



Regional, Focussed, On-ground

CLLMM Survivorship Monitoring (2014 Plantings)

DRAFT Interim Report

**to the Department of Environment, Water
and Natural Resources**

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1. Project overview

The Coorong, Lower Lakes and Murray Mouth (CLLMM) is an internationally significant wetland system, recognised under the Ramsar Convention, supporting a diverse range of habitats and species at the terminus of the Murray River in South Australia. The CLLMM region is highly diverse supporting freshwater, estuarine and marine ecosystems over its estimated 142,500 hectares, and is culturally significant to the local Ngarrindjeri Nation.

The Coorong, Lower Lakes and Murray Mouth region is a focal area for the Department of Environment, Water and Natural Resources (DEWNR), the lead agency responsible for the environmental management of the Ramsar site. Management and active restoration works in the region are coordinated and primarily delivered by DEWNR's Coorong, Lower Lakes and Murray Mouth (CLLMM) Program.

The CLLMM Bioremediation and Revegetation Project is funded by the Australian Government's Murray Futures Program. The initial focus was on emergency works in response to long-term drought conditions, but with the return of water to the Lower Lakes system in 2010, the emphasis shifted to habitat restoration and building ecosystem resilience. The magnitude of the CLLMM Program has resulted in restoration works that provide significant habitat benefits for the fauna and flora of the CLLMM region.

In order to identify the factors that influence vegetation survival in the CLLMM region, survivorship surveys have been undertaken at revegetation sites in previous years during spring and autumn, which represent 3 and 9 months after planting, respectively. This monitoring gives an indication of the success of recent revegetation works and informs future plantings.

2. Methodology

2.1. Transects

The sampling component of the surveys consisted of a number of 50m transects, with the number of transects on each restoration site proportional to the size of the site. The number of transects on individual sites ranged from 7 transects on the Poltalloch Swamp site, up to 87 transects at the Treloar Lucky site.

To ensure the robustness of the method and prevent site selection bias for transects, the starting coordinates for each site were determined by DEWNR from randomly generated points.

Plantings were implemented in distinct zones signifying differences in landform and soil types (e.g. Inundated, Lake/Lagoon Edge, Rising Ground). Transect direction was therefore determined on-site, and where possible were run only within the zone that the transect was started in (refer to **Figure 1**).

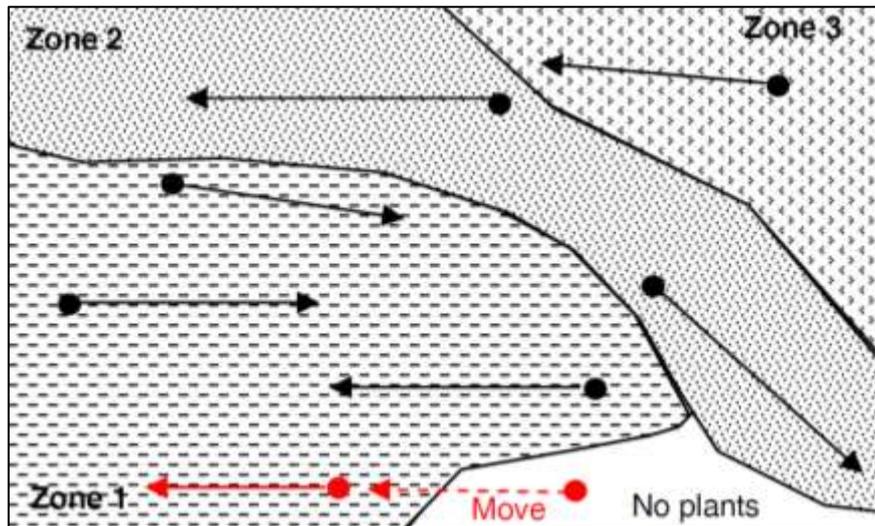


Figure 1 - Transect direction

Each transect consisted of a 50m line, starting at the supplied coordinates. The transect was then walked, counting all individual plants one metre to the left of the transect. At the end of the 50m transect line, the direction was reversed, and plants on the other side were counted while walking back to the starting point (refer to **Figure 2**).

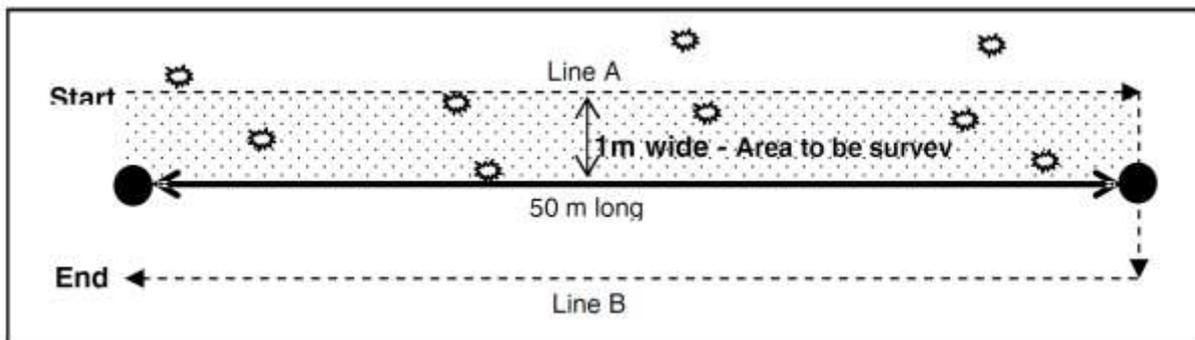


Figure 2 - Transect area

2.2. Site photographs

At each site, at least one photo was taken at locations which reflected overall site condition. Easting and northing was recorded for each photo, along with bearing and approximate height.

2.3. Survivorship scoring

Each plant counted was identified to species level and recorded as either dead or alive. Where possible, dead plants were identified to species level, and where this was not possible they were recorded as “Dead (unknown species)”.

2.4. Observational notes

Observations were taken at each site, recording overall plant health, conditions of tree guards, impacts from pest plants and animals, stock incursion, and site condition notes including site preparation and any signs of follow-up maintenance such as spraying of weeds or fence repair. Where areas were found to be unplanted, this was also recorded.

2.5. Data management

Data was captured on hard copy datasheets and then manually entered into a Microsoft Access database supplied by DEWNR, and delivered as an electronic file.

2.6. Feedback on methodology

This is the second year that this team has conducted the CLLMM revegetation survivorship monitoring and no major issues were found with the survey methodology.

As in the 2013 monitoring, the two teams worked together on the first two days to 'calibrate' with each other on method and plant identification. The two teams then split up across sites in the same region as this was found to be the most efficient approach. A tour of the new planting sites was also given by Goolwa to Wellington Local Action Planning Association (GWLAP) staff in the first few days of monitoring, and this was useful in both locating sites and identifying the 2014 plantings on sites that also contained earlier plantings.

The database and the site notes in this report provide good coverage of the condition of the plantings as of October 2014.

3. Issues locating sites and waypoints

In general, location of sites and waypoints went smoothly. However there were a few small issues that affected the team during the surveys.

The maps provided didn't list the transect numbers which made navigation to transects difficult, but this was quickly resolved by the team creating maps from the transect shapefiles for use on tablets, and then making new maps when a printer was available.

If possible, it is recommended that all waypoint names be visible on the maps and not hidden due to close proximity to other waypoints. Some waypoints had a symbol on the map but no name, making it more difficult to ensure that all waypoints in that area were surveyed. This was resolved by searching through the waypoint list for a given site and locating any waypoint names missing from the map.

It should be noted that one of the sites (Griffen) could not be accessed by vehicle due to fallen trees, requiring the survey team to walk in. At the site, it was found that there were no 2014 plantings – so the site was not assessed, leading to 7 transects not surveyed. This information would have been beneficial prior to surveys as a different site could have been surveyed as an alternative.

As anticipated, some transects were unplanted. All transects were inspected for evidence of planting or site preparation, and where possible, unplanted transects were moved into adjoining areas. Unplanted transects were particularly noted on the Wellington Lodge and Mundoo South sites.

4. Site condition

Most sites were in fairly good condition with evidence of slashing and spot spraying prior to planting. It should be noted that sites appeared to be affected by low rainfall in the region and this seemed to be affecting plant vigour, with many plants appearing dry and exhibiting poor growth. Recent rainfall data is included in Section 6.

Good plant vigour was noted at the Connelly, Poltalloch and Meningie Cemetery sites. Brief notes on each of the survey sites are included in Appendix C – Management recommendations.

There is evidence of browsing on plants at most sites, but it is unknown how much this is affecting plant survivorship due to the number of other variables. Paper tree guards were working sufficiently in most instances; however, some guards were knocked over by kangaroos or grazed by either kangaroos or snails.

5. Results

5.1. Overview

The spring 2014 survivorship monitoring resulted in the planned survey of 450 transects across 20 revegetation sites in the period of 13th-19th October 2014. The forecast time for the monitoring was accurate, with monitoring work completed within 7 days by two teams of two surveyors. The full results of the monitoring are included in Appendix A – Survivorship results.

Overall survivorship was good, with 86.6% of counted plants still alive at the time of Spring monitoring. Survivorship at individual sites ranged from 77.3% at the Henshell 2014 site through to 94.2% at the Jockwar Lake Edge site (Table 1).

Table 1: Survivorship by site

Species name	Plants surveyed	Alive	Dead	Survival %
Alexandrina Dairies Hwy	3449	3007	442	87.2
Camp Coorong	410	366	44	89.3
Connelly	287	260	27	90.6
Fiebig Hwy	203	190	13	93.6
Griffen (not surveyed: no plantings)	-	-	-	-
Henshell 2014	255	197	58	77.3
Jockwar Lake Edge	707	666	41	94.2
Meningie Cemetery	253	232	21	91.7
Mundoo Ewe Island	392	325	67	82.9
Mundoo Massive	1869	1682	187	90.0
Mundoo South	618	483	135	78.2
Noonameena	1701	1275	426	75.0
Poltalloch Swamp	310	274	36	88.4
Schultz	582	530	52	91.1
Treloar Lucky	4143	3512	631	84.8

Species name	Plants surveyed	Alive	Dead	Survival %
Watkins	1729	1620	109	93.7
Wellington Lodge Swamp Sth	393	370	23	94.1
Wilkinson	100	87	13	87.0
Total	17401	15076	2325	86.6

A total of 8 distinct planting zones were recorded across all sites (Table 2). No transects were located in Inundated (zone 0), Cliff (zone 6) or Cliff Top (zone 7) zones.

Table 2: Survivorship by zone

Zone	Zone name	Plants surveyed	Alive	Dead	Survival (%)
1	Inundated	0	0	0	-
2	Saline Swamp	52	48	4	92.3
3	Saline Edge	4967	4237	730	85.3
4	Rising Ground	3518	3111	407	88.4
5	Slope/Embankment	8	7	1	87.5
6	Cliff	0	0	0	-
7	Cliff Top	0	0	0	-
8	Sandhill	3848	3427	421	89.1
9	Other Inland	2872	2559	313	89.1
10	Coastal	2055	1611	444	78.4
13	Blow-out	81	76	5	93.8
Total		17401	15076	2325	86.6

A total of 109 species (Table 3) were identified across all planting sites during spring monitoring. Species that had notably low survivorship included *Adriana quadripartita* (50%) and *Poa poiformis* var. *poiformis* (57.7%).

Table 3: Survivorship by species

Species name	Plants surveyed	Alive	Dead	Survival (%)
<i>Acacia acinacea</i>	3	3	0	100
<i>Acacia brachybotrya</i>	10	10	0	100
<i>Acacia calamifolia</i>	131	124	7	94.7
<i>Acacia cupularis</i>	70	68	2	97.1
<i>Acacia dodonaeifolia</i>	31	30	1	96.8
<i>Acacia leiophylla</i>	14	8	6	57.1
<i>Acacia ligulata</i>	160	140	20	87.5
<i>Acacia longifolia</i> ssp. <i>sophorae</i>	191	147	44	77.0
<i>Acacia microcarpa</i>	8	8	0	100
<i>Acacia mitchellii</i>	1	1	0	100
<i>Acacia myrtifolia</i>	69	65	4	94.2
<i>Acacia paradoxa</i>	59	57	2	96.6
<i>Acacia pycnantha</i>	235	205	30	87.2
<i>Acacia</i> sp.	24	24	0	100
<i>Acacia spinescens</i>	45	45	0	100

Species name	Plants surveyed	Alive	Dead	Survival (%)
<i>Adriana klotzschii</i> (NC)	15	9	6	60.0
<i>Adriana quadripartita</i>	50	25	25	50.0
<i>Allocasuarina muelleriana</i> ssp.	29	27	2	93.1
<i>Allocasuarina pusilla</i>	33	32	1	97.0
<i>Allocasuarina</i> sp.	7	7	0	100
<i>Allocasuarina verticillata</i>	723	636	87	88.0
<i>Atriplex paludosa</i> ssp.	648	618	30	95.4
<i>Atriplex prostrata</i>	5	5	0	100
<i>Atriplex semibaccata</i>	284	273	11	96.1
<i>Atriplex suberecta</i>	283	273	10	96.5
<i>Austrostipa elegantissima</i>	81	74	7	91.4
<i>Austrostipa flavescens</i>	212	209	3	98.6
<i>Austrostipa nodosa</i>	44	44	0	100
<i>Austrostipa</i> sp.	92	89	3	96.7
<i>Banksia marginata</i>	10	10	0	100
<i>Banksia ornata</i>	32	30	2	93.8
<i>Billardiera cymosa</i> ssp.	192	190	2	99.0
<i>Bursaria spinosa</i> ssp. <i>spinosa</i>	411	387	24	94.2
<i>Callistemon rugulosus</i>	27	27	0	100
<i>Callitris gracilis</i>	47	45	2	95.7
<i>Calytrix tetragona</i>	18	18	0	100
<i>Carpobrotus rossii</i>	102	100	2	98.0
<i>Clematis microphylla</i>	189	183	6	96.8
<i>Correa</i> sp.	2	2	0	100
<i>Dianella brevicaulis</i>	297	286	11	96.3
<i>Dianella brevicaulis/revoluta</i> var.	35	32	3	91.4
<i>Dianella revoluta</i> var.	36	30	6	83.3
<i>Disphyma crassifolium</i> ssp. <i>clavellatum</i>	173	172	1	99.4
<i>Dodonaea baueri</i>	1	1	0	100
<i>Dodonaea intricata</i>	1	1	0	100
<i>Dodonaea viscosa</i> ssp. <i>spatulata</i>	180	167	13	92.8
<i>Duma florulenta</i>	155	151	4	97.4
<i>Einadia nutans</i> ssp.	16	16	0	100
<i>Enchylaena tomentosa</i> var.	406	388	18	95.6
<i>Enneapogon nigricans</i>	4	4	0	100
<i>Eucalyptus baxteri</i>	27	27	0	100
<i>Eucalyptus camaldulensis</i> ssp.	8	8	0	100
<i>Eucalyptus diversifolia</i> ssp. <i>diversifolia</i>	209	189	20	90.4
<i>Eucalyptus fasciculosa</i>	51	48	3	94.1
<i>Eucalyptus incrassata</i>	168	159	9	94.6
<i>Eucalyptus leucoxylon</i> ssp.	4	4	0	100
<i>Eucalyptus odorata</i>	12	11	1	91.7
<i>Eucalyptus porosa</i>	4	4	0	100
<i>Eucalyptus</i> sp.	7	6	1	85.7
<i>Ficinia nodosa</i>	1880	1787	93	95.1

Species name	Plants surveyed	Alive	Dead	Survival (%)
<i>Gahnia filum</i>	1348	1152	196	85.5
<i>Hakea mitchellii</i>	91	87	4	95.6
<i>Hakea rostrata</i>	10	9	1	90.0
<i>Hakea sp.</i>	5	5	0	100
<i>Hakea vittata</i>	9	8	1	88.9
<i>Juncus kraussii</i>	1076	922	154	85.7
<i>Kennedia prostrata</i>	54	43	11	79.6
<i>Kunzea pomifera</i>	112	102	10	91.1
<i>Lasiopetalum baueri</i>	11	10	1	90.9
<i>Leptospermum myrsinoides</i>	198	194	4	98.0
<i>Lomandra sp.</i>	12	12	0	100
<i>Lotus australis</i>	17	17	0	100
<i>Maireana brevifolia</i>	30	29	1	96.7
<i>Maireana oppositifolia</i>	673	652	21	96.9
<i>Melaleuca acuminata ssp. acuminata</i>	28	26	2	92.9
<i>Melaleuca brevifolia</i>	24	24	0	100
<i>Melaleuca halmaturorum</i>	457	373	84	81.6
<i>Melaleuca lanceolata</i>	112	93	19	83.0
<i>Melaleuca uncinata</i>	49	45	4	91.8
<i>Muehlenbeckia gunnii</i>	100	98	2	98.0
<i>Myoporum insulare</i>	337	320	17	95.0
<i>Nitraria billardierei</i>	7	7	0	100
<i>Olearia axillaris</i>	526	506	20	96.2
<i>Olearia ramulosa</i>	14	14	0	100
<i>Pelargonium australe</i>	110	105	5	95.5
<i>Pimelea humilis</i>	33	31	2	93.9
<i>Pittosporum angustifolium</i>	40	38	2	95.0
<i>Platylobium sp.</i>	5	5	0	100
<i>Poa labillardieri var. labillardieri</i>	542	526	16	97.0
<i>Poa poiformis var. poiformis</i>	402	232	170	57.7
<i>Poa sp.</i>	33	33	0	100
<i>Puccinellia stricta</i>	667	585	82	87.7
<i>Rhagodia candolleana ssp. candolleana</i>	80	79	1	98.8
<i>Rhagodia crassifolia</i>	5	5	0	100
<i>Rytidosperma caespitosum</i>	434	415	19	95.6
<i>Rytidosperma setaceum</i>	65	65	0	100
<i>Rytidosperma sp.</i>	24	24	0	100
<i>Senecio sp.</i>	1	1	0	100
<i>Solanum lasiophyllum</i>	38	38	0	100
<i>Solanum linearifolium</i>	2	2	0	100
<i>Tetragonia implexicoma</i>	118	115	3	97.5
<i>Thomasia petalocalyx</i>	1	1	0	100
<i>Threlkeldia diffusa</i>	133	128	5	96.2
<i>Trifolium incarnatum var. incarnatum</i>	3	3	0	100
Dead (unknown species)	917	0	917	0.0

Species name	Plants surveyed	Alive	Dead	Survival (%)
<i>Vittadinia cuneata var.</i>	107	90	17	84.1
<i>Vittadinia sp.</i>	24	21	3	87.5
<i>Xanthorrhoea caespitosa</i>	28	20	8	71.4
<i>Xanthorrhoea semiplana ssp.</i>	28	27	1	96.4
Total	17401	15076	2325	86.6

6. Discussion

The survivorship result across all Spring 2014 sites (86.6%) was consistent with the result of the Spring 2013 sites (86.5%) (Tuck & Bachmann 2014). Considering the drier conditions after planting compared to the previous year (Table 4), this can be interpreted as a good result.

The lower rainfall has contributed to drier site conditions than in the previous year. Signs of inundation were not observed, removing a significant factor in plant deaths in 2013. However, plant vigour was low at many sites, and maintaining the current high level of survivorship through the anticipated hot summer will be a significant challenge. Consequently, it is recommended that plants at high-value sites are watered over summer if dry, hot conditions persist.

Table 4: Rainfall in mm in the survey region over the years 2013 and 2014 (source: Australian Bureau of Meteorology)

	Year	Apr	May	Jun	Jul	Aug	Sep
Meningie (Waltowa)	2013	28.8	64.4	90.6	89.8	63.6	28.8
	2014	30.6	55.6	62.2	100.4	26.4	19.2
Narrung (Yalkuri)	2013	44.7	75.2	103.6	107.1	64.0	56.8
	2014	9.0	24.6	-	94.4	-	16.0
Goolwa Barrage	2013	34.9	61.2	105.4	83.5	58.4	42.5
	2014	20.8	46.8	69.2	67.5	22.8	28.6

6.1. Notable sites

Watkins (94%) had the joint highest level of survivorship, which is likely facilitated by the apparent high standard of site preparation and maintenance. Weeds were sprayed out effectively before planting and evidence was noted of recent slashing around and within patches to reduce competition from weedy grasses.

Jockwar Lake Edge also had a high survivorship at 94% despite high loads of pasture grasses and evidence of rabbit grazing. This site would likely have a high level of moisture availability due to its proximity to the lake and this may be a factor.

Noonameena (75%) had the lowest survivorship among all sites, with competition from high loads of weedy grasses including *Pennisetum clandestinum* and *Ehrharta* spp. *Arctotheca calendula*, *Euphorbia terracina* and *Hypochaeris* spp. were also prevalent.

Henshell 2014 (77%) was also negatively affected by weed competition, with weedy grasses growing higher than the guards in some areas. It appeared that effective spot spraying before planting had not been undertaken.

6.2. Individual zones

Individual zones showed varying survivorship, with plantings in Blow-out areas highest at 94% survival (although a small sample size of 81 plants) and Coastal zones lowest at 79% survival. This result is consistent with the final results of the 2013 monitoring, where Coastal zone plantings had the lowest survivorship among all zones (Tuck & Bachmann 2014). The lower level of survivorship in

this zone could be reflective of the harsher conditions at coastal sites, with generally poorer soils and high exposure to wind, which can blow guards over, remove surface moisture, increase salinity due to salt spray, and blow debris around, disturbing plants.

6.3. Individual species

As has been noted in previous surveys, the task of identifying dead plants to a species level is often not possible. While some species may have significant die-off, some plants tend to be unidentifiable after death and their species survival percentage may not reflect the true survival rate. Of the 17,401 plants surveyed, 917 were unidentifiable (5.2%), which is consistent with the 2013/2013 monitoring events (Tuck & Bachmann 2014).

With that in mind – most species showed high survival, but some commonly-planted species with notable die-off included *Poa poiformis* var. *poiformis* (57.7% survival) and *Acacia longifolia* ssp. *sophorae* (77% survival).

7. References

Tuck, J. and Bachmann, M. (2014) *CLLMM Vegetation Survivorship Monitoring (2013 Plantings)*. Report to the Department of Environment, Water and Natural Resources, Government of South Australia. NGT Consulting, Mount Gambier, South Australia.

Appendix A – Survivorship by site and zone

Alexandrina Dairies Hwy

Zone	Plants surveyed	Alive	Dead	Survival (%)
3	339	317	22	93.5
4	367	349	18	95.1
8	1941	1642	299	84.6
9	802	699	103	87.2
Total	3449	3007	442	87.2

Camp Coorong

Zone	Plants surveyed	Alive	Dead	Survival (%)
9	410	366	44	89.3
Total	410	366	44	89.3

Connelly

Zone	Plants surveyed	Alive	Dead	Survival (%)
9	287	260	27	90.6
Total	287	260	27	90.6

Fiebig Hwy

Zone	Plants surveyed	Alive	Dead	Survival (%)
3	203	190	13	93.6
Total	203	190	13	93.6

Griffen (not surveyed as not planted)

Henshell 2014

Zone	Plants surveyed	Alive	Dead	Survival (%)
2	37	35	2	94.6
3	103	85	18	82.5
4	115	77	38	67.0
Total	255	197	58	77.3

Jockwar Lake Edge

Zone	Plants surveyed	Alive	Dead	Survival (%)
3	93	75	18	80.6
4	498	484	14	97.2
8	116	107	9	92.2
Total	707	666	41	94.2

Meningie Cemetery

Zone	Plants surveyed	Alive	Dead	Survival (%)
9	253	232	21	91.7
Total	253	232	21	91.7

Mundoo Ewe Island

Zone	Plants surveyed	Alive	Dead	Survival (%)
3	392	325	67	82.9
Total	392	325	67	82.9

Mundoo Massive

Zone	Plants surveyed	Alive	Dead	Survival (%)
3	437	395	42	90.4
4	834	730	104	87.5
10	517	481	36	93.0
13	81	76	5	93.8
Total	1869	1682	187	90.0

Mundoo South

Zone	Plants surveyed	Alive	Dead	Survival (%)
3	110	53	57	48.2
4	246	180	66	73.2
9	262	250	12	95.4
3	110	53	57	48.2
Total	618	483	135	78.2

Noonameena

Zone	Plants surveyed	Alive	Dead	Survival (%)
2	15	13	2	86.7
3	148	132	16	89.2
10	1538	1130	408	73.5
Total	1701	1275	426	75.0

Poltalloch Swamp

Zone	Plants surveyed	Alive	Dead	Survival (%)
3	93	86	7	92.5
4	217	188	29	86.6
Total	310	274	36	88.4

Schultz

Zone	Plants surveyed	Alive	Dead	Survival (%)
3	166	160	6	96.4
9	416	370	46	88.9
Total	582	530	52	91.1

Treloar Lucky

Zone	Plants surveyed	Alive	Dead	Survival (%)
3	2733	2277	456	83.3
4	968	853	115	88.1
9	442	382	60	86.4
Total	4143	3512	631	84.8

Watkins

Zone	Plants surveyed	Alive	Dead	Survival (%)
8	1729	1620	109	93.7
Total	1729	1620	109	93.7

Wellington Lodge Swamp Sth

Zone	Plants surveyed	Alive	Dead	Survival (%)
3	150	142	8	94.7
4	243	228	15	93.8
Total	393	370	23	94.1

Wilkinson

Zone	Plants surveyed	Alive	Dead	Survival (%)
4	30	22	8	73.3
5	8	7	1	87.5
8	62	58	4	93.5
Total	100	87	13	87.0

Appendix B – Survivorship by site and species

Alexandrina Dairies Hwy

Species name	Plants surveyed	Alive	Dead	Survival (%)
<i>Acacia calamifolia</i>	77	73	4	94.8
<i>Acacia ligulata</i>	144	124	20	86.1
<i>Acacia longifolia ssp. sophorae</i>	78	56	22	71.8
<i>Acacia pycnantha</i>	115	96	19	83.5
<i>Acacia spinescens</i>	13	13	0	100
<i>Allocasuarina pusilla</i>	4	4	0	100
<i>Allocasuarina verticillata</i>	200	171	29	85.5
<i>Atriplex paludosa ssp.</i>	34	33	1	97.1
<i>Atriplex prostrata</i>	3	3	0	100
<i>Atriplex semibaccata</i>	19	18	1	94.7
<i>Atriplex suberecta</i>	29	29	0	100
<i>Austrostipa elegantissima</i>	26	26	0	100
<i>Austrostipa flavescens</i>	83	80	3	96.4
<i>Austrostipa nodosa</i>	9	9	0	100
<i>Austrostipa sp.</i>	65	63	2	96.9
<i>Banksia marginata</i>	9	9	0	100
<i>Banksia ornata</i>	9	7	2	77.8
<i>Billardiera cymosa ssp.</i>	10	10	0	100
<i>Bursaria spinosa ssp. spinosa</i>	129	119	10	92.2
<i>Callitris gracilis</i>	38	36	2	94.7
<i>Carpobrotus rossii</i>	27	27	0	100
<i>Clematis microphylla</i>	25	25	0	100
<i>Dianella brevicaulis</i>	126	120	6	95.2
<i>Disphyma crassifolium ssp. clavellatum</i>	4	4	0	100
<i>Dodonaea viscosa ssp. spatulata</i>	61	52	9	85.2
<i>Duma florulenta</i>	10	10	0	100
<i>Enchylaena tomentosa var.</i>	39	36	3	92.3
<i>Enneapogon nigricans</i>	4	4	0	100
<i>Eucalyptus diversifolia (NC)</i>	2	2	0	100
<i>Eucalyptus diversifolia ssp. diversifolia</i>	98	86	12	87.8
<i>Eucalyptus incrassata</i>	9	9	0	100
<i>Ficinia nodosa</i>	327	323	4	98.8
<i>Gahnia filum</i>	177	160	17	90.4
<i>Hakea mitchellii</i>	47	44	3	93.6
<i>Hakea sp.</i>	2	2	0	100
<i>Hakea vittata</i>	5	4	1	80.0
<i>Juncus kraussii</i>	131	129	2	98.5
<i>Kennedia prostrata</i>	9	5	4	55.6
<i>Kunzea pomifera</i>	2	2	0	100
<i>Lasiopetalum baueri</i>	7	7	0	100
<i>Maireana oppositifolia</i>	43	41	2	95.3

Species name	Plants surveyed	Alive	Dead	Survival (%)
<i>Melaleuca acuminata</i> ssp. <i>acuminata</i>	2	0	2	0.0
<i>Melaleuca halmaturorum</i>	16	15	1	93.8
<i>Melaleuca lanceolata</i>	26	23	3	88.5
<i>Muehlenbeckia gunnii</i>	75	74	1	98.7
<i>Myoporum insulare</i>	33	32	1	97.0
<i>Nitraria billardierei</i>	4	4	0	100
<i>Olearia axillaris</i>	276	259	17	93.8
<i>Pelargonium australe</i>	56	53	3	94.6
<i>Pittosporum angustifolium</i>	7	7	0	100
<i>Poa labillardieri</i> var. <i>labillardieri</i>	179	175	4	97.8
<i>Puccinellia stricta</i>	71	69	2	97.2
<i>Rhagodia candolleana</i> ssp. <i>candolleana</i>	6	5	1	83.3
<i>Rhagodia crassifolia</i>	1	1	0	100
<i>Rytidosperma caespitosum</i>	118	113	5	95.8
<i>Tetragonia implexicoma</i>	35	34	1	97.1
<i>Threlkeldia diffusa</i>	26	26	0	100
<i>Dead (unknown species)</i>	203	0	203	0.0
<i>Vittadinia cuneata</i> var.	60	44	16	73.3
<i>Xanthorrhoea caespitosa</i>	6	2	4	33.3
Total	3449	442	3007	87.2

Camp Coorong

Species name	Plants surveyed	Alive	Dead	Survival (%)
<i>Acacia cupularis</i>	6	6	0	100
<i>Acacia leiophylla</i>	1	1	0	100
<i>Acacia longifolia ssp. sophorae</i>	12	10	2	83.3
<i>Acacia pycnantha</i>	2	2	0	100
<i>Acacia sp.</i>	22	22	0	100
<i>Allocasuarina verticillata</i>	80	67	13	83.8
<i>Bursaria spinosa ssp. spinosa</i>	16	15	1	93.8
<i>Carpobrotus rossii</i>	12	12	0	100
<i>Dianella brevicaulis</i>	3	3	0	100
<i>Dodonaea viscosa ssp. spatulata</i>	12	11	1	91.7
<i>Enchylaena tomentosa var.</i>	11	8	3	72.7
<i>Eucalyptus diversifolia ssp. diversifolia</i>	31	28	3	90.3
<i>Ficinia nodosa</i>	18	18	0	100
<i>Gahnia filum</i>	8	8	0	100
<i>Juncus kraussii</i>	11	10	1	90.9
<i>Kunzea pomifera</i>	14	14	0	100
<i>Melaleuca acuminata ssp. acuminata</i>	2	2	0	100
<i>Melaleuca brevifolia</i>	11	11	0	100
<i>Melaleuca halmaturorum</i>	2	2	0	100
<i>Melaleuca lanceolata</i>	11	11	0	100
<i>Myoporum insulare</i>	1	1	0	100
<i>Olearia axillaris</i>	49	48	1	98.0
<i>Rhagodia candolleana ssp. candolleana</i>	13	13	0	100
<i>Solanum lasiophyllum</i>	38	38	0	100
<i>Solanum linearifolium</i>	2	2	0	100
<i>Tetragonia implexicoma</i>	3	3	0	100
<i>Unidentified sp.</i>	19	0	19	0.0
Total	410	366	44	89.3

Connelly

Species name	Plants surveyed	Alive	Dead	Survival (%)
<i>Acacia acinacea</i>	1	1	0	100
<i>Acacia brachybotrya</i>	10	10	0	100
<i>Acacia cupularis</i>	6	6	0	100
<i>Acacia pycnantha</i>	13	13	0	100
<i>Allocasuarina verticillata</i>	47	40	7	85.1
<i>Atriplex paludosa ssp.</i>	28	25	3	89.3
<i>Atriplex semibaccata</i>	35	34	1	97.1
<i>Billardiera cymosa ssp.</i>	11	11	0	100
<i>Carpobrotus rossii</i>	4	4	0	100
<i>Disphyma crassifolium ssp. clavellatum</i>	17	17	0	100
<i>Duma florulenta</i>	1	1	0	100
<i>Einadia nutans ssp.</i>	9	9	0	100
<i>Enchylaena tomentosa var.</i>	24	23	1	95.8
<i>Eucalyptus camaldulensis ssp.</i>	8	8	0	100
<i>Eucalyptus odorata</i>	4	4	0	100
<i>Melaleuca brevifolia</i>	8	8	0	100
<i>Melaleuca halmaturorum</i>	4	4	0	100
<i>Melaleuca lanceolata</i>	9	7	2	77.8
<i>Myoporum insulare</i>	8	7	1	87.5
<i>Nitraria billardierei</i>	3	3	0	100
<i>Rhagodia candolleana ssp. candolleana</i>	8	8	0	100
<i>Rhagodia crassifolia</i>	4	4	0	100
<i>Rytidosperma caespitosum</i>	2	2	0	100
<i>Threlkeldia diffusa</i>	2	2	0	100
<i>Unidentified sp.</i>	12	0	12	0.0
<i>Vittadinia cuneata var.</i>	9	9	0	100
Total	287	260	27	90.6

Fiebig Hwy

Species name	Plants surveyed	Alive	Dead	Survival (%)
<i>Atriplex paludosa ssp.</i>	9	9	0	100
<i>Atriplex semibaccata</i>	6	6	0	100
<i>Atriplex suberecta</i>	6	6	0	100
<i>Disphyma crassifolium ssp. clavellatum</i>	2	2	0	100
<i>Duma florulenta</i>	3	3	0	100
<i>Enchylaena tomentosa var.</i>	2	2	0	100
<i>Gahnia filum</i>	52	52	0	100
<i>Juncus kraussii</i>	19	19	0	100
<i>Maireana oppositifolia</i>	13	13	0	100
<i>Melaleuca halmaturorum</i>	48	44	4	91.7
<i>Myoporum insulare</i>	15	13	2	86.7
<i>Olearia axillaris</i>	1	1	0	100
<i>Puccinellia stricta</i>	18	15	3	83.3
<i>Rhagodia candolleana ssp. candolleana</i>	2	2	0	100
<i>Threlkeldia diffusa</i>	4	3	1	75.0
<i>Unidentified sp.</i>	3	0	3	0.0
Total	203	190	13	93.6

Griffen (not surveyed)

Henshell 2014

Species name	Plants surveyed	Alive	Dead	Survival (%)
<i>Acacia calamifolia</i>	3	3	0	100
<i>Acacia cupularis</i>	2	2	0	100
<i>Acacia ligulata</i>	3	3	0	100
<i>Acacia longifolia ssp. sophorae</i>	10	10	0	100
<i>Acacia spinescens</i>	4	4	0	100
<i>Allocasuarina verticillata</i>	13	5	8	38.5
<i>Atriplex paludosa ssp.</i>	21	19	2	90.5
<i>Atriplex semibaccata</i>	8	7	1	87.5
<i>Atriplex suberecta</i>	17	17	0	100
<i>Bursaria spinosa ssp. spinosa</i>	3	3	0	100
<i>Carpobrotus rossii</i>	12	12	0	100
<i>Dianella brevicaulis</i>	3	2	1	66.7
<i>Dianella brevicaulis/revoluta var.</i>	16	14	2	87.5
<i>Disphyma crassifolium ssp. clavellatum</i>	7	7	0	100
<i>Enchylaena tomentosa var.</i>	8	7	1	87.5
<i>Gahnia filum</i>	16	9	7	56.3
<i>Hakea vittata</i>	1	1	0	100
<i>Kunzea pomifera</i>	6	5	1	83.3
<i>Maireana brevifolia</i>	7	6	1	85.7
<i>Maireana oppositifolia</i>	10	7	3	70.0
<i>Melaleuca halmaturorum</i>	13	13	0	100
<i>Melaleuca lanceolata</i>	10	10	0	100
<i>Olearia axillaris</i>	5	5	0	100
<i>Pelargonium australe</i>	11	10	1	90.9
<i>Puccinellia stricta</i>	10	9	1	90.0
<i>Rhagodia candolleana ssp. candolleana</i>	7	7	0	100
<i>Unidentified sp.</i>	29	0	29	0.0
Total	255	197	58	77.3

Jockwar Lake Edge

Species name	Plants surveyed	Alive	Dead	Survival (%)
<i>Acacia calamifolia</i>	13	13	0	100
<i>Acacia ligulata</i>	6	6	0	100
<i>Acacia pycnantha</i>	3	3	0	100
<i>Acacia spinescens</i>	1	1	0	100
<i>Allocasuarina verticillata</i>	21	20	1	95.2
<i>Atriplex paludosa ssp.</i>	42	38	4	90.5
<i>Atriplex semibaccata</i>	1	1	0	100
<i>Atriplex suberecta</i>	43	41	2	95.3
<i>Austrostipa flavescens</i>	11	11	0	100
<i>Austrostipa nodosa</i>	28	28	0	100
<i>Bursaria spinosa ssp. spinosa</i>	2	2	0	100
<i>Callitris gracilis</i>	2	2	0	100
<i>Carpobrotus rossii</i>	1	1	0	100
<i>Dianella brevicaulis</i>	14	13	1	92.9
<i>Disphyma crassifolium ssp. clavellatum</i>	2	2	0	100
<i>Dodonaea viscosa ssp. spatulata</i>	2	2	0	100
<i>Duma florulenta</i>	4	4	0	100
<i>Enchylaena tomentosa var.</i>	21	21	0	100
<i>Ficinia nodosa</i>	112	110	2	98.2
<i>Gahnia filum</i>	43	35	8	81.4
<i>Hakea vittata</i>	1	1	0	100
<i>Juncus kraussii</i>	120	119	1	99.2
<i>Kunzea pomifera</i>	6	5	1	83.3
<i>Maireana oppositifolia</i>	42	39	3	92.9
<i>Melaleuca halmaturorum</i>	2	2	0	100
<i>Melaleuca lanceolata</i>	8	6	2	75.0
<i>Muehlenbeckia gunnii</i>	11	11	0	100
<i>Myoporum insulare</i>	14	14	0	100
<i>Olearia axillaris</i>	13	13	0	100
<i>Pelargonium australe</i>	2	2	0	100
<i>Puccinellia stricta</i>	89	85	4	95.5
<i>Rhagodia candolleana ssp. candolleana</i>	3	3	0	100
<i>Tetragonia implexicoma</i>	7	7	0	100
<i>Unidentified sp.</i>	12	0	12	0.0
<i>Vittadinia cuneata var.</i>	5	5	0	100
Total	707	666	41	94.2

Meningie Cemetery

Species name	Plants surveyed	Alive	Dead	Survival (%)
<i>Acacia calamifolia</i>	10	8	2	80.0
<i>Acacia mitchellii</i>	1	1	0	100
<i>Acacia paradoxa</i>	2	2	0	100
<i>Acacia pycnantha</i>	22	20	2	90.9
<i>Acacia spinescens</i>	2	2	0	100
<i>Allocasuarina verticillata</i>	21	20	1	95.2
<i>Banksia ornata</i>	7	7	0	100
<i>Bursaria spinosa ssp. spinosa</i>	78	76	2	97.4
<i>Dodonaea viscosa ssp. spatulata</i>	6	6	0	100
<i>Eucalyptus diversifolia ssp. diversifolia</i>	18	18	0	100
<i>Eucalyptus incrassata</i>	11	11	0	100
<i>Hakea mitchellii</i>	20	20	0	100
<i>Melaleuca acuminata ssp. acuminata</i>	16	16	0	100
<i>Pittosporum angustifolium</i>	23	22	1	95.7
<i>Unidentified sp.</i>	9	0	9	0.0
<i>Xanthorrhoea caespitosa</i>	7	3	4	42.9
Total	253	232	21	91.7

Mundoo Ewe Island

Species name	Plants surveyed	Alive	Dead	Survival (%)
<i>Adriana quadripartita</i>	5	4	1	80.0
<i>Atriplex paludosa</i> ssp.	47	47	0	100
<i>Atriplex semibaccata</i>	1	1	0	100
<i>Atriplex suberecta</i>	1	0	1	0.0
<i>Disphyma crassifolium</i> ssp. <i>clavellatum</i>	17	17	0	100
<i>Duma florulenta</i>	25	25	0	100
<i>Enchylaena tomentosa</i> var.	9	9	0	100
<i>Ficinia nodosa</i>	19	19	0	100
<i>Juncus kraussii</i>	43	43	0	100
<i>Maireana oppositifolia</i>	59	57	2	96.6
<i>Melaleuca halmaturorum</i>	17	17	0	100
<i>Myoporum insulare</i>	13	13	0	100
<i>Puccinellia stricta</i>	103	69	34	67.0
<i>Threlkeldia diffusa</i>	4	4	0	100
<i>Unidentified sp.</i>	29	0	29	0.0
Total	392	325	67	82.9

Mundoo Massive

Species name	Plants surveyed	Alive	Dead	Survival (%)
<i>Acacia calamifolia</i>	4	4	0	100
<i>Acacia cupularis</i>	18	18	0	100
<i>Acacia leiophylla</i>	1	1	0	100
<i>Acacia longifolia ssp. sophorae</i>	14	14	0	100
<i>Acacia pycnantha</i>	24	22	2	91.7
<i>Acacia sp.</i>	1	1	0	100
<i>Acacia spinescens</i>	5	5	0	100
<i>Adriana quadripartita</i>	14	7	7	50.0
<i>Allocasuarina pusilla</i>	9	9	0	100
<i>Allocasuarina sp.</i>	7	7	0	100
<i>Allocasuarina verticillata</i>	6	6	0	100
<i>Atriplex paludosa ssp.</i>	42	41	1	97.6
<i>Atriplex semibaccata</i>	57	57	0	100
<i>Atriplex suberecta</i>	34	33	1	97.1
<i>Austrostipa flavescens</i>	75	75	0	100
<i>Banksia ornata</i>	8	8	0	100
<i>Billardiera cymosa ssp.</i>	7	7	0	100
<i>Bursaria spinosa ssp. spinosa</i>	29	28	1	96.6
<i>Carpobrotus rossii</i>	16	15	1	93.8
<i>Clematis microphylla</i>	10	10	0	100
<i>Dianella brevicaulis</i>	85	85	0	100
<i>Disphyma crassifolium ssp. clavellatum</i>	17	17	0	100
<i>Dodonaea viscosa ssp. spatulata</i>	5	5	0	100
<i>Duma florulenta</i>	20	20	0	100
<i>Enchylaena tomentosa var.</i>	47	47	0	100
<i>Eucalyptus diversifolia ssp. diversifolia</i>	1	1	0	100
<i>Eucalyptus incrassata</i>	1	1	0	100
<i>Ficinia nodosa</i>	360	358	2	99.4
<i>Gahnia filum</i>	23	23	0	100
<i>Hakea mitchellii</i>	9	9	0	100
<i>Juncus kraussii</i>	184	92	92	50.0
<i>Kennedia prostrata</i>	9	7	2	77.8
<i>Kunzea pomifera</i>	5	5	0	100
<i>Maireana brevifolia</i>	23	23	0	100
<i>Maireana oppositifolia</i>	76	76	0	100
<i>Melaleuca halmaturorum</i>	35	35	0	100
<i>Melaleuca uncinata</i>	3	3	0	100
<i>Muehlenbeckia gunnii</i>	8	7	1	87.5
<i>Myoporum insulare</i>	62	57	5	91.9
<i>Olearia axillaris</i>	62	61	1	98.4
<i>Olearia ramulosa</i>	1	1	0	100
<i>Pelargonium australe</i>	12	12	0	100
<i>Pittosporum angustifolium</i>	2	1	1	50.0

Species name	Plants surveyed	Alive	Dead	Survival (%)
<i>Poa labillardieri</i> var. <i>labillardieri</i>	154	154	0	100
<i>Poa</i> sp.	33	33	0	100
<i>Puccinellia stricta</i>	43	43	0	100
<i>Rhagodia candolleana</i> ssp. <i>candolleana</i>	7	7	0	100
<i>Rytidosperma caespitosum</i>	119	119	0	100
<i>Tetragonia implexicoma</i>	9	9	0	100
<i>Unidentified</i> sp.	70	0	70	0.0
<i>Vittadinia cuneata</i> var.	1	1	0	100
<i>Xanthorrhoea caespitosa</i>	2	2	0	100
Total	1869	1682	187	90.0

Mundoo South

Species name	Plants surveyed	Alive	Dead	Survival (%)
<i>Acacia calamifolia</i>	6	6	0	100
<i>Acacia microcarpa</i>	7	7	0	100
<i>Acacia paradoxa</i>	19	19	0	100
<i>Acacia pycnantha</i>	4	3	1	75.0
<i>Adriana quadripartita</i>	1	0	1	0.0
<i>Allocasuarina verticillata</i>	5	5	0	100
<i>Atriplex paludosa ssp.</i>	8	8	0	100
<i>Atriplex semibaccata</i>	11	10	1	90.9
<i>Atriplex suberecta</i>	8	6	2	75.0
<i>Austrostipa elegantissima</i>	18	16	2	88.9
<i>Austrostipa flavescens</i>	19	19	0	100
<i>Billardiera cymosa ssp.</i>	1	1	0	100
<i>Bursaria spinosa ssp. spinosa</i>	12	12	0	100
<i>Carpobrotus rossii</i>	7	7	0	100
<i>Clematis microphylla</i>	4	4	0	100
<i>Dianella brevicaulis/revoluta var.</i>	3	3	0	100
<i>Dianella revoluta var.</i>	18	16	2	88.9
<i>Dodonaea viscosa ssp. spatulata</i>	3	3	0	100
<i>Duma florulenta</i>	2	2	0	100
<i>Enchylaena tomentosa var.</i>	4	3	1	75.0
<i>Enneapogon nigricans</i>	0	0	0	#DIV/0!
<i>Ficinia nodosa</i>	53	53	0	100
<i>Hakea mitchellii</i>	4	4	0	100
<i>Juncus kraussii</i>	9	7	2	77.8
<i>Kennedia prostrata</i>	2	2	0	100
<i>Kunzea pomifera</i>	29	29	0	100
<i>Maireana oppositifolia</i>	15	14	1	93.3
<i>Melaleuca acuminata ssp. acuminata</i>	8	8	0	100
<i>Melaleuca halmaturorum</i>	105	48	57	45.7
<i>Myoporum insulare</i>	11	11	0	100
<i>Puccinellia stricta</i>	115	90	25	78.3
<i>Rhagodia candolleana ssp. candolleana</i>	1	1	0	100
<i>Rytidosperma setaceum</i>	33	33	0	100
<i>Rytidosperma sp.</i>	24	24	0	100
<i>Tetragonia implexicoma</i>	3	3	0	100
<i>Threlkeldia diffusa</i>	7	4	3	57.1
<i>Unidentified sp.</i>	37	0	37	0.0
<i>Vittadinia cuneata var.</i>	2	2	0	100
Total	618	483	135	78.2

Noonameena

Species name	Plants surveyed	Alive	Dead	Survival (%)
<i>Acacia cupularis</i>	35	33	2	94.3
<i>Acacia leiophylla</i>	12	6	6	50.0
<i>Acacia longifolia ssp. sophorae</i>	71	51	20	71.8
<i>Adriana quadripartita</i>	14	2	12	14.3
<i>Allocasuarina verticillata</i>	65	57	8	87.7
<i>Atriplex paludosa ssp.</i>	13	13	0	100
<i>Atriplex semibaccata</i>	2	2	0	100
<i>Atriplex suberecta</i>	1	1	0	100
<i>Billardiera cymosa ssp.</i>	26	24	2	91.7
<i>Carpobrotus rossii</i>	12	12	0	100
<i>Clematis microphylla</i>	23	22	1	95.7
<i>Dianella brevicaulis</i>	8	8	0	100
<i>Disphyma crassifolium ssp. clavellatum</i>	5	5	0	100
<i>Enchylaena tomentosa var.</i>	18	17	1	94.4
<i>Eucalyptus diversifolia ssp. diversifolia</i>	36	33	3	91.7
<i>Eucalyptus incrassata</i>	17	13	4	76.5
<i>Ficinia nodosa</i>	521	456	65	87.5
<i>Gahnia filum</i>	8	8	0	100
<i>Juncus kraussii</i>	15	15	0	100
<i>Kennedia prostrata</i>	13	8	5	61.5
<i>Kunzea pomifera</i>	24	18	6	75.0
<i>Lotus australis</i>	17	17	0	100
<i>Maireana oppositifolia</i>	13	12	1	92.3
<i>Melaleuca halmaturorum</i>	14	14	0	100
<i>Muehlenbeckia gunnii</i>	1	1	0	100
<i>Myoporum insulare</i>	87	86	1	98.9
<i>Olearia axillaris</i>	60	59	1	98.3
<i>Pelargonium australe</i>	12	11	1	91.7
<i>Poa poiformis var. poiformis</i>	402	232	170	57.7
<i>Rhagodia candolleana ssp. candolleana</i>	2	2	0	100
<i>Tetragonia implexicoma</i>	27	27	0	100
<i>Threlkeldia diffusa</i>	10	10	0	100
<i>Unidentified sp.</i>	117	0	117	0.0
Total	1701	1275	426	75.0

Poltalloch Swamp

Species name	Plants surveyed	Alive	Dead	Survival (%)
<i>Allocasuarina verticillata</i>	9	8	1	88.9
<i>Atriplex paludosa ssp.</i>	12	10	2	83.3
<i>Atriplex prostrata</i>	2	2	0	100
<i>Atriplex semibaccata</i>	14	13	1	92.9
<i>Atriplex suberecta</i>	25	24	1	96.0
<i>Carpobrotus rossii</i>	2	2	0	100
<i>Dianella brevicaulis</i>	6	6	0	100
<i>Duma florulenta</i>	7	7	0	100
<i>Enchylaena tomentosa var.</i>	15	13	2	86.7
<i>Ficinia nodosa</i>	47	47	0	100
<i>Gahnia filum</i>	12	11	1	91.7
<i>Juncus kraussii</i>	24	24	0	100
<i>Maireana oppositifolia</i>	37	35	2	94.6
<i>Melaleuca halmaturorum</i>	5	5	0	100
<i>Melaleuca lanceolata</i>	5	4	1	80.0
<i>Myoporum insulare</i>	19	18	1	94.7
<i>Puccinellia stricta</i>	35	34	1	97.1
<i>Tetragonia implexicoma</i>	8	7	1	87.5
<i>Threlkeldia diffusa</i>	4	4	0	100
<i>Unidentified sp.</i>	22	0	22	0.0
Total	310	274	36	88.4

Schultz

Species name	Plants surveyed	Alive	Dead	Survival (%)
<i>Acacia calamifolia</i>	10	9	1	90.0
<i>Acacia cupularis</i>	3	3	0	100
<i>Acacia ligulata</i>	7	7	0	100
<i>Acacia longifolia ssp. sophorae</i>	6	6	0	100
<i>Acacia pycnantha</i>	4	4	0	100
<i>Adriana quadripartita</i>	4	4	0	100
<i>Allocasuarina verticillata</i>	29	29	0	100
<i>Atriplex paludosa ssp.</i>	32	32	0	100
<i>Atriplex semibaccata</i>	27	27	0	100
<i>Atriplex suberecta</i>	16	15	1	93.8
<i>Austrostipa elegantissima</i>	11	11	0	100
<i>Austrostipa flavescens</i>	24	24	0	100
<i>Banksia marginata</i>	1	1	0	100
<i>Billardiera cymosa ssp.</i>	3	3	0	100
<i>Clematis microphylla</i>	5	5	0	100
<i>Dianella brevicaulis</i>	26	24	2	92.3
<i>Dianella brevicaulis/revoluta var.</i>	16	15	1	93.8
<i>Disphyma crassifolium ssp. clavellatum</i>	2	2	0	100
<i>Dodonaea viscosa ssp. spatulata</i>	1	1	0	100
<i>Einadia nutans ssp.</i>	7	7	0	100
<i>Enchylaena tomentosa var.</i>	54	54	0	100
<i>Eucalyptus diversifolia ssp. diversifolia</i>	1	1	0	100
<i>Eucalyptus porosa</i>	4	4	0	100
<i>Ficinia nodosa</i>	59	59	0	100
<i>Hakea mitchellii</i>	3	3	0	100
<i>Hakea vittata</i>	1	1	0	100
<i>Juncus kraussii</i>	32	32	0	100
<i>Kunzea pomifera</i>	5	5	0	100
<i>Maireana oppositifolia</i>	1	1	0	100
<i>Melaleuca brevifolia</i>	5	5	0	100
<i>Melaleuca halmaturorum</i>	16	16	0	100
<i>Muehlenbeckia gunnii</i>	1	1	0	100
<i>Myoporum insulare</i>	2	2	0	100
<i>Olearia axillaris</i>	15	15	0	100
<i>Pelargonium australe</i>	6	6	0	100
<i>Poa labillardieri var. labillardieri</i>	7	7	0	100
<i>Puccinellia stricta</i>	23	23	0	100
<i>Rytidosperma caespitosum</i>	41	40	1	97.6
<i>Threlkeldia diffusa</i>	10	10	0	100
<i>Unidentified sp.</i>	46	0	46	0.0
<i>Vittadinia cuneata var.</i>	3	3	0	100
<i>Xanthorrhoea caespitosa</i>	13	13	0	100
Total	582	530	52	91.1

Treloar Lucky

Species name	Plants surveyed	Alive	Dead	Survival (%)
<i>Acacia calamifolia</i>	3	3	0	100
<i>Acacia paradoxa</i>	10	10	0	100
<i>Acacia pycnantha</i>	19	17	2	89.5
<i>Adriana klotzschii</i> (NC)	15	9	6	60.0
<i>Adriana quadripartita</i>	12	8	4	66.7
<i>Allocasuarina verticillata</i>	40	29	11	72.5
<i>Atriplex paludosa</i> ssp.	316	300	16	94.9
<i>Atriplex semibaccata</i>	100	94	6	94.0
<i>Atriplex suberecta</i>	73	73	0	100
<i>Austrostipa elegantissima</i>	26	21	5	80.8
<i>Austrostipa nodosa</i>	7	7	0	100
<i>Austrostipa</i> sp.	27	26	1	96.3
<i>Bursaria spinosa</i> ssp. <i>spinosa</i>	54	45	9	83.3
<i>Callitris gracilis</i>	7	7	0	100
<i>Carpobrotus rossii</i>	8	7	1	87.5
<i>Clematis microphylla</i>	5	5	0	100
<i>Dianella brevicaulis</i>	18	18	0	100
<i>Disphyma crassifolium</i> ssp. <i>clavellatum</i>	94	93	1	98.9
<i>Dodonaea viscosa</i> ssp. <i>spatulata</i>	2	2	0	100
<i>Duma florulenta</i>	79	75	4	94.9
<i>Enchylaena tomentosa</i> var.	144	138	6	95.8
<i>Eucalyptus diversifolia</i> ssp. <i>diversifolia</i>	18	16	2	88.9
<i>Ficinia nodosa</i>	240	221	19	92.1
<i>Gahnia filum</i>	970	814	156	83.9
<i>Hakea mitchellii</i>	4	3	1	75.0
<i>Hakea</i> sp.	1	1	0	100
<i>Juncus kraussii</i>	408	356	52	87.3
<i>Kunzea pomifera</i>	14	12	2	85.7
<i>Lasiopetalum baueri</i>	4	3	1	75.0
<i>Maireana oppositifolia</i>	336	332	4	98.8
<i>Melaleuca halmaturorum</i>	168	147	21	87.5
<i>Melaleuca lanceolata</i>	40	30	10	75.0
<i>Myoporum insulare</i>	60	55	5	91.7
<i>Pittosporum angustifolium</i>	8	8	0	100
<i>Poa labillardieri</i> var. <i>labillardieri</i>	187	175	12	93.6
<i>Puccinellia stricta</i>	121	109	12	90.1
<i>Rytidosperma caespitosum</i>	137	124	13	90.5
<i>Rytidosperma setaceum</i>	32	32	0	100
<i>Tetragonia implexicoma</i>	20	19	1	95.0
<i>Threlkeldia diffusa</i>	61	61	0	100
<i>Trifolium incarnatum</i> var. <i>incarnatum</i>	3	3	0	100
<i>Unidentified</i> sp.	247	0	247	0.0
<i>Vittadinia cuneata</i> var.	5	4	1	80.0
Total	4143	3512	631	84.8

Watkins

Species name	Plants surveyed	Dead	Alive	Survival (%)
<i>Acacia calamifolia</i>	4	4	0	100
<i>Acacia dodonaeifolia</i>	31	30	1	96.8
<i>Acacia microcarpa</i>	1	1	0	100
<i>Acacia myrtifolia</i>	69	65	4	94.2
<i>Acacia paradoxa</i>	27	26	1	96.3
<i>Acacia pycnantha</i>	28	24	4	85.7
<i>Acacia spinescens</i>	12	12	0	100
<i>Allocasuarina muelleriana</i> ssp.	29	27	2	93.1
<i>Allocasuarina pusilla</i>	20	19	1	95.0
<i>Allocasuarina verticillata</i>	175	167	8	95.4
<i>Banksia ornata</i>	7	7	0	100
<i>Billardiera cymosa</i> ssp.	133	133	0	100
<i>Bursaria spinosa</i> ssp. <i>spinosa</i>	84	84	0	100
<i>Callistemon rugulosus</i>	24	24	0	100
<i>Calytrix tetragona</i>	18	18	0	100
<i>Clematis microphylla</i>	113	108	5	95.6
<i>Dianella revoluta</i> var.	3	3	0	100
<i>Dodonaea intricata</i>	1	1	0	100
<i>Dodonaea viscosa</i> ssp. <i>spatulata</i>	88	88	3	96.5
<i>Eucalyptus baxteri</i>	27	27	0	100
<i>Eucalyptus diversifolia</i> ssp. <i>diversifolia</i>	4	4	0	100
<i>Eucalyptus fasciculosa</i>	47	44	3	93.6
<i>Eucalyptus incrassata</i>	127	122	5	96.1
<i>Eucalyptus leucoxydon</i> ssp.	4	4	0	100
<i>Eucalyptus odorata</i>	6	5	1	83.3
<i>Eucalyptus</i> sp.	7	6	1	85.7
<i>Ficinia nodosa</i>	73	72	1	98.6
<i>Hakea mitchellii</i>	4	4	0	100
<i>Hakea rostrata</i>	8	7	1	87.5
<i>Hakea</i> sp.	2	2	0	100
<i>Hakea vittata</i>	1	1	0	100
<i>Kennedia prostrata</i>	21	21	0	100
<i>Kunzea pomifera</i>	7	7	0	100
<i>Leptospermum myrsinoides</i>	197	193	4	98.0
<i>Lomandra</i> sp.	12	12	0	100
<i>Melaleuca lanceolata</i>	1	1	0	100
<i>Melaleuca uncinata</i>	41	37	4	90.2
<i>Muehlenbeckia gunnii</i>	4	4	0	100
<i>Olearia axillaris</i>	45	45	0	100
<i>Olearia ramulosa</i>	13	13	0	100
<i>Pimelea humilis</i>	33	31	2	93.9
<i>Platylobium</i> sp.	5	5	0	100
<i>Rhagodia candolleana</i> ssp. <i>candolleana</i>	29	29	0	100

Species name	Plants surveyed	Dead	Alive	Survival (%)
<i>Rytidosperma caespitosum</i>	17	17	0	100
<i>Thomasia petalocalyx</i>	1	1	0	100
<i>Unidentified sp.</i>	54	0	54	0.0
<i>Vittadinia cuneata var.</i>	22	22	0	100
<i>Vittadinia sp.</i>	24	21	3	87.5
<i>Xanthorrhoea semiplana ssp.</i>	26	25	1	96.2
Total	1729	1620	109	93.7

Wellington Lodge Swamp Sth

Species name	Plants surveyed	Alive	Dead	Survival (%)
<i>Atriplex paludosa</i> ssp.	44	43	1	97.7
<i>Atriplex semibaccata</i>	3	3	0	100
<i>Atriplex suberecta</i>	30	28	2	93.3
<i>Carpobrotus rossii</i>	1	1	0	100
<i>Dianella brevicaulis</i>	8	7	1	87.5
<i>Disphyma crassifolium</i> ssp. <i>clavellatum</i>	6	6	0	100
<i>Duma florulenta</i>	4	4	0	100
<i>Enchylaena tomentosa</i> var.	10	10	0	100
<i>Ficinia nodosa</i>	51	51	0	100
<i>Gahnia filum</i>	39	32	7	82.1
<i>Juncus kraussii</i>	80	76	4	95.0
<i>Maireana oppositifolia</i>	28	25	3	89.3
<i>Melaleuca halmaturorum</i>	11	10	1	90.9
<i>Myoporum insulare</i>	12	11	1	91.7
<i>Poa labillardieri</i> var. <i>labillardieri</i>	15	15	0	100
<i>Puccinellia stricta</i>	39	39	0	100
<i>Rhagodia candolleana</i> ssp. <i>candolleana</i>	2	2	0	100
<i>Tetragonia implexicoma</i>	5	5	0	100
<i>Threlkeldia diffusa</i>	2	2	0	100
<i>Unidentified sp.</i>	3	0	3	0.0
Total	393	370	23	94.1

Wilkinson

Species name	Plants surveyed	Alive	Dead	Survival (%)
<i>Acacia acinacea</i>	2	2	0	100
<i>Acacia calamifolia</i>	1	1	0	100
<i>Acacia paradoxa</i>	1	0	1	0.0
<i>Acacia pycnantha</i>	1	1	0	100
<i>Acacia sp.</i>	1	1	0	100
<i>Acacia spinescens</i>	8	8	0	100
<i>Allocasuarina verticillata</i>	12	12	0	100
<i>Banksia ornata</i>	1	1	0	100
<i>Billardiera cymosa ssp.</i>	1	1	0	100
<i>Bursaria spinosa ssp. spinosa</i>	4	3	1	75.0
<i>Callistemon rugulosus</i>	3	3	0	100
<i>Clematis microphylla</i>	4	4	0	100
<i>Correa sp.</i>	2	2	0	100
<i>Dianella revoluta var.</i>	15	11	4	73.3
<i>Dodonaea baueri</i>	1	1	0	100
<i>Eucalyptus fasciculosa</i>	4	4	0	100
<i>Eucalyptus incrassata</i>	3	3	0	100
<i>Eucalyptus odorata</i>	2	2	0	100
<i>Hakea rostrata</i>	2	2	0	100
<i>Leptospermum myrsinoides</i>	1	1	0	100
<i>Melaleuca halmaturorum</i>	1	1	0	100
<i>Melaleuca lanceolata</i>	2	1	1	50.0
<i>Melaleuca uncinata</i>	5	5	0	100
<i>Pelargonium australe</i>	11	11	0	100
<i>Senecio sp.</i>	1	1	0	100
<i>Tetragonia implexicoma</i>	1	1	0	100
<i>Threlkeldia diffusa</i>	3	2	1	66.7
<i>Unidentified sp.</i>	5	0	5	0.0
<i>Xanthorrhoea semiplana ssp.</i>	2	2	0	100
Total	100	87	13	87.0

Appendix C – Management recommendations

Site name	Location (E/N)	Issue/recommendation
Alexandrina Dairies – Hwy	Across site	Juvenile <i>Asparagus asparagoides</i> individuals common across site. Advise follow-up removal/spot spraying.
		<i>Pennisetum clandestinum</i> and <i>Ehrharta</i> spp. grasses are recovering at the northern end of the site and will need treatment soon. Blue lupins common.
		<i>Acacia saligna</i> and other woody weeds shooting after initial treatment. Advise follow up treatment.
Camp Coorong		<i>Asparagus asparagoides</i> seen in the adjacent carpark.
Noonameena	0343008/6041598	<i>Lycium ferocissimum</i> individual.
	0342865/6042049	<i>Asparagus asparagoides</i> individual.
Watkins	East end of site	One <i>Disa bracteata</i> individual found and reported to GWLAP.

Appendix D – Brief site notes

Alexandrina Dairies – PlanID 356

Generally good site condition, especially in lower lying areas. Plant health appeared to be poorer as elevation increased, with more stressed and dead plants on higher ground. *Asparagus asparagoides* was common, although most plants were juvenile. There were also patches of *Acacia saligna* and other woody weeds which were observed to be shooting from plants that had been treated with herbicide. Rabbits present.

Camp Coorong – PlanID 407

Guards had been pulled off or damaged on most plants in the south-eastern end of the site (likely by kangaroos) and the remaining guards were in poor condition. *Allocasuarina verticillata* had been subject to heavy grazing. Pest plant species included *Oenothera stricta* and *Arctotheca calendula*. *Asparagus asparagoides* was also seen in the adjacent carpark.

Connelly – PlanID 379

Plants were very healthy and with good growth compared to other sites. There were high loads of pasture grasses surrounding the guards which the owner intends to slash. There were no other significant pest plant or animal issues.

Fiebig – PlanID 355

Plants are generally in good health. *Myoporum insulare* was noted to be struggling. Many weeds were seen on the roadside but are currently not encroaching into the site. No significant pest plant or animal issues were noted.

Griffin – PlanID 385

Griffin contained only 2013 or older plantings, but the site was checked for plant health and general condition. Plants were noted to be healthy with very good growth. Spot spraying around plants was still suppressing weeds, although some *Citrullus lanatus* was still present in these areas. Two rabbits were seen while on the site.

Henshell 2014 – PlanID 386

Strong annual weed growth is competing with seedlings for space and moisture, affecting plant survivorship and health. Signs of rabbits were noted.

Jockwar Lake Edge – PlanID 361

Plants are generally healthy, despite high loads of pasture grasses. There were signs of rabbit activity, with diggings and heavy grazing in various spots.

Meningie Cemetery – PlanID 340

Pine removal site with significant weed cover, including *Oenothera stricta*, *Oxalis pes-caprae* (Soursob), *Solanum nigrum* and *Asparagus asparagoides*. Despite this, plant health was very good and Corflute guards were working well.

Mundoo Ewe Island – PlanID 343

Site was generally in good condition with no notable weed or pest animal issues. Seedlings are small but survivorship appears to be fair.

Mundoo Massive – Plan ID 341

Plant health and vigour was good despite competition from pasture grasses and broadleaf weeds such as *Trifolium sp.* and *Plantago sp.* 3 hares were seen at the site and some evidence of grazing was seen. Snails (mostly *Theba pisana*) were common.

Mundoo South – PlanID 342

Generally poor survivorship and plant vigour. It was noted that some areas were not planted, or had plantings that were low-density or patchy. No significant pest plant or animal issues were noted.

Noonameena – PlanID 346

Many plants were of poor health. *Oenothera stricta* was present across the site along with *Pennisetum clandestinum* and *Ehrharta sp.* grasses. Some established native plants were noted including *Olearia sp.*, *Gahnia sp.* and *Senecio sp.*

Poltalloch – PlanID 352

No major issues recorded at this site. Plants were generally healthy, with good growth.

Schultz – PlanID 394

Signs of effective weed and pest control. Some plant deaths were noted, but generally the health of surviving plants was good.

Treloar Lucky – PlanID 357

Poor seedling vigour with many plants near death. Weed control has been ineffective with pasture grasses dominant. Regrowth of treated *Lycium ferocissimum* is common across the site and follow up spraying is recommended.

Watkins – PlanID 402b

Plant health and site condition was generally good, but *Pteridium esculentum* and *Ehrharta spp.* grass competition is increasing in places. Some scattered rubbish was noted. One *Disa bracteata* individual was found in the east end of the site and reported to the GWLAP.

Wilkinson – PlanID 404

Plant health and growth was good. The site was generally in good condition with no notable weed or pest animal issues.

Wellington Lodge Swamp South – PlanID 371

Many unplanted spots were seen through the site, suggesting that the planting crew may have run out of seedlings. Most surviving plants were small with poor growth.