2008 MONITORING OF GROUNDWATER DEPENDENT VEGETATION – SOUTHERN BLACKWOOD PLATEAU & SCOTT COASTAL PLAIN

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A Report to Water Smart Australia and the Department of Water

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Table of Contents

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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.

In 2005 24 sites, representing both wetland and phreatophytic terrestrial vegetation, were identified across the southern Blackwood Plateau and the eastern Scott Coastal Plain. Permanent monitoring transects were established at all sites and baseline monitoring undertaken. All sites were re-monitored in 2006 however, as good baseline data had been collected, approximately 50% of sites were re-monitored in 2007. During early 2008 new transects were also established and baseline monitoring undertaken at five wetland sites across the Western Scott Coastal Plain.

During the current spring monitoring round, 15 existing sites were assessed including those established in early 2008. A further two transects were also established, replacing sites of non-representative vegetation and/or hydrological condition.

The deliverables associated with this project were 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.

The results of the 2008 vegetation monitoring indicated that there has been some change in wetland vegetation condition and structure since the 2006 and 2007 assessments. However, these were generally related to condition changes in a limited number of individual trees (at sites with low tree densities), re-identification of species (especially dioecious sedges) and changes in the season of monitoring and in the light of incomplete hydrological datasets.

There was no clear trend in mean canopy condition, exotic richness or compositional change across the wetland or terrestrial sites monitored during 2008. Mean canopy condition improved across six of the 11 previously monitored wetland transects. The vast majority of transects remained free of exotic species during the current monitoring round, with non-natives only identified at five of the 17 transects. Changes in species composition were generally greater than those noted during the 2007 monitoring round, with 10 of the 15 previously monitored sites <80% similar in composition to that described in the previous assessment (2006 or 2007). Species richness increased at the majority of sites in 2008, mostly due to the change in seasonality of monitoring and the subsequent inclusion of annual species.

Many of the original, hand-augered piezometers have been replaced by permanent bores installed by drilling contractors. However, six of those yet to be replaced continued to dry

some months before the end of the summer/ autumn drying phase, resulting in incomplete hydrological records for Blackpoint/ Fouracres Rd wetland, Blackpoint Rd base of dunes, Darradup Rd West, Milyeanup Wetland and Terrestrial sites and the Poison Gully terrestrial site. In addition, there are no current monitoring bores at the new Blackpoint/ Mayall Rd and Stewart Rd Wetland sites, Adelaide Rd or Dennis Rd. EWRs have also yet to be determined for these sites along with Reedia North, Reedia South and Scott River Rd. Review of EWRs could therefore only be made on a limited number of sites; Blackpoint/ Fouracres Rd wetland, Blackpoint Rd wetland, Blackpoint Rd terrestrial and Jack Track.

Results suggested that, despite a slight increase in groundwater levels since 2006, EWRs were breached at the Blackpoint/ Fouracres Rd. wetland site. This corresponded with a 4% decline in canopy condition and the greatest change in species composition. Although no other breaches occurred, a short term (since 2006) decline in water levels at Poison Gully Wetland coincided with a 6% decline in canopy condition with a longer term (since 2000) decline at Jack Track corresponding to a 7% reduction in canopy health. These results were in contrast to a short term groundwater level decline and a 22% increase in health at the Blackpoint Rd terrestrial site. However, this site was dominated by large numbers of *C. calophylla* and *E. marginata*, which may respond to drier conditions.

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 was reduced in the 2007 round, with approximately 50% of sites monitored. During early 2008 new transects were also established and baseline monitoring undertaken at five wetland sites across the Western Scott Coastal Plain.

During the current spring monitoring round, 15 existing sites were assessed including those established in early 2008. A further two transects were also established, replacing sites of non-representative vegetation and/or hydrological condition.

The deliverables associated with this project are as follows:

- Annual spring vegetation monitoring at existing and newly established transects.
- Discussion and interpretation of results including identification of trends or impacts related to changes in water regimes.
- Review of current Ecological Water Requirements.

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 fourth monitoring period at selected existing sites (Table 1) and a discussion of any identified trends or impacts related to changes in water regimes. Results of baseline monitoring at the 2 newly established sites are also presented. Monitoring was undertaken over spring 2008.

Table 1: Monitoring history of existing and newly established sites. * denotes transects established during spring 2008.

Site	2005	2006	2007	2008
Adelaide Rd (w)			*	*
Blackpoint Rd (w)	*	*		*
Blackpoint Rd (t)	*	*		*
Blackpoint Rd base of dunes (w)	*	*		*
Blackpoint Rd dunes (w)	*	*		
Blackpoint/ Fouracres Rd (w)	*	*	*	*
Blackpoint/ Fouracres Rd (t)	*	*	*	
*Blackpoint/ Mayall Rd				*
Darradup Rd west (w)	*	*		*
DarradupRd east (w)	*	*	*	
Darradup Rd east (t)	*	*	*	
Darradup Rd north (t)	*	*		
Dennis Rd (w)			*	*
Jack Track (t)	*	*		*
Jangardup Rd (w)	*	*		
Lake Jasper east (w)	*	*	*	
Lake Jasper south (w)	*	*	*	
Long bottom Rd (w)	*	*		
Longbottom Rd (t)	*	*		
Milyeanup (w)	*	*		*
Milyeanup (t)	*	*		*
Pneumonia Rd (w)	*	*	*	
Poison Gully (w)	*	*	*	*
Posion Gully (t)	*	*	*	*
Reedia north (w)			*	*
Reedia south (s)			*	*
Scott Rd (t)	*	*	*	
Scott River Rd (w)			*	*
Stewart Rd (w)	*	*		
*Stewart Rd 2 (w)				*
Stewart Rd (t)	*	*	*	

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 2 identifies vegetation monitoring parameters relevant to each of the above monitoring objectives.

Table 2: 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);

- Poison Gully
- Blackpoint Rd
- Blackpoint Rd base of dunes
- Darradup Rd west
- Milyeanup
- Reedia North
- Reedia South
- *Stewart Rd
- *Blackpoint/ Mayall Rd.

*denotes newly established transects.

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;

- Blackpoint/ Fouracres Rd
- Adelaide Rd
- Dennis Rd
- Scott River 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.*

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.*

Monitoring should 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.

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 are undertaking 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.

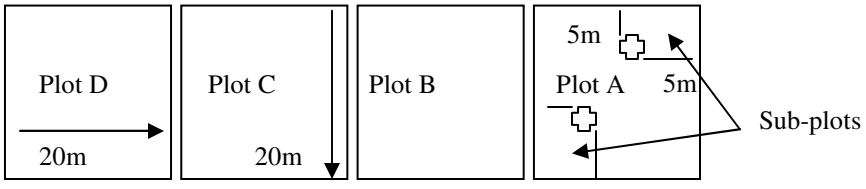

Figure 1: Standard set-up of sub-plots on monitoring transects at wetland and terrestrial sites.

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 1 to 3 years, 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, 2 and 3. 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 3. 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 06/07 - 08/09 monthly rainfall (Figure 2) show that during 2008 long-term monthly averages were exceeded during April, May, July, October and November.

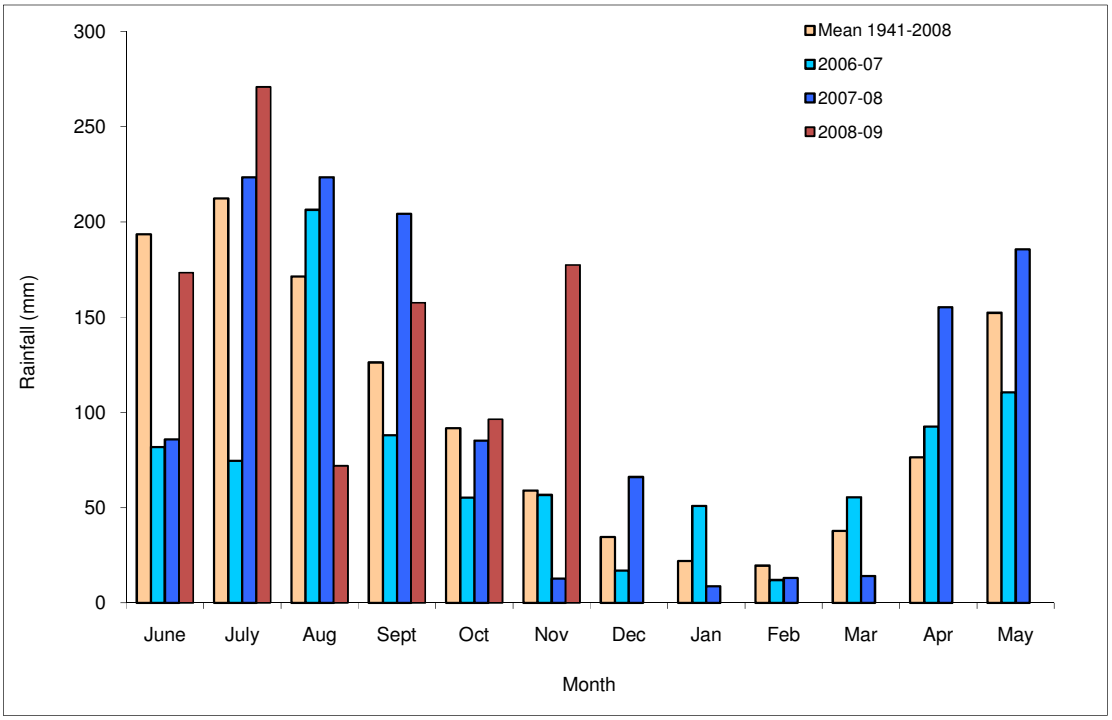

Figure 2: Long term (1941-2007) average monthly Pemberton rainfall compared to monthly rainfall recorded during 2006/07, 2007/08 and 2008/09.

Table 3: Summary table of changes in vegetation (across entire transect), fire history and hydrological conditions. No changes in vegetation data are available for the Stewart Rd and Blackpoint/ Mayall Rd sites as 2008 represents the first round of monitoring. 2008 hydrodata are unavailable for Reedia North and South.

Sites/ year last assessed	Vegetation change since previous assessment			Fire		Hydrological conditions (2008)			
	[1]Tree health	[2]Inc exotics	[3]Similarity index	Pre 07/08	Post 07/08	Minimum water level (m AHD)	[4]Annual rainfall (mm)	[4]Annual evap. (mm)	[4]Winter rainfall (June-Oct mm)
Wetlands									
Blackpoint Rd (06)	0.70	0	0.77	N	N	43.43	1086	1194.6	579.4
Blackpoint/Fouracres Rd (07)	-4.08	0	0.68	N	N	45.25*	1086	1194.6	579.4
Blackpoint Rd - Base of Dunes (06)	20.5	0	0.78	N	N	27.08*	924	1194.6	579.4
Darradup Rd West (06)	8.99	0	0.81	N	N	104.15*	924	1205.8	508.8
Milyeanup (06)	14.78	-100	0.70	N	N	38.52*	924	1205.8	508.8
Poison Gully (07)	-6.25	0	0.81	N	N	31.12	924	1205.8	508.8
Stewart Rd (08)	NA	NA	NA	Y	N	89.75*	924	1205.8	508.8
Blackpoint/ Mayall Rd (08)	NA	NA	NA	N	N	-	1086	1194.6	579.4
Terrestrial									
Blackpoint Rd (06)	22.41	100	0.92	N	N	43.73	1086	1194.6	579.4
Jack Track (06)	-7.32	0	0.88	N	N	40.16	1086	1194.6	579.4
Milyeanup (06)	17.95	-50	0.68	N	N	40.99*	924	1205.8	508.8
Poison Gully (07)	4.57	0	0.78	N	N	32.61*	924	1205.8	508.8
Western Scott Coastal Plain									
Adelaide Rd (07)	-1.61	0	0.73	N	N	-	1034	1247.6	634.5
Dennis Rd (07)	-10.68	-0.25	0.88	N	N	-	878	1199.4	491.2
Reedia North (07)	-30.14	0	0.72	N	N	26.3 (2007)	1078	1214	563.2
Reedia South (07)	4.17	100	0.78	N	N	24.23 (2007)	1078	1214	563.2
Scott River Rd (07)	4.90	0	0.75	N	N	16.72	878	1199.4	491.2

[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. *Bore dry in summer

Wetland Sites

Blackpoint Rd Wetland

The transect at this site started at the piezometer approximately 20 m from the roadside running 80 m in a north-westerly direction across the wetland. The dominant vegetation changed with increased elevation moving from sedges and sparse *Pericalymma ellipticum* and *Taxandria inundata* through an area of denser shrubs and into very dense *Melaleuca preissiana* woodland with *Eucalyptus marginata* and a variety of understorey species (Figure 3). The first 10 m of the transect and much of the surrounding area was inundated during the 2005 baseline monitoring however, in December 2006 the area was totally dry. During the current monitoring round the entire transect was inundated to depths up to 0.70m. There has been no change in the number of exotics recorded since the 2006 assessment, with no exotic species identified in the 8 sub-plots during any monitoring periods (Table 3). There was a slight improvement of 0.7 % in canopy condition with species composition 77% similar to that recorded in 2006.

The health of the single *M. preissiana* in plot A declined between 2006 and 2008 (2006: 19; 2008: 17) however, this large, multi-stemmed individual remaining in good condition (Appendix 1.1.1, Appendix 3, Table 4). Sub-plot A1 was previously dominated by the Priority 4 shrub species *Melaleuca basicephala* however, this species was not recorded during the current round, possibly due to the level of inundation (Appendix 2.1.1). The cover and abundance of previously abundant species, *Taxandria inundata* and *Hakea certophylla* had also declined, with the large sedge, *Meeboldinia scariosa*, now dominant. Only nine species, mostly sedges, were recorded in this sub-plot in 2008 decreasing from 13 in 2006 (Table 5). Species richness was greater in A2 with 23 species recorded in 2008, up from 18 in 2006. *P. ellipitcum, H. certophylla* and the sedges, *Chordifex amblycoleus, Chaetanthus leptocarpoides* and *Cyathochaeta clandestina*, remained dominant.

There were no trees recorded in plot B. The cover and abundance of *P. ellipitcum* remained unchanged from 2006, remaining dominant in sub-plot B1 with the sedges *Meeboldina scariosa* and *Platychorda applanata* and other sedge species. Fourteen species were recorded in this plot in 2008, 13 in 2006. Although *P. ellipitcum* remained abundant across B2, the cover of *H. certophylla* had declined. However, the sedges, *Mesomelaena tetragona* and *P. applanata* also remained very abundant. Nineteen species were recorded in this plot in 2008, 14 in 2006.

The canopy condition of the moderate to large *M. preissiana* dominating the extremely dense vegetation on higher ground within plot C increased slightly from 2006 (2006: 7-16, mean 12.3; 2008: 9-17, mean 13). The previous dominance of the shrub species, *Beaufortia sparsa* in the understorey of sub-plot C1 decreased slightly with *Anarthria scabra* and *Pultenaea reticulata* now most abundant and *Sphenotoma gracile* also common. Thirteen species were recorded in this plot in 2006 decreasing to 12 in 2008. Species richness was higher in C2, which supported 24 species (25 in 2006), including the still dominant shrub, *P. ellipitcum* and sedges *A. scabra* and *C. amblycoleus.*

Table 4: Blackpoint Rd - summary of transect data; diameter, health and density of overstorey species (all plots are 20 x 20 m).

Plot		A			B			C			D		
Year	**Spec.**	**05**	**06**	**08**	**05**	**06**	**08**	**05**	**06**	**08**	**05**	**06**	**08**
Diameter range[2]	M.p.	7.8-35.7	5.6-35.7	6.5-35.7	-	-	-	5-50	4-50	4-50	<2-27.3	<2-27.3	<2-25
	E.m.	-	-	-	-	-	-	-	-	-	<2-12.6	<2-12.6	<2-13
Health Mean[3]	M.p.	19	19	17	-	-	-	12.4	12.3	13	11.2	11.8	13.8
	E.m.	-	-	-	-	-	-	-	-	-	17.0	17.5	15.5
Health Range	M.p.	19	19	17	-	-	-	7-16	7-16	9-17	7-15	7-16	9-17
	E.m.	-	-	-	-	-	-	-	-	-	15-19	16-19	13-18
Density[4]	M.p.	1	1	1	-	-	-	14	14	15	17	17	19
	E.m.	-	-	-	-	-	-	-	-	-	2	2	2

[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 5: Blackpoint Rd - summary of understorey data (all plots are 5 x 5m).

Plot	A1			A2			B1			B2			C1			C2			D1			D2		
Year	**05**	**06**	**08**	**05**	**06**	**08**	**05**	**06**	**08**	**05**	**06**	**08**	**05**	**06**	**08**	**05**	**06**	**08**	**05**	**06**	**08**	**05**	**06**	**08**
No. species	10	13	9	24	18	23	12	13	14	17	14	19	17	13	12	29	25	24	13	15	20	25	22	17
No. exotics	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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

The canopy condition of the numerous small to moderately sized *M. preissiana* in Plot D increased from 2006 (2006: 7-16, mean 11.8; 2008: 9-17, mean 13.8) while the two multi-stemmed *E. marginata* were less healthy than previously recorded (2006: 16-19, mean 17; 2008: 13-18, mean 15.5). Sub-plot D1 was still dominated by *T. parviceps* and *B. sparsa*, with *A. prolifera* also abundant. Species richness had increased from 15 in 2006 to 20 in 2008. The dominance of *T. parviceps* and *B. sparsa* continued across D2 with *Tricostularia neesii*. Species richness declined from 22 in 2006 to 17.

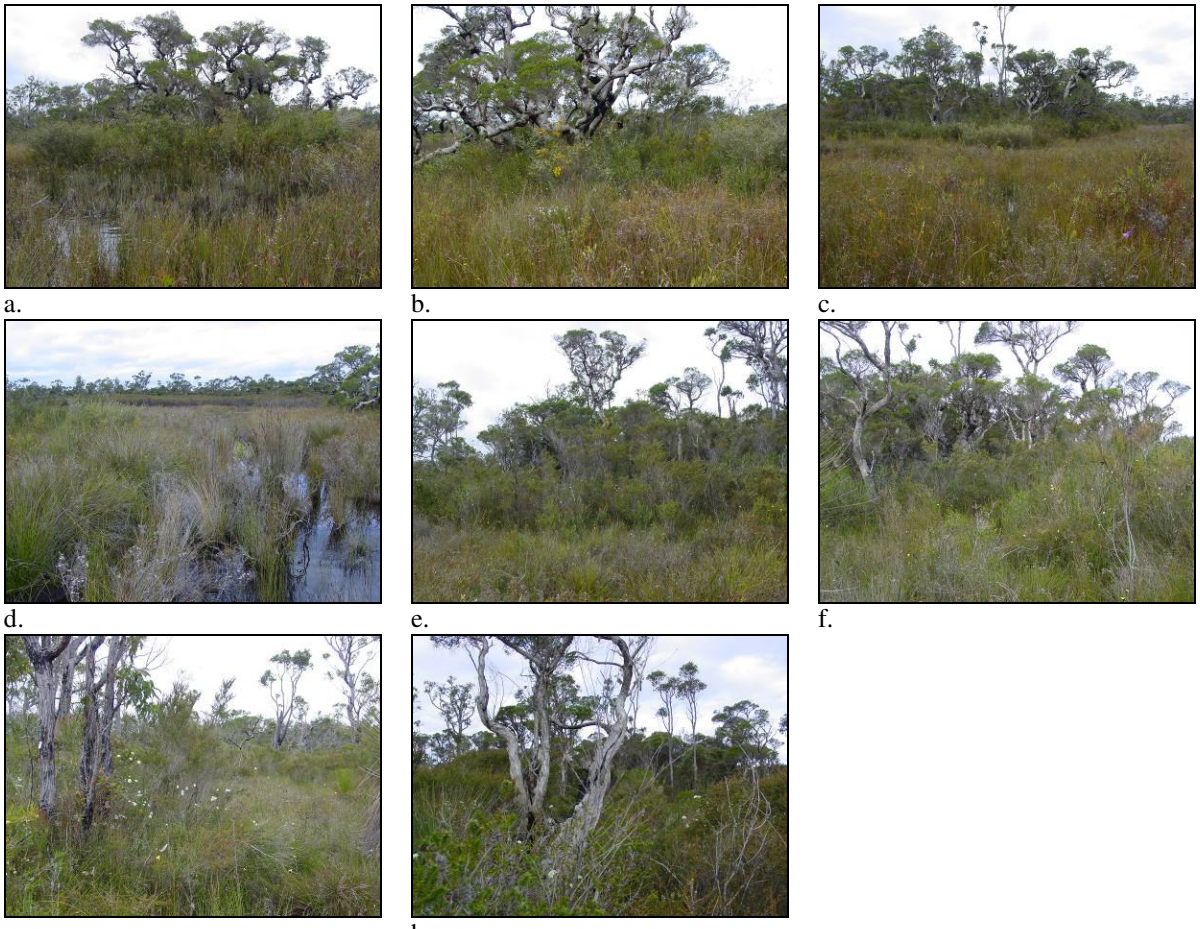

Figure 3: Blackwood Rd Wetland vegetation monitoring transect. All photos taken looking diagonally across the plot. a) 0-20m; b) 20-0 m; c) 20-40 m; d) 40-20 m; e) 40-60 m; f) 60-40 m; g) 60-80m; h) 80-60m.

Hydrological data for bore 60914933, in close proximity to the Blackpoint Rd wetland transect, were available from April 2006 (Figure 4). There was no obvious change in minimum or maximum groundwater levels over this period.

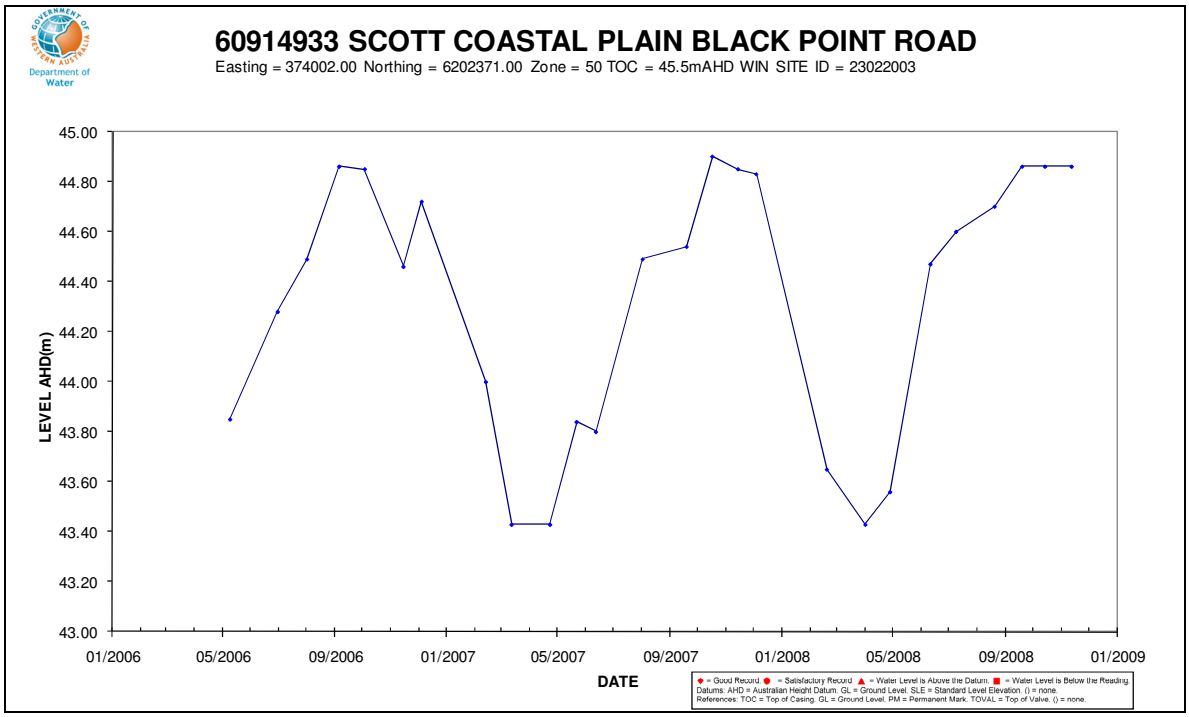

Figure 4: Blackpoint Rd wetland groundwater levels 2006-2008.

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 (Figure 5). There was some decline in canopy condition across the transect during 2008 with mean health decreasing by 4% (Table 3). Species composition was 68% similar to that described in 2007 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, although lower lying areas of the transect were muddy during the 2008 round. During the 2006 assessment it was also noted that much of the previously abundant *P. ellipticum* had dried off and thinned across the site. Although there was little change during 2007, abundance increased again during 2008. 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 stabilized.

The overstorey of Plot A was formed of moderately sized *E. marginata* the condition of which improved further during 2008 (2007: 9-19, mean 13.1; 2008: 9-18, mean 13.8). Fourteen *E. marginata* seedlings/ saplings and four healthy *C. calophylla* saplings (2007: 14-17, mean 15.3; 2008: 15, mean 15) were also recorded (Appendix 1.1.2, Appendix 3, Table 6). The density of *P. ellipticum* remained unchanged in sub-plot A1 however, it was no longer dominant with the sedge species, *A. scabra, A. prolifera* and *M. tetragona* now most abundant (Appendix 2.1.2). Twenty five species, all native, were noted in this plot in 2007, 33 in 2008 (Table 7). *A. scabra* was again dominant in A2 along with *T. parviceps*. The abundance of sedges *A. prolifera* and *Mesomelaena gracilipes* increased during 2008 with these species now co-dominant. In 2007 a total of 25 species were recorded in this plot, increasing to 33 in 2008.

The canopy condition of the single, small *E. marginata* in plot B declined during 2008 (2007: 19; 2008: 15) however, the two seedlings first recorded in the plot in 2007, remained healthy. *T. parviceps* and *P. ellipitcum* remained the most dominant species in the understorey of B1 with *M. tetragona, A. prolifera* and *H. angustifolium* also common. Nineteen species were recorded in this plot in 2007, 33 in 2008. *P. ellipticum* and *T. parviceps* were also dominant in B2, with *M. tetragona* and *B. sparsa*. A total of 19 species were identified in 2007, 23 in 2008. *Schoenus indutus*, a Priority one species, recorded in this plot in 2006 and 2007, was not noted in 2008.

The condition of the four small to moderately sized *M. preissiana* in plot C declined during 2008 (2007: 11-19, mean 15.4; 2008: 8-17, mean 11.8). The two new *E. marginata* seedlings first recorded in 2007 remained healthy. Sedges, including the

Priority 1 species, *S. indutus* were either lost from plot C1 or had been previously misidentified as *Meeboldinia denmarkica*. *P. ellipitcum* remained the dominant species, with *B. sparsa* also still common and the cover and abundances of *A. prolifera, M. denmarkica* and *Dasypogon bromeliifolius* increasing to make them co-dominant. Twenty five species were recorded in C1 in 2007, 33 in 2008. In sub-plot C2 *P. ellipitcum* was again dominant with *M. tetragona*. Eleven native species were identified in 2007, 16 in 2008.

The health of the multi-stemmed *M. preissiana* forming the overstorey in plot D also decreased during 2008 (2007: 15-19, mean 17; 2008: 10-17, mean 12.9), although the six seedlings recorded in 2007 remained healthy. As with plot C, a high proportion of species in this plot were sedges. *P. ellipitcum*, X. *preissii* and *H. angustifolium* remained prominent in D1 with the increased cover of *M. denmarkica* making this species now co-dominant. Twenty three species were recorded in this plot in 2007, 24 in 2008. *B. sparsa* continued to be the most abundant species in D2 with *D. bromeliifolius, P. ellipticum* and *T. parviceps* now also abundant. Twenty two native species were identified in this plot in 2007, increasing to 30 in 2008.

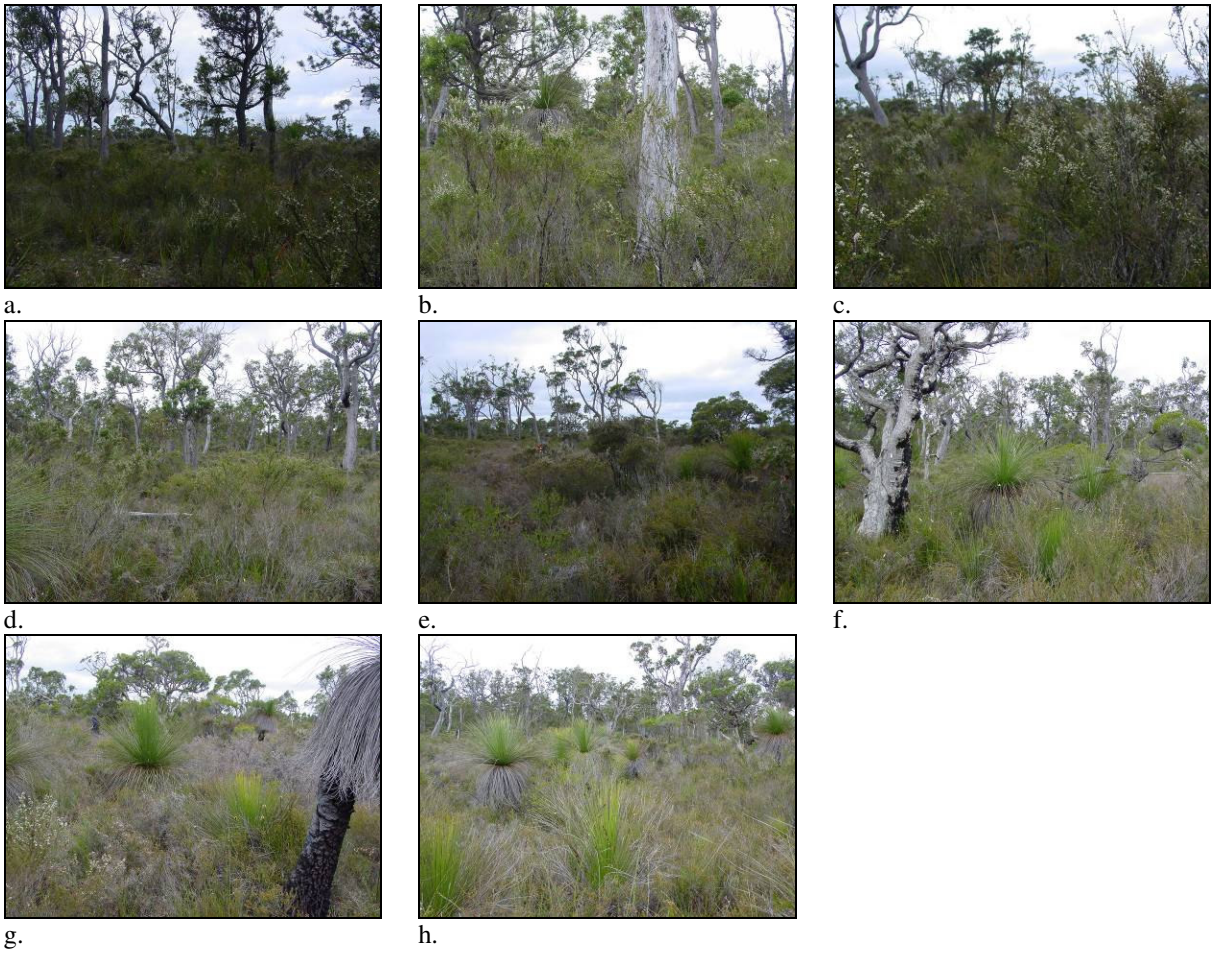

Figure 5: Blackpoint/ Fouracres Rd wetland vegetation monitoring transect. All photos taken looking diagonally across the plot; a) 0-20m; b) 20-0 m; c) 20-40 m; d) 40-20 m; e) 40-60 m; f) 60-40 m; g) 60-80m; h) 80-60m.

Table 6: Blackpoint/ Fouracres Rd - summary of transect data; diameter, health and density of overstorey species (all plots are 20 x 20 m).

Plot		A				B				C				D			
Year	Spec[1].	05	06	07	08	05	06	07	08	05	06	07	08	05	06	07	08
Diameter range[2]	M.p.	-	-	-	-	-	-	-	-	5.2 - 46	5.2 - 46	5.2 - 46	<2-46.5	4.2 - 22.5	4.2 - 22.5	4.2 - 22.5	<2-21
	E.m.	<2 - 41.2	<2 - 41.2	<2 - 42	<2-42	3.1-8.6	3.1 - 8.6	4.6 - 10.5	1.5-4.6	-	-	-	-	-	-	-	-
	C.c	-	-	<2-2.7	<2-3.2	-	-	-		-	-	-	-	-	-	-	-
Health Mean[3]	M.p.	-	-	-	-	-	-	-	-	9.5	10.8	15.4	11.8	10.8	11.0	17	12.9
	E.m.	11.6	12.6	13.1	13.8	15.0	15.0	19	15	-	-	-	-	-	-	12	-
	C.c	-	-	15.3	15	-	-	-	-	-	-	-	-	-	-	-	-
Health Range	M.p.	-	-	-	-	-	-	-	-	7 - 13	9 - 14	11 - 19	8-17	7 - 13	9 - 14	15 - 19	10-17
	E.m.	8 - 17	8 - 17	9 - 19	9-18	15	15	19	15	-	-	-	-	-	-	-	-
	C.c	-	-	14 - 17	15	-	-	-	-	-	-	-	-	-	-	-	-
Density[4]	M.p.	-	-	-	-	-	-	-	-	4	4	5	5	5	5	5 + 6 sdlngs	7+6 spling
	E.m.	8	8	8 + 14 sdlng	8	1	1	1 + 2 sdlng	1 + 2 sdlng	-	-	2 sdlng	-	-	-	-	-
	C.c	-	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-

[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 7: 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	08	05	06	07	08	05	06	07	08	05	06	07	08	05	06	07	08	05	06	07	08	05	06	07	08	05	06	07	08
No. species	30	28	25	33	29	30	25	37	28	24	19	33	20	20	19	23	31	31	25	33	12	12	11	16	23	22	23	24	29	22	22	30
No. exotics	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	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	0	0	0	0	0.05	0	0	0

Hydrological data for bore 60810087, in close proximity to the Blackpoint/ Fouracres Rd wetland transect, were only available from April 2007 (Figure 6). Although relatively consistent, monthly data were available during that time, the bore was dry from May to June 2007 and February to April 2008. This limited data showed a slight increase in maximum groundwater levels from 2007 to 2008.

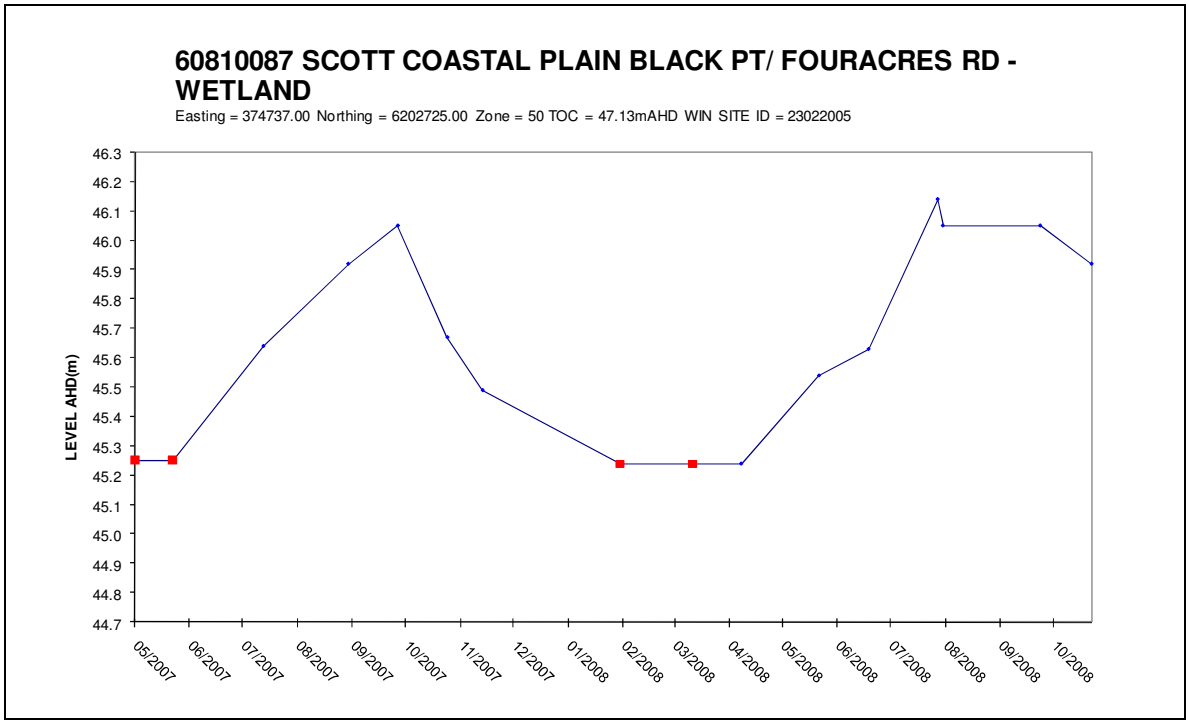

Figure 6: Blackpoint/ Fouracres Rd wetland groundwater levels 2007- 2008.

Blackpoint Rd – base of dunes

The 80 m transect at this site ran north-west from the piezometer perpendicular to the road. The elevation decreased slightly across the transect with a corresponding change in vegetation composition from shrub/ sedgeland to a *M. rhaphiophylla* woodland with *B. littoralis* over a dense shrub understorey (Figure 7). A large number of *M. rhaphiophylla* saplings occurred across the area. Although the site was dry during the 2005 and 2006 monitoring rounds, it was completely inundated during the 2008 round.

There was a significant increase in canopy condition across the transect since the 2006 assessment with mean health increasing by 20% (Table 3). Species composition was 78% similar to that described in 2006 and there was no change in the number of exotics with none identified during the assessment.

The mean health of the two multi-stemmed *M. rhaphiophylla* plot A improved from 2006 (Appendix 1.1.3, Appendix 3, Table 8). Nine *M. rhaphiophylla* and one *B. littoralis* saplings of moderate health also occurred in the plot (*M. rhaphiophylla* – 2006: 10-13, mean 11.3; 2008: 11-19, mean 13.5; *B. littoralis* – 2006: 0-13, mean 6.5; 2008: 17).

The understorey across sub-plot A1 remained fairly dense and dominated by shrubs and sedges including *T. parviceps, T. linearifolia* and *Hypolaena pubescens* with *Loxocarya striata* also now abundant. A total of 19 species were recorded in this sub-plot in 2006, 20 in 2008 (Appendix 2.1.3, Table 9). The composition of the understorey in A2 also remained relatively unchanged. Species composition was similar to A1 however, *T. parvicpes* was dominant with *Hypolaena exculsa* and *Evandra aristata*. A total of 16 species were identified in 2006 and 2008.

The canopy condition of the numerous *M. rhaphiophylla* and *B. littoralis* saplings in plot B improved between 2006 and 2008 (*M. rhaphiophylla* – 2006: 10-13, mean 12.9; 2008: 7-19, mean 14.9; *B. littoralis* – 2006:13, mean; 2008: 16-21, mean 18.4). The understorey of sub-plot B1 was still dominated by *T. linearifolia* and the sedge species *Lepidosperma longitudinale* with *T. parviceps* and *Eutaxia virgata*. Twenty species were recorded in 2006, decreasing to 18 in 2008. Species composition in B2 remained very similar to B1 with the abundance of *T. parviceps, L. longitudinale*, *E. virgata, M. scariosa* and *H. pubescens* increasing since 2006. Twenty one species were recorded in this plot in 2006, 20 in 2008.

Melaleuca rhaphiophylla saplings and larger individuals dominated plot C along with a number of *B. littoralis* saplings. Canopy condition generally improved from 2006 (*M. rhaphiophylla* – 2006: 10-13, mean 11.9; 2008: 11-23, mean 14.6; *B. littoralis* – 2006: 15-18, mean 16.17; 2008: 15-21, mean 19.3). *A. juniperina* and *Acacia pulchella* subsp. *goadbyi* dominated the relatively sparse understorey of sub-plot C1, with a total 21 species, mostly shrubs and sedges, recorded 2006 and 14 in 2008. The dominance of *A. pulchella* subsp. *goadbyi* continued across C2, with *T. linearifolia, A. juniperiana*, *H. linearis* and *L. striata* also abundant. Twenty species were also recorded in C2 in 2006 and 2008.

Multi-stemmed *M. rhaphiophylla* and *B. littoralis* continued to dominate the overstorey across plot D. There has been little change in the canopy condition of these trees since 2006 (*M. rhaphiophylla* – 2006: 11-15, mean 13.1; 2008: 11-17, mean 13; *B. littoralis* – 2006: 17-20, mean 18; 2008: 21-23, mean 22.3). In the understorey of sub-plot D1, *L. longitudinale* and *T. linearifolia* remained dominant along with the large shrub *M. lateritia* and a *Baumea* sp. Nineteen species were recorded in D1 in 2006, 11 in 2008. The cover and abundance of the dominant species, *T. linearifolia*, increased further in D2 with *A. pulchella* var *goadbyi* now co-dominant. *A. juniperina, L. longitudinale* and *E. virgata* also became more prominent in this subplot. Seventeen species were recorded in 2006, 18 in 2008.

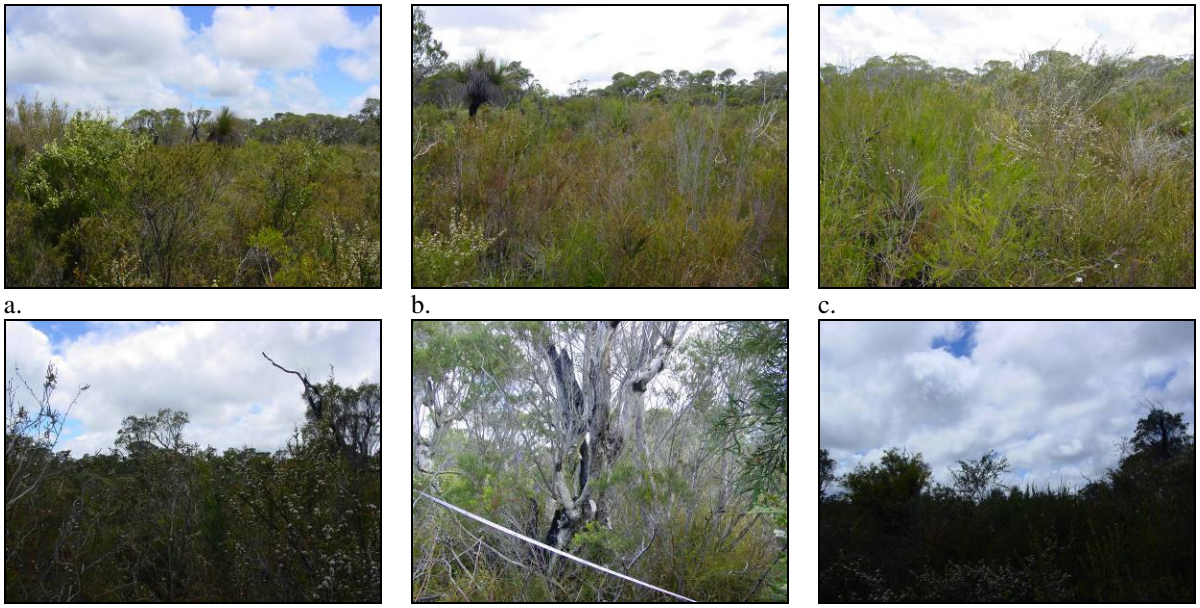

Figure 7: Blackpoint Rd – base of dunes wetland vegetation monitoring transect. All photos taken looking diagonally across the plot. a) 0-20m; b) 20-0 m; c) 20-40 m; d) 40-20 m; e) 40-60 m; f) 60-40 m.

Table 8: Blackpoint Rd base of dunes - summary of transect data; diameter, health and density of overstorey species (all plots are 20 x 20 m).

Plot		A			B			C			D		
Year	Spec[1].	05	06	08	05	06	08	05	06	08	05	06	08
Diameter range[2]	M.r.	<2 - 15.7	<2 - 15.7	<2-16.7	<2	<2	<2	<2 - 35.5	<2 - 35.5	<2-29.5	<2 - 35	<2 - 35	<2-35.6
	B.l.	<2 - 3.5	<2 - 3.5	<2-3.5	<2	<2	<2-2	<2 - 5	<2 - 5	<2-9	<2 - 6.5	<2 - 6.5	<2-9
Health Mean[3]	M.r.	11.1	11.3	13.5	13.0	12.9	14.93	11.5	11.9	14.56	13.0	13.1	13
	B.l.	9.0	6.5	17	13.0	13.0	18.38	17.1	16.7	19.29	18.0	18.0	22.33
Health Range	M.r.	11 - 13	10-13	11-19	13	10 - 13	7-19	10 - 13	10 - 13	11-23	10 - 15	11 - 15	11-17
	B.l.	5 - 13	0 - 13	17	13	13	16-21	17 - 18	15 - 18	15-21	17 - 20	17 - 20	21-23
Density[4]	M.r.	2 + 9 seedlings/ saplings	11	11	1 + 26 seedlings/ saplings	27	27	8	8	8	7	7	7
	B.l.	2	1(1)	1	8	8	8	7	7	3 + 10 seedlings	3	3	3 + 1 seedling

[1]Overstorey species – B.l. = *Banksia littoralis;* M.r. = *Melaleuca rhaphiophylla*
[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. Figures in parenthesis represent number of tree deaths since previous assessment.

Table 9: Blackpoint Rd base of dunes - summary of understorey data (all plots are 5 x 5m).

Plot	A1			A2			B1			B2			C1			C2			D1			D2		
Year	05	06	08	05	06	08	05	06	08	05	06	08	05	06	08	05	06	08	05	06	08	05	06	08
No. species	22	19	20	18	16	16	24	20	18	24	21	20	20	21	14	20	20	20	19	19	11	18	17	18
No. exotics	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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

Hydrological data for bore 60914934, in close proximity to the Blackpoint Rd – base of dunes wetland transect, were only available from April 2006 (Figure 8). Data showed a general decrease in maximum groundwater levels however, it was not possible to comment on changes in minimum as the bore appeared to dry each summer.

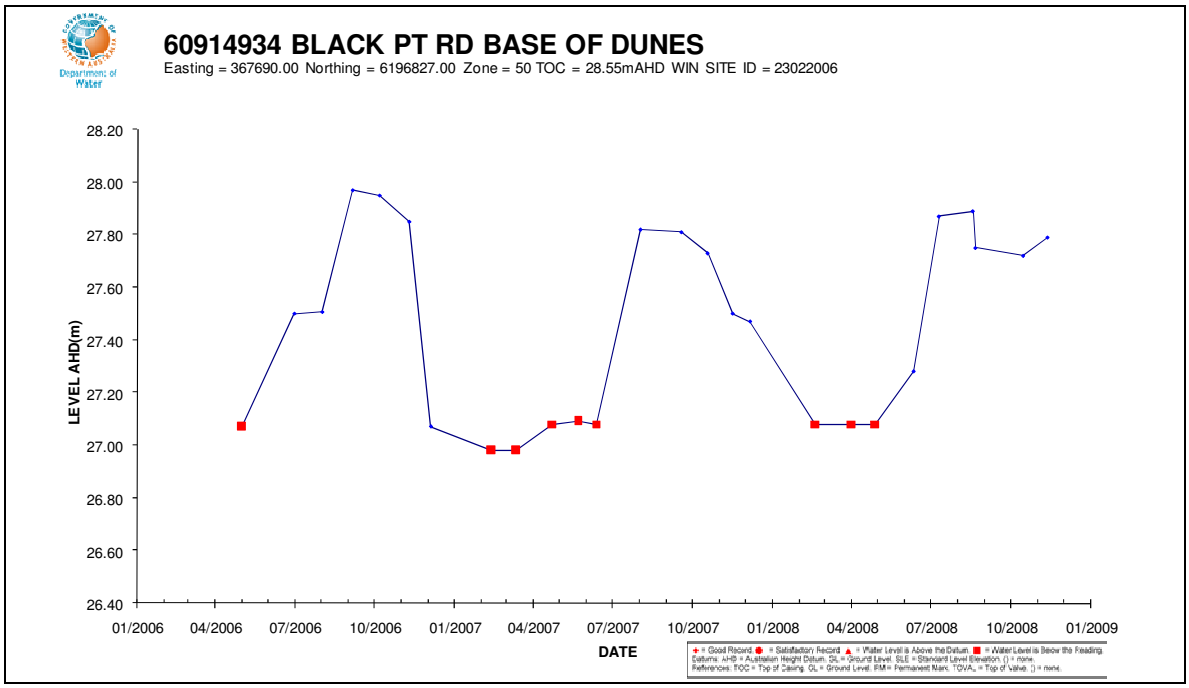

Figure 8: Blackpoint Rd – base of dunes groundwater levels 2006-2008.

Darradup Rd – west

This transect at this wetland, also on Darradup Rd, was established to run south from the piezometer to a point 80 m into the wetland. There was a slight decrease in elevation across the transect however, the vegetation remained unchanged with emergent *M. preissiana* over a dense understorey of *A. juniperiana, T. parviceps*, *Beaufortia sparsa* and mixed sedges (Figure 9). Canopy condition improved by 9% between 2006 and 2008, with species 81% similar to that described in 2006 (Table 3). No exotics have been identified at this site since monitoring commenced in 2005.

Two small *M. preissiana* occurred in plot A (Appendix 1.1.4, Appendix 3, Table 10). The canopy condition of both individuals decreased from 2006 (2005: 11-15, mean 13; 2008: 11-12, mean 11.5). *T. parviceps* and *B. sparsa* continued to dominate sub-plots A1 and A2 with *D. bromeliifolius* now also abundant in both, the large shrub, *Homalospermum firmum* common in A1 and *M. tetragona* in A2. A1 supported 25 species in 2006 and 23 in 2008, 21 species were recorded in A2 in 2006 and 22 in 2008 (Appendix 2.1.4, Table 11).

The canopy of condition of the single *M. preissiana* in plot B improved markedly between 2006 and 2008, while the small *B. littoralis* became less healthy (*M. preissiana* - 2006: 11, 2008: 21; *B. littoralis* – 2006: 19; 2008: 11). *T. parviceps, D. bromeliifolius* and *H. firmum* continued to dominate across sub-plots B1 and B2, with *E. aristata* and *H. excelsa* also abundant in B1. Twenty species were recorded in B1 in 2006, 21 in 2008. Twenty species were identified in B2 in 2006, 25 in 2008.

The canopy condition of the two small *M. preissiana* in plot C improved (2006: 10, 2008: 11-15, mean 15). *T. parviceps* again dominated the understorey of both sub-plots, with *D. bromeliifolius, B. sparsa* and *H. firmum* also abundant. C1 supported 21 species in 2006 and 24 in 2008, while 19 species were recorded in C2 in 2006 and 20 in 2008.

Moderately sized *M. preissiana* occurred in plot D. The condition of these trees declined slightly between 2006 and 2008 (2006: 11-16, mean; 2008: 7-15, mean 11). Sub-plot D1 was dominated by *T. parviceps, D. bromeliifolius* and *H. firmum*. The sparse understorey of D2 was still dominated by the sedge, *M. tetragona* with a second sedge, *Cyathochaeta avenacea,* now also very prominent. Twenty one species were recorded in D1 in 2006, 19 in 2008. D2 supported 20 species in 2006, 25 in 2008.

Table 10: Darradup Rd west - summary of transect data; diameter, health and density of overstorey species (all plots are 20 x 20 m).

Plot		A			B			C			D		
Year	Spec[1].	05	06	08	05	06	08	05	06	08	05	06	08
Diameter range[2]	M.p.	5.8 - 15.4	5.8 - 15.4	<2-16.5	12	12	12	5.5 - 6.6	5.5 - 6.6	<2-7.5	8.8 - 23.4	8.8 - 23.4	4.3-23
	B.l.	-	-	-	3 - 3.5	3 - 3.5	3-3.5	-	-	-	-	-	-
Health Mean[3]	M.p.	8	13	11.5	9	11	21	6.3	10	15	9.8	12.3	11
	B.l.	-	-	-	17	19	11	-	-	-	-	-	-
Health Range	M.p.	6-11	11-15	11-12	9.0	11	21	5	10	11-21	7-13	11-16	7-15
	B.l.	-	-	-	17	19	11	-	-	-	-	-	-
Density[4]	M.p.	2	2	2	1	1	1	2	2	2	4	4	4
	B.l.	-	-	-	1	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 11: Darradup Rd west - summary of understorey data (all plots are 5 x 5m).

Plot	A1			A2			B1			B2			C1			C2			D1			D2		
Year	05	06	08	05	06	08	05	06	08	05	06	08	05	06	08	05	06	08	05	06	08	05	06	08
No. species	26	25	23	20	21	22	18	20	21	24	20	25	20	21	24	21	19	20	20	21	19	22	20	25
No. exotics	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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

a. b. c.

d. e. f.

g. h.

Figure 9: Darradup Rd West 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.

Hydrological data for bore 60810090, in close proximity to the Darradup Rd West wetland transect, were available from July 2006 (Figure 10). As the bore appeared to dry during each summer it is not possible to comment on minimum groundwater levels however, maximums appeared to have increased slightly since 2006.

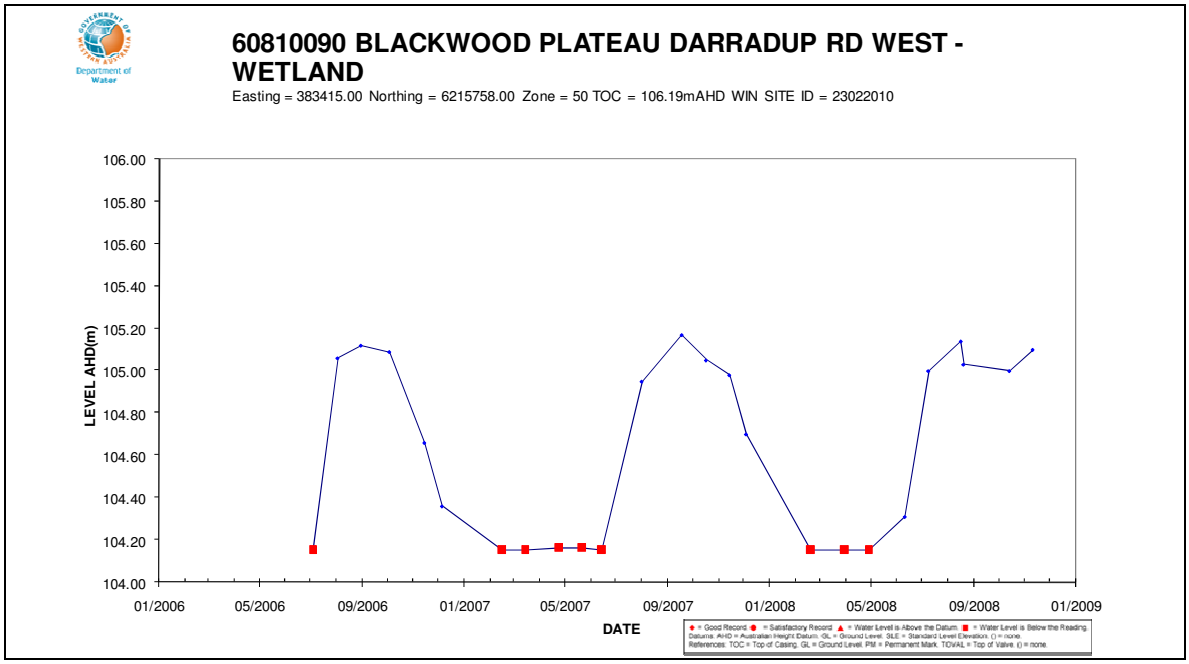

Figure 10: Darradup Rd west groundwater levels 2006-2008.

Milyeanup

A 60 m transect was established to traverse the wetland at this site, with the piezometer located near the center of the basin. The elevational gradient of the transect was lowest in the basin, where a number of small creeks were running, increasing towards the wetland fringe. Vegetation composition and structure changed across the wetland in response to changing water levels. The species poor, yet very dense vegetation of the basin was dominated by *T. linearifolia, T. parviceps* and a number of sedge species including *Lepidosperma tetraquetrum* (Figure 11). The wetland fringes comprised fewer sedges, a greater density of shrubs and tree species including *E rudis, B. littoralis, E. marginata* and *C. calophylla*. As the basin was relatively narrow only three plots were established.

There was a 14.8% increase in canopy health between the 2006 and 2008 monitoring rounds, with species composition across the transect 70% similar to that recorded during the 2006 assessment (Table 3). The single exotic species previously recorded at the site was not identified during the current round.

The overstorey of plot A was dominated by small to moderate *E. rudis* and small *B. littoralis*. The canopy health of some individuals has remained poor and a small number have declined slightly however, the condition of the majority of trees has improved since 2006 (*E. rudis* - 2006: 3-15, mean 8.8; 2008: 3-19, mean 10.4; *B. littoralis* – 2006: 15, mean 15; 2008: 17-19, mean 18) (Appendix 1.1.5, Appendix 3, Table 12). The understorey of sub-plot A1 was still dominated by the fern *Pteridium esculentum* however, the cover of *T. linearifolia* has decreased, with *A. uliginosa* and *Empodisma gracillima* now more abundant. (Appendix 2.1.5). *T. linearifolia* and *L. tetraquetrum* remained dominant in A2 with three other sedge species also very prominent. Eighteen species, including one exotic, were recorded in A1 in 2006, 19 in 2008. A2 supported 11 species in 2006, 6 in 2008 (Table 13).

No trees were recorded in plot B. The almost impenetrable vegetation of sub-plot B1 was dominated by *E. gracillima T. linearifolia, L. tetraquetrum* and an unidentified sedge species. *T. linearifolia* was also dominant in B2 with *T. juniperiana* and a second unidentified sedge. Eight species were noted in B1 in 2006 and 2008. B2 supported 13 species in 2006 and nine in 2008.

Plot C represented the transition from wetland to terrestrial vegetation with the overstorey formed of small to large *C. calophylla* and small to moderately sized *E. marginata*. Although the canopy condition of most trees improved from 2006 to 2008, a single *C. calophylla* was lost (*C. calophylla* - 2006: 5-19, mean 14.1; 2008: 7-21, mean 14.8; *E. marginata* – 2006: 12-17, mean 13.1; 2008: 11-15, mean 15.9). *T. linearifolia* remained the dominant species in the understorey of sub-plot C1 with an unidentified sedge species also abundant in 2008. Less mesic species, including *Acacia extensa, P. esculentum* and *X. preissii* still formed the understorey in C2. Eleven species were recorded in C1 in 2006, 10 in 2008, with 24 in C2 in 2006 and 22 in 2008.

Table 12: Milyeanup - summary of transect data; diameter, health and density of overstorey species (all plots are 20 x 20 m).

Plot		A			B			C		
Year	Spec[1].	05	06	08	05	06	08	05	06	08
Diameter range[2]	B.l.	<2	<2	<2	-	-	-	-	-	-
	E.r.	<2-35.7	<2-35.7	<2-36.3	-	-	-	-	-	-
	C.c.	-	-	-	-	-	-	<2-78.8	<2-78.8	
	E.m.	-	-	-	-	-	-	<2-14.2	<2-15.1	
Health Mean[3]	B.l.	15	15	18	-	-	-	-	-	-
	E.r.	9.4	8.8	10.4	-	-	-	-	-	-
	C.c.	-	-	-	-	-	-	13.0	14.1	14.76
	E.m.	-	-	-	-	-	-	12.7	13.1	15.9
Health Range	B.l.	15	15	17-19	-	-	-	-	-	-
	E.r.	3-14	3-15	3-19	-	-	-	-	-	-
	C.c.	-	-	-	-	-	-	10-17	5-19	7-21
	E.m.	-	-	-	-	-	-	12-16	12-17	11-21
Density[4]	B.l.	2	1	2	-	-	-	-	-	-
	E.r.	14	14	16	-	-	-	-	-	-
	C.c.	-	-	-	-	-	-	28	28	29 (1)
	E.m.	-	-	-	-	-	-	10	10	10

[1]Overstorey species –B.l = *Banksia littoralis;* C.c. = *Corymbia calophylla*; E.m. = *Eucalyptus marginata*; E.r. = *Eucalyptus rudis*
[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. Figures in parenthesis represent tree deaths since the previous assessment.

Table 13: Milyeanup - summary of understorey data (all plots are 5 x 5m).

Plot	A1			A2			B1			B2			C1			C2		
Year	05	06	08	05	06	08	05	06	08	05	06	08	05	06	08	05	06	08
No. species	17	18	19	10	11	6	7	8	8	12	13	9	12	11	10	24	24	22
No. exotics	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Weediness index	0.08	0.08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

a. b. c.

d. e. f.

Figure 11: Milyeanup 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.

Hydrological data for bore 60914937, in close proximity to the Milyeanup wetland transect, were available from May 2006 (Figure 12). As the bore appeared to have dried each summer it is not possible to comment on changes in minimum groundwater levels however, maximums had increased slightly each year since 2006.

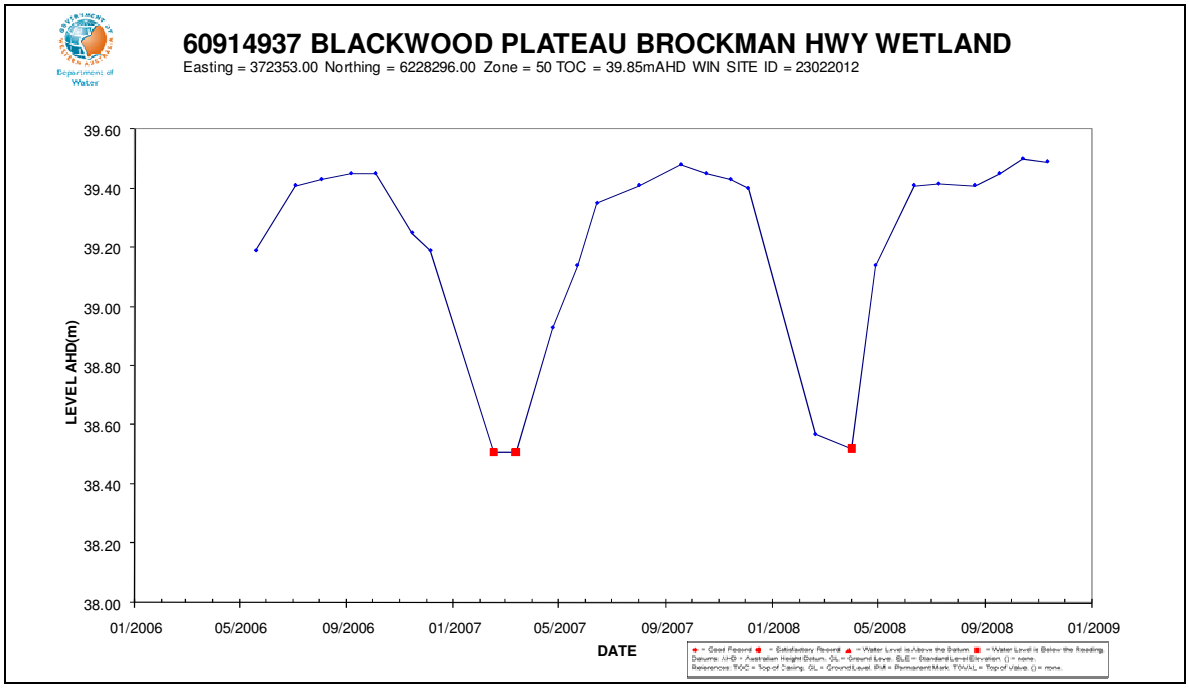

Figure 12: Milyeanup groundwater levels 2006-2008.

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* (Figure 13).

During 2008 there was further decline in canopy condition with mean tree health across the transect increasing by 6.2% (Table 3). Species composition was 81% similar to that described in 2007 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 declined since the 2007 monitoring round, (2005, 2006, 2007: 9; 2008: 7) (Appendix 1.1.6, Appendix 3, Table 14). *Anarthria scabra* continued to dominate the understorey of sub-plot A1 with *X. preissii* now less prevalent than *T. parviceps* and *P. reticulata* (Appendix 2.1.6). A total of 18 species were recorded in this plot in 2007, 20 in 2008 (Table 15). A *Baumea* sp. was still very dominant in A2, with *Callistemon glaucus* and *T. parviceps* also common. Nine species were recorded in this plot in 2007, 10 in 2008.

The health of the two small *M. preissiana* in Plot B declined slightly during 2008 while the single *B. littoralis* remained unchanged, but healthy (*M. preissiana* 2007: 15-21, mean 18; 2008: 15-19, mean 17, *B. littoralis* –2007 and 2008: 21). The unidentified sedge species from A2 remained very dominant in sub-plot B1, with *Sphenotoma gracile, T. parviceps, B. sparsa* and *E. gracillimum.* Nine native species were recorded in this plot in 2007 and 10 in 2008. *T. parviceps, B. sparsa* and *Baumea* sp. were still dominant in B2. Twelve species were recorded in B2 in 2007 and 17 in 2008.

Table 14: 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	08	05	06	07	08
Diameter range[2]	M.p.	9.1 - 16.7	9.1 - 16.7	7.0 – 14.5	7-16	<2 - 19.5	<2 - 19.5	<2 - 19	<2-19
	B.l.	-	-	-	-	8.8 - 13.2	8.8 - 13.2	8 - 13	13.8
Health Mean[3]	M.p.	9	9	9	7	15	16	18	17
	B.l.	-	-	-	-	18	21	21	21
Health Range	M.p.	9	9	9	7	13 - 17	15 - 17	15 - 21	15-19
	B.l.	-	-	-	-	18	21	21	21
Density[4]	M.p.	1	1	1	1	2	2	2	2
	B.l.	-	-	-	-	1	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 15: Poison Gully - summary of understorey data (all plots are 5 x 5m).

Plot	A1				A2				B1				B2			
Year	05	06	07	08	05	06	07	08	05	06	07	08	05	06	07	08
No. species	17	18	18	20	7	7	9	10	10	9	9	10	11	13	12	17
No. exotics	0	0	0	0	0	0	0	0	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

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

Bore 60910125, in close proximity to the Poison Gully transect was established in mid-2006 (Figure 14). Data indicated a short-term, declining trend in minimum and maximum groundwater levels however, the water regime appeared somewhat aseasonal.

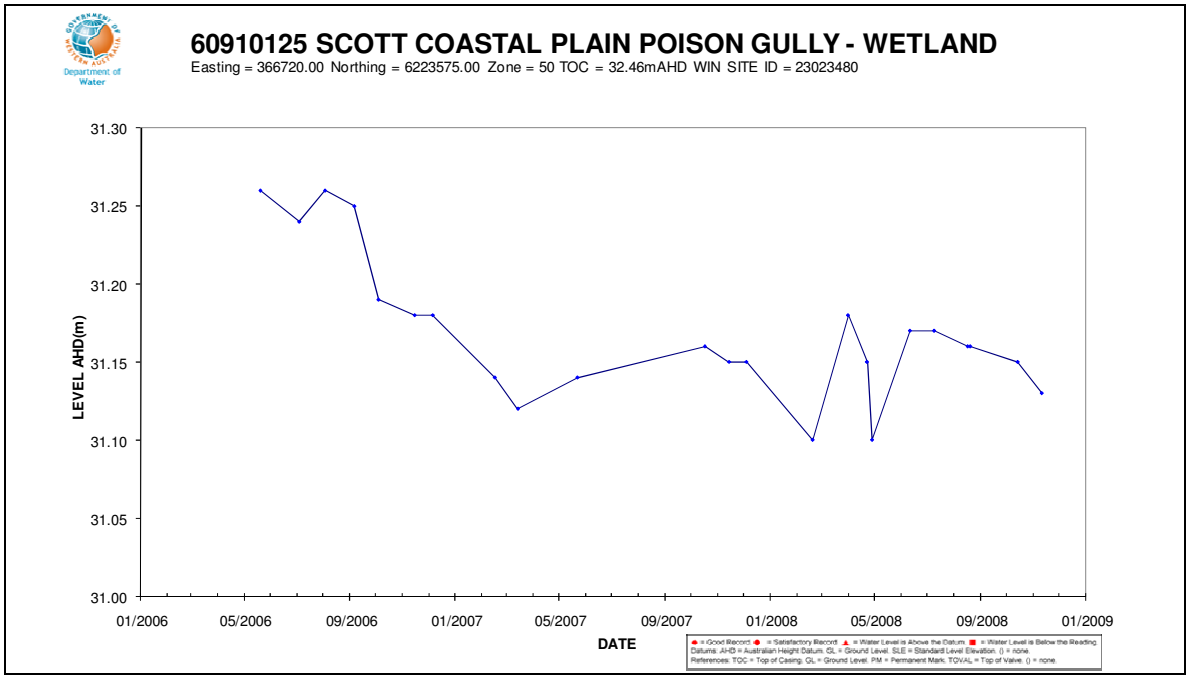

Figure 14: Poison Gully wetland groundwater levels 2006-2008.

Blackpoint/ Mayall Rd

The newly established transect was located adjacent to farmland on the north-eastern corner of D'Entrecasteaux National Park, approximately 200 m east of the intersection of Blackpoint and Mayall Rds. As a bore is yet to be established at this site, a location was chosen to allow drill rig access without having to traverse inundated, roadside sumps. The 80 m transect ran perpendicular to the road, increasing in elevation with distance. The elevational gradient is reflected in changes in species composition with the low lying area adjacent to the road dominated by sedges and *M. preissiana,* progressing through mixed wetland shrubs and sedges and into *E. marginata* woodland over less mesic shrubs (Figure 15). The multi-stemmed nature of the trees across the site suggested the area have been burnt sometime in the past. A total of seven exotic species were recorded on the transect.

At the time of baseline monitoring in November 2008, the first 13.5 m of Plot A was inundated. Healthy, multi-stemmed *M. preissiana* (2008: 17-21, mean: 19) formed the overstorey across the first 5 m of this plot, with multi-stemmed *E. marginata* of moderate to good health (2008: 9-20, mean: 14.2) located on higher ground near the end of the plot (Appendix 1.1.7, Appendix 3, Table 16). The largely inundated understorey of sub-plot A1 was dominated by the sedge *Meeboldina scariosa* and *Astartea fascicularis*. A total of 20 species, including seven exotics were recorded, giving this plot a weediness index of 0.97 (Appendix 2.1.7, Table 17). *Anarthria scabra* and *D. bromeliifolius* were dominant on the higher ground of A2 with the shrub *M. thymoides* also abundant. A total of 30 native species were identified in A2.

Small *E. marginata,* ranging in health from poor to very good (2008: 5-21, mean: 12.3), occurred in dense clumps across plot B, with a small number of seedling/ saplings also noted. An unidentified *Hypocalymma* sp. was most dominant in B1 with sedges *E. aristata* and *M. denmarkica* also abundant. Twenty seven native and three exotics occurred in the plot, which scored a weediness index value of 0.17. Dense *A. scabra* dominated the understorey of B2. *M. thymoides, Andersonia caerulea, Jacksonia horrida* and *Schoenus efoliatus* were also common. Twenty five species were identified in B2.

Clumps of small *E. marginata* also occurred across plot C. Although mean tree health was slightly higher than that recorded in Plot B, some individuals were very unhealthy (2008: 1-17, mean: 12.6). *Hypocalymma* sp. and *T. parviceps* were the most dominant of the 21 native species recorded in sub-plot C1. *A. scabra* was dominant in C2 with *T. parviceps* and *M. thymoides*. A further 27 species were identified in this plot.

Plot D supported *E. marginata* of similar habit and health to those recorded in plot C (2008: 3-20; mean: 15.8). *A. scabra* was very dominant in the understorey of both D1 and D2, with *J. horrida* and an *Acacia* sp. also prominent in D1 and *M. thymoides* in D2. Twenty five and 26 native species were identified in D1 and D2 respectively.

Table 16: Blackpoint/ Mayall 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].	08	09	10	08	09	10	08	09	10	08	09	10
Diameter range[2]	Mp	<2-20			-			-			-		
	Em	<2-13.5			<2-14.7			<2-12.5			<2-14.2		
Health Mean[3]	Mp	19			-			-			-		
	Em	14.2			12.3			12.6			15.8		
Health Range	Mp	17-21			-			-			-		
	Em	9-20			5-21			1-17			3-20		
Density[4]	Mp	4			-			-			-		
	Em	5			37			44			20		

[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 17: Blackpoint/ Mayall Road - summary of understorey data (all plots are 5 x 5m).

Plot	A1			A2			B1			B2			C1			C2			D1			D2		
Year	08	09	10	08	09	10	08	09	10	08	09	10	08	09	10	08	09	10	08	09	10	08	09	10
No. species	20			30			30			25			21			29			25			26		
No. exotics	7			0			3			0			0			0			0			0		
Weediness index	0.97			0			0.17			0			0			0			0			0		

Figure 15: Blackpoint/ Mayall Rds 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.

Stewart Rd

This 80 m transect was the second established at a wetland on Stewart Rd between Great South and Milyeanup Rds. Unlike the first transect, it runs parallel to the road moving upgradient from the wetland proper into littoral and then terrestrial vegetation (Figure 16). It also incorporates a greater diversity and density of trees, including *M. preissiana, B. littoralis, E. marginata* and *C. calophylla*. At the time of assessment the transect was inundated to 40 m.

A small number of healthy *M. preissiana* (2008: 17-19, mean: 18.5) (Appendix 1.1.8, Appendix 3, Table 18) occurred within the first 5 m of plot A in an area that was inundated to a depth of approximately 0.3 m. Sub-plot A1 was dominated by the native shrubs, *P. ellipticum* and *Hakea ceratophylla* with mixed sedges including *M. scariosa, Hypolaena* sp. and *Chordifex amblycoleus* (Appendix 2.1.8, Table 19). The P4 species *M. basicephala,* was also recorded in the plot. A total of 15 native species were identified in A1. *M. basicephala* was the most dominant shrub in A2, with *H. ceratophylla, Eriostemon* sp. and the sedge, *Leptocarpus elegans.* Fourteen species were recorded in A2.

No trees occurred in plot B. The dominance of *H. ceratophylla* and *L. elegans* continued across inundated sub-plots B1 and B2, with an unidentified Papilionaceae sp. also abundant in B1 and an unidentified sedge common in B2. Seventeen species were recorded in B1, 13 in B2.

Plot C represented the transition was wetland to littoral vegetation. The large *M. preissiana, C. calophylla* and *E. marginata* across Plot C showed evidence of having been impacted by fire within the last four years with the canopies of most trees still re-establishing (*M. preissiana* – 2008: 12-23, mean 17.1; *E. marginata* - 2008: 10-22, mean 15.2; *C. calophylla* – 2008: 13-18, mean 15.6). The understorey of sub-plot C1 was dominated by wetland species, including *P. ellipitcum, M. scariosa, M. basicephala* and *Hypolaena* sp. A total of 13 species were identified in this plot. Although many less mesic species occurred in sub-plot C2, *T. juniperiana* and *M. graciliceps* were dominant. Twenty five native species were noted in C2.

The density of overstorey species increased in plot D with a large number of *E. marginata* seedlings and saplings also recorded across the plot. The health of the vast majority of trees ranged from good to very good (*M. preissiana* – 2008: 12-21, mean 17.5; *E. marginata* – 2008: 12-23, mean 18.5; *C. calophylla* – 2008: 3-20, mean 14.9, *B. littoralis* – 2008: 21-23, mean 22). *T. juniperiana* was dominant in the understorey of D1 and D2 with the native fern *Lindsaea linearis* also abundant in D2. A total of 27 species were recorded in D1, 23 in D2.

Table 18: Stewart 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].	08	09	10	08	09	10	08	09	10	08	09	10
Diameter range[2]	Mp	<2-46			-			<2-42.5				<2-53	
	Em	-			-			<2-46.5				<2-35	
	Cc	-			-			17-33				<2-34.6	
	Bl	-			-			-				<2	
Health Mean[3]	Mp	18.5			-			17.1				17.5	
	Em	-			-			15.2				18.5	
	Cc	-			-			15.6				14.9	
	Bl	-			-			-				22	
Health Range	Mp	17-19			-			12-23				12-21	
	Em	-			-			10-21				12-23	
	Cc	-			-			13-18				3-20	
	Bl	-			-			-				21-23	
Density[4]	Mp	4			-			17				8	
	Em	-			-			11				50	
	Cc	-			-			5				9	
	Bl	-			-			-				2	

[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 19: Stewart Road - summary of understorey data (all plots are 5 x 5m).

Plot	A1			A2			B1			B2			C1			C2			D1			D2		
Year	08	09	10	08	09	10	08	09	10	08	09	10	08	09	10	08	09	10	08	09	10	08	09	10
No. species	15			14			17			13			13			25			27			23		
No. exotics	0			0			0			0			0			0			0			0		
Weediness index	0			0			0			0			0			0			0			0		

Figure 16: Stewart 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.

Although a bore is yet to be installed adjacent to the new transect, hydrodata available for bore 60914938 established in 2006 in close proximity to the initial transect suggested that maximum groundwater levels have remained relatively stable in the short-term (Figure 17). However, as the bore appeared to dry each summer, it is not possible to comment on trends in minimum levels.

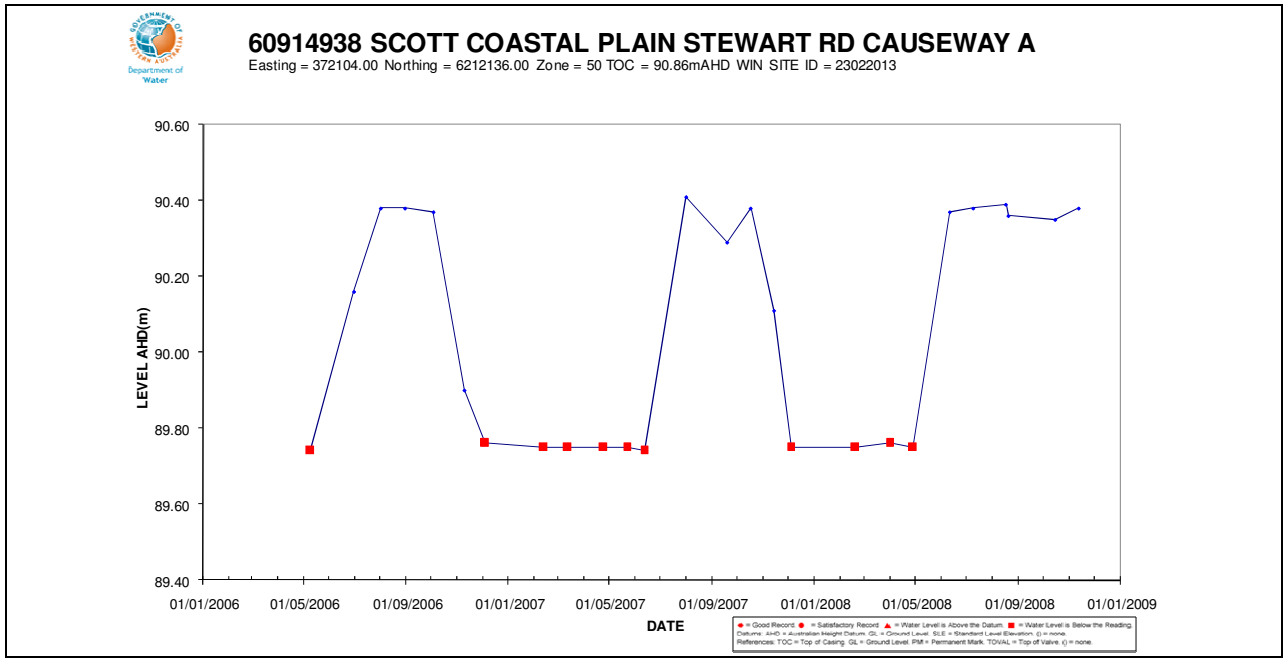

Figure 17: Stewart Rd Causeway wetland groundwater levels 2006-2008.

Western Scott Coastal Plain Sites

The five Western Scott Coastal Plain sites were established in February 2008 with baseline monitoring also undertaken at this time. As the current assessment represents the first spring monitoring, there is likely to be some disparity in species lists/ composition between the two monitoring rounds (ie. summer vs. spring).

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 18). There is little change in elevation across the transect. No hydrological data were available for this site. Although the transect was dry at the time of monitoring, surface water had been noted across plots A and B in an earlier site visit.

There was little change in canopy condition between February and November, with a 1.6% decline in health (Table 3). No exotics were recorded across the transect and species composition was 73% similar to that described in February.

M. 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 1.1.9, Appendix 3, Table 20). The canopy condition of the *C. calophylla* remained unchanged from baseline monitoring (Feb and Nov 2008: 13-21, mean 16.3). However, although *M. preissiana* remained in good to very good condition, mean health had decreased since baseline monitoring (Feb 2008: 13-19, mean 14.7; Nov 2008: 11-19, mean 14.1). Sub-plot A1 remained sparsely vegetated with *P. ellipticum* and *Hibbertia hypericoides* most abundant and still only one or two individuals of other species present (Appendix 2.1.9, Table 21). The P1 species¸ *Hemigenia rigida* identified in February was no longer present. A total of 18 native species were recorded in February, 19 in November. *P. ellipticum* and the sedge, *M. ustulata* remained very abundant in A2. Twenty two species were identified in this plot in February, 27 in November.

The health of the two mature *M. preissiana* in plot B declined during 2008 (Feb 2008: 13-17, mean 15; Nov 2008: 11-17, mean 13.5) however, the *M. preissiana* and *C. calophylla* saplings recorded in February had persisted. The understorey remained much denser than plot A with *P. ellipticum* and *X. preissii* still most abundant in B1 and *P. ellipticum, Adenanthos meisneri, M. denmarkica* and *Melanostachys ustulata* in B2. A total of 20 species were recorded in B1 in February, 23 in November. Twenty five species were identified in B2 during both baseline and spring monitoring.

M. preissiana in Plot C, ranged from saplings to large, multi-stemmed trees, the health of which remained unchanged during 2008 (Feb and Nov: 13-15, mean 14.5). *P. ellipticum* was still very dominant across both sub-plots with *M. tetragona* also abundant in C1 and *M. ustulata* and *M. denmarkica* in C2. Nineteen native species were recorded in C1 in February, 24 in November, with 20 and 23 in C2 during February and November respectively.

The health of one of the two moderately sized *M. preissiana* in plot D improved slightly during 2008 (Feb 2008: 17, mean 17; Nov 2008: 17-19, mean 18). Sub-plot D1 was still densely

vegetated with *A. fascicularis, T. juniperiana* and *M. tetragona* abundant. The sedges, *Lyginea imberbis, M. denmarkica* and *H. exsulca,* were dominant in the muddy ground of D2. Nineteen species were recorded in D1 in February, 28 in November. During the same periods 24 and 28 species were identified in D2.

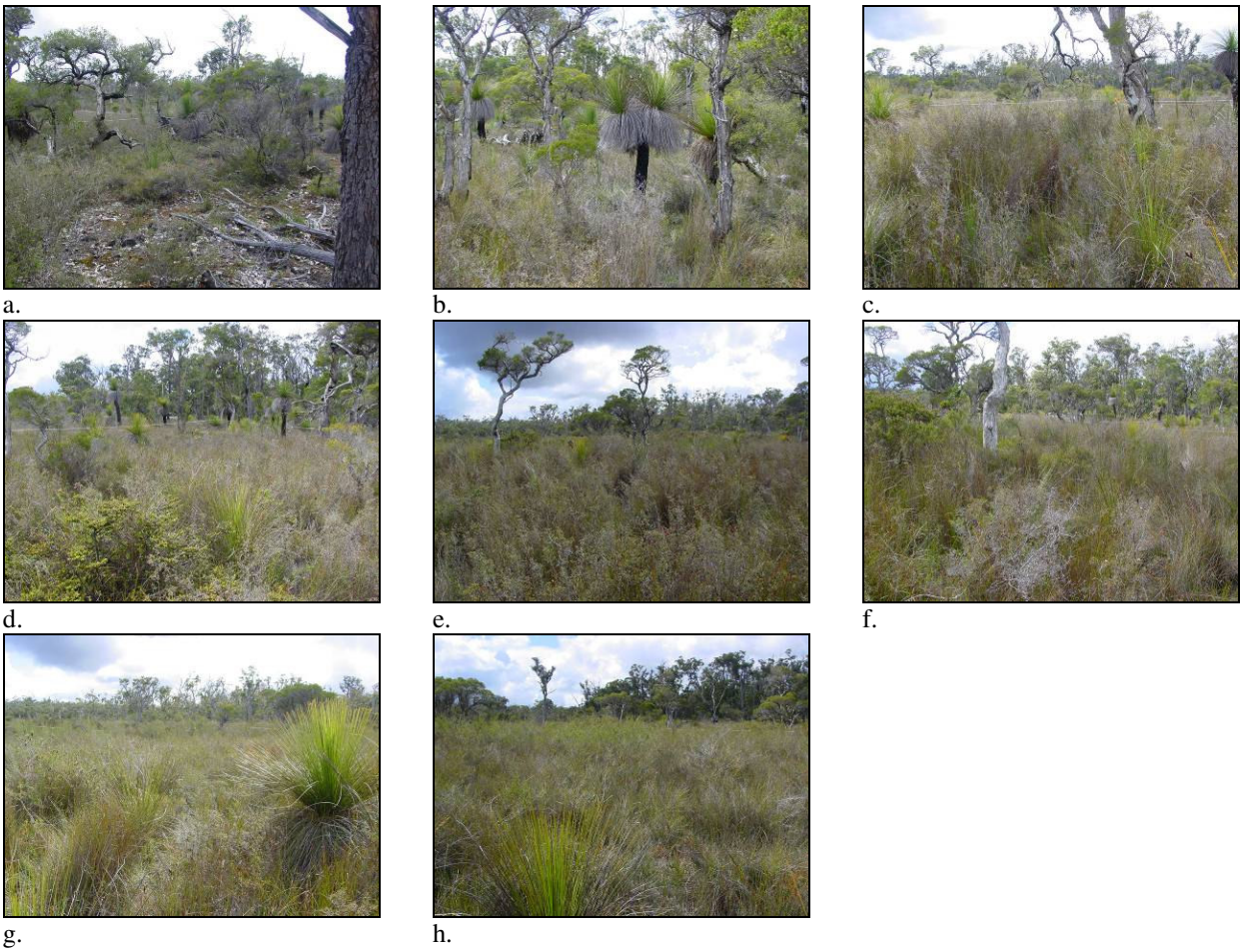

Figure 18: Adelaide Road wetland vegetation monitoring transect. All photos taken looking diagonally across the plot; a) 0-20m; b) 20-0 m; c) 20-40 m; d) 40-20 m; e) 40-60 m; f) 60-40 m; g) 60-80m; h) 80-60m.

Table 20: 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	08	09	07/08	08	09	07/08	08	09	07/08	08	09
Diameter range[2]	M.p	<2-28.9	<2-28.9		<2- 5.8	<2-45.8		<2 - 25.0	<2-25		9.5 - 13.2	9.5-13.2	
	C.c	<2-7.1	<2-27.1		-	-		-	-		-	-	
	E.m	-	-		<2	<2		-	-		-	-	
Health Mean[3]	M.p	14.7	14.11		15	13.5		14.5	14.5		17	18	
	C.c	16.3	16.33		-	-		-	-		-	-	
	E.m	-	-		-	-		-	-		-	-	
Health Range	M.p	13-19	11-19		13-17	11-17		13- 5	13-15		17	17-19	
	C.c	13-21	13-21		-	-		-	-		-	-	
	E.m	-	-		-	-		-	-		-	-	
Density[4]	M.p	9	9		3 + 2 saplings	5		4	4		2	2	
	C.c	3 + 16 seedlings & 4 saplings	3		-	-		-	-		-	-	
	E.m	-	-		4 saplings	4 sap		-	-		-	-	

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

Plot	A1			A2			B1			B2			C1			C2			D1			D2		
Year	07/08	08	09	07/08	08	09	07/08	08	09	07/08	08	09	07/08	08	09	07/08	08	09	07/08	08	09	07/08	08	09
No. species	18	19		22	27		20	23		25	25		19	24		20	23		19	28		24	28	
No. exotics	0	0		0	0		0	0		0	0		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	

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 (Figure 19). Three Priority flora species, *Grevillea papillosa*, *Adenanthos detmoldii* and *Cyathochaeta* stipiodes, occurred on the transect. Although the site was completely dry at the time of baseline monitoring, during November the transect was inundated from 5 m to 80 m to depths of up to 0.35 m.

There was a 10.7% decline in canopy condition across the transect between February and November 2008 (Table 3). The number of exotics declined by 0.25%, falling from 12 to 9, and species composition was 88% similar to that recorded during baseline monitoring.

The overstorey of plot A comprised a single, multi-stemmed *M. preissiana* and several small *C. calophylla* (Appendix 1.1.10, Appendix 3, Table 22). A single *B. littoralis* seedling and several *C. calophylla* seedlings/ saplings were also recorded across the plot. The health of the *M. preissiana* and the *C. calophylla* increased slightly during 2008 (*M. preissiana* – Feb 2008: 19, Nov 2008: 21; *C. calophylla* – Feb 2008: 15-21, mean 17.8; Nov 2008: 15-21, mean 18.7) however the condition of the *B. littoralis* declined slightly (Feb 2008: 23; Nov 2008: 21).

The sedges *M. tetragona* and *Empodisma gracillimum*, along with the shrubs *B. sparsa, Grevillea papillosa*, a P3 species, and *Adenanthos detmoldii*, a P4 species still dominated across the low, species rich, understorey of sub-plot A1 (Appendix 2.1.10, Table 23). Two of the 26 species identified in February were exotic and the plot scored a weediness index value of 0.11. During November monitoring 30 species were identified, none of which were exotic. Sub-plot A2 was located on the edge of an access track in the wettest area of the transect. This was reflected in a high percentage of exotics (seven of 14 species in Feb, five of six in Nov) and the significant decline in species richness since baseline monitoring. *Juncus microcephala** and *Mentha pulegium** remained the most abundant. The weediness index value declined from 2.61 to 1.92, but remained the highest on the transect.

The condition of the single, multi-stemmed *M. preissiana* in the open overstorey of plot B improved during 2008 (Feb: 17: Nov: 19) however, the small *B. littoralis* was slightly less healthy in spring (Feb: 23; Nov: 21). Exotics were less common in the understorey with the native sedges *Juncus pallidus* and *Baumea juncea* now most abundant, and *Alternanthera nodiflora,* the small native herb, also common. *J. pallidus* dominated the understorey of B2 with *A. fascicularis* and *G. papillosa.* During baseline monitoring six of the 16 species identified in B1 were exotic, the plot scoring a weediness index value of 1.08. In November species richness had declined to 10, with three exotics and a weediness value of 0.33. In B2, overall species richness declined from 16 to 10, exotic richness from seven to four, and the weediness value from 1.32 to 0.77.

The canopy condition of the single, large, multi-stemmed *M. preissiana* in plot C declined during 2008 (Feb: 15; Nov: 11). *J. pallidus, A. nodiflora* and the exotic herb, *Epilobium hirtigerum** remained dominant in the understorey of C1, with the Priority species, *Cyathochaeta stipoides,*

also now abundant. Of a total of 18 species recorded in February, eight were exotic (weediness index value of 1.4). By November total richness had declined to 14 with four exotics (weediness value of 0.56). *A. fascicularis* still dominated C2 with *C. stipoides, M. pulegium** and *A. nodiflora* now also prevalent. Seven of the 20 species identified in C2 during baseline monitoring were exotic, giving the plot a weediness index of 0.89. In November richness had declined to 12, with two exotics and a weediness index value of 0.4

The overstorey of Plot D was formed by a single, large, multi-stemmed *M. preissiana* the canopy condition of which remained unchanged (Feb: 21; Nov: 21). Two small *M. preissiana* and a small *B. littoralis* occurred just beyond the transect, but were included in the assessment. All small individuals remained in very good condition (*M. preissiana* – Feb 2008: 23, Nov 2008: 20, mean 19-21; *B. littoralis* – Feb 2008: 23; Nov 2008: 23). The Priority species, *G. papillosa* was dominant in sub-plot D1 with *Medicago* sp.* and *X. preissii*. In February nine of the 30 species in D1 were exotic, the plot scoring a weediness index of 0.84. In November species richness had declined to 25, with six exotics and a weediness value 0.41. *G. papillosa* and *X. preissii* were also dominant in D2, with *Medicago* sp.*, *M. pulegium** and *Tricostularia neesii*. A weediness index of 0.56 was recorded in February with 7 exotics identified out of a total of 30 species. In November eight of 17 species were exotic with weediness values increasing to 0.85.

Figure 19: 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 22: 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	08	09	07/08	08	09	07/08	08	09	07/08	08	09
Diameter range[2]	M.p	31.0-35.4	31-35.4		11.1-22.3	11.1-22.3		7.5-13.7	7.5-13.7		<2-21.8	<2-21.8	
	C.c	<2-7.5	<2-8.5		-	-		-	-		-	-	
	B.l	<2	<2		10.6	3-12.3		-	-		23	4.2	
Health Mean[3]	M.p	19	21		17	19		15	11		22.3	20.3	
	C.c	17.8	18.7		-	-		-	-		-	-	
	B.l	23	21		23	19		-	-		23	23	
Health Range	M.p	19	21		17	19		15	11		21-23	19-21	
	C.c	15-21	15-21		-	-		-	-		-	-	
	B.l	23	21		23	19		-	-		23	23	
Density[4]	M.p	1	1		1	1		1	1		3	3	
	C.c	7 + 16 seedlings & 2 saplings	7		-	-		-	-		-	-	
	B.l	1	1		1	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 23: Dennis Road - summary of understorey data (all plots are 5 x 5m).

Plot	A1			A2			B1			B2			C1			C2			D1			D2		
Year	07/08	08	09	07/08	08	09	07/08	08	09	07/08	08	09	07/08	08	09	07/08	08	09	07/08	08	09	07/08	08	09
No. species	26	31		14	6		16	10		16	8		18	14		20	12		30	25		29	17	
No. exotics	2	0		7	5		6	3		7	4		8	4		7	2		9	6		7	8	
Weediness index	0.11	0		2.61	1.92		1.08	0.33		1.32	0.77		1.40	0.56		0.89	0.4		0.84	0.41		0.56	0.85	

Reedia North

The Reedia North site is located on Blackwood Rd within the Blackwood River National Park. The transect traverses a sedge dominated wetland on Spearwood Brook, a tributary of the Blackwood River. The 80 m transect runs east from open *E. marginata/ C. calophylla* woodland, down gradient (Figure 20) across the sedge/ shrub dominated basin and back into *E. marginata/ C. calophylla* woodland on the far side. There was no surface water at the time of transect establishment and baseline monitoring however, shallow water was ponding and flowing slowly in low lying areas during the spring monitoring.

There was a significant (30.1%) decline in mean canopy health across the transect during 2008. However, this was largely due to the addition of unhealthy trees overlooked during the baseline assessment (Table 3). No exotics were recorded on the transect in either monitoring period and species composition was 72% similar to that described during February.

Several medium sized and one very large *E. marginata* formed the overstorey of Plot A with *A. fraseriana.* The canopy condition of the mature *E. marginata* improved over 2008 (Feb 2008: 4-14, mean 10.6; Nov 2008: 4-19, mean 11.7) (Appendix 1.1.11, Appendix 3, Table 24). *E. marginata, C. calophylla* and *B. littoralis* seedlings persisted in the understorey however, the health of the *B. littoralis* seedling declined markedly (Feb: 23, Nov: 3). Although the understorey of sub-plot A1 was sparsely vegetated, 22 native species were identified in February, increasing to 26 in November (Appendix 2.1.11, Table 25). *Dasypogon bromeliifolius* was extremely abundant with *H. hypericoides* also relatively common. Species richness also declined in A2 dropping from 37 to 30 species. An unidentified *Baumea* sp. was now most common, with two further unidentified sedges and *T. linearifolia* also abundant.

Plot B represented the transition into wetland vegetation. Although no mature trees were recorded, five *C. calophylla* seedlings/ saplings, all remained in very good condition (Feb and Nov 2008: 21-23, mean 22). The dense understorey of sub-plot B1 was dominated by *T. linearifolia* and *A. fascicularis* and sedges including *X. gracillima* and *Empodisma* sp. A total of 16 native species were identified in this plot in February, decreasing to nine in November. The domination of *T. linearifolia* 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. *T. linearifolia* was most abundant in species poor C1 with the sedges *Sporadanthus rivularis, X. gracillima* and *Baumea* sp. Nine species were recorded in C1 in February seven in November. The dominance of *T. linearifolia* and mixed sedges continued in C2. In C2, 27 species were noted in February, 19 in November.

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 declined slightly during 2008 (*E. marginata* – Feb 2008: 6-15, mean 11.3, Nov: 11.2, mean 7-15; *C. calophylla* – Feb 2008: 7-15, mean 11, Nov 2008: 9, mean 9).

Although the large shrubs, *T. linearifolia* and *Homalospermum firmum,* where the most dominant individual species in D1, mixed sedges, including *Baumea* sp. Blackwood and *X. gracillima* continued to dominate the understorey. A total of 14 native species were identified in D1 during baseline monitoring, 10 during spring. The species composition of D2 reflected the increase in elevation, with *T. parviceps, Mesomelaena tetragona, X. preissii, Leucopogon australis, H. firmum*, and *C. calophylla* seedlings most abundant in the understorey. Twenty four species were noted in D2 in February, increasing to 25 in November.

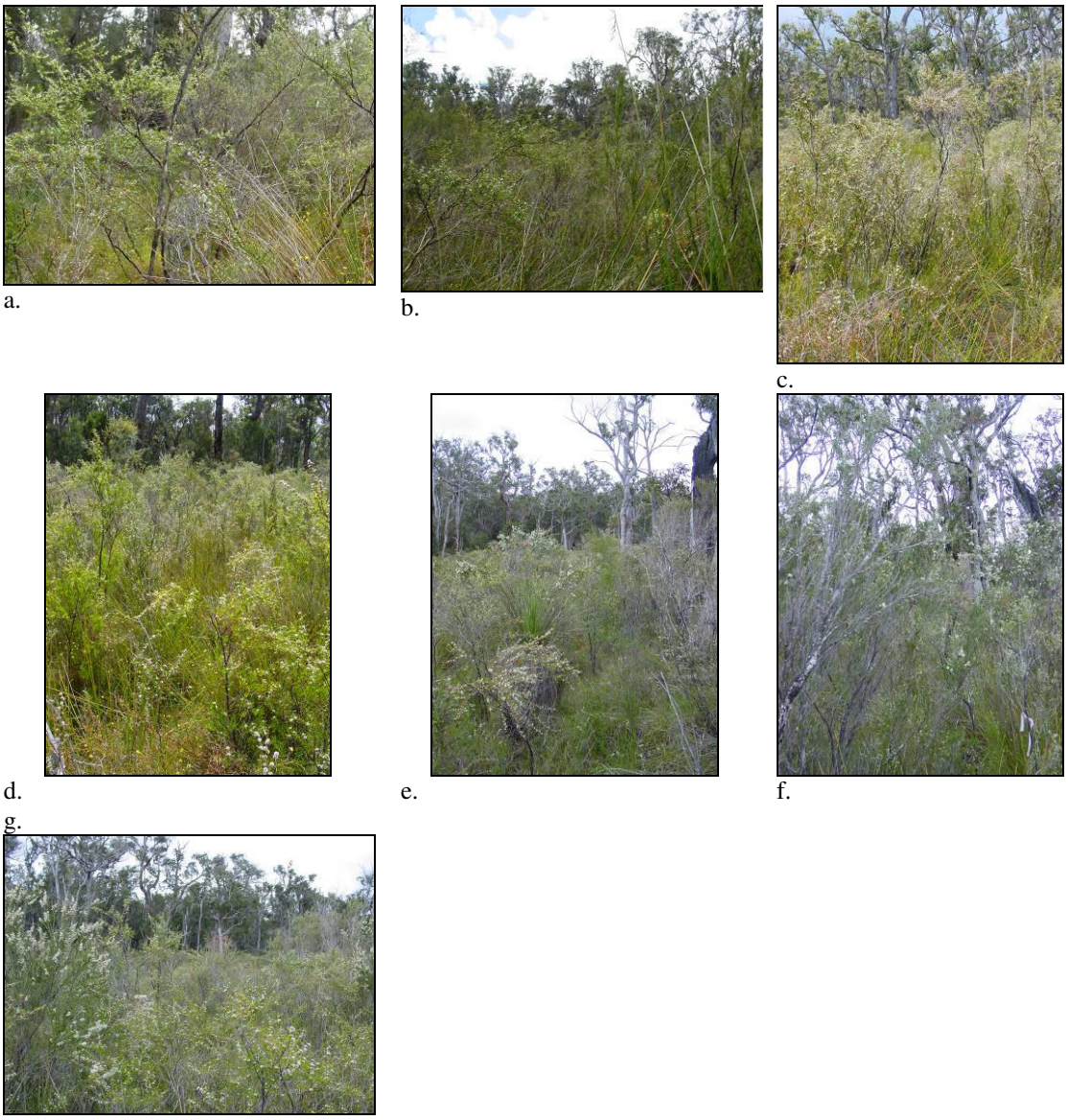

Figure 20: Reedia North wetland vegetation monitoring transect. All photos taken looking diagonally across the plot; a) 0-20m; b) 20-0 m; c) 20-40 m; d) 40-20 m; e) 40-60 m; f) 60-40 m; g) 60-80m.

Table 24: 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	08	09	07/08	08	09	07/08	08	09	07/08	08	09
Diameter range[2]	E.m.	<2- 02.0	<2-102		-	-		<2	<2		<2-39.6	<2-68.7	
	C.c.	<2	<2		<2-2.3	2.2-3.8		-	37.8		41.4-68.0	41-68	
	B.l	<2	<2		-	-		-	-		-		
Health Mean[3]	E.m.	10.6	11.67		-	-		13	16		11.3	11.25	
	C.c.	-	-		22	22		-	5		11	9	
	B.l	23	3		-	-		-	-		-	-	
Health Range	E.m.	4-14	4-19		-	-		13	16		6-15	7-15	
	C.c.	-	-		21-23	21-23		-	-		7-15	9	
	B.l	23	3		-	-		-	-		-	-	
Density[4]	E.m.	9 + 13 seedlings	9		-	-		1	1		6 + 76 seedlings & 8 saplings	8	
	C.c.	8 seedlings	-		2 + 2 seedlings & 1 sapling	2		6 seedlings	1 + 6 seedlings		2 + 19 seedlings	2	
	B.l	1	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 25: Reedia North - summary of understorey data (all plots are 5 x 5m).

Plot	A1			A2			B1			B2			C1			C2			D1			D2		
Year	07/08	08	09	07/08	08	09	07/08	08	09	07/08	08	09	07/08	08	09	07/08	08	09	07/08	08	09	07/08	08	09
No. species	22	26		37	30		16	9		13	12		9	7		27	19		14	10		24	25	
No. exotics	0	0		0	0		0	0		0	0		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	

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 21). 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.

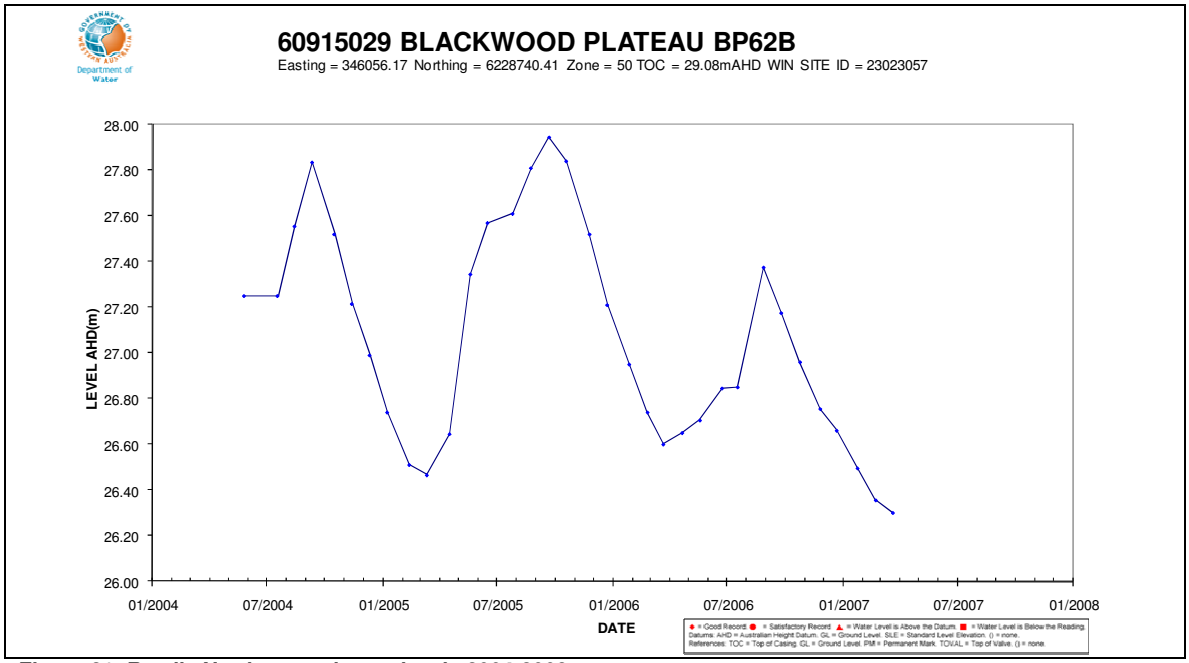

Figure 21: Reedia North groundwater levels 2004-2008.

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* (Declared Rare Flora) dominated wetland on Adelaide Brook, a tributary of the Blackwood River.

The 80 m transect runs east from open, mixed, *Eucalyptus* woodland, down a steep gradient through sparse *E. megacarpa,* across the sedge dominated basin and back into *E. marginata/ C. calophylla* woodland on the far side (Figure 22). Although the basin was dry at the time of transect establishment and baseline monitoring, numerous narrow, 'creeks' were flowing through the area during the November monitoring round. There was a 4.2% improvement in mean canopy health across the transect during 2008 (Table 3). A single exotic species was recorded in November and species composition was 78% similar to that described during February.

The canopy condition of the *E. marginata* forming the majority of the overstorey in plot A, improved during 2008, along with the four large *E. megacarpa* and the single *C. calophylla* (Appendix 1.1.12, Appendix 3, Table 26). The condition of the seedlings and/ or saplings of each species also improved during this time (*E. marginata* – Feb 2008: 11-21, mean 16.2, Nov 2008: 9-21, mean 16.3; *E. megacarpa* – Feb 2008: 11-21, mean 16.5; Nov 2008: 15-21, mean 16.8; *C. calophylla* – Feb 2008: 17, Nov 2008: 19). The understorey of sub-plot A1 was dominated by *Baumea* sp., *T. parviceps, H. hypericoides* and *T. neesii*. A total of 23 native species were identified in the plot in February increasing to 34 in November (Appendix 2.1.12, Table 27). Native sedges dominated sub-plot A2. Although the P3 species, *Cyathochaeta teretifolia* was the most prevalent species in February, it was not recorded in November, most likely the result of misidentification. In November *H. firmum, T. linearifolia, Loxocarya cineria* and *Lepidosperma* sp. were the most abundant species in the plot. A total of 19 native species were identified in this plot in February, 11 in November.

There was a slight improvement in the canopy condition of the medium sized *E. marginata* in the open overstorey of plot B (Feb 2008: 7-13, mean 10; Nov 2008: 9-13, mean 11) and a decline in the small *E. megacarpa* (Feb 2008: 15-19, mean 18; Nov 2008: 15-19, mean 16.3). The health of seedlings and/ or saplings of both *Eucalyptus* species and *C. calophylla* remained largely unchanged as did the *A. fraseriana*. *T. parviceps* was abundant in the understorey of B1, with *Leucopogon australis* and *Drosera* sp. also relatively common. A total of 22 native species were recorded in this plot during baseline monitoring and 27 in November. Although sub-plot B2 was species poor (11 and 12 species in Feb and Nov respectively), it was densely vegetated. The DRF species, *Reedia spathacea*, dominated the plot with *H. firmum, S. rivularis* and *B. rubiginosa* and *E. gracillima* also abundant.

There were no trees in Plot C. Although sub-plot C1 was less dense than species-poor B2 (11 and 13 species in Feb and Nov respectively), a small number of species again represented the majority of the vegetative cover. One exotic was also recorded in C1,

resulting in a weediness value of 0.13. *S. rivularis* was most abundant with *H. firmum, A. pulchella, T. linearifolia* and *R. spathacea.* Sixteen native species were identified in C2 in February increasing to 23 in November. The small shrub, *Boronia fastigiata*, was most abundant with *Xyris* sp., *T. linearifolia, H. firmum* and *S. rivularis* also common.

The condition of the two small *E. megacarpa* in plot D improved during 2008 (Feb 2008: 16-19, mean 17.5; Nov 2008: 17-19, mean 18). The understorey of species-poor, sub-plot D1 (12 and 14 species in Feb and Nov respectively) was dominated by *R. spathacea,* with *T. linearifolia, B. rubiginosa, E. gracillima* and *Aotus cordifolium* also common. *Tetraria capillaris, S. rivularis* and were the most abundant of the remaining species. *H. firmum, B. rubiginosa, Leptocarpus* sp. and *B. fastigiata* were the most abundant species in D2. Sixteen species were identified in February, increasing to 18 in November, including one exotic (weediness value, 0.09).

Figure 22: Reedia South wetland vegetation monitoring transects. 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 26: 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	08	09	07/08	08	09	07/08	08	09	07/08	08	09
Diameter range[2]	E.m.	<2-20.5	<2-20.5		9.6-18.6	9.6-18.8		-	-		-	-	
	C.c.	6.0	5.6		-	-		-	-		-	-	
	E.mc	39.7-46.4	39.7-46.4		<2-38.4	<2-38.4		-	-		3.2-16.8	2.3-16.8	
Health Mean[3]	E.m.	16.2	16.28		10	11		-	-		-	-	
	C.c.	17	19		-	-		-	-		-	-	
	E.mc	16.5	16.75		16	16.33		-	-		17.5	18	
Health Range	E.m.	11-21	9-21		7-3	9-13		-	-		-	-	
	C.c.	17	19		-	-		-	-		-	-	
	E.mc	11-21	15-21		15-19	15-19		-	-		16-19	17-19	
Density[4]	E.m.	17 + 59 seedlings & 4 saplings	18		2 + 22 seedlings & 1 sapling	2		-	-		-	-	
	C.c.	1 + 11 seedlings	1		8 seedlings	-		-	-		-	-	
	E.mc	4 + 4 seedlings	4		6 + 6 seedlings & 2 saplings	6		-	-		2 + 2 seedlings	2	

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

Plot	A1			A2			B1			B2			C1			C2			D1			D2		
Year	07/08	08	09	07/08	08	09	07/08	08	09	07/08	08	09	07/08	08	09	07/08	08	09	07/08	08	09	07/08	08	09
No. species	23	34		19	11		22	27		11	12		11	13		16	23		12	14		16	18	
No. exotics	0	0		0	0		0	0		0	0		0	1		0	0		0	0		0	1	
Weediness index	0	0		0	0		0	0		0	0		0	0.13		0	0		0	0		0	0.09	

Groundwater level monitoring has been undertaken at bore 60915034, in close vicinity to the Reedia South transect, since 2004, but was only available consistently up to early 2007 with a single data point recorded in November 2008 (Figure 23). 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.

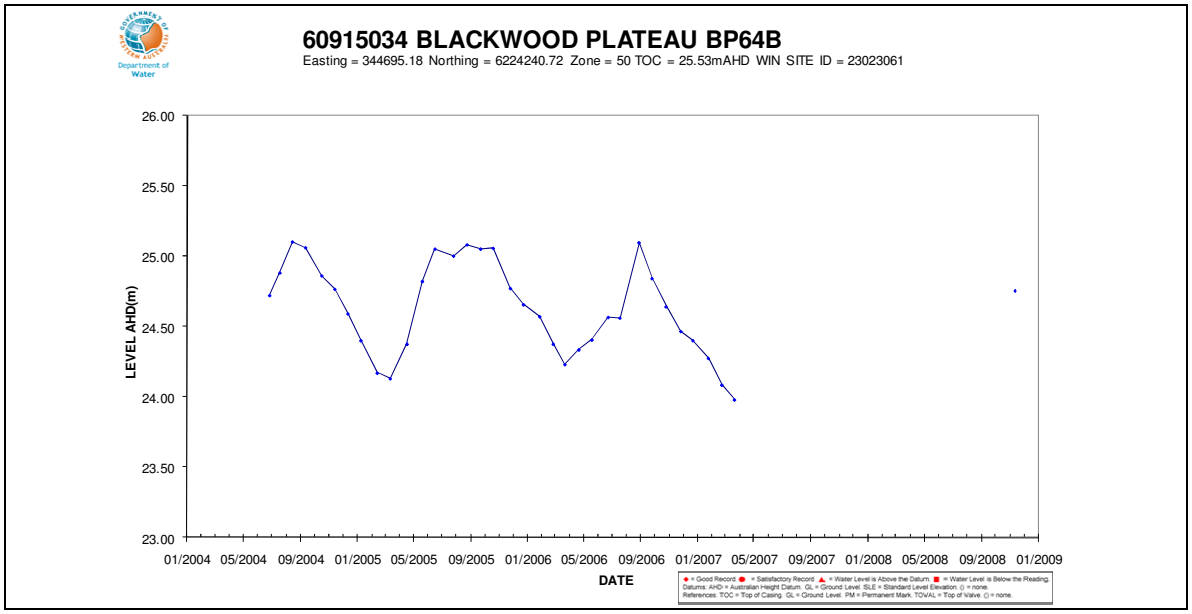

Figure 23: Reedia South groundwater levels 2004-2008.

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 (Figure 24).

Although the transect was dry at the time of transect establishment in February, low lying areas dominated by sedges, were inundated during the November monitoring. Between February and November there was a 4.9% improvement in mean canopy health across the transect (Table 3). Two exotic species were recorded in both November and February and species composition was 75% similar between the two rounds.

The overstorey of plot A was formed by small to medium sized *E. marginata* and *M. preissiana* the health of which increased slightly during 2008 (*E. marginata* – Feb 2008: 10-20, mean 16.5; Nov 2008: 11-21, mean 17.6; *M. preissiana* – Feb 2008: 13-21, mean 16.5; Nov 2008: 13-19, mean 16) (Appendix 1.1.13, Appendix 3, Table 28). A1 was still dominated by the shrubs *B. sparsa* and *T. parviceps* with *D. bromeliifolius* and sedges, *A. prolifera, A. scabra* and *Melanostachys ustulata* also prevalent (Appendix 2.1.13, Table 29). A total of 25 species were identified in A1 in February, 20 in November. *T. parviceps*, *K. recurva, A. prolifera* and *M. ustulata* were also still most abundant in A2. The P3 species *Cyathochaeta stipoides* was recorded in both sub-plots in low abundances. In February 21 species were noted in A2, 26 in November.

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* remained in very good condition (Feb 2008: 18; Nov 2008; 18), the *E. marginata* in poor to very good condition although mean health declining since February (Feb 2008: 5-19, mean 13.2; Nov 2008: 3-19, mean 8.3) while the *C. calophylla* improved in condition (Feb 2008: 7; Nov 2008: 7-19, mean 13). Sub-plot B1 was still dominated by very dense *A. scabra* with *K. recurva, D. bromeliifolius* and *M. ustulata* also fairly abundant. Twenty native species were identified in B1 in February, falling to 20 in November. *A. prolifera* remained very dense in B2 with *T. parviceps, B. sparsa* and *H. firmum* also common. Fifteen native and one exotic were identified in B2 during spring, 13 native species only in November.

No trees occurred in plot C. Sub-plot C1 was densely vegetated with sedges *Meeboldinia scariosa* and *A. prolifera* and shrubs, *H. firmum, T. parviceps* and *B. sparsa* still most abundant. One of the 21 species identified in this plot during baseline monitoring was exotic, the plot scoring a weediness rating of 0.06. The same exotic was recorded in November along with 18 native species with the plot scoring a slightly higher weediness rating of 0.07. The vegetation in sub-plot C2 was also very dense. *A. scabra* remained most abundant with *T. parviceps* and *H. firmum* also dominant. Despite the density of the vegetation only 13 species were recorded in this plot in February increasing to 15 in November.

The canopy condition of the single, large, healthy, multi-stemmed *M. preissiana* in plot D declined slightly during 2008 (Feb 2008:19; Nov 2008: 17). In the understorey of sub-plot D1 *A. scabra* was still most abundant 1 with *H. firmum, T. parviceps* and *Schoenus* sp. also common.

Sixteen species were recorded in this plot in February, 14 in November. *A. fascicularis, M. scariosa* and *Amphipogon turbinatus* dominated the species poor sub-plot D2. Although only nine species were recorded in February and 11 in November, this plot remained very densely vegetated.

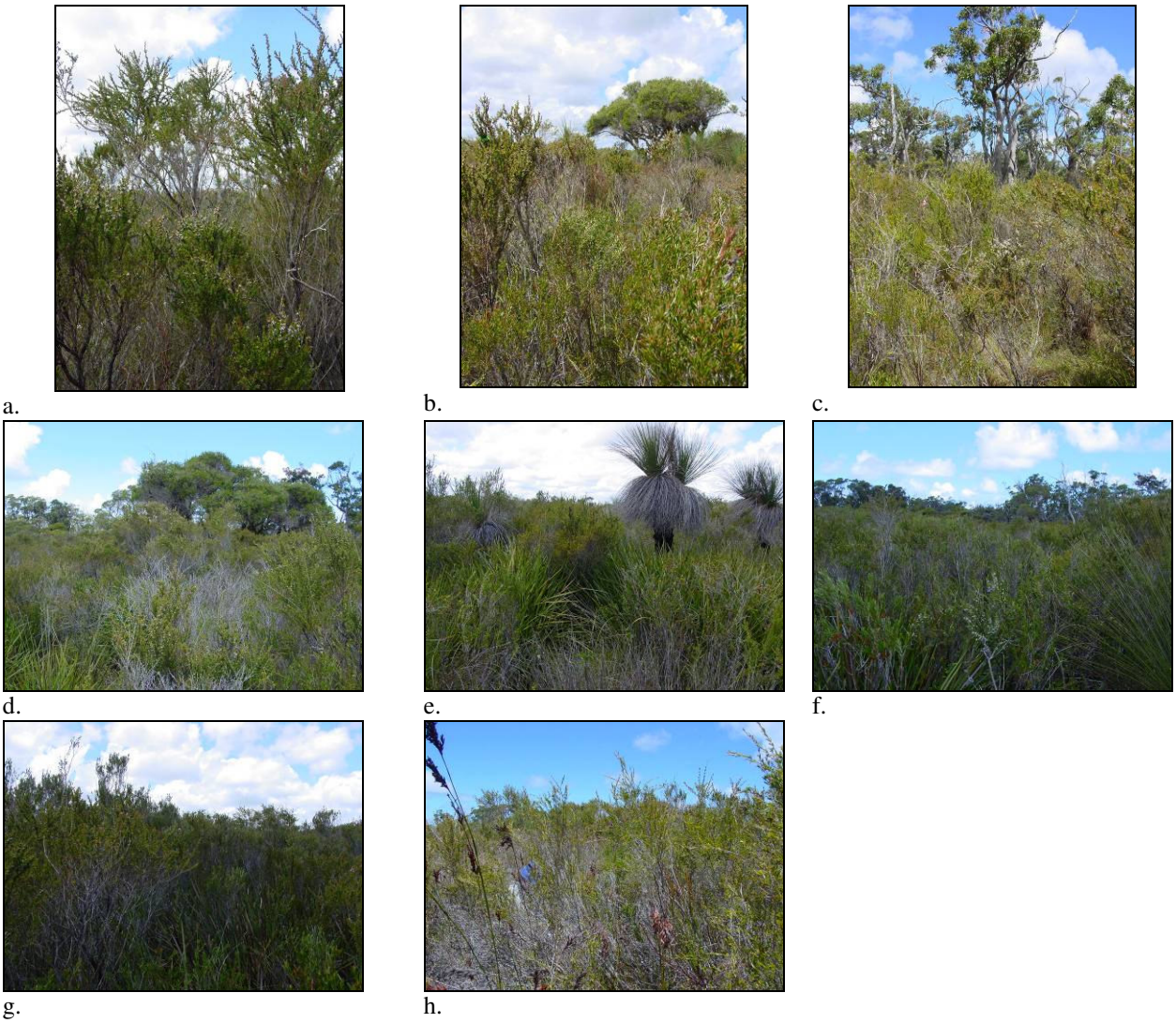

Figure 24: Scott River Road wetland vegetation monitoring transects. All photos taken looking diagonally across the plot; a) 0-20m; b) 20-0 m; c) 20-40 m; d) 40-20 m; e) 40-60 m; f) 60-40 m; g) 60-80m; h) 80-60m.

Table 28: 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	08	09	07/08	08	09	07/08	08	09	07/08	08	09
Diameter range[2]	M.p	<2-14.1	<2-14.1		4.7-21.0	4.7-21		-	-		5.7-28.4	5.7-28.4	
	C.c	-	-		7.2-10.0	7.3-17.9		-	-		-	-	
	E.m	6.6-32.5	6.8-32.5		4.0-14.0	4-14.4		-	-		-	-	
Health Mean[3]	M.p	15	16		18	18		-	-		19	17	
	C.c	-	-		7	13		-	-		-	-	
	E.m	16.5	17.63		13.2	8.33		-	-		-	-	
Health Range	M.p	13-21	13-19		18	18		-	-		19	17	
	C.c	-	-		7	7-9		-	-		-	-	
	E.m	10-20	11-21		5-19	3-19		-	-		-	-	
Density[4]	M.p	4	4		1	1		-	-		1	1	
	C.c	-	-		3	3		-	-		-	-	
	E.m	8	8		4 + 11 seedlings & 1 sapling	4		-	-		-	-	

[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 29: 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	08	09	07/08	08	09	07/08	08	09	07/08	08	09	07/08	08	09	07/08	08	09	07/08	08	09	07/08	08	09
No. species	25	20		21	26		20	22		16	13		21	19		13	15		16	14		9	11	
No. exotics	0	0		0	0		0	0		1	0		1	1		0	0		0	0		0	0	
Weediness index	0	0		0	0		0	0		0.08	0		0.06	0.07		0	0		0	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 25). 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 November 2008 represents the first round of spring vegetation monitoring at this site it is not possible to comment on the relationship between vegetation condition and the water regime.

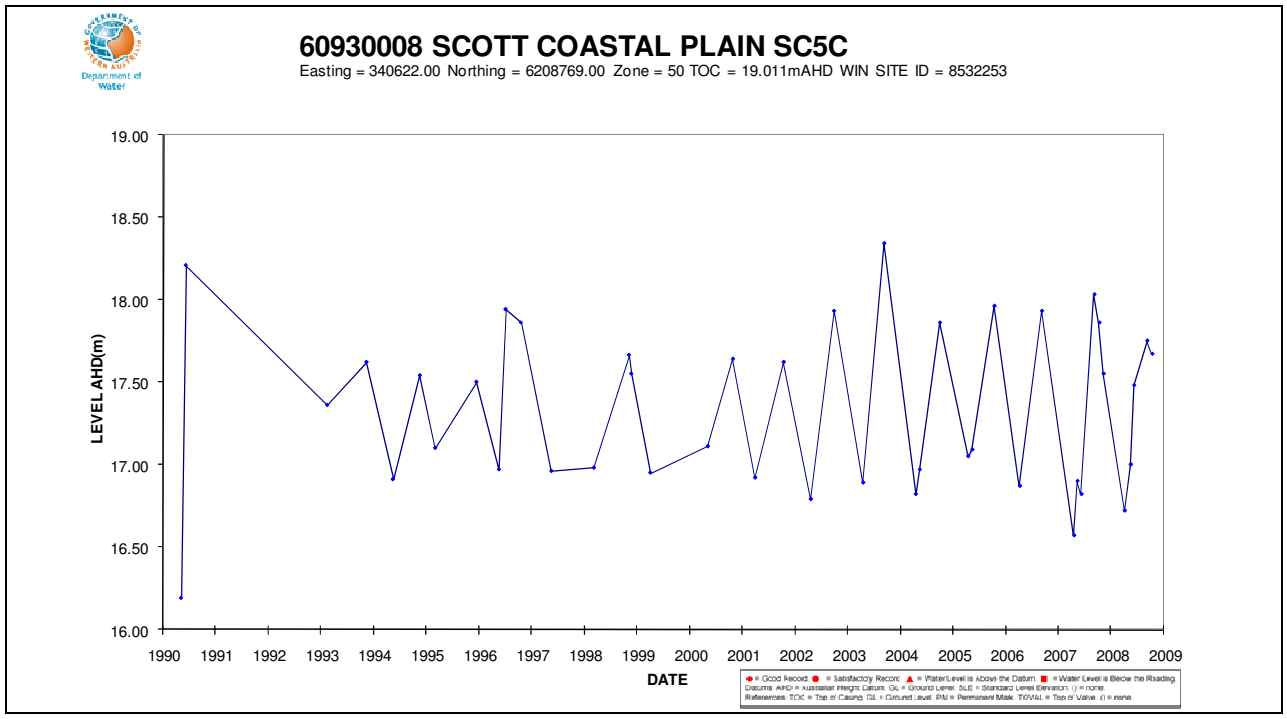

Figure 25: Scott River Rd groundwater levels 1990-2008.

Terrestrial Sites

Blackpoint Rd terrestrial

The transect at this site ran 80 m south-east from bore SC18B into open *E. marginata/* C. *calophylla* woodland (Figure 26). There was a significant change in elevation across the transect reflected by increased dominance of mesic species in the understorey. Between 2006 and 2008 there was a significant improvement (22.4%) in canopy condition across the transect (Table 3). There was also an increase in the number of exotics (from 0 to 1) and very little change in species composition (92% similar).

There was little change in the condition of the vast number of small to medium *C. calophylla* and the small to large *E. marginata* that formed the overstorey of plot A including that of the 252 saplings/ seedlings recorded (*C. calophylla* – 2006: 10-19, mean 12; 2008: 10-18, mean 15.4; *E. marginata* – 2006: 7-18, mean 15.4; 2008: 8-23, mean 15.9) (Appendix 1.2.1, Appendix 3, Table 30). The shrub species, *Petrophile diversifolia* was still dominant in the understorey of sub-plot A1 with *P. umbrosa* and the native fern *Lindsaea linearis*. However, the abundance of both *Acacia browniana* and *Podocarpus drounynianus* had declined (Appendix 2.2.1). The sub-plot supported 28 species in 2005, 26 in 2006 and 29 in 2008 (Table 31). One exotic species was recorded in 2008, the plot scoring a weediness rating of 0.06. *P. diversifolia* and *P. umbrosa* remained dominant in A2. A total of 26 species were recorded in this plot in 2005 and 2006, 30 in 2008.

The overstorey of plot B was formed by small to large *C. calophylla* and *E. marginata.* While the canopy condition of the *E. marginata* improved between 2006 and 2008 (2006: 12-18, mean 14.6, 2008: 15-23, mean 18.1) *C. calophylla* declined slightly (2006: 8-16, mean 13.9, 2008: 5-21, mean 13.1). *P. diversifolia, X. preissii, P. umbrosa* and *L. linearis* were still prominent in the understorey of sub-plot B1. A total of 30 species were recorded in 2005, 27 in 2006 and 29 in 2008. The understorey of B2 was dominated by *A. scabra, A. prolifera, T. parviceps* and *M. gracilipes*. A total of 31 species were recorded in this plot in 2005, 30 in 2006 and 29 in 2008.

Small to large *E. marginata* and *C. calophylla,* including 20 saplings/ seedlings, formed the overstorey across plot C. Despite the death of a *C. calophylla,* mean canopy condition improved between 2006 and 2008 (*E. marginata* - 2006: 10-13, mean 11.5; 2008: 9-21, mean 14; *C. calophylla* - 2006: 9-17, mean 12.4; 2008: 0-21, mean 15.3). *T. parviceps* and *X. preissii* were dominant in the understorey of C1 with *L. linearis* still also common. Thirty three species were recorded in 2005, 30 in 2006 and 36 in 2008, including an exotic. The sub-plot scored a weediness rating as 0.04. *T. parviceps* and *L. linearis* remained dominant in C2 with *X. preissii* and *A. scabra* also prevalent in 2008. A total of 38 native species were recorded in C2 in 2005, 33 in 2006 and 39 in 2008.

Table 30: Blackpoint Rd terrestrial - summary of transect data; diameter, health and density of overstorey species (all plots are 20 x 20 m).

Plot		A			B			C			D		
Year	Spec[1].	05	06	08	05	06	08	05	06	08	05	06	08
Diameter range[2]	E.m.	<2-73	<2-73	<2-74	<2-61.7	<2-61.7	<2-62.3	<2-67.6	<2-67.6	<2-67.7	<2-60	<2-60	3.6-60
	C.c.	<2-50	<2-50	<2-45	<2-54	<2-54	<2-52	<2-83	<2-83	<2-83	2.7-47.4	2.7-47.4	<2-47.3
Health Mean[3]	E.m.	15.2	15.4	15.9	14.2	14.6	18.1	11.5	11.5	14	8.2	8.6	13
	C.c.	12.0	12.0	16.6	13.8	13.9	13.1	12.3	12.4	15.3	11.6	12.4	14.9
Health Range	E.m.	7-18	7-18	8-23	12-17	12-18	15-23	10-13	10-13	9-21	0-13	0-13	5-19
	C.c.	10-19	10-18	11-23	8-15	8-16	5-21	9-15	9-17	0-21	9-14	9-15	4-21
Density[4]	E.m.	21	21	21	14	14	20	2	2	4	5	5	5
	C.c.	32	32	32	17	16	10 (1)	16	17	33	16	16	19
		+ 252 Euc/ Corymbia sd/sp						+ 20 Euc/ Corymbia sd/sp			+ 13 Euc/ Corymbia sd/sp		

[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 31: Blackpoint Rd terrestrial - summary of understorey data (all plots are 5 x 5m).

Plot	A1			A2			B1			B2			C1			C2			D1			D2		
Year	05	06	08	05	06	08	05	06	08	05	06	08	05	06	08	05	06	08	05	06	08	05	06	08
No. species	28	26	29	26	26	30	30	27	29	31	30	29	33	30	36	38	33	39	39	37	44	41	37	39
No. exotics	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	0	1
Weediness index	0	0	0.06	0	0	0	0	0	0	0	0	0.06	0	0	0.04	0	0	0	0	0	0.03	0	0	0.05

The mean health of the small to medium *C. calophylla* and small to large *E. marginata* (13 saplings/ seedlings) forming the overstorey of plot D improved since the 2006 monitoring round (*E. marginata* - 2006: 0-13, mean 8.6; 2008: 5-19, mean 13; *C. calophylla* - 2006: 9-15, mean 12.4; 2008: 4-21, mean 14.9). The understorey of sub-plot D1 was still dominated by *X. preissii* and *P. umbrosa.* Thirty nine native species were recorded in the plot in 2005 and 37 in 2006, with 43 native and one exotic in 2008 (weediness of 0.03). *T. parviceps* and *P. diversifolia* continued to dominate D2, in which a total of 41 species was recorded in 2005 and 37 in 2006. One of the 39 species identified in 2008 was exotic, the plot scoring a weediness rating of 0.05.

Figure 26: Blackpoint 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.

Groundwater level monitoring has been undertaken at bore 60830001 in close proximity to the transect since 1992 (Figure 27). Although records were incomplete between 1992 and 2000, groundwater levels appeared to have declined during this time. Levels then

generally decreased from 2000 to a low in 2006, before increasing slightly during 2007 and 2008. Although the recent increase in water levels corresponded with an improvement in mean canopy condition across the transect, research is required to further quantify the relationship between water regime and vegetation condition.

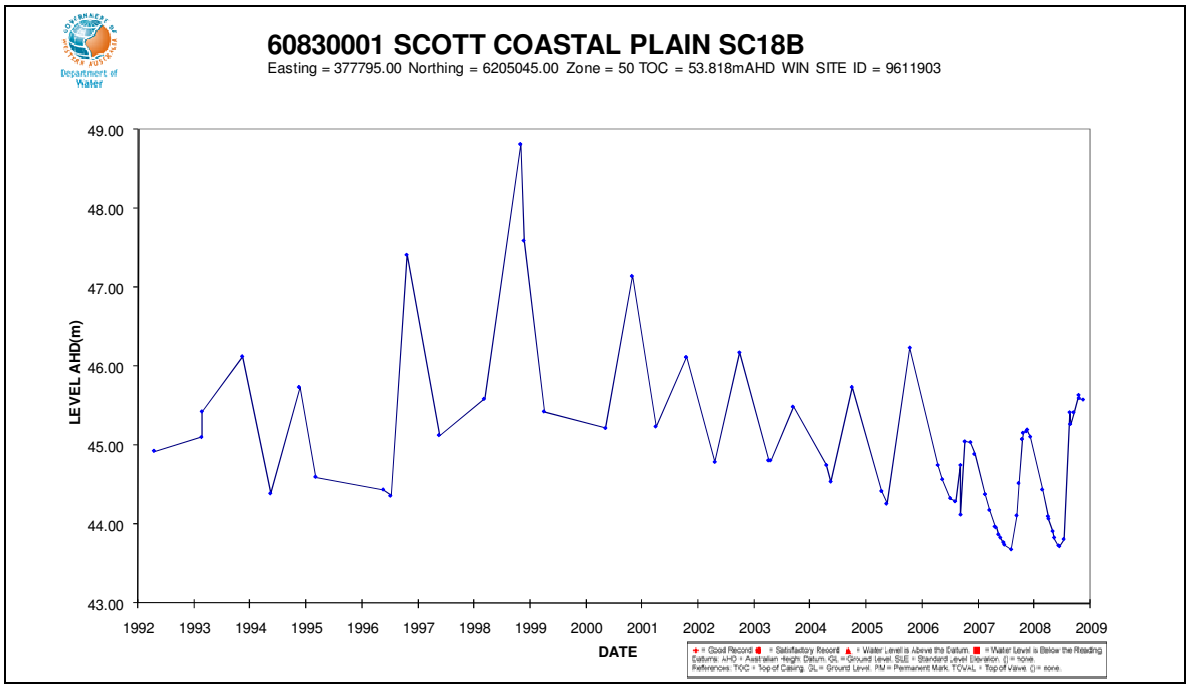

Figure 27: Blackpoint Rd groundwater levels 1990-2008.

Jack Track

The transect at this site ran 80 m north-east from bore SC8 into open *E. marginata* woodland (Figure 28). Although there was little change in elevation across the transect, and *A. scabra* was the dominant species across the site (replacing *P. ellipticum*, dominant in 2005 and 2006), xeric species became more prominent at higher elevations. There was some decline in canopy condition (7.3%) between 2006 and 2008, with no change in the number of exotics (still 0) (Table 3). Species composition across the transect was 88% similar to that described in 2006.

The condition of the single *E. marginata* in plot A declined between 2006 and 2008 (2006: 17; 2008: 15) (Appendix 1.2.2, Appendix 3, Table 32). The understorey of sub-plot A1 was still dominated by *A. scabra* however, the abundance of *P. ellipticum* had declined, with *A. prolifera* and *M. thymoides* now co-dominant. Twenty seven native species were recorded in 2005, 23 in 2006 and 25 in 2008 (Appendix 2.2.2, Table 33). *A. scabra* remained dominant in A2, with *Andersonia caerula* now more abundant that either *A. obovatus* or *Leucopogon sp*.. A total of 25 species of shrub and sedge were recorded in 2005, 24 in 2006 and 19 in 2008.

The overstorey of plot B was formed by small to medium *E. marginata* the condition of which declined slightly since 2006 (2006: 15-18, mean 16; 2008: 8-21, mean 15.1). *A. scabra* and *A. prolifera* were dominant in B1, the later replacing *P. ellipticum.* A total of 35 species were recorded in the sub-plot in 2005, 32 in 2006 and 27 in 2008. The dominance of *A. scabra* continued across B2, with *A. prolifera* and *M. thymoides* the most dominant of the remaining species. Thirty five species were identified in B1 in 2005, 25 in 2006 and 23 in 2008.

Small to large *E. marginata* formed the overstorey in plot C. Canopy condition declined further between 2006 and 2008 (2006: 15-19, mean 17.6; 2008: 13-19, mean 15.8). As with previous sub-plots, the dense understorey of C1 was dominated by *A. scabra* with *Leucopogon* sp., *A. prolifera* and *M. thymoides*. *A. scabra* was also dominant in C2 with *A. prolifera, X. preissii, Dillwynia laxiflora* and *M. thymoides*. A total of 27 species were recorded in C1 in 2005, 23 in 2006 and 20 in 2008. C2 supported 29 species in 2005, 24 in 2006 and 26 in 2008.

A number of small *E. marginata*, including numerous saplings, formed the overstorey of plot D. Canopy condition declined from 2006 to 2008 (2006: 11 - 20, mean 15.9; 2008: 8-19, mean 14.9). The dense understorey of D1 was also dominated by *A. scabra* with *M. thymoides, A. prolifera* and *Lomandra nigricans.* Twenty eight species were recorded in 2005, 22 in 2006 and 21 in 2008. *A. scabra*, *M. thymoides, A. obovatus* and *X. preissii* were dominant in the understorey of D2. A total of 24 species were recorded in this plot in 2005, 19 in 2006 and 14 in 2008.

Table 32: Jack Track - summary of transect data; diameter, health and density of overstorey species (all plots are 20 x 20 m).

Plot		A			B			C			D		
Year	Spec[1].	05	06	08	05	06	08	05	06	08	05	06	08
Diameter range[2]	E.m.	13.8	13.8	14.2	<2 - 55	<2 - 55	<2-55.7	<2 - 67.7	<2 - 67.7	<2-70.7	<2 - 19	<2 - 19	<2-20.6
Health Mean[3]		17	17	15	16.3	16.0	15.1	17.7	17.6	16.6	15.8	15.9	14.9
Health Range		17	17	15	15 - 17	15 - 18	8-21	15 - 19	15 - 19	13-19	11 - 19	11 - 20	8-19
Density[4]	E.m.	1	1	1	3	3	8+9 saps	7	7	9	11 + 20 saps	11	18 + 2 resp

[1]Overstorey species – 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 33: Jack Track - summary of understorey data (all plots are 5 x 5m).

Plot	A1			A2			B1			B2			C1			C2			D1			D2		
Year	05	06	08	05	06	08	05	06	08	05	06	08	05	06	08	05	06	08	05	06	08	05	06	08
No. species	27	23	25	25	24	19	35	32	27	35	25	23	27	23	20	29	24	26	28	22	21	24	19	14
No. exotics	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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

Figure 28: Jack Track 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.

Groundwater level monitoring has been undertaken at bore 60930033 in close proximity to the transect since 1992 (Figure 29). Although records were also incomplete at this site between 1992 and 2000, groundwater levels appeared to have declined during this time. Levels then generally decreased from 2000 to 2006, before increasing slightly during 2007 and 2008. Although the recent increase in water levels corresponded with a decline in mean canopy condition of terrestrial tree species across the transect, research is required to further quantify the relationship between water regime and vegetation condition.

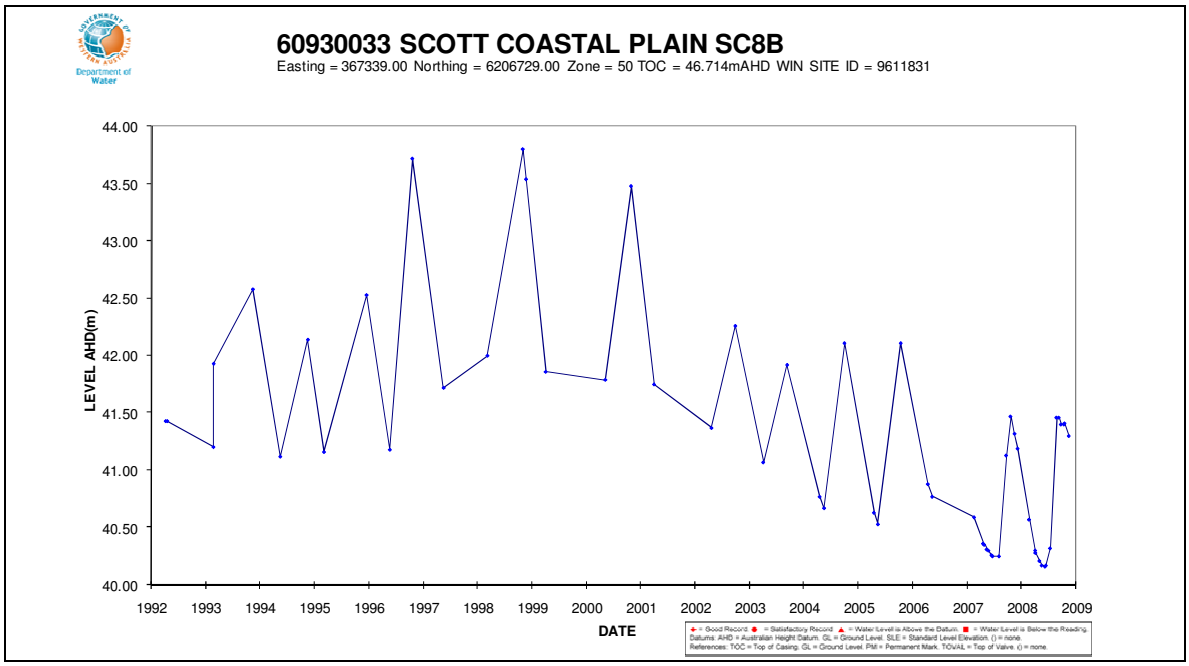

Figure 29: Jack Track groundwater levels 1990-2008.

Milyeanup

The transect established at this site ran 60 m from the edge of the Brockman Highway wetland transect through fringing *B. littoralis* and wetland shrubs into low open woodland of *E. marginata, C. calophylla* and *B. grandis* (Figure 30). The elevation increased with distance and was reflected in a change from an understorey dominated by wetland species to one of terrestrial species only. Only three plots were established as the transect was located between the wetland and a forestry access track. Between 2006 and 2008 there was a 4.6% improvement in mean canopy condition across the transect (Table 3). The number of exotics identified at the site halved from two to one, while species composition across the transect in 2008 was 68% similar to that described in 2006. Although the transect was species rich, very few individual species had high cover and abundance values. As a result a slight change in a species abundance between 2006 and 2008 could cause an apparent change in dominant species across a sub-plot.

The overstorey of plot A was formed by small to medium *E. marginata* and *C. calophylla* with small *B. grandis* and a single small *B. littoralis*, the canopy condition of all species improved between 2006 and 2008 (*E. marginata* - 2006: 14-21, mean 17.6; 2008: 16-23, mean 19.08; *C. calophylla* - 2006: 13-21, mean 17.6; 2008: 15-21, mean 17.67; *B. grandis* - 2006: 11-19, mean 14.8; 2008: 15.23, mean 19.11; *B. littoralis* - 2006: 21; 2008: 23). (Appendix 1.2.3, Appendix 3, Table 34). The shrub *Bossiaea linophylla* and sedge *Desmocladus fascicularis* replaced *Lomandra* sp. and *Gompholobium marginatum* as the dominant species in the understorey of sub-plot A1 (Appendix 2.2.3, Table 34). Thirty eight species, including one exotic, were identified in this plot in 2005, 38 native species in 2006 and 28 natives in 2008. The dominant species recorded in A2 during 2008 were again different to those recorded in the previous monitoring round with *Opercularia hispidula*, *Lomandra* sp. and the unidentified shrub replaced by *Anigozanthos flavida* and *B. linophylla*. The change in species dominance across sub-plots A1 and A2 reflects the high species richness and associated inability of any species to dominate. Thirty eight species were recorded in A2 in 2005, 36 in 2006 and 33 in 2008.

The canopy condition of the small *C. calophylla* and *B. grandis* and small to large *E. marginata* forming the overstorey of plot B, improved between 2006 and 2008 (*E. marginata* – 2006: 13-16, mean 13.3; 2008: 13-19, mean 16; *C. calophylla* - 2006: 14-21, mean 16.9; 2008: 13-21, mean 17.7; *B. grandis* – 2006: 12-19, mean 16.9; 2008: 15-21, mean 19.56). *Mirbelia dilata* and *A. flavida* were dominant in the understorey of sub-plot B1 previously dominated by *P. esculentum, M. reidlei* and a Poaceae sp. Thirty three species were identified in B1 in 2005 and 2006 and 37 in 2008. *X. occidentale, M. riedlei* and *B. linophylla* remained dominant in the understorey of sub-plot B2. Twenty six species were recorded in B2 in 2005 and 29, including one exotic (weediness value 0.05) in 2006. An exotic was also identified amongst the 31 species found in 2008 (weediness value of 0.06).

Small to medium *C. calophylla* and *E. marginata* formed the overstorey of plot C with a number of small *B. grandis*. Canopy condition in the plot still ranged from moderate to good, improving between 2006 and 2008 in all three species (*E. marginata* - 2006: 3-19,

mean 15.7; 2008: 5-21, mean 17; *C. calophylla* - 2006: 12-23, mean 15.2; 2008: 9-21, mean 16.67; *B. grandis* - 2006: 0-15, mean 11.9; 2008: 0-21, mean 13.56). The understorey of sub-plot C1 was made up of herbs, shrubs and sedges, of which *P. esculentum* and *M. reidlei* became dominant in 2006, with *B. linophylla* also abundant in 2008. Twenty eight species were recorded in sub-plot C1 in 2005, 33, including one exotic in 2006 (weediness values of 0.05) and 31, also including one exotic (weediness value of 0.07) in 2008. *Chorizema nanum* remained dominant in C2 with *B. linophylla, Podolepis lessonii* and *Lepidosperma pubisquameum* co-dominant in 2008. Thirty two species were recorded in C2 in 2005, 31 in 2006 and 28 in 2008. An exotic species was identified in each sub-plot in both 2006 and 2008, resulting in weediness values of 006 and 0.07 respectively.

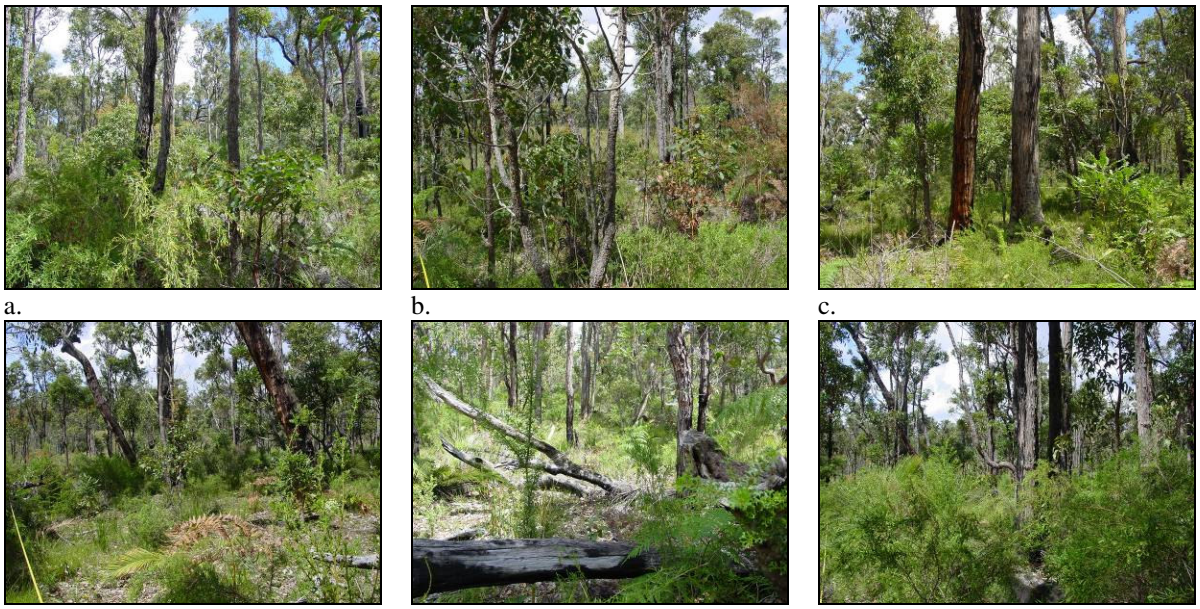

Figure 30: Milyeanup terrestrial vegetation monitoring transect. All photos taken looking diagonally across the plot. a). 0-20m; b) 20-0 m; c) 20-40 m; d) 40-20 m; e) 40-60 m; f) 60-40 m.

Table 34: Milyeanup terrestrial - summary of transect data; diameter, health and density of overstorey species (all plots are 20 x 20 m).

Plot		A			B			C		
Year	Spec[1].	05	06	08	05	06	08	05	06	08
Diameter range[2]	B.g.	<2 - 4.8	<2 - 4.8	<2-8	<2 - 14.4	<2 - 14.4	<2-15	<2 – 8.6	<2 – 8.6	<2-7.1
	B.l.	4.8	4.8	10	-	-	-	-	-	-
	C.c.	<2 - 22.5	<2 - 22.5	<2-24.3	<2 - 12.5	<2 - 12.5	<2-13.8	<2 – 57.1	<2 – 57.1	<2-57.1
	E.m.	<2 - 59.6	<2 - 59.6	<2-27.3	<2 – 71.6	<2 – 120	<2-120	<2 – 32.2	<2 – 32.2	<2-35
Health Mean[3]	B.g.	14.7	14.8	19.11	15.9	16.9	19.56	13.1	11.9	13.56
	B.l.	21.0	21.0	23	-	-	-	-	-	-
	C.c.	16.1	17.6	17.67	15.2	16.9	17.7	14.6	15.2	16.67
	E.m.	16.6	17.6	19.08	14.6	13.3	16	14.6	15.7	17
Health Range	B.g.	11 - 18	11 - 19	15-23	12 - 18	12 - 19	15-21	9 - 15	0 - 15	0-21
	B.l.	21	21	23	-	-	-	-	-	-
	C.c.	13 - 21	13 - 21	15-21	14 - 18	14 - 21	13-21	12 - 18	12 - 23	9-21
	E.m.	14 - 20	14 - 21	16-23	13 - 17	13 - 16	13-19	12 - 19	3 - 19	5-21
Density[4]	B.g.	14	15	17	17	17	18	9	9	9
	B.l.	1	1	1	-	-	-	-	-	-
	C.c.	15	15	15	10	10	10	21	21	21
	E.m.	14	13	13	7	7	7	34	34	17

[1]Overstorey species –B.l.= *Banksia littoralis;* 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 35: Milyeanup terrestrial - summary of understorey data (all plots are 5 x 5m).

Plot	A1			A2			B1			B2			C1			C2		
Year	05	06	08	05	06	08	05	06	08	05	06	08	05	06	08	05	06	08
No. species	38	38	28	38	36	33	33	33	37	26	29	31	28	33	31	32	31	28
No. exotics	1	0	0	0	0	0	0	0	0	0	1	1	0	1	1	0	1	1
Weediness index	0.04	0	0	0	0	0	0	0	0	0	0.05	0.06	0	0.05	0.07	0	0.06	0.07

Groundwater level monitoring has been undertaken at bore 60914941 since May 2006 (Figure 31). Data suggested that annual maximum water levels have declined over this time however, as the bore appeared to dry each summer, it was not possible to comment on changes in minimum groundwater levels.

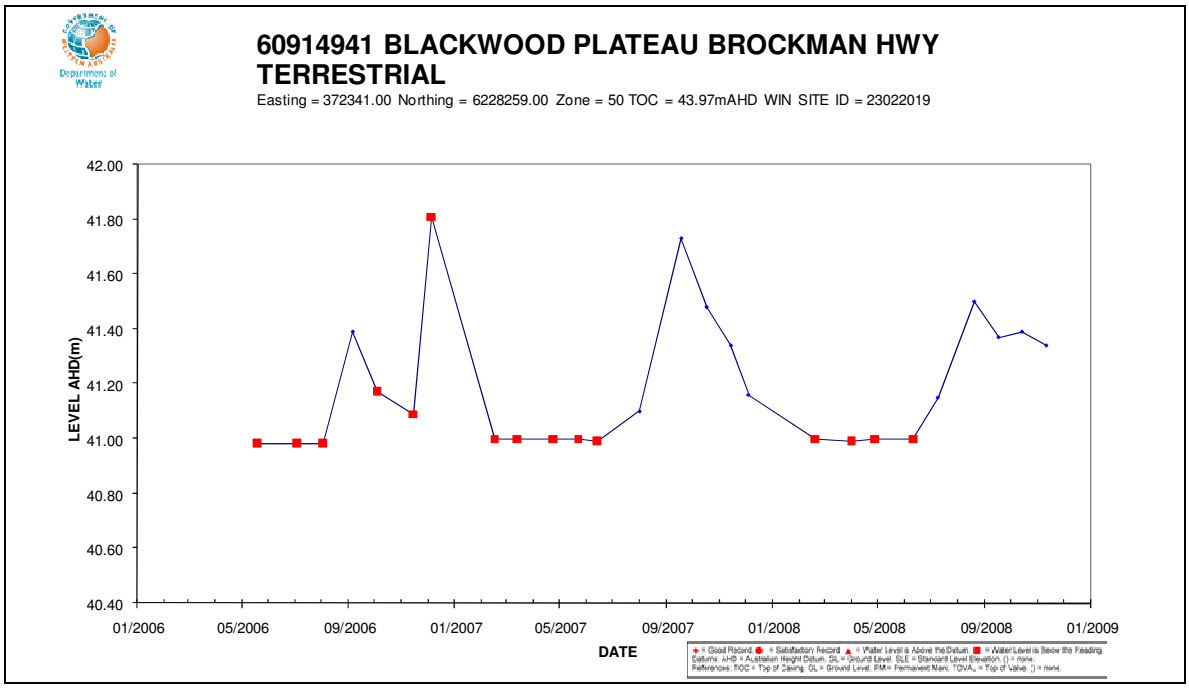

Figure 31: Milyeanup groundwater levels 1990-2008.

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 (Figure 32). During 2008 there was some change in canopy condition with mean tree health across the transect increasing by 4.6% (Table 3). Species composition was 78% similar to that described in 2007 and there was no change in the number of exotics with none identified during any assessment.

The overstorey of plot A was formed by 10 small to medium *E. marginata* the canopy condition of which improved over 2008 (2007: 4-18, mean 12.2; 2008: 7-17, mean 12.9) (Appendix 1.2.4, Appendix 3, Table 36). The eight *E. marginata* seedlings and two saplings recorded in the plot during the previous assessment persisted.

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 2.2.4). Thirteen species were recorded in this plot in 2006, 15 in 2007 and 2008 (Table 37). *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 and 2008.

The canopy condition of the small to medium *E. marginata* and *C. calophylla* in plot B declined further during 2008 (*E. marginata* - 2007: 9-18, mean 12.7; 2008: 10-15, mean 12.4; *C. calophylla* - 2007: 9-11, mean 10; 2008: 9, mean 9). However, the health of *B. grandis* and *B. attenuata* improved (*B. grandis* - 2007: 20; 2008: 19-21, mean 20.3; *B. attenuata* - 2007: 20; 2008: 22). The 15 *E. marginata* and three *B. grandis* seedlings/ saplings recorded in the plot during the previous assessment remained in god health.

Anarthria scabra was again the most dominant species in the understorey of sub-plot B1 with *P. reticulata* and *Lomandra nigricans* also relatively common. Thirty one species were recorded in 2006, 28 in 2007 and 33 in 2008. *P. reticulata* was still the most abundant species in B2 with *D. bromeliifolius* and *A. scabra* also prominent. A total of 29 species were recorded in this plot in 2006 and 27 in 2007 and 2008.

A larger number of small to large *E. marginata* (including numerous seedlings/ saplings) and *C. calophylla* and small *B. attenuata* and *B. grandis* were recorded in plot C. The canopy condition of *E. marginata* and *B. grandis* declined during 2008 (*E. marginata* - 2007: 10-19, mean 14.1; 2008: 10-17, mean 13.3; *B. grandis* - 2007: 18-21, mean 20.7; 2008: 15-21, mean 19.8) while *B. attenuata* and *C. calophylla* improved in condition (*B. attenuata* - 2007: 15-23, mean 18.4; 2008: 0-23, mean 19.8; *C. calophylla* - 2007: 11-14, mean 12.5; 2008: 16.-17, mean 16.5).

Dasypogon bromeliifolius continued to be dominant in the understorey of sub-plots C1 and C2, with *A. scabra* co-dominant in C1 and the shrub *M. thymoides* in C2. C1 remained species rich, supporting 33 species in 2006, 32 in 2007 and 34 in 2008. Thirty three species were identified in C2 in 2006 with 34 recorded in both 2007 and 2008.

The overstorey of plot D was formed by small to medium *E. marginata*, *C. calophylla* and *B. attenuata* with small *B. grandis*. Although canopy condition improved in *C. calophylla* during 2008 (2007: 9-12, mean 10; 2008: 13-16, mean 14.3) it declined in all other tree species: (*E. marginata* - 2007: 6-21, mean 16.4; 2008: 10-20, mean 13.2; *B. grandis* - 2007: 18-23, mean 20; 2008: 6-21, mean 18.6; *B. attenuata* - 2007: 18-23, mean 21.3; 2008: 15-21, mean 19.3).

Anarthria scabra, *M. thymoides* and *D. bromeliifolius* 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, 40 and 31 in 2008.

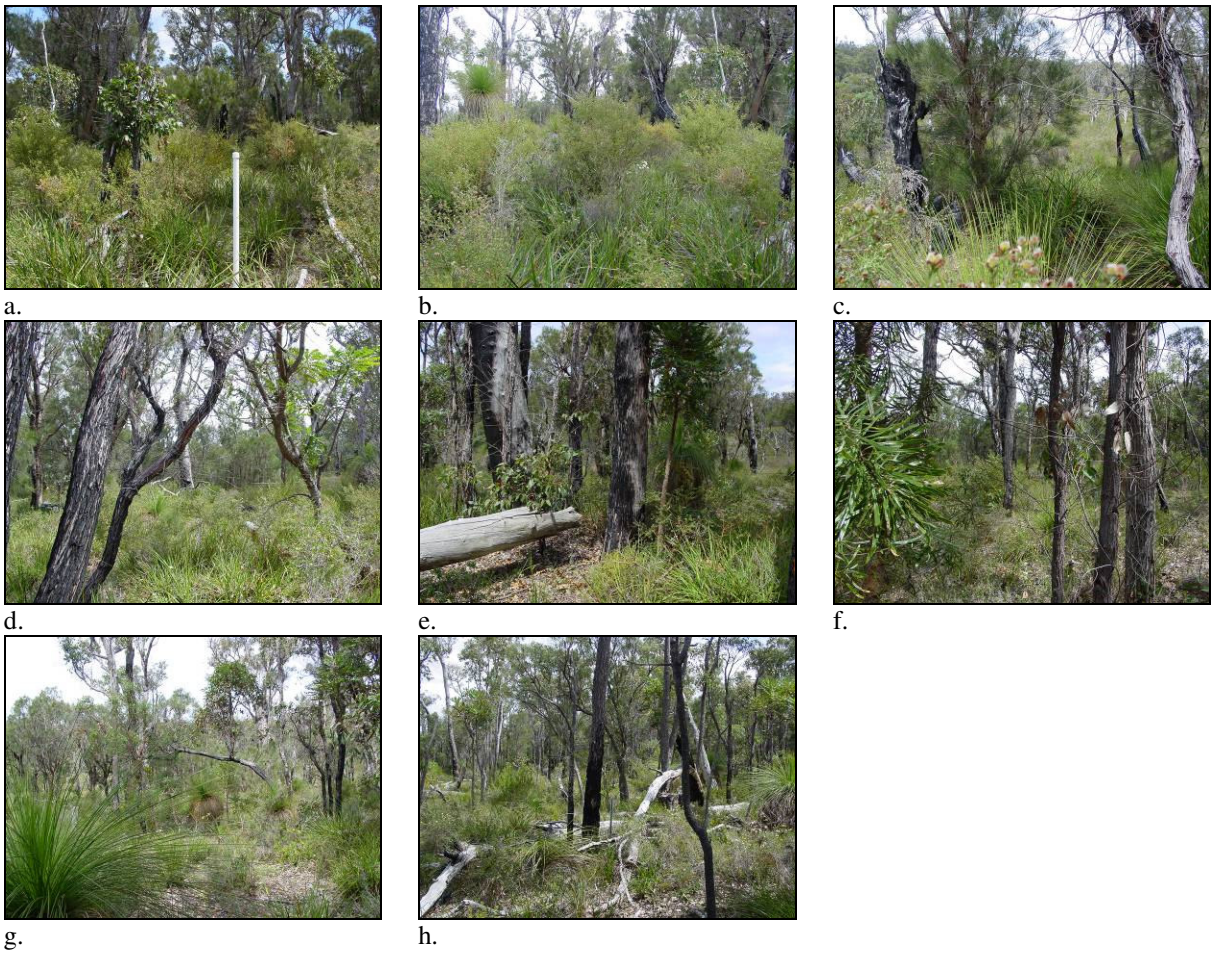

Figure 32: Poison Gully terrestrial vegetation monitoring transect. All photos taken looking diagonally across the plot; a) 0-20m; b) 20-0 m; c) 20-40 m; d) 40-20 m; e) 40-60 m; f) 60-40 m; g) 60-80m.

Table 36: Poison Gully terrestrial - summary of transect data; diameter, health and density of overstorey species (all plots are 20 x 20 m).

Plot		A				B				C				D			
Year	Spec[1].	05	06	07	08	05	06	07	08	05	06	07	08	05	06	07	08
Diameter range[2]	E.m.	<2 - 36.2	<2 - 36.2	<2 - 36.2	<2- 36.2	<2 - 63.3	<2 - 63.3	<2 - 63.3	<2-64	<2 - 81	<2 - 81	<2 - 81.0	<2-81	<2 - 61	<2 - 61	<2 - 61.5	<2 - 61.5
	C.c.	-	-	-	-	23 - 27.9	23 - 27.9	23.0 - 27.9	24-29	24 - 60	24 - 60	24 - 60	24-60	8.4 - 24.7	8.4 - 24.7	8.4 - 24.7	15.2-25
	B.g.	-	-	-	-	3.8 - 11.7	3.8 - 11.7	<2 - 11.7	<2-13	<2 - 8.8	<2 - 8.8	<2 - 8.8	<2-9	<2 - 8	<2 - 8.2	<2 - 8.2	<2-8
	B.a.	-	-	-	-	-	-	-	12	<2 - 6	<2 - 6	<2 - 6	<2-7.7	<2 - 22.5	<2 - 22.5	<2 - 22.5	<2-15.3
Health Mean[3]	E.m.	12.8	14.3	12.2	12.9	13.9	13.4	12.7	12.4	13.1	13.9	14.1	13.3	12.7	14.1	16.44	13.2
	C.c.	-	-	-	-	14.5	10.5	10.0	9	14.0	14.0	12.5	16.5	14.0	15.3	10	14.3
	B.g.	-	-	-	-	16.5	17.5	20.0	20.3	12.9	13.7	20.7	19.8	12.3	15.6	20.0	18.6
	B.a.	-	-	-	-	13.0	18.0	20.0	22	15.6	16.0	18.4	19.8	14.0	15.0	21.3	19.3
Health Range	E.m.	9 - 16	11 - 18	4 - 18	7-17	11 - 15	9 - 17	9 - 18	10-15	11 - 16	10 - 17	10 - 19	10-17	10 - 14	10 - 18	6 - 21	10-20
	C.c.	-	-	-	-	14 - 15	7 - 15	9 - 11	9	13 - 15	14	11 - 14	16-17	13 - 15	14 - 16	9 - 12	13-16
	B.g.	-	-	-	-	16 - 17	17 - 18	20	19-21	10 - 15	12 - 17	18 - 21	15-21	8 - 14	11 - 18	18 - 23	6-21
	B.a.	-	-	-	-	13	18	20	22	15 - 16	15 - 18	15 - 23	0-23	12 - 16	12 - 17	18 - 23	15-21
Density[4]	E.m.	8	8	8 + 2 sd & 2 sp	8 + 2 sd & 2 sp	7	7	7 + 12 sd & 3 sp	7 + 15	13	13	13 + 18 sd & 7 sp	15	18	18	18 + 20 sd & 8 sp	18 + 20 sd & 8 sp
	C.c.	-	-	-	-	2	2	2	2	2	2	2	2	3	3	3	3
	B.g.	-	-	-	-	2	2	3 + 3 sd	3 + 3 sd	12	12	12	12	16	15	12 + 15 sd	13+ 15 sds
	B.a.	-	-	-	-	1	1	1	1	8	8	8	11	5	5	6	6

[1]Overstorey species – C.c. = *Corymbia calophylla*; E.m. = *Eucalyptus marginata*; B.g. = *Banksia grandis*; B.a. = *Banksia attenuata*.
[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 37: 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	08	05	06	07	08	05	06	07	08	05	06	07	08	05	06	07	08	05	06	07	08	05	06	07	08	05	06	07	08
No. species	13	13	15	15	27	27	23	23	35	31	28	33	27	29	27	27	39	33	32	34	38	33	34	34	39	36	34	40	26	27	24	31
No. exotics	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Weed 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	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 33). 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 clear 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.

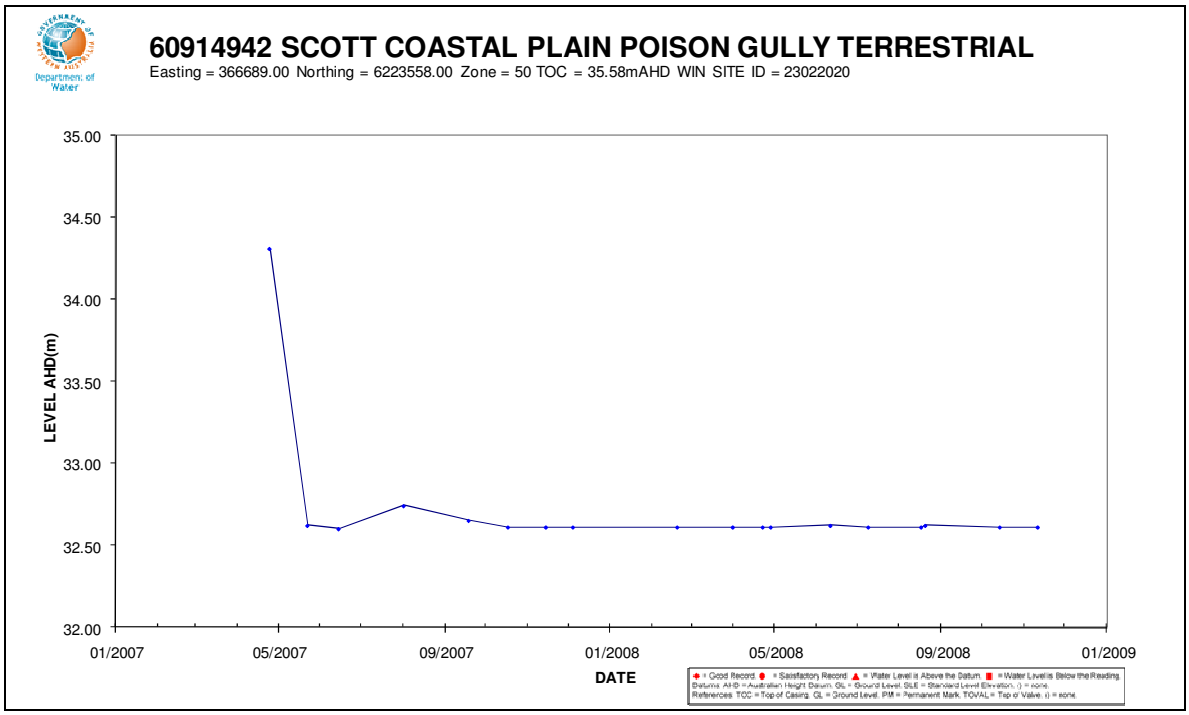

Figure 33: Poison Gully terrestrial site groundwater levels 2007-2008.

Discussion

There was no clear trend in mean canopy condition, exotic richness or compositional change across the wetland or terrestrial sites monitored during 2008.

Mean canopy condition improved across six of the 11 previously monitored wetland transects; Blackpoint Rd base of dunes (20.5%), Milyeanup (14.8%), Darradup Rd West (9%), Scott River Rd (5%), Reedia South (4.2%) and Blackpoint Rd (0.7%). The significant improvement across the Blackpoint Rd base of dunes site reflected the continued growth in the relatively large number of *M. rhaphiophylla* and *B. littoralis* saplings and seedlings recorded on the transect in 2005 and 2006. The low densities of trees across the other wetland sites resulted in any increases in health ratings having a greater impact on mean values. This also occurred at many of the sites at which a decline in canopy condition was noted; Reedia North (-30.1%), Dennis Rd (-10.7%), Poison Gully (-6.2%), Blackpoint/ Fouracres Rd (-4.1%) and Adelaide Rd (-1.6%). However, the significant decline at Reedia North was exacerbated by the addition of two unhealthy trees overlooked during baseline monitoring. Canopy condition improved across three of the four terrestrial sites; Blackpoint Rd (22.4%), Milyeanup (17.9%) and Poison Gully (4.6%) with a decline recorded at Jack Track (-7.3%).

Comparison of changes in canopy condition and water regimes suggested an inverse relationship at seven of the 11 previously monitored sites for which hydrological data were available, including the four terrestrial sites. That is, as groundwater levels declined, canopy condition improved etc. Although this may hold true at sites dominated by terrestrial tree species (ie. terrestrial sites), it is unlikely to represent the actual response of wetland species and is most likely an artifice of the incomplete, short-term hydrological dataset. Ongoing vegetation and groundwater level monitoring is required to fully examine the relationship between water regime and canopy condition.

The vast majority of transects remained free of exotic species during the current monitoring round, with non-natives only identified at five of the 17 transects. Although the nine species identified at Dennis Rd. was by the far the highest, this was a decline from the 12 recorded during baseline monitoring and was most likely the result of the complete inundation of the transect during winter and spring 2008. Declines in exotics were also noted at both the Milyeanup transects, where the single species recorded in 2006 were absent in 2008. There was no change in number of exotics on the Scott River transect with two species identified during both the 2008 baseline and spring monitoring. Exotics were noted on the Reedia South and Blackpoint Rd Terrestrial transects for the first time in November 2008, with one species recorded at each site.

Changes in species composition were generally greater than those noted during the 2007 monitoring round, with 10 of the 15 previously monitored sites <80% similar in composition to that described in the previous assessment (2006 or 2007). Species richness increased at the majority of sites in 2008, mostly due to the change in seasonality of monitoring and the subsequent inclusion of annual species. Although this partially explains the changes in species composition (reflected in the similarity matrix) it is also likely that some species, specifically sedge species, were mis-identified prior to 2008. As

many sedges are dioecious correct identification may have reduced the number of species where both male and female plants had been previously identified as separate species. This is supported by the low similarities recorded at wetland sites dominated by mixed sedges (eg. Blackpoint/ Fouracres Rd: 68% and Milyeanup: 70%) compared to 'sedge-free' terrestrial sites (eg. Blackpoint Rd: 92% and Jack Track: 88%).

Many of the original, hand-augered piezometers have been replaced by permanent bores installed by drilling contractors. However, seven 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 Blackpoint/ Fouracres Rd wetland, Blackpoint Rd base of dunes, Darradup Rd West, Milyeanup Wetland and Terrestrial, the new Stewart Rd Wetland site and the Poison Gully terrestrial site. In addition, there are no current monitoring bores or piezometers at the new Blackpoint/ Mayall Rd site, Adelaide Rd or Dennis Rd.

The results of the 2008 vegetation monitoring indicate that there has been some change in wetland vegetation condition and structure since the 2006 and 2007 assessments. However, as these are generally related to condition changes in a limited number of individual trees, re-identification of species and changes in the season of monitoring and in the light of incomplete hydrological datasets, the null hypotheses should still be accepted 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;
   - Poison Gully Wetland
   - Blackpoint Rd
   - Blackpoint Rd – base of dunes
   - Darradup Rd West
   - Milyeanup Wetland
   - Reedia North
   - Reedia South
   - Scott River Rd
   - Adelaide Rd.

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

3. Increasing depth to groundwater will not lead to a change in the structure, condition and vigour of phreatophytic vegetation;
   - Poison Gully Terrestrial
   - Milyeanup Terrestrial
   - Jack Track
   - Blackpoint Rd Terrestrial

It is not possible to comment on changes at the newly established Stewart Rd and Blackpoint/ Mayall Rd wetland sites.

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, 2008 minimum water levels and autumn minimum EWRs (where identified) 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. As monitoring was undertaken in November 2008, minimum groundwater levels from the previous autumn (April-May, 2008) were considered to be most relevant to vegetation condition at the time of the assessment. EWRs have been yet to be determined for the Western Scott Coastal Plain sites and the newly established Stewart Rd and Blackpoint/ Mayall Rd wetland sites.

Results/ Discussion

Autumn minimums from 2006, 2007 and 2008 and autumn minimum EWRs are presented in Table 35. However, as bores at Blackpoint Rd base of dunes, Darradup Rd West, Poison Gully Wetland and both Milyeanup Wetland and Terrestrial sites dried during 2008 actual minimums are unknown. Comment could therefore only be made on a limited number of sites; Blackpoint/ Fouracres Rd wetland, Blackpoint Rd wetland, Blackpoint Rd terrestrial and Jack Track.

Results suggested that, despite a slight increase in groundwater levels since 2006, EWRs were breached at the Blackpoint/ Fouracres Rd. wetland site. This corresponded with a 4% decline in canopy condition and the greatest change in species composition. Although no other breaches occurred, a short term (since 2006) decline in water levels at Poison Gully Wetland coincided with a 6% decline in canopy condition with a longer term (since 2000) decline at Jack Track corresponding to a 7% reduction in canopy health. These results were in contrast to a short term groundwater level decline and a 22% increase in health at the Blackpoint Rd terrestrial site. However, this site was dominated by large numbers of *C. calophylla* and *E. marginata*, which may respond to drier conditions.

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

Table 38: Minimum ground and surface water levels at criteria sites, autumn 2008-2008, compared to autumn minimum EWRs. Values in red type represent 'breached' EWRs.

Site/ bore	Autumn groundwater level (mAHD)			Autumn min EWR (mAHD)
	2006	**2007**	**2008**	
Wetlands				
Blackpoint Rd		43.43	43.43	42.95
Blackpoint/ Fouracres Rd (b)	-	45.25	45.24*	45.45
Blackpoint Rd base of dunes		26.98	27.08*	26.46
Darradup Rd west		104.15	104.15*	103.92
Milyeanup	-	38.51	38.52*	38.45
Poison Gully	-	31.12	31.10	30.47
Reedia South/ BP64B	-	24.23	-	-
Reedia North/ BP62B	-	26.3	-	-
Dennis Rd	-	-	-	-
Scott River Rd/ SC5C	16.87	16.57	16.72	-
Adelaide Rd	-	-	-	-
[1]Stewart Rd	-	-	89.75	-
[1]Blackpoint/ Mayall Rds	-	-	-	-
Terrestrial				
Blackpoint Rd	44.29	43.68	43.73	42.69
Jack Track	40.76	40.24	40.16	39.62
Milyeanup	-	40.99	40.99*	39.65
Poison Gully	-	32.61	32.61*	31.06

[1]sites established spring 2008. *bores/ piezometer dry during summer/autumn 2008

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Appendices

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

1.1 Wetlands

1.1.1 Blackpoint Rd

Plot	Species	Tag Number	DBH	Canopy condition		
				05	**06**	**08**
A	*Melaleuca preissiana*	235	12.5, 35.2, 35.7, 15.6, 25.5, 7.0, 11.4, 9.0, 6.5, 25.2, 21.4, 29.8, 31.4, 7.8, 28.6, 16.4, 28	19	19	17
B	No Trees					
C	*Melaleuca preissiana*	236	38.3, 26.2	15	15	13
		237	24.7	14	14	15
		238	33.8	16	16	15
		239	6.8, 5.0, 16.0	13	13	15
		240	4.0	9	9	13
		241	25.8	13	13	13
		242	10.5	9	9	17
		243	13.6	11	11	15
		244	8.6	7	7	11
		245	11.0, 21.0	9	9	9
		246	50.0	13	13	13
		247	45.0	15	15	11
		248	12.8	16	16	13
		249	37.0, 5.8, 10.0	13	12	11
		250	17.0	12	13	11
D	*Melaleuca preissiana*	251	9.0, 6.0, 9.5, 13.2	7	8	9
		252	10.3	11	12	7
		253	8.2	9	10	8
		254	15.8, 19.7, 8.0	15	16	14
		255	4.2	9	9	15
		256	4.3, 8.5, 6.0, 8.1	9	10	13
		NT	<2.0	13	13	17
		NT	<2.0	13	14	17
		NT	<2			17
		NT	<2			17
		257	25.5	13	13	15
		258	9.5	7	7	8
		259	9.8, 27.3, 14.5, 7.0	11	11	17
		260	8.0	9	10	11
		NT	5, <2, <2, <2	13	12	9
		NT	<2.0	13	14	17
		NT	<2.0	13	13	17
		NT	2.1, 1.5	13	14	17
		NT	<2.0	13	14	17
	Eucalyptus marginata	262	13.0, 9.1, 8.7, 9.2, 11.0, 7.0, 7.0, 4.7, 11.5, <2.0 x 4	19	19	18
		263	12.6, 3.3, 5.0, 12.2, <2.0 x 4	15	16	13

1.1.2 Black Point/ Fouracres Rd

Plot	Species	Tag Number	DBH	Canopy condition			
				05	**06**	**07/08**	**08**
A	*Eucalyptus marginata*	218	9.2	17	18	19	15
		219	22.2	15	17	14	18
		220	6.3	10	15	19	13
		221	30.7	8	8	10	9
		NT	3.5, 3.2, 4.2	8	8	10	19
		222	19.5, 15.7, <2	14	15	15	15
		223	42	12	10	9	12
		224	41.2	9	10	9	10
	14 seedlings						
	Corymbia calophylla	NT	<2, <2, 2.8	-	-	14	15
		NT	3.2, <2, <2	-	-	17	15
		NT	2.5, 2.7	-	-	15	15
B	*Eucalyptus marginata*	225	1.5, 4.6	15	15	19	20
	2 seedlings						
C	*Melaleuca preissiana*	226	10	9	9	11	11
		227	28.7	9	11	15	12
		228	8.4, 46.5, 18.3	13	14	17	11
		229	11, 5.9	7	9	15	8
		NT	<2	-	-	19	17
	Eucalyptus marginata	NT	<2, <2	-	-	12	9
	2 seedlings						
D	*Melaleuca preissiana*	230	6.4	7	7	15	11
		231	7.3, 6.3, 4.7, 4, <2	9	9	15	11
		232	20.8, 23, 14.2, <2, <2, 8	13	13	17	13
		233	21.3, 6.7, 11.5, 20, 20.3	13	14	19	13
		234	14.2, <2	12	12	19	15
		NT	3.8				17
	6 saplings	NT	<2				10

1.1.3 Blackpoint Rd – Base of Dunes

Plot	Species	Tag Number	DBH	Canopy condition		
				05	06	08
A	*Banksia littoralis*	NT	3.7	13	13	17
		938	3.0, 3.5, 2.3, <2.0, <2.0	5	Dead	Dead
	Melaleuca rhaphiophylla	936	9.1	10	13	13
		937	9.5, 6.6, 10.5, 6.1, 8, 4.1, 9, 16.7, 11, 15.1, 5.3	13	13	13
		NT	4.3, <2, <2	11	11	11
		NT	5.4	11	11	11
		NT	<2, <2	11	10	15
		NT	<2.0	11	11	17
		NT	<2.0	11	11	15
		NT	<2.0	11	11	19
		NT	<2.0	11	11	13
		NT	<2.0	11	11	11
		NT	<2.0	11	11	11
B	*Banksia littoralis*	NT	<2, <2, <2, <2	13	13	21
		NT	<2.0	13	13	19
		NT	<2.0	13	13	19
		NT	<2.0	13	13	19
		NT	<2.0	13	13	17
		NT	<2.0	13	13	17
		NT	<2.0	13	13	16
		NT	<2.0	13	13	19
	Melaleuca rhaphiophylla	NT	<2.0	13	13	16
		NT	<2.0	13	13	17
		NT	<2.0	13	10	15
		NT	<2.0	13	13	17
		NT	<2.0	13	13	15
		NT	<2.0	13	13	19
		NT	<2.0	13	13	19
		NT	<2.0	13	13	15
		NT	<2.0	13	13	16
		NT	<2.0	13	13	11
		NT	<2.0	13	13	13
		NT	<2.0	13	13	17
		NT	<2.0	13	13	19
		NT	<2.0	13	13	15
		NT	<2.0	13	13	7
		NT	<2.0	13	13	11
		NT	<2.0	13	13	12
		NT	<2.0	13	13	16
		NT	<2.0	13	13	9
		NT	<2.0	13	13	19
		NT	<2.0	13	13	13
		NT	<2.0	13	13	11
		NT	<2.0	13	13	15
		NT	<2.0	13	13	17
		NT	<2.0	13	13	15
		NT	<2.0	13	13	19

		NT	<2.0	13	13	15
C	*Banksia littoralis*	NT	<2, <2, <2	17	15	21
		NT	<2.0	17	16	15
		NT	<2.0	17	17	19
		NT	<2.0	17	17	19
		945	9	18	18	21
		NT	<2.0	17	17	19
		NT	<2.0	17	17	21
	+10 seedlings					
	Melaleuca rhaphiophylla	939	9.0, 4.3, 9.8, 4.3, 5.2, 7.9, 4.0, 3.4, 3.0, 4.0, 6.2, 4.2, 7.0, 5.5, 5.8, 3.0, 3.7, 7.0, 16.5	11	12	11
		940	26.2 +21 stems between 5.8 & 7.3cm	12	13	13
		NT	<2.0	13	13	15
		941	22.5, 7.3, 10.5, 11.1	12	12	13
		942	36.3, 4.7, 4.5, 9, 2.2, 5, 5.1, 4.9	11	11	13
		943	6.4, 7.6	10	10	11
		944	8.1, 26.5, 29.4, 7, 9.9, 11.7, 29.1, 10.5, 11.6, <2, <2, <2	11	12	15
		946	6.5, 5.4, 6.2, 9.5, 7, 5.5, 29.5, 4.2, 13.2, 9, 8.7	12	12	17
D	*Banksia littoralis*	949	6.5, 4.1, 3.0	20	20	23
		NT	<2.0	17	17	21
		NT	3.1			23
		954	5.9, 9, 4.5	17	17	23
	+ 1 seedling					
	Melaleuca rhaphiophylla	947	10.2, 5.1, <2, <2, <2	10	11	11
		948	12.1, 7.2, 12.2, 10, 35.2	13	13	11
		950	4.1, 3.8, 7, 18.7, 4.5, 35.6	15	15	11
		951	26, 25.1, 22, 6.1, 20.4, 15	13	13	13
		952	5.4, 7.2, 14.1, 4.3, 22.3, 26.4, 6, 4.5, 11	14	14	17
		953	23.2, 8.7, 5.0, 4.8, 7.3, 7.0, 4.0	13	13	13
		955	5.5, 5.5, 6.2, 6.3, 13.1, 7.8, 5.1, 15.2, 7.4	13	13	15

1.1.4 Darradup Rd West

Plot	Species	Tag Number	DBH	Canopy condition		
				05	**06**	**08**
A	*Melaleuca preissiana*	277	16.5, 14.4, <2, <2, <2, <2	10	15	12
		278	5.8	6	11	11
B	*Banksia littoralis*	279	3.5, 3, 3	17	19	21
	Melaleuca preissiana	280	12	9	11	13
C	*Melaleuca preissiana*	281	6.3, 6.5, <2	5	10	11
		282	7.5, <2, <2	5	10	15
		NT	<2			21
D	*Melaleuca preissiana*	283	14.1, 5.6, 12 ,20.8, 33, 11.6, 23.4	13	16	15
		284	18.4	10	11	11
		285	9	9	11	11
		286	4.2	7	11	7

1.1.5 Milyeanup

Plot	Species	Tag Number	DBH	Canopy condition		
				05	**06**	**08**
A	*Banksia littoralis*	NT	<2	15	15	17
		NT	<2	15	15	19
	Eucalyptus rudis	597	35, 18.5	5	4	7
		598	<2,<2, <2	3	3	3
		599	28.6	5	3	5
		NT	<2, ,2	3	3	10
		600	22.4, <2	3	3	3
		NT	<2	12	12	7
		NT	<2	12	12	7
		601	3.8, <2, <2, 35	9	3	3
		602	29.3	12	15	19
		603	31.5	12	15	16
		604	3	14	13	11
		605	16.1	14	13	16
		NT	<2	14	13	15
		606	34.7, 17.3, 36.3	14	11	19
		NT	<2			15
B	No Trees					
C	*Corymbia calophylla*	607	74.6	16	13	19
		609	6.3	13	15	17
		612	78.8	17	16	16
		NT	3, <2	12	17	17
		NT	<2	12	12	19
		NT	<2	12	12	Dead
		NT	<2	12	12	15
		615	7.3, 8.1, 3.5	14	14	19
		NT	4.2, ,2	16	16	21
		NT	3	12	12	20
		NT	<2	12	12	7
		NT	<2	12	12	13
		NT	<2	12	12	15
		614	9	12	15	13
		611	5.7	11	11	11
		616 (NT)	16.5	13	19	15
		610	2	10	5	9
		617 (NT)	14.8	15	14	18
		618	7	13	10	13
		619	14.5	12	17	17
		620	11.5	13	14	15
		621 (NT)	14.8	12	15	17
		622	10	11	15	9
		623	8	11	15	13
		624	7.8	13	15	12
		625	16.9	16	19	19
		626	13.5	17	19	19
		627	11.7	14	17	19
		NT	3			11
	Eucalyptus marginata	613	15, 11.5	15	18	19

		608	12.7, 15.1	16	17	21
		NT	<2	12	12	17
		NT	<2	12	12	15
		NT	<2	12	12	12
		NT	<2	12	12	15
		NT	<2	12	12	19
		NT	<2	12	12	17
		NT	<2	12	12	11
		NT	<2	12	12	13
	20+*C. calophylla*	Seedlings				

1.1.6 Poison Gully

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

1.1.7 Blackpoint/ Mayall Rd

Plot	Species	Tag Number	DBH	Canopy condition		
				08		
A	*Melaleuca preissiana*	983	8.7, 9, 4.1, 3.4, 2, <2, 3.7, <2	19		
		984	6.3, 4.8, 3.1, 6, 4, 6.8, 5.8 ,8.6, 6.5, 9.8, 6.7, 2.6, 3.7, 2.7, <2, <2	21		
		985	12.8, 11.3. 8.5	17		
		986	20, 4, 10.3, 5.3, 9.1, 13.4, 8.3, 3.3, 12.2, 13.8, 12.9, 10.5	19		
	Eucalyptus marginata	987	5.3, 5.3, <2, <2	9		
		NT	<2	11		
		988	7.1, 5.8, <2	20		
		989	5.7, 7.3, 6.8, 13.5, 4.6	16		
		NT	<2, <2	15		
B	*Eucalyptus marginata*	990	11.9	13		
		NT	2.3	21		
		NT	3.2	12		
		NT	2, <2	17		
		NT	<2	15		
		NT	<2	17		
		NT	<2	15		
		NT	<2	20		
		991	3.5, 2.4	11		
		992	9.7	11		
		993	14.7, 8.4	9		
		994	5.6, <2,<2	9		
		995	9.8, <2	14		
		996	11.8, 11.9	16		
		997	9.1	7		
		998	8	9		
		NT	<2	9		
		NT	<2	10		
		NT	<2	11		
		NT	<2	12		
		NT	<2	13		
		NT	<2	14		
		NT	<2	15		
		NT	<2	16		
		999	<2, <2	6		
		323	<2	6		
		324	4, 4.1	11		
		325	12.5, <2	15		
		NT	<2	5		
		326	3.6	16		
		327	2.3	18		
		328	4	11		
		329	4.5, 8, <2	11		
		330	4.2, 4	13		

		NT	2.8, <2	11		
		NT	<2, <2	9		
		NT	2.2	7		
C	*Eucalyptus marginata*	331	<2, <2, <2, 11.5, 3.4	9		
		332	5, <2	7		
		333	9	15		
		334	5.5	12		
		335	5.5, 3.6	13		
		336	9.5	15		
		337	<2, 12.5	11		
		338	8.5	12		
		339	5.5	15		
		340	5.5	15		
		341	3.5	13		
		342	3.7	17		
		343	<2, 3.7	11		
		344	3.4, 3.3	7		
		345	7.3	9		
		346	5.8	13		
		347	4.1	11		
		348	4, <2	13		
		349	4.5	13		
		NT	1, 3	15		
		NT	<2	9		
		NT	<2	15		
		NT	3.4	15		
		NT	2	13		
		NT	<2	1		
		NT	<2	10		
		350	5.5	15		
		NT	<2	13		
		351	4.4	15		
		352	5.9, <2	12		
		NT	<2	15		
		NT	<2	13		
		353	5,7, <2	14		
		354	3	17		
		NT	<2	12		
		NT	<2	15		
		NT	<2	15		
		NT	<2	9		
		355	3.3	13		
		356	4.5	17		
		357	2.5, 4.2	14		
		358	3.5	16		
		NT	<2	12		
		NT	<2	10		
D	*Eucalyptus marginata*	360	6.3, 6.5, 6.5, 2, <2, <2, 5.4	15		
		361	7.5, 5.5	17		
		NT	<2	18		
		362	12.5, 4.5, 2.3, 14.2	18		

		363	6.2, 3.1	17		
		364	5.3	17		
		365	6, 8.7	15		
		366	12.1, 10.5, 5.4, 12	17		
		367	7.2, 7.9, 6.3, <2	15		
		368	16	14		
		369	3	20		
		370	6	19		
		371	8	3		
		372	5.6, 2.5	17		
		NT	<2	17		
		373	5.5	19		
		374	4.1	7		
		NT	2.5	15		
		NT	<2, <2	17		
		375	2.4	19		

1.1.8 Stewart Rd (relocated transect)

Plot	Species	Tag Number	DBH	Canopy condition		
				08		
A	*Melaleuca preissiana*	376	15.7, 17, 12.8, 26, 21.9, 32.3	19		
		377	46.1	19		
		378	8.3, ,2	17		
		379	8.7, 4, 2.9, 5, 3.5, 3.9	19		
B	No trees					
C	*Melaleuca preissiana*	380	42.5, 11.4	21		
		381	20.7	17		
		382	7.5, 7.9	15		
		383	26.9	14		
		384	38.8	17		
		385	10.5, 14.3	12		
		386	22, 21	19		
		389	8.3, 54	21		
		391	<2, <2, 4.5, 16, 4.7, 10.5, 6.7			
		NT	2.3	14		
		394	14.1	13		
		216	27.9	19		
		217	30	16		
		NT	<2, <2, <2	23		
		220	15	17		
		221	8.5	17		
		222	7.1	17		
		223	20, 27.4	18		
	Eucalyptus marginata	387	46.4	22		
		390	28.4, 9.8	20		
		392	28.9	16		
		NT	<2, <2, <2, <2	21		
		395	18.8	17		
		396	<2, <2, 15.7	10		
		397	14.7, <2, <2	10		
		398	<2, <2, 15.5	12		
		NT	<2, <2	17		
		NT	4.7	10		
		399	10.2, 19, 20.3	12		
	Corymbia calophylla	388	17.2	15		
		393	18.8	16		
		400	33	17		
		218	26.1	13		
		219	17.3	18		
D	*Melaleuca preissiana*	224	53.5	19		
		225	<2, 32.5	16		
		226	29.3	17		
		233	41, 9	12		

		234	48.1, 4.5, 5	18		
		NT	<2	16		
		248	36.8	21		
		NT	<2, <2, <2	21		
	Eucalyptus marginata	227	35	19		
		230	13.2, 2.4, 14.3	18		
		NT	<2, <2	23		
		NT	<2, <2	21		
		NT	<2, <2, <2, <2	19		
		NT	<2, <2, 3	23		
		NT	<2	19		
		NT	<2	19		
		231	4.8, 26, <2	20		
		NT	<2, <2	21		
		323	16.7, 13.8	18		
		NT	<2	19		
		NT	<2	19		
		NT	<2	21		
		NT	<2	21		
		236	9.4	16		
		NT	<2, 4.9	16		
		237	10	16		
		240	23.5	20		
		241	9	12		
		242	10, <2, 28.8	21		
		NT	<2, <2	20		
		NT	<2, 8.2	19		
		NT	<2	19		
		NT	<2	19		
		243	20, 11.4	20		
		NT	11.8	18		
		244	18.2	18		
		NT	6.7	15		
		NT	2.7	17		
		NT	9.6	13		
		245	8.5, 27	16		
		NT	<2	15		
		NT	<2	15		
		NT	<2, <2, 7, 7.3	17		
		NT	7.6	21		
		NT	<2, <2, <2, <2, <2	15		
		260	9.3, 10.6, 9.6	21		
		NT	<2	23		
		NT	<2	21		
		246	8.6	15		
		NT	8.2	14		
		NT	2.9	19		
		249	30.8	21		
		250	21.1, <2, <2, <2	20		
		258	16.7, <2, <2, <2, <2	20		
		259	21.3	21		
		NT	<2	19		
		NT	<2	17		

		NT	<2	15		
	Corymbia calophylla	228	20.6	20		
		229	26.8	16		
		235	34.2	18		
		238	7.8	17		
		239	17.2	9		
		261	14.5	19		
		247	13.7	19		
		NT	8, 7.3	13		
		NT	<2	3		
	Banksia littoralis	NT	<2	23		
		NT	<2	21		

1.1.9 Adelaide Rd (Upper Margaret)

Plot	Species	Tag Number	DBH	Canopy condition		
				07/08	**08**	
A	*Corymbia calophylla*	598	16.9	13	13	
		599	27.3	15	15	
		NT	<2, <2, <2, <2, <2	21	21	
	16 seedlings 4 saplings					
	Melaleuca preissiana	600	22.2, 9.0, 4.9, 6.8, 5.2, 3.0, 3.0, 3.0	19	19	
		958	9.9, 6.0	15	15	
		959	9.3	13	11	
		NT	<2, <2, <2, <2	13	15	
		960	12.0, 8.8	13	11	
		961	10.5	13	13	
		NT	2.2	13	13	
		962	13.6, 9.7	15	13	
		963	28.9, 12.4, 4.4, 6.1, 2.4, 3.0, 4.1, 6.7	19	17	
B	*Melaleuca preissiana*	964	45.8, 26.5	17	17	
		965	10.0, 6.0, 3.4	13	13	
		NT	<2, <2, <2	15	13	
		NT	<2, <2, <2		11	
		NT	<2, <2		15	
	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	13	
		NT	<2, <2	13	15	
		967	12.6, 5.3, 6.6, 10.6, 14.3	15	15	
		968	25.0	15	15	
D	*Melaleuca preissiana*	969	13.2	17	17	
		970	9.5	17	19	

1.1.10 Dennis Rd (Scott Nth)

Plot	Species	Tag Number	DBH	Canopy condition		
				07/08	**08**	
A	*Corymbia calophylla*	569	7, 5, 6.1, 7.5	21	21	
		NT	<2	17	21	
		NT	<2	15	19	
		NT	<2	15	15	
		NT	<2	15	15	
		570	7.9	21	21	
		571	8.5	21	19	
	16 seedlings 2 saplings					
	Melaleuca preissiana	572	35.4, 31.0	19	21	
	Banksia littoralis	NT	<2, <2	23	21	
B	*Melaleuca preissiana*	573	17.5, 11.1, 16.4, 22.3, 18.9, 16.0	17	19	
	Banksia littoralis	574	12.3, 3	23	19	
C	*Melaleuca preissiana*	575	11.8, 7.5, 8.1, 13.7, 11.8, 10.2, 10.5	15	11	
D	*Melaleuca preissiana*	576	18.5, 5.5, 21.8, 11.5, 3.7, 4.6	21	21	
		NT	<2, <2	23	21	
		NT	<2	23	19	
	Banksia littoralis	NT	4.2	23	13	

1.1.11 Reedia North

Plot	Species	Tag Number	DBH	Canopy condition		
				07/08	**08**	
A	*Eucalyptus marginata*	530	60.7	9	11	
		531	102.0	10	13	
		532	36.0	4	4	
		533	47.4	9	9	
		534	9.8	14	15	
		NT	<2	13	13	
		NT	<2	11	10	
		NT	<2	13	11	
		NT	<2	13	19	
	13 seedlings					
	Banksia littoralis	NT	<2, <2	23	3	
	C. calophylla 8 seedlings					
B	*Corymbia calophylla*	NT	3.8, 2.7	21	21	
		NT	2.4, 2.1	23	23	
	2 seedlings 1 sapling				16	
C	*Eucalyptus marginata*	NT	<2	13	16	
	Corymbia calophylla	NT	37.8		5	
	C.calophylla 6 seedlings				15	
D	*Eucalyptus marginata*	535	35.6	9	11	
		536	68.7	6	7	
		NT	<2	13	15	
		NT	<2	13	13	
		537	7.8, 9.1, 11.2	12	11	
		540	23.3, 39.6	15	15	
		NT	29		7	
		NT	7.8, 9.1, 44.7		11	
	76 seedlings 8 saplings					
	Corymbia calophylla	539	41.4	15	9	
		541	68.0	7	9	
	19 seedlings					

1.1.12 Reedia South

Plot	Species	Tag Number	DBH	Canopy condition		
				07/08	08	
A	*Eucalyptus marginata*	542	8.3, 6.1	19	19	
		538	8.7	19	19	
		543	16.6	21	21	
		544	13	20	21	
		545	8.4	21	21	
		546	9.5	21	21	
		552	13	18	18	
		551	7.3	13	11	
		550	8.5	11	9	
		549	5.1	15	17	
		548	7.8	21	19	
		553	6.8	15	15	
		554	20.5, 15.7	11	11	
		555	14.4, 102	11	11	
		561	8.5, 8.1	13	11	
		560	9.5	12	11	
		562	<2, <2, <2	19	19	
		NT	<2, <2		19	
	59 seedlings, 3 saplings					
	Corymbia calophylla	547	5.6	17	19	
	11 seedlings					
	Eucalyptus megacarpa	556	46.4	17	15	
		557	40.5	21	21	
		558	42.7	11	10	
		559	39.7	17	21	
	4 seedlings					
B	*Eucalyptus marginata*	563	18.8	7	9	
		564	9.6	13	13	
	22 seedlings, 1 sapling					
	Eucalyptus megacarpa	NT	3.5	17	17	
		NT	<2	15	17	
		NT	<2	15	15	
		NT	<2	15	15	
		565	9.6	15	15	
		566	3, 38.4, 8.8	19	19	
	6 seedlings, 2 saplings					
	C.calophylla 8 seedlings					
C	No trees					
D	*Eucalyptus megacarpa*	567	16.8, 2.3, 6.4	16	17	
		568	4	19	19	
	2 seedlings					

1.1.13 Scott River Rd (Scott Sth)

Plot	Species	Tag Number	DBH	Canopy condition		
				07/08	08	
A	*Eucalyptus marginata*	577	20.1, 15.5	17	19	
		581	11.7, 12.2	19	21	
		582	10.3	19	21	
		583	9.8	15	17	
		584	6.8	10	11	
		585	31.0	15	13	
		586	32.5, 13.4, 15.2	17	18	
		593	13.3, 10.7	20	21	
	Melaleuca preissiana	578	14.1	13	13	
		579	14.0	15	15	
		580	9.5	17	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	19	
B	*Eucalyptus marginata*	587	13.0	5	3	
		588	11.9	12	13	
		592	14.4	17	19	
		596	7.3, 4.0	19	17	
	11 seedlings 1 sapling					
	Corymbia calophylla	589	17.9	7	9	
		590	10.2	7	9	
		591	7.3	7	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	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	17	

1.2 Terrestrial sites

1.2.1 Blackpoint Rd

Plot	Species	Tag Number	DBH	Canopy condition		
				05	06	08
A	*Corymbia calophylla*	81	14.2	15	16	19
		82	9.3	10	10	12
		83	50	15	17	11
		84	7.6	19	17	21
		85	8.5	16	17	19
		86	8.2	16	16	17
		87	25.7	17	18	17
		89	17.2	14	15	15
		91	10.2	14	15	16
		96	13.4	17	17	19
		97	17.7	13	13	17
		NT	<2,<2, <2	10	10	20
		NT	<2, <2	10	10	17
		NT	2.7	10	10	18
		NT	<2	10	10	23
		NT	3.3	10	10	15
		NT	<2, <2	10	10	11
		NT	<2, <2	10	10	11
		99	17.2	15	15	17
		100	12.2	15	15	17
		102	21.5	13	13	13
		103	33.1	15	15	13
		104	8	13	13	19
		105	51.7	17	18	21
		107	45.8	15	16	19
		110	3.6	14	15	20
		NT	<2	18	18	15
		NT	<2	18	18	15
		111	12	13	13	11
		112	20	10	12	20
		114	28.4, 12.4	15	16	19
		115	5.5	12	12	13
	Eucalyptus marginata	88	25, 7	15	16	18
		90	8.3	17	17	21
		92	8.7	14	14	17
		93	22.9	17	17	17
		94	8.5	14	15	15
		95	6.5	17	17	16
		NT	2	18	18	13
		NT	<2	18	18	13
		NT	<2	18	18	Dead
		98	7.6	16	16	21
		101	64.5	13	13	13
		106	74.2	15	17	23
		108	28.4, 9.2	15	16	19

		109	27.3	7	7	8
		113	10.2	13	13	15
		116	5.5	14	15	21
		117	12.3, 6.5	12	13	19
		118	5.4, 3.8	12	10	17
		NT	<2	18	18	13
		NT	<2	18	18	17
		NT	<2	18	18	17
	252 *Euc/ Corymbia* seedlings					
B	*Eucalyptus marginata*	119	24.5, 13, 13, 51.7	14	14	15
		123	62.3	16	16	21
		126	55.7	11	12	15
		127	48.8	16	18	19
		128	10.3	13	15	17
		NT	<2	15	15	15
		NT	<2	15	15	15
		NT	<2	15	15	15
		NT	3.1	15	15	21
		130	10	17	17	21
		131	61.7	13	13	17
		134	12	15	16	19
		135	5	12	11	21
		NT	12.2	12	12	17
		NT	<2	15	15	18
		NT	<2, <2	15	15	19
		NT	<2	15	15	13
		NT	3.2, <2	15	15	21
		NT	<2	15	15	23
		NT	<2	15	15	20
	Corymbia calophylla	120	15.7	13	13	13
		121	11.7	13	13	13
		122	8.5	16	16	21
		124	14.5	14	14	17
		125	31.3	10	10	11
		129	44.2	15	16	15
		NT	3	8	8	8
		NT	<2	15	15	5
		132	38.5	13	11	11
		133	54	13	15	17
C	*Corymbia calophylla*	137	12	15	15	17
		139	20.6	15	15	17
		140	7.7	14	12	19
		141	6.2	13	14	21
		142	10.8	15	17	19
		143	11.6	11	11	15
		NT	9.8	12	12	17
		146	7.7	11	11	13
		147	4	11	11	17
		148	10.7	11	10	13

		NT	50	9	9	17
		150	72	9	9	13
		151	Dead	13	15	Dead
		152	8.2	12	12	17
		153	83	13	13	19
		154	6.8	13	13	19
		NT	<2			15
		NT	3			15
		NT	2.5			15
		NT	3.6			19
		NT	4.5			19
		NT	9.6			19
		NT	<2			5
		NT	<2			9
		NT	<2			12
		NT	<2			15
		NT	<2			17
		NT	<2			15
		NT	<2			15
		NT	<2			12
		NT	<2			14
		NT	<2			16
		NT	<2, <2			21
	Eucalyptus marginata	138	45.3	13	13	15
		145	67.6	10	10	9
		NT	<2, <2, <2			21
		NT	<2			11
	Eucalyptus/ Corymbia	20+ seedlings		16	16	16
D	*Corymbia calophylla*	155	22.5	10	12	12
		157	16.2	12	14	11
		158	12.7	13	13	13
		161	14.1	13	13	19
		162	15.4	12	13	19
		163	10	13	13	19
		164	17.3	11	13	15
		166	20.7	13	13	17
		167	3.7	9	9	15
		168	8.5	13	13	17
		169	26.5	9	10	4
		170	4.3	14	14	21
		172	21.8	9	9	9
		173	47.3	12	12	15
		174	39	11	13	11
		175	9.5	12	15	21
		NT	<2			13
		NT	<2			17
		NT	<2			15
	Eucalyptus marginata	156	Dead	dead	dead	Dead
		159	36.4	6	6	5
		160	60	11	12	15

		NT	3.6	13	13	19
		171	38.5	11	12	13
	Eucalyptus/ Corymbia	13 x NT		15	15	
		NT	3.5			17
		NT	7			19

1.2.2 Jack Track

Plot	Species	Tag Number	DBH	Canopy condition		
				05	**06**	**08**
A	*Eucalyptus marginata*	521	14.2	17	17	15
B	*Eucalyptus marginata*	522	8.4	15	15	15
		523	24, 23, 7, 55.7	19	18	13
		NT	<2, <2	15	15	15
		NT	<2			8
		NT	<2			13
		NT	4.7			19
		NT	2.6			17
		NT	3			21
	9 saplings					
C	*Eucalyptus marginata*	524	59.4, 8.8, 8.7, 12.2, 59.6, 10.3	19	19	15
		525	26.3	15	17	17
		526	41.5, 41.2	19	19	19
		527	70.7, 7.2, 21	19	19	16
		528	49.3	17	17	19
		NT	3.5, <2	16	15	13
		NT	<2			17
		NT	<2			17
		529	22.2, 23.3, 27.9, 29.8	19	17	16
D	*Eucalyptus marginata*	530	8.5	13	13	9
		531	11.6, 7	18	19	17
		532	9.6	18	18	13
		533	5.7	14	15	11
		534	4.1	13	11	8
		535	20.6, 10.8	19	20	17
		536	8.9	15	16	15
		537	11, 11.3, 13.5	19	18	19
		538	5.4, 7.1, <2, <2	18	18	19
		539	9.9	11	11	11
		540	5.5, 10.1	17	17	15
		NT	<2			19
		NT	<2			15
		NT	<2			19
		NT	<2			17
		NT	<2			13
		NT	<2			15
		NT	<2			17
	2 resprouters					

1.2.3 Milyeanup

Plot	Species	Tag Number	DBH	Canopy condition		
				05	06	08
A	*Banksia grandis*	635	5.6,3.5	17	19	21
		NT	<2	11	11	19
		642	4.1, 3.1	18	19	21
		NT	<2	17	17	19
		NT	<2	13	13	19
		NT	<2	15	15	17
		646 (NT)	3.4, ,2	14	13	19
		NT	4.1, <2			19
		NT	3.6, <2			19
		636	8	14	19	19
		647	2.5, <2	12	9	19
		648	5, 6.1	17	19	19
		NT	2.2	14	14	19
		NT	<2	16	16	19
		NT	2.2, 2.1	18	18	21
		649	4, ,2	17	17	23
		NT	<2	11	11	15
		NT	<2	11	11	17
	Banksia littoralis	643	10	21	21	23
	Corymbia calophylla	628	7.3	15	15	15
		629	8	15	17	17
		630	13.5	16	19	19
		632	24.3	18	20	21
		633	12	15	15	15
		634	8	16	19	19
		NT	<2	16	16	17
		NT	<2	16	16	15
		NT	<2	16	16	19
		NT	<2			15
		NT	<2			15
		641	7.5, 9.5	17	19	21
		644	10.8	21	21	19
		645	10.9	16	21	21
		NT	<2	18	18	17
	Eucalyptus marginata	631	14, 21.5, <2	17	20	18
		637	15, 11.8	17	21	20
		638	12.1	15	19	15
		639	11.1, 13.2, 18.3, 23, 16.4, 4.6, 15.1, 27.3, 13.8	16	19	23
		NT	<2	17	17	19
		NT	<2	16	16	21
		NT	<2	16	16	17
		NT	3.7	14	14	16
		NT	2.5	17	17	19
		NT	3.2	17	17	21
		NT	<2	17	17	17

		NT	3.3	17	17	21
		650	16.5, 16.1, 61.2	20	19	21
B	*Banksia grandis*	651	11.8	17	19	19
		652	7.1	17	17	19
		653	13.3	17	19	19
		656	8.7, 6	17	15	21
		659	6.4	14	19	21
		NT	2, 2, <2	12	12	19
		NT	<2	15	15	21
		NT	<2	13	13	21
		NT	3			19
		663	6.2	14	19	17
		667	15	17	17	15
		668	11.7	17	17	19
		669	12.3	17	17	21
		670	12.4, 9	17	19	23
		671	9.3, 14.2, 9.8	18	19	21
		672	5.2	16	14	17
		NT	4.1	16	19	21
		NT	4.5, 3.4	16	17	19
	Corymbia calophylla	654	10.8	17	21	19
		655	4, 2.2	14	15	19
		660 (NT)	13.8	15	21	17
		661	12.3	15	19	19
		NT	2.2	15	15	19
		NT	<2	18	18	18
		NT	<2	14	14	15
		NT	3.2	14	10	13
		673	6.6, 2.3	16	19	21
		NT	<2	14	17	17
	Eucalyptus marginata	657	71.6, 3.5	13	12	13
		658	13.3, 47.8	13	13	19
		662	53.3	17	13	19
		NT	<2	14	15	19
		664	66	16	13	13
		665	35.1, 13.2, 8.3	15	14	16
		666	120	14	13	13
C	*Banksia grandis*	674	<2, <2, <2, <2, <2	15	9	15
		678	6.8, 6	13	15	15
		NT	<2	14	14	17
		NT	<2	11	11	19
		686	Dead	9	Dead	dead
		687	Dead	15	15	Dead
		NT	<2	13	15	19
		NT	<2	13	13	21
		NT	<2	15	15	16
	Corymbia calophylla	675	7.1	13	19	17
		NT	4	13	13	19
		NT	3.5	12	12	16
		NT	<2	14	14	19
		NT	<2	16	16	21

		NT	<2	16	16	16
		NT	<2	12	12	15
		NT	<2	14	14	16
		689	13.4	18	23	19
		690	9	19	21	17
		NT	<2	13	15	17
		692	7.5	16	14	17
		695	3.2, <2	14	15	9
		698	10.8	16	19	15
		NT	2.8	13	13	15
		NT	3.5	15	15	15
		NT	<2	15	15	15
		NT	<2	14	14	17
		NT	<2	13	13	19
		NT	<2	13	13	21
		703	57.1	17	13	15
	Eucalyptus marginata	676	21.2, 8.6	13	9	11
		677	19.3	14	13	15
		NT	<2	15	15	19
		679	11.5, 33.2	14	15	19
		680	8.2, 15	14	19	18
		681	16.7, 18.8	18	19	19
		682	12.2, 15, 18.9	17	17	19
		683	29.5	14	19	21
		684	11.1	13	19	21
		685	32	16	16	17
		NT	<2	12	15	17
		688	11.5	15	19	17
		NT	<2	15	17	19
		691	16	16	19	19
		693	5.8	14	15	17
		694 (NT)	7.8	17	19	19
		NT	3.1	17	19	19
		696	5.3	9	3	5
		NT	2.8 <2	14	14	16
		697	7.5	16	15	19
		NT	<2	14	14	12
		NT	<2	12	13	16
		NT	<2	14	14	19
		699	7.2, <2	13	15	13
		NT	<2	14	14	15
		700	20.3	15	19	17
		NT	<2	15	15	16
		NT	<2	14	14	18
		701	10.3	15	17	17
		NT	<2	13	13	15
		NT	<2	13	13	15
		702	9.6	16	19	19
		704	20.5, 7.1	18	19	19
		705	17.5, 35, 24.2	19	19	21

1.2.4 Poison Gully

Plot	Species	Tag Number	DBH	Canopy condition			
				05	06	07/08	08
A	*Eucalyptus marginata*	383	11.3, 9.8, 7.5	12	15	13	11
		384	12.3, 10.0	12	13	15	13
		385	36.2	16	16	18	16
		386	3.8, 10.0, 6.1	12	11	15	12
		387A	19.5	12	13	9	11
		388	6.2	13	17	16	17
		389	<2.0, <2.0, <2.0, <2.0	9	11	4	7
		390	17.7, 9.8, 17.0, 19.0, 9.6, 18.1, 15.0, 18.9, 9.5, 10.5	16	18	9	16
	2 saplings 2 seedlings						
B	*Eucalyptus marginata*	391	10.0, 9.2	13	14	14	10
		393	7, <2.0	15	14	11	14
		395	9.3	11	17	10	12
		396	17.6, 15.2, <2.0, 10.0, 6.1 11.3, 16.0	13	14	18	14
		397	41.5	15	13	16	11
		399	29.7	15	13	11	15
		401	64.1	15	9	9	11
	3 saplings 12 seedlings						
	Corymbia calophylla	392	29.1	14	7	11	9
		402	24	15	14	9	9
	Banksia grandis	394	13.5	16	17	20	19
		NT	4.5, 2.5, <2	17	18	20	21
		NT	4.8	-	-	20	21
	3 seedlings						
	Banksia attenuata	403	12	13	18	20	22
C	*Eucalyptus marginata*	404	40.0	11	10	16	10
		405	22.3	12	14	11	13
		406	21.5	13	14	14	13
		NT	<2.0	12	9	19	11
		408	18.2, 7.8, 7.8	11	12	18	16
		410	17.5	12	14	18	13
		411	81.0	14	14	10	13
		NT	<2.0	14	14	14	14
		413	17.7, 3.5	14	16	12	15
		414	8.3, 9	14	14	14	13
		415	17, <2.0, 11	15	15	16	16
		418	30.0, 6.3, 10.5	16	14	13	16
		420	8.5	13	17	17	17
		NT	<2				10

		NT	5 x<2				10
	5 saplings 18 seedlings						
	Corymbia calophylla	412	60.0	13	14	11	16
		419	24.2	15	14	14	17
	Banksia attenuata	NT	7.7, 4	15	15	23	23
		407	3.3	16	18	21	Dead
		NT	5 x <2.0	15	15	15	21
		NT	3.5, 3	15	15	16	23
		NT	3	16	16	15	21
		NT	<2.0	16	16	16	23
		421	6.0	16	18	21	21
		422	2.3	16	15	20	21
		444	4.8				21
		NT	<2				21
		NT	<2				23
	Banksia grandis	NT	3.3	15	15	21	21
		409	3.8, <2.0	10	17	21	21
		NT	<2.0, 3	13	13	21	15
		NT	<2.0, <2	13	13	21	19
		NT	<2.0	13	13	21	21
		NT	<2.0, <2	13	13	21	21
		NT	<2.0	12	12	21	19
		NT	<2.0	12	12	18	21
		NT	<2.0	12	12	21	19
		NT	<2.0	12	12	21	21
		416	9.1, 4.8, 2.0	15	17	20	19
		417	6.7, 6.2	15	15	21	21
D	*Corymbia calophylla*	423	25	15	16	12	14
		424	21.3	13	14	9	13
		444	18.2, 15.2	14	16	9	16
	Eucalyptus marginata	426	61.5	17	16	14	17
		NT	4	12	12	17	13
		433	17.6, 21.8, 13.2	14	18	19	20
		NT	<2.0	12	12	15	11
		435	30.5	14	18	18	19
		NT	2.1	12	12	17	14
		NT	<2.0, <2	12	12	17	12
		437	10.2, 12.2	13	17	21	16
		440	9.9, 14	12	15	9	13
		441	7.5, 4.1	10	10	6	10
		442	10.1, 5.8, 2.4	10	10	11	10
		445	12.6	12	17	21	15
		446	15.3, 13.2, 6.7, 12.2	14	14	15	15
		447	8.7, <2.0	12	15	17	14
		448	17.8, 7.7	14	17	16	16
		NT	<2.0, <2, <2	13	13	21	16
		NT	<2.0, <2	13	13	21	14
		NT	<2.0, <2	13	13	21	10
	8 saplings						

	20 seedlings						
	Banksia attenuata	429	9.4	15	17	23	21
		430	14.3	15	17	21	21
		431	15.3, 6.4, 7.1, 4.0	16	17	19	21
		NT	<2.0	12	12	23	17
		NT	<2.0	12	12	21	15
		387B	12, 10.9	-	-	21	21
	Banksia grandis	425	4, 3.4	13	17	18	19
		427	6.3	14	17	19	17
		NT	<2.0	13	13	21	17
		428	8.0, 5.8	14	17	18	19
		432	7.5	13	17	23	19
		434	5.9	10	17	21	18
		436	9	12	17	21	19
		438	5.2, 5.2, 8	13	15	19	18
		439	3.4, 3.2	12	13	19	18
		443	6.7, 4.5	14	18	21	21
		NT	<2.0, <2	8	11	19	15
		NT	<2.0, <2	12	15	21	21
		NT	2.5				21
	15 seedlings						

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

2.1 Wetlands

2.1.1 Blackpoint Rd

Species	Cover and abundance							
	A1	A2	B1	B2	C1	C2	D1	D2
Taxandria inundata	3	2	1					
Pericalymma ellipticum		9	5	7		6	1	1
Hakea certophylla	2	5	3	2				
Meeboldina scariosa	5	3	5	3		2		
Sp 55 Hypolaena (large)	4		4					
Sp BW63 *Shoenus cruentus*	2		4					
Xyris roycei	1	3		2		4	2	2
Melaleuca basicephala P4		1						
Astartea juniperiana								
Mesomelaena tetragona		4		7		3		
Sp 26 Restionaceae sp.								
Beaufortia sparsa		4			5	4	6	6
Cassytha racemosa		6					3	
Chordifex amblycoleus	4	5	2	2		4		
Lyginea barbata								
Eutaxia obovata					1			
Platychorda applanata		4	4	5				
Sphenotoma gracile		1		1	5	2	2	2
Diaspasis filifolia	3	3		1				
Pimelea sulphurea		1						
Calothamnus lateralis		2	1	2		2		
Cyathochaeta clandestina		6	3					
Petrophile serruiae		1	3	1				
Eucalyptus marginata								
Dampiera linearis							1	1
Tricostularia neesii				3		3	3	6
Taxandria lineairfolia		4						
Acacia browniana								
Anarthria scabra					6	4	4	
Stylidium scandens					2	3	3	3
Melaleuca preissiana		2			8			
Pultenaea reticulata					8			
Sp 77 *Acacia longifolia*					1	2	3	
Persoonia longiflora								
Adenanthos obovatus				2		3	2	1
Anarthria prolifera							3	
Sp 15 Papilionaceae sp.						2		1
Xanthorrhoea preissii						2	1	3
Cyathochaeta avenacea								
Dasypogon bromeliifolius					3	3	2	3
Pimelea longiflora						3	2	3
Sp 45 *Sporadanthus strictus*				4		3		
Sp 49 *Meeboldinia denmarkica*						3		
Daviesia inflata						2		2
Hakea falcata		1				1		
Xanthorrhoea brunonis								

Johnsonia lupupina							2	
Acacia semitrullata					3		4	
Sp. 65 *Juncus* sp.	3							
Comesperma confertum		2	1	1				
Sp. 75 *Chaetanthus leptocarpoides (f)*		6	3	2		4		
Sp. 69 *Aotus gracillima*		3		1				
Sp. BW69 Papillionaceae sp.			3	2		1		
Sp. BW62				1	2			1
Taxandria parviceps					2	3	6	9
Mesomelaena graciliceps							2	3
Thysantous tenellus							1	
Drosera menzesii								1

2.1.2 Blackpoint/ Fouracres Rd

Species	Cover and abundance							
	A1	A2	B1	B2	C1	C2	D1	D2
Taxandria parviceps	4	6	7	6	5		4	5
Pericalymma ellipticum	3	3	7	5	6	9	7	5
Anarthria scabra	5	8			4			
Stylidium scandens	3	3	2		2			
Lindsaea linearis	4	3			1			1
Mesomelaena tetragona	6	4	6	7		5	3	4
Eucalyptus marginata	1	5			2			
Adenanthos obovatus	1	1	1	3	1			2
Hibbertia stellaris	2			2	2		3	
Sphaerolobium medium	2	2						
Anarthria prolifera	5	5	6		5		4	5
Acacia browniana		3						
Andersonia caerula	1	3	3		1			
Xanthorrhoea preissii	2		2		3	1	5	4
Dampiera linearis		1	2		1			1
Sp 15 Papilionaceae sp.	1	2		2			1	1
Sp 16 *Acacia extensa*								
Conostylis laxiflora								
Sp 19 *Schoenus sublateralis*		1	3					
Sp 20 *Hemigenia sp.*	2	2		2			3	1
Hypocalymma angustifolium	2	2	6		3		6	4
Nuytsia floribunda			3				2	
Drosera menziesii	2	1	1	1			1	
Lyginia barbata	3		1		2		2	
Sp 27 *Hypolaena* large	3	3	2	3	3	3	3	2
Cyathochaeta avenacea	2			3			2	
Leschenaultia biloba	1		2	1				
Platysace tenuissima		2						
Thysanotus tenullus	2	3	1		1			
Conostylis setigera subsp. *setigera*	2			1				
Sp 182 Rubiaceae sp.								
Platysace filifolia								
Xylomelon occidentale								
Dasypogon bromeliifolius		4	4	4	6		6	4
Evandra aristata		2			3		3	2
Lomandra caespitosa	3	3	2		3			
Pimelea longiflora	2	2			1	1		
Johnsonia lupulina	3	1	4		1			2
Sp 37 *Leucopogon australis*		2						
Cassytha racemosa	1		1					
Beaufortia sparsa		2	3	5	4			6
Melaleuca preissiana					3		2	3
Xyris roycei				4	3	2	3	3
Schoenus indutus P1								
Amphipogon turbinatus			2	3	2			3
Sp 45 *Sporadanthus strictus*				2		3		2
Chordifex amblycoleus				2		3		1
Sp 47 *Schoenusn efoliatus*				3	3		2	

Lyginea imberbis	1		3					
Sp 49 *Meeboldinia denmarkica*			2		6		7	4
Sp 50 *Tricostularia neesii*					2	3	2	2
Eutaxia obovata						2		
Hakea certophylla						4		
Calothamnus lateralis						2	1	1
Platychorda applanata						4	4	
Sp 56 *Leucopogon* sp.								
Poaceae sp*								
Sphenotoma gracile	1		1		1			3
Sp 61 *Meeboldinia scariosa*	4	3		4		3		3
Schoenus curvifolius	1		2					2
Mesomoleana graciliceps	2	5	4	2	4		2	2
Lomandra purpurea	1							
Thelymitra sp.		1	1		1			
Drosera sp.		2	2		2			
Agrostocrinum stypandroides		1						
Pultenaea drummondii		1						
Trachymene-like		1	1					
Mitrasacme paradoxa		1						
Burchardia umbellata		1						
Drosera sp. (yellow)			1					
Acacia sp.			1					1
Drosera pulchella				1				
Xanthorrhoea brunonis				1	2			
Schoenus cruentus						2		
Sp BW 68 (Lime green plant)						1		
Sphaerolobium fornicatum								3

2.1.3 Blackpoint Rd Base of Dunes

Species	Cover and abundance							
	A1	A2	B1	B2	C1	C2	D1	D2
Taxandria linearifolia	3		5	3	3	8	8	10
Evandra aristata	4	4		2				
Astartea juniperina		2	3	4	4	5		4
Eutaxia virgata	4	2	4	7	3	4		5
Sphenotoma gracile		3						
Meeboldinia scariosa	3		3	5		4		3
Cassytha racemosa	4	2	3	2	2	5	2	6
Comesperma confertum	1		2		1	2		2
Dampiera linearis	3	2	2	1	1	2		
Hakea linearis	4	2	3	4	3	5	3	3
Boronia stricta	3	2	2	3		2		
Acacia pulchella var. *goadbyi*	3		3	4	5	7	4	9
Acacia semitrullata	3	2	3	3				
Melaleuca rhaphiophylla	3	2		3	5			6
Lepidosperma longitudinale			4	4	3	2	8	6
Hypolaena pubescens	7		2	5		3		
Taxandria parviceps	4	8	4	4				
Sp 204 *Hypolaena exculsa*		4	3	3	3			5
Sp 205 *Persoonia elliptica*		2						
Kunzea spathulata	2	3			2	4		2
Banksia littoralis			2	2		2		
Sp 207 *Pimelea sp.*	2			3	1	3		6
Patersonia occidentalis	2							
Melaleuca laterita						2	5	
Xyris roycei					2	3		4
Sp 209 *Loxocarya striata*	5		2			5	2	3
Stylidium sp.						2		1
Sp BW 77						2	4	4
Baumea Sp.							5	3
Platychorda sp.								
Orchid sp.				1				
Utricularia multifida	1	1	2	3				
Drosera sp.		1						
Sp 209	2						1	
Villarsia parnassifolia							1	

2.1.4 Darradup Rd West

Species	Cover and abundance							
	A1	A2	B1	B2	C1	C2	D1	D2
Mesomelaena tetragona	3	4		2	3	5	3	7
Dampiera linearis	2					1	1	1
Sp 15 Papilionaceae sp.	2	2	2	2	4		2	2
Drosera menziesii	1							
Dasypogon bromeliifolius	5	5	6	8	5	7	7	
Evandra aristata	3		7	1				
Beaufortia sparsa	7	4	4	4	5	4	4	
Hakea certophylla	3	2						
Calothamnus lateralis	3	3			3		3	
Sphenotoma gracile	3	2	1	2	2	3	2	
Comesperma confertum				1				
Homalospermum firmum	5	3	6	7	6	6	5	
Astartea juniperiana	4	2		1	3	3	3	
Taxandria parviceps	6	9	8	7	6	7	8	3
Sp 37 *Leucopogon australis*		1	3	2	2	2		
Sphaerolobium fornicatum	2	2	2	2	2	3	1	
Conospermum capitatum	2			1	1	1	1	
Sp 97 *Hypolaena exsulca*	3	3	5	3	4	3		
Empodisma gracillimum			2	2	2	3	3	2
Sp 26 *Leptocarpus* sp.	3	2	3	3	3	2	2	
Mesomelaena gracilipes		3	3	3	2	2	2	
Drosera pulchella								1
Adenathos obovatus	1	1	2	3	3	3	3	
Sp 19 *Schoenus sublateralis*								
Sp. BW68 *Leptomeria* sp.	1							
Thysanotus tenellus	1			1		1		
Drosera sulphera		1	2	1		1	1	
Melaleuca preissiana		2			1			
Sp 41 *Drosera sp.*			1		1			
Conostylis laxiflora		2		2	2			
Boronia anceps	3	3	1	3	2	2	2	3
Daviesia inflata			2	3				
Cassytha racemosa				1	1			
Pimelea longiflora				1				
Haemodorum spicatum			1					
Acacia semitrullata		1	3		2	3	2	
Pericalymma ellipticum								2
Acacia browniana					1			1
Eucalyptus marginata								1
Lindsaea linearis								1
Sp. 113 *Cyathochaeta avenacea*								7
Patersonia umbrosa	1							1
Taxandria linearifolia								3
Dryandra lindleyana								2
Hibbertia cunninghamii								2
Stylidium diversifolia								2
Xanthorrhoea brunonis	1							
Grevillea quercifolia								1

Lomandra sp.		1						1
Sp BW75			1					
Corymbia calophylla								1
Eucalyptus megacarpa								1
Taxandria juniperia								1
Leptomeria sp.								1
Sp BW76 *Petrophile* sp.								1
Hibbertia pilosa								1

2.1.5 Milyeanup

Species	Cover and abundance					
	A1	A2	B1	B2	C1	C2
Taxandria linearifolia	4	8	7	10	8	
Sp 168 *Leucopogon sp.*	3					
Pteridium esculentum	8	3			2	8
Banksia littoralis	2					
Astartea juniperina	3	1	1	3	3	
Comesperma confertum	2				1	
Acacia uliginosa	5			5	4	
Acacia pulchella var. goadbyi	1					
Eucalyptus rudis	3					
Mirbelia dilatata	2					3
Tremandra stelligera	4					
Dampiera hederacea	5			2		
Sp 175	5			10	9	
Sphaerolobium medium	4	3	3	4	3	
Empodisma gracillima	5		10	3	4	
Lepidosperma tetraquetrum		10	8	3		
Sp 181 Restionaceae sp.		10	9			
Taxandria juniperiana				8		2
Cassytha racemosa	1				4	3
Anigozanthos flavidus						2
Platysace filiformis						2
Scaevola calliptera						3
Xanthorrhoea preissii						3
Lomandra caespitosa						4
Acacia extensa						5
Patersonia umbrosa						2
Bossiaea linophylla						5
Corymbia calophylla						8
Eucalyptus marginata						4
Opercularia hispidula	2					4
Hypolaena exsulca						3
Leucopogon hirsutus	3				2	
BW77			2			
Dampiera sp.			1			
Leucopogon propinquus						2
Lindsaea linearis						3
Loxocarya sp.						3
Macrozamia riedlei						2
Desmocladus fasicularis						2
Thomasia sp.	1					
Sp. 75						2

2.1.6 Poison Gully

Species	Cover and abundance			
	A1	A2	B1	B2
Astartea juniperina	3	1	3	1
Casuarina fraseriana	2			
Eucalyptus marginata	2			
Anarthria scabra	7			
Dampiera linearis	2		1	
Sp 16 *Acacia sp.*	3			
Pimelea longiflora	2			
Cassytha racemosa	1	3	3	2
Beaufortia sparsa		2	5	5
Sp 47 *Schoenus efoliatus*	2			3
Sphenotoma gracile			7	1
Pulteneae reticulata	6			
Kunzea recurva				
Sphaerolobium fornicatum	2	1	3	
Sp 97 *Hyploaena exsulca*	4			4
Empodisma gracillimum	2	4	5	1
Taxandria pariceps	6	4	5	8
Loxocarya exsulca	2			1
Sp 115 *Baumea* sp.	4	10	9	5
Callistemon glaucus		4	4	3
Pultenaea drummondii				3
Xanthorrea preissii	5			
Podocarpus drouynianus	2			
Billardiera laxiflora	2			
Mirbelia dilata				3
Leucopogon sp.	1	2		
Dampiera linearis		2		
Lyginea sp.				1
Drosera macrantha subsp. *macrantha*				1
Unknown herb				1
Comesperma confertum				1

2.1.7 Blackpoint/ Mayall Rds

Species	Cover and abundance							
	A1	A2	B1	B2	C1	C2	D1	D2
Beaufortia sparsa			3		4			
Hypocalymma (yellow)			7		8			
Kunzea recurva	4	3	3		3	1	2	3
Taxandria parviceps	3	2		4	6	7	3	
Adenanthos obovatus		2	2	3	1	3	4	2
Schoenus efoliatus				5	1	4		
Lysinema cilatum		1	1	4	2	2	3	
Anarthria prolifera		3	3	4	4	3	3	3
Xanthorrhoea preissii		2		4	3	2	4	2
Acacia sp.	2	3	3	4	2	4	3	1
Drosera sp.		1	1	1	1	1	1	2
Dampiera linearis		3			2	1	1	3
Hypolaena exculsa	4	3		3	3	3	3	3
Cassytha sp.		1			3	3		
Lyginea barbata	1		2		2		2	
Evandra aristata	2	2	6	1	4		3	
Thelymitra sp.		1			1			
Astartea fascicularis	5							
Meeboldina scariosa	7							
Dasypogon bromeliifolius	1	5	4	4	2	4		3
**Briza minor*	1		2					
**Lolium rigidum*	1							
**Medicago* sp.	3							
**Holcus lanatus*	2							
Juncus pallidus	3							
**Mentha pulegium*	3							
Isolepsis sp. 1	1			1				1
**Hypochaeris glabra*	2		1					
Meeboldina denmarkica	3		6		2			
Drosera sp.	1							
Cotula sp.	1							
Anarthria scabra		9	4	9		8	10	8
Eucalyptus marginata		3		5		4		
Melaleuca thymoides		5		7		7	5	7
Hibbertia stellaris		1			1			
Sp BW59 *Acacia* sp.		4	3	5	4	3	6	3
Johnsonia lupulina		1		1		1		2
Andersonia caerulea		2	2	5	2	2	2	1
Sp BW60 Papilionaceae sp		1						
Lomandra caespitosa		2						
Sp T182		1						2
Pimelea spectablis		1		2		1	2	1
Sp BW61 *Bossiaea linophylla*		2		3	3	2	2	
Sp BW62 *Sphaerolobium* sp.		1						1
Sp BW63 *Anarthria* sp.		2	2		2			
Taxandria juniperiana		4						
Nuytsia floribunda			3	2				
Xyris roycei			2					

Boronia denticulata			1					
Pericalymma ellipticum			4		2			
Microtis sp.			1					
Darwinia sp.			2				1	
Stylidium sp.			2					
Isolepis sp.			2					
Levenhookia sp.			2					
Vellereophyton dealbatum			1					
Sp BW58 *Tricostularia neesii*					2			
**Larugus ovatus*			1					
Sp BW64 *Amphipogon turbinatus*			2		2			
Patersonia occidentalis		2		1	2	1		2
Jacksonia horrida				5	1	3	5	4
Sp BW65 *Hibbertia* sp.				2		2	2	2
Scaevola calliptera				1				
Boronia spathulata					1	1	1	
Hypocalymma robustum						2	2	1
Stylidium schoenoides						1		1
Platysace filiformis							1	
Mesomelaena graciliceps					1	1		
Sp BW66 Papilionaceae sp						1	1	1
Burchardia umbellata								1
Velleia trinervis								2

2.1.8 Stewart Rd

Species	Cover and abundance							
	A1	A2	B1	B2	C1	C2	D1	D2
Hakea ceratophylla	6	5	7	7	6			
Chordifex amblycoleus	3		3		2			
Pericalymma ellipticum	8	2	3	2	10		2	
Hakea trifurcata / varia	3		1					
Hypolaena sp. (large)	4	2	3	3	6			
Sp. BW69 Papilionaceae	3	5	6	3	2			
Melaleuca basicephala P4	2	1	2	2	3			
Astartea fascicularis	1							
Meeboldina scariosa	5	2	2	2	7			
Schoenus cruentus	4	2	2	3				
Sp. BW71 *Cassytha* sp	1	3	3	2	2			
SP BW74 *Eriostemon* sp.	2	5	4	4	3			
Melaleuca laterita	1	6						
Sp. 65 (sedge)	5	4	2	7	1			
Sp. BW70 (sedge)	3	2	2	3	3			
Platychordia applanta		1	2		2			
Sp. BW40 *Leptocarpus elegans*		9	8	7				
Sp. BW73 *Chorizandra cymbaria*			3					
Sp. BW72 *Leptomeria* sp.			1	2	3			
Eucalyptus marginata						4		8
Corymbia calophylla						5	3	2
Melaleuca preissiana						6	9	
Taxandria juniperiana						8	8	8
Podocarpus drouynianus						1	1	1
Comesperma confertum						1	2	
Dampiera linearis						2	2	
Cassytha racemosa						4	1	2
Stylidium sp.						2	1	
Patersonia occientalis						2		2
Xanthorrhoea brunonis						2	1	1
Gompholobium ovatum						2		
Kingia australis						3		4
Sphenotoma gracile						2	2	2
Leucopogon australis						2	1	1
Adenanthos obovatus						1	1	3
Scaevola calliptera						2	2	1
Lindsaea linearis						1	3	5
Drosera sp.						1		
Xanthosia candida						1	2	2
Mesomelaena graciliceps						6	3	4
Lepidosperma sp.						3	3	2
Thelymitra sp.						1		1
Acacia mooreana						1	2	
Billardiera laxiflora						1	1	1
Isopogon sphaerocephalus							1	1
Xylomelon occidentalis							1	1
Boronia spathulata							2	1
Pimelea spectablis							1	2

Platysace filiformis							1	
Conostylis sp.							2	
Hypolaena exsulca							2	3

2.1.9 Adelaide Road (Upper Margaret)

Species	Cover and abundance							
	A1	A2	B1	B2	C1	C2	D1	D2
Pericallyma ellipticum	3	7	9	8	8	5		2
Leschenaultia expansa	1							
Hibbertia hypercoides	4	3						
Patersonia umbrosa	2	1	2	1	2			
Allocasuarina fraseriana	3							
Desmocladus fascicularis	2	4	3					
Xanthorrhoea preissii	2	3	7	3	3	3		2
Lepidosperma longitudinale					1			
Drosera sp. (small)	3						2	
Gompholobium capitatum	2	1	1			1		
Hypocalymma angustifolium		2	2					
Sp. 46 Unknown herb	1		1					
Hemigenia rigida	1		1					
Melaleuca preissiana		7	2	1	8	3		
Dasypogon bromeliifolius		3		2	3			
Corymbia calophylla		2						
Adenanthos obovatus		2			3	1	3	1
Melanostachys ustulata		9		7	3	7	3	
Calothamnus lateralis		2		2			3	2
Acacia divergens		1			1		2	
Mesomelaena tetragona		4	3	4	4	4	5	
Bossiaea linearis?				4		2		
Conostylis setigera		3	4		2			
Hibbertia rhadinopda		4			4			
Boronia dichotoma					1	2	1	1
Stirlingia latifolia			1	3	1		1	1
Eutaxia sp.		2		2	3	3	3	3
Viminaria juncea			3					
Cassytha sp.			1		2			2
Hypolaena exsulca		2	2					4
Lyginia imberis		3		2		4	3	5
Beaufortia sparsa				3		3	2	2
Adenanthos meisneri				7				
Baxteria australis		3	3	2	3	2	4	4
Dampiera linearis		1		1	1	1		2
Conospermum caeruleum							1	
Sp. 36 *Sporadanthus strictus*						3	4	
Leucopogon gilbertii				1				
Hakea ceratophylla					1		2	1
Daviesia sp.				1				
Sp. 54 *Lepyrodia elegans*		3	2	4	6	2	3	2
Astartea fascicularis						1	5	5
Taxandria parviceps							5	
Taxandria juniperiana						3		
Hakea sulcata							4	2
Amphipogon turbinatus							1	
Chordifex amblycoleus							3	2
Melaleuca basicephala (P4)							3	2
Leptomeria squarrulosa							2	
Sp. 58 Restionaceae sp.								1
Sp BW78 *Goodeniaceae* sp.	1							
Sp 44 *Darwinea* sp.	3		2					
Lobelia tenuior	1							

Sp BW79 *Stylidium calcartum*	2							
Leptospermum squarmatum	2						2	
Sedge sp.	1							
Lomandra nigricans	2							
Sp BW80 *Leucopogon* sp.	1							
Anarthria prolifera		2						
Meeboldinia denmarkica		5		5		7		5
Drosera pallida		2	2	2	2	2	1	2
Utricularia multifida		2		2	1	1		
Drosera sp.			1	1	3	1		
Sp BW81			2	1				
Stylidium amoenum			3	3	1			
Sedge sp.			3					
Stylidium perpusillum						2		
Diaspasis filifolia							2	
Comesperma flavum							1	1
Stylidium junceum subsp. *junceum*							1	2
Sp BW87								3

2.1.10 Dennis Road (Scott Nth)

Species	Cover and abundance							
	A1	A2	B1	B2	C1	C2	D1	D2
Xanthorrhoea preissii	4	5					5	7
Beaufortia sparsa	7						2	
Grevillea papillosa P3	5		3	6	5	3	6	7
Adenanthos detmoldii P4	6				3		4	
Adenanthos obovatus	2						2	
Eutaxia epacridoides	3				1			1
Amphipogon turbinatus	5							
Leptocarpus tenax	5						3	3
Tricostularia neesii	5						4	6
Empodisma gracillimum	7						2	
Baxteria australis	2							
Dasypogon bromeliifolius	2							3
Mesomelaena tetragona	8		4			1	3	5
Anarthria prolifera	2						4	
Patersonia occidentalis	2							
Schoenus efoliatus	4							4
Xyris sp.	3							
Persoonia graminea	1							
Lepidosperma squamatum	2							
Dampiera linearis	2		2		1		2	
Acacia browniana	1							
*Juncus microcephala**		7						2
Cyathochaeta avenacea		3		3	2	5	2	
Melaleuca preissiana			5		7			
Banksia littoralis		2		1				
Hakea ceratophylla		3	3	3		5	3	3
*Mentha pulegium**		9	4	3	3	6	3	5
*Rumex crispus**		4	2	2	4	3	2	3
*Epilobium hirtigerum**			3	3	5		3	3
*Holcus lanatus**		2			1		2	2
Alternanthera nodiflora			5	5	5	6	2	
Juncus pallidus			7	7	8	2	4	
Calothamnus lateralis	2		1	2		1	2	1
Baumea juncea			8		2	4	2	
*Conyza sumatrensis**		2		1				3
Astartea fascicularis			2	6		7		
Cyathochaeta stipiodes P3					5			
Taxandria linearifolia					3		2	
*Sonchus asper**							1	
Jansonia formosa							4	
Daviesia inflata							1	
Johnsonia lupulina								2
Meeboldina scariosa						3	3	2
Chordifex amblycoleus					1	1	2	2
Boronia fastigiata	3							
Sphenotoma gracile	2							
Stylidium scandens	3							
Sp BW87 *Eutaxia virgata*	3							
Thysanotus multiflorus	1							
Drosera sp.	1							
Sp BW88 *Dampiera* sp.	2							
Medicago sp.	2	7			3		5	5
Eucalyptus marginata	1							

Microtis sp.		2					1	1
Sp. BW71 *Cassytha* sp.						1		
*Aster subulatus**								2
*Briza minor**							1	1
Chorizandra sp.								2
Schoenus cruentus								2
Orchid sp.							1	
Sp. 36 Restio sp.					2			

2.1.11 Reedia North

Species	Cover and abundance							
	A1	A2	B1	B2	C1	C2	D1	D2
Xanthorrhoea preissii	4							3
Xanthorrhoea gracilis	3							
Allocasuarina fraseriana	3	7						
Macrozamia reidlei	1							
Leucopogon propinquus	2	4						2
Patersonia umbrosa	3	2				3		2
Dasypogon bromeliifolius	7	4						
Acacia extensa	4	3						
Lepidosperma squamatum	3							
Podocarpus drouynianus	2							
Hypolaena exsulca	4	6						3
Hibbertia hypercoides	6							4
Eucalyptus marginata	6	8						5
Gompholobium confertum	2	1						
Loxocarya cineria	2							
Anigozanthos flavidus	1							
Conostylis setigera	2							
Desmocladus fasciculatus	2							
Lomandra caespitosa		2						
Taxandria linearifolia		7	8	8	8	7	7	
Acacia divergens		5	3	3		2		
Anarthria prolifera		5		4		4		
Corymbia calophylla						2		4
Xyris gracillima		3	3	5	6	3	5	
Astartea fascicularis			5	4		4	2	
Boronia fastigiata		4				1		
Tetrarrhena laevis		2						1
Acacia browniana		1					4	3
Sporadanthus rivularis				8	7	3	5	
Leucopogon hirsutus		3		2		2		1
Dampiera hederacea			3			2		1
Empodisma gracillima		2	5					
Mesomelaena tetragona		3					3	8
Gonocarpus diffusus				2			2	2
Baumea sp. Blackwood							6	
Hibbertia perfoliata			2	2				
Lepidosperma tetraquetrum			3					
Tricostularia neesii				6				
Baumea rubiginosa				2				
Drosera glanduligera						2		2
Acacia pulchella					4			
Hovea trisperma						1		1
Amphipogon sp.		2						
Johnsonian lupulina						3		
Dampiera linearis						1		
Pentapeltis peltigra						1		2
Pimelea sp.								1
Amphipogon turbinatus	1	3				2		1
Homalospermum firmum?							7	
Taxandria parviceps	2		5					5
Stylidium sp.								3
Lomandra pauciflora								3
Hibbertia cunninghamii						1		1

Lindsaea linearis	2							
Sp BW84				3				
Jansonia formosa P sp.	1							
Haemodorum sp.	1							
Thysanotus manglesianus	1	1						
Scaevola calliptera	3							
Xyris sp.	1							
Goodenia eatoniana		2						
Banksia littoralis		1						
Baxteri a australis		4						
Unknown climer		2						
Comesperma confertum		1			1			
Flat lime sedge		7						
Round lime sedge		7						
Sp BW82 *Baumea* sp.		8			9		4	
Diapasis filifolia					1			
Thysanotus tenellus								1
Sphearolobium sp.						1		1
Thysanotus sp.								1
Sp BW85 *Anarthria* sp								2

2.1.12 Reedia South

Species	Cover and abundance							
	A1	A2	B1	B2	C1	C2	D1	D2
Taxandria parviceps	7		6			3		
Eucalyptus marginata	7		2					
Corymbia calophylla	3							
Astartea fascicularis							2	3
Hibbertia hypercoides	6		3					
Leucopogon verticillatus	1							
Lindsaea linearis	4							
Leucopogon australis	2		4					
Patersonia occidentalis	3		3					
Pimelea sp.	2		2			2		
Anarthria prolifera	2		3			2		2
Tetrarrhena laevis	2							
Tetraria capillaris	4							
Lepidosperma squamatum	2							
Gompholobium confertum	2							
Podocarpus drouynianus			3					
Dampiera linearis	1		2					
Goodenia eatoniana			1					
Pentapeltis sp.	2		3					
Hakea amplexicaulis	2							
Mesomelaena graciliceps	2							
Desmocladus fasciculatus	1							
Taxandria linearifolia	1	6		4	6	5	5	
Homalospermum firmum?		7		6	6	5	3	5
Boronia fastigiata	1	6	3	4	3	7	4	6
Acacia pulchella		2		3	6	3	2	3
Beaufortia sparsa		2				3	2	3
Loxocarya cineria		6				3		3
Xyris sp.				3	3	6	4	3
Hypolaena exsulca			3			3		
Hakea lasanthoides		3	4					
Cassytha sp.		1			2	2		2
Leucopogon hirsutus						1		
Sporadanthus rivularis				7	8	5		4
Lomandra purpurea			1					
Allocasuarina fraseriana	8	4	5					
Eucalyptus megacarpa			2			2		4
Stylidium sp.	2							
Acacia divergens			2					
Baumea rubiginosa				5	5		8	5
Reedia spathacea DRF				5	6	3	8	
Comesperma confertum							1	
Sp. BW9 *Lepidosperma* sp.?		5			2	4	4	
Sp BW10 *Leptocarpus/Meeboldina* sp.		3				3		5
Aotus cordifolium							5	
Mesomelaena tetragona			3					
Thysanotus sp.			2					2
Agrostocrinum stypandroides	1							
Thysanotus tenellus	1							
Drosera sp.	2		4			2	2	
Hibbertia cunninghamii	1		1					
Lobelia sp.	1		2					

Orchid sp.	1							
Chorizandra sp.	1							
Johnsonia lupulina	1		1					
Sphaerolobium sp.	2		1			1		2
Tricostularia neesii	6			3	3			3
Baumea sp.	8		3		2			
Xyris sp. (tall)				2				
Diapasis filifolia				2		1		
Empodissima gracillima				5			5	
Actinotus omnifertilis						4		
Amphipogon turbinatus			2			2		2
*Cynodon dactylon**					3			2
Xyris sp. (scaly)					1			1

2.1.13 Scott River Road (Scott Sth)

Species	Cover and abundance							
	A1	A2	B1	B2	C1	C2	D1	D2
Taxandria parviceps	6	8	3	7	4	7	5	4
Beaufortia sparsa	7	3		5		4	4	2
Cassytha sp.	2	3						2
Anarthria scabra	5		9	5		9	9	
Anarthria prolifera	6	6	2	9	5	4	3	
Xanthorrhoea preissii	3	6	2	4		3	3	
Gompholobium capitatum	3	2	2					
Melanostachys ustulata	5	6	4					
Sphenotoma gracile	3	2	2		2	3	3	
Lyginea barbata		2	3					
Cyathochaeta stipiodes P3	2	3						
Lindsaea linearis	2		3					
Mesomelaena graciliceps	2		3					
Hypolaena pubescens	5							
Kunzea recurva		5	4	1				
Lomandra nigricans	3	2						
Dasypogon bromeliifolius	7	2	4	4	4	3	4	
Hypolaena exsulca			2					
Hypolaena caespitosa	4	3						
Homalospermum firmum		3		6	6	5	5	
Eucalyptus marginata		2	5	1				
Adenanthos obovatus		1	1					
Dampiera linearis						2	1	
BW89*Acacia hastulata*	2	1	2		2	2	4	
Baxteria australis			2	2	2		4	
Johnsonia lupulina	1							
Evandra aristata		2		2	2	2		
Corymbia calophylla			4					
Jacksonia horrida	1		3					
*Soleirolia soleirolii.**					1			
Schoenus sp.					4	4	5	
Astartea fascicularis					4			9
Sp. 36 *Sporodantus strictus*					3			
Platychorda applanta					2			3
Loxocarya cineria					3			3
Amphipogon turbinatus		1			3	2		4
Leucopogon australis							2	
Actinotus omnifertilis				2	2		1	
Melaleuca preissiana								2
Calothamnus lateralis								3
Meeboldinia scariosa					8			5
Pericalymma ellipticum					4			3
Sphaerolobium sp.			1					
Comesperma confertum			1		1	2		
Empodisma gracillima						3		
Leucopogon sp.				2				
Drosera sp.	1	2	1					
Hypocalymma angustifolium		1						
Scaevola calliptera		2						
Orchid sp		1						
Diapasis filifolia		1			4			
Sp BW91		2						

2.2 Terrestrial Sites

2.2.1 Blackpoint Rd

Species	Cover and abundance							
	A1	A2	B1	B2	C1	C2	D1	D2
Hovea elliptica	3	4	1		1		2	1
Hibbertia cunninghamii	4	2	1	2	3	1	3	1
Chorizema rhombeum	3	2	1		2	2	2	2
Patersonia umbrosa	5	6	5	3	3	3	6	3
Platysace tenuissima	4	2	2		2		2	
Petrophile diversifolia	6	5	4			1	2	5
Acacia browniana	1	2		3	1	5	3	1
Sp 9 Small mint herb	1	2					1	
Stylidium amoenum	2		1	1	1	1	2	2
Stylidium fasciculatum	2	4					2	
Lindsaea linearis	5	3	4	4	5	5	3	3
Podocarpus drouynianus	4	2	3	3			1	
Leucopogon verticillatus	3	2	1	1				
Samolus repens	2	2						
Pimelea spectabilis	1	1	2		3	1	1	
Pentapeltis peltigera	2	2	1				2	2
Goodenia eatoniana			1		1		1	
Boronia crenulata	3					1		1
Sphaerolobium fornicatum	1	1		3	2	1	1	
Grevillea quercifolia	1		2		2	1	3	2
Gompholobium obovatum	1	2	3	2		2	2	2
Desmocladus fasciculatus								2
Eucalyptus marginata	10	3	9	10	3	1		
Corymbia calophylla	7	5	5	1	2	6	5	3
Scaevola calliptera	2	3	2	3	2	3	3	2
Sp 28 *Leucopogon propinquus*	1	1			1	2	1	
Sp 29 *Thelymitra paludosa*		1		1	1		2	1
Sp 30 *Lagurus ovatus**	2			2	1		1	2
Lomandra caespitosa		2			3		2	2
Anarthria prolifera			2	4	3	4	3	4
Macrozamia riedlei			2				2	1
Opercularia hispidula	2	3	3	2	1	1		
Tremandra diffusa		1		2				
Billardiera laxiflora		1	1	1		1	1	1
Comesperma confertum					1			1
Xanthorrhoea preissii			5	4	6		5	3
Sp 35 *Lepidosperma pubisquateum*			2				2	
Johnsonia lupulina			2					
Platysace filiformis			2	2	3	4	2	
Sp 37								
Dampiera linearis				1			3	2
Sp 40 *Lepidosperma sp.*								
Gompholobium knightianum								
Agrostocrinum				1		1	1	

stypandroides								
Cassytha racemosa								
Agonis flexuosa		3		1				
Taxandria parviceps				8	8	6	4	7
Acacia extensa				2	1	1		
Persoonia longiflora				1	1	1		
Sp 46 *Leucopogon australis*				2				
Adenanthos obovatus							1	
Sp 48 *Drosera sp.*					1	1	1	1
Sp 49 *Pterostylis* sp.						1		
Tripterococcus brunonis								
Stylidium scandens					2	3		
Andersonia caerulea					2	3	3	
Hakea amplexicaulis					2	2	2	2
Xanthorrhoea brunonis						3		2
Dasypogon bromeliifolius						3		
Sp 57 *Leucopogon capitellatus*						1		1
Hypocalymma robustum					1	1	1	1
Comesperma ciliatum						2		
Mesomelaena tetragona						2	3	1
Anarthria scabra				5	4	6	4	
Hypolaena exculsa								
Sollya heterophylla	1		1					
Sp 155 *Mesomelaena gracilipes*			2	5		5	3	4
Thysanotus tenellus						1	2	1
Hakea linearis								3
Astroloma pallidum								2
Drosera erythrorhiza								1
Sp 69 Orchidaceae sp.								
Xylomelon occidentale						1		3
Banksia grandis								1
Restionaceae Sp.	1	3			2			
Stylidum junceum subsp. *junceum*	2	2	1		1		2	1
Burchardia umbellata		1					1	
Daviesa inflata					1			

2.2.2 Jack Track

Species	Cover and abundance							
	A1	A2	B1	B2	C1	C2	D1	D2
Xanthorrhoea brunonis					1			
Xanthorrhoea preissii	1	2	3		3	5	4	6
Anarthria prolifera	5		6	4	4	5	5	4
Adenathos obovatus	3	3	3	3	3	3	3	5
Andersonia caerula	3	5		4		2	2	2
Hypocalymma robustum	1		3	1	1	1	2	
Dasypogon bromeliifolius		4		3	3	2	1	5
Anarthria scabra	7	8	10	10	10	10	8	9
Johnsonia lupinia	2		2	2	4	2	2	
Lyginia barbata	3	3	3			1	1	
Melaleuca thymoides	6	3	5	5	4	7	7	6
Pimelea longiflora	1		2	4	4	4	2	2
Pericalymma ellipticum	4	4	3		3			2
Lechenaultia biloba	1							
Hibbertia pilosa	4	2		3	1		2	2
Patersonia occidentalis		1				1	2	
Hibbertia stellaris	2	1						
Kunzea recurva	3		4	2	3	1	2	
Bossiaea linophylla	2	1						
Lindsaea linearis			1				1	
Nuytsia floribunda	2		4	1		2		
Sp 162 *Leucopogon gilbertii*	4	4	3					
Sp 163 *Leucopogon* sp. Darradup	3	3	3	4	5	3		4
Sp 164	1							
Lomandra nigricans	4	4	4	3	3	2	5	
Stylidium repens								
Hypolaena exsulca	2	2						
Petrophile linearis			2	1		1	1	
Lysinema ciliatum		4	3	3		2		
Sphenotoma gracile				2				
Sp 168 *Dillwynia laxiflora*		4	4	2	2	5	4	6
Tetratheca setigera			2	1	1	2	1	
Lomandra caespitosa								
Eucalyptus marginata			2	8		9		2
Cassytha racemosa			1			2	4	
Acacia uliginosa			1					
Comesperma confertum			1					
Dampiera linearis				2				
Sp 155 *Mesomelaena graciliceps*					1	3		
Conospermum capitatum subsp. *glabratum*			1	1				
Scaevola calliptera					1			
Allocasuarina fraseriana		1				3		2
Sphaerolobium fornicatum								
Caladenia sp.	1							
Drosera sp.	1							
Mitrasacme paradoxa	1					1		
Hodgsoniola junciformis			1			1		

Thelymitra sp.							1	
Papilonaceae sp.			1					
Boronia sp. (Stewart rd)				1				
Scaevola sp.					2			

2.2.3 Milyeanup

Species	Cover and abundance					
	A1	A2	B1	B2	C1	C2
Platysace tenuissima	2	2	3		1	2
Opercularia hispidula	2				3	
Lindsaea linearis		2				
Chorizema nanum	2	2	2		3	3
Lolium tremulentum					2	2
Grevillea quercifolia						1
Desmocladus fasciculatus	4	2	3	2	2	
Dampiera linearis	2		1		1	
Acacia extensa	2	2		3		
Leucopogon australis	3	2			2	
Persoonia longiflora	1		1			
Mesomelaena tetragona	1					
Conostylis laxiflora		2		2		
Tetraria capillaris		3	2		2	
Podolepsis lessonii						3
Kennedia coccinea		2			1	
Hypoleana exsulca	3		2			2
Eucalyptus marginata	6	4	4	6	6	4
Corymbia calophylla	6		3	3	3	8
Hibbertia cunninghamii	2	3		1		2
Bossiae linophylla	6	4	3	7	3	4
Dampiera headenaceae						2
Gompholobium marginatum		3	2	2	2	2
Agrostocrinum stypandroides	1		2			
Cyathochaeta avenacea			1	3		2
Banksia littoralis						1
Mirbelia dilatata	3	3	4		2	3
Anigozanthos flavida	2	4	4			2
Lagenphora huegelii				2		
Thysantous multiflorus			1		2	
Haemodorum spicatum	2					
Billardiera floribunda				1		1
Pteridium esculentum	3	2	3		3	
Sp 182	2	2		2	2	
Thysantous tenellus					1	
Hypolaena exsulca		2		1		
Scaevola calliptera					1	
Leucopogon verticillatus	2					
Fleshy exotic				1		
Anigozanthus manglesii						1
Patersonia umbrosa	2		3	2	2	
Taxandria linearifolia						
Dasypogon bromeliifolius						
Sp 269 *Stylidium* sp.						
Sp 270						
Xylomelon occidentale		3	3	5		
Banksia grandis	1	3	3		1	3
Xanthorrhoea preissii		4				

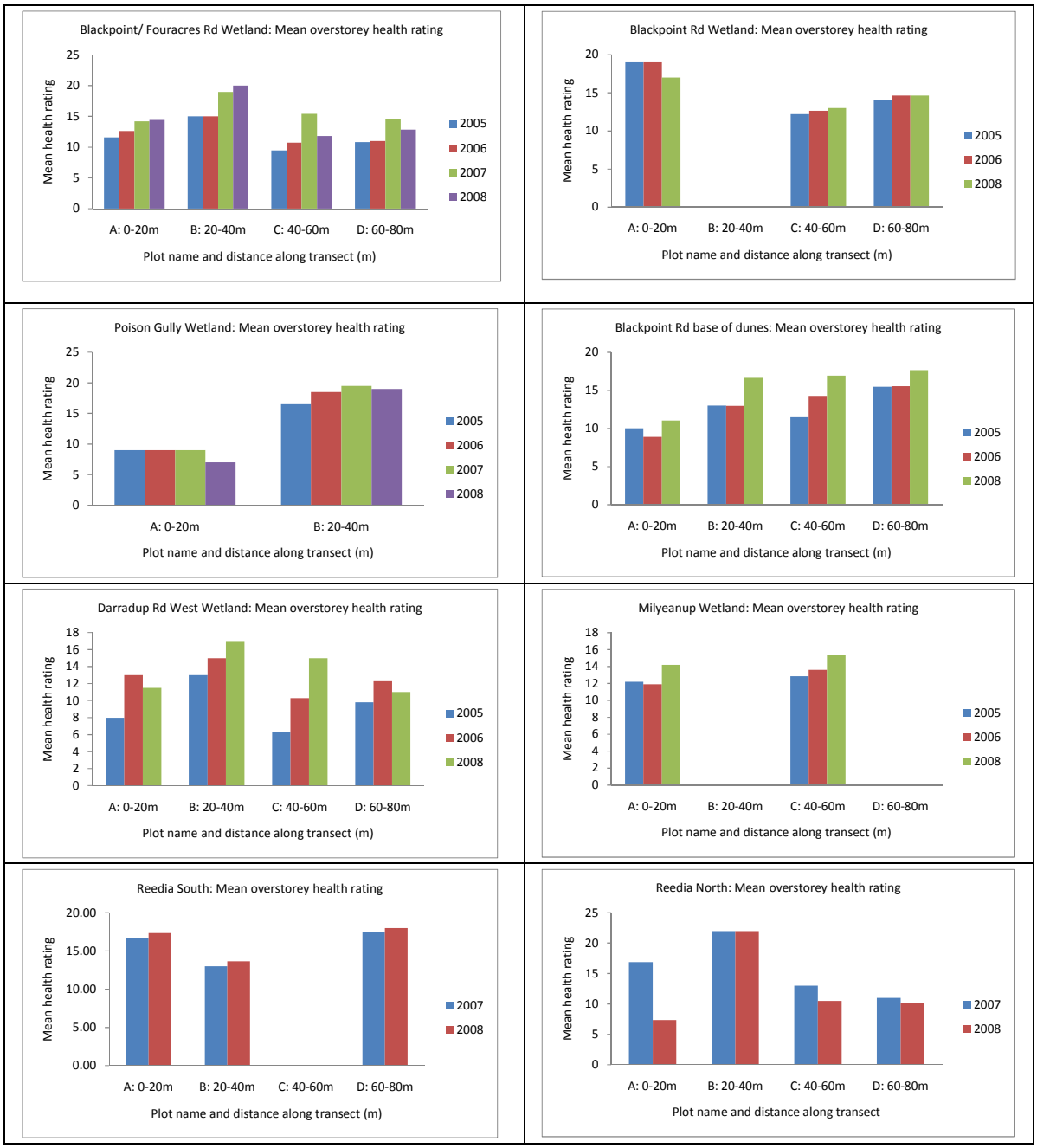
Macrozamia riedlei		3	3	4	2	
Conostylis setigera	3	2	2		1	
Lomandra caespitosa	4		2			
Sp 37			2			
Gompholobium knightiatum	3		1			
Hypolaena pubescens						
Gompholobium preissii						
Hibbertia sylvertris						
Acacia uglinosa	2					
Stylidium sp.				1		1
Sp 129	2		2			
Acacia pulchella goadabyi		1	1			
Trachymene sp.		2	2	1	1	
Tetraria laevis		2				
Acacia pulchella						
Pentapeltis peltigera			2		2	
Xanthosia candida			3		2	3
Lepidosperma pubisquameum		2			2	4
Lagrus obovatus			1			2
Sp 211 Poaceae sp.		2	2			1
Samolus repens		2	2	3	3	2
*Sonchus oleareus**				1	2	2
Stylidium amoenum						2
Astroloma ciliatum		2	1			
Stackhousia monogyna		2		2		
Tripterococcus brunonis						1
Restio sp.		3				
Banksia littoralis		1			1	
Trifolium sp.			1	2		
Drosera sp.			1	1		
Kennedia prostrata			1			
Thysanotis sp.					1	
Levenhookia pusilla				1	1	2

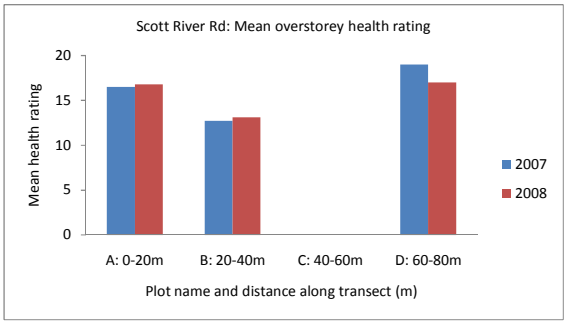
2.2.4 Poison Gully

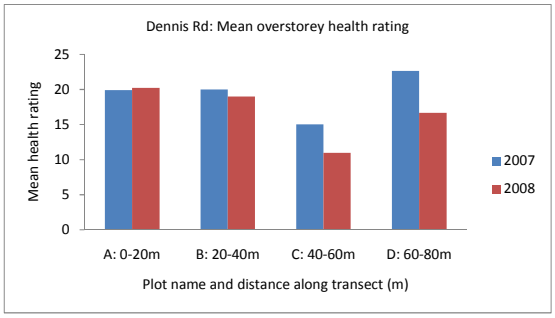
Species	Cover and abundance							
	A1	A2	B1	B2	C1	C2	D1	D2
Astartea juniperiana	3							
Dasypogon bromeliifolius	5	6	3	3	5	4	4	4
Anarthria scabra	8	6	7	3	4	3	6	5
Hypolaena exsulca	2	1	1		3	2	2	2
Pultenaea reticulata	7		4	4	3			3
Eucalyptus marginata	4		7	3	6	5	4	4
Melaleuca thymoides	3	1	3		3	4	5	2
Pimelea longiflora	2							
Xanthorrhoea preissii	1		3	1	2	1	3	
Stylidium scandens			3	2	2	3	2	3
Sp 35 *Lepidosperma pubsquteum*	2	2				1	1	1
Leucopogon australis	2							
Hypolaena pubescens	1		2	1	2	2	1	1
Tricoryne elatior								
Adenanthos obovatus		2			2	2	1	2
Allocasuarina fraseriana		7	1	6	1	4		
Adenanthos meisneri		2		2		2	2	5
Anarthria prolifera		3	2	1	3	3	3	2
Desmocladus fasciculatus		2	2	1	2	2	2	1
Xylomelon occidentale		2	2		1			
Daviesia inflate					2	3	3	2
Xanthorrhoea gracilis		1					1	
Sp 134 *Lomandra caespitosa*		3	3	2			3	
Lomandra nigricans		2	4	1			1	
Hibbertia cunninghamii			1	1		1		1
Astroloma pallidum						1		
Sp 150 *Levenhookia pusilla*								1
Xanthorrhoea brunonia								
Platysace tenuissima							1	
Pentapeltis peltigera		1	1	2	3	2	2	1
Ricinocarpos glaucus								
Trymalium floribundum								
Sp 75 *Tetraria capillaries*	2	1	2					
Platysace filiformis								
Scaevola calliptera			1		1		1	1
Dampiera linearis		1	1	1	3		1	2
Banksia grandis			4			3	1	2
Hakea ruscifolia			2		2	2		
Acacia extensa		1	1	1		1		
Sp 177 *Drosera sp.*	1				1			
Thysantous tenellus			1					
Epacridaceae sp.					1	1		2
Conostylis setigera		2	2	2	2	2	3	1
Sp 182							1	
Sp 183 *Hibbertia pilosa*			1					
Burchardia umbellate			1	1				
Grevillea quercifolia					3	1	3	
Haemodorum spicatum				1				

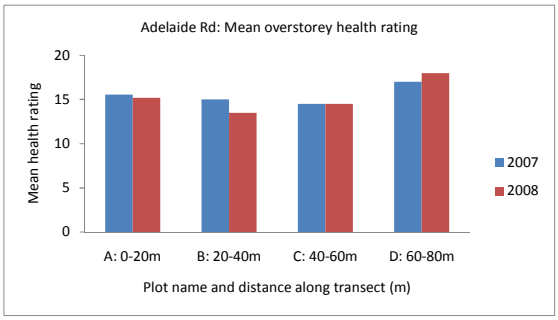
Petrophile linearis		1	1	1	1	1		
Isopogon sphaerocephalus		1		1	1	2	1	3
Lindsaea linearis	2							
Gompholobium polymorphum		1						
Banksia attenuate				2	3			
Sp 30 Poaceae sp.*								
Macrozamia riedlei					1	1		
Hypocalymma robustum					2	2		
Sp 112 *Jacksonia* sp.					2		2	1
Patersonia umbrosa					2			
Hibbertia quadricolour			1	2	2	2	1	2
Dryandra lindeyana					2			
Acacia stenoptera								
Corymbia calophylla						4	4	
Patersonia occidentalis						2	2	
Thelymitra aff. *macrophylla*							1	
Cassytha racemosa							1	
Sp 24 Orchidaceae sp.							1	
Boronia denticulate				2			2	
Philotheca spicata								
Thysanotus manglesianus							1	
Acacia pulchella							2	
Hibbertia hypercoides								1
Podocarpus drouynianus				1				3
Sp 194 Epacridaceae sp.								2
Stylidium repens			1			1		
Billardiera laxiflora				1		1		
Gompholobium ovatum					1		2	
Conostylis laxiflora			1				2	
Stylidium schoenoides			1					
Caladenia flava							2	
Stylidium sp.								1
Samolus repens			2					
Conostylis aculeata								1
Sp. 192 *Bossiea* sp.					1	1	1	1

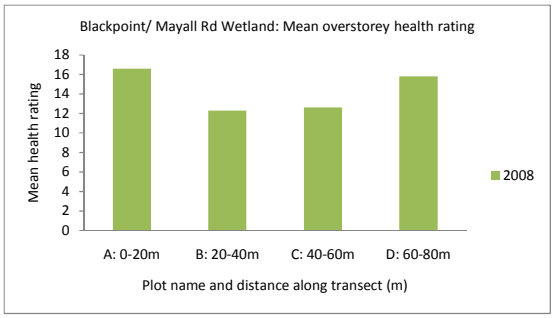
Appendix 3: Mean canopy health of overstorey species.

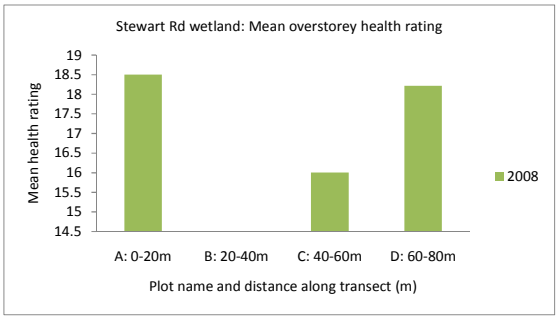


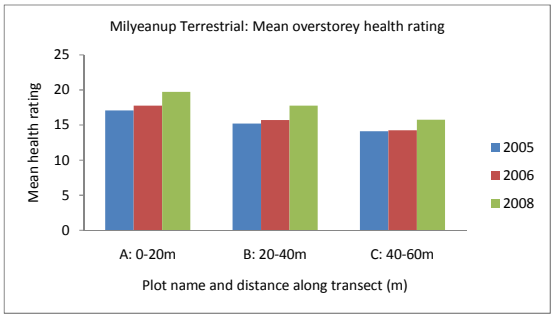

Scott River Rd: Mean overstorey health rating
Mean health rating
20
15
10
5
0
A: 0-20m
B: 20-40m
C: 40-60m
D: 60-80m
Plot name and distance along transcent (m)
2007
2008

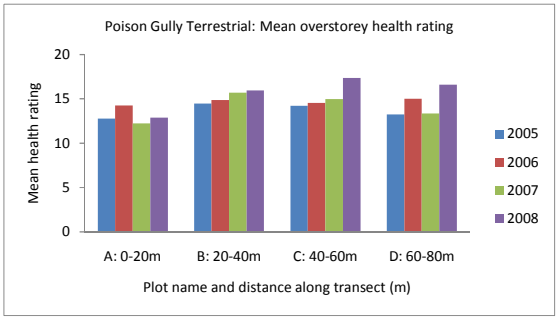

Dennis Rd: Mean overstorey health rating
Mean health rating
25
20
15
10
5
0
A: 0-20m
B: 20-40m
C: 40-60m
D: 60-80m
Plot name and distance along transcent (m)
2007
2008

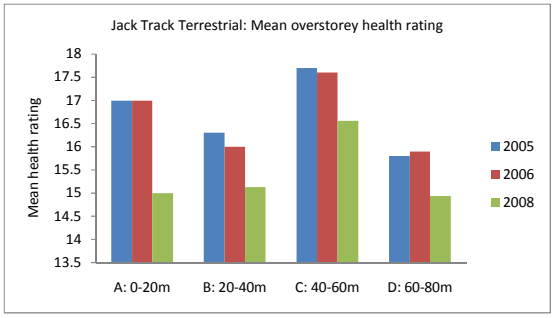

Adelaide Rd: Mean overstorey health rating
Mean health rating
20
15
10
5
0
A: 0-20m
B: 20-40m
C: 40-60m
D: 60-80m
Plot name and distance along transcent (m)
2007
2008

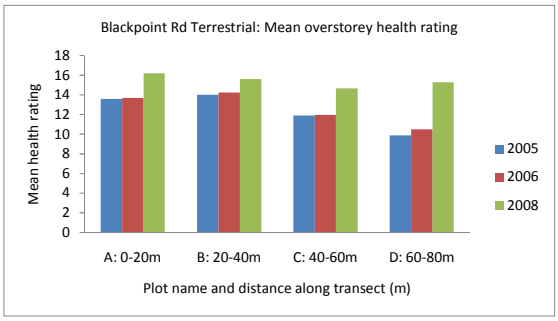

Blackpoint/ Mayall Rd Wetland: Mean overstorey health rating
Mean health rating
18
16
14
12
10
8
6
4
2
0
A: 0-20m
B: 20-40m
C: 40-60m
D: 60-80m
Plot name and distance along transcent (m)
2008


Stewart Rd wetland: Mean overstorey health rating
Mean health rating
19
18.5
18
17.5
17
16.5
16
15.5
15
14.5
A: 0-20m
B: 20-40m
C: 40-60m
D: 60-80m
Plot name and distance along transcent (m)
2008


Milyeanup Terrestrial: Mean overstorey health rating
Mean health rating
25
20
15
10
5
0
A: 0-20m
B: 20-40m
C: 40-60m
Plot name and distance along transcent (m)
2005
2006
2008


Poison Gully Terrestrial: Mean overstorey health rating
Mean health rating
20
15
10
5
0
A: 0-20m
B: 20-40m
C: 40-60m
D: 60-80m
Plot name and distance along transcent (m)
2005
2006
2007
2008


Jack Track Terrestrial: Mean overstorey health rating
Mean health rating
18
17.5
17
16.5
16
15.5
15
14.5
14
13.5
A: 0-20m
B: 20-40m
C: 40-60m
D: 60-80m
2005
2006
2008


Blackpoint Rd Terrestrial: Mean overstorey health rating
Mean health rating
18
16
14
12
10
8
6
4
2
0
A: 0-20m
B: 20-40m
C: 40-60m
D: 60-80m
Plot name and distance along transcent (m)
2005
2006
2008

Appendix 4: GPS locations of all Sites

Site					
Adelaide Rd (Upper Margaret)	0m	50 350230 E	Darradup Rd North terrestrial (BP42)	0m	
		62 52053 N			
	80m	50 350250 E		80m	
		62 52134 N			
Blackpoint Rd Terrestrial	0m	50 377804 E	Darradup Rd West Wetland	0m	50 383494 E
		62 05051 N			6215758 N
	80m	50 377854 E		80m	50 383482 E
		62 04984 N			6215687N
Blackpoint Rd Wetland	0m	50 373925 E	Dennis Rd (Scott Nth)	0m	50 345412 E
		6202502 N			62 15434 N
	80m	50 373999 E		80m	50 345455 E
		6202375 N			62 15498 N
Blackpoint/ Fouracres Rd Terrestrial	0m	50 374672 E	Jack Track Terrestrial	0m	50 367277 E
		6202799 N			6206783 N
	80m			80m	50 367332 E
					6206842 N
Blackpoint/ Fouracres Rd Wetland	0m	50 374663 E	Lake Jasper East	0m	underwater
		6202770 N			
	80m	50 374727 E		80m	50 379705 E
		6202716 N			6190418 N
Blackpoint Rd base of dunes	0m	50 367695 E	Lake Jasper South (SC21)	0m	50 377324 E
		6196829 N			6190682 N
	80m	50 367625 E		80m	
		6196850 N			
Blackpoint Rd - Dunes	0m	50 367279 E	Longbottom Rd Terr.	0m	50 371556 E
		6196132 N			6229253 N
	80m	50 367221 E		80m	50 371553 E
		6196117 N			6229193 N
Blackpoint/ Mayall Rd Wetland	0m	50 371593 E	Longbottom Rd wetland	0m	50 371559 E
		6199912 N			6229301 N
	80m	50 371529 E		80m	50 371638 E
		6199866 N			6229350 N
Darradup Rd East Terrestrial	0m	50384148 E	Milyeanup Terrestrial	0m	50 372339 E
		6215590 N			6228264 N
	80m			80m	50 372299 E
					62228225 N
Darradup Rd East Wetland	0m	50 384052 E	Milyeanup Wetland	0m	50 372373 E
		6215595 N			6228313 N
	80m			80m	50 372329 E
					6228264 N

Pneumonia Rd	0m	50 382525 E
		61 98766 N
	80m	50 382562 E
		61 98837 N
Poison Gully Terrest.	0m	50 366688 E
		6223564 N
	80m	50 366634 E
		6223507 N
Poison Gully Wetland	0m	50 366726 E
		6223574 N
	80m	50 366687
		6223565 N
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
Scott Rd (SC22)	0m	50 383669 E
		6189277N
	80m	50 383615E
		6189246 N
Scott River Rd (Scott Sth)	0m	50 340691 E
		6208371 N
	80m	50 340703 E
		6208445 N
Stewart Rd Terrestrial (BP20)	0m	50 371398 E
		6212835 N
	80m	50 371406 E
		6212902 N
Stewart Rd Wetland	0m	50 372011 E
		6212200 N
	80m	50 371942 E
		6212233N