2007 MONITORING OF GROUNDWATER DEPENDENT VEGETATION – SOUTHERN BLACKWOOD PLATEAU & EASTERN SCOTT COASTAL PLAIN

Lake Jasper

A Report to Water Smart Australia and the Department of Water

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The Australian Government's Water Smart Australia programme is part of the $2 billion Australian Government Water Fund. It provides funding for large-scale projects that will make a significant contribution to the sustainable and efficient management of Australia's water resources.

Summary

The Department of Water (DoW) is undertaking groundwater allocation planning work in the Busselton-Capel and Blackwood groundwater areas. As part of the allocation process, groundwater-dependent ecosystems of high ecological value have been identified and the water regimes (EWRs) required to maintain those values at low risk have been determined.

On the southern Blackwood Plateau and the eastern Scott Coastal Plain 24 sites, representing both wetland and phreatophytic terrestrial vegetation, were identified, and permanent monitoring transects established. Baseline monitoring was undertaken in 2005 and all sites were re-monitored in 2006. As good baseline data had been collected, approximately 50% of sites, including key iconic sites on the Blackwood and at Lake Jasper, were re-monitored in 2007. The remaining sites will be re-monitored in the 2008 round. During early 2008 new transects were also established and baseline monitoring undertaken at five wetland sites across the Western Scott Coastal Plain.

The deliverables associated with this project were as follows:

- Vegetation monitoring and establishment of western Scott Coastal Plain transects.
- Discussion and interpretation of results including identification of trends or impacts related to changes in water regimes.
- Review of current Ecological Water Requirements.

Results of the 2007 monitoring indicated improvements in tree canopy condition across the majority of transects, with the exception of the Stewart Rd and Scott Rd terrestrial sites. EWRs were not breached at these sites. However, groundwater levels rose prior to 2007 possibly resulting in to water-logging of the deep rooted Eucalypt sp. dominant in the overstories. Improved canopy conditions were recorded at other sites at which short-term groundwater level declines occurred.

Species richness decreased across the majority of sites, generally as a result of sampling in summer after many annual species had completed their life-cycles. Although the number of exotic species also decreased at some sites (Lake Jasper South and East) there was an increase at others (Pneumonia Rd and Stewart Rd). However, changes were insignificant as numbers did not vary by more than 1 or 2 species across entire transects. As changes in species richness were relatively small, there was also little change in species composition across transects, with nine of the 11 sites >85% similar in composition between 2006/07 and 2007/08. Species composition at the two remaining sites, Lake Jasper East and South, was still in flux as vegetation continued to recover from the 2005 fires.

EWRs appeared to have been breached at three wetland sites in autumn 2007; Lake Jasper East, Blackpoint/ Fouracres Rd. and Darradup Rd. East. Although declines below the EWRs of 0.85 m, 0.2 m and 0.52 m respectively were recorded, these readings were not reflective of actual groundwater level declines at Blackpoint/ Fouracres Rd. and Darradup Rd. East as piezometers had dried prior to the end of autumn. It must also be

noted that the existing EWR at Lake Jasper East will be reviewed following monitoring in spring 2008 to better reflect current groundwater levels (measured at a newly installed piezometer) rather than surface water levels. Despite groundwater level declines mean canopy condition improved, richness of exotics decreased or remained at zero and there was little change in species composition at all three sites. Although these results initially suggest that the EWRs are non-representative of vegetation requirements at these sites, it must be noted that vegetation at both Lake Jasper East and Darradup East is still re-establishing following fires in 2005. Continued improvements in canopy condition are therefore not unexpected. It is also possible that above average winter rainfall recorded in Pemberton in 2007 offset the potential negative impacts generally associated with water table decline.

Continued vegetation and water level monitoring is required at the southern Blackwood and Scott Coastal Plain sites to further investigate relationships between changes in vegetation condition associated with groundwater level change and/ or climate change.

Project context

The Department of Water (DoW) is undertaking groundwater allocation planning work in the Busselton-Capel and Blackwood groundwater areas. As part of the allocation process, groundwater-dependent ecosystems of high ecological value have been identified and the water regimes required to maintain those values at low risk have been determined. These are referred to as Ecological Water Requirements (EWRs).

On the southern Blackwood Plateau and the eastern Scott Coastal Plain EWR sites have been established representing both wetland and phreatophytic terrestrial vegetation. This involved establishment of vegetation transects with baseline vegetation monitoring, and construction or utilisation of existing piezometers to measure groundwater levels. This work comprised the requirements of contracted works conducted by the Centre for Ecosystem Management (Edith Cowan University) in 2005 (Froend & Loomes, 2006a).

Previous monitoring rounds (2005 & 2006) have included assessments of all 24 sites established in 2005. As good baseline data have been collected, the monitoring effort can now be reduced. As a result, in the 2007 round, approximately 50% of sites, including key iconic sites on the Blackwood and at Lake Jasper, were monitored. The remaining sites will be re-monitored in the 2008 round.

The deliverables associated with this project are as follows:

- Vegetation monitoring.
- Discussion and interpretation of results including identification of trends or impacts related to changes in water regimes.
- Review of current Ecological Water Requirements.

In addition, the DoW required expansion of the existing monitoring program to include sites in the Western Scott Coastal Plain region. Transects were established and baseline monitoring undertaken in summer 2008 at five sites previously selected by DoW staff. Re-monitoring will occur in spring 2008.

Background

A number of reasons for the implementation of a monitoring program have been identified and include: to characterise variations in responses of ecosystems to natural variability in the environment; to collect baseline data on an ecosystem as part of the inventory process; to record ecological changes occurring as result of specific natural or anthropological events; to measure progress towards set objectives of a management program and; to audit performance of management agencies and land users (Bunn, Boon, Brock, & Schofield, 1997; Finlayson & Mitchell, 1999). All of the above reasons, particularly the latter three, are relevant to the monitoring of wetland and terrestrial vegetation of the Southern Blackwood and Eastern Scott Coastal Plain study area.

This report presents the results of the third monitoring period at selected existing sites and a discussion of any identified trends or impacts related to changes in water regimes. Results of baseline monitoring at the 5 newly established Western Scott Coastal Plain sites are also presented. Monitoring was undertaken over summer 2007/08.

Vegetation Monitoring

Approach/ Methods

Monitoring approach

Monitoring is defined as the collection of specific information for management purposes in response to hypotheses derived from assessment activities, and the use of these results for implementing management (Finlayson, 2003).

Parameters used in monitoring should reflect the ecological values, environmental condition and health of GDEs and have a defined relationship with groundwater levels. Froend and Zencich (2002) listed the following specific parameters as suitable for examining vegetation response to changed water regimes:

- Species diversity of plant communities;
- Cover and abundance of indicator plant species;
- Species evenness over time;
- Weediness index overtime;
- Regeneration index over time;
- Canopy fullness/density of indicator species;
- Community distribution/zonation change or distribution of indicator plant species along a gradient;
- Size (height) and age structure (dbh) of a local population;
- Canopy health.

When monitoring vegetation it is important to measure environmental variables that will influence vegetation communities, namely:

- Groundwater levels and fluctuating water regimes (duration of wet/dry phases, seasonality etc);
- Water quality (nutrient concentrations, salinity, toxicants);
- Soil water retention capacity and soil stratigraphy (water retention layers);
- Climatic information (rainfall and maximum temperatures during summer/early autumn);
- Frequency of fire disturbance (measured by recording the presence or absence of fire ephemeral native legumes).

Hypotheses

The formulation of a testable hypothesis is critical to the effectiveness of a monitoring program. Finlayson and Mitchell (1999) explain that monitoring is underpinned by the assumption that there is a specific reason for the collection of data, and the assumption should be clearly stated and presented as a hypothesis, subsequently tested and the information assessed and fed back into the management process. Management performance and accountability are also critical to effective monitoring and should be monitored alongside ecological parameters (Finlayson & Mitchell, 1999). An iterative relationship between monitoring and management should exist, resulting in an adaptive management program, where monitoring data provides a check on the progress of

management and if necessary, the management program can be amended to ensure objectives are being met (Bunn et al., 1997). A strong relationship between monitoring and research should also be encouraged in order to refine and extend scientific knowledge of the ecosystem (Bunn et al., 1997).

The critical importance of monitoring objectives, stated as clear and testable hypotheses, to the effectiveness of a monitoring program, has been emphasised by number of authors (see Bunn et al., (1997); Finlayson and Mitchell (1999) and Finlayson (2003)). For each GDE clear identification and definition of monitoring objectives should be developed and expressed and testable hypotheses. These hypotheses should relate the loss of environmental values of a specific GDE to the groundwater regime and should incorporate monitoring parameters as compliance criteria. For instance, if a wetland has diverse littoral and fringing vegetation in good condition, supporting a diverse macroinvertebrate community and providing habitat for water birds, an appropriate hypothesis may be:

> *Increasing depth to groundwater will lead to a change in the structure, condition and vigour of littoral and fringing vegetation resulting in the decline of habitat values.*

The 'change in structure, condition and vigour' can be measured using relevant parameters (i.e. species diversity, species cover and abundance, vegetation structure, community distribution etc.). However, what constitutes a 'change' resulting in a loss of values will depend on the current condition of the littoral and fringing vegetation which led to the assignment of habitat values.

A vegetation monitoring regime for wetland and terrestrial criteria sites was proposed by Froend and Loomes (2006b). Initially overarching monitoring objectives were identified to provide general direction for the entire program. Monitoring objectives applicable at site level were then developed based on previously identified management objectives (Froend & Loomes, 2006b).

The suggested overarching monitoring objectives for wetland and terrestrial vegetation criteria sites of the study area were as following;

1. To forecast ecosystem response to a changing groundwater regime.
2. To ensure an early-warning system for critical GDE components.
3. To improve understanding of GDE response to changing groundwater regime.

To address these at a site level the following monitoring objectives were recommended;

- To detect changes in species composition related to water regime change.
- To detect changes in species distribution related to water regime change.
- To detect changes in species richness related to water regime change.
- To detect changes in species mortality related to water regime change.
- To detect changes in species condition and vigour related to water regime change.
- To detect changes in community structure related to water regime change.
- To detect changes in water regime.

Table 1: Monitoring objectives and relevant monitoring parameters.

Monitoring objective	Monitoring parameters
To detect changes in species composition related to water regime change	- species diversity - species cover and abundance
To detect changes in species distribution related to water regime change	- species evenness - species distribution
To detect changes in species richness related to water regime change	- species diversity
To detect changes in species mortality related to water regime change	- canopy health - species cover and abundance
To detect changes in species condition and vigour related to water regime change	- regeneration index - canopy health
To detect changes in community structure related to water regime change	- community distribution/ zonation - weediness index - size and age structure of tree populations
To detect changes in water regime	- ground and surface water levels

Although it was possible to develop testable hypotheses for each monitoring objective, it was more expedient to develop an 'all-encompassing' hypothesis for each site based on identified ecological values. Therefore only three hypotheses have been developed based on the ecological values of criteria sites.

The following wetlands/ wetland sites are known to support unaltered groundwater dependent flora and fauna assemblages (V & C Semeniuk Research Group, 2005);

- Lake Jasper East
- Pneumonia Rd
- Poison Gully

The following hypothesis was applied to monitoring at these sites;

> *Increasing depth to groundwater will lead to a change in the structure, condition and vigour of littoral and fringing vegetation resulting in the decline of faunal habitat values.*

The remaining wetlands/ wetland sites are not thought to support groundwater dependent fauna however all support unaltered flora assemblages;

- Lake Jasper South
- Darradup Rd East
- Blackpoint/ Fouracres Rd.

The following hypothesis was applied to monitoring at these sites;

> *Increasing depth to groundwater will lead to a change in the structure, condition and vigour of littoral and fringing.*

Hypotheses have yet to be developed for the newly established Western Scott Coastal Plain wetland sites.

Although it is probable that all terrestrial sites support fauna it is unlikely that any species exhibit more than a very low level of groundwater dependence. Therefore the following hypothesis was applied to monitoring at these sites;

> *Increasing depth to groundwater will lead to a change in the structure, condition and vigour of phreatophytic vegetation.*

It was suggested that monitoring be undertaken in late spring to ensure all sites are accessible and that surface water levels in wetlands have declined sufficiently to allow field work to be completed. Spring is also the peak flowering period facilitating plant identification. However, as the monitoring contract was awarded in spring 2007, monitoring was not undertaken until summer.

Monitoring of ground and surface water levels at each site represents the best 'early warning' signal of potential impacts of changing water regimes on ecosystem health. As the frequency of monitoring at criteria sites should be sufficient to detect seasonal fluctuations it should be undertaken on a seasonal basis at the very least, although monthly monitoring is recommended. Although hand-dug piezometers were installed at the time of transect establishment, they could not be dug deeper than the existing water table. In response the DoW and contractors have commenced a program to install permanent piezometers.

Methods

A permanent 20 m wide, belt-transect was established at each site. Standard transects are composed of four 20 x 20m plots (Figure 1). Within each 20 x 20 m quadrat, all trees were tagged at breast height (approx. 1.5 M) with a numbered galvanised tag. Two 5 x 5 m sub-plots were established within each quadrat, and marked with galvanised steel posts for assessment of all understorey plants. Sub-plots were located in the bottom right and top left-hand corners of each 20 x 20 m plot.

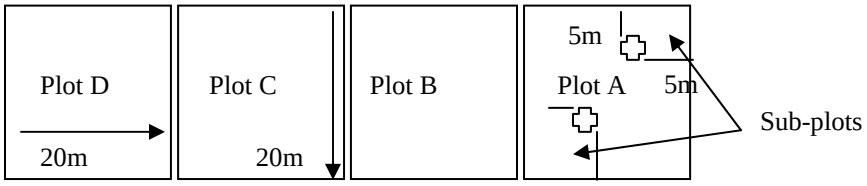


Figure 1: Standard set-up of sub-plots on monitoring transects at wetland and terrestrial sites.

During each monitoring round, the species, diameter at tag height and crown condition of each tree within each plot were recorded. In the case of individual tree with multiple stem, all stems were measured at the same height as the position of the tag or at breast height. In addition to tracking growth and vigour of trees in the future, stem diameters also permit size class analysis of populations. Crown assessments were carried out using a subjective three part scale where a score was recorded for crown density, dead branches

and epicormic growth. Using diagrams for comparison, a score was given for each component (9, 7, 5, 3, 1 for crown density and dead branches and 5, 4, 3, 2, 1 for epicormic growth) (Ladd, 1996) and these scores totalled to give a health assessment score for each tree. Tree health or canopy condition was described as poor (1-5), moderate (6-11) or good (12-17) or very good (18-23).

Within each 5 x 5 m plot all species were identified and their cover estimated using the Domin-Krajina scale of cover and abundance (Kent & Coker, 1992). This technique allows comparison of changes in the relative importance of individual species within each plot over time. Based on this floristic data, a weediness index was calculated for each plot by dividing the cover of exotic species by the cover of natives and adding the number of exotics divided by the number of natives (Ladd, 1996). This provides an indication of the extent of weed invasion in each plot and changes over time.

To improve the understanding of relationships between vegetation condition and water regimes and to test the hypotheses, changes in canopy health, species composition and other vegetation measures are compared to water level trends and other influences including recent fire history and rainfall. However, as water level monitoring at the majority of sites has only commenced within the last 12 to 24 months, relationships between water regime change and vegetation can only be described in the short term.

Results

Tables documenting the health and DBH measurements of dominant tree species in each plot and the cover and abundance values of all species within monitored sub-plots are presented in Appendices 1 and 2. A summary of changes in selected vegetation parameters (across entire transect), fire history and hydrological conditions, including annual and winter rainfall is presented in Table 2. Descriptions of these data follow on a site by site basis.

Bureau of Meteorology rainfall records were sourced for Pemberton as this was the closest meteorological station. Long-term, average, monthly rainfall and 2006/07, 2007/08 monthly rainfall (Figure 2) show that long-term monthly averages were exceeded during August 2006, and January, March, April, July, August and September 2007, and December and April 2008. Data also show that 2007/08 was wetter than the previous 12 month period with 2006/07 monthly totals exceeded in every month except November 2007 and January and March 2008.

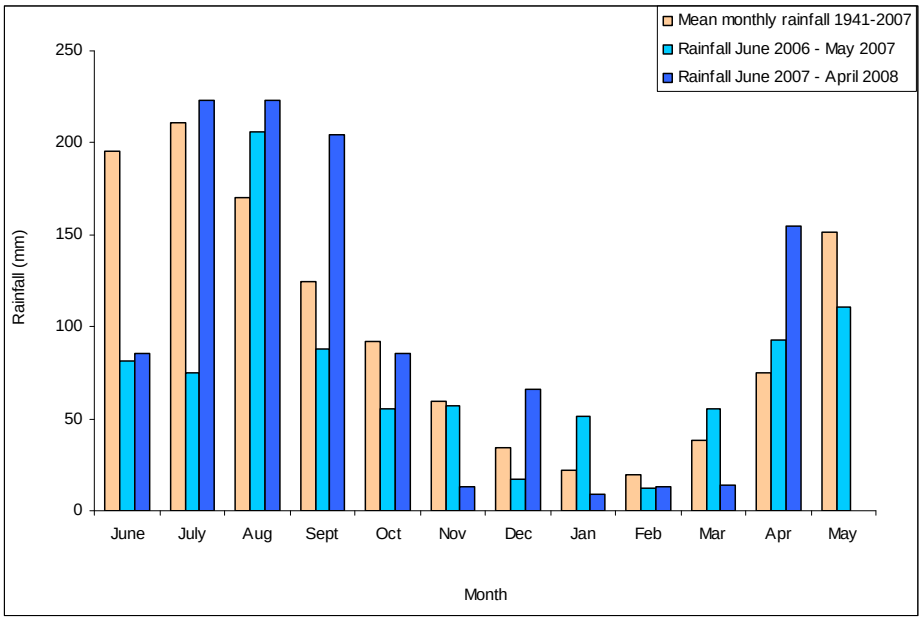


Figure 2: Long term (1941-2007) average monthly rainfall compared to monthly rainfall 2006/07 and 2007/08 recorded at Pemberton.

Table 2: Summary table of changes in vegetation (across entire transect), fire history and hydrological conditions. No changes in vegetation data are available for the Western Scott Coastal Plain sites as 07/08 represents the first round of monitoring.

Sites	Vegetation change 06-07/08			Fire		Hydrological conditions (2007)			
	[1]Tree health	[2]Inc exotics	[3]Similarity index	Fire Pre 07/08	Fire Post 07/08	Minimum water level (m AHD)	[4]Annual rainfall (mm)	[4]Annual evaporation (mm)	[4]Winter rainfall (June-Oct mm)
Wetlands									
Lake Jasper South	47.49	-42.86	0.69	Y	N	39.03	1053	1284	724
Lake Jasper East	29.83	-100	0.83	Y	N	37.65	1053	1284	724
Pneumonia Road	17.10	0	0.91	N	N	28.61	1048	1296	724
Blackpoint/Fouracres Rd	24.98	0	0.93	N	N	45.25 dry	1013	1279	724
Darradup Rd East	16.12	0	0.88	Y	N	101.18 dry	1005	1279	727
Poison Gully	9.07	0	0.89	N	N	31.12	926	1323	664
Terrestrial									
Blackpoint/Fouracres Rd	15.07	0	0.91	N	N	43.90	1013	1279	724
Darradup Rd East	18.76	0	0.90	Y	N	105.78	1005	1279	727
Poison Gully	9.11	0	0.90	N	N	32.62	926	1323	664
Stewart Rd	-12.89	200	0.95	N	N	88.88	972	1282	684
Scott Rd	-13.22	0	0.94	N	N	37.03	1089	1283	726
Western Scott Coastal Plain									
Reedia South	n/a	n/a	n/a	N	N	24.23	908	1339	748
Reedia North	n/a	n/a	n/a	N	N	26.3	908	1339	748
Dennis Rd	n/a	n/a	n/a	N	N	-	894	1324	627
Scott River Rd	n/a	n/a	n/a	N	N	-	866	1329	604
Adelaide Rd	n/a	n/a	n/a	N	N	-	926	1333	712

[1]% change in mean tree health/ canopy condition. [2]% change in abundance of exotic species. [3]Compositional similarity matrix. [4]Sourced from SILO Data Drill

Wetland Sites

Lake Jasper – South

A significant area of bushland in the D'Entrecasteux National Park, including much of the southern and eastern regions of Lake Jasper, was affected by bushfires in early 2005. An 80 m transect running east-west was established approximately 10 m south-west of bores SC21A and B on the south side of Lake Jasper, some 500 m from the lake edge, in an area impacted by the fires. The transect increased in elevation along its length, with the vegetation changing from relatively dense *Banksia littoralis* and *Melaleuca preissiana* to more sparse yet larger *M. preissiana*.

As a result of the 2005 fires all trees scored relatively poor canopy health/condition values during baseline monitoring. As expected, as regeneration continues, the canopy health of all study trees improved further during 2007/08 increasing by 47.49% across the transect (Appendix 1.1.1, Tables 3 & 4). The density of understorey vegetation had also increased, with the majority of the transect so thickly vegetated as to be almost inaccessible (Table 4, Appendix 2.1.1). As a result, only two photos were taken in this round as it was virtually impossible to photograph all plots (Figures 3A-D). Despite increased density, species richness declined significantly across the transect (Table 4), with the cover and abundance of exotics decreasing by 42.86% and species composition only 69% similar to that recorded in 2006 (Table 3). These results reflect both continued re-establishment of vegetation at the site and seasonal drying of annual exotics.

The canopy condition of the large, mature *B. littoralis* dominating Plot A improved slightly during 2007 while the two smaller *M. preissiana* improved significantly (*B. littoralis* – 2006: 18-20, mean 18.5; 2007/08: 20-21, mean 20.7, *M. preissiana* – 2006: 11-12, mean 11.5; 2007/08: 19-21, mean 20). The condition of all trees within the plot is now classified as very good.

The domination of by *Lepidosperma gladiatum* (coastal sword sedge) and *Thomasia foliosa* continued in the understorey of sub-plot A1 (Appendix 2.1.1). However, the cover and abundance of previously dominant *Anigozanthos flavidia* (red kangaroo paw) and the native herb, *Senecio ramossissmus* declined. Species richness declined from 20 to 13, with the loss of two exotics resulting in a fall in the weediness index from 0.26 to 0.11. *Taxandria inundata,* a large shrub/ small tree species, remained dominant in sub-plot A2 with *L. gladiatum* also still abundant. The large shrub, *Callistachys lanceolata,* was also common however, the cover and abundance of previously prevalent *Lepidosperma longitudinale* and *A. flavidia* had decreased since 2006. The plot remained species poor supporting nine native species only.

Plot B was dominated by several, small to moderate sized *M. preissiana* and two larger *B. littoralis.* The canopy condition the *B. littoralis* improved from good in 2006 (14-18, mean 16) to very good in 2007 (21-23, mean 22). The canopy condition of *M. preissiana* also improved over 2007 (2006: 9-14, mean 10.8; 2007: 13-23, mean 18.8) increasing from moderate to very good.

The cover and abundance of *Acacia pulchella* increased in the understorey of sub-plot B1 during 2007. This species was the most abundant with *Xanthorrhoea preissii* and *Macrozamia reidlei* also still common along with *Agonis flexuosa* (native peppermint) seedlings which have continued to establish. Species richness decreased further over 2007 falling from 20 to 13 with the one exotic recorded in 2006 no longer present in the plot. *A. flavida* was no longer dominant in the understorey of B2 with the previously abundant *S. ramossissmus* not recorded in the plot in 2007. *L. gladiatum* and *C. lanceolata* were themost abundant species. The single exotic identified in 2006, was not recorded in 2007, with only 7 species occurring across the plot compared to 11 in 2006.

Small to moderate sized *B. littoralis* dominated plot C with two small *M. preissiana* also occurring. All trees were previoulsy in moderate condition however the health of both species increased over 2007 (*B. littoralis* – 2006: 9-16, mean; 2007: 21-23, mean 21.5, 13.8; *M. preissiana* – 2006: 9-16, mean 13.8; 2007: 21).

Young *A. flexuosa* remained common in the understorey of sub-plot C1 with *A. pulchella* and an unidentified Epacridaceae sp. however, the abundance of *Xanthorrhoea brunonis* had declined. Seven species were identified in 2007, eight less than 2006. The single exotic was lost from the plot. The cover and abundance of *X. brunonis* had also declined in sub-plot C2 along with *A. flavidus*, leaving *C. lanceolata* and *A. pulchella* the dominant species. The plot supported 11 native species, eight less than 2006. None of these were exotic.

The overstorey of Plot D is dominated by two moderate to large, multi-stemmed *M. preissiana* and a small, single-stemmed individual. Canopy condition in this plot increased from good (14-17, mean 15.5) in 2006 to very good (17-21, mean 19.6) in 2007.

Although the dominance of *X. brunonis*, *A. flexuosa* and the Epacridaceae sp. declined in sub-plot D1, the cover and abundance of *T. inundata*, *A. pulchella* and *Pultenaea reticulata* increased to make these the most common species in 2007. Eleven native species were recorded in the plot in 2007, seven less than 2006. Sub-plot D2 was still dominated by *T. inundata* which has increased in cover and abundance since the last assessment. The fern *Pteridium esculatum* and Epacridaceae sp. also remain abundant. Twenty species were identified in 2006 falling to 10 in 2007. No exotics were recorded during the 2007 assessment.

Table 3: Lake Jasper south - summary of transect data; diameter, health (canopy condition) and density of overstorey species (all plots are 20 x 20m).

Plot/ year		A			B			C			D		
	Spec[1].	05	06	07	05	06	07	05	06	07	05	06	07
Diameter range[2]	M.p.	6.0 - 7.5	6.0 - 7.5	6.0 - 7.5	3 - 16.4	3 - 16.4	3 - 16.4	3.4 - 8.1	3.4 - 8.1	3.4 - 8.1	3.6 - 46.4	3.6 - 46.4	3.6 - 46.4
	B.l.	24 - 43.2	24 - 43.2	24 - 43.2	14.3 - 28.4	14.3 - 28.4	14.3 - 28.4	<2 - 18.2	<2 - 18.2	<2 - 18.2	-	-	-
Health Mean[3]	M.p.	11.0	11.5	20	11.0	10.8	18.8	11.0	11.5	21	11.5	15.5	19.6
	B.l.	11.7	18.5	20.7	12.0	16.0	22	11.8	13.8	21.5	-	-	-
Health Range	M.p.	11	11 - 12	19 - 21	11	9 - 14	13 - 23	11	11 - 12	21	11 - 12	14 - 17	17 - 21
	B.l.	11 - 13	18 - 20	20 - 21	12	14 - 18	21 - 23	11 - 13	9 - 16	21 - 23	-	-	-
Density[4]	M.p.	2	2	2	7	7	7	2	2	2	2	2	3
	B.l.	6	6	6	2	2	2	4	4	4	-	-	-

[1]Overstorey species – M.p. = *Melaleuca preissiana*; B.l.= *Banksia littoralis*
[2]Diameter Range is the range in individual stem diameters (cm) at breast height (1.3m).
[3]Mean health rating for all overstorey species.
[4]Density is number of trees in each plot.

Table 4: Lake Jasper south - summary of understorey data (all plots are 5 x 5m).

Plot	A1			A2			B1			B2			C1			C2			D1			D2		
Year	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07
No. species	28	20	13	13	10	9	24	20	13	15	11	7	17	15	7	24	19	11	15	18	11	21	20	10
No. exotics	5	3	1	-	-	0	2	1	0	-	1	0	1	1	0	-	-	0	-	-	0	2	2	0
Weediness index	0.34	0.26	0.11	0	0	0	0.16	0.10	0	0	0.18	0	0.09	0.09	0	0	0	0	0	0	0	0.19	0.17	0

a. b.

c. d.

Figure 3: Lake Jasper South vegetation monitoring transect; a) 20–0m, 2007/08; b) 20–0m, 2006; c) 20-40m, 2007/08; d) 20-40m, 2006.

Although monitoring of bore 60830005, in close proximity to the transect, commenced in 1992, the record is incomplete with no data recorded between July 1996 and April 2003 and little since September 2004 (Figure 4). However, available data showed that the minimum autumn groundwater level recorded in 2007 was lower than that recorded in autumn 2006 and higher than 2003 and 2004. The higher level in 2006 is possibly a result of decreased evapotranspiration following the 2005 fires.

The paucity of hydrodata, especially immediately prior and post-fire, in combination with post-fire vegetation regeneration renders any assessment of the relationship between vegetation condition and the water regime problematic. In order to describe the vegetation-hydrology relationship a longer, more consistent hydrological data set is required and, ideally, vegetation composition and condition should have undergone post-fire succession and stabilized.

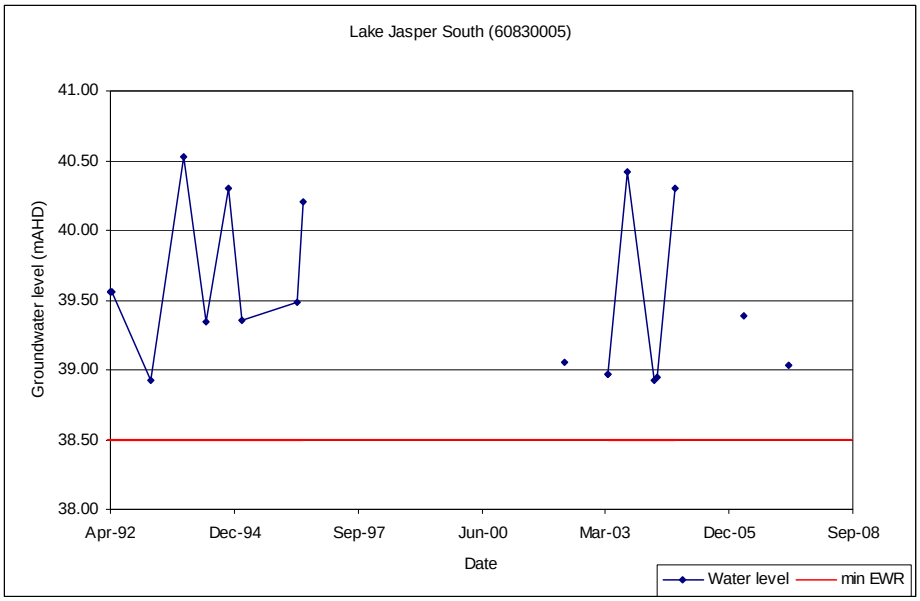


Figure 4: Lake Jasper South groundwater levels 1992 - 2008.

Lake Jasper – East

A second site was identified on the eastern side of lake in close proximity to an existing staff gauge within the recreation area. This site had also been burnt during the 2004/05 fires and has regenerated extensively in the last two years. Canopy condition (Appendix 1.1.2, Table 5, Figures 5A-F) and understorey density has therefore increased since baseline monitoring (Table 6, Appendix 2.1.2). Plot A of the 80 m transect extends into the lake and is dominated by the sedges *Baumea articulata* and *B. juncea*. *Melaleuca preissiana* and *B. littoralis* occur further along the transect with *Eucalyptus megacarpa* and *B. attenuata* becoming dominant in the overstorey with increasing elevation. There was some improvement in tree health during 2007 with canopy condition increasing by 29.83% (Table 2). Although there was generally a decline in species richness across sub-plots, including the loss of the single exotic species recorded in 2006, species composition was 83% similar between 2006 and 2007.

The majority of Plot A appears to be underwater for a large part of the year as supported by the continued dominance of *Baumea articulata* and *B. juncea* with *B. articulata* extending into deeper water beyond the transect. Although *T. inundata* occurs in the plot no common wetland trees are present. There was very little change in the understorey of sub-plot A1, with *B. articulata* and *B. juncea* still dominant and wetland species tolerant of inundation including *Villarsia parnissifolia*, still common. *Baumea articulata* and *B. juncea* remained the only species recorded in sub-plot A2.

Plot B was dominated by small to very large *M. preissiana* the health of which improved over 2007 (2006: 10-18, mean 15; 2007: 15-18, mean 16.25). The canopy condition of two large *Eucalyptus megacarpa* and a single *B. littoralis*, had also improved since the last assessment (*E. megacarpa* – 2006: 11, mean 11; 2007: 12-16, mean 14, *B. littoralis* – 2006: 15, mean 15; 2007: 21, mean 21).

Baumea juncea continued to dominate the understorey of sub-plot B1 with the large shrubs, *T. inundata* and *C. lanceolata* also still present. Although species richness in this plot increased from nine to six no exotics were recorded. The mid point of plot B represented the transition from mesic to more terrestrial species which was reflected by greater species diversity in sub-plot B2. The fern *P. esculatum* remains dominant in the understorey of B2, with *M. reidlei* and *X. preissii* also common. Eighteen native species were again recorded in the plot.

The canopy condition of the three moderately sized *E. megacarpa* in Plot C improved during 2007 (2006: 9-13, mean 9.5; 2007: 9-19, mean 14.5) as had the health of the single small *B. littoralis* (2006: 19; 2007: 21). The abundance of *P. esculentum* in sub-plot C1 had declined significantly since the 2006 assessment (>80% to <1%) with *X. preissii, A. cyclops* and an Epacridaceae sp. now dominant. Species richness had also fallen with only 11 species recorded in 2007 compared to 20 in 2006. The abundance of *P. esculatum* increased in C2 remaining co-dominant with *X. preissii. A. rostellifera* and Epacridaceae sp. were also common. Species richness declined from 20 to 11 in 2007 with no exotics recorded.

The overstorey of plot D was dominated by 14 small to moderately sized *Banksia attenuata* and four small to moderately sized *E. megacarpa*. The canopy health of both species improved during 2007 (*E. megacarpa* –2006: 9-10, mean 9.5; 2007: 13-21, mean 18, *B. attenuata* –2006: 9-10, mean 14.8; 2007: 9-21, mean 18).

Macrozamia reidleii and *X. preissii* continued domination of the understorey of sub-plots D1 and D2, with *A. cyclops* also common in both. Species richness in D1 decreased from 17 to 12 during 2007 and 21 to 11 in D2. No exotics were recorded in either sub-plot.

Figure 5: Lake Jasper East vegetation monitoring transect. All photos taken looking diagonally across the plot; a) 0-20m, b) 20- 0m; c) 20- 40m; c) 40- 60m; d) 60- 40m; e) 60- 80m; f) 80- 60m.

Table 5: Lake Jasper east - summary of transect data; diameter, health and density of overstorey species (all plots are 20 x 20m).

Plot/ year		A			B			C			D		
	Spec[1].	05	06	07	05	06	07	05	06	07	05	06	07
Diameter range[2]	M.p.	-	-	-	<2 - 104	<2 - 104	<2 -104	-	-	-	-	-	-
	B.l.	-	-	-	10.3	10.3	10.3	15.6	15.6	18	-	-	-
	B.a.	-	-	-	-	-	-	-	-	-	<2.0 - 29.8	<2.0 - 29.8	<2 - 32.0
	E.mc.	-	-	-	43.8 - 79.4	43.8 - 79.4	43.8 - 79.4	30.9- 43.1	30.9- 43.1	3 - 46.4	2.6 - 45.1	2.6 - 45.1	2.6 - 45.1
Health Mean[3]	M.p.	-	-	-	15	15	16.25	-	-	-	-	-	-
	B.l.	-	-	-	19	15	21	18	19	21	-	-	-
	B.a.	-	-	-	-	-	-	-	-	-	16.2	14.8	18.07
	E.mc.	-	-	-	11.5	11	14	13	9.5	14.5	13	9.5	18
Health Range	M.p.	-	-	-	12 - 18	10 - 18	15 - 18	-	-	-	-	-	-
	B.l.	-	-	-	19	15	21	18	19	21	-	-	-
	B.a.	-	-	-	-	-	-	-	-	-	14 - 19	6 - 20	9 - 21
	E.mc.	-	-	-	11 - 12	11	12 - 16	13 - 16	9 - 13	9 - 19	10 - 16	9 - 10	13 - 21
Density[4]	M.p.	-	-	-	4	4	4	-	-	-	-	-	-
	B.l.	-	-	-	1	1	1	1	1	1	-	-	-
	B.a.	-	-	-	-	-	-	-	-	-	14	14	14
	E.mc.	-	-	-	2	2	2	3	3	4	2	2	4

[1]Overstorey species – M.p. = *Melaleuca preissiana*; B.l.= *Banksia littoralis; B.a. = Banksia attenuata; E.mc. = Eucalyptus megacarpa.*
[2]Diameter Range is the range in individual stem diameters (cm) at breast height (1.3m).
[3]Mean health rating for all overstorey species.
[4]Density is number of trees in each plot.

Table 6: Lake Jasper east - summary of understorey data (all plots are 5 x 5m).

Plot	A1			A2			B1			B2			C1			C2			D1			D2		
Year	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07
No. species	9	6	6	2	2	2	7	9	6	16	18	18	18	20	11	20	17	11	19	17	12	18	21	11
No. exotics	-	-	0	-	-	0	0	-	0	1	-	0	-	-	0	1	1	0	-	-	0	-	1	0
Weediness index	0	0	0	0	0	0	0	0	0	0.09	0	0	0	0	0	0.08	0.06	0	0	0	0	0	0.07	0

As bore 60810002, in close proximity to the eastern transect, was only established in early 2007 limited, yet relatively consistent, monthly hydrological data are available (Figure 6). However, the hydrograph showed that the minimum autumn groundwater level recorded in 2008 was lower than that recorded in autumn 2007. This is possibly a result of increased evapotranspiration as vegetation establishes following the 2005 fires.

As was noted for the southern transect, the paucity of hydrodata, especially immediately prior and post-fire, in combination with post-fire vegetation regeneration renders any assessment of the relationship between vegetation condition and the water regime problematic. In order to describe the vegetation-hydrology relationship a longer, more consistent hydrological data set is required and, ideally, vegetation composition and condition should have undergone post-fire succession and stabilized.

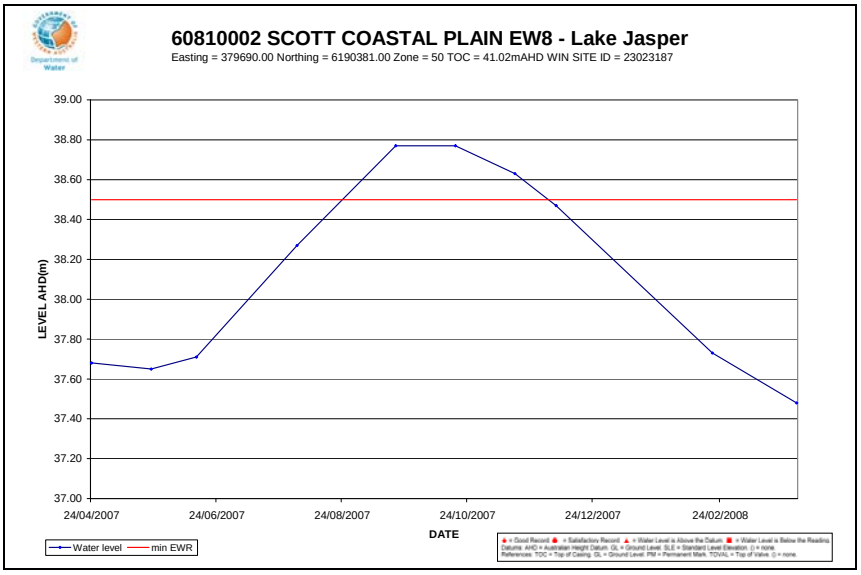


Figure 6: Lake Jasper East groundwater levels 2007- 2008.

Pneumonia Rd

The Pneumonia Rd transect was established at the piezometer approximately 200 m north-east of the road near the end of a drainage ditch. The 80 m transect decreased in elevation with distance moving from an area of open *E. marginata* woodland with a terrestrial understorey across the wetland dominated by *P. ellipticum* and sedges with emergent *M. preissiana* and *T. linearifolia*. Canopy condition improved by 17% during 2007. However, there was very little change in species composition across the transect (91% similar to 2006) and no change in the number of exotics (Table 2).

A significant proportion of vegetation across this transect and the surrounding area was inundated at the time of baseline monitoring in 2005. However, the site was completely dry during both the 2006 and 2007 monitoring rounds.

A large number of small *M. preissiana* dominated the overstorey of plot A with one small *E. marginata* also recorded. The canopy condition had improved in both species over 2007 (*M. preissiana* –2006: 7 - 17, mean 14.5; 2007: 9-19, mean 16.1, *E. marginata* – 2006: 15; 2007: 21) (Appendix 1.1.3, Table 7).

The cover and abundance of *Pericalymma ellipitcum* in sub-plot A1 has not increased again since declining significantly during 2006. Low sedges including *Lyginea barbata, Desmocladus castaneus* and two unidentified Restionaceae sp. were still dominant the understorey of this plot (Appendix 2.1.3). Twenty five native species were recorded in 2006 and 19 in 2007 (Table 8, Figures 7A-H). The cover of *P. ellipticum* had also decreased in A2. *Taxandria parviceps, L. barbata, D. castaneus* and two *Sphaerolobium* species were still dominant with *Dasypogon bromeliifolius*. A total of 28 native species were recorded in this plot in 2006, decreasing to 23 native and one exotic in 2007.

The canopy condition of the small to moderately sized *M. preissiana* and small *B. littoralis* in plot B improved during 2007 (*M. preissiana* - 2006: 13-17, mean 14.5; 2007: 13-17, mean 15.3, *B. littoralis* - 2006: 13-17, mean 15; 2007: 13-23, mean 18). *T. linearifolia* and *Hakea ceratophylla* were still dominant in sub-plot B1 with the sedge *Mesomelaena tetragona* now also common. Twenty three species including a Priority 4 (P4) species, *M. basicephala*, were identified in this plot in 2006, decreasing to 22 species in 2007. The dominance of *T. linearifolia, D. castaneus* and *M. tetragona* continued across B2. A total of 25 species were recorded in this plot in 2006 decreasing to 22 in 2007.

The canopy condition of small to moderate *M. preissiana* forming the overstorey in plot C improved during 2007 (2006: 11-15, mean 13.1; 2007: 11-17, mean 14.5). *P. ellipitcum* was slightly less prolific in C1 with *T. linearifolia* and a sedge species still common. Seventeen species including the P4 species, *M. basicephala*, were identified in this plot in 2006, 19 in 2007. Sub-plot C2 was also dominated by *P. ellipitcum* and *T. linearifolia* with *D. bromeliifolius, D, castaneus* and *Acacia myrtifolia* also still prominent in 2007. A total of 27 native species were recorded in 2006, decreasing to 21 native and one exotic in 2007.

The canopy condition of *M. preissiana* in Plot D improved further during 2007 (2006: 11-15, mean 12.8; 2007: 11-19, mean 14.5). The dominance of *P. ellipitcum* increased in sub-plot D1 with an unidentified Restionaceae sp. also common. Ten species including the P4 species were recorded in 2006, 14 in 2007. The domination of *P. ellipitcum* continued in D2 with the abundance of two Restionaceae sp. and *D. bromeliifolius* increasing during 2007. Twenty eight were noted in this plot in 2006, 25 in 2007.

a. b. c.

d. e. f.

g. h.

Figure 7: Pneunmonia Rd vegetation monitoring transect. All photos taken looking diagonally across the plot; a) 0-20m; b) 20-0 m; c) 20-40 m; d) 40-20 m; e) 40-60 m; f) 60-40 m; g) 60-80m; h) 80-60m.

Table 7: Pneumonia Rd - summary of transect data; diameter, health and density of overstorey species (all plots are 20 x 20 m).

Plot/ year		A			B			C			D		
	Spec[1].	05	06	07	05	06	07	05	06	07	05	06	07
Diameter range[2]	M.p.	<2 - 15.3	<2 - 15.3	<2 - 15.3	2 - 21	2 - 21	<2 - 21.3	<2 - 22.6	<2 - 22.6	<2 - 23.2	<2 - 72	<2 - 72	<2 - 72
	E.m.	<2 - 3.4	<2 - 3.4	<2 - 4	-	-	-	-	-	-	-	-	-
	B.l.	-	-	-	<2 - 7	<2 - 7	<2 - 8.2	-	-	-	-	-	-
Health Mean[3]	M.p.	14.1	14.5	16.1	13.5	14.5	15.3	12.7	13.1	14.5	12.0	12.8	14.5
	E.m.	15	15	21	-	-	-	-	-	-	-	-	-
	B.l.	-	-	-	15.0	15.0	18	-	-	-	-	-	-
Health Range	M.p.	9 - 15	9 - 17	9 - 19	13 - 15	13 - 16	13 - 17	11 - 15	11 - 15	11 - 17	11 - 15	11 - 15	11 - 19
	E.m.	15	15	21	-	-	-	-	-	-	-	-	-
	B.l.	-	-	-	13 - 17	13 - 17	13 - 23	-	-	-	-	-	-
Density[4]	M.p.	31	31	31	12	12	12	12	12	12	10	10	10
	E.m.	1	1	1	-	-	-	-	-	-	-	-	-
	B.l.	-	-	-	2	2	2	-	-	-	-	-	-

[1]Overstorey species – M.p. = *Melaleuca preissiana*; B.l. = *Banksia littoralis;* E.m.= *Eucalyptus marginata*
[2]Diameter Range is the range in individual stem diameters (cm) at breast height (1.3m).
[3]Mean health rating for all overstorey species.
[4]Density is number of trees in each plot.

Table 8: Pneumonia Rd - summary of understorey data (all plots are 5 x 5m).

Plot	A1			A2			B1			B2			C1			C2			D1			D2		
Year	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07
No. species	20	25	19	24	28	24	20	23	22	23	25	22	16	17	19	29	27	22	12	10	14	27	28	25
No. exotics	1	-	0	1	1	1	-	-	0	-	-	0	-	-	0	2	-	1	-	-	0	-	-	0
Weediness index	0.1	0	0	0.06	0.06	0.07	0	0	0	0	0	0	0	0	0	0.12	0	0.08	0	0	0	0	0	0

As bore 60810086, in close proximity to the Pneumonia Rd transect was only established in mid-2006, limited, yet relatively consistent, monthly hydrological data were available (Figure 8). Although the data may not actually reflect the autumn 2006 minimum (first reading was May 2006), it can be assumed that the level recorded was higher than the 2007 and 2008 minimum.

Despite a short-term, declining trend in groundwater levels, there were no indications of declining vegetation condition or changes in community composition across the Pneumonia Rd transect during the current monitoring round. A longer hydrological data set and further vegetation monitoring are required before an assessment of the relationship between vegetation condition and the water regime is possible.

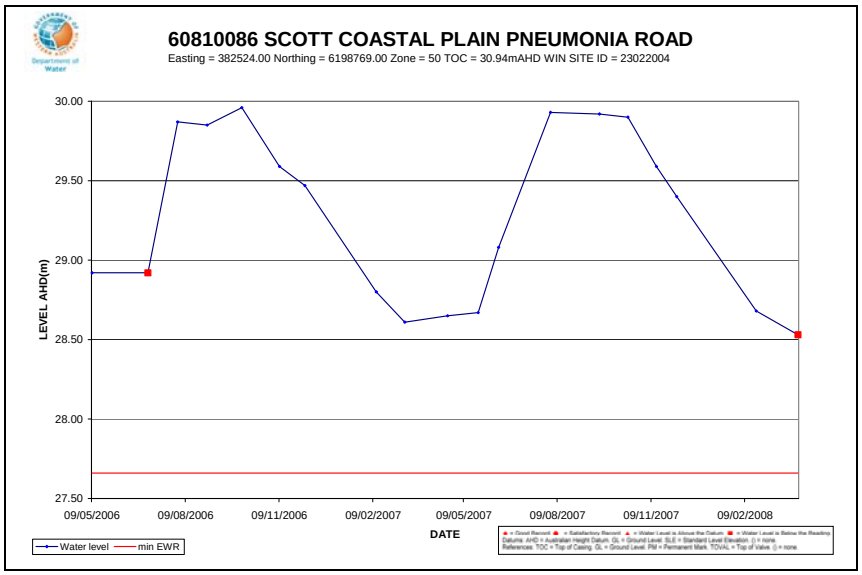


Figure 8: Pneumonia Rd wetland groundwater levels 2006 – 2008.

Blackpoint/ Fouracres Rd

This transect at this site, near the intersection of Blackpoint and Fouracres Rds., was established to run south-east between a piezometer on the roadside and a second piezometer 80 m into the wetland. The transect decreased in elevation with distance with a corresponding change in dominant species. *Eucalyptus marginata* with a predominately terrestrial understorey occurred over the first 15 m changing to vegetation dominated by *P. ellipticum* and emergent *M. preissiana* with more mesic species in the understorey. There was some improvement in canopy condition across the transect during 2007 with mean health increasing by 25% (Table 2). Species composition was 93% similar to that described in 2006 and there was no change in the number of exotics with none identified during the assessment.

Plots C and D on this transect were largely inundated during the baseline monitoring period in 2005 however, the transect was completely dry during the 2006 and 2007 monitoring. During the 2006 assessment it was also noted that much of the previously abundant *P. ellipticum* had dried off and thinned across the site. However, there had been little change during 2007. As this species does not generally tolerate inundation, it appears to have responded negatively to the above average rainfall experienced in the area during 2005, but has subsequently stabalised.

The overstorey of Plot A was formed of moderately sized *E. marginata* the condition of which improved further during 2007 (2006: 8-18, mean 12.6; 2007: 9-19, mean 13.1). Fourteen *E. marginata* seedlings/ saplings and three healthy *C. calophylla* saplings (2007: 14-17, mean 15.3) were also recorded (Appendix 1.1.4, Table 9). The density of *P. ellipticum* had declined further in sub-plot A1 however, it remained dominant with the sedge species, *Anarthria scabra* and *M. tetragona* and *T. parviceps* (Appendix 2.1.4). Twenty eight species, all native, were noted in this plot in 2006, 25 in 2007 (Table 10). *A. scabra* was again dominant in A2 along with *L. barbata* and *T. parviceps*. In 2006 a total of 30 species were recorded in this plot, decreasing to 25 in 2007.

The canopy condition of the single, small *E. marginata* in plot B improved during 2007 (2006: 15; 2007: 19). Two new seedlings of this species were also recorded in the plot. *T. parviceps* was dominant in the understorey of B1 along with *P. ellipitcum, M. tetragona, A. prolifera, L. barbata* and *D. bromeliifolius*. Twenty four species were recorded in this plot in 2006, 19 in 2007. *M. tetragona* and *A. prolifera* were also dominant in B2, with *P. ellipticum* and *T. parviceps*, the density of which increased during 2007. A total of 20 species were identified in 2006, 19 in 2007. *Schoenus indutus*, a Priority one species, was recorded in this plot in both years.

The condition of the four small to moderately sized *M. preissiana* in plot C improved further during 2007 (2006: 9 - 14, mean 10.8; 2007: 11-19, mean 15.4). Two new *E. marginata* seedlings were also recorded. Sedges, including the Priority 1 species, *S. indutus* continued to be the dominant life form in plot A1 however, *P. ellipitcum* remained the dominant species, with *B. sparsa* also common. Thirty one species were

recorded in C1 in 2006, 25 in 2007. In sub-plot C2 *P. ellipitcum* was again dominant with *M. tetragona*. Twelve native species were identified in 2006, 11 in 2007.

The health of the multi-stemmed *M. preissiana* forming the overstorey in plot D also improved during 2007 (2006: 7-14, mean 11; 2007: 15-19, mean 17), with six seedlings also recorded. As with plot C, a high proportion of species in this plot were sedges. *P. ellipitcum* and X. *preissii* remained prominent in D1 however, the cover of *H. angustifolium* had declined slightly. Twenty two species were recorded in this plot in 2006, 23 in 2007. *P. ellipticum* and *B. sparsa* continued to be the most abundant species in D2 with *D. bromeliifolius* now also abundant. Twenty two native species were identified in this plot in both 2006 and 2007.

Figure 9: Blackpoint/ Fouracres Rd wetland vegetation monitoring transect. All photos taken looking diagonally across the plot; a) 0-20m; b) 20-0 m; c) 20-40 m; d) 40-20 m; e) 40-60 m; f) 60-40 m; g) 60-80m; h) 80-60m.

Table 9: Blackpoint/ Fouracres Rd - summary of transect data; diameter, health and density of overstorey species (all plots are 20 x 20 m).

Plot/ year		A			B			C			D		
	Spec[1].	05	06	07	05	06	07	05	06	07	05	06	07
Diameter range[2]	M.p.	-	-	-	-	-	-	5.2 - 46	5.2 - 46	5.2 - 46	4.2 - 22.5	4.2 - 22.5	4.2 - 22.5
	E.m.	<2 - 41.2	<2 - 41.2	<2 - 42.0	3.1 - 8.6	3.1 - 8.6	4.6 - 10.5	-	-	-	-	-	-
	C.c	-	-	<2 - 2.7	-	-	-	-	-	-	-	-	-
Health Mean[3]	M.p.	-	-	-	-	-	-	9.5	10.8	15.4	10.8	11.0	17
	E.m.	11.6	12.6	13.1	15.0	15.0	19	-	-	-	-	-	12
	C.c	-	-	15.3	-	-	-	-	-	-	-	-	-
Health Range	M.p.	-	-	-	-	-	-	7 - 13	9 - 14	11 - 19	7 - 13	9 - 14	15 - 19
	E.m.	8 - 17	8 - 17	9 - 19	15	15	19	-	-	-	-	-	-
	C.c	-	-	14 - 17	-	-	-	-	-	-	-	-	-
Density[4]	M.p.	-	-	-	-	-	-	4	4	5	5	5	5 + 6 seedlings
	E.m.	8	8	8 + 14 seedlings	1	1	1 + 2 seedlings	-	-	2 seedlings	-	-	-
	C.c	-	-	3	-	-	-	-	-	-	-	-	-

[1]Overstorey species – M.p. = *Melaleuca preissiana*; E.m. = *Eucalyptus marginata*; C.c = *Corymbia calophylla*
[2]Diameter Range is the range in individual stem diameters (cm) at breast height (1.3m).
[3]Mean health rating for all overstorey species.
[4]Density is number of trees in each plot.

Table 10: Blackpoint/ Fouracres Rd - summary of understorey data (all plots are 5 x 5m).

Plot	A1			A2			B1			B2			C1			C2			D1			D2		
Year	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07
No. species	30	28	25	29	30	25	28	24	19	20	20	19	31	31	25	12	12	11	23	22	23	29	22	22
No. exotics	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	1	-	0
Weediness index	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05	0	0

Hydrological data for bore 60810087, in close proximity to the Blackpoint/ Fouracres Rd wetland transect, were only available from June 2007 to April 2008 (Figure 8). Although relatively consistent, monthly data were available during that time, the bore was dry from May to June 2007 and February to April 2008. Due to the paucity of hydrological data available for this site, it is not possible to comment on the relationship between groundwater levels and vegetation condition.

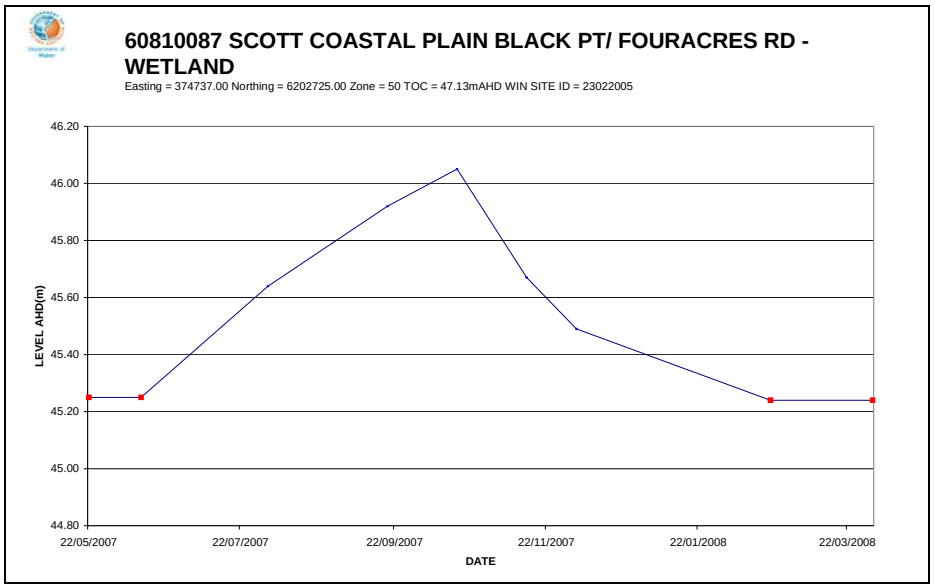


Figure 10: Blackpoint/ Fouracres Rd wetland groundwater levels 2007- 2008.

Darradup Rd – east

The transect at the Darradup Rd site was established to run north-east between a piezometer on the roadside and a second piezometer installed 80 m into the wetland. There is little change in the elevation across the transect with little change also occurring in vegetation composition. *M. preissiana* is dominant in the open overstorey with some *E. marginata* and *Nutysia floribunda*. This site had been burnt within the 12 month period prior to base-line monitoring however, all trees continue to recover and the understorey re-establish.

During 2007 there was some change in canopy condition with mean tree health across the transect increasing by 16% (Table 2). Species composition was 88% similar to that described in 2006 and there was no change in the number of exotics with none identified during this assessment.

Small, multi-stemmed *M. preissiana* and small *E. marginata* formed the overstorey in plot A. Canopy condition in both species improved during 2007 (*M. preissiana* - 2006: 12-21, mean 16.4; 2007: 18-21, mean 19, *E. marginata* – 2006: 16-19, mean 17.5; 2007: 19-23, mean 21) (Appendix 2.1.6, Table 11). *Anarthria scabra* remained dominant across sub-plot A1 with the prominence of *D. bromeliifolius* and *Andersonia caerula* increasing and *Lyginea imberbis* also remaining common (Appendix 2.1.6, Table 12). *Anarthria scabra* and *T. parviceps* were the most abundant species in D2 with *D. bromeliifolius* thinning slightly during 2007. Twenty four species were recorded in A1 and 25 in A2 in 2006, 20 and 19 in 2007.

Small to moderate sized *M. preissiana* and small *E. marginata*, including 4 saplings, formed the overstorey across plot B. The condition of both species improved during 2007 (*M. preissiana* - 2006: 7-5, mean 9.8; 2007: 7-15, mean 19.6, *E. marginata* – 2006: 17-19, mean 17.6; 2007 – 18-21, mean 19.6). *A. scabra* continued to dominate the understorey of both sub-plots, with *D. bromeliifolius* and *L. imberbis* more abundant in sub-plot B1. *A. juniperiana* was also common in B2 and the abundance of shrubs *A. obovatus* and *S. gracile* and sedges *X. roycei* and *E. aristata* increased. Twenty six species were identified in B1 in 2006, 23 in 2007. In B2, 20 species were recorded in 2006 and 16 in 2007.

Multi-stemmed *M. preissiana*, the health of which had improved since 2006, formed the overstorey in plot C (2006: 9-12, mean 10.2; 2007: 9-15, mean 12.2). The dominance of *A. scabra* continued in C1 with the shrub species, *H. angustifolium* and *A. juniperiana*, also common along with *D. bromeliifolius* and the sedge, *Xyris roycei*. Twenty three species were identified in this plot in 2006, 18 in 2007. *Anarthria scabra* and *H. angustifolium* were also dominant in C2 however the abundance of *D. bromeliifolius* had declined. A total of 21 species were recorded in this plot in 2006 and 2007.

Plot D was dominated by small to moderately sized *M. preissiana*. Canopy condition increased in most individuals in 2007 (2006: 5-13, mean 10.5; 7-15, mean 11.5). Sub-plot D1 was dominated by *D. bromeliifolis* and *H. angustifolium* with *P. ellipticum* and *X. roycei* also abundant in 2007. Twenty species occurred in this sub-plot in 2006 and 17 in

2007. *Anarthria scabra* and *H. angustifolium* remained dominant in D2 with the abundance of *A. juniperiana* decreasing slightly. A total of 20 species were recorded in this plot in 2006, 17 in 2007.

Figure 11: Darradup Rd East wetland vegetation monitoring transect. All photos taken looking diagonally across the plot; a) 0-20m; b) 20-0 m; c) 20-40 m; d) 40-20 m; e) 40-60 m; f) 60-40 m; g) 60-80m; h) 80-60m.

Table 11: Darradup Rd east - summary of transect data; diameter, health and density of overstorey species (all plots are 20 x 20m).

Plot/ year		A			B			C			D		
	Spec.	05	06	07	05	06	07	05	06	07	05	06	07
Diameter range[2]	M.p.	<2 - 15.3	<2 - 15.3	3.3 - 16.1	2.5 - 35.2	2.5 - 35.2	3.0 - 35.2	3.5 - 13.8	3.5 - 13.8	2.3 - 27.5	<2 - 43.8	<2 - 43.8	<2 - 43.8
	E.m.	<2 - 9.2	<2 - 9.2	<2 - 10.5	<2 - 9.3	<2 - 9.3	<2 - 10.1	-	-	-	-	-	-
Health Mean[3]	M.p.	16.6	16.4	19	10.5	9.8	10	11.6	10.2	12.2	9.5	10.5	11.5
	E.m.	16	17.5	21	15.6	17.6	19.6	-	-	-	-	-	-
Health Range	M.p.	16 - 18	12 - 21	18 - 21	9 - 12	7 - 15	7 - 15	9 - 13	9 - 12	9 - 15	7 - 13	7 - 13	7 - 15
	E.m.	16	16 - 19	19 - 23	13 - 16	17 - 19	18 - 21	-	-	-	-	-	-
Density[4]	M.p.	3	3	3	4	4	4	5	5	5	8	8	8
	E.m.	4	4	5	8	8	8	-	-	-	-	-	-

[1]Overstorey species – M.p. = *Melaleuca preissiana*; E.m.= *Eucalyptus marginata*
[2]Diameter Range is the range in individual stem diameters (cm) at breast height (1.3m).
[3]Mean health rating for all overstorey species.
[4]Density is number of trees in each plot.

Table 12: Darradup Rd east - summary of transect data (all plots are 5 x 5m).

Plot	A1			A2			B1			B2			C1			C2			D1			D2		
Year	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07
No. species	20	24	20	23	25	19	25	26	23	24	20	16	26	23	18	27	21	21	19	20	17	24	20	17
No. exotics	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0
Weediness index	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

As bore 60810092, in close proximity to the Darradup Rd East wetland transect was only established in mid-2006, limited, yet relatively consistent, monthly hydrological data were available (Figure 12). Although the data may not actually reflect the autumn 2006 minimum (first reading was May 2006), it can be assumed that the level recorded was higher than the 2007 minimum.

This site was also burnt prior to baseline monitoring and continues to re-establish. Despite a possible short-term, declining trend in groundwater levels, there were no indications of declining vegetation condition or changes in community composition across the transect during the current monitoring round. In order to describe the vegetation-hydrology relationship a longer hydrological data set is required and, ideally, vegetation composition and condition should have undergone post-fire succession and stabilized.

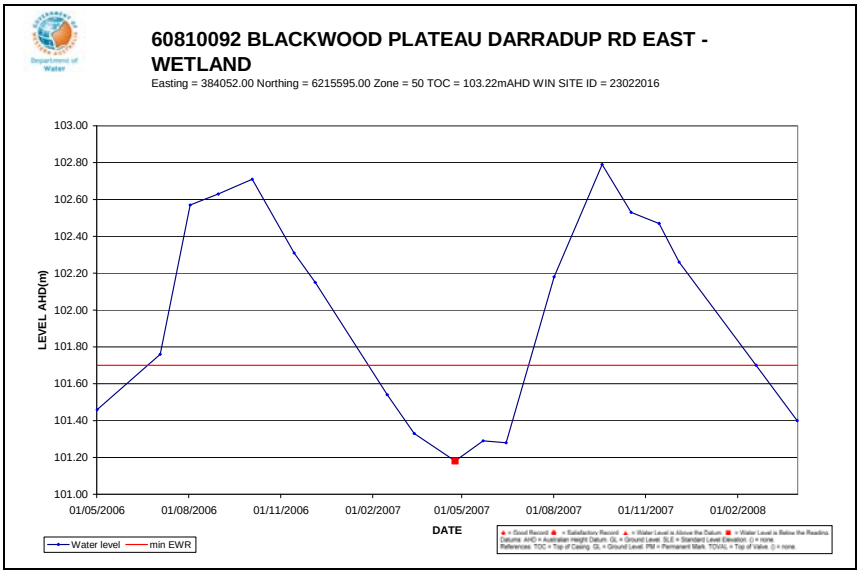


Figure 12: Darradup Rd East wetland groundwater levels 2006- 2008

Poison Gully

Only two plots were established on the transect at Poison Gully due to the shape of the wetland and location of the piezometer and a man-made sump. The 40 m transect ran west from the roadside across the basin and into the fringing vegetation. The piezometer was located near the center of the basin, where the elevational gradient was at its lowest before rising towards the wetland edge and the road. Long-term monitoring bores are also located in close proximity to the wetland. The vegetation across the basin was dominated by tall mixed, shrubland (*T. linearifolia, A. juniperiana* and *Pultenaea reticulata*) with sedge species and emergent *M. preissiana*.

During 2007 there was some change in canopy condition with mean tree health across the transect increasing by 9% (Table 2). Species composition was 89% similar to that described in 2006 and there was no change in the number of exotics with none identified during this assessment.

The condition of the single, moderately sized *M. preissiana* in Plot A has not improved since monitoring commenced, still scoring a moderate health rating (2005, 2006 and 2007: 9) (Appendix 1.1.6, Table 13). *Anarthria scabra* and *X. preissii* continued to dominate the understorey of sub-plot A1 with *T. parviceps* and *A. fraseriana* also common (Appendix 2.1.6). A total of 18 species were recorded in this plot in both 2006 and 2007 (Table 17). An unidentified sedge was very dominant in A2, with *Callistemon glacis* and *T. parviceps* also common. Seven species were recorded in this plot in 2006, 9 in 2007.

The health of the two small *M. preissiana* in Plot B improved during 2007 while the single *B. littoralis* remained unchanged, but healthy (*M. preissiana* 2006: 15-17, mean 16; 2007: 15-21, mean 18, *B. littoralis* – 2006 and 2007: 21). The unidentified sedge species from A2 was also very dominant in sub-plot B1, with *T. parviceps* and *Empodisma gracillimum.* Nine native species were recorded in this plot in 2006 and 2007. *Beaufortia sparsa,* the sedge and *T. parviceps* were dominant in B2. However, the cover of *C. glaucus* declined slightly. Thirteen species were recorded in B2 in 2006 and 12 in 2007.

Table 13: Poison Gully - summary of transect data; diameter, health and density of overstorey species (all plots are 20 x 20 m).

Plot/ year		A			B		
	Spec[1].	05	06	07	05	06	07
Diameter range[2]	M.p.	9.1 - 16.7	9.1 - 16.7	7.0 – 14.5	<2 - 19.5	<2 - 19.5	<2 - 19
	B.l.	-	-	-	8.8 - 13.2	8.8 - 13.2	8 - 13
Health Mean[3]	M.p.	9	9	9	15	16	18
	B.l.	-	-	-	18	21	21
Health Range	M.p.	9	9	9	13 - 17	15 - 17	15 - 21
	B.l.	-	-	-	18	21	21
Density[4]	M.p.	1	1	1	2	2	2
	B.l.	-	-	-	1	1	1

[1]Overstorey species – M.p. = *Melaleuca preissiana*; B.l.= *Banksia littoralis*
[2]Diameter Range is the range in individual stem diameters (cm) at breast height (1.3m).
[3]Mean health rating for all overstorey species.
[4]Density is number of trees in each plot.

Table 14: Poison Gully - summary of understorey data (all plots are 5 x 5m).

Plot	A1			A2			B1			B2		
Year	05	06	07	05	06	07	05	06	07	05	06	07
No. species	17	18	18	7	7	9	10	9	9	11	13	12
No. exotics	-	-	0	-	-	0	-	-	0	-	-	0
Weediness index	0	0	0	0	0	0	0	0	0	0	0	0

a.

b.

c.

d.

Figure 13: Poison Gully wetland vegetation monitoring transect. All photos taken looking diagonally across the plot; a) 0-20m; b) 20-0 m; c) 20-40 m; d) 40-20 m

As bore 60910125, in close proximity to the Poison Gully transect was only established in mid-2006, limited, yet relatively consistent, monthly hydrological data were available (Figure 14). Although the data does not reflect the autumn 2006 minimum (first reading was June 2006), it can be assumed that the level recorded was higher than the 2007 and 2008 minimum.

Despite a short-term, declining trend in groundwater levels, there were no indications of declining vegetation condition or changes in community composition across the Poison Gully transect during the current monitoring round. A longer hydrological data set and further vegetation monitoring are required before an assessment of the relationship between vegetation condition and the water regime is possible.

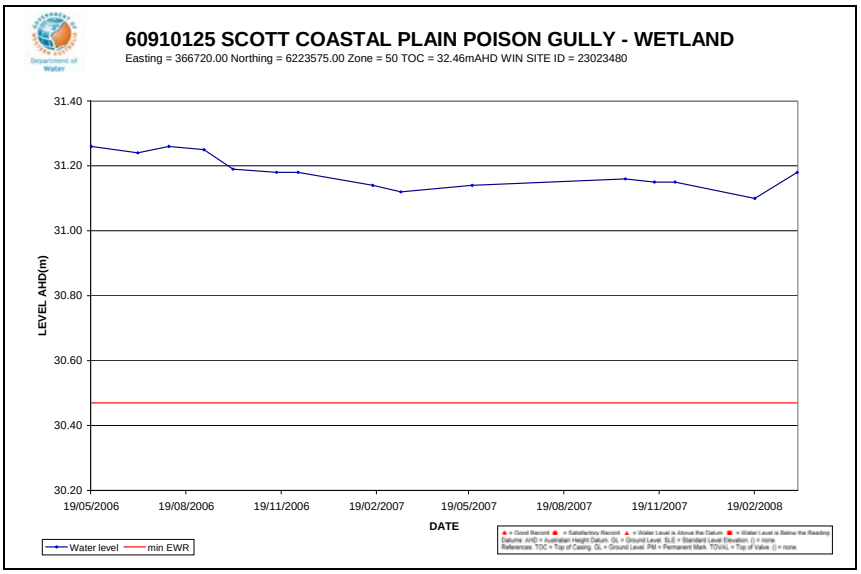


Figure 14: Poison Gully wetland groundwater levels 2006-2008.

Terrestrial Sites

Blackpoint/ Fouracres Rd

The 80 m long transect at this site was established on the opposite side of Blackpoint Rd. from the Blackpoint/ Fouracres Rd wetland site. The transect runs west from the roadside through open, species rich *E. marginata*/ *C. calophylla* woodland. Although the elevation increases slightly with distance there is little change in vegetation composition and structure along the transect.

During 2007 there was some change in canopy condition with mean tree health across the transect increasing by 15% (Table 2). Species composition was 91% similar to that described in 2006 and there was no change in the number of exotics with none identified during this assessment.

The overstorey of plot A was formed by *C. calophylla* saplings and small to medium sized *E. marginata* and *Banksia grandis* (Appendix 1.2.1, Table 15). The canopy condition of most trees improved during 2007 (*C. calophylla* - 2006: 11-17, mean 13.9; 2007: 11-19, mean 15.1, *E. marginata* – 2006: 14-20, mean 16; 2007: 14-23, mean 18.2, *B. grandis* – 2006: 10-15, mean 13.4; 2007: 14-21, mean 18.2). A number of seedlings of each species were recorded during this assessment however, these were not all 'new' seedlings.

Although the density of some of the most abundant species in the understorey of sub-plot A1 (*X. occidentale, Persoonia longiflora* and *M. riedlei*) had declined since the 2006 assessment (Appendix 2.2.1, Table 16), they remained relatively dominant with X. *preissii* and *A. prolifera* still most prevalent. Thirty eight species were recorded in A1 in 2006 falling to 35 in 2007. Abundances of *X. occidentale, D. bromeliifolius, Acacia browniana* and *X. preissii* had also declined in sub-plot A2 yet these species remained dominant. A2 supported 34 species in 2006 declining to 33 in 2007.

The canopy condition of the small to medium sized *C. calophylla* and small *B. grandis* forming the overstorey in plot B improved during 2007 (*C. calophylla* – 2006: 11-15, mean 13.9; 2007: 13-21, mean 16.4, *B. grandis* – 2006: 14-15, mean 14.8; 2007: 15-21, mean 19.8). Forty *B. grandis* seedlings were recorded in the plot during this assessment however, these were not all 'new' seedlings.

Sub-plot B1 supported 33 species in 2005 and 28 in 2007. Although the abundance of *X. preissii* declined over 2007, it was the most dominant species in both years, with *Podocarpus drounynianus* co-dominant in 2007. Thirty species were recorded in B2 in 2006, 27 in 2006. *Anarthria scabra* was dominant in the understorey with *T. parviceps*, and *D. bromeliifolius* also prevalent. The cover of *X. preissii*, *A. prolifera* and *A. browniana* declined in 2007 however, these species remained relatively common.

The overstorey of plot C was formed by a large *E. marginata*, small to medium *C. calophylla* and *B. grandis* saplings, the condition of which had improved since 2005 (*E. marginata* – 2006: 12-15, mean 13.5; 2007: 14-15, mean 14.5, *C. calophylla* - 2006: 10-

14, mean 12.8; 2007: 11-15, mean 13.4, *B. grandis* – 2006: 10-13, mean 12.2; 2007: 11-21, mean 18.7). A number of seedlings of each species were recorded during this assessment however, these were not all 'new' seedlings.

The understorey of sub-plot C1 remained relatively species poor, supporting 23 species in 2006 and only 17 in 2007. Although scoring low cover and abundance values, *P. drouynianus, A. obovatus* and *P. umbrosa* were most common. *A. scabra* remained abundant and dominant in C2 with an *Acacia* sp., *D. bromeliifolius* and *X. preissii* also fairly abundant. This plot supported 387 species in 2006 and 37 in 2007.

A large *E. marginata* and a very large *C. calophylla* were dominant in the overstorey of plot D with a number of smaller individuals of each species and *B. grandis*. Although the canopy condition most trees improved during 2007 (*E. marginata* –2006: 10-14, mean 12; 2007: 14-15, mean 12.8, *B. grandis* – 2006: 11-13, mean 12.5; 2007: 11-19, mean 15.8), the health of the *C. calophylla* declined (*C. calophylla* - 2006: 14; 2007: 11). A number of *B. grandis* seedlings were recorded during this assessment however, these were not all 'new' seedlings.

Xanthorrhoea preissii, T. parviceps and *A. scabra* were the most dominant of the 29 species recorded in sub-plot D1 in 2006 and of the 26 recorded in 2007. *A. scabra* remained very dense in D2 with *D. bromeliifolius, P. drouynianus* and *Xanthorrhoea preissii* also abundant. Twenty five species were recorded in D2 in 2006, 23 in 2007.

Figure 15: Blackpoint/ Fouracres Rd terrestrial vegetation monitoring transect. All photos taken looking diagonally across the plot; a) 0-20m; b) 20-0 m; c) 20-40 m; d) 40-20 m; e) 40-60 m; f) 60-40 m; g) 60-80m; h) 80-60m.

Table 15: Blackpoint/ Fouracres Rd terrestrial - summary of transect data; diameter, health and density of overstorey species (all plots are 20 x 20 m).

Plot/ year		A			B			C			D		
	Spec[1].	05	06	07	05	06	07	05	06	07	05	06	07
Diameter range[2]	E.m.	3.5 - 45	<2 - 45	<2 - 45.0	-	-	-	<2 - 80.8	<2 - 80.8	<2 - 80.8	20 - 62	<2 - 62	20.0 - 62.2
	C.c.	<2	<2 - 36.7	<2 - 15.5	<2 - 26.7	<2 - 26.7	<2 - 26.7	<2 - 29	<2 - 39	<2 - 39.0	94.2	<2 - 94	94.2
	B.g.	2.7 - 14	2.7 - 14	<2 - 14.0	<2 - 9.1	<2 - 9.1	<2 - 16.2	<2 - 5	<2 - 5	<2 - 5.0	<2 - 13.8	<2 - 13.8	<2 - 13.8
Health Mean[3]	E.m.	15.3	16	18.2	-	-	-	12.0	13.5	14.5	10.7	12.0	12.8
	C.c.	13.0	13.9	15.1	13.5	13.9	16.4	11.4	12.8	13.4	11.0	14.0	11
	B.g.	13.0	13.4	18.2	14.8	14.8	19.8	11.8	12.2	18.7	11.8	12.5	15.8
Health Range	E.m.	12 - 19	14 - 20	14 - 23	-	-	-	9 - 15	12 - 15	14 - 15	10 - 11	10 - 14	14 - 15
	C.c.	10 - 15	11 - 17	11- 19	11 - 15	11 - 15	13 - 21	11 - 13	10 - 14	11 - 15	11	14	11
	B.g.	11 - 14	10 - 15	14 - 21	14 - 15	14 - 15	15 - 21	9 - 13	10 - 13	11 - 21	10 - 13	11 - 13	11 - 19
Density[4]	E.m.	5	5	5 + 34 seedlings	-	-	-	2	2	2 + 17 seedlings	4	3	5
	C.c.	13	16	17 + 30 seedlings	10	10	10	5	5	5 + 15 seedlings	1	1	1
	B.g.	9	9	13 + 96 seedlings	5	5	5 + 40 seedlings	6	6	6 + 9 seedlings	4	4	5 + 46 seedlings

[1]Overstorey species – C.c. = *Corymbia calophylla*; E.m.= *Eucalyptus marginata*; B.g. = *Banksia grandis*
[2]Diameter Range is the range in individual stem diameters (cm) at breast height (1.3m).
[3]Mean health rating for all overstorey species.
[4]Density is number of trees in each plot.

Table 16: Blackpoint/ Fouracres Rd terrestrial - summary of understorey data (all plots are 5 x 5m).

Plot	A1			A2			B1			B2			C1			C2			D1			D2		
Year	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07
No. species	41	38	35	36	34	33	37	33	28	32	30	27	23	23	17	37	38	37	29	29	26	30	25	23
No. exotics	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0
Weediness index	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

As bore 60810091, in close proximity to the Blackpoint/ Fouracres Rd terrestrial transect was only established in mid-2006, limited, yet relatively consistent, monthly hydrological data were available (Figure 16). Although the data does not reflect the autumn 2006 minimum (first reading was June 2006), it can be assumed that the level recorded was higher than the 2007 and 2008 minimum.

Despite a short-term, declining trend in groundwater levels, there were no indications of declining vegetation condition or changes in community composition across the transect during the current monitoring round. A longer hydrological data set and further vegetation monitoring are required before an assessment of the relationship between vegetation condition and the water regime is possible.

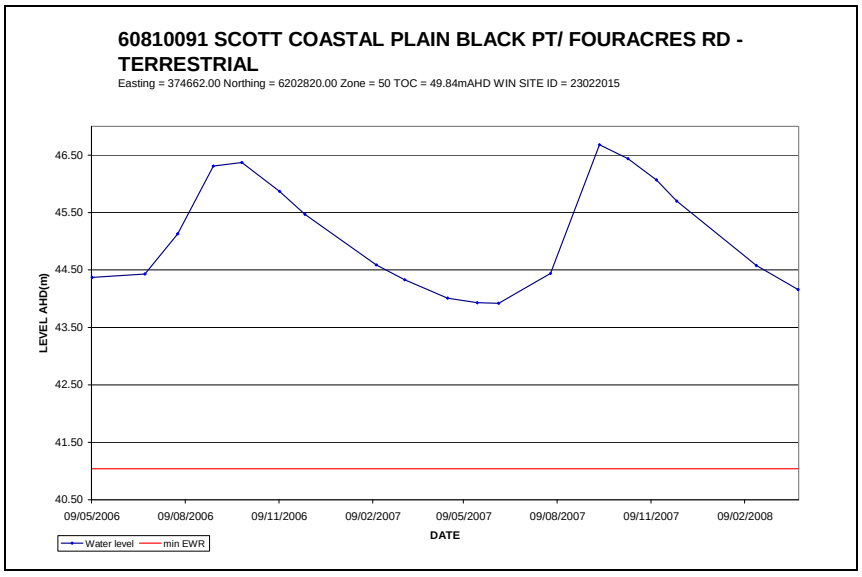


Figure 16: Blackpoint/ Fouracres Rd terrestrial site groundwater levels 2006-2008.

Darradup Rd east terrestrial

This 80m transect was established in the terrestrial vegetation fringing the Darradup Rd east wetland however, unlike the wetland, vegetation across this transect was not impacted by fire in 2005. The transect runs west from the wetland edge through open *E. marginata* woodland with *C. calophylla* and *Allocasuarina fraseriana*. Although the elevation increased with distance there was little change in vegetation composition and structure.

During 2007 there was some change in canopy condition with mean tree health across the transect increasing by 18.8% (Table 2). Species composition was 90% similar to that described in 2006 and there was no change in the number of exotics with none identified during this assessment.

A small number of moderately sized *E. marginata* and a *B. ilicifolia* make up the overstorey of plot with a number of *A. fraseriana*. The canopy condition of most individuals improved further during 2007 (*E. marginata* – 2006: 10-15, mean 13.6; 2007: 13-23, mean 18, *B. ilicifolia* – 2006:13; 2007:18) (Appendix 1.2.2, Table 17).

The understorey of sub-plot A1 supported 27 species of trees, shrubs and sedges in 2006 and 25 in 2007. The plot was still dominated by *T. parviceps* and *A. scabra* with *D. bromeliifolius* also common (Appendix 2.2.2, Table 18). These species were also still dominant in A2 with the shrub *Adenanthos meisneri.* Twenty seven species were recorded in 2006, 26 in 2007.

Nineteen small to large sized *E. marginata* and a single large *C. calophylla* occurred across plot B with a number of *A. fraseriana*. The canopy condition of most individuals improved in 2006 (*E. marginata* – 2006: 9-18, mean 14.4; 2007: 7-21, mean 19) with the exception of a single *E. marginata* and the *C. calophylla*, the health of which has continued to decline since 2005 (*C. calophylla* – 2005: 15; 2006: 14; 2007: 13). *Taxandria parviceps* and *A. meisneri* dominated the understorey of sub-plot B1, with *A. obovatus* and *A. scabra* also still abundant. The plot supported 27 species in 2006 and 24 in 2008. Thirty one species were recorded in B2 in 2006, 30 in 2007. *A. scabra, D. bromeliifolius, A. obovatus* and *T. parviceps* remained dominant in the understorey.

Numerous *E. marginata,* including saplings, and single multi-stemmed *C. calophylla* and *M. preissiana* occurred in plot C with *A. fraseriana* and *Nutysia floribunda*. All trees were of poor to moderate health in 2005 with most improving during 2006 with the exception of the *C. calophylla* and *M. preissiana.* However, the health of all individuals improved during 2007 (*E. marginata* – 2006: 9-16, mean 13.8; 2007: 11-21, mean 17.4, *C. calophylla* – 2006: 7; 2007: 9, *M. preissiana* - 2006: 10; 2007: 11).

Taxandria parviceps was dominant in the understorey of sub-plot C1, with *A. meisneri* and an unidentified Poaceae sp. also abundant. Although the cover and abundance of *A. scabra* and *P. ellipticum* declined during 2007, they were still relatively prevalent. Thirty two species were recorded in C1 in 2006, 28 in 2007. *T. parviceps* was also the most

abundant species in C2 with the fern, *Lindsaea linearis*. The cover of *P. ellipticum* had also declined in this plot. Twenty six species were recorded in C2 in 2006, 25 in 2007.

Forty four small to medium *E. marginata* and 46 *C. calophylla* occurred across plot D. The canopy condition of most trees improved during 2007 (*E. marginata* – 2006: 9-16, mean 13.6; 2007: 6-21, mean 16.9, *C. calophylla* – 2006: 9-17, mean 14; 2007: 10-19, mean 16.9). *A. fraseriana* and *N. floribunda* also occurred in the overstorey. *T. parvicpes* was again the most dominant species in sub-plot D1 with *L. Linearis*, although the cover of the later had decreased during 2007. The sub-plot supported 28 species in 2006 and 2007. *T. parvicpes* and *Patersonia occidentalis* continued to dominate D2. Twenty three species were identified in this sub-plot in 2006, 27 in 2007.

Figure 17: Darradup Rd East terrestrial vegetation monitoring transect. All photos taken looking diagonally across the plot; a) 0-20m; b) 20-0 m; c) 20-40 m; d) 40-20 m; e) 40-60 m; f) 60-40 m; g) 60-80m; h) 80-60m.

Table 17: Darradup Rd east - summary of transect data; diameter, health and density of overstorey species (all plots are 20 x 20 m).

Plot/ year		A			B			C			D		
	Spec[1].	05	06	07	05	06	07	05	06	07	05	06	07
Diameter range[2]	E.m.	7.7 - 36	<2 - 36	3.0 - 36	2.3 - 49.6	2.3 - 49.6	3.2 - 49.6	<2 - 33.8	<2 - 45.8	<2 - 45.8	<2 - 41	<2 - 41	<2 - 41
	C.c.	-	-	-	52.0	52.0	52.0	3.8 - 51.8	3.8 - 51.8	3.8 - 51.8	<2 - 45	<2 - 45	<2 - 45
	B.i.	13.4	13.4	13.4	-	-	-	-	-	-	-	-	-
	M.p.	-		-	-		-	16 - 58.8	16 - 58.8	16 - 58.8	-	-	-
Health Mean[3]	E.m.	12.5	13.6	16.4	12.4	14.4	16.4	13.0	13.8	17.4	13.0	13.6	16.6
	C.c.	-	-	-	15.0	14.0	13.0	11.0	7.0	9.0	14.4	14.0	16.9
	B.i.	12.0	13.0	18.0	-	-	-	-	-	-	-	-	-
	M.p.	-	-	-	-	-	-	13.0	10.0	11.0	-	-	-
Health Range	E.m.	10 - 14	10 - 15	13 - 23	8 - 16	9 - 18	7 - 21	8 - 16	9 - 16	11 - 21	9 - 15	9 - 16	6 - 21
	C.c.	-	-	-	15	14	13	11	7	9	10 - 16	9 - 17	10 - 19
	B.i.	12	13	18	-	-	-	-	-	-	-	-	-
	M.p.	-	-	-	-	-	-	13	10	11	-	-	-
Density[4]	E.m.	8	8	8	19	19	19	18 + 12 seedlings/ saplings	18 + 14 seedlings/ saplings	32	31 + 13 seedlings/ saplings	31 + 13 seedlings/ saplings	44
	C.c.	-	-	-	1	1	1	1	1	1	13 + 33 seedlings/ saplings	13 + 33 seedlings/ saplings	46
	B.i.	1	1	1	-	-	-	-	-	-	-	-	-
	M.p.	-	-	-	-	-	-	1	1	1	-	-	-

[1]Overstorey species – M.p. = *Melaleuca preissiana*; B.l.= *Banksia littoralis;* C.c. = *Corymbia calophylla*; E.m.= *Eucalyptus marginata*
[2]Diameter Range is the range in individual stem diameters (cm) at breast height (1.3m). [3]Mean health rating for all overstorey species. [4]Density is number of trees in each plot.

Table 18: Darradup Rd east - summary of understorey data (all plots are 5 x 5m).

Plot	A1			A2			B1			B2			C1			C2			D1			D2		
	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07
No. species	25	27	25	22	27	26	26	27	24	28	31	30	33	32	28	26	26	25	28	28	28	29	23	27
No. exotics	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0
Weediness index	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

As bore 60810093, in close proximity to the Darradup Rd East terrestrial transect was only established in mid-2006, limited, yet relatively consistent, monthly hydrological data were available (Figure 18). As the bore was dry between July and August 2006, the data does not reflect the 2006 minimum. However, minimums (and maximums) were higher in 2007 and possibly 2008, indicating a short-term increase in groundwater levels. Despite an apparent relationship between higher groundwater levels and vegetation condition, a longer hydrological data set and further vegetation monitoring are required before a comprehensive assessment of the relationship between vegetation condition and the water regime is possible.

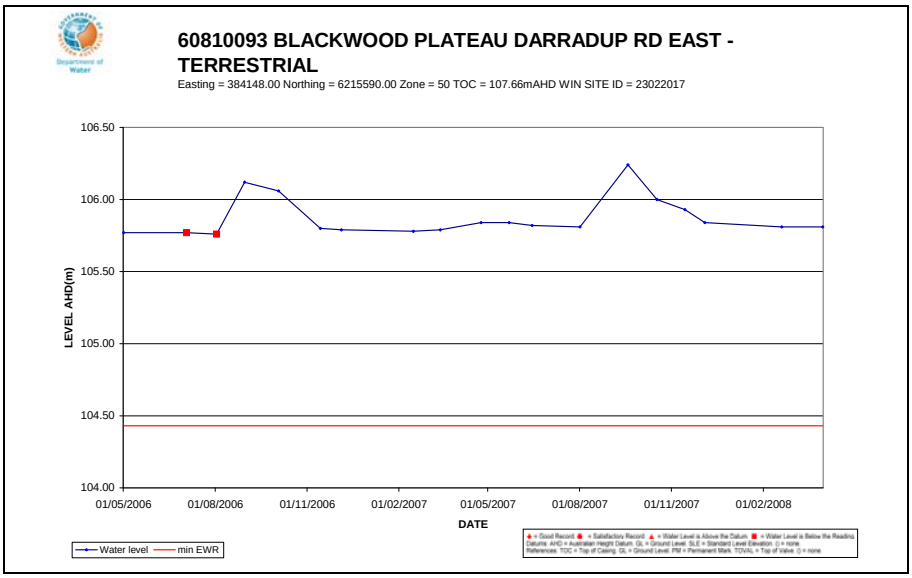


Figure 18: Darradup Rd East terrrestrial site groundwater levels 2006-2008.

Poison Gully terrestrial

The 80 m transect at this site was established in fringing vegetation adjacent to the Poison Gully wetland transect. Although the elevation increased markedly with distance there was little change in species composition and structure, with open *E. marginata*, *B. grandis* and *A. fraseriana* woodland.

During 2007 there was some change in canopy condition with mean tree health across the transect increasing by 9% (Table 2). Species composition was 90% similar to that described in 2006 and there was no change in the number of exotics with none identified during this assessment.

The overstorey of plot A was formed by eight small to medium *E. marginata* the canopy condition of which declined over 2007, although this was due to a large decline in one individual (2006: 11-18, mean 14.3; 2007: 4-18, mean 12.2) (Appendix 1.2.3, Table 19). Eight *E. marginata* seedlings and two saplings were recorded in the plot during this assessment however, these were not all 'new' seedlings.

Although sub-plot A1 remained relatively species poor, the understorey was still dense due to the prevalence of *D. bromeliifolius, A. scabra*, *P. reticulata* and *M. thymoides* (Appendix 2.2.3). Thirteen species were recorded in this plot in 2006, 15 in 2007 (Table 20). *D. bromeliifolius, A. scabra* and a *Lomandra* sp. continued to dominate across B2 in which 27 species were recorded in 2006 and 23 in 2007.

The canopy condition of the small to medium *E. marginata* and *C. calophylla* in Plot B declined further during 2007 (*E. marginata* – 2006: 9-17, mean 13.4; 2007: 9-18, mean 12.7, *C. calophylla* - 2006: 7-15, mean 10.5; 2007: 9-11, mean 10). However, the health of *B. grandis* and *B. attenuata* improved (*B. grandis* – 2006: 17-18, mean 17.5; 2007: 20, *B. attenuata* – 2006: 18; 2007: 20). Fifteen *E. marginata* and three *B. grandis* seedlings/ saplings were recorded in the plot during this assessment however, these were not all 'new' plants.

Anarthria scabra was again the most dominant species in the understorey of sub-plot B1 with *P. reticulata, Hypolaena pubescens* and *Lomandra purpurea* also relatively common. Thirty one species were recorded in 2006, 28 in 2007. *D. bromeliifolius, A. scabra* and *P. reticulata* remained prominent in B2. A total of 29 species were recorded in this plot in 2006 and 27 in 2007.

A larger number of small to large *E. marginata* (including 25 seedlings/ saplings) and *C. calophylla* and small *B. attenuata* and *B. grandis* were recorded in plot C. The canopy condition of most individuals improved over 2007 (*E. marginata* – 2006: 10-17, mean 13.9; 2007: 10-19, mean 14.1, *B. grandis* – 2006: 12-17, mean 13.7; 2007: 18-21, mean20.7, *B. attenuata* – 2006: 15-18, mean 16; 2007: 15-23, mean 18.4), with the exception of a large *C. calophylla* (2006: 14, mean 14; 2007: 11-14, mean 12.5).

Although the number of species recorded in C1 and C2 decreased further over 2007, possibly due to the drying of annuals, both remained species rich, supporting 33 species

in 2006 and 32 and 34 respectively in 2007. *A. scabra* continued to be dominant in the understorey of both plots with *D. bromeliifolius* co-dominant in C1 and the shrub *Melaleuca thymoides* in C2.

The overstorey of plot D was formed by small to medium *E. marginata*, *C. calophylla* and *B. attenuata* with small *B. grandis*. Canopy condition generally improved during 2007 (*E. marginata* – 2006: 10-18, mean 14.1; 2007: 6-21, mean 16.4, *B. grandis* – 2006: 11-18, mean 15.6; 2007: 18-23, mean 20, *B. attenuata* – 2006: 12-17, mean 15; 2007: 18-23, mean 21.3) however, the health of all three *C. calophylla* declined (2006: 14-16, mean 15.3). Twenty *E. marginata* and 15 *B. grandis* seedlings/ saplings were recorded in the plot during this assessment however, these were not all 'new' plants.

Anarthria scabra and *M. thymoides* were again prominent in the understorey of both sub-plots with *A. meisneri* also common in D2. Thirty six species were recorded in D1 and 27 in D2 in 2006, 34 and 24 in 2007.


a.


b.


c.


d.


e.


f.


g.

Figure 19: Poison Gully terrestrial vegetation monitoring transect. All photos taken looking diagonally across the plot; a) 0-20m; b) 20-0 m; c) 20-40 m; d) 40-20 m; e) 40-60 m; f) 60-40 m; g) 60-80m.

Table 19: Poison Gully terrestrial - summary of transect data; diameter, health and density of overstorey species (all plots are 20 x 20 m).

Plot/ year		A			B			C			D		
	Spec[1].	05	06	07	05	06	70	05	06	07	05	06	07
Diameter range[2]	E.m.	<2 - 36.2	<2 - 36.2	<2 - 36.2	<2 - 63.3	<2 - 63.3	<2 - 63.3	<2 - 81	<2 - 81	<2 - 81.0	<2 - 61	<2 - 61	<2 - 61.5
	C.c.	-	-	-	23 - 27.9	23 - 27.9	23.0 -27.9	24 - 60	24 - 60	24 - 60	8.4 - 24.7	8.4 - 24.7	8.4 - 24.7
	B.g.	-	-	-	3.8 - 11.7	3.8 - 11.7	<2 - 11.7	<2 - 8.8	<2 - 8.8	<2 - 8.8	<2 - 8	<2 - 8.2	<2 - 8.2
	B.a.	-	-	-	-	-	-	<2 - 6	<2 - 6	<2 - 6	<2 - 22.5	<2 - 22.5	<2 - 22.5
Health Mean[3]	E.m.	12.8	14.3	12.2	13.9	13.4	12.7	13.1	13.9	14.1	12.7	14.1	16.44
	C.c.	-	-	-	14.5	10.5	10.0	14.0	14.0	12.5	14.0	15.3	10
	B.g.	-	-	-	16.5	17.5	20.0	12.9	13.7	20.7	12.3	15.6	20.0
	B.a.	-	-	-	13.0	18.0	20.0	15.6	16.0	18.4	14.0	15.0	21.3
Health Range	E.m.	9 - 16	11 - 18	4 - 18	11 - 15	9 - 17	9 - 18	11 - 16	10 - 17	10 - 19	10 - 14	10 - 18	6 - 21
	C.c.	-	-	-	14 - 15	7 - 15	9 - 11	13 - 15	14	11 - 14	13 - 15	14 - 16	9 - 12
	B.g.	-	-	-	16 - 17	17 - 18	20	10 - 15	12 - 17	18 - 21	8 - 14	11 - 18	18 - 23
	B.a.	-	-	-	13	18	20	15 - 16	15 - 18	15 - 23	12 - 16	12 - 17	18 - 23
Density[4]	E.m.	8	8	8 + 2 seedlings & 2 saplings	7	7	7 + 12 seedlings & 3 saplings	13	13	13 + 18 seedlings & 7 saplings	18	18	18 + 20 seedlings & 8 saplings
	C.c.	-	-	-	2	2	2	2	2	2	3	3	3
	B.g.	-	-	-	2	2	3 + 3 seedlings	12	12	12	16	15	12 + 15 seedlings
	B.a.	-	-	-	1	1	1	8	8	8	5	5	6

[1]Overstorey species – C.c. = *Corymbia calophylla*; E.m. = *Eucalyptus marginata*; B.g. = *Banksia grandis*; B.a. = *Banksia attenutata*.
[2]Diameter Range is the range in individual stem diameters (cm) at breast height (1.3m).
[3]Mean health rating for all overstorey species.
[4]Density is number of trees in each plot.

Table 20: Poison Gully terrestrial - summary of understorey data (all plots are 5 x 5m).

Plot	A1			A2			B1			B2			C1			C2			D1			D2		
Year	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07
No. species	13	13	15	27	27	23	35	31	28	27	29	27	39	33	32	38	33	34	39	36	34	26	27	24
No. exotics	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0
Weediness index	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

As bore 60914942, in close proximity to the Poison Gully terrestrial transect was only established in April 2007, limited, yet relatively consistent, monthly hydrological data were available since that time (Figure 20). However, the bore appears to have been dry since October 2007, as evidenced by the 'bottoming out' of the hydrograph. This may reflect a short-term decline in groundwater levels. Despite this, there were no indications of declining vegetation condition or changes in community composition across the transect during the current monitoring round. A longer, more accurate hydrological data set and further vegetation monitoring are required before a comprehensive assessment of the relationship between vegetation condition and the water regime is possible.

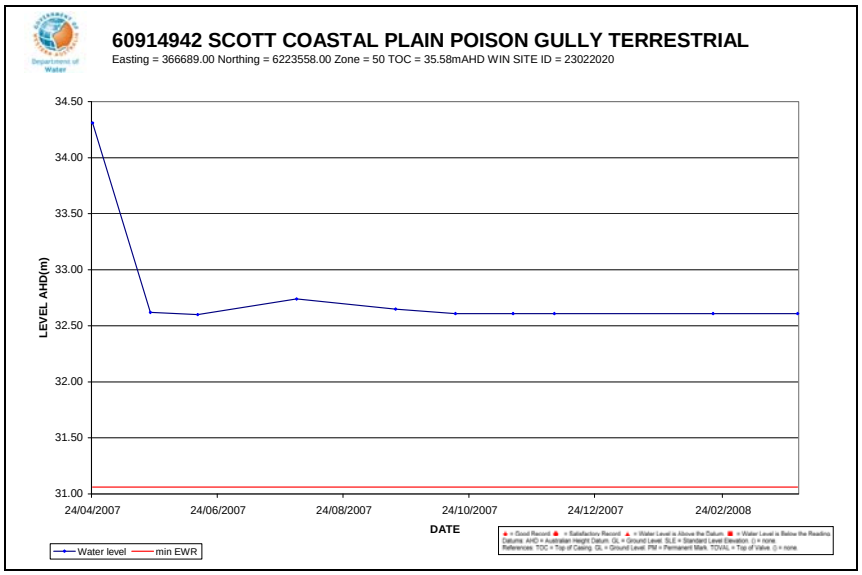


Figure 20: Poison Gully terrestrial site groundwater levels 2007-2008.

Stewart Rd terrestrial

The transect at this site ran 80 m north-west from bore BP20B into closed *E. marginata* woodland. The site has been logged in the past but appeared have undergone a recruitment event in recent years as indicated by the high number of seedlings and saplings recorded across the transect. There was little change in elevation across the transect which was reflected in the homogeneity in vegetation composition and structure.

During 2007 there was some change in canopy condition with mean tree health across the transect decreasing by 12% (Table 2). Species composition was 95% similar to that described in 2006 and there was an increase in the number of exotics.

The overstorey of plot A was formed by a large number of small to medium *E. marginata* and *C. calophylla* with a large number of saplings/ seedlings also recorded. Canopy condition in both species declined during 2007 (*E. marginata* – 2006: 12-21, mean 16.9; 2007: 6-21, mean 16, *C. calophylla* - 2006: 11-20, mean 16.1; 2007: 9-20, mean 15.1) (Appendix 1.2.4, Table 21).

Patersonia umbrosa, Bossiaea ornata and an unidentified sedge continued to dominate the understorey of sub-plot A1 (Appendix 2.2.4) however the cover of *Grevillea quercifolia* and *Hakea amplexicaulis* had declined. Thirty eight species were recorded in both 2006 and 2007 (Table 22). *P. umbrosa* and *B. ornata* were also prevalent in A2 however, *T. parvicpes* was dominant. A total of 33 species were recorded in A2 in 2006 and 34 in 2007.

The composition of the overstorey in plot B was very similar to plot A, with a large number of mature and juvenile *E. marginata* and *C. calophylla* recorded. Canopy condition in both species declined during 2007 (*E. marginata* – 2006: 0-21, mean 17.1; 2007: 0-23, mean 15.2, *C. calophylla* - 2006 14-19, mean 16.6; 2007: 9-19, mean 13.9). The understorey of both sub-plots B1 and B2 was still dominated by *T. parviceps, P. umbrosa, B. ornata* and other shrub species. Thirty one species were recorded in B1 and 29 in B2 in 2006, 37 and 34 in 2007.

There was little change in the composition of the overstorey between Plots B and C with canopy health again declining during 2007 (*E. marginata* – 2006: 12-21, mean 17.4; 2007: 4-21, mean 14.3, *C. calophylla* – 2006: 0-20, mean 16.3; 2007: 0-19, mean 13.6). Although species composition varied between sub-plots C1 and C2, *T. parviceps, P. umbrosa, B. ornata* and other shrub species remained dominant in the understorey. Thirty two species were recorded in sub-plot C1 and 30 in C2 in 2006, 32 and 29 in 2007.

Eucalyptus marginata and *C. calophylla* were also dominant in the overstorey of Plot D where canopy condition had also declined (*E. marginata* – 2006: 12- 0, mean 16.9; 2007: 0-21, mean 12, *C. calophylla* – 2006: 0-19, mean 16.2; 2007: 0-19, mean 13.4). Saplings and seedlings of each species were prevalent in the understorey. Sub-plot D1 and D2 were still dominated by *T. parviceps, P. umbrosa* and *B. ornata*, with an unidentified sedge and *Acacia* sp. also common in D2 in 2007. Thirty one species were recorded in D1 in both 2006 and 2007 and 29 in D2.

a. b. c.

d. e. f.

g. h.

Figure 21: Stewart Rd terrestrial vegetation monitoring transect. All photos taken looking diagonally across the plot; a) 0-20m; b) 20-0 m; c) 20-40 m; d) 40-20 m; e) 40-60 m; f) 60-40 m; g) 60-80m; h) 80-60m.

Table 21: Stewart Rd terrestrial - summary of transect data; diameter, health and density of overstorey species (all plots are 20 x 20 m).

Plot/ year		A			B			C			D		
	Spec[1].	05	06	07	05	06	07	05	06	07	05	06	07
Diameter range[2]	E.m.	<2 - 48	<2 - 48	<2 - 48	<2 - 45.0	<2 - 45	<2 - 45	<2 - 42.5	<2 - 42.5	<2 - 42.5	<2 - 46.4	<2 - 46.4	<2 - 51.8
	C.c.	<2 - 18	<2 - 18.4	<2 - 18.4	<2 - 19.4	<2 - 19.4	<2 - 21.5	<2 - 32.5	<2 - 32.5	<2 - 32.5	<2 - 49.7	<2 - 49.7	<2 - 49.7
Health Mean[3]	E.m.	12.0	16.9	16.0	13.7	17.1	15.25	13.6	17.4	14.3	12.7	16.9	12.0
	C.c.	12.0	16.1	15.2	12.3	16.6	13.9	12.7	16.3	13.6	12.0	16.2	13.4
Health Range	E.m.	6 - 16	12 - 21	6 - 21	0 - 17	0 - 21	0 - 23	9 - 17	12 - 21	4 - 21	7 - 16	12 - 20	0 - 21
	C.c.	9 - 16	11 - 20	9 - 20	7 - 15	14 - 19	9 - 19	3 - 17	0 - 20	0 - 19	3 - 16	0 - 19	0 - 19
Density[4]	E.m.	66 + 54 seedlings/ saplings	66	69 + 54 seedlings/ saplings	50 + 79 seedlings/ saplings	50	51 + 79 seedlings/ saplings	30 + 73 seedlings/ saplings	30	31 + 73 seedlings/ saplings	40 + 38 seedlings/ saplings	42	42 + 38 seedlings/ saplings
	C.c.	24 + 66 seedlings/ saplings	24	25 + 66 seedlings	31 + 56 seedlings/ saplings	32	32 + 56 seedlings/ saplings	41 + 27 seedlings/ saplings	41	41 + 27 seedlings/ saplings	52 + 63 seedlings/ saplings	50	51 + 63 seedlings/ saplings

[1]Overstorey species – C.c. = *Corymbia calophylla*; E.m.= *Eucalyptus marginata*
[2]Diameter Range is the range in individual stem diameters (cm) at breast height (1.3m).
[3]Mean health rating for all overstorey species.
[4]Density is number of trees in each plot.

Table 22: Stewart Rd terrestrial - summary of understorey data (all plots are 5 x 5m).

Plot	A1			A2			B1			B2			C1			C2			D1			D2		
Year	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07
No. species	39	38	38	32	33	34	37	31	37	24	29	34	33	32	32	28	30	29	37	31	31	29	29	29
No. exotics	-	-	0	-	-	0	-	-	1	-	-	1	-	-	0	-	-	0	-	-	1	-	-	1
Weediness index	0	0	0	0	0	0	0	0	0.03	0	0	0.03	0	0	0	0	0	0	0	0	0.03	0	0	0.036

Bore 60910257 (BP20B), in close proximity to the Stewart Rd terrestrial transect was established in 2003, providing consistent, monthly hydrological data since that time, although data has not been made available beyond April 2007 (Figure 22). Autumn minimums and spring maximums generally increased between 2003 and 2006 however, there was a decline in groundwater levels over the 2006/ early 2007 period.

Tree canopy condition declined during 2007. As this site is dominated by terrestrial, Eucalyptus species, this may be a reflection of higher groundwater levels and possibly water-logging of deep roots. However, further monitoring is required before a comprehensive assessment of the relationship between vegetation condition and the water regime at this site is possible.

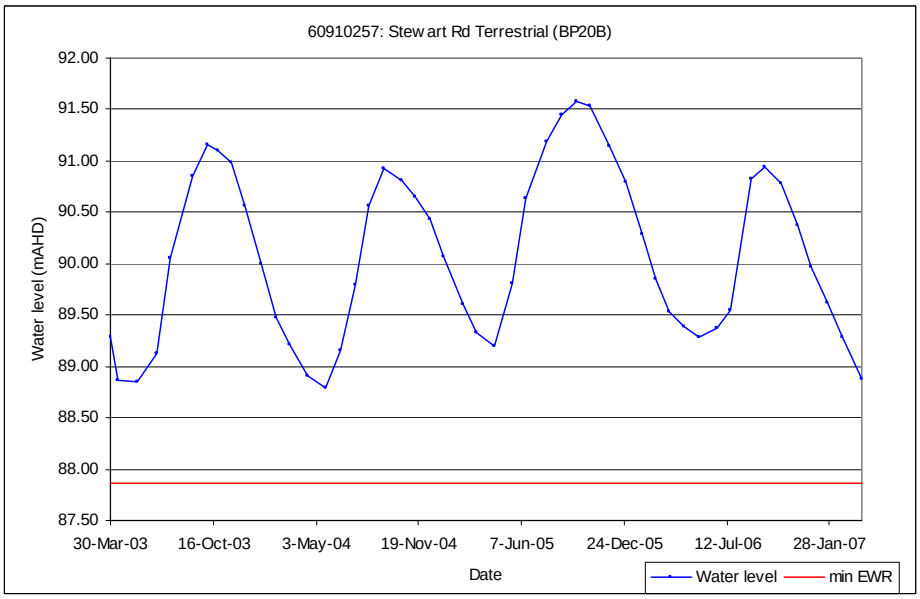


Figure 22: Stewart Rd terrestrial site groundwater levels 2003-2007.

Scott Rd

The 80 m transect at this site ran south from bore SC22B through open *E. marginata* woodland towards a *M. preissiana* woodland. This change in vegetation composition reflected the significant decrease in elevation across the transect. Due to the degree of change in elevation, a piezometer was also installed at the end of the transect. The understorey was very dense across most of the site.

During 2007 there was some change in canopy condition with mean tree health across the transect decreasing by 13% (Table 2). Species composition was 94% similar to that described in 2006 and there was no change in the number of exotics with none identified during this assessment.

Small to large *C. calophylla* and medium sized *E. marginata* formed the overstorey of plot A (Appendix 1.2.5, Table 23). The canopy condition of both species declined during 2007 (*E. marginata* – 2006: 12-16, mean 14; 2007: 11-16, mean 13.5, *C. calophylla* – 2006: 11-20, mean 14.2; 2007: 9-19, mean 13). The cover and abundance of *T. parviceps* and *A. scabra* increased during 2007 and these species continued to dominate in the understorey of sub-plots A1 and A2 with *A. prolifera* also common in A2 (Appendix 2.2.5). A total of 29 species were recorded in A1 in 2006, 28 in 2007 with 20 recorded in A2 in 2006 and 22 in 2007 (Table 24).

The canopy condition of the variously aged *E. marginata* in the overstorey of plot B improved in 2007 (2006: 7-15, mean 12.8; 2007: 8-21, mean 15.6) while the health of *C. calophylla* declined (2006: 15; 2007: 9-15, mean 11). *Taxandria parviceps, A. scabra* and *A. prolifera* continued to dominate the understorey across sub-plots B1 and B2. Twenty four species were identified in B1 in 2006, 23 in 2007. B2 supported 19 in 2006 and 18 in 2007.

A small to medium sized *E. marginata, C. calophylla* and *M. preissiana* formed the overstorey of plot C. The condition of *E. marginata* and *C. calophylla* fell during 2007 (*E. marginata* – 2006: 9-15, mean 14; 2007: 11-15, mean13, *C. calophylla* - 2006: 9-15, mean 12, 2007: 5-17, mean 10.7) while the health of *M. preissiana* improved (2006: 8-13, mean 10.3; 2007: 10-21, mean 14.8). *T. parviceps, A. scabra* and *A. prolifera* remained abundant in C1 where 26 species were recorded in 2006 and 24 in 2007. *T. parviceps* was also dominant in C2 with the grass *Johnsonia lupinia*. Fifteen species were identified in 2006 and 14 in 2007.

Small to medium *E. marginata* and *M. preissiana* and a single *C. calophylla* formed the overstorey across plot D. There was a slight improvement in the health of the *M. preissiana* during 2007 (2006: 3-10, mean 8.3; 2007: 3-11, mean 8.5) and a larger decline in *E. marginata* (2006: 17-19, mean 18.5; 2007: 13-21, mean 17.7) however, the condition of the *C. calophylla* fell significantly since the last assessment (2006: 19; 2007: 9).

Taxandria parviceps, *J. lupinia* and *X. preissii* retained dominance in the understorey of both sub-plots. D1 supported a total of 10 species in 2006, 11 in 2007. Seventeen species were recorded in D2 in 2006, 15 in 2007.

Figure 23: Scott Rd terrestrial vegetation monitoring transect. All photos taken looking diagonally across the plot. a) 0-20m; b) 20-0 m; c) 20-40 m; d) 40-20 m; e) 40-60 m; f) 60-40 m; g) 60-80m; h) 80-60m.

Table 23: Scott Rd - summary of transect data; diameter, health and density of overstorey species (all plots are 20 x 20 m).

Plot/ year		A			B			C			D		
	Spec[1].	05	06	07	05	06	07	05	06	07	05	06	07
Diameter range[2]	E.m.	39.8 - 45	39.8 - 45	40.2 - 45.6	<2 - 53	<2 - 53	<2 - 53.2	45.3	45.3	<2 - 46.5	7 - 62.8	7 - 67.1	<2 - 70.0
	C.c.	<2 - 120	<2 - 120	<2 - 120	<2 - 72.2	<2 - 72.2	<2 - 72.2	2.7 - 45.5	2.7 - 45.5	2.7 - 46.5	46.7	46.7	46.7
	M.p.	-	-	-	-	-	-	<2 - 60.4	<2 - 60.4	<2 - 61.2	4.8 - 12.7	4.8 - 12.7	5 - 12.8
Health Mean[3]	E.m.	14.5	14.0	13.5	12.7	12.8	15.6	11.0	14.0	13.0	18.0	18.5	17.7
	C.c.	13.7	14.2	13.0	13.3	15.0	11.0	11.4	12.0	10.7	19.0	19.0	9.0
	M.p.	-	-	-	-	-	-	10	10.3	14.8	8.5	8.3	8.5
Health Range	E.m.	12 - 17	12 - 16	11 - 16	5 - 15	7 - 15	8 - 21	9 - 14	9 - 15	11 - 15	17 - 19	17 - 19	13- 21
	C.c.	10 - 20	11 - 20	9 - 19	13 - 14	15	9 - 15	9 - 14	9 - 15	5 - 17	19	19	9
	M.p.	-	-	-	-	-	-	8 - 13	8 - 13	10 - 21	5 - 10	3 - 10	3 - 11
Density[4]	E.m.	2	2	2	15	15	17	1	1	2	4	4	6
	C.c.	13	13	13	3	3	4	7	7	7	1	1	1
	M.p.	-	-	-	-	-	-	4	4	4	4	4	4

[1]Overstorey species – M.p. = *Melaleuca preissiana*; C.c. = *Corymbia calophylla*; E.m.= *Eucalyptus marginata*
[2]Diameter Range is the range in individual stem diameters (cm) at breast height (1.3m).
[3]Mean health rating for all overstorey species.
[4]Density is number of trees in each plot.

Table 24: Scott Rd terrestrial - summary of understorey data (all plots are 5 x 5m).

Plot	A1			A2			B1			B2			C1			C2			D1			D2		
Year	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07
No. species	33	29	28	28	20	22	23	24	23	22	19	18	26	26	24	15	15	14	11	10	11	22	17	15
No. exotics	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0
Weediness index	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Although monitoring of bore 60830007, in close proximity to the Scott Rd terrestrial transect, commenced in 1992, the record is incomplete with little data recorded between March 1995 and October 2001 (Figure 24). However, the comprehensive data available since 2002 showed that minimum autumn groundwater levels increased from 2003-2006 before declining in 2007 and 2008.

As with the Stewart Rd site, tree canopy condition declined during 2007. As many terrestrial Eucalypts occur at this site, this may be a reflection of higher groundwater levels and possibly water-logging of deep roots. However, further monitoring is required before a comprehensive assessment of the relationship between vegetation condition and the water regime at this site is possible.

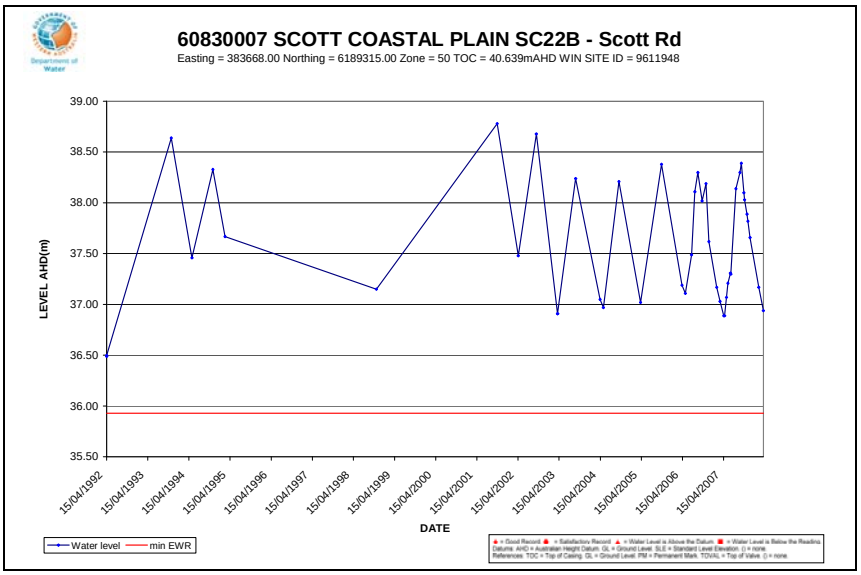


Figure 24: Scott Rd terrestrial site groundwater levels 1992-2007.

Western Scott Coastal Plain Sites

Reedia Wetlands

The Reedia wetlands are geographically restricted and nationally and regionally significant as they support the critically endangered frog species, *Geocrinia vitellina* and *G. alba*, the Declared Rare Flora species (DRF) *Reedia spathacea* and a proposed TEC (Del Borrello, 2008). The flora and vegetation within the broad valleys is distinct from other swamp vegetation in the area due to the specific site conditions created by the wet clay-loam soils (Mattiske Consulting, 2004). Both heath and sedge communities exist in the swamps depending on site conditions and possibly fire regimes (Mattiske Consulting, 2004).

Reedia South

The Reedia South site is located on Denny Rd partly within the Blackwood River National Park and partly within State Forest. The transect traverses a *Reedia spathacea* (sedge) dominated wetland (Figure 25) on Adelaide Brook, a tributary of the Blackwood River.

a.

b.

Figure 25: a) The location of the Reedia south transect; b) *Reedia spathulata*.

The 80 m transect runs east from open, mixed, *Eucalyptus* woodland, down a steep gradient (Figure 26) through sparse *E. megacarpa,* across the sedge dominated basin and back into *E. marginata/ C. calophylla* woodland on the far side (Figures 27a-h). Although there was clear evidence of previous water flow, the basin was dry at the time of transect establishment and baseline monitoring.

Eucalyptus marginata of different age and size classes formed the majority of the overstorey in Plot A, with four large *M. megacarpa* and a single *C. calophylla* (Appendix 1.3.1, Table 25). A number of seedlings and/ or saplings of each species were also recorded. The canopy condition of *E. marginata* and *E. megacarpa* ranged from

moderate to very good (*E. marginata* - 11-21, mean 16.5, *E. megacarpa* – 11-21, mean 16.5) with the single *C. calophylla* in good condition (17).

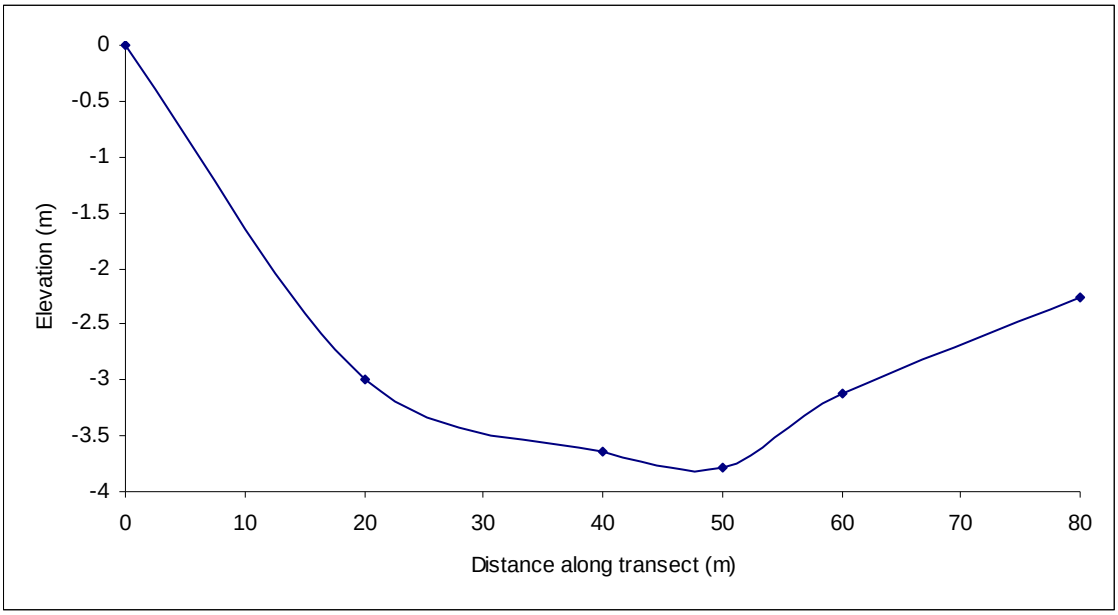


Figure 26: Elevations measured across the Reedia South monitoring transect.

The understorey of sub-plot A1 was dominated by *T. parviceps* and *A. fascicularis*. A further nine shrubs were identified in the plot including *Hibbertia hypericoides* and *Adenanthos obovatus*, along with five sedges and numerous herbs and grasses (Appendix 2.3.1, Table 26). A total of 23 species were identified, none of which were exotic. Native sedges dominated sub-plot A2. The P3 species, *Cyathochaeta teretifolia* was the most prevalent with *Loxocarya cineria*, *Hypolaena exsulca* and *Sporadanthus rivularis* also common. *Acacia pulchella* and *Beaufortia sparsa* were the most abundant shrubs in the plot. A total of 19 native species were identified in this plot.

Medium sized *E. marginata* in moderate to good condition (7-13, mean 10) and small *E. megacarpa* in good to very good condition (15-19, mean 18) formed the open overstorey of Plot B with *Allocasuarina fraseriana*. A number of seedlings and/ or saplings of both *Eucalyptus* species and *C. calophylla* were also recorded.

Hypolaena exsulca was very abundant in the understorey of B1, with a second sedge, *A. prolifera*. *Patersonia occidentalis* and the shrub, *Hakea lasianthoides* were also relatively common. A total of 22 native species were recorded in this plot. Although sub-plot B2 was species poor (11 native species in total), it was densely vegetated. The DRF species, *Reedia spathacea*, dominated the plot with *A. pulchella*, the large shrub *Homalospermum firmum, S. rivularis* and *C. teretifloia* also abundant.

There were no trees in Plot C. Although sub-plot C1 was less dense than species-poor B2 (11 species in total), a small number of species again represented the majority of the vegetative cover. *Homalospermum firmum* was most abundant with *A. pulchella*,

Lomandra paucifolia and *R. spathacea.* Sixteen native species were identified in C2. *Reedia spathacea* and the small shrub, *Boronia fastigiata*, were most abundant with *A. pulchella, S. rivularis* and *T. linearifolia* also common.

Two small *E. megacarpa* in good to very good condition (16-19, mean 17.5) occurred in Plot D. The understorey of species-poor, sub-plot D1 (12 species in total) was dominated by *R. spathacea*, with *B. fastigiata* and *C. teretifloia* also common. *Tetraria capillaris, S. rivularis* and *T. linearifolia* were the most abundant of the remaining species. *C. teretifloia* was the most abundant of the 16 species in D2. *Homalospermum firmum B. fastigiata* and the large, myrtaceous shrub, *Astartea fascicularis,* were also relatively common.

a. b. c. d. e. f. g. h.

Figure 27: Reedia South wetland vegetation monitoring transect. All photos taken looking diagonally across the plot; a) 0-20m; b) 20-0 m; c) 20-40 m; d) 40-20 m; e) 40-60 m; f) 60-40 m; g) 60-80m; h) 80-60m.

Table 25: Reedia South - summary of transect data; diameter, health and density of overstorey species (all plots are 20 x 20 m).

Plot/ year		A			B			C			D		
	Spec[1].	07/08	09	10	07/08	09	10	07/08	09	10	07/08	09	10
Diameter range[2]	E.m.	<2 - 102.0			9.6 - 18.6			-			-		
	C.c.	6.0			-			-			-		
	E.mc	39.7 - 46.4			<2 - 38.4			-			3.2 - 16.8		
Health Mean[3]	E.m.	16.5			10			-			-		
	C.c.	17			-			-			-		
	E.mc	16.5			16			-			17.5		
Health Range	E.m.	11 - 21			7 - 13			-			-		
	C.c.	17			-			-			-		
	E.mc	11 - 21			15 – 19			-			16 - 19		
Density[4]	E.m.	17 + 59 seedlings & 4 saplings			2 + 22 seedlings & 1 sapling			-			-		
	C.c.	1 + 11 seedlings			8 seedlings			-			-		
	E.mc	4 + 4 seedlings			6 + 6 seedlings & 2 saplings			-			2 + 2 seedlings		

[1]Overstorey species – C.c. = *Corymbia calophylla*; E.m.= *Eucalyptus marginata*; E.mc = *Eucalyptus megacarpa*
[2]Diameter Range is the range in individual stem diameters (cm) at breast height (1.3m).
[3]Mean health rating for all overstorey species.
[4]Density is number of trees in each plot.

Table 26: Reedia South - summary of understorey data (all plots are 5 x 5m).

Plot	A1			A2			B1			B2			C1			C2			D1			D2		
Year	07/08	09	10	07/08	09	10	07/08	09	10	07/08	09	10	07/08	09	10	07/08	09	10	07/08	09	10	07/08	09	10
No. species	23			19			22			11			11			16			12			16		
No. exotics	0			0			0			0			0			0			0			0		
Weediness index	0			0			0			0			0			0			0			0		

Groundwater level monitoring has been undertaken at bore 60915034, in close vicinity to the Reedia South transect, since 2004, but was only available up to early 2007 (Figure 28). The data indicates that minimum water levels increased from 2005 to 2006, but declined during 2007. As 2008 represents the first round of vegetation monitoring at this site it is not possible to comment on the relationship between vegetation condition and the water regime.

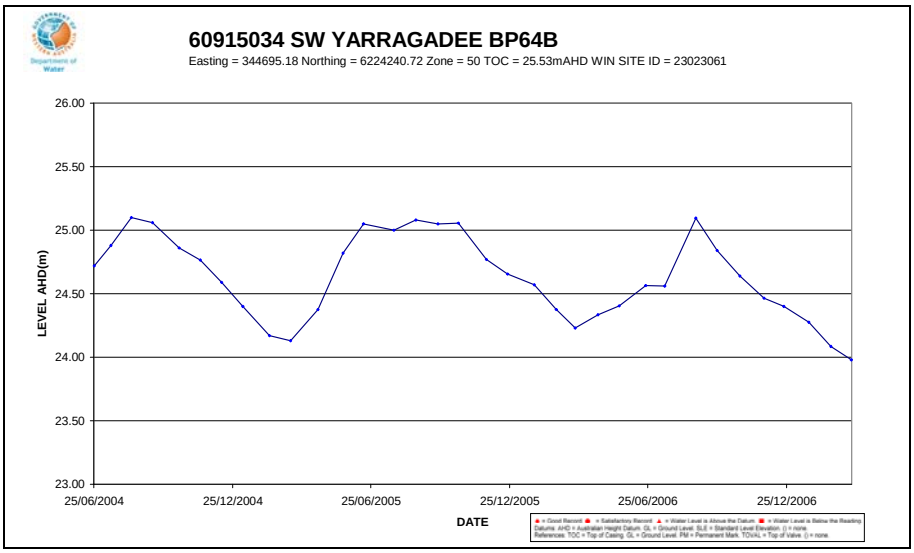


Figure 28: Reedia South groundwater levels 2004-2007.

Reedia North

The Reedia North site is located on Blackwood Rd within the Blackwood River National Park. The transect traverses a sedge dominated wetland (Figure 29) on Spearwood Brook, a tributary of the Blackwood River.

Figure 29: a & b) The location of the Reedia North transect.

The 80 m transect runs east from open *E. marginata/ C. calophylla* woodland, down gradient (Figures 30 & 31) across the sedge/ shrub dominated basin and back into *E. marginata/ C. calophylla* woodland on the far side. Although there was no surface water flow at the time of transect establishment and baseline monitoring, water was ponding in depressions.

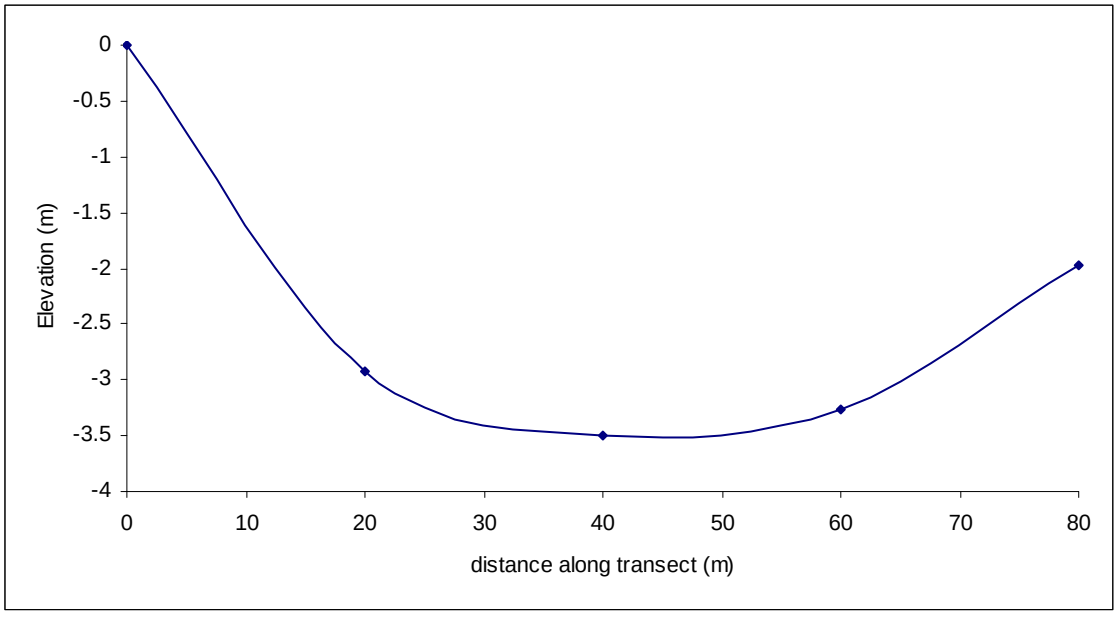


Figure 30: Elevations measured across the Reedia North monitoring transect.

Several medium sized and one very large *E. marginata* formed the overstorey of Plot A with *A. fraseriana.* The canopy condition of the mature trees ranged from poor to good however, mean health was moderate (4-14, mean 10.6) (Appendix 1.3.2, Table 27). *E. maginata, C. calophylla* and *B. littoralis* seedlings were noted in the understorey.

Although the understorey of sub-plot A1 was sparsely vegetated, 22 native species were identified (Appendix 2.3.2, Table 28). *Dasypogon bromeliifolius* was extremely abundant with *Lepidosperma squamatum* and *H. hypericoides* also relatively common. A2 was species rich, supporting 37 shrub, sedge and herb species. *T. linearifolia* was most abundant, with *D. bromeliifolius, L. squamatum* and *X. gracilis* the most common of the remaining species.

Plot B represented the transition into wetland vegetation. Although no mature trees were recorded, five *C. calophylla* seedlings/ saplings, all in very good condition (21-23, mean 22) were noted. The dense understorey of sub-plot B1 was dominated by *T. linearifolia* and *A. fascicularis* and sedges including *X. gracillima, Empodisma* sp. and *Cyathochaeta teretifolia,* a P3 species. A total of 16 native species were identified in this plot. The domination of *T. linearifolia* and *A. fascicularis* continued across B2, with a second *Empodisma* sp. and another sedge, *Tricostularia neesii,* also common. Thirteen species were recorded in this plot.

No mature trees were recorded in the overstorey of Plot C, in the wetland basin however, a single *E. marginata* sapling and several *C. calophylla* saplings/ seedlings were recorded in the understorey. The sedges, *Empodisma* sp., *C. teretifolia* and *Baumea* sp. Blackwood were most abundant in species poor C1 with *X. gracillima* and *T. linearifolia* also common. The dominance of *T. linearifolia* continued in C2 with *Gonocarpus diffuses, A. fascicularis* and *C. calophylla* seedlings also abundant. Nine species were recroded in C1, 27 in C2.

Plot D represented the transition from wetland to terrestrial vegetation. Medium sized *E. marginata* and large *C. calophylla* formed the overstorey of Plot D with a large number of seedlings of each species also recorded. The canopy condition of the mature trees ranged from poor to good (*E. marginata* – 6-15, mean 11.3; *C. calophylla* – 7-15, mean 11).

Sedges continued to dominate the understorey in the lower lying area of the plot, with *Empodisma* sp., *C. teretifolia* and *Baumea* sp. Blackwood dominant in D1 with *A. fascicularis.* The species composition D2 reflects the increase in elevation, with *Mesomelaena tetragona, X. preissii, Leucopogon australis, H. firmum, T. linearifolia* and *C. calophylla* seedlings most abundant in the understorey. A total of 14 native species were identified in D1, 24 in D2.

a. b. c.

d. e. f.

g. h.

Figure 31: Reedia North wetland vegetation monitoring transect. All photos taken looking diagonally across the plot; a) 0-20m; b) 20-0 m; c) 20-40 m; d) 40-20 m; e) 40-60 m; f) 60-40 m; g) 60-80m; h) 80-60m.

Table 27: Reedia North - summary of transect data; diameter, health and density of overstorey species (all plots are 20 x 20 m).

Plot/ year		A			B			C			D		
	Spec[1].	07/08	09	10	07/08	09	10	07/08	09	10	07/08	09	10
Diameter range[2]	E.m.	<2 - 102.0			-			<2			<2 - 39.6		
	C.c.	<2			<2 - 2.3			-			41.4 - 68.0		
	B.l	<2			-			-			-		
Health Mean[3]	E.m.	10.6			-			13			11.3		
	C.c.	-			22			-			11		
	B.l	23			-			-			-		
Health Range	E.m.	4 - 14			-			13			6 - 15		
	C.c.	-			21 - 23			-			7 - 15		
	B.l	23			-			-			-		
Density[4]	E.m.	9 + 13 seedlings			-			1			6 + 76 seedlings & 8 saplings		
	C.c.	8 seedlings			2 + 2 seedlings & 1 sapling			6 seedlings			2 + 19 seedlings		
	B.l	1			-			-			-		

[1]Overstorey species – C.c. = *Corymbia calophylla*; E.m.= *Eucalyptus marginata*; B.l = *Banksia littoralis*
[2]Diameter Range is the range in individual stem diameters (cm) at breast height (1.3m).
[3]Mean health rating for all overstorey species.
[4]Density is number of trees in each plot.

Table 28: Reedia North - summary of understorey data (all plots are 5 x 5m).

Plot	A1			A2			B1			B2			C1			C2			D1			D2		
Year	07/08	09	10	07/08	09	10	07/08	09	10	07/08	09	10	07/08	09	10	07/08	09	10	07/08	09	10	07/08	09	10
No. species	22			37			16			13			9			27			14			24		
No. exotics	0			0			0			0			0			0			0			0		
Weediness index	0			0			0			0			0			0			0			0		

Groundwater level monitoring has been undertaken at bore 60915029, in close vicinity to, but upslope from the Reedia South transect, since 2004, but was only available up to early 2007 (Figure 32). The data indicates that minimum water levels increased from 2005 to 2006, but declined during 2007. As 2008 represents the first round of vegetation monitoring at this site it is not possible to comment on the relationship between vegetation condition and the water regime.

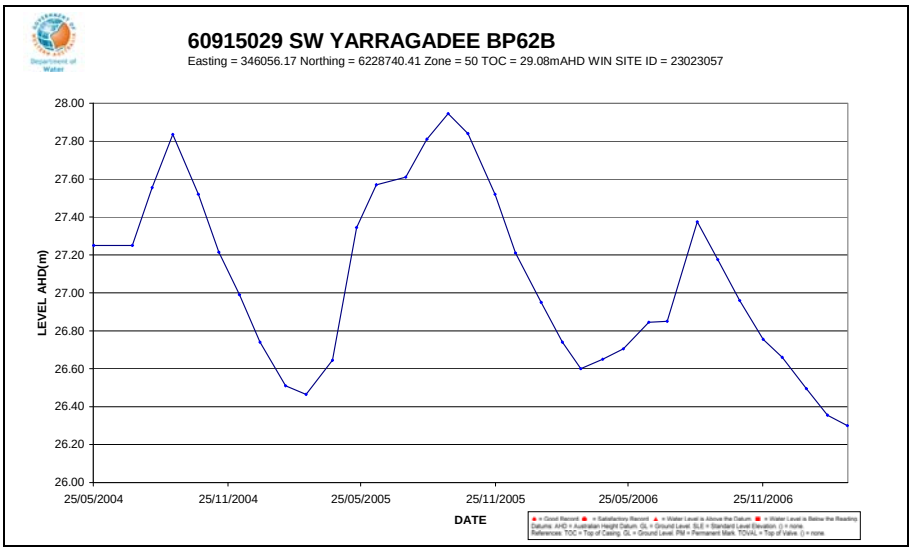


Figure 32: Reedia North groundwater levels 2004-2007.

Dennis Road (Scott North)

The site is located on Dennis Rd south of Paget Rd in an area of highly disturbed, remnant vegetation. The 80 m transect runs north from a small, area of woodland dominated by *C. calophylla*, down-gradient through a band of *M. preissiana* and across the dense, shrub dominated basin (Figures 33 and 34). No hydrological data were available for this site.

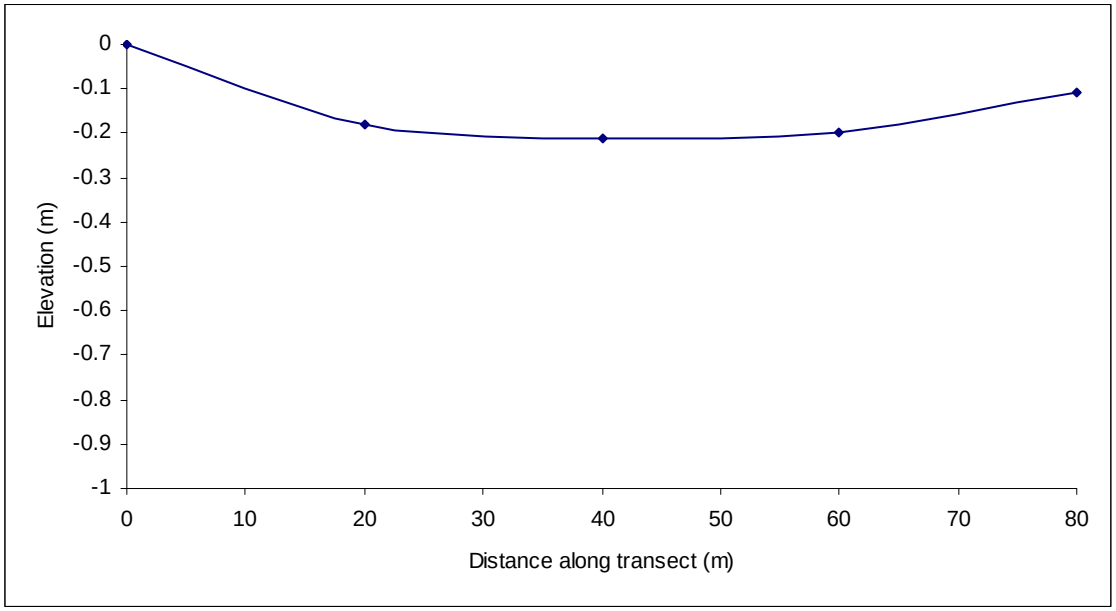


Figure 33: Elevations measured across the Dennis Rd (Scott North) monitoring transect.

The overstorey of Plot A comprised a single, multi-stemmed *M. preissiana* and several small *C. calophylla* (Appendix 1.3.3, Table 29). A single *B. littoralis* seedling and several *C. calophylla* seedlings/ saplings were also recorded across the plot. The canopy of the *M. preissiana* and the *B. littoralis* were in very good condition (*M. preissiana* - 19; *B. littoralis* - 23), with the health of the *C. calophylla* ranging from good to very good (15-21, mean 17.8).

The low, species rich, understorey of sub-plot A1 was dominated by the sedges *Tricostularia neesii* and *Empodisma gracillimum*, along with the shrubs *B. sparsa* and *Grevillea papillosa*, a P3 species, and *X. preissii* (Appendix 2.3.3, Table 30). *Adenanthos detmoldii*, a P4 species, was also relatively abundant in the plot. Two of the 26 species identified in A1 were exotic and the plot scored a weediness index of 0.11. Sub-plot A2 was located on the edge of an access track. This was reflected in a high number of exotics (seven of 14 species) of which, *Mentha pulegium** and *Juncus microcephala** were the most abundant. The plot scored a weediness index of 2.61, the highest on the transect.

The open overstorey of Plot B was formed of a single, multi-stemmed *M. preissiana* in good health (17) and a small *B. littoralis* in very good condition (23). Exotics were again common in the understorey with *M. pulegium** the dominant species. However, the natives sedges, *Mesomelaena tetragona, Juncus pallidus* and *Baumea juncea*, were also abundant. *Grevillea papillosa* was also recorded in the plot. *Grevillea papillosa* dominated the understorey of B2,

with *A. fascicularis, J. pallidus, C. avenacea* and the small native herb, *Alternanthera nodiflora* also common. A second P3 species, *Cyathochaeta stipoides* was also identified. Six of the sixteen species identified in B1 were exotic, seven of the 16 in B2, the plots scoring weediness indices of 1.08 and 1.32 respectively.

A single, large, multi-stemmed *M. preissiana* in good condition (15) occurred in the overstorey of Plot C. *J. pallidus, A. nodiflora* and the exotic herb, *Epilobium hirtigerum** were dominant in the understorey of C1. Of a total of 18 species, three were priority taxa, *G. papillosa, C. stipoides* and *A. detmoldii,* and eight were exotic (weediness index of 1.4). *A. fascicularis* dominated C2 with *C. avenacea, B. juncea* and the shrub, *Hakea ceratophylla* relatively common. *Cyathochaeta stipoides* also occurred in this plot. Seven of the 20 species identified in C2 were exotic, giving the plot a weediness index of 0.89.

The overstorey of Plot D was formed by a single, large, multi-stemmed *M. preissiana* in very good condition (21). Two small *M. preissiana* and a small *B. littoralis* occurred just beyond the transect, but were included in the assessment. All small individuals were in very good condition (*M. preissiana* - 23, *B. littoralis* - 23). The Priority species, *G. papillosa* was dominant in sub-plot D1 with *M. pulegium*. A. detmoldii* was also recorded in this plot. Nine of the 30 species in D1 were exotic, the plot scoring a weediness index of 0.84. *G. papillosa* was also dominant in D2, with only one or two individuals of all other species recorded. A weediness index of 0.56 was recorded with 7 exotics identified out of a total of 30 species.

Figure 34: Dennis Road wetland vegetation monitoring transect. All photos taken looking diagonally across the plot; a) 0-20m; b) 20-0 m; c) 20-40 m; d) 40-20 m; e) 40-60 m; f) 60-40 m; g) 60-80m; h) 80-60m.

Table 29: Dennis Road - summary of transect data; diameter, health and density of overstorey species (all plots are 20 x 20 m).

Plot/ year		A			B			C			D		
	Spec[1].	07/08	09	10	07/08	09	10	07/08	09	10	07/08	09	10
Diameter range[2]	M.p	31.0 - 35.4			11.1 - 22.3			7.5 - 13.7			<2 - 21.8		
	C.c	<2 - 7.5			-			-			-		
	B.l	<2			10.6			-			23		
Health Mean[3]	M.p	19			17			15			22.3		
	C.c	17.8			-			-			-		
	B.l	23			23			-			23		
Health Range	M.p	19			17			15			21 - 23		
	C.c	15 - 21			-			-			-		
	B.l	23			23			-			-		
Density[4]	M.p	1			1			1			3		
	C.c	7 + 16 seedlings & 2 saplings			-			-			-		
	B.l	1			1			-			1		

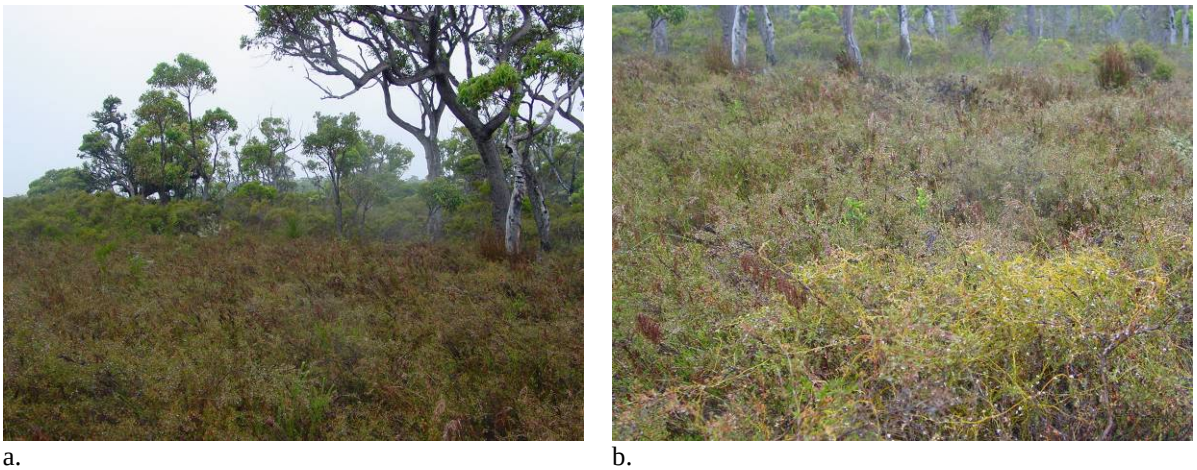
[1]Overstorey species – C.c. = *Corymbia calophylla*; M.p = *Melaleuca preissiana*; B.l = *Banksia littoralis*
[2]Diameter Range is the range in individual stem diameters (cm) at breast height (1.3m).
[3]Mean health rating for all overstorey species.
[4]Density is number of trees in each plot.

Table 30: Dennis Road - summary of understorey data (all plots are 5 x 5m).

Plot	A1			A2			B1			B2			C1			C2			D1			D2		
Year	07/08	09	10	07/08	09	10	07/08	09	10	07/08	09	10	07/08	09	10	07/08	09	10	07/08	09	10	07/08	09	10
No. species	26			14			16			16			18			20			30			29		
No. exotics	2			7			6			7			8			7			9			7		
Weediness index	0.11			2.61			1.08			1.32			1.40			0.89			0.84			0.56		

Scott River Road (Scott South)

The Scott River Rd site is located adjacent to the Scott National Park to the north of Scott River. The 80 m transect runs perpendicular to the road, 20m east of powerlines. There is little change in elevation moving north from open *E. marginata* woodland, through fringing *M. preissiana* and across a very, densely vegetated, wetland basin (Figures 35-37). No hydrological data were available for this site.



a. b.

Figure 35a & b): Location of the Scott River Rd transect.

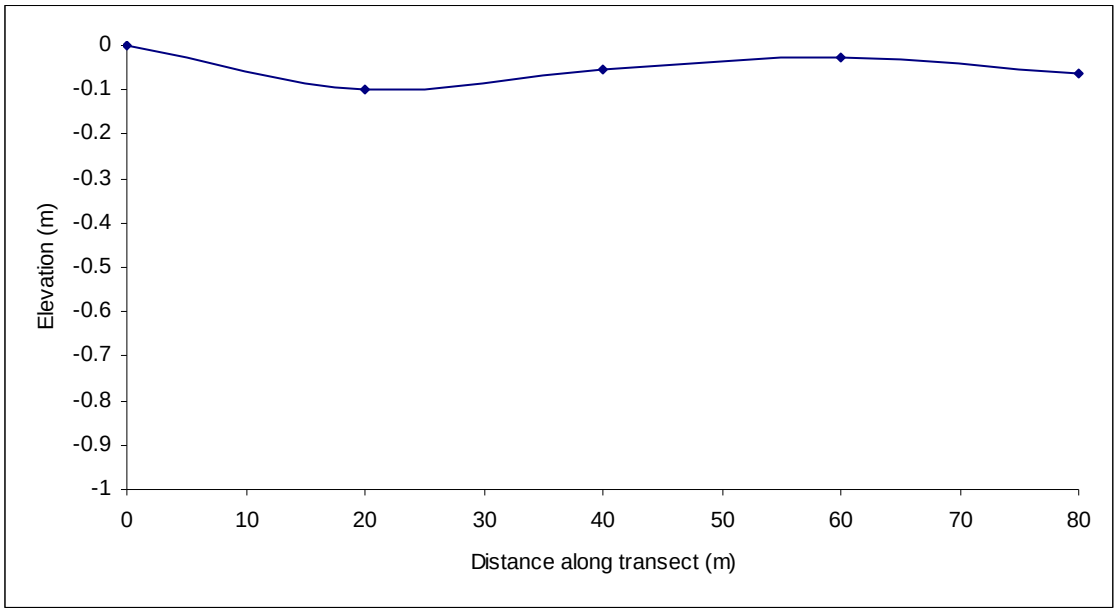


Figure 36: Elevations measured across the Scott River Rd (Scott South) monitoring transect.

The overstorey of Plot A was formed by small to medium sized *E. marginata* and *M. preissiana* of moderate to very good health (*E. marginata* – 10-20, mean 16.5, *M. preissiana* – 13-21, mean 16.5) (Appendix 1.3.4, Table 31). A1 was dominated by the shrubs *B. sparsa, T. parviceps* and *K. recurva* with sedges, *A. prolifera, A. scabra* and *Melanostachys ustulata* also prevalent

(Appendix 2.3.4, Table 32). *T. parviceps*, *K. recurva, A. prolifera* and *M. ustulata* were also most abundant in A2. The P3 species *Cyathochaeta stipoides* was recorded in both sub-plots in low abundances. A total of 25 species were identified in A1, 21 in A2.

A single, large, multi-stemmed *M. preissiana* occurred in Plot B with three small *C. calophylla* and several *E. marginata*, including seedlings and saplings. The *M. preissiana* was in very good condition (18), the *E. marginata* in poor to very good condition (5-19, mean 13.2) and the *C. calophylla* in poor condition (7). *Cyathochaeta stipiodes* was recorded in low abundances in sub-plot B1, which was dominated by very dense *A. scabra*. *T. parviceps* and *M. ustulata* were also fairly abundant. *A. prolifera* was dense in B2 with *A. scabra* also still very prevalent. *T. parviceps, B. sparsa* and *Homalospermum firmum* were common. Twenty native species were identified in B1 and 15 native and one exotic in B2, which scored a weediness index of 0.08.

No trees occurred in Plot C. Sub-plot C1 was densely vegetated with *A. prolifera*, *Schoenus* sp. and shrubs, *T. parviceps, B. sparsa* and *H. firmum* most abundant. One of the 21 species identified in this plot was exotic, the plot scoring a weediness index of 0.06. The vegetation in sub-plot C2 was also very dense. *A. scabra* was most abundant with *T. parviceps* and *H. firmum* also dominant. Despite the density of the vegetation only 13 species were recorded in this plot.

A single, large, healthy (19), multi-stemmed *M. preissiana* occurred in Plot D. *A. scabra* was very abundant in D1 with *H. firmum* and *Schoenus* sp. also common. Sixteen species were recorded in this plot. *A. fascicularis, Patersonia occidentalis* and *Leptocarpus tenax* dominated the species poor sub-plot D2. Although only nine species were recorded, this plot was very densely vegetated.

a. b. c.

d. e. f.

g. h.

Figure 37: Scott River Road wetland vegetation monitoring transect. All photos taken looking diagonally across the plot; a) 0-20m; b) 20-0 m; c) 20-40 m; d) 40-20 m; e) 40-60 m; f) 60-40 m; g) 60-80m; h) 80-60m.

Table 31: Scott River Road - summary of transect data; diameter, health and density of overstorey species (all plots are 20 x 20 m).

Plot/ year		A			B			C			D		
	Spec[1].	07/08	09	10	07/08	09	10	07/08	09	10	07/08	09	10
Diameter range[2]	M.p	<2 - 14.1			4.7 - 21.0			-			5.7 - 28.4		
	C.c	-			7.2 - 10.0			-			-		
	E.m	6.6 - 32.5			4.0 - 14.0			-			-		
Health Mean[3]	M.p	16.5			18			-			19		
	C.c	-			7			-			-		
	E.m	16.5			13.2			-			-		
Health Range	M.p	13 - 21			18			-			19		
	C.c	-			7			-			-		
	E.m	10 - 20			5 - 19			-			-		
Density[4]	M.p	4			1			-			1		
	C.c	-			3			-			-		
	E.m	8			4 + 11 seedlings & 1 sapling			-			-		

[1]Overstorey species – C.c. = *Corymbia calophylla*; M.p = *Melaleuca preissiana*; E.m = *Eucalyptus marginata*
[2]Diameter Range is the range in individual stem diameters (cm) at breast height (1.3m).
[3]Mean health rating for all overstorey species.
[4]Density is number of trees in each plot.

Table 32: Scott River Road - summary of understorey data (all plots are 5 x 5m).

Plot	A1			A2			B1			B2			C1			C2			D1			D2		
Year	07/08	09	10	07/08	09	10	07/08	09	10	07/08	09	10	07/08	09	10	07/08	09	10	07/08	09	10	07/08	09	10
No. species	25			21			20			16			21			13			16			9		
No. exotics	0			0			0			1			1			0			0			0		
Weediness index	0			0			0			0.08			0.06			0			0			0		

Groundwater level monitoring has been undertaken at bore 60930008, some distance and upslope from the Scott River Rd transect, since 1990 (Figure 38). The data indicates that minimum water levels remained relatively stable from 1990 to 2002 before falling between 2002 and 2004, increasing in 2005 and falling again to reach their lowest levels in 2007. Despite a historically low minimum, the second highest maximum was also recorded in 2007. As the bore is some distance from the transect and 2008 represents the first round of vegetation monitoring at this site it is not possible to comment on the relationship between vegetation condition and the water regime.

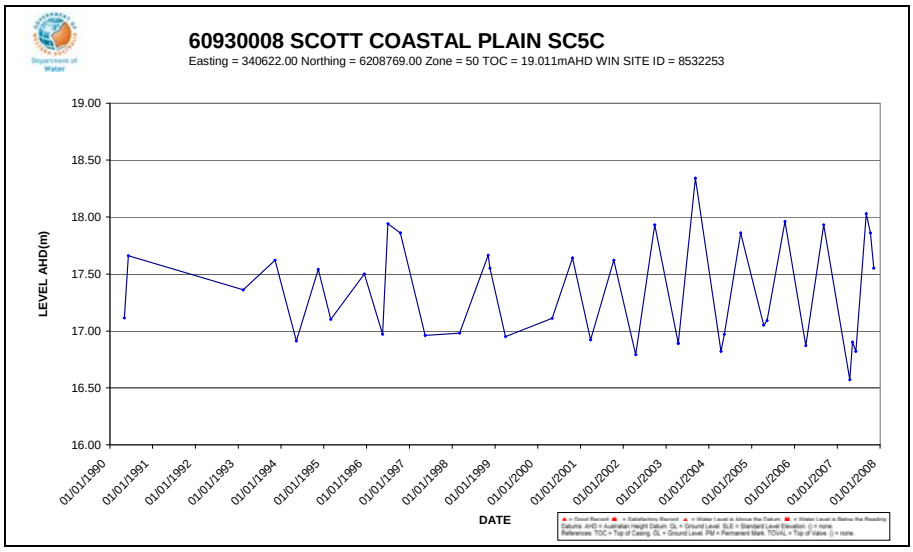


Figure 38: Scott River Rd groundwater levels 1990-2008.

Adelaide Road (Upper Margaret)

The Adelaide Rd site is located between Margaret River and Margaret River North. The 80 m transect runs parallel to the road, heading north from open, mixed *Eucalyptus* woodland through fringing *M. preissiana* and into a wetland basin dominated by low shrubs and sedges (Figure 38). There is little change in elevation across the transect (Figure 39). No hydrological data were available for this site.

a.

b.

Figure 39a & b): Location of the Adelaide Rd transect.

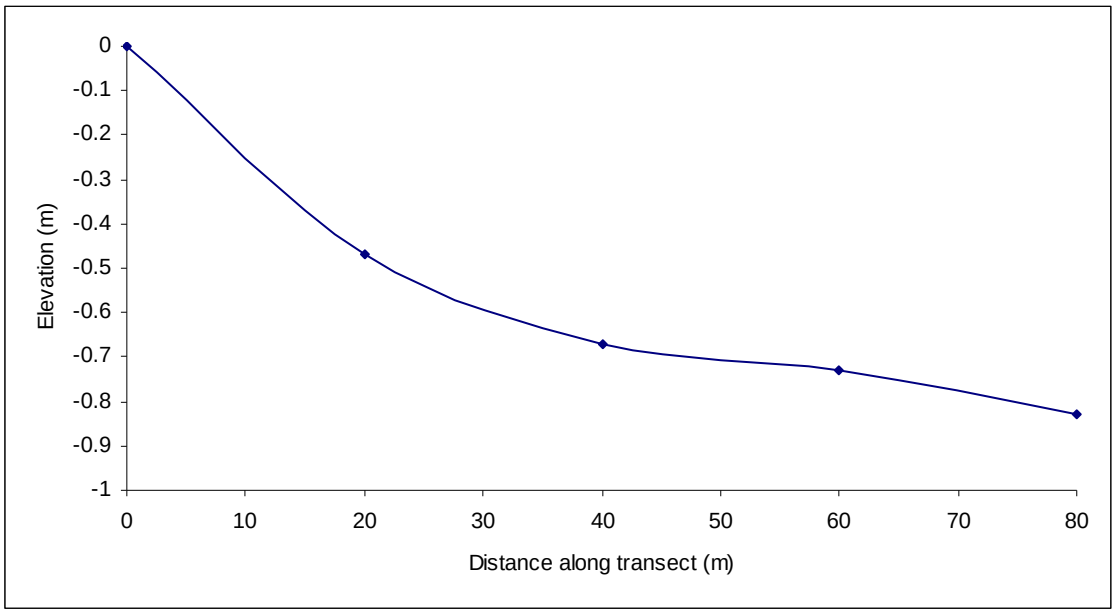


Figure 40: Elevations measured across the Adelaide Rd (Upper Margaret) monitoring transect.

Melaleuca preissiana and *C. calophylla* of various age classes, including *C. calophylla* seedlings and saplings occurred in the overstorey of Plot A with *A. fraseriana* (Appendix 1.3.5, Table 33). The canopy condition of the *C. calophylla* ranged from good to very good (13-21, mean 16.3) however, the mature individuals were less healthy than smaller trees. *M. preissiana* were also in good to very good condition (13-19, mean 14.7), with large, multi-stemmed individuals healthier than smaller trees.

Sub-plot A1 was sparsely vegetated with *P. ellipticum* and *Leschenaultia expansa* most abundant and only one or two individuals of other species present (Appendix 2.3.5, Table 34). A P1 species¸ *Hemigenia rigida* was identified. A total of 18 native species were recorded. *P. ellipticum* and the sedge, *Melanostachys ustulata* were very abundant in A2 with *D. bromeliifolius* also relatively common. Twenty two species were identified in this plot.

Two healthy, mature *M. preissiana* (13-17, mean 15) and a number of *M. preissiana* and *C. calophylla* saplings occurred in Plot B. The understorey was much denser than Plot A with *P. ellipticum, X. preissii* most abundant in B1 and *Mesomaleana tetragona* and an unidentified herb also common. A total of 20 species were recorded in this sub-plot. *P. ellipticum* was also abundant in B2 with the native shrub, *Adenanthos meisneri* and *M. ustulata.* Twenty five species were identified in b2.

The small number of *M. preissiana* occurring in Plot C ranged from saplings to large, multi-stemmed trees, all of good health (13-15, mean 14.5). *P. ellipticum* was very dominant across both sub-plots with *M. tetragona* also common inC1 and *M. ustulata* in C2. Nineteen native species were recorded in C1, 20 in C2.

Two moderately sized, healthy *M. preissiana* (17) occurred in Plot D. Sub-plot D1 was densely vegetated with *A. fascicularis, Taxandria juniperiana* and *Hakea sulcata* abundant. The sedge, *Hypolaena exsulca,* was dominant in D2. Nineteen species were recorded in D1 24 in D2.


a.


b.


c.


d.


e.


f.


g.


h.

Figure 41: Adelaide Road wetland vegetation monitoring transect. All photos taken looking diagonally across the plot; a) 0-20m; b) 20-0 m; c) 20-40 m; d) 40-20 m; e) 40-60 m; f) 60-40 m; g) 60-80m; h) 80-60m.

Table 33: Adelaide Road - summary of transect data; diameter, health and density of overstorey species (all plots are 20 x 20 m).

Plot/ year		A			B			C			D		
	Spec[1].	07/08	09	10	07/08	09	10	07/08	09	10	07/08	09	10
Diameter range[2]	M.p	<2 - 28.9			<2 - 45.8			<2 - 25.0			9.5 - 13.2		
	C.c	<2 - 27.1			-			-			-		
	E.m	-			<2			-			-		
Health Mean[3]	M.p	14.7			15			14.5			17		
	C.c	16.3			-			-			-		
	E.m	-			-			-			-		
Health Range	M.p	13 - 19			13 - 17			13 - 15			17		
	C.c	13 - 21			-			-			-		
	E.m	-			-			-			-		
Density[4]	M.p	9			3 + 2 saplings			4			2		
	C.c	3 + 16 seedlings & 4 saplings			-			-			-		
	E.m	-			4 saplings			-			-		

[1]Overstorey species – C.c. = *Corymbia calophylla*; M.p = *Melaleuca preissiana; E.m = Eucalyptus marginata*
[2]Diameter Range is the range in individual stem diameters (cm) at breast height (1.3m).
[3]Mean health rating for all overstorey species.
[4]Density is number of trees in each plot.

Table 34: Adelaide Road - summary of understorey data (all plots are 5 x 5m).

Plot	A1			A2			B1			B2			C1			C2			D1			D2		
Year	07/08	09	10	07/08	09	10	07/08	09	10	07/08	09	10	07/08	09	10	07/08	09	10	07/08	09	10	07/08	09	10
No. species	18			22			20			25			19			20			19			24		
No. exotics	0			0			0			0			0			0			0			0		
Weediness index	0			0			0			0			0			0			0			0		

Discussion

An improvement in tree canopy condition was noted across the majority of transects, with the exception of the Stewart Rd and Scott Rd terrestrial sites. However, increased groundwater levels at these sites prior to 2007 may have lead to water-logging of the deep rooted Eucalypt sp. dominant in the overstories, thereby reducing canopy health. Improved canopy conditions were recorded at other sites at which short-term groundwater level declines occurred. It is possible that above average winter rainfall recorded in Pemberton in 2007 offset the potential negative impacts generally associated with water table decline.

Species richness decreased across the majority of sites, generally as a result of sampling in summer after many annual species had completed their life-cycles. Although the number of exotic species also decreased at some sites (Lake Jasper South and East) there was an increase at others (Pneumonia Rd and Stewart Rd). However, changes were insignificant as numbers did not vary by more than 1 or 2 species across entire transects. As changes in species richness were relatively small, there was also little change in species composition across transects, with nine of the 11 sites >85% similar in composition between 2006/07 and 2007/08. Species composition at the two remaining sites, Lake Jasper East and South, was still in flux as vegetation continued to recover from the 2005 fires.

Many of the original, hand-augered piezometers have been replaced by permanent bores installed by drilling contractors. However, two of those yet to replaced continue to dry some months before the end of the summer/ autumn drying phase, resulting in incomplete hydrological records for the Blackpoint/ Fouracres Rd wetland site and Poison Gully terrestrial site.

The results of the 2007 vegetation monitoring indicate that there has been little to no change in wetland vegetation condition, distribution or structure since the 2006 assessment. The null hypotheses are therefore rejected for all sites as below;

1. Increasing depth to groundwater will not lead to a change in the structure, condition and vigour of littoral and fringing vegetation resulting in the decline of habitat values;
   - Lake Jasper East
   - Pneumonia Rd
   - Poison Gully

2. Increasing depth to groundwater will not lead to a change in the structure, condition and vigour of littoral and fringing vegetation;
   - Lake Jasper South
   - Darradup Rd East
   - Blackpoint/ Fouracres Rd.

3. Increasing depth to groundwater will not lead to a change in the structure, condition and vigour of phreatophytic vegetation;

- Scott Rd
- Stewart Rd Terrestrial
- Poison Gully Terrestrial
- Darradup Rd East Terrestrial.
- Blackpoint/ Fouracres Rd Terrestrial.

However, continued and long-term monitoring of the southern Blackwood and Scott Coastal Plain sites is required to further investigate relationships between changes in vegetation condition associated with groundwater level change and/ or climate change.

EWR Review

Approach/ Methods

In this section of the report, 2007 minimum water levels and autumn minimum EWRs were compared to identify any breaches in water level criteria. Where breaches had occurred, current vegetation condition, recent changes in vegetation health and other factors such as disturbance and rainfall were considered, to determine if groundwater level change was likely to have been the cause. Although monitoring was not undertaken until summer 2008, 2007 autumn minimums were considered to be most relevant to vegetation condition at the time of the assessment. EWRs have been yet to be set for the newly established western Scott Coastal Plain sites.

Results/ Discussion

Autumn minimums from 2006 and 2007 and autumn minimum EWRs are presented in Table 35. EWRs appeared to have been breached at three wetland sites in autumn 2007; Lake Jasper East, Blackpoint/ Fouracres Rd. and Darradup Rd. East. Although declines below the EWRs of 0.85 m, 0.2 m and 0.52 m respectively were recorded, these readings were not reflective of actual groundwater level declines at Blackpoint/ Fouracres Rd. and Darradup Rd. East as piezometers had dried prior to the end of autumn. It must also be noted that the existing EWR at Lake Jasper East will be reviewed following monitoring in spring 2008 to better reflect current groundwater levels (measured at a newly installed piezometer) rather than surface water levels.Despite groundwater level declines of such significance mean canopy condition improved, richness of exotics decreased or remained at zero and there was little change in species composition at all three sites (Table 2).

Although these results initially suggest that the EWRs are non-representative of vegetation requirements at these sites, it must be noted that vegetation at both Lake Jasper East and Darradup East is still re-establishing following fires in 2005. Continued improvements in canopy condition are therefore not unexpected. However, the 0.20 m decline at the Blackpoint/ Fouracres Rd wetland site was associated with a significant (29%) improvement in canopy condition. Higher than average rainfall recorded at Pemberton over winter 2007 also suggests that groundwater decline was offset by the higher availability of meteoric water.

In addition, two terrestrial sites, Stewart Rd and Scott Rd experienced canopy condition decline without breaching EWRs. Hydrological data suggest that health declines may reflect the increased water availability at these sites over the years preceding 2006, and the subsequent response of the terrestrial Eucalypt species dominant at both sites.

Further review and refinement of EWRs is required for all sites. Ongoing vegetation and groundwater monitoring will facilitate this process.

Table 35: Minimum ground and surface water levels at criteria sites, autumn 2006-2007, compared to autumn minimum EWRs. Values in red type represent 'breached' EWRs.

Site/ bore	Groundwater level (mAHD)		Autumn min EWR (mAHD)
	Autumn 06	Autumn 07	
Wetlands			
Lake Jasper South/ SC21B	39.39	39.03	38.50
Lake Jasper East/ EW8	-	37.65	38.50*
Pneumonia Rd/	28.92	28.61	27.66
Blackpoint/ Fouracres Rd (b)	-	45.25 (dry)	45.45
Darradup Rd East	101.46	101.18 (dry)	101.70
Poison Gully	-	31.12	30.47
Terrestrial			
Blackpoint/ Fouracres Rd	44.36	43.90	41.04
Darradup Rd East	105.76	105.78	104.43
Poison Gully	-	32.62	31.06
Stewart Rd/ BP20B	89.39	88.88	87.86
Scott Rd/ SC22B	37.18	37.03	35.93
Western Scott Coastal Plain			
Reedia South/ BP64B	-	24.23	-
Reedia North/ BP62B	-	26.3	-
Dennis Rd	-	-	-
Scott River Rd/ SC5C	16.87	16.57	-
Adelaide Rd	-	-	-

*EWR to reviewed in 2008

Appendices

Appendix 1: Field data – DBH and canopy condition of overstorey species

1.1 Wetlands

1.1.1 Lake Jasper - south

Plot	Species	Tag Number	DBH	Canopy condition		
				05	06	07/08
A	*Banksia littoralis*	449	24.0	11	19	21
		450	41.6, 37.1	11	20	21
		451	38.4	11	18	21
		452	33.7	11	18	20
		455	27.3, 40.5	13	18	20
		456	43.2	13	18	21
	Melaleuca preissiana	453	6.0	11	11	21
		454	7.5	11	12	19
B	*Banksia littoralis*	463	28.4, 21.0	12	18	21
		465	17.0, 14.3	12	14	23
	Melaleuca preissiana	457	5.4, 4.0, 3.5	11	10	23
		458	6.8, 8.2, 3.1	11	9	17
		459	5.3, 3.0	11	11	17
		460	8.0, 7.3	11	11	19
		461	5.3	11	9	13
		462	14.3, 11	11	11	23
		464	16.4, 15.7, 13.8	11	14	20
C	*Banksia littoralis*	466	2.0, <2.0, <2.0	12	16	21
		467	14.9, 17.1, 18.2, 17.0	13	16	21
		470	14.0, 15.2, 8.4	11	14	23
		471	13.8, 9.3, 6.5	11	9	21
	Melaleuca preissiana	468	8.1	11	11	21
		469	5.2, 3.4	11	12	21
D	*Melaleuca preissiana*	472	18.0, 19.7, 16.5	11	14	21
		473	9.4, 4.2, 6.3, 14.2, 6.5, 3.6, 11.3, 10.8, 25.5, 12.4, 8.6, 4.4, 9.5, 9.1, 3.8, 46.4	12	17	21
		NT	7.5	-	-	17

1.1.2 Lake Jasper - east

Plot	Species	Tag Number	DBH	Canopy condition		
				05	**06**	**07/08**
A	No trees					
B	*Melaleuca preissiana*	601	104.0	16	16	17
		602	100.0, 9.0	17	16	18
		NT	<2.0	18	18	15
		606	8.7	12	10	15
	Banksia littoralis	603	10.3	19	15	21
	Eucalyptus megacarpa	604	79.4	12	11	16
		605	43.8	11	11	12
C	*Banksia littoralis*	609	18	18	19	21
	Eucalyptus megacarpa	607	37.4	13	13	17
		608	46.4	16	9	19
		610	25, 3, 3, 3, 3	13	9	13
		NT	3, 3, 3, 3, 3, 3	-	-	9
D	*Eucalyptus megacarpa*	611	45.1	10	9	13
		619	7.5, <2,c 4.2, 4.5, 5.5	16	10	21
		NT	4, 3	-	-	17
		NT	2.5	-	-	21
	Banksia attenuata	NT	<2.0	16	16	21
		612	25.3	16	15	21
		613	13.4, 13.3	18	13	21
		NT	<2.0	17	17	21
		NT	<2.0	16	16	21
		NT	<2.0	17	17	21
		614	7.4	16	6	15
		615	24.0	19	17	21
		616	23.8, 29.8	17	20	20
		617	10	14	13	15
		618	20.0	13	9	21
		NT	<2.0	16	16	9
		NT	<2.0	16	16	13
		NT	<2.0	16	16	13

1.1.3 Pneumonia Rd

Plot	Species	Tag Number	DBH	Canopy condition		
				05	06	07/08
A	*Melaleuca preissiana*	27	8.1, 1.4	13	13	15
		28	1.7	15	15	15
		29	4.0	9	9	9
		30	8.0	13	14	15
		31	15.3, 12.6	15	15	11
		32	9.2, 6.2, 2.0	15	15	15
		33	7.6	13	13	17
		34	<2.0	15	17	19
		35	<2.0	15	17	17
		NT	<2.0	15	15	19
		NT	<2.0	15	15	19
		NT	<2.0	15	15	19
		NT	<2.0	15	15	19
		NT	<2.0	15	15	17
		NT	<2.0	15	15	15
		36	3.0	15	17	17
		37	2.5	15	17	19
		38	14.8, 9.6	13	13	15
		NT	<2.0	15	15	19
		39	6.8	13	13	17
		40	<2.0, 8.5	13	15	15
		41	4.6, 5.2	13	11	15
		42	5.5, 2.5	13	13	13
		43	8.2, 5.0, 2.4, 2.1	13	14	15
		44	<2.0, <2.0	13	13	15
		45	9.4, <2.0,	13	13	15
		46	7.1, 7.5	15	15	15
		47	8.2, 10.1	15	15	15
		48	3.2, <2.0	15	15	15
		NT	<2.0	15	18	19
		49	3.0, <2.0, <2.0, <2.0, <2.0, <2.0	15	16	19
	Eucalyptus marginata	50	3.4, <2.0	15	15	21
B	*Melaleuca preissiana*	51	2.4	15	16	15
		52	15.5, 21.0	15	15	15
		53	5.8, 1.5, 2.0	13	15	13
		54	8.6	13	13	15
		55	11.0	13	13	17
		56	9.7	13	13	15
		57	6.2	13	13	13
		58	2.0	15	17	17
		59	13.6	13	16	17
		60	7.9	13	15	17
		61	3.0	13	14	13
		62	11.0	13	14	17
	Banksia littoralis	NT	<2.0	13	13	13

		63	7.0, 3.0	17	17	23
C	*Melaleuca preissiana*	64	10.5, 9.1	13	13	15
		65	22.6	15	15	15
		66	5.1	11	13	11
		67	8.5	11	11	13
		NT	<2.0	13	13	15
		NT	<2.0	13	13	15
		68	23.2	13	14	15
		69	8.0	11	13	15
		70	7.5, 4.9	11	11	13
		NT	<2.0	15	15	15
		NT	<2.0	13	13	15
		NT	<2.0	13	13	17
D	*Melaleuca preissiana*	71	72.0, 2.5, 3.5	15	17	12
		72	8.0,	13	13	13
		73	6.7	13	14	13
		74	5.6	11	11	11
		75	7.0	11	13	11
		76	7.3	11	11	17
		77	12, 3.0	13	14	19
		78	6.5, 5.8	11	13	15
		79	9.5	11	11	15
		80	9.5, 3.5, 2.1, <2.0, <2.0, <2.0, <2.0	11	11	19

1.1.4 Black Point/ Fouracres Rd

Plot	Species	Tag Number	DBH	Canopy condition		
				05	**06**	**07/08**
A	*Eucalyptus marginata*	218	9.2	17	18	19
		219	22.2	15	17	14
		220	6.3	10	15	19
		221	30.7	8	8	10
		NT	<2.0	8	8	10
		222	19.5, 15.7, <2.0	14	15	15
		223	42.0	12	10	9
		224	41.2	9	10	9
	14 seedlings					
	Corymbia calophylla	NT	2.7, 2.5	-	-	14
		NT	3.2	-	-	17
		NT	<2.0, <2.0	-	-	15
B	*Eucalyptus marginata*	225	10.5, 4.6	15	15	19
	2 seedlings					
C	*Melaleuca preissiana*	226	10.9	9	9	11
		227	28.2	9	11	15
		228	46.0, 17.7, 8.5	13	14	17
		229	10.5, 5.2	7	9	15
		NT	<2.0	-	-	19
	Eucalyptus marginata	NT	<2.0, <2.0	-	-	12
	2 seedlings					
D	*Melaleuca preissiana*	230	5.8	7	7	15
		231	6.8, 6.5, 6.0, 4.2	9	9	15
		232	14.0, 4.0, 22.5, 20.5, 5.0, 8.5	13	13	17
		233	11.0, 15.0, 12.0, 19.7, 19.8, 6.2	13	14	19
		234	14.0	12	12	19
	6 seedlings					

1.1.5 Darradup Rd - East

Plot	Species	Tag Number	DBH	Canopy condition		
				05	**06**	**07/08**
A	*Melaleuca preissiana*	1	8.3, 3.7, 10.9, 13.4, 4.5	18	12	18
		2	7.0, 16.1, 8.2	18	12	18
		4	10.8, 6.6, 3.3	16	19	21
	Eucalyptus marginata	3	3.9	16	21	23
		5	6.7, 10.2, 10.5, 4.5, 7.0	16	19	21
		NT	<2.0	16	16	21
		NT	<2.0	16	16	21
		NT	<2.0	-	-	19
B	*Melaleuca preissiana*	6	18.2, 16.1	12	9	9
		7	35.2, 27.8, 26.7	12	15	15
		8	4.0	9	7	7
		9	3.0	9	8	9
	Eucalyptus marginata	10	8.8	13	19	19
		NT	<2.0	16	17	21
		NT	<2.0	16	17	21
		NT	<2.0	16	17	19
		NT	<2.0	16	17	19
		11	7.7, 7.4, <2.0	16	18	19
		12	10.1	16	18	18
		13	2.9, <2.0, <2.0	16	18	21
C	*Melaleuca preissiana*	14	12.6	11	12	15
		15	3.8	9	9	9
		16	27.5, 11.3, 5.5, 8.0, 4.5	13	10	11
		17	11.6, 13.5, 9.8, 12.8, 8.9	12	9	11
		18	6.5, 5.8, 3.1, 8.4, 4.3, 2.3, 5.5	13	11	15
D	*Melaleuca preissiana*	19	43.8, 27.8	7	5	7
		20	2.8, 2.0, 10.5	7	7	7
		21	2.8	11	13	11
		22	<2.0, <2.0, <2.0	9	13	11
		23	8.0, 5.5	11	13	11
		24	25.3, 12.3, 8.3, 8.5, 7.8, 8.0	13	11	15
		NT	<2.0	9	11	15
		25	2.0, 2.5, <2.0, <2.0	9	11	15

1.1.6 Poison Gully

Plot	Species	Tag Number	DBH	Canopy condition		
				05	**06**	**07/08**
A	*Melaleuca preissiana*	381	16, 7, 14.5	9	9	9
B	*Melaleuca preissiana*	379	13, 8.5, 7.5	17	17	21
		380	8, 8.5, <2, <2, 11, 19	13	15	15
	Banksia littoralis	382	13, 8	18	21	21

1.2 Terrestrial sites

1.2.1 Black Point/ Fouracres Rd

Plot	Species	Tag Number	DBH	Canopy condition		
				05	06	07/08
A	*Corymbia calophylla*	176	13.8	10	12	17
		178	15.5	12	14	15
		179	4.2	11	12	17
		181	9.3, 3.0, <2.0	11	11	17
		182	36.7	14	17	11
		183	5.5, 6.7	12	12	17
		184	12.8	13	15	15
		185	15.0	13	15	13
		187	6.4, <2.0	12	12	19
		188	9.5	13	15	17
		189	3.0, 4.2	14	15	15
		190	5.5	13	11	11
		528	14.7	-	-	15
		NT	4.5	-	-	11
		NT	<2.0	15	15	15
		NT	<2.0	15	15	15
		NT	<2.0	15	15	17
	34 seedlings					
	Eucalyptus marginata	180	10.0, 8.1, 4.5, 9.0	12	14	19
		177	23.5, 24.8	15	16	23
		186	13.0, 45.0	15	15	14
		191	28.0	19	20	20
		NT	<2.0	15	15	15
	30 seedlings					
	Banksia grandis	192	8.0	13	14	21
		193	8.3	13	14	19
		194	4.6, 2.7	12	15	20
		195	5.0, 5.7	16	15	19
		196	6.4	11	10	17
		197	6.7	14	14	19
		198	10.7, 12.0	12	12	17
		199	14.0	14	15	17
		200	12.6, 9.2	12	12	15
		NT	4.0	-	-	14
		NT	3.5	-	-	19
		NT	<2.0, <2.0, <2.0	-	-	21
		NT	<2.0, <2.0	-	-	19
	96 seedlings					
B	*Corymbia calophylla*	201	26.7	13	15	15
		202	20.4	11	11	13
		203	8.3	13	14	15
		NT	<2.0	15	15	19
		NT	<2.0	15	15	19
		NT	<2.0	15	15	19
		NT	<2.0	15	15	19

		204	5.8	13	14	15
		205	16.2	13	13	15
		NT	<2.0	12	12	15
	Banksia grandis	NT	5.0	15	15	21
		NT	<2.0	15	15	21
		NT	<2.0	15	15	21
		NT	<2.0	15	15	21
		206	9.4	14	14	15
	40 seedlings					
C	*Banksia grandis*	NT	<2.0	10	10	17
		NT	<2.0	13	13	21
		NT	<2.0	13	13	21
		NT	<2.0	13	13	21
		NT	<2.0	13	13	21
		210	5.0, 4.7, 3.2	9	11	11
	9 seedlings					
	Eucalyptus marginata	207	80.8	9	12	14
		NT	<2.0	15	15	15
	17 seedlings					
	Corymbia calophylla	208	27.0	11	14	11
		NT	<2.0	13	14	15
		NT	<2.0	13	14	15
		209	39.0	8	10	11
		NT	<2.0	12	12	15
	15 seedlings					
D	*Corymbia calophylla*	211	94.2	11	14	11
	Eucalyptus marginata	212	62.2	11	14	14
		213	45.1	10	10	6
		214	20.0	11	12	15
		529	40.7	-	-	14
		NT	<2.0	13	13	15
	Banksia grandis	215	13.8	12	13	17
		216	8.9, 3.8	12	13	19
		217	5.1	10	11	11
		NT	<2.0	13	13	17
		NT	3.0, <2.0, 3.7, 5.0	-	-	15
	46 seedlings					

1.2.2 Darradup Rd East

Plot	Species	Tag Number	DBH	Canopy condition		
				05	06	07/08
A	*Eucalyptus marginata*	287	28.0, 8.6	11	14	15
		288	7.7	13	14	21
		NT	3.0	13	15	23
		289	21.5, 21.5	14	14	13
		290	21.5	10	14	17
		291	29.7	14	14	15
		292	20.2	12	10	13
		293	36.0	13	14	14
	Banksia ilicifolia	294	13.4	12	13	18
B	*Eucalyptus marginata*	295	49.6	14	10	9
		296	5.2, 4.3	15	14	19
		297	26.8	15	15	15
		298	9.0	12	17	21
		299	8.0	14	17	20
		300	10.0	12	17	17
		301	5.4, 5.0	16	16	20
		302	5.1	11	14	19
		303	10.4	13	17	19
		NT	3.3	16	17	17
		304	6.7	10	15	17
		305	24.5	11	14	15
		306	6.1, 6.5, 6.7	10	17	15
		307	4.1	9	14	17
		308	28.0	13	18	21
		309	16.7, 5.3	14	9	19
		311	11.4	8	14	11
		312	16.5, 13.7, 3.2	13	9	14
		313	12.7	9	9	7
	Corymbia calophylla	310	52.0	15	14	13
C	*Eucalyptus marginata*	314	6.9	9	15	15
		315	7.7	8	15	19
		NT	<2.0	15	15	19
		NT	<2.0	15	15	19
		NT	<2.0	15	15	19
		NT	<2.0	15	15	19
		NT	<2.0	15	15	19
		NT	<2.0	15	15	19
		NT	<2.0	15	15	19
		NT	<2.0	15	15	19
		NT	<2.0	15	15	19
		NT	<2.0	15	15	19
		NT	<2.0	15	15	19
		NT	<2.0	15	15	17
		NT	<2.0	15	15	17
		317	45.8	16	11	15
		318	8.8	9	9	11
		319	17.8	13	16	21

		320	19.5	13	14	15
		321	14.0	13	14	19
		322	7.8	13	14	15
		323	4.1	10	10	15
		324	14.6	11	10	15
		325	8.5	10	10	15
		326	22.0	13	14	21
		327	24.5	13	18	19
		328	14.6	13	18	21
		329	33.8	13	14	19
		330	8.1	12	9	15
		331	5.1	9	9	13
		332	12.8	12	15	17
		370	23.5	14	9	11
		371	14.0	11	14	21
	Corymbia calophylla	316	7.4, 3.8, 14.0, 51.8	11	7	9
	Melaleuca preissiana	333	16.0, 58.8	13	10	11
D	*Corymbia calophylla*	334	10.0, 14.2	12	14	13
		340	33.0	14	13	14
		343	8.3	16	11	11
		345	17.0	13	11	11
		346	23.0	13	13	11
		349	5.6	11	11	11
		355	12.7	11	10	11
		358	11.6	13	13	13
		360	45.0	14	9	11
		364	41.5	14	14	13
		367	12.9	10	11	11
		369	30.0	12	14	10
		NT	<2.0	15	13	19
		NT	<2.0	15	13	19
		NT	<2.0	15	13	19
		NT	<2.0	15	13	19
		NT	<2.0	15	13	19
		NT	<2.0	15	13	19
		NT	<2.0	15	13	19
		NT	<2.0	15	13	19
		NT	<2.0	15	13	19
		NT	<2.0	15	13	19
		NT	<2.0	15	13	19
		378	5.5	13	10	11
		NT	<2.0	15	15	19
		NT	<2.0	15	15	19
		NT	<2.0	15	15	19
		NT	<2.0	15	15	19
		NT	<2.0	15	15	19
		NT	<2.0	15	15	19
		NT	<2.0	15	15	19
		NT	<2.0	15	15	19
		NT	<2.0	15	15	19
		NT	<2.0	15	15	19
		NT	<2.0	15	17	19

		NT	<2.0	15	17	19
		NT	<2.0	15	17	19
		NT	<2.0	15	17	19
		NT	<2.0	15	17	19
		NT	<2.0	15	17	19
		NT	<2.0	15	17	19
		NT	<2.0	15	17	19
		NT	<2.0	15	17	19
		NT	<2.0	15	15	19
		NT	<2.0	15	15	19
		NT	<2.0	15	15	19
		NT	<2.0	15	15	19
	Eucalyptus marginata	335	11.8	12	14	15
		336	32.1	12	14	15
		337	9.4	13	16	21
		338	7.5	9	13	15
		339	7.2	9	13	16
		341	9.5, 5.1	13	16	17
		342	10.5	13	14	19
		344	41.0	14	9	8
		347	9.4	14	9	11
		348	10.7	13	13	13
		350	9.6	13	14	19
		351	11.0	13	14	19
		352	9.9	12	15	16
		353	5.4	10	7	6
		354	19.3	14	16	18
		356	7.4	9	12	15
		357	11.0	12	15	11
		359	15.2	13	16	17
		361	37.0	13	9	19
		362	28.2	14	12	19
		363	30.3	12	14	19
		365	9.1	13	14	19
		366	6.4	11	13	13
		368	24.0	13	12	15
		372	14.7	14	12	13
		373	8.7	12	13	17
		374	7.2	11	13	13
		375	6.0	10	11	11
		376	13.0	14	16	19
		377	6.5	10	14	17
		527	16.5	-	-	17
		NT	<2.0	15	13	19
		NT	<2.0	15	13	19
		NT	<2.0	15	13	19
		NT	<2.0	15	13	19
		NT	<2.0	15	17	19
		NT	<2.0	15	17	19
		NT	<2.0	15	17	19
		NT	<2.0	15	17	19
		NT	<2.0	15	15	19
		NT	<2.0	15	15	19

		NT	<2.0	15	15	19
		NT	<2.0	15	15	19
		NT	<2.0	15	15	19

1.2.3 Poison Gully

Plot	Species	Tag Number	DBH	Canopy condition		
				05	06	07/08
A	*Eucalyptus marginata*	383	11.0, 9.8, 7.3	12	15	13
		384	12.6, 9.0	12	13	15
		385	36.2	16	16	18
		386	3.8, 10.0, 6.1	12	11	15
		387A	19.2	12	13	9
		388	5.0	13	17	16
		389	<2.0, <2.0, <2.0, <2.0	9	11	4
		390	17.7, 9.8, 17.0, 19.0, 9.6, 18.1, 15.0, 18.9, 9.5, 10.5	16	18	9
	2 saplings 2 seedlings					
B	*Eucalyptus marginata*	391	10.0, 9.0	13	14	14
		393	5.7, <2.0	15	14	11
		395	8.7	11	17	10
		396	17.6, 15.2, <2.0, 10.0, 6.1 11.3, 16.0	13	14	18
		397	40.6	15	13	16
		399	29.5	15	13	11
		401	63.3	15	9	9
	3 saplings 12 seedlings					
	Corymbia calophylla	392	27.9	14	7	11
		402	23.0	15	14	9
	Banksia grandis	394	11.7	16	17	20
		398	3.8	17	18	20
		NT	2, <2, <2	-	-	20
	3 seedlings					
	Banksia attenuata	403	11.1	13	18	20
C	*Eucalyptus marginata*	404	40.0	11	10	16
		405	21.7	12	14	11
		406	21.5	13	14	14
		NT	<2.0	12	9	19
		408	18.1, 6.8, 6.9	11	12	18
		410	17.1	12	14	18
		411	81.0	14	14	10
		NT	<2.0	14	14	14
		413	17.6, 3.4	14	16	12
		414	8.7, 7.9	14	14	14
		415	16.4, <2.0, 10.7	15	15	16
		418	30.0, 6.3, 10.5	16	14	13
		420	7.5	13	17	17
	7 saplings 18 seedlings					
	Corymbia	412	60.0	13	14	11

	calophylla					
		419	24.0	15	14	14
	Banksia attenuata	NT	<2.0, <2.0	15	15	23
		407	3.3	16	18	21
		NT	<2.0	15	15	15
		NT	<2.0	15	15	16
		NT	<2.0	16	16	15
		NT	<2.0	16	16	16
		421	6.0	16	18	21
		422	2.3	16	15	20
	Banksia grandis	NT	<2.0	15	15	21
		409	2.6, <2.0, <2.0	10	17	21
		NT	<2.0	13	13	21
		NT	<2.0	13	13	21
		NT	<2.0	13	13	21
		NT	<2.0	13	13	21
		NT	<2.0	12	12	21
		NT	<2.0	12	12	18
		NT	<2.0	12	12	21
		NT	<2.0	12	12	21
		416	8.8, 4.6, 3.0, <2.0	15	17	20
		417	6.4, 5.9	15	15	21
D	*Corymbia calophylla*	423	24.7, 8.4	15	16	12
		424	21.7	13	14	9
		444	17.9, 14.4	14	16	9
	Eucalyptus marginata	426	61.5	17	16	14
		NT	<2.0	12	12	17
		433	17.2, 21.4, 13.0	14	18	19
		NT	<2.0	12	12	15
		435	29.1	14	18	18
		NT	<2.0	12	12	17
		NT	<2.0	12	12	17
		437	10.1, 12.0	13	17	21
		440	10.0, 13.7	12	15	9
		441	6.6, 8.8	10	10	6
		442	9.0, 6.7	10	10	11
		445	11.2	12	17	21
		446	15.2, 12.7, 6.8, 11.9	14	14	15
		447	8.3, <2.0	12	15	17
		448	17.0, 7.7	14	17	16
		NT	<2.0	13	13	21
		NT	<2.0	13	13	21
		NT	<2.0	13	13	21
	8 saplings 20 seedlings					
	Banksia attenuata	429	9.3	15	17	23
		430	22.5	15	17	21
		431	14.1, 5.5, 5.5, 3.0	16	17	19
		NT	<2.0	12	12	23
		NT	<2.0	12	12	21
		387B	11.8, 6.9	-	-	21
	Banksia grandis	425	4.6	13	17	18

		427	5.6	14	17	19
		NT	<2.0	13	13	21
		428	8.0, 5.1	14	17	18
		432	6.9	13	17	23
		434	7.2	10	17	21
		436	8.2	12	17	21
		438	4.8, 5.0, 7.4	13	15	19
		439	3.7, 2.8	12	13	19
		443	6.0, 4.0	14	18	21
		NT	<2.0	8	11	19
		NT	<2.0	12	15	21
	15 seedlings					

1.2.4 Stewart Rd

Plot	Species	Tag Number	DBH	Canopy condition		
				05	06	07/08
A	*Corymbia calophylla*	NT	6.2	13	17	17
		102	11.5	12	19	13
		402	5.7	10	13	12
		401	6.4	11	17	14
		403	5.4	12	15	13
		396	5.3	9	15	15
		410	9.7	12	17	19
		109	11.5	12	17	20
		NT	7.8	10	17	18
		NT	11.8	10	19	16
		409	3.4	7	11	9
		405	6.9	10	16	17
		965	18.4	12	16	9
		128	17.5, 9	14	20	13
		394	9.7	14	19	17
		132	11.8	14	13	17
		393	7.7	14	14	17
		133	11.1	15	20	18
		122	17.3	16	15	13
		399	8.3	11	17	15
		389	7.5	13	13	19
		406	5.8	-	15	15
		416	6.9	-	16	13
		420	6.9	-	15	15
		392	10.4	-	-	17
	66 seedlings/ saplings	NT	<2			
	Eucalyptus marginata	956	10.2, 13.7	14	21	21
		957	17.8	14	21	21
		101	9.8	13	19	18
		113	10.9	11	15	21
		958	15.7	14	17	17
		959	17.0	13	17	20
		398	7.6	10	16	17
		108	16.7	11	19	20
		404	8	10	15	17
		411	7.3	9	17	17
		960	17.3	16	19	20
		388	6.5	10	17	11
		105	13.6, 6.7	15	19	20
		395	8.2	9	16	15
		115	14.5, 17.1, 10.7	11	19	19
		103	11.1	12	17	20
		961	40.2	13	16	8
		112	12.8	11	19	21
		113	10	10	12	12
		NT	8.7	11	18	18
		412	17.2	-	-	13
		400	5, 7.6	-	-	9

		390	13.7	-	-	20
		962	25.8	14	19	21
		NT	8.9	7	12	12
		963	17.4	12	15	17
		422	5.5	6	13	7
		423	9.3	7	14	9
		117	13.2	10	16	16
		419	8.5	9	18	6
		415	3.6	11	17	17
		964	17.3	13	17	16
		130	14.9	13	17	17
		NT	3.2	12	16	13
		136	15.5	13	19	19
		966	20.5	14	15	18
		969	18.0	12	17	19
		125	4.8, 4.4	9	16	15
		121	12	11	15	15
		126	15.0	12	17	19
		107	21.5, 10.5	13	20	17
		NT	9.7	13	17	17
		391	10.0	12	19	16
		106	19.7	15	19	11
		131	13.5	12	19	17
		NT	9.3	12	16	16
		421	9.7	13	18	14
		104	11.5	13	15	9
		119	11.2	13	15	14
		124	12.8	13	16	15
		123	11.8, 11	14	15	19
		417	5.9	11	12	9
		117	10.5	13	16	15
		110	16.9	15	20	20
		111	24.1	15	20	23
		397	8.6	10	12	15
		418	8.3	12	14	11
		129	10.3	12	19	12
		120	12.4, 11.2	11	18	17
		414	7.5	12	18	19
		127	11.5	14	16	14
		134	14.5	14	17	17
		413	6.9	13	18	17
		135	14	10	16	10
		118	10.0	12	17	17
		NT	3.5	10	17	17
		968	25.5, 7.8	13	20	20
		967	9.2, 3.6, 10.4, 48.0	16	18	18
		137	11.5, 15.1	15	18	20
	54 seedlings/ saplings	NT	<2			
B	*Corymbia calophylla*	428	7.3	10	16	15
		427	7.4	10	15	15
		NT	3.2	11	16	16
		523	6.5	10	17	9

		426	6.5	7	14	9
		425	7.5	10	17	11
		NT	7.0	10	16	16
		154	13.2	15	18	15
		158	13.5	11	16	19
		516	6.8	11	18	17
		518	6.8	11	18	11
		424	8.8	11	17	11
		434	7.1	13	14	15
		167	10.1	13	17	17
		432	7.2	12	15	15
		159	11.7	12	17	13
		975	19.4	13	19	17
		NT	4.3, 3.0, 7.2	14	18	17
		433	7.8	11	19	15
		519	11.3	13	17	13
		450	8.9	14	15	10
		513	7.0	13	14	14
		139	11.8	15	14	13
		154	12.2	15	17	15
		155	18.5	13	18	11
		147	15.1	15	18	13
		151	10.3	12	16	9
		440	6.0	13	18	11
		163	21.5	15	15	15
		453	7.3	14	16	15
		168	10.0	13	19	19
		514	6.0	15	17	14
	56 seedlings/ saplings	NT	<2			
	Eucalyptus marginata	NT	7.4, 6.1	10	14	14
		970	17.8	14	18	17
		436	7.7	11	16	15
		971	45.0	14	20	15
		972	21.7	15	19	15
		449	6.7	11	16	15
		160	20.5	14	20	17
		973	26.0, 15.8	18	18	16
		448	8.2	13	16	17
		431	7.2	10	16	11
		148	26.8, 24.2	15	17	10
		149	12.5	13	14	5
		974	8.6, 36.5, 16.0, 6.8	17	18	16
		152	10.0	12	16	11
		161	12.9	12	18	17
		162	12.8	13	19	17
		150	8.2	14	16	15
		143	11.0	13	16	15
		144	15.3			15
		165	18.6	14	19	16
		976	8.3, 28.0, 5.3	15	16	9
		520	22.9	16	19	21
		435	7.0	13	18	9

		NT	21.6	dead	dead	dead
		521	4.9	15	17	11
		142	15.5	15	19	16
		NT	6.1	13	17	15
		429	7.3	13	16	15
		428	7.2	14	16	15
		438	3.7	14	18	15
		153	6.8	13	18	13
		439	5.8	14	18	13
		430	6.0	16	17	13
		NT	4.3	16	18	17
		146	17.6	15	17	16
		452	7.6	16	16	23
		164	11.4	15	17	15
		155	14.3	15	18	15
		166	11.7	12	18	
		977	17.0	15	19	16
		157	15.3	13	20	13
		141	18.8	16	21	21
		140	12.7	13	17	17
		145	12.4	13	17	15
		437	7.7	15	18	17
		978	18.0	15	18	15
		517	9	14	17	15
		152	13.5	14	16	9
		979	14.4	14	18	13
		169	8.5, 9.4, 5.6	15	18	19
		138	12.4	14	17	13
	79 seedlings/ saplings	NT	<2			
C	*Corymbia calophylla*	480	6.8	11	16	11
		NT	4.5	3	dead	dead
		189	10.0	11	17	17
		NT	6.0	11	16	
		458	9.0	13	18	17
		454	6.5	13	17	15
		174	16.3	13	17	15
		478	8.6	13	18	7
		463	9.7	14	19	13
		461	9.3	11	17	15
		462	9.5	15	18	9
		455	9.5	13	19	13
		445	6.2, 5.7	12	17	11
		983	32.5	16	18	10
		196	12..2	13	18	13
		172	12.0	15	18	17
		194	10.3	12	17	17
		477	11.7	12	18	19
		476	13.2	14	17	17
		188	14	14	17	13
		481	6, 6	12	15	12
		457	6.7	11	14	11
		479	9.3	13	16	9

		455	8.5	13	16	15
		442	7.3	12	15	15
		197	10.0	15	17	15
		511	7.0	13	17	11
		191	15.1	12	20	15
		173	111	14	17	13
		195	10.9	12	17	11
		451	7.9	11	13	17
		465	7.6	11	14	17
		987	16.5	15	17	19
		472	7.5	17	15	13
		988	20.2	15	17	11
		192	14.2	14	16	13
		460	6.8	13	15	12
		475	9.7	13	18	12
		474	7.5	14	17	13
		468	6.8	13	17	15
		466	8.0	9	13	15
	27 seedlings/ saplings	NT	<2			
	Eucalyptus marginata	980	19.5, 10.2	17	20	19
		193	14.4	13	12	4
		171	16.1	11	19	17
		981	35.0	15	20	13
		512	7	13	18	11
		198	9.4, 10.5	15	18	15
		982	27.8	17	19	8
		199	21.5	16	21	21
		200	12.9	14	17	15
		170	18.5			15
		984	18.8	16	17	16
		985	23.6	16	20	11
		464	8.1	13	17	15
		986	37.7	10	16	15
		176	10	12	17	15
		441	7.3	14	17	21
		175	28.8		18	17
		190	12.7	11	16	15
		444	9.1	14	19	17
		443	6.1	15	18	17
		NT	5.4	7	12	
		NT	4.0	9	13	
		447	7.3	12	17	11
		467	11	13	17	11
		469	3.8	15	16	13
		187	7.5, 11.2	15	17	18
		471	5.3	12	18	10
		470	9.8	15	19	16
		473	7.7, 3.3	15	17	17
		459	6.9	13	16	17
		989	42.5	17	21	16
	73 seedlings/ saplings	NT	<2			

D	*Corymbia calophylla*	NT	5.5	3	dead	dead
		485	9.2	14	16	15
		500	7.2	12	17	15
		484	7.5	11	15	13
		490	9.0	12	17	13
		990	23.3	14	17	7
		489	7.3	10	16	13
		177	10.1	10	16	15
		991	29.7	14	17	9
		492	6.4	13	18	15
		216	10.5	14	17	9
		NT	3.2	12	16	16
		213	11.9	13	19	18
		488	8	13	16	13
		181	15, 8.7	16	18	13
		487	7.5	14	16	13
		491	5.2	12	15	16
		220	22.3	12	17	9
		180	12.1	13	16	17
		182	11.5	10	16	17
		230	11.7	13	17	13
		222	15.2	11	18	15
		219	20.1	11	16	11
		483	8.8	13	16	15
		217	10.2	11	16	13
		202	13.2, 5.0	11	15	11
		501	7.2	10	14	13
		504	7.5	13	18	15
		510	8	12	18	3
		498	10	11	16	11
		185	15.2	12	17	15
		995	29.0	13	19	13
		179	13.2	10	17	15
		204	18.5	-	17	13
		205	11.3	12	17	13
		497	9.5	13	-	17
		210	15.7	14	17	13
		506	6.6	11	14	13
		229	10.5	12	14	9
		223	13.0	14	17	19
		209	11.3	14	17	15
		207	14.8	11	19	11
		211	20.8	-	16	11
		499	6.9	11	15	15
		231	14	12	15	19
		494	7.7	11	17	13
		505	8.0	10	13	15
		NT	3.4	12	18	17
		226	12.2	14	18	17
		1000	49.7	12	19	10
		502	6.8	12	15	13
	63 seedlings/ saplings	NT	<2			

	Eucalyptus marginata	503	6.5	14	16	15
		201	12.1	14	17	15
		178	20.5	13	18	16
		493	9.3	13	17	9
		NT	10.0	12	16	16
		NT	5.5	10	14	15
		486	7.8	14	15	19
		215	14.0	15	18	15
		214	14.6	15	17	15
		NT	6.2	15	17	14
		992	25.3	14	17	13
		496	8.7	14	18	17
		206	22	13	19	15
		NT	6.2	13	17	16
		218	19.2	12	17	9
		223	24.0	15	19	19
		203	12.7	13	18	19
		224	11.0	10	18	19
		221	12.7	12	17	13
		NT	3.4	14	18	14
		208	15.7	12	16	8
		NT	5.8	13	17	13
		NT	6.8	14	18	14
		NT	8.5	14	18	15
		NT	6.1	11	15	13
		993	20.8	11	15	15
		NT	5.8	11	15	13
		NT	6.0, 4.3, 5.3	11	15	14
		186	9.8, 10.0, 10.7, 13.3	12	19	12
		NT	5.1	7	13	12
		184	16.8	11	17	15
		183	8.3, 15.4	14	16	17
		212	21.8	12	19	21
		996	25.4	16	18	14
		997	51.8	14	20	15
		227	12.5	12	18	8
		NT	8.0	11	17	15
		225	15.8	11	17	17
		482	6.7	11	17	17
		998	37.7	13	14	dead
		228	44.0	12	12	11
		999	46.4	16	20	13
	38 seedlings/ saplings	NT	<2			

1.2.5 Scott Rd

Plot	Species	Tag Number	DBH	Canopy condition		
				05	06	07/08
A	*Corymbia calophylla*	474	95.2	12	13	10
		475	15.3	10	12	13
		477	120.0	20	20	17
		478	55.8	19	19	19
		479	30.3	15	16	13
		480	5.0, 6.3	15	15	13
		482	26.7	14	14	12
		483	3.8	10	11	9
		484	8.9	11	11	13
		485	8.8	10	10	13
		NT	2.5	14	14	11
		NT	<2.0	14	15	11
		NT	<2.0	14	14	15
	Eucalyptus marginata	476	45.6	17	16	11
		481	40.2	12	12	16
B	*Eucalyptus marginata*	486	19.9, 7	7	7	8
		487	7	14	14	17
		488	53.2	13	14	13
		490	18.1	13	11	11
		525	29.5			17
		526	8.2, 6.5			21
		491	10	15	15	18
		492	2.2, <2.0	15	15	16
		493	9.5	15	15	21
		494	3.7	15	15	19
		495	5.5	15	15	16
		NT	<2.0	15	14	16
		497	15	15	15	21
		498	21.5	13	14	13
		500	33.4	8	8	9
		501	21.1	5	8	16
		502	18.2, 31.8, <2.0	12	12	13
	Corymbia calophylla	489	3.2, <2.0	14	15	15
		496	72.2	13	15	9
		524	34.4			11
		499	30.6	13	15	9
C	*Corymbia calophylla*	503	9.5	9	10	9
		504	14.2	9	9	6
		505	21	12	12	8
		506	12.1	11	13	13
		508	46.5	14	14	5
		509	3	11	11	17
		NT	2.6	14	15	17
	Eucalyptus	507	46.5	11	14	11

	marginata					
		NT	<2, <2	-	-	15
	Melaleuca preissiana	510	25.2, 61.2, 43.6	13	13	10
		511	6.0	8	8	13
		NT	<2.0	10	10	15
		NT	<2.0	10	10	21
D	*Eucalyptus marginata*	512	64.1, 70	19	19	13
		513	9.5, 10, 11, 7.5	19	19	21
		519	26.8	17	17	18
		520	40.5	17	19	18
		NT	<2	-	-	15
		NT	<2	-	-	21
	Corymbia calophylla	514	46.7	19	19	9
	Melaleuca preissiana	515	12.8	10	10	9
		516	7.6	5	3	3
		517	5	10	10	11
		518	8	9	10	11

1.3 Eastern Scott Coastal Plain sites

1.3.1 Reedia South

Plot	Species	Tag Number	DBH	Canopy condition		
				07/08		
A	*Eucalyptus marginata*	542	8.1, 5.4	19		
		538	8.2	19		
		543	16.2	21		
		544	12.5	20		
		545	7.6	21		
		546	8.4	21		
		552	12.4	18		
		551	6.8	13		
		550	7.8	11		
		549	5.0	15		
		548	7.6	21		
		553	5.9	15		
		554	20.3, 15.5	11		
		555	14.4, 102.0	11		
		561	8.4, 8.4	13		
		560	9.8	12		
		562	<2, <2, <2	19		
	59 seedlings 4 saplings					
	Corymbia calophylla	547	6.0	17		
	11 seedlings					
	Eucalyptus megacarpa	556	46.4	17		
		557	40.5	21		
		558	42.7	11		
		559	39.7	17		
	4 seedlings					
B	*Eucalyptus marginata*	563	18.6	7		
		564	9.6	13		
	22 seedlings 1 sapling					
	Eucalyptus megacarpa	NT	3.1	17		
		NT	<2	15		
		NT	<2	15		
		NT	<2	15		
		565	9.4	15		
		566	3, 38.4, 8.8	19		
	6 seedlings 2 saplings					
	C.calophylla 8 seedlings					
C	No trees					
D	*Eucalyptus megacarpa*	567	16.8, 2.3, 6.4	16		

		568	3.2	19		
	2 seedlings					

1.3.2 Reedia North

Plot	Species	Tag Number	DBH	Canopy condition		
				07/08		
A	*Eucalyptus marginata*	530	60.7	9		
		531	102.0	10		
		532	36.0	4		
		533	47.4	9		
		534	9.8	14		
		NT	<2	13		
		NT	<2	11		
		NT	<2	13		
		NT	<2	13		
	13 seedlings					
	Banksia littoralis	NT		23		
	C. calophylla 8 seedlings					
B	*Corymbia calophylla*	NT	2.3, <2	21		
		NT	1.9, <2	23		
	2 seedlings 1 sapling					
C	*Eucalyptus marginata*	NT	<2	13		
	C.calophylla 6 seedlings					
D	*Eucalyptus marginata*	535	35.6	9		
		536	68.7	6		
		NT	<2	13		
		NT	<2	13		
		537	7.8, 9.1, 11.2	12		
		540	23.3, 39.6	15		
	76 seedlings 8 saplings					
	Corymbia calophylla	539	41.4	15		
		540	68.0	7		
	19 seedlings					

1.3.3 Dennis Rd (Scott Nth)

Plot	Species	Tag Number	DBH	Canopy condition		
				07/08		
A	*Corymbia calophylla*	569	6, 5.1, 3.8	21		
		NT	<2	17		
		NT	<2	15		
		NT	<2	15		
		NT	<2	15		
		570	7.3	21		
		571	7.5	21		
	16 seedlings 2 saplings					
	Melaleuca preissiana	572	35.4, 31.0	19		
	Banksia littoralis	NT	<2	23		
B	*Melaleuca preissiana*	573	17.5, 11.1, 16.4, 22.3, 18.9, 16.0	17		
	Banksia littoralis	574	10.6	23		
C	*Melaleuca preissiana*	575	11.8, 7.5, 8.1, 13.7, 11.8, 10.2, 10.5	15		
D	*Melaleuca preissiana*	576	18.5, 5.5, 21.8, 11.5, 3.7, 4.6	21		
		NT	<2	23		
		NT	<2	23		
	Banksia littoralis	NT	<2	23		

1.3.4 Scott River Rd (Scott Sth)

Plot	Species	Tag Number	DBH	Canopy condition		
				07/08		
A	*Eucalyptus marginata*	577	20.1, 15.5	17		
		581	11.1, 11.8	19		
		582	9.9	19		
		583	9.7	15		
		584	6.6	10		
		585	31.0	15		
		586	32.5, 13.4, 15.2	17		
		593	12.6, 9.9	20		
	Melaleuca preissiana	578	14.1	13		
		579	14.0	15		
		580	9.5	17		
		594	9.8, 7.8, 10.2, 3.0, <2, <2, <2, 5.6, 7.6, 6.8, 6.2, <2, 3.5, 3.3, 4.2, 3.4, 3.3, <2, 4.6, <2, 7.0	21		
B	*Eucalyptus marginata*	587	13.0	5		
		588	11.7	12		
		592	14.0	17		
		596	7.3, 4.0	19		
	11 seedlings 1 sapling					
	Corymbia calophylla	589	17.6	7		
		590	10.0	7		
		591	7.2	7		
	Melaleuca preissiana	595	21.0, 20.0, 15.3, 16.5, 4.7, 19.0, 18.8, 18.6, 11.0, 13.7, 9.4	18		
C	No trees					
D	*Melaleuca preissiana*	597	19.5, 15.0, 14.9, 22.1, 12.0, 6.8, 11.0, 17.0, 10.0, 7.1, 7.8, 10.2, 5.7, 7.5, 13.3, 27.5, 14.3, 28.4, 14.8, 6.5, 10.0, 8.3, 9.7, 14.0, 15.2, 18.0, 9.7, 10.0, 5.7	19		

1.3.5 Adelaide Rd (Upper Margaret)

Plot	Species	Tag Number	DBH	Canopy condition		
				07/08		
A	*Corymbia calophylla*	598	16.7	13		
		599	27.1	15		
		NT	<2, <2, <2, <2, <2	21		
	16 seedlings 4 saplings					
	Melaleuca preissiana	600	21.8, 9.0, 4.9, 6.8, 5.2, 3.0, 3.0, 3.0	19		
		958	9.9, 6.0	15		
		959	9.3	13		
		NT	<2, <2, <2, <2	13		
		960	12.0, 8.8	13		
		961	10.5	13		
		NT	2.2	13		
		962	13.6, 9.7	15		
		963	28.9, 12.4, 4.4, 6.1, 2.4, 3.0, 4.1, 6.7	19		
B	*Melaleuca preissiana*	964	45.8, 26.5	17		
		965	10.0, 6.0, 3.4	13		
		NT	<2, <2, <2	15		
	2 saplings					
	Eucalyptus marginata 4 saplings					
C	*Melaleuca preissiana*	966	7.5, 2.8, 4.1, 7.4, 15.5, 16.2, 7.8, 3.0, <2, <2, 6.5, 5.0	15		
		NT	<2, <2	13		
		967	12.6, 5.3, 6.6, 10.6, 14.3	15		
		968	25.0	15		
D	*Melaleuca preissiana*	969	13.2	17		
		970	9.5	17		

Appendix 2: Field data – cover and abundance of species in sub-plots.

2.1 Wetlands

2.1.1 Lake Jasper

Species	Cover and abundance							
	A1	A2	B1	B2	C1	C2	D1	D2
Banksia littoralis	6	-	3	-	6	4	2	-
Agonis flexuosa	2	-	6	-	5	3	3	2
Xanthorrhoea preissii	1	-	4	-	-	4	-	2
Xanthorrhoea brunonis	1	-	3	-	3	4	4	-
Lepidosperma gladiatum	5	4	-	4	-	3	-	-
Senecio ramossissmus	1	-	-	-	-	-	-	-
Anigozanthos flavidus	3	2	-	4	-	4	-	-
Callistachys lanceolata	2	4	2	6	-	6	-	-
Lobelia tenuior	-	-	-	-	-	-	-	-
Muehlenbecka adpressa	2	1	-	2	-	1	-	-
*Chenopodium album**	-	-	-	-	-	-	-	-
Sp. 128	-	-	-	-	-	-	-	-
Lepidosperma longitudinale	1	3	1	2	2	1	2	-
Sp. 131 Poaceae sp.	-	-	-	-	-	-	-	-
Thomasia foliosa	4	-	2	-	-	-	-	-
*Conyza bonariensis**	1	-	-	-	-	-	-	-
Isolepis cernua	-	-	1	-	-	-	-	-
Opercularia hispidula	-	-	-	-	-	-	-	-
Sp. 136*	-	-	-	-	-	-	-	-
Stackhousia monogyna	3	3	3	4	10	1	4	3
Hardenbergia comptoneana	-	-	-	-	-	-	-	-
Villarsia parnissifolia	-	-	-	-	-	-	-	-
Trachymene pilosa	-	-	-	-	-	-	-	-
Sp. 142 Restionaceae sp.	-	3	-	-	-	-	-	-
Taxandria inundata	-	8	-	-	1	-	8	10
*Hypochaeris glabra**	-	-	-	-	-	-	-	-
Macrozamia reidlei	-	-	4	-	-	-	-	3
Sp. 148	-	-	-	-	-	-	-	-
Hibbertia cunninghamii	-	-	-	-	-	-	-	-
Austostipa compressa	-	-	-	-	-	-	-	-
Mitrasacme paradoxa	-	-	2	-	-	-	-	-
Scaevola calliptera	-	-	1	-	-	-	-	-
Acacia pulchella	-	-	6	-	8	6	4	4
Sp. 153 *Drosera* sp.	-	-	-	-	-	-	-	-
Drosera menziesii	-	-	-	-	-	-	-	-
Comesperma confertum	-	-	-	-	-	-	-	-
Hypolaena pubescens	-	-	-	-	-	-	2	-
Tripterococcus brunonis	-	-	-	-	-	-	-	-
Velleia trinervis	-	-	-	-	-	-	1	-
Pteridium esculatum	-	-	-	-	-	-	3	4
Chorizndra cymbaria	-	-	-	-	-	-	-	-
Pultenaea reticulata	-	-	-	-	-	-	9	3
Thysanotus multiflorus	-	-	-	-	-	-	-	-
Anarthria scabra	-	-	-	-	-	-	-	2
Stylidium sp. 1	-	-	-	-	-	-	-	1
Hibbertia cunneformis	-	2	-	-	-	-	-	-
Sollya heterophylla	-	-	-	1	-	-	-	-

2.1.2 Lake Jasper – east

Species	Cover and abundance							
	A1	A2	B1	B2	C1	C2	D1	D2
Taxandria inundata	4	-	3	-	2	-	-	-
Anigozanthos flavida	3	-	2	-	-	-	-	-
Baumea articulata	6	8	-	2	-	-	-	-
Callistachys lanceolata	1	-	1	2	2	-	-	-
Muehlenbecka adpressa	-	-	1	1	-	-	-	-
Baumea juncea	5	8	2	5	-	-	-	-
Villarsia parnissifolia	2	-	1	3	-	-	-	-
Melaleuca preissiana	-	-	-	6	-	-	-	-
Sp 217	-	-	-	-	-	-	-	-
Pteridium esculatum	-	-	7	-	2	6	2	-
Tripterococcus brunonis	-	-	1	-	-	-	-	-
Macrozamia reidlei	-	-	5	-	3	3	6	3
Senecio ramossissmus	-	-	2	-	-	-	-	-
Opercularia hispidula	-	-	2	-	-	-	-	-
Acacia rostellifera	-	-	2	-	-	5	-	-
Hibbertia cunninghamii	-	-	1	-	-	-	-	-
Stackhousia monogyna	-	-	3	-	4	4	3	2
Xanthorrhoea preissii	-	-	4	-	5	6	5	3
Xanthorrhoea brunonis	-	-	-	-	-	-	-	-
Sp 129 Asteraceae sp.	-	-	-	-	-	-	-	-
Eucalyptus megacarpa	-	-	3	-	-	3	-	-
Stylidium amoenum	-	-	-	-	-	-	-	-
Sp 131 Poaceae sp.	-	-	-	-	-	-	-	2
Hardenbergia comptoneana	-	-	-	-	-	1	1	-
Hypolaena exculsa	-	-	-	-	2	3	2	2
Dampiera linearis	-	-	-	-	1	-	1	-
Anarthria prolifera	-	-	-	-	1	-	3	-
Sp 37 *Leucopogon sp.*	-	-	-	-	-	2	-	-
Sp 182 Rubiaceae sp.*	-	-	-	-	-	-	-	-
Isolepis cernua	-	-	-	-	-	-	-	-
Stylidium diversifolia	-	-	-	-	-	-	-	-
Sp 227	-	-	-	-	-	-	-	-
Mitrasacme paradoxa	-	-	-	-	-	-	-	1
Hypolaena pubescens	-	-	-	-	-	-	2	1
Banksia attenuata	-	-	-	-	-	-	1	-
Comesperma confertum	-	-	-	-	-	-	-	-
Pultenaea drummondii	-	-	1	-	3	3	2	1
Gompholobium tomentosum	-	-	-	-	-	-	-	-
Sp 228 Epacridaceae sp.	-	-	-	-	-	-	-	2
Kunzea sp.	-	-	-	-	-	-	-	1
Acacia cyclops	-	-	-	-	5	2	3	3
Acacia operculana lispidula	-	-	2	-	-	-	-	-

2.1.3 Pneumonia Rd

Species	Cover and abundance							
	A1	A2	B1	B2	C1	C2	D1	D2
Eucalyptus marginata	2	-	-	-	-	-	-	-
Pericalymma ellipticum	3	3	3	2	4	4	8	8
Xanthorrhoea preissii	3	2	2	2	3	1	-	-
Xanthorrhoea brunonis	3	2	2	3	-	-	-	1
Melaleuca preissiana	6	5	-	-	-	2	-	-
Dampiera trigona	1	-	1	2	1	1	-	1
Acacia myrtifolia	4	3	2	3	-	4	-	3
Sp 249 *Acacia* sp.	-	-	-	-	-	-	-	-
Desmocladus castanues	4	6	-	4	-	5	-	2
Scaevola calliptera	2	-	-	-	-	1	-	-
Dampiera linearis	-	2	-	-	-	-	-	-
Xanthosia huegelii	-	1	-	-	-	-	-	-
Sp 265 *Drosera* sp.	-	-	-	-	-	-	-	-
Conostylis laxiflora	2	1	-	-	-	1	-	1
Lyginia barbata	4	4	-	2	-	-	-	-
Thysanotus dichotomus	-	1	-	-	-	-	-	-
Leschenaultia biloba	-	-	-	-	-	-	-	-
Hibbertia stellaris	-	-	-	-	-	1	-	-
Agrostocrinum stypandroides	-	-	-	-	-	-	-	-
Sp 261 Restionaceae sp.	5	2	-	4	-	3	-	4
Lomandra purpurea	-	-	-	-	-	-	-	-
Sp 255 Restionaceae sp.	5	4	3	-	4	-	-	4
Platyscae filiformis	-	-	-	-	-	-	-	-
Dasypogon bromeliifolius	3	4	-	2	-	-	-	4
Pimelea lanata	-	-	-	1	-	3	-	-
Adenanthos obovatus	-	1	-	-	-	-	-	-
*Polypogon monspeliensis**	-	2	-	-	-	2	-	-
Taxandria parviceps	-	6	-	-	-	-	-	-
Hypolaena pubescens	-	1	-	-	2	3	-	-
Anigozanthos flavida	-	1	-	-	-	-	-	-
Xyris roycei	2	-	2	2	2	1	3	2
Mesomelaena tetragona	-	-	4	6	2	-	-	-
Tremandra diffusa	-	-	-	1	-	-	-	-
Diaspasis filifolia	-	-	1	1	-	-	2	3
Amphipogon turbinatus	-	2	2	-	-	-	2	2
Comesperma confertum	-	-	1	-	-	-	-	1
Hakea ceratophylla	-	-	5	-	3	-	3	1
Hakea linearis	-	-	2	2	2	1	1	2
Banksia littoralis	-	-	2	-	-	-	-	-
Taxandria linearifolia	-	-	4	7	5	7	-	2
Sphaerolobium fornicatum	1	4	3	3	2	4	-	3
Melaleuca basicephala (P4)	-	-	1	-	2	-	1	-
Pattersonia occidentalis	2	2	-	-	-	1	1	-
Cassytha racemosa	-	-	-	-	-	-	-	-
Villarsia parnasifolia	1	-	-	1	-	-	-	-
Hibbertia cunninghamii	-	-	1	1	-	-	-	2
Sp 252 Restionaceae sp.	-	-	-	-	2	4	2	2
Cythochaeta avenacea	-	1	-	-	-	-	-	-

Meeboldinia scarious	-	-	-	-	2	-	2	-
Conospermum capitatum	-	-	-	1	-	-	-	-
Eutaxia virgata	-	-	-	-	1	1	2	2
Pimelea spectabilis	-	-	1	-	3	2	3	3
Sp 55 Restionaceae sp.	-	-	4	1	3	-	5	3
Sp 264	3	5	1	3	-	3	-	-
Chordifex amblycoleus	-	-	3	-	2	-	3	1
Nuytsia floribunda	-	-	-	-	-	-	-	2
Hakea sulcata	-	-	-	-	1	-	-	-
Pentapeltis peltigera	-	-	-	-	-	-	-	-
Platychorda applanata	-	-	-	-	-	-	-	2

2.1.4 Blackpoint/ Fouracres Rd

Species	Cover and abundance							
	A1	A2	B1	B2	C1	C2	D1	D2
Taxandria parviceps	4	5	5	4	2	-	3	4
Pericalymma ellipticum	3	2	4	4	5	8	5	5
Anarthria scabra	4	8	-	-	3	-	-	-
Stylidium scandens	1	1	-	-	-	-	-	-
Lindsaea linearis	2	2	-	-	-	-	-	-
Mesomelaena tetragona	4	3	4	4	-	4	1	3
Eucalyptus marginata	1	5	-	-	2	-	-	-
Adenanthos obovatus	1	1	1	1	2	-	1	1
Hibbertia stellaris	-	-	-	-	-	-	-	-
Sphaerolobium medium	2	1	1	-	1	-	-	-
Anarthria prolifera	3	3	4	4	4	-	2	3
Acacia browniana	1	-	-	-	-	-	-	-
Andersonia caerula	1	1	1	-	-	-	-	-
Xanthorrhoea preissii	1	1	-	-	2	-	4	2
Dampiera linearis	-	-	-	-	-	-	-	-
Sp 15 Papilionaceae sp.	2	2	-	3	-	-	1	-
Sp 16 *Acacia sp.*	-	-	-	-	-	-	-	-
Conostylis laxiflora	1	-	-	-	-	-	-	-
Sp 19 *Isolepis sp.*	-	-	2	-	2	-	-	2
Sp 20 *Hemigenia sp.*	2	2	1	1	1	-	1	1
Hypocalymma angustifolium	1	1	3	-	3	-	3	2
Nuytsia floribunda	1	-	-	-	-	-	2	-
Drosera menziesii	-	-	-	-	-	-	-	-
Lyginia barbata	3	4	4	3	1	2	-	2
Sp 27 Restionaceae sp.	2	2	2	2	1	-	-	1
Cyathochaeta avenacea	1	-	-	1	-	-	2	-
Leschenaultia biloba	-	-	-	-	1	-	-	-
Platysace tenuissima	2	-	-	-	-	-	-	-
Thysanotus sp.	-	-	-	-	-	-	-	-
Conostylis setigera subsp. *setigera*	1	-	-	-	-	-	-	-
Sp 182 Rubiaceae sp.	-	-	-	-	-	-	-	-
Platysace filifolia	2	1	1	-	-	-	-	-
Xylomelon occidentale	-	1	-	-	-	-	-	-
Dasypogon bromeliifolius	-	2	4	3	1	1	3	4
Evandra aristata	-	1	-	-	3	-	2	2
Lomandra caespitosa	-	2	2	-	-	-	-	-
Pimelea longiflora	-	1	1	-	1	-	-	-
Johnsonia lupulina	1	-	2	-	1	-	-	1
Sp 37 *Leucopogon* sp.	-	1	-	-	-	-	-	-
Cassytha racemosa	-	-	1	-	-	-	-	-
Beaufortia sparsa	-	1	3	2	4	-	-	5
Melaleuca preissiana	-	-	-	1	2	-	1	2
Xyris roycei	-	-	-	3	2	2	2	3
Schoenus indutus P1	-	-	-	3	2	-	2	-
Amphipogon turbinatus	-	-	-	1	1	-	1	3
Sp 45 Restionaceae sp.	-	-	-	1	-	1	-	1
Chordifex amblycoleus	-	-	-	2	-	3	-	-

Sp 47	-	-	-	-	-	-	-	-
Lyginea imberbis	-	-	-	2	2	-	1	-
Sp 49 Restionaceae sp.	-	-	-	-	2	-	2	-
Sp 50	-	-	-	-	-	-	1	-
Eutaxia obovata	-	-	-	-	-	-	-	-
Hakea certophylla	-	-	-	-	-	3	-	-
Calothamnus lateralis	-	-	-	-	-	2	1	1
Platychorda applanata	-	-	-	-	-	2	-	-
Sp 55 Restionaceae sp.	-	-	-	-	-	2	2	-
Sp 56 *Leucopogon* sp.	-	-	-	-	-	-	1	-
Poaceae sp*	-	-	-	-	-	-	-	-
Sphenotoma gracile	-	-	-	-	-	-	-	2
Sp 61 Restionaceae sp.	-	-	-	-	-	-	-	1

2.1.5 Darradup Rd East

Species	Cover and abundance							
	A1	A2	B1	B2	C1	C2	D1	D2
Anarthria scabra	9	10	8	9	3	8	-	5
Adenanthos obovatus	3	3	2	4	1	2	2	3
Pimelea longiflora	-	-	2	2	1	3	2	3
Haemodoracea spicatum	-	-	1	-	-	-	-	-
Sp 270 *Jacksonia* sp.	2	1	2	-	-	-	-	-
Xanthorrhoea preissii	-	-	-	-	-	-	-	-
Dasypogon bromeliifolius	5	2	4	3	2	3	6	2
Johnsonia lupulina	1	1	-	-	1	1	-	-
Velleia trinervis	-	-	-	-	-	-	-	-
Drosera marchantii	1	-	-	-	-	-	-	-
Comesperma flavum	1	-	-	-	-	-	-	-
Melaleuca thymoides	1	2	-	-	-	-	-	-
Sp 241 *Dampiera* sp.	-	-	-	-	-	-	-	-
Lyginea imberbis	4	3	5	3	2	3	3	1
Sphenotoma gracilis	1	1	1	4	2	1	1	1
Adenanthos meisneri	2	-	-	-	-	-	-	-
Pericalymma ellipticum	2	2	3	3	4	2	4	3
Andersonia caerula	4	2	3	-	-	-	-	1
Stylidium scandens	-	-	-	-	-	-	-	-
Hypolaena exsulca	2	3	3	3	2	1	1	-
Sp D2 *Pulteneae* sp.	-	-	-	-	-	-	-	-
Sp D3 Epacridaceae sp	3	3	3	-	-	3	-	-
Hypocalymma angustifolium	-	-	1	2	3	4	5	4
Cassytha racemosa	-	2	1	-	-	-	1	2
Astartea juniperiana	-	-	-	4	4	2	-	-
Sphaerolobium fornicatum	-	-	1	-	-	-	-	-
Beaufortia sparsa	-	2	-	2	2	1	-	3
Sp 247 *Acacia* sp.	3	1	3	-	1	3	1	1
Nuytsia floribunda	-	3	3	-	-	3	2	1
Eucalyptus marginata	1	-	6	-	-	-	-	-
Dampiera linearis	-	-	-	-	-	-	-	-
Scaevola calliptera	-	-	-	-	-	-	1	-
Sp 262 *Isolepis* sp	-	-	-	1	-	-	-	-
Sp. 266 *Drosera* sp.	-	-	-	-	-	-	-	-
Melaleuca preissiana	-	-	-	4	2	4	1	2
Hypocalymma ericifolium	2	2	1	-	-	-	-	-
Lomandra nigricans	-	-	1	-	1	1	-	2
Boronia anceps	-	-	-	2	2	2	3	-
Xyris roycei	1	-	4	4	5	3	4	3
Evandra aristata	1	3	3	4	-	1	-	-
Drosera sulphurea	-	-	-	-	-	-	-	-
Stylidium repens	-	-	-	-	2	-	1	-
Mitrasacme paradoxa	-	-	1	-	-	-	-	-
Hakea ceratophylla	-	-	-	-	-	-	3	-
Sp 182 Rubiaceae sp.	-	-	-	-	-	-	-	-
Taxandria parviceps	-	4	-	-	-	2	-	5

2.1.6 Poison Gully

Species	**Cover and abundance**			
	A1	**A2**	**B1**	**B2**
Astartea juniperina	3	1	2	1
Casuarina fraseriana	3	-	-	-
Eucalyptus marginata	2	-	-	-
Anarthria scabra	8	-	-	-
Dampiera linearis	-	-	-	-
Sp 16 *Acacia sp.*	1	-	-	-
Pimelea longiflora	1	-	-	-
Cassytha racemosa	1	2	1	2
Beaufortia sparsa	-	2	3	6
Sp 47 Sedge	2	-	-	-
Sphenotoma gracile	1	1	3	1
Pulteneae reticulata	3	-	-	-
Kunzea recurva	-	-	-	-
Sphaerolobium fornicatum	-	2	1	-
Sp 97 Restionaceae sp.	2	-	-	3
Empodisma gracillimum	2	3	4	1
Taxandria pariceps	4	4	4	7
Loxocarya exsulca	2	-	-	1
Sp 115 Sedge	3	8	9	5
Callistemon glaucus	-	4	3	3
Pultenaea sp.	-	-	-	3
Xanthorrea preissii	5	-	-	-
Podocarpus drouynianus	1	-	-	-
Billardiera laxiflora	2	-	-	-
Mirbelia dilata	-	-	-	2

2.2 Terrestrial Sites

2.2.1 Blackpoint/ Fouracres Rd

Species	Cover and abundance							
	A1	A2	B1	B2	C1	C2	D1	D2
Hovea elliptica	2	-	1	-	-	2	1	1
Hibbertia cunninghamii	2	1	1	-	1	2	1	1
Patersonia umbrosa	2	1	2	2	3	-	-	-
Platysace tenuissima	1	2	3	1	-	2	1	1
Acacia browniana	1	1	1	3	-	3	-	-
Lindsaea linearis	1	1	3	2	2	1	2	2
Podocarpus drouynianus	2	2	4	2	3	-	4	4
Pimelea spectabilis	2	2	-	1	-	2	1	-
Sphaerolobium fornicatum	2	1	-	-	-	1	-	-
Grevillea quercifolia	2	2	-	-	-	-	-	-
Scaevola calliptera	2	2	-	-	-	2	1	2
Anarthria prolifera	4	3	3	3	2	3	3	2
Dampiera linearis	2	-	-	1	-	2	-	-
Taxandria parviceps	-	1	2	4	1	3	4	1
Leucopogon verticillatus	1	-	-	-	-	2	-	-
Persoonia longiflora	2	1	2	2	1	2	-	1
Sp 48 *Drosera sp.*	-	-	-	-	-	-	-	-
Stylidium scandens	1	2	1	1	1	1	-	1
Daviesia inflata	3	3	2	1	-	2	-	-
Andersonia caerulea	1	2	3	2	2	2	1	-
Hypocalymma robustum	-	2	2	2	1	1	2	1
Mesomelaena tetragona	2	1	-	-	-	-	-	-
Conostylis laxiflora	1	-	-	-	1	-	-	-
Drosera erythrorhiza	-	-	-	-	-	-	1	-
Xylomelon occidentale	3	3	3	-	1	2	1	2
Banksia grandis	4	6	1	1	2	2	1	-
Macrozamia riedlei	3	-	1	2	-	1	1	3
Xanthorrhoea preissii	4	5	4	3	2	3	5	4
Corymbia calophylla	5	4	2	2	1	4	5	2
Eucalyptus marginata	4	4	-	-	-	-	-	8
Samolus repens	1	-	-	-	-	-	-	-
Anarthria scabra	1	3	3	5	2	6	4	9
Sp 75 Sedge	3	2	2	1	-	2	1	-
Thelymitra aff. *macrophylla*	-	-	-	-	-	-	-	-
Comesperma ciliatum	1	-	-	-	-	-	-	-
Kennedia coccinea	1	-	-	-	-	1	-	-
Thysanotus multiflours	-	-	-	-	-	-	-	-
Agrostocrinum stypandroides	-	-	-	-	-	-	-	-
Cassytha racemosa	-	2	-	-	-	2	-	-
Adenanthos obovatus	1	2	3	1	3	2	3	3
Dasypogon bromeliifolius	-	3	3	4	-	3	3	4
Sp 62 (Restionaceae)	-	2	-	-	-	-	1	-
Billardiera laxiflora	2	2	-	1	-	2	-	-
Opercularia hispidula	-	-	-	-	-	2	-	-
Sp 83 *Acacia sp.*	-	2	1	1	-	3	1	3

Platysace filiformis	-	2	-	1	-	2	-	1
Acacia extensa	-	-	2	-	-	2	-	-
Tremandra diffusa	-	-	-	-	-	-	-	-
Bossiaea praetermisa	-	-	-	-	-	1	-	-
Johnsonia lupinina	-	-	2	-	-	-	-	-
Sp 90 *Lomandra sp.*	-	-	-	-	-	-	-	-
Burchardia umbellata	1	-	-	-	-	-	-	-
Leucopogon capitellatus	-	-	1	-	-	-	-	-
Leucopogon propinqus	-	-	-	2	-	-	-	-
Stylidium schoendes	-	-	-	-	-	-	-	-
Xanthorrhoea brunonis	-	-	-	-	-	2	-	2
Comesperma calymega	-	-	-	-	-	-	-	-
Sp 46 *Leucopogon sp.*	-	-	-	-	-	1	1	-
Pulteneae reticulata	-	-	-	-	-	-	2	-
Epacridaceae sp.	1	1	1	2	-	3	1	2

2.2.2 Darradup Rd East

Species	Cover and abundance							
	A1	A2	B1	B2	C1	C2	D1	D2
Hypocalymma robustum	2	3	3	2	-	-	-	1
Anarthria scabra	6	9	4	6	3	3	2	-
Scaevola calliptera	-	-	-	-	-	-	-	-
Burchardia umbellata	-	-	-	-	-	-	-	-
Lindsaea linearis	1	2	3	3	2	4	4	1
Adenanthos obovatus	2	2	4	4	3	2	1	1
Sp 48 *Drosera sp.*	-	-	-	-	-	-	-	-
Dasypogon bromeliifolius	4	5	-	5	3	2	-	1
Nuytsia floribunda	1	1	1	-	-	1	8	-
Taxandria parviceps	6	7	4	6	5	4	5	4
Pentapeltis peltigera	1	-	-	-	-	-	-	-
Eucalytpus marginata	2	4	2	5	-	6	-	5
Allocasuarina fraseriana	9	4	9	3	1	1	4	2
Adenanthos meisneri	3	4	5	2	4	-	-	-
Leucopogon propinqus	1	2	-	2	-	-	2	1
Lomandra purpurea	2	2	3	2	3	-	-	-
Sp 101 grass/sedge	1	-	-	1	5	2	4	2
Pimelea spectabilis	1	1	1	-	2	1	-	1
Hypolaena exculsa	2	2	2	-	-	-	-	-
Dampiera linearis	1	1	1	-	-	-	-	-
Drosera pallida	-	-	-	-	-	-	-	-
Trachymene pilosa	2	-	1	1	-	-	-	-
Sp 105 Cyperaceae sp.	2	1	-	1	-	-	-	-
Lyginea barbata	-	2	2	-	2	-	-	-
Melaleuca thymoides	-	2	3	1	-	-	-	-
Petrophile linearis	-	2	1	1	-	-	-	-
Opercularia hispidula	-	3	-	1	-	-	-	-
Stylidium scandens	2	3	2	3	2	2	1	-
Leucopogon elatior	2	2	3	-	-	-	-	-
Haemodorum spicatum	1	-	-	-	-	-	-	-
Persoonia longiflora	-	-	2	1	-	-	-	-
Sp 182	-	1	-	-	-	-	1	-
Drosera erythrorhiza	-	-	-	-	-	-	-	-
Comesperma confertum	-	1	-	1	-	-	-	-
Daviesia inflata	-	-	1	1	-	-	-	-
Sp 112 Papilionaceae sp.	-	-	1	1	-	-	-	-
Xanthorrhoea gracilis	-	-	2	-	-	-	-	-
Podocarpus drouynianus	-	-	-	3	-	-	-	-
Corymbia calophylla	-	-	-	5	7	7	4	7
Platysace filiformis	2	2	2	2	-	-	2	-
Pimelea longiflora	-	-	-	1	1	-	-	-
Comesperma confertum	-	-	-	1	-	-	-	-
Cassytha racemosa	-	1	-	2	-	-	-	-
Platysace tenuissima	-	-	-	1	-	-	-	-
Agrostocrinum stypandroides	-	-	-	-	-	-	-	-
Acacia browniana var browniana	-	-	-	-	-	2	3	3
Conostylis laxiflora	-	-	-	-	2	-	1	-
Patersonia umbrosa	-	-	-	-	2	2	1	4

Hibbertia cunninghamii	-	-	-	-	1	3	1	2
Pericalymma ellipitcum	-	-	-	-	3	-	-	-
Pultenaea reticulata	-	-	-	-	2	-	-	-
Xyris roycei	-	-	-	-	1	-	-	-
Desmocladus fasciculatus	-	-	-	-	1	-	-	2
Patersonia occidentalis	-	-	-	-	2	-	-	-
Conostylis setigera	-	-	-	-	1	2	2	-
Boronia denticulata	-	-	-	-	2	1	1	-
Sp 125 *Acacia sp.*	-	-	-	-	2	-	-	-
Gompholobium confertum	-	-	-	-	1	3	-	3
Sp 29 Orchidaceae sp.	-	-	-	-	-	-	-	-
Thelymitra aff. *macrophylla*	-	-	-	-	-	-	-	-
Stylidium diversifolia	-	-	-	-	-	-	1	-
Sp 129	-	-	-	-	1	-	3	1
Lomandra caespitosa	-	-	-	-	-	2	-	-
Acacia alata var. *alata*	-	-	-	-	-	3	2	1
Sp 131	-	-	-	-	-	-	-	2
Lechenaultia biloba	-	-	-	-	-	-	-	-
Sp 133 *Sphaerolobium sp.*	-	-	-	-	-	1	1	-
Grevillea quercifolia	-	-	-	-	-	1	1	2
Sp 134 *Lomandra sp.*	-	-	-	-	-	-	3	-
Stylidium calcaratum	-	-	-	-	-	-	1	-
Lomandra nigricans	-	-	-	-	-	-	-	-
Sp 30 Poaceae sp.*	-	-	-	-	-	-	-	-
Leucopogon verticillatus	-	-	-	-	-	-	-	1
Xanthorrhoea brunonis	1	-	-	-	-	2	1	1
Papilionaceae sp 2.	-	-	-	-	-	-	1	-
Macrozamia riedlei	-	-	-	-	-	-	-	1
Hibbertia pilosa	-	-	-	-	-	-	-	1
Sp 138 *Boronia sp.*	1	-	-	1	-	-	-	1
Petrophile serruiae	-	-	-	-	-	1	1	1
Drosera pulchella	-	-	-	-	-	-	-	-
Melaleuca preissiana	-	-	-	-	2	-	-	-
Johnsonia lupinia	-	-	-	-	-	1	-	-
Kennedia coccinea	-	-	-	-	-	-	-	1

2.2.3 Poison Gully

Species	Cover and abundance							
	A1	A2	B1	B2	C1	C2	D1	D2
Astartea juniperiana	2	-	-	-	-	-	-	-
Dasypogon bromeliifolius	5	5	2	3	4	3	2	3
Anarthria scabra	7	6	6	3	4	3	3	4
Hypolaena exsulca	2	2	-	-	2	2	2	-
Pultenaea reticulata	5	-	3	4	2	-	-	3
Eucalyptus marginata	3	-	7	3	4	5	3	3
Melaleuca thymoides	4	1	2	-	3	4	4	1
Pimelea longiflora	1	-	-	-	-	-	-	-
Xanthorrhoea preissii	1	-	2	1	-	2	1	-
Stylidium scandens	-	-	2	1	1	3	1	3
Sp 35 Cyperaceae sp.	2	2	-	-	-	1	1	1
Leucopogon australis	2	-	-	-	-	-	-	-
Hypolaena pubescens	1	-	3	2	1	2	2	2
Tricoryne elatior	-	-	-	-	-	-	-	-
Adenanthos obovatus	-	2	-	-	1	3	1	2
Allocasuarina fraseriana	-	6	1	6	1	3	-	-
Adenanthos meisneri	-	2	-	2	-	2	2	5
Anarthria prolifera	-	2	1	1	2	2	2	1
Desmocladus fasciculatus	-	2	2	1	2	2	1	-
Xylomelon occidentale	-	2	2	-	1	-	-	-
Daviesia inflata	-	-	-	-	-	3	2	1
Xanthorrhoea gracilis	-	1	-	-	-	-	1	-
Sp 134 *Lomandra sp.*	-	3	2	1	-	-	-	-
Lomandra purpurea	-	2	3	1	-	-	1	1
Hibbertia cunninghamii	-	-	-	1	-	1	-	1
Astroloma pallidum	-	-	-	-	-	-	-	-
Sp 150	-	-	-	-	-	-	-	-
Xanthorrhoea brunonia	-	2	2	2	2	2	2	2
Platysace tenuissima	2	1	1	-	2	1	2	-
Pentapeltis peltigera	-	-	1	1	2	-	1	1
Ricinocarpos glaucus	-	-	-	-	-	-	-	-
Trymalium floribundum	-	1	-	-	-	-	-	-
Sp 75 Restionaceae sp	3	1	1	-	-	1	-	-
Platysace filiformis	-	2	1	1	-	-	-	-
Scaevola calliptera	-	-	1	-	1	-	1	-
Dampiera linearis	-	1	1	1	1	-	2	-
Banksia grandis	-	-	3	1	-	3	1	2
Hakea ruscifolia	-	-	1	-	2	-	-	-
Acacia extensa	-	1	1	1	-	1	-	-
Sp 177 *Drosera sp.*	-	-	-	-	-	-	-	-
Thysantous tenellus	-	-	-	-	-	-	-	-
Sp 180 Epacridaceae sp.	-	-	-	-	1	1	-	-
Conostylis setigera	-	-	2	1	1	1	1	-
Sp 182	-	-	-	-	-	-	-	-
Sp 183 *Hibbertia sp.*	-	-	1	-	-	-	-	-
Burchardia umbellata	-	-	-	-	-	-	-	-
Grevillea quercifolia	-	-	1	-	2	1	2	-
Haemodorum spicatum	-	-	-	-	-	-	-	-
Petrophile linearis	-	-	1	1	1	1	-	1

Isopogon sphaerocephalus	-	1	-	1	1	2	1	2
Lindsaea linearis	1	-	-	-	-	-	-	-
Gompholobium sp.	-	1	-	-	-	-	-	-
Banksia attenuata	-	-	-	1	2	-	-	-
Sp 30 Poaceae sp.*	-	-	-	-	-	-	-	-
Macrozamia riedlei	-	-	-	-	1	1	-	-
Hypocalymma robustum	-	-	-	-	2	1	-	-
Sp 112 Papilionaceae sp.	-	-	-	-	2	3	3	2
Patersonia umbrosa	-	-	-	-	2	-	-	-
Hibbertia quadricolour	-	-	-	1	2	2	1	1
Dryandra lindeyana	-	-	-	-	2	-	-	-
Acacia stenoptera	-	-	-	-	1	-	-	-
Corymbia calophylla	-	-	-	-	-	4	4	-
Patersonia occidentalis	-	-	-	-	-	1	2	-
Thelymitra aff. *macrophylla*	-	-	-	-	-	-	-	-
Cassytha racemosa	-	-	-	-	-	-	1	-
Sp 24 Orchidaceae sp.	-	-	-	-	-	-	-	-
Boronia denticulata	-	-	-	2	-	-	2	-
Philotheca spicata	-	-	-	-	-	-	-	-
Thysanotus manglesianus	-	-	-	-	-	-	1	-
Acacia pulchella	-	-	-	-	-	-	2	-
Hibbertia hypercoides	-	-	-	-	-	-	-	1
Podocarpus drouynianus	-	-	-	-	-	-	-	2
Sp 194 Epacridaceae sp.	-	-	-	-	-	-	-	2
Stylidium repens	-	-	-	-	-	1	-	-
Billardiera laxiflora	-	-	-	-	-	1	-	-
Gompholobium ovatum	-	-	-	1	-	-	2	-

2.2.4 Stewart Rd

Species	Cover and abundance							
	A1	A2	B1	B2	C1	C2	D1	D2
Patersonia umbrosa	4	4	5	4	3	4	3	4
Stylidium amoenum	1	1	-	1	1	-	1	1
Lindsaea linearis	2	-	-	2	-	-	-	-
Podocarpus drouynianus	2	-	-	-	-	-	-	-
Pentapeltis peltigera	2	1	1	2	1	-	-	1
Grevillea quercifolia	2	2	2	2	2	2	2	2
Platysace tenuissima	1	1	1	1	-	1	2	1
Sp 37 Sedge	-	-	-	-	-	-	-	-
Dampiera linearis	2	1	1	1	2	1	1	1
Xanthorrhoea brunonis	1	-	-	-	1	-	-	-
Taxandria parviceps	2	5	6	4	3	4	4	4
Adenanthos obovatus	2	2	3	1	3	1	2	1
Hakea amplexicaulis	2	2	3	2	2	3	2	3
Mesomelaena tetragona	3	-	-	3	1	-	-	-
Hypocalymma robustum	2	-	1	-	-	-	-	-
Sp 75 Sedge	4	2	3	3	3	2	3	5
Eucalyptus marginata	7	7	4	4	7	5	5	6
Corymbia calophylla	7	5	3	6	3	4	5	4
Hibbertia cunninghamii	1	1	2	-	1	-	-	-
Sp 157 *Thysanotus sp.*	2	-	-	2	-	-	-	-
Bossiaea ornata	6	4	4	4	2	1	4	4
Agrostocrinum stypandroides	-	-	-	-	-	-	-	-
Sphaerolobium grandiflorum	1	2	3	2	2	2	2	2
Dryandra lindleyana subsp. *lindleyana*	3	-	-	-	-	-	-	-
Drosera stelliflora	-	-	-	-	-	-	-	-
Acacia obovata	3	1	2	-	-	-	-	-
Billardiera laxiflora	2	1	-	1	1	1	1	-
Sp 254	2	-	-	-	-	-	-	-
Sp 255 *Dampiera* sp.	-	1	1	-	-	-	-	-
Sp 256	1	1	1	2	2	4	2	2
Lomandra caespitosa	1	1	1	-	-	1	-	-
Sp 90 *Lomandra sp.*	2	-	-	-	-	-	-	-
Isopogon sphaerocephalus	3	2	2	1	1	-	-	1
Sp 257 *Acacia* sp.	3	1	1	1	1	3	-	4
Sp 258 *Hakea* sp.	-	1	1	2	2	-	-	-
Hibbertia hypericoides	1	-	-	-	-	-	-	-
Trymalium floribundum	2	-	-	-	-	-	-	-
Sp 259	1	-	-	1	-	-	-	-
Sp 260 Epacridaceae sp.	1	1	1	-	-	-	-	-
Sp 30 Poaceae sp. *	-	-	1	1	-	-	1	1
Sp 134 *Lomandra sp.*	-	2	-	-	-	-	-	-
Scaevola calliptera	-	1	1	-	-	1	-	-
Sphenotoma capitatum	-	2	2	2	3	3	2	2
Sp 105 Sedge	-	2	2	2	3	2	2	2
Acacia browniana	1	2	1	1	1	-	2	2
Anarthria prolifera	2	1	1	1	-	1	1	-
Poranthera huegelii	-	2	2	-	3	-	-	-
Sp 263 *Acacia* sp.	-	2	3	2	2	2	2	1

Sp 264 Cyperaceae sp.	-	3	3	2	2	-	3	-
Cassytha racemosa	-	-	1	1	-	-	-	-
Leucopogon propinqus	-	-	1	2	-	2	1	-
Leucopogon verticillatus	-	-	1	-	1	-	1	1
Daviesia preissii	-	-	2	-	-	-	-	-
Acacia extensa	-	-	-	1	1	1	1	1
Comesperma ciliatum	-	-	-	-	-	-	-	-
Xanthorrhoea preissii	-	-	-	-	2	-	2	-
Johnsonia lupinina	-	-	-	-	1	1	-	-
Sp 34 *Xanthorrhoea sp.*	-	-	-	-	-	3	2	-
Petrophile diversifolia	1	-	-	-	-	3	2	2
Sp 138 *Boronia sp.*	-	-	-	-	-	-	-	-
Gompholobium cyaninum	-	-	-	-	-	2	-	-
Lomandra nigricans	-	-	-	-	-	1	2	-
Kennedia coccinea	-	-	-	-	-	-	1	-
Drosera macrantha subsp *macrantha*	-	-	-	-	-	-	-	-
Sp 268 Poaceae sp.*	-	-	-	-	-	-	-	-
Pimelea spectabilis	-	-	-	-	-	-	-	1
Comesperma ciliatum	-	-	-	-	-	-	-	1
Lepidosperma pubisquatmatum	-	-	-	-	-	-	-	2
Thysanotus multiflorus	1	1	1	2	2	1	2	1

2.2.5 Scott Rd

Species	Cover and abundance							
	A1	A2	B1	B2	C1	C2	D1	D2
Lindsaea linearis	2	3	3	2	2	2	1	2
Samolus repens	1	1	1	1	-	-	-	-
Lomandra caespitosa	2	1	-	-	-	-	-	-
Anarthria prolifera	3	5	4	6	5	-	1	2
Xanthorrhoea brunonis	3	1	-	1	2	-	-	-
Platysace filiformis	3	-	3	-	1	-	-	-
Dampiera linearis	1	2	2	1	1	1	-	1
Agonis flexuosa	3	-	-	-	-	-	-	-
Taxandria parviceps	4	7	6	10	8	10	10	7
Acacia extensa	2	3	3	3	3	-	3	-
Adenanthos obovatus	2	-	-	-	-	1	-	-
Stylidium scandens	-	1	-	-	-	-	-	-
Dasypogon bromeliifolius	3	-	2	-	2	-	-	-
Hypocalymma robustum	1	1	1	-	1	1	-	-
Hypolaena exculsa	2	-	2	2	2	-	2	-
Anarthria scabra	9	5	6	4	6	-	-	-
Andersonia caerula	1	2	1	-	1	-	-	1
Bossiaea praetermisa	2	-	2	-	2	-	-	-
Johnsonia lupinia	1	-	2	2	2	4	3	4
Eucalyptus marginata	7	3	2	5	1	-	-	-
Melaleuca thymoides	2	-	-	-	-	-	-	-
Corymbia calophylla	7	4	10	3	1	2	1	3
Platytheca galioides	2	1	1	-	-	-	-	-
Philotheca spicata	1	-	-	-	-	-	-	-
Sp 142 Sedge	-	-	-	-	-	-	-	-
Gompholobium tomentosum	1	-	1	-	-	-	-	-
Macrozamia riedlei	1	-	1	-	-	-	-	-
Pultenaea reticulata	1	-	-	-	-	-	-	-
Agrostocrinum stypandroides	-	-	-	-	-	-	-	-
Scaevola calliptera	-	1	1	1	1	1	-	-
Cassytha racemosa	-	1	-	1	1	-	-	-
Xanthorrhoea preissii	-	3	3	-	2	3	3	4
Opercularia hispidula	-	-	-	-	-	-	-	-
Patersonia occidentalis	2	2	-	-	-	-	-	-
Sp 147 *Acacia* sp.	-	2	-	2	2	-	-	2
Stylidium repens	-	1	-	-	-	-	-	-
Trymalium floribundum	-	1	-	-	-	-	-	-
Sp 151 *Leucopogon* sp.	-	-	3	3	2	-	-	-
Sp 83 *Acacia* sp.	-	-	-	2	-	-	-	-
Petrophile linearis	-	-	1	-	-	-	-	-
Sp 153 *Eutaxia* sp.	-	-	-	-	-	-	-	-
Melaleuca preissiana	-	-	-	3	-	1	-	-
Sp 155 Sedge	1	-	-	-	3	-	-	-
Conostylis laxiflora	-	-	-	-	-	3	2	1
Pericalymma ellipticum	-	-	-	-	-	1	-	-
Sp 126 Papilionaceae sp.	-	-	-	-	1	2	2	1
Boronia crenulata	-	-	-	-	-	-	1	2
Pimelea spectabilis	-	-	-	-	-	-	-	1

Hovea elliptica	-	-	-	-	-	-	-	1
Sp 46 *Leucopogon* sp.	-	-	-	-	1	-	-	1
Hibbertia stellaris	-	-	-	-	-	-	-	-
Acacia sp.	-	-	-	-	-	1	-	-

Appendix 2.3: Eastern Scott Coastal Plain

2.3.1 Reedia South

Species	Cover and abundance							
	A1	A2	B1	B2	C1	C2	D1	D2
Taxandria parviceps	5	3	3	-	-	-	-	-
Eucalyptus marginata	3	-	-	-	-	-	-	-
Corymbia calophylla	3	-	1	-	-	-	-	-
Astartea fascicularis	7	2	-	-	-	1	2	4
Hibbertia hypercoides	3	-	2	-	-	-	-	-
Leucopogon verticillatus	1	-	-	-	-	-	-	-
Lindsaea linearis	2	-	-	-	-	-	-	-
Leucopogon australis	2	1	3	-	-	-	-	-
Patersonia occidentalis	3	-	4	-	-	-	-	-
Pimelea sp.	1	-	1	-	-	1	-	-
Anarthria prolifera	2	2	5	-	-	-	-	3
Tetrarrhena laevis	2	-	-	-	-	-	-	-
Tetraria capillaris	3	-	-	4	-	3	4	-
Lepidosperma squamatum	2	-	-	-	-	-	-	-
Gompholobium confertum	2	-	-	-	-	-	-	-
Podocarpus drouynianus	1	-	2	-	-	-	-	-
Dampiera linearis	1	-	1	-	-	-	-	-
Adenanthos ovatus	1	-	1	-	-	-	-	-
Goodenia eatoniana	1	-	3	-	-	-	-	-
Pentapeltis sp.	1	-	2	-	-	-	-	-
Hakea amplexicaulis	1	-	-	-	-	-	-	-
Mesomelaena graciliceps	2	-	-	-	-	-	-	2
Desmocladus fasciculatus	1	-	-	-	-	-	-	-
Taxandria linearifolia	-	1	-	2	4	4	4	3
Homalospermum firmum?	-	3	-	6	7	2	3	4
Boronia fastigiata	-	3	1	1	3	6	5	4
Acacia pulchella	-	4	-	6	5	5	-	3
Beaufortia sparsa	-	4	-	-	-	2	-	3
Loxocarya cinereia	-	5	-	-	-	-	-	-
Xyris sp.	-	4	-	-	2	3	2	2
Hypolaena exsulca	-	4	7	2	-	2	-	3
Hakea lasanthoides	-	2	4	-	-	-	-	-
Cassytha sp.	-	2	-	-	1	-	-	1
Leucopogon sp.	-	1	-	-	-	-	-	-
Billardiera variifolia	-	1	-	-	-	-	-	-
Cyathochaeta teretifolia P3	-	7	3	5	3	2	6	-
Sporadanthus rivularis	-	4	-	5	3	4	4	-
Lomandra pauciflora	-	2	-	-	4	-	-	2
Allocasuarina fraseriana	-	-	7	-	-	-	-	-
Eucalyptus megacarpa	-	-	2	-	-	-	-	3
Stylidium sp.	-	-	2	-	-	-	-	-
Acacia divergens	-	-	1	-	-	-	-	-
Cyathochaeta avenacea	-	-	-	2	-	-	-	6
Baumea rubiginosa	-	-	-	3	2	-	-	-
Reedia spathacea DRF	-	-	-	7	4	6	7	-
Comesperma sp.	-	-	-	-	-	1	-	-
Lepidosperma sp.?	-	-	-	-	-	1	2	2
Leptocarpus/Meeboldina sp.	-	-	-	-	-	3	3	3
Aotus cordifolium	-	-	-	-	-	-	3	-
Mesomelaena tetragona	-	-	2	-	-	-	-	-
Thysanotus sp.	-	-	1	-	-	-	-	-

2.3.2 Reedia North

Species	Cover and abundance							
	A1	A2	B1	B2	C1	C2	D1	D2
Xanthorrhoea preissii	3	2	-	-	-	-	-	4
Xanthorrhoea gracilis	3	4	-	-	-	1	-	3
Allocasuarina fraseriana	4	4	-	-	-	-	-	-
Macrozamia reidlei	2	-	-	-	-	-	-	-
Leucopogon propinquus	1	-	-	-	-	-	-	-
Patersonia umbrosa	2	-	-	-	-	-	-	2
Dasypogon bromeliifolius	8	4	-	-	-	-	-	-
Acacia extensa	1	3	-	-	-	-	-	-
Lepidosperma squamatum	4	4	-	-	-	1	-	2
Podocarpus drouynianus	3	-	-	-	-	-	-	2
Hypolaena exsulca	3	-	-	-	-	-	-	3
Hibbertia hypercoides	4	1	-	-	-	-	-	-
Eucalyptus marginata	2	4	-	-	-	-	-	-
Gompholobium confertum	1	1	-	-	-	-	-	-
Loxocarya cineria	2	-	-	-	-	-	-	-
Anigozanthos flavidus	1	2	-	-	-	-	-	-
Conostylis setigera	2	-	-	-	-	-	-	-
Desmocladus fasciculatus	2	-	-	-	-	-	-	-
Lomandra caespitosa	2	-	-	-	-	-	-	-
Mesomelaena graciliceps	1	-	-	-	-	-	-	-
Lomandra sericea	1	2	-	-	-	-	-	-
Tetraria octandra	1	-	-	-	-	-	-	-
Patersonia occidentalis	-	1	-	-	-	3	-	-
Taxandria linearifolia	-	5	5	5	5	8	5	5
Acacia divergens	-	2	3	1	-	1	-	-
Anarthria prolifera	-	3	3	-	-	-	-	2
Corymbia calophylla	-	1	-	-	-	4	-	4
Platysace filiformis	-	3	-	-	-	1	-	3
Xyris gracillima	-	2	4	2	4	3	3	-
Astartea fascicularis	-	2	4	4	-	4	2	-
Boronia fastigiata	-	2	-	-	-	2	-	1
Tetrarrhena laevis	-	2	-	-	-	-	-	1
Billardiera floribunda	-	1	-	-	-	-	-	-
Scaevola calliptera	-	1	-	-	-	-	-	-
Cyathochaeta avenacea	-	2	-	-	-	-	-	-
Leucopogon australis	-	1	-	-	-	-	-	4
Gompholobium knightianum	-	1	-	-	-	-	-	-
Acacia browniana	-	1	-	-	-	3	-	2
Sporadanthus rivularis	-	3	2	-	-	3	-	-
Leucopogon hirsutus	-	3	2	1	-	2	-	-
Pronaya sp.	-	1	-	-	-	-	-	-
Dampiera hederacea	-	3	4	-	-	1	-	-
Empodisma sp. (tall)	-	3	6	-	-	-	-	-
Mesomelaena tetragona	-	1	-	2	-	-	1	4
Gonocarpus diffusus	-	2	2	3	1	6	2	-
Comesperma virgatum	-	1	-	-	-	-	-	-
Agrostocrinum scabrum	-	1	-	-	-	-	-	-
Empodisma sp. (small)	-	3	3	4	6	3	5	-
Cyathochaeta teretifolia P3	-	-	6	-	8	-	8	-
Baumea sp. Blackwood	-	-	1	3	6	2	4	-
Hibbertia perfoliata	-	-	2	2	-	-	1	-
Schoenus sp.	-	-	2	-	-	-	-	-
Lepidosperma tetraquetrum	-	-	2	-	-	-	-	-

Tricostularia neesii	-	-	-	4	-	3	2	-
Baumea rubiginosa	-	-	-	3	-	-	-	-
Drosera glanduligera	-	-	-	1	-	2	-	-
Acacia pulchella	-	-	-	-	3	-	-	-
Cassytha sp.	-	-	-	-	1	-	2	-
Utricularia sp.	-	-	-	-	1	1	1	-
Actinotus omnifertilis	-	-	-	-	-	2	-	-
Hovea trisperma	-	-	-	-	-	1	-	-
Amphipogon sp.	-	-	-	-	-	2	-	-
Johnsonian lupulina	-	-	-	-	-	1	-	-
Dampiera linearis	-	-	-	-	-	1	-	-
Pentapeltis peltigra	-	-	-	-	-	-	-	1
Pimelea sp.	-	-	-	-	-	1	-	-
Amphipogon turbinatus	-	-	-	-	-	1	-	-
Homalospermum firmum?	-	-	-	-	-	-	5	-
Sporadanthus sp.	-	-	-	-	-	-	2	-
Taxandria parviceps	-	-	-	-	-	-	-	3
Stylidium sp.	-	-	-	-	-	-	-	2
Marianthus tenuis	-	-	-	-	-	-	-	1
Eucalyptus marginata	-	-	-	-	-	-	-	3
Lomandra pauciflora	-	-	-	-	-	-	-	2
Pultenaea drummondii	-	-	-	-	-	-	-	1
Amperea simulans	-	-	-	-	-	-	-	1
Hibbertia cunninghamii	-	-	-	-	-	-	-	1

2.3.3 Dennis Road (Scott Nth)

Species	Cover and abundance							
	A1	A2	B1	B2	C1	C2	D1	D2
Xanthorrhoea preissii	4	4	-	-	-	-	2	2
Beaufortia sparsa	5	-	-	-	-	-	1	-
Grevillea papillosa P3	4	-	3	8	3	-	5	5
Adenanthos detmoldii P4	3	-	-	-	2	-	2	-
Adenanthos obovatus	2	-	-	-	-	-	1	-
Eutaxia epacridoides	2	-	-	-	-	-	-	1
Amphipogon turbinatus	5	-	-	-	-	-	-	2
Leptocarpus tenax	4	-	-	-	-	-	-	2
Tricostularia neesii	5	-	-	-	-	-	2	1
Empodisma gracillimum	5	-	-	-	-	-	-	-
Baxteria australis	3	-	-	-	-	-	-	1
Dasypogon bromeliifolius	2	-	-	-	-	-	-	3
Mesomelaena tetragona	3	-	4	-	1	2	3	3
Anarthria prolifera	2	-	-	-	-	-	-	-
Patersonia occidentalis	2	-	-	-	-	-	-	-
Schoenus efoliatus	2	-	-	-	-	-	-	1
Xyris sp.	1	-	-	-	-	-	-	-
*Solanum nigrum**	1	1	-	1	1	-	-	-
Persoonia graminea	1	-	-	-	-	-	-	-
Lepidosperma squamatum	2	1	-	-	-	-	1	-
Dampiera linearis	1	-	1	-	-	-	-	-
Acacia browniana	1	-	-	-	-	-	-	-
Conostylis serrulata	1	-	-	-	-	-	-	-
*Juncus microcephala**	1	4	-	2	1	2	3	2
Cyathochaeta avenacea	1	3	3	4	2	4	1	3
Melaleuca preissiana	-	2	3	-	3	-	-	-
Banksia littoralis	-	2	-	1	-	-	-	-
Hakea ceratophylla	-	2	3	2	-	4	1	2
Restionaceae sp. (small)	1	-	-	-	1	2	-	1
*Mentha pulegium**	-	8	6	3	2	2	4	3
*Rumex crispus**	-	2	1	2	2	2	2	-
*Epilobium hirtigerum**	-	3	2	2	4	2	1	1
*Holcus lanatus**	-	2	-	-	-	-	1	2
*Symphyotricum squamatum**	-	1	2	3	2	1	2	1
Alternanthera nodiflora	-	1	1	4	4	2	2	2
*Cyperus laevigatus**	-	-	2	-	-	-	-	-
Juncus pallidus	-	-	4	4	6	2	3	2
Calothamnus lateralis	-	-	1	1	-	1	1	1
Baumea juncea	-	-	4	-	-	4	2	-
*Conyza sumatrensis**	-	-	2	3	2	3	1	-
Astartea fascicularis	-	-	-	4	-	7	2	-
Cyathochaeta stipiodes P3	-	-	-	1	1	2	-	-
Taxandria linearifolia	-	-	-	-	2	-	-	-
*Sonchus asper**	-	-	-	-	1	1	2	-
Centipedia cunninghamii	-	-	-	-	-	1	-	-
Restionaceae sp. (tall)	-	-	-	-	-	3	3	-
Helichrysum luteolbum?	-	-	-	-	-	2	-	-
Jansonia formosa	-	-	-	-	-	-	3	-
*Hypochaeris glabra**	-	-	-	-	-	-	1	1
Lepidosperma/Baumea sp.	-	-	-	-	-	-	2	2
Daviesia inflata	-	-	-	-	-	-	1	-
Prasophyllum sp.	-	-	-	-	-	-	1	2
Johnsonia lupulina	-	-	-	-	-	-	1	2

Meeboldina sp.	-	-	-	-	-	-	-	2
Chordifex amblycoleus	-	-	-	-	-	-	-	2
*Vellereophyton dealbatum**	-	-	-	-	-	-	-	1

2.3.4 Scott River Road (Scott Sth)

Species	Cover and abundance							
	A1	A2	B1	B2	C1	C2	D1	D2
Taxandria parviceps	5	7	4	4	4	6	3	-
Beaufortia sparsa	7	3	-	5	4	4	-	-
Cassytha sp.	2	1	-	-	-	-	-	3
Anarthria scabra	4	-	9	7	3	8	8	-
Anarthria prolifera	5	6	2	9	5	4	3	-
Xanthorrhoea gracilis	1	-	1	2	3	2	3	-
Xanthorrhoea preissii	2	1	2	2	-	4	3	-
Gompholobium tomentosum	2	1	1	-	-	-	-	-
Melanostachys ustulata	4	8	4	-	-	-	-	-
Sphenotoma gracile	3	3	3	-	2	-	3	-
Eutaxia epacridoides	2	-	-	-	-	-	-	-
Lyginea barbata	2	-	-	-	-	-	-	-
Cyathochaeta stipiodes P3	2	2	2	-	-	-	-	-
Lindsaea linearis	2	-	1	-	-	-	-	-
Mesomelaena graciliceps	3	-	-	-	-	-	-	-
Gompholobium confertum	1	-	-	-	-	-	-	-
Hypolaena pubescens	2	2	-	-	-	-	-	-
Kunzea recurva	4	4	3	2	-	-	-	-
Lomandra sp.	4	3	-	-	-	-	-	-
Dasypogon bromeliifolius	1	-	1	3	3	3	3	-
Nuytsia floribunda	1	-	-	-	-	-	-	-
Hypolaena exsulca	1	2	1	2	-	-	1	-
Thysanotus multiflorus	1	-	-	-	-	-	-	-
Hypolaena caespitosa	1	-	-	-	-	-	-	-
Desmocladus fasciculatus	1	-	-	-	2	-	-	-
Homalospermum firmum	-	2	-	4	4	6	4	-
Eucalyptus marginata	-	2	3	-	-	-	-	-
Adenanthos obovatus	-	1	1	1	-	-	-	-
Dampiera linearis	-	1	-	1	2	2	1	-
Acacia divergens	-	1	1	2	2	2	3	-
Baxteria australis	-	2	-	-	-	-	-	-
Johnsonia lupulina	-	1	-	-	-	-	-	-
Evandra aristata	-	1	-	1	3	-	3	-
Corymbia calophylla	-	-	4	-	-	-	-	-
Jacksonia horrida	-	-	3	-	-	-	-	-
Mesomelaena tetragona	-	-	3	-	-	-	-	-
Petrophile/Isopogon	-	-	1	-	-	-	-	-
*Soleirolia soleirolii.**	-	-	-	1	1	-	-	-
Schoenus sp.	-	-	-	3	4	2	4	-
Astartea fascicularis	-	-	-	-	3	-	-	7
Patersonia ellipticum	-	-	-	-	2	-	-	6
Leptocarpus tenax	-	-	-	-	3	-	-	5
Sp. 36 Unknown sedge	-	-	-	-	2	-	-	-
Platychorda applanta	-	-	-	-	3	-	-	3
Loxocarya cineria	-	-	-	-	3	3	-	2
Amphipogon turbinatus	-	-	-	-	2	2	-	-
Leucopogon australis	-	-	-	-	-	-	1	-
Patersonia occidentalis	-	-	-	-	-	-	1	-
Actinotus omnifertilis	-	-	-	-	-	-	1	-
Melaleuca preissiana	-	-	-	-	-	-	-	3
Calothamnus lateralis	-	-	-	-	-	-	-	1
Beaufortia sparsa	-	-	-	-	-	-	-	1

2.3.5 Adelaide Road (Upper Margaret)

Species	Cover and abundance							
	A1	A2	B1	B2	C1	C2	D1	D2
Pericallyma ellipticum	3	8	6	7	7	6	-	2
Leschenaultia expansa	3	2	1	-	-	-	-	1
Hibbertia hypercoides	1	-	1	-	-	-	-	-
Patersonia umbrosa	2	-	-	-	-	-	-	-
Allocasuarina fraseriana	1	-	-	-	-	-	-	-
Desmocladus fascicularis	2	3	2	2	3	-	-	-
Xanthorrhoa preissii	2	-	6	2	1	3	-	2
Lepidosperma longitudinale	2	-	-	-	-	-	-	-
Gompholobium knightianum	1	-	-	-	-	-	-	-
Drosera sp. (small)	1	-	-	-	-	-	1	1
Gompholobium capitatum	1	1	-	-	-	-	-	-
Hypocalymma sp.	2	-	-	-	-	-	-	-
Hypocalymma angustifolium	-	1	1	-	-	1	-	-
Poaceae sp.	1	-	-	-	-	-	-	-
Sp. 46 Unknown herb	1	-	-	-	-	-	-	-
Hemiandra pungens	1	-	-	-	-	-	-	-
Stylidium latifolium	1	-	2	-	-	-	-	-
Hemigenia rigida	1	-	2	-	-	-	-	-
Myrtaceae sp.	1	-	-	-	-	-	-	-
Melaleuca preissiana	-	6	2	3	8	3	-	-
Dasypogon bromeliifolius	-	4	2	-	-	2	-	2
Corymbia calophylla	-	2	-	-	-	-	-	-
Adenanthos obovatus	-	2	-	-	2	2	1	1
Melanostachys ustulata	-	7	-	6	-	5	3	2
Calothamnus lateralis	-	3	-	3	-	1	3	-
Acacia divergens	-	1	-	-	1	-	-	-
Mesomelaena tetragona	-	3	4	3	4	-	2	3
Bossiaea linearis?	-	1	-	2	-	1	-	-
Conostylis setigera	-	2	3	2	1	-	-	-
Hibbertia rhadinopda	-	1	4	-	3	-	-	-
Leptocarpus elegans	-	2	-	3	-	3	-	-
Boronia dichotoma	-	1	1	1	1	2	-	2
Lyginea imberis	-	2	-	3	-	2	-	-
Conostylis sp.	-	2	-	-	1	-	-	-
Stirlingia latifolia	-	1	1	-	1	-	2	1
Sphaerolobium sp.	-	2	-	-	-	-	1	-
Viminaria juncea	-	-	2	-	-	-	-	-
Xanthorrhoa gracilis	-	-	2	-	-	-	-	-
Cassytha sp.	-	-	1	-	1	1	-	2
Hypolaena exsulca	-	-	2	2	-	-	2	5
Lyginia imberis	-	-	1	-	1	-	-	-
Beaufortia sparsa	-	-	-	2	-	3	2	2
Adenanthos meisneri	-	-	-	7	-	-	-	-
Baxteria australis	-	-	-	1	2	2	2	3
Schoenus efoliatus	-	-	-	3	-	3	-	-
Dampiera linearis	-	-	-	1	1	1	-	1
Xanthorrhoea gracilis	-	-	-	2	-	-	-	-
Conospermum caeruleum	-	-	-	2	-	-	-	-
Sp. 36 Unknown sedge	-	-	-	2	-	2	2	2
Leucopogon gilbertii	-	-	-	2	1	-	-	-
Hakea ceratophylla	-	-	-	1	1	-	1	1
Daviesia sp.	-	-	-	1	-	-	-	-
Lepyrodia elegans	-	-	-	2	-	-	-	-

Cyathochaeta avenacea	-	-	-	-	2	-	-	-
Astartea fascicularis	-	-	-	-	-	2	6	3
Taxandria parviceps	-	-	-	-	-	2	-	-
Taxandria juniperiana	-	-	-	-	-	-	6	-
Hakea sulcata	-	-	-	-	-	-	5	1
Amphipogon turbinatus	-	-	-	-	-	-	1	-
Chordifex amblycoleus	-	-	-	-	-	-	3	1
Melaleuca sp.	-	-	-	-	-	-	2	1
Leptomeria squarrulosa	-	-	-	-	-	-	-	1
Sp. 58 Restionaceae sp.	-	-	-	-	-	-	-	3
Sp. 42 Restionaceae sp.	-	-	-	-	-	-	3	2

Appendix 3: GPS locations of Western Scott Coastal Plain Sites

Reedia North	
0m	50 346045 E 62 28717 N
80m	50 346130 E 62 28713 N
Reedia Sth	
0m	50 344917 E 62 24274 N
80m	50 344866 E 62 24217 N
Dennis Rd (Scott Nth)	
0m	50 345412 E 62 15434 N
80m	50 345455 E 62 15498 N
Scott River Rd (Scott Sth)	
0m	50 340691 E 62 08371 N
80m	50 340703 E 62 08445 N
Adelaide Rd (Upper Margaret)	
0m	50 350230 E 62 52053 N
80m	50 350250 E 62 52134 N

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