*Hypolaena*	*exsulca*	
Restionaceae	*Lepyrodia*	*muirii*	
Restionaceae	*Meeboldina*	*scariosa*	
Stylidiaceae	*Stylidium*	*squamosotuberosum*	

Table 24 Flora identified as being present in the quadrats along the transect of UFI 5032

Family	Genus	Species	Status
Anarthriaceae	*Lyginia*	*imberbis*	
Anarthriaceae	*Lyginia*	*barbata*	
Asparagaceae	*Laxmannia*	*ramosa*	
Asparagaceae	*Lomandra*	*caespitosa*	
Asparagaceae	*Lomandra*	*hermaphrodita*	
Asparagaceae	*Thysanotus*	*manglesianus*	
Asparagaceae	*Thysanotus*	*multiflorus*	
Asteraceae	*Ursinia*	*anthemoides*	*
Centrolepidaceae	*Aphelia*	*cyperoides*	
Colchicaceae	*Burchardia*	*congesta*	
Cyperaceae	*Carex*	*inversa*	
Cyperaceae	*Lepidosperma*	*longitudinale*	
Cyperaceae	*Lepidosperma*	*pubisquameum*	
Cyperaceae	*Schoenus*	*brevisetis*	
Cyperaceae	*Schoenus*	*efoliatus*	
Cyperaceae	*Schoenus*	*sublateralis*	
Dasypogonaceae	*Dasypogon*	*bromeliifolius*	

Family	Genus	Species	Status
Dilleniaceae	*Hibbertia*	*huegelii*	
Dilleniaceae	*Hibbertia*	*stellaris*	
Dilleniaceae	*Hibbertia*	*subvaginata*	
Droseraceae	*Drosera*	*glanduligera*	
Droseraceae	*Drosera*	sp. (insufficient material)	
Ericaceae	*Leucopogon*	*conostephioides*	
Ericaceae	*Leucopogon*	*racemulosus*	
Euphorbiaceae	*Monotaxis*	*occidentalis*	
Fabaceae	*Acacia*	*stenoptera*	
Fabaceae	*Aotus*	*gracillima*	
Fabaceae	*Bossiaea*	*eriocarpa*	
Fabaceae	*Euchilopsis*	*linearis*	
Fabaceae	*Gastrolobium*	*capitatum*	
Fabaceae	*Gompholobium*	*tomentosum*	
Fabaceae	*Jacksonia*	*furcellata*	
Fabaceae	*Jacksonia*	*sternbergiana*	
Fabaceae	*Kennedia*	*prostrata*	
Goodeniaceae	*Dampiera*	*linearis*	
Haemodoraceae	*Conostylis*	*juncea*	
Haemodoraceae	*Phlebocarya*	*ciliata*	
Hemerocallidaceae	*Johnsonia*	*pubescens*	
Hemerocallidaceae	*Tricoryne*	*elatior*	
Iridaceae	*Orthrosanthus*	*laxus*	
Iridaceae	*Patersonia*	*occidentalis*	
Juncaceae	*Juncus*	*pallidus*	
Lauraceae	*Cassytha*	*aurea*	
Lauraceae	*Cassytha*	*flava*	
Lauraceae	*Cassytha*	sp. (insufficient material)	
Lauraceae	*Cassytha*	*racemosa*	
Myrtaceae	*Astartea*	*scoparia*	

Family	Genus	Species	Status
Myrtaceae	*Baeckea*	sp. (insufficient material)	
Myrtaceae	*Calothamnus*	*lateralis*	
Myrtaceae	*Eucalyptus*	*marginata*	
Myrtaceae	*Hypocalymma*	*angustifolium*	
Myrtaceae	*Hypocalymma*	*angustifolium* subsp. Swan Coastal Plain	
Myrtaceae	*Kunzea*	*glabrescens*	
Myrtaceae	*Kunzea*	*micrantha* subsp *micrantha*	
Myrtaceae	*Melaleuca*	*brevifolia*	
Myrtaceae	*Melaleuca*	*lateritia*	
Myrtaceae	*Melaleuca*	*preissiana*	
Myrtaceae	*Melaleuca*	*teretifolia*	
Myrtaceae	*Melaleuca*	*thymoides*	
Myrtaceae	*Pericalymma*	*ellipticum* var. *ellipticum*	
Myrtaceae	*Regelia*	*inops*	
Orchidaceae	*Caladenia*	sp. (insufficient material)	
Orchidaceae	*Leporella*	*fimbriata*	
Orchidaceae	*Microtis*	*media*	
Orchidaceae	*Pterostylis*	sp. (insufficient material)	
Orchidaceae	*Thelymitra*	*flexuosa*	
Orchidaceae	*Thelymitra*	sp. (insufficient material)	
Poaceae	*Aira*	*cupaniana*	*
Poaceae	*Briza*	*maxima*	*
Poaceae	*Briza*	*minor*	*
Poaceae	*Microlaena*	*stipoides*	
Poaceae	*Neurachne*	*alopecuroidea*	
Proteaceae	*Adenanthos*	*meisneri*	
Proteaceae	*Adenanthos*	*obovatus*	
Proteaceae	*Banksia*	*attenuata*	
Proteaceae	*Banksia*	*dallanneyi* var *dallaneyi*	

Family	Genus	Species	Status
Proteaceae	*Banksia*	*ilicifolia*	
Proteaceae	*Banksia*	*menziesii*	
Proteaceae	*Petrophile*	*linearis*	
Restionaceae	*Desmocladus*	*asper*	
Restionaceae	*Hypolaena*	exsulca	
Restionaceae	*Meeboldina*	*scariosa*	
Stylidiaceae	*Stylidium*	*brunonianum*	P4
Stylidiaceae	*Stylidium*	*glaucum*	P4
Stylidiaceae	*Stylidium*	*repens*	
Stylidiaceae	*Stylidium*	*striatum*	P4
Xanthorrhoeaceae	*Xanthorrhoea*	*preissii*	

Table 25 Flora identified as being present in the quadrats along the transect of UFI 5056

Family	Genus	Species	Status
Aizoaceae	*Carpobrotus*	*edulis*	*
Anarthriaceae	*Lyginia*	*barbata*	
Apiaceae	*Actinotus*	*leucocephalus*	
Apiaceae	*Centella*	*asiatica*	
Araceae	*Lemna*	*disperma*	
Araliaceae	*Trachymene*	*pilosa*	
Asparagaceae	*Laxmannia*	*squarrosa*	
Asparagaceae	*Lomanadra*	*caesiptosa*	
Asparagaceae	*Lomandra*	*purpurea*	
Asparagaceae	*Sowerbaea*	*laxiflora*	
Asparagaceae	*Thysanotus*	*manglesianus*	
Asparagaceae	*Thysanotus*	*multiflorus*	
Asparagaceae	*Thysanotus*	*triandrus*	
Asparagaceae	*Thysanotus*	*thyrsoideus*	

Family	Genus	Species	Status
Asteraceae	*Arctotheca*	*calendula*	*
Asteraceae	*Brachyscome*	*iberidifolia*	
Asteraceae	*Cotula*	*coronopifolia*	*
Asteraceae	*Hypochaeris*	*radicata*	*
Asteraceae	*Hypochaeris*	sp. (insufficient material)	*
Asteraceae	*Lactuca*	*serriola*	*
Asteraceae	*Lepidosperma*	*scabrum*	
Asteraceae	*Podotheca*	*angustifolia*	
Asteraceae	*Rhodanthe*	*citrina*	
Asteraceae	*Rhodanthe*	*pyrethrum*	
Asteraceae	*Siloxerus*	*humifusus*	
Asteraceae	*Sonchus*	*asper*	*
Asteraceae	*Taraxacum*	*officinale*	*
Asteraceae	*Ursinia*	*anthemoides*	*
Asteraceae	*Vellereophyton*	*dealbatum*	*
Campanulaceae	*Lobelia*	*tenuior*	
Campanulaceae	*Wahlenbergia*	*preissii*	
Casuarinaceae	*Allocasuarina*	*fraseriana*	
Celastraceae	*Stackhousia*	*monogyna*	
Colchicaceae	*Burchardia*	*congesta*	
Cyperaceae	*Cyperus*	*tenellus*	*
Cyperaceae	*Isolepis*	*marginata*	*
Cyperaceae	*Lepidosperma*	*longitudinale*	
Cyperaceae	*Schoenus*	*grandiflorus*	
Cyperaceae	*Schoenus*	*pennisetis*	
Cyperaceae	*Schoenus*	sp. (insufficient material)	
Cyperaceae	*Schoenus*	*benthamii*	P3
Dasypogonaceae	*Dasypogon*	*bromeliifolius*	

Family	Genus	Species	Status
Dennstaedtiaceae	*Pteridium*	*esculentum*	
Dilleniaceae	*Hibbertia*	*stellaris*	
Droseraceae	*Drosera*	*macrantha*	
Droseraceae	*Drosera*	*menziesii*	
Droseraceae	*Drosera*	sp. (insufficient material)	
Fabaceae	*Acacia*	*stenoptera*	
Fabaceae	Acacia	*applanata*	
Fabaceae	*Acacia*	*dentifera*	
Fabaceae	*Acacia*	*pulchella*	
Fabaceae	*Acacia*	*saligna*	
Fabaceae	*Acacia*	sp. (insufficient material)	
Fabaceae	*Bossiaea*	*eriocarpa*	
Fabaceae	*Eutaxia*	*virgata*	
Fabaceae	*Gompholobium*	*tomentosum*	
Fabaceae	*Jacksonia*	*sternbergiana*	
Fabaceae	*Kennedia*	*prostrata*	
Fabaceae	*Lotus*	*angustissimus*	*
Fabaceae	*Lupinus*	*angustifolius*	*
Fabaceae	*Ornithopus*	*compressus*	*
Fabaceae	*Trifolium*	*hirtum*	
Fabaceae	*Viminaria*	*juncea*	
Goodeniaceae	*Dampiera*	*linearis*	
Goodeniaceae	*Dampiera*	*trigona*	
Goodeniaceae	*Goodenia*	*coerulea*	
Goodeniaceae	*Goodenia*	*pulchella*	
Goodeniaceae	*Lechenaultia*	*expansa*	
Haemodoraceae	*Anigozanthos*	*viridis*	
Haemodoraceae	*Conostylis*	*aculeata*	

Family	Genus	Species	Status
Haemodoraceae	*Conostylis*	*candicans*	
Haemodoraceae	*Conostylis*	*setigera*	
Haemodoraceae	*Haemodorum*	sp. (insufficient material)	
Hemerocallidaceae	*Agrostocrinum*	*hirsutum*	
Hemerocallidaceae	*Agrostocrinum*	*scabrum*	
Hemerocallidaceae	*Caesia*	*micrantha*	
Hemerocallidaceae	*Johnsonia*	*pubescens*	
Hemerocallidaceae	*Stypandra*	*glauca*	
Hemerocallidaceae	*Tricoryne*	*elatior*	
Iridaceae	*Patersonia*	*occidentalis*	
Iridaceae	*Watsonia*	*meriana* var. *bulbillera*	*
Juncaceae	*Juncus*	*pallidus*	
Juncaginaceae	*Triglochin*	*lineraris*	
Juncaginaceae	*Triglochin*	*protuberans*	
Loganiaceae	*Phyllangium*	*paradoxum*	
Loranthaceae	*Nuytsia*	*floribunda*	
Menyanthaceae	*Villarsia*	*albiflora*	
Myrtaceae	*Astartea*	*affinis*	
Myrtaceae	*Calothmnus*	*lateralis*	
Myrtaceae	*Calytrix*	sp. (insufficient material)	
Myrtaceae	*Corymbia*	*calophylla*	
Myrtaceae	*Eucalyptus*	*marginata*	
Myrtaceae	*Eucalyptus*	*rudis*	
Myrtaceae	*Hypocalymma*	*angustfolium*	
Myrtaceae	*Hypocalymma*	*robustum*	
Myrtaceae	*Kunzea*	*ericifolia*	
Myrtaceae	*Melaleuca*	*preissiana*	
Myrtaceae	*Melaleuca*	*rhaphiophylla*	

Family	Genus	Species	Status
Myrtaceae	*Melaleuca*	*thymoides*	
Myrtaceae	*Pericalymma*	*ellipticum*	
Orchidaceae	*Caladenia*	sp. (insufficient material)	
Orchidaceae	*Disa*	*bracteata*	*
Orchidaceae	*Microtis*	sp. (insufficient material)	
Orchidaceae	*Prasophyllum*	*drummondii*	
Orchidaceae	*Prasophyllum*	*elatum*	
Orchidaceae	*Pterostylis*	sp. (insufficient material)	
Orchidaceae	*Thelymitra*	*cornicina*	
Orchidaceae	*Thelymitra*	*crinita*	
Orchidaceae	*Thelymitra*	*macrophylla*	
Orchidaceae	*Thelymitra*	*paucifolia*	
Orchidaceae	*Theylmitra*	aff *holmesii*	
Orchidaceae	*Theylmitra*	*nuda*	
Oxalidaceae	*Oxalis*	*pes-caprae*	*
Philydraceae	*Philydrella*	*pygmaea*	
Poaceae	*Aira*	*caryophyllea*	*
Poaceae	*Austrostipa*	*compessa*	
Poaceae	*Austrostipa*	*elegantissima*	
Poaceae	*Avena*	*barbata*	*
Poaceae	*Briza*	*maxima*	*
Poaceae	*Briza*	*minor*	*
Poaceae	*Bromus*	*diandrus*	*
Poaceae	*Cynodon*	*dactylon*	*
Poaceae	*Ehrharta*	*brevifolia*	*
Poaceae	*Ehrharta*	*calycina*	*
Poaceae	*Lolium*	*perenne*	*
Poaceae	*Microlaena*	*stipoides*	

Family	Genus	Species	Status
Poaceae	*Neurachne*	*alopecuroidea*	
Poaceae	*Phalaris*	*canariensis*	*
Poaceae	*Phalaris*	*minor*	*
Poaceae	*Pharlis*	*paradoxa*	*
Primulaceae	*Anagallis*	*arvensis*	*
Proteaceae	*Adenanthos*	*obovatus*	
Proteaceae	*Synaphea*	*petiolaris*	
Restionaceae	*Desmocladus*	*fasciculatus*	
Restionaceae	*Desmocladus*	*flexuosa*	
Restionaceae	*Hypolaena*	*exsulca*	
Restionaceae	*Lepyroidia*	*glauca*	
Rubiaceae	*Opercularia*	*hispidula*	
Rubiaceae	*Opercularia*	*vaginata*	
Rutaceae	*Boronia*	*dichotoma*	
Rutaceae	*Philotheca*	*spicata*	
Stylidiaceae	*Stylidium*	*brunonianum*	P4
Stylidiaceae	*Stylidium*	*calcaratum*	
Xanthorrhoeaceae	*Xanthorrhoea*	*preissii*	

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