

# Warrell Creek to Nambucca Heads Landscape Rehabilitation Monitoring – Operational Phase Summer 2022

**Prepared for:**

**Sandpiper Ecological Surveys  
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## 1 Introduction

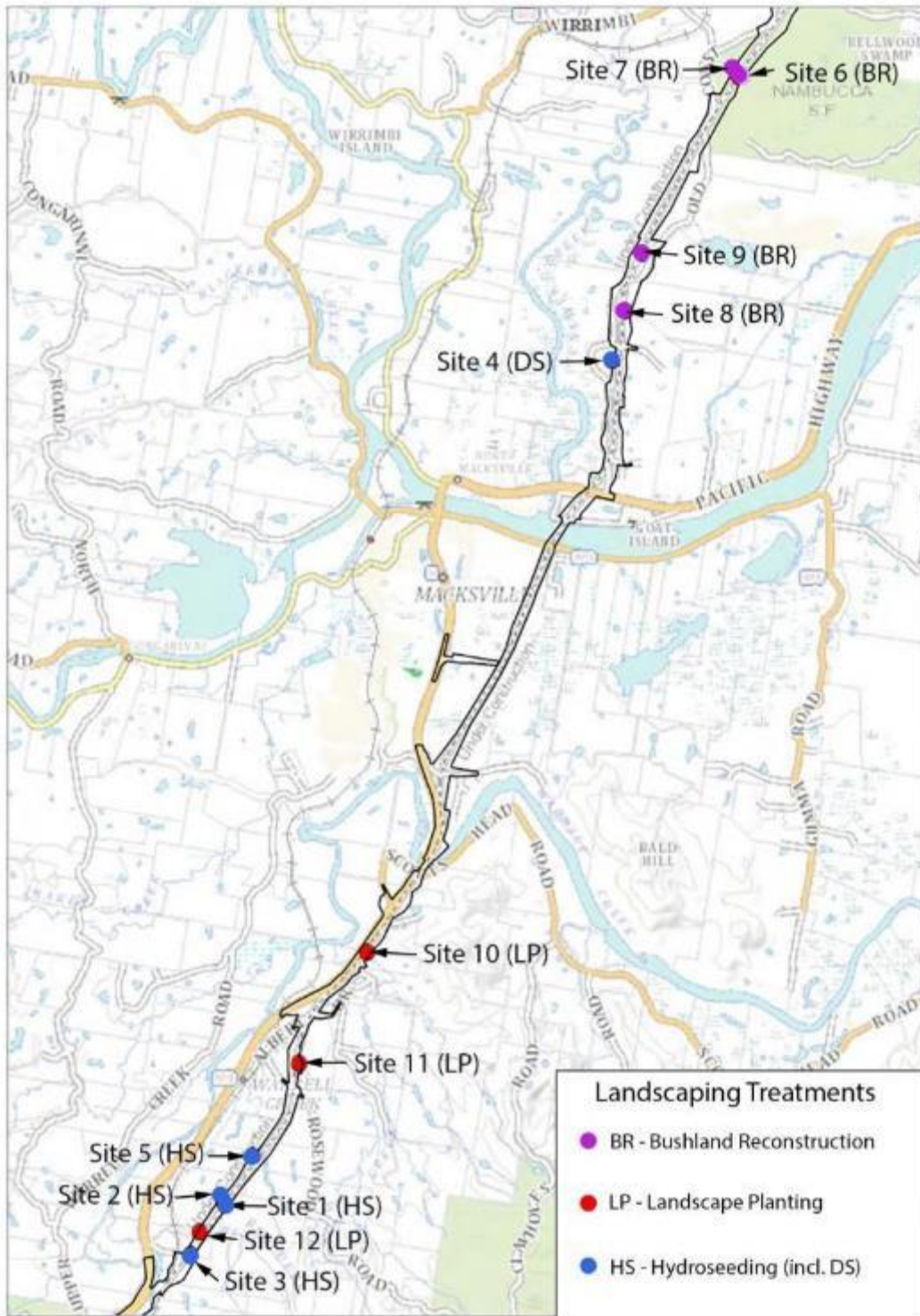
To assess the results and effectiveness of the landscape rehabilitation treatments, 12 Sites representing four landscaping treatments are being monitored for the first four years of operation of the upgrade, as required by the *Warrell Creek to Nambucca Heads Operational Ecological and Water Quality Monitoring Brief* (Roads and Maritime Services 2018a) and the *Warrell Creek to Nambucca Heads Stage 2 Ecological Monitoring Program Revision C, June 2018* (Roads and Maritime Services 2018b).

**Table 1** Monitoring locations and landscaping treatments (RMS 2018a).

| No. | Location  | Treatment                                  |
|-----|---|--|
| 1   | Fill 4 Embankment East – Southern Zone          | Seed Mix 1 (hydroseeding)                  |
| 2   | Fill 4 Embankment West – Southern Zone          | Seed Mix 2 (hydroseeding)                  |
| 3   | Cut 2 Embankment East – Southern Zone           | Seed Mix 3 (hydroseeding)                  |
| 4   | Ancillary Area Fill 19 West – Northern Zone     | Seed Mix 4 (direct seeding)                |
| 5   | Fill 5 Vegetated Drainage Swale – Southern Zone | Seed Mix 5 (hydroseeding)                  |
| 6   | Cut 22 Embankment East – Northern Zone          | Bushland Reconstruction (see note 1 below) |
| 7   | Cut 22 Embankment West – Northern Zone          | Bushland Reconstruction                    |
| 8   | Fill 20 Embankment East – Northern Zone         | Bushland Reconstruction                    |
| 9   | Cut 18 Embankment East – Northern Zone          | Bushland Reconstruction                    |
| 10  | Williamson Creek                                | Landscape Planting (see note 2 below)      |
| 11  | Stoney Creek                                    | Landscape Planting                         |
| 12  | Butchers Creek                                  | Landscape Planting                         |

Monitoring methods are described in the annual monitoring report.

The following report presents the results of quarterly monitoring for Summer 2022.



**LEGEND**

- Project boundary
- Landscape monitoring site



Figure 1: Monitoring Site Locations and Landscaping Treatments

## Results

### Hydroseeding - (Sites 1, 2, 3 and 5)

- *Setaria sphaecelata* and *Acacia fimbriata* still dominant

### Direct seeding (Sites 4)

- This treatment was applied to only one location. This Site is dominated by exotic pasture grasses and maintained by tractor slashing.

### Bushland reconstruction (Sites 6, 7, 8 and 9)

#### Previous:-

- *Setaria* absent at Sites on cut batters where a thin layer of topsoil salvaged from bushland was applied over gravelly subsoil.
- Sites continued to have relatively high native species diversity; cover of exotic species very low, except for Site 9.
- The native parasitic vine *Cassytha melantha* was not quite as dense in plots 6 and 7
- Good native grass cover - *Cymbopogon refractus* and *Themeda australis* in all plots.
- Eucalypt saplings that seeded from adjoining forest are growing fast, some 5 m.
- Site 9 was half slashed from roadside but native grasses have persisted.

#### Current:-

- Shrubs thinning out – high mortality of *Dodonaea triquetra*, *Acacia longifolia*, *Cassytha*, *Acacia fimbriata*.
- Saplings 8-10 m tall.
- Grass layer dense – *Themeda*, *Cymbopogon*, Whiskey Grass – changing to grassy eucalypt forest.
- Exotics – Ragweed, Coastal Morning Glory, *Paspalum urvillei*, Red Lantana, no *Setaria*.
- Plot 9 – *A. fimbriata* and good ground cover of *Themeda* and *Cymbopogon* but *Setaria* dominating in lower 10 m slashed along highway .
- Site 8 – *A. fimbriata* – *A. irrorate* (thinned) – *Setaria* dominating - *A. longifolia* and *D. triquetra* almost died out.

## Landscape planting (Sites 10, 11 and 12)

### Previous:-

- These Sites are all on creek drainage lines that were revegetated after diversion during construction. Vegetation was disturbed by floods in 2021, although maintains a dense cover of exotic and native grass and herbs.
- Maundia almost gone from translocation below bridge at Site 10, probably due to scouring out of shallow layer of mud placed over rock lined drainage works.
- Large in situ patch downstream just outside project boundary.

### Current:-

- Maundia – about 50 stems, bank dominated by *Persicaria strigose*
- Plot 11 – between plot and highway on embankment, *A. irrorata* high density has suppressed Setaria, ground bare, 1 Ac/4m<sup>2</sup>

## Monitoring Sites – plant species composition recorded Summer 2022

### Landscape monitoring site 1 – Hydroseeding/Seed Mix treatment

| Date                            | Site no. | Stake 1 coordinates                                     | Stake 2 coordinates |
|---------------------------------|----------|---|---------------------|
| 20/12/2022                      | 1        | 490057, 6595205   | 490079, 6595238     |
| Plant species                   |          | Braun-Blanquet scale of cover abundance (% crown cover) |                     |
| <i>Acacia fimbriata</i>         |          | 6   |                     |
| <i>Acacia irrorata</i>          |          | 2   |                     |
| <i>Acacia longifolia</i>        |          | 2   |                     |
| <i>Acacia melanoxylum</i>       |          | 1   |                     |
| <i>Ageratum houstonianum</i>    |          | 3   |                     |
| <i>Cinnamomum camphora</i>      |          | 2   |                     |
| <i>Commersonia dasyphylla</i>   |          | 1   |                     |
| <i>Conyza bonariensis</i>       |          | 1   |                     |
| <i>Lantana camara</i>           |          | 1   |                     |
| <i>Passiflora edulis</i>        |          | 2   |                     |
| <i>Passiflora subpeltata</i>    |          | 1   |                     |
| <i>Senecio madagascariensis</i> |          | 2   |                     |
| <i>Setaria sphacelata</i>       |          | 6   |                     |
| <i>Siratro atropurpureum</i>    |          | 2   |                     |
| <i>Verbena bonariensis</i>      |          | 2   |                     |

Braun-Blanquet scale (% crown cover): 1 = <1%, 2 = 1-5%, 3 = 5-25%, 4 = 25-50%, 5 = 50-75%, 6 = 75-100%.

## Landscape monitoring site 2 – Hydroseeding Seed Mix treatment

| Date                         | Site no.  | Stake 1 coordinates | Stake 2 coordinates |
|------------------------------|---|---------------------|---------------------|
| 20/12/2022                   | 2   | 490052, 6595299     | 490026, 6595259     |
| Plant species                | Braun-Blanquet scale of cover abundance (% crown cover) |                     |                     |
| <i>Acacia fimbriata</i>      | 5   |                     |                     |
| <i>Acacia irrorata</i>       | 2   |                     |                     |
| <i>Acacia longifolia</i>     | 2   |                     |                     |
| <i>Billardiera scandens</i>  | 1   |                     |                     |
| <i>Conyza bonariensis</i>    | 2   |                     |                     |
| <i>Ageratum houstonianum</i> | 3   |                     |                     |
| <i>Grevillea banksii</i>     | 1   |                     |                     |
| <i>Kennedia rubicunda</i>    | 1   |                     |                     |
| <i>Paspalum mandiocanum</i>  | 1   |                     |                     |
| <i>Physalis peruviana</i>    | 1   |                     |                     |
| <i>Pultenaea villosa</i>     | 1   |                     |                     |
| <i>Setaria sphacelata</i>    | 6   |                     |                     |
| <i>Senna floribunda</i>      | 1   |                     |                     |
| <i>Sida rhombifolia</i>      | 1   |                     |                     |
| <i>Verbena rigida</i>        | 2   |                     |                     |

Braun-Blanquet scale (% crown cover): 1 = <1%, 2 = 1-5%, 3 = 5-25%, 4 = 25-50%, 5 = 50-75%, 6 = 75-100%.

### Landscape monitoring site 3 – Hydroseeding/Seed Mix 3 treatment

| Date                              | Site no. | Stake 1 coordinates                                     | Stake 2 coordinates |
|-----------------------------------|----------|---|---------------------|
| 20/12/2022                        | 3        | 489722, 6594721   | 489686, 6594689     |
| Plant species                     |          | Braun-Blanquet scale of cover abundance (% crown cover) |                     |
| <i>Acacia fimbriata</i>           |          | 5   |                     |
| <i>Acacia melanoxylon</i>         |          | 2   |                     |
| <i>Acacia longifolia</i>          |          | 2   |                     |
| <i>Acacia melanoxylum</i>         |          | 1   |                     |
| <i>Conyza bonariensis</i>         |          | 1   |                     |
| <i>Eucalyptus microcorys</i>      |          | 1   |                     |
| <i>Hakea sericea</i>              |          | 1   |                     |
| <i>Kennedia rubicunda</i>         |          | 1   |                     |
| <i>Lantana camara</i>             |          | 1   |                     |
| <i>Macroptilium atropurpureum</i> |          | 1   |                     |
| <i>Paspalum mandiocanum</i>       |          | 2   |                     |
| <i>Polygala multiflora</i>        |          | 2   |                     |
| <i>Senecio madagascariensis</i>   |          | 1   |                     |
| <i>Setaria sphacelata</i>         |          | 6   |                     |

Braun-Blanquet scale (% crown cover): 1 = <1%, 2 = 1-5%, 3 = 5-25%, 4 = 25-50%, 5 = 50-75%, 6 = 75-100%.



## Landscape monitoring site 4 – Direct Seeding mix 4 treatment

| Date                            | Site no.  | Stake 1 coordinates | Stake 2 coordinates |
|---------------------------------|---|---------------------|---------------------|
| 20/12/2022                      | 4   | 494369, 6604590     | 494387, 6604626     |
| Plant species                   | Braun-Blanquet scale of cover abundance (% crown cover) |                     |                     |
| <i>Acacia falcata</i>           | 1   |                     |                     |
| <i>Acacia irrorata</i>          | 2   |                     |                     |
| <i>Acacia melanoxylon</i>       | 2   |                     |                     |
| <i>Ageratum houstonianum</i>    | 2   |                     |                     |
| <i>Centella asiatica</i>        | 1   |                     |                     |
| <i>Conyza bonariensis</i>       | 2   |                     |                     |
| <i>Cynodon dactylon</i>         | 2   |                     |                     |
| <i>Dodonaea triquetra</i>       | 1   |                     |                     |
| <i>Gomphocarpus fruticosus</i>  | 2   |                     |                     |
| <i>Hypochaeris radicata</i>     | 1   |                     |                     |
| <i>Kennedia rubicunda</i>       | 1   |                     |                     |
| <i>Paspalum dilatatum</i>       | 1   |                     |                     |
| <i>Paspalum mandiocanum</i>     | 3   |                     |                     |
| <i>Senecio madagascariensis</i> | 1   |                     |                     |
| <i>Setaria sphacelata</i>       | 6   |                     |                     |
| <i>Sida rhombifolia</i>         | 1   |                     |                     |

Braun-Blanquet scale (% crown cover): 1 = <1%, 2 = 1-5%, 3 = 5-25%, 4 = 25-50%, 5 = 50-75%, 6 = 75-100%.

## Landscape monitoring site 5 – Hydroseeding/Seed Mix 5 treatment

| Date                            | Site no.  | Stake 1 coordinates | Stake 2 coordinates |
|---------------------------------|---|---------------------|---------------------|
| 20/12/2022                      | 5   | 490383, 6595788     | 490359, 6595741     |
| Plant species                   | Braun-Blanquet scale of cover abundance (% crown cover) |                     |                     |
| <i>Acacia fimbriata</i>         | 3   |                     |                     |
| <i>Acacia irrorata</i>          | 2   |                     |                     |
| <i>Acacia melanoxylum</i>       | 1   |                     |                     |
| <i>Centella asiatica</i>        | 1   |                     |                     |
| <i>Conyza bonariensis</i>       | 1   |                     |                     |
| <i>Cynodon dactylon</i>         | 1   |                     |                     |
| <i>Eucalyptus microcorys</i>    | 1   |                     |                     |
| <i>Paspalum dilatatum</i>       | 1   |                     |                     |
| <i>Paspalum mandiocanum</i>     | 1   |                     |                     |
| <i>Senecio madagascariensis</i> | 1   |                     |                     |
| <i>Setaria sphacelata</i>       | 6   |                     |                     |
| <i>Verbena bonariensis</i>      | 1   |                     |                     |

Braun-Blanquet scale (% crown cover): 1 = <1%, 2 = 1-5%, 3 = 5-25%, 4 = 25-50%, 5 = 50-75%, 6 = 75-100%.

## Landscape monitoring site 6 – Bushland Reconstruction treatment

| Date                               | Site no.  | Stake 1 coordinates | Stake 2 coordinates |
|------------------------------------|---|---------------------|---------------------|
| 20/12/2022                         | 6   | 495781, 6607729     | 495814, 6607767     |
| Plant species                      | Braun-Blanquet scale of cover abundance (% crown cover) |                     |                     |
| <i>Acacia fimbriata</i>            | 3   |                     |                     |
| <i>Acacia irrorata</i>             | 1   |                     |                     |
| <i>Acacia longifolia</i>           | 3   |                     |                     |
| <i>Acacia ulicifolia</i>           | 1   |                     |                     |
| <i>Allocasuarina torulosa</i>      | 1   |                     |                     |
| <i>Alphitonia excelsa</i>          | 1   |                     |                     |
| <i>Billardiera scandens</i>        | 2   |                     |                     |
| <i>Callistemon sp.</i>             | 2   |                     |                     |
| <i>Carex maculata</i>              | 1   |                     |                     |
| <i>Cassytha sp.</i>                | 4   |                     |                     |
| <i>Conyza bonariensis</i>          | 2   |                     |                     |
| <i>Cymbopogon refractus</i>        | 4   |                     |                     |
| <i>Cynodon dactylon</i>            | 1   |                     |                     |
| <i>Dodonaea triquetra</i>          | 2   |                     |                     |
| <i>Doodia aspera</i>               | 1   |                     |                     |
| <i>Entolasia stricta</i>           | 1   |                     |                     |
| <i>Eucalyptus microcorys</i>       | 2   |                     |                     |
| <i>Eucalyptus pilularis</i>        | 2   |                     |                     |
| <i>Eucalyptus resinifera</i>       | 1   |                     |                     |
| <i>Gonocarpus tetragynus</i>       | 1   |                     |                     |
| <i>Hibbertia aspera</i>            | 1   |                     |                     |
| <i>Hypochaeris radicata</i>        | 3   |                     |                     |
| <i>Ipomea cairica</i>              | 2   |                     |                     |
| <i>Lepidosperma laterale</i>       | 1   |                     |                     |
| <i>Leptospermum polygalifolium</i> | 3   |                     |                     |
| <i>Lomandra longifolia</i>         | 1   |                     |                     |
| <i>Mitrasacme sp.</i>              | 1   |                     |                     |
| <i>Native Stipa sp.</i>            | 1   |                     |                     |
| <i>Ozothamnus diosmifolius</i>     | 1   |                     |                     |
| <i>Paspalum urvillei</i>           | 1   |                     |                     |
| <i>Persoonia stradbrokeensis</i>   | 2   |                     |                     |
| <i>Polygala multiflora</i>         | 2   |                     |                     |
| <i>Pultenaea retusa</i>            | 1   |                     |                     |
| <i>Pultenaea villosa</i>           | 1   |                     |                     |
| <i>Scleria rugosa</i>              | 1   |                     |                     |
| <i>Themeda australis</i>           | 3   |                     |                     |

Braun-Blanquet scale (% crown cover): 1 = <1%, 2 = 1-5%, 3 = 5-25%, 4 = 25-50%, 5 = 50-75%, 6 = 75-100%.

## Landscape monitoring site 7 – Bushland Reconstruction treatment

| Date                                       | Site no.  | Stake 1 coordinates | Stake 2 coordinates |
|--|---|---------------------|---------------------|
| 20/12/2022                                 | 7   | 495744, 6607783     | 495782, 6607824     |
| Plant species                              | Braun-Blanquet scale of cover abundance (% crown cover) |                     |                     |
| <i>Acacia fimbriata</i>                    | 2   |                     |                     |
| <i>Acacia elongata</i>                     | 1   |                     |                     |
| <i>Acacia longifolia</i>                   | 2   |                     |                     |
| <i>Allocasuarina torulosa</i>              | 1   |                     |                     |
| <i>Billardiera scandens</i>                | 2   |                     |                     |
| <i>Callistemon sp.</i>                     | 2   |                     |                     |
| <i>Cassytha pubescens</i>                  | 3   |                     |                     |
| <i>Centaurium erythraea</i>                | 3   |                     |                     |
| <i>Cheilanthes sieberi</i>                 | 1   |                     |                     |
| <i>Conyza bonariensis</i>                  | 1   |                     |                     |
| <i>Cymbopogon refractus</i>                | 3   |                     |                     |
| <i>Daviesia ulicifolia</i>                 | 1   |                     |                     |
| <i>Dodonaea triquetra</i>                  | 3   |                     |                     |
| <i>Eucalyptus microcorys</i>               | 1   |                     |                     |
| <i>Eucalyptus pilularis</i>                | 2   |                     |                     |
| <i>Gahnia aspera</i>                       | 2   |                     |                     |
| <i>Hakea gibbosa</i>                       | 1   |                     |                     |
| <i>Gonocarpus tetragynus</i>               | 1   |                     |                     |
| <i>Hibbertia aspera</i>                    | 1   |                     |                     |
| <i>Hypocheirus radicata</i>                | 2   |                     |                     |
| <i>Lepidosperma laterale</i>               | 2   |                     |                     |
| <i>Lepidosperma laterale</i>               | 1   |                     |                     |
| <i>Leptospermum juniperinum</i>            | 1   |                     |                     |
| <i>Leptospermum sp. aff polygalifolium</i> | 3   |                     |                     |
| <i>Lomandra longifolia</i>                 | 1   |                     |                     |
| <i>Melaleuca linariifolia</i>              | 1   |                     |                     |
| <i>Melaleuca sieberi</i>                   | 1   |                     |                     |
| <i>Ozothamnus diosmifolius</i>             | 1   |                     |                     |
| <i>Persoonia sp.</i>                       | 1   |                     |                     |
| <i>Polygala multiflora</i>                 | 1   |                     |                     |
| <i>Pultenaea villosa</i>                   | 1   |                     |                     |
| <i>Pratia purpurascens</i>                 | 1   |                     |                     |
| <i>Themeda australis</i>                   | 1   |                     |                     |

Braun-Blanquet scale (% crown cover): 1 = <1%, 2 = 1-5%, 3 = 5-25%, 4 = 25-50%, 5 = 50-75%, 6 = 75-100%.

## Landscape monitoring site 8 – Bushland Reconstruction treatment

| Date                           | Site no.  | Stake 1 coordinates | Stake 2 coordinates |
|--------------------------------|---|---------------------|---------------------|
| 20/12/2022                     | 8   | 494514, 6605138     | 494523, 6605177     |
| Plant species                  | Braun-Blanquet scale of cover abundance (% crown cover) |                     |                     |
| <i>Acacia falcata</i>          | 2   |                     |                     |
| <i>Acacia fimbriata</i>        | 5   |                     |                     |
| <i>Acacia floribunda</i>       | 1   |                     |                     |
| <i>Acacia irrorata</i>         | 2   |                     |                     |
| <i>Acacia longifolia</i>       | 3   |                     |                     |
| <i>Acacia myrtifolia</i>       | 1   |                     |                     |
| <i>Ageratina adenophorum</i>   | 1   |                     |                     |
| <i>Ageratum houstonianum</i>   | 2   |                     |                     |
| <i>Baccharis halimifolia</i>   | 2   |                     |                     |
| <i>Cassutha pubescens</i>      | 2   |                     |                     |
| <i>Centella asiatica</i>       | 2   |                     |                     |
| <i>Conyza bonariensis</i>      | 1   |                     |                     |
| <i>Cymbopogon refractus</i>    | 2   |                     |                     |
| <i>Dodonaea triquetra</i>      | 2   |                     |                     |
| <i>Kennedia rubicunda</i>      | 1   |                     |                     |
| <i>Lobelia alata</i>           | 1   |                     |                     |
| <i>Megathyrsus maximus</i>     | 1   |                     |                     |
| <i>Ozothamnus diosmifolius</i> | 1   |                     |                     |
| <i>Panicum sp.</i>             | 3   |                     |                     |
| <i>Paspalum conjugatum</i>     | 1   |                     |                     |
| <i>Paspalum dilatatum</i>      | 1   |                     |                     |
| <i>Paspalum mandiocanum</i>    | 3   |                     |                     |
| <i>Paspalum urvillei</i>       | 1   |                     |                     |
| <i>Plantago lanceolata</i>     | 2   |                     |                     |
| <i>Pultenaea villosa</i>       | 1   |                     |                     |
| <i>Polygala multiflora</i>     | 2   |                     |                     |
| <i>Setaria sphacelata</i>      | 6   |                     |                     |
| <i>Sida rhombifolia</i>        | 1   |                     |                     |

Braun-Blanquet scale (% crown cover): 1 = <1%, 2 = 1-5%, 3 = 5-25%, 4 = 25-50%, 5 = 50-75%, 6 = 75-100%.

## Landscape monitoring site 9 – Bushland Reconstruction treatment

| Date                            | Site no.  | Stake 1 coordinates | Stake 2 coordinates |
|---------------------------------|---|---------------------|---------------------|
| 20/12/2022                      | 9   | 494703, 6605781     | 494721, 6605830     |
| Plant species                   | Braun-Blanquet scale of cover abundance (% crown cover) |                     |                     |
| <i>Acacia fimbriata</i>         | 3   |                     |                     |
| <i>Acacia irrorata</i>          | 2   |                     |                     |
| <i>Acacia longifolia</i>        | 3   |                     |                     |
| <i>Alphitonia excelsa</i>       | 2   |                     |                     |
| <i>Babingtonia sylvestris</i>   | 1   |                     |                     |
| <i>Billardiera scandens</i>     | 2   |                     |                     |
| <i>Callistemon salignus</i>     | 1   |                     |                     |
| <i>Commersonia dasyphylla</i>   | 1   |                     |                     |
| <i>Centalla asiatica</i>        | 2   |                     |                     |
| <i>Conyza bonariensis</i>       | 3   |                     |                     |
| <i>Cymbopogon refractus</i>     | 3   |                     |                     |
| <i>Daviesia ulicifolia</i>      | 1   |                     |                     |
| <i>Desmodium rhytidophyllum</i> | 1   |                     |                     |
| <i>Dodonaea triquetra</i>       | 1   |                     |                     |
| <i>Entolasia stricta</i>        | 2   |                     |                     |
| <i>Eucalyptus microcorys</i>    | 2   |                     |                     |
| <i>Eucalyptus pilularis</i>     | 1   |                     |                     |
| <i>Fimbristylis dichotoma</i>   | 1   |                     |                     |
| <i>Gahnia aspera</i>            | 1   |                     |                     |
| <i>Gonocarpus tetragynus</i>    | 1   |                     |                     |
| <i>Hardenbergia violacea</i>    | 1   |                     |                     |
| <i>Hibbertia aspera</i>         | 1   |                     |                     |
| <i>Hibbertia scandens</i>       | 1   |                     |                     |
| <i>Kennedia rubicunda</i>       | 1   |                     |                     |
| <i>Lantana camara</i>           | 1   |                     |                     |
| <i>Lophostemon suaveolens</i>   | 1   |                     |                     |
| <i>Ozothamnus diosmifolius</i>  | 1   |                     |                     |
| <i>Passiflora edulis</i>        | 1   |                     |                     |
| <i>Paspalum mandiocanum</i>     | 4   |                     |                     |
| <i>Paspalidium distans</i>      | 2   |                     |                     |
| <i>Paspalum urvillei</i>        | 2   |                     |                     |
| <i>Persoonia adenantha</i>      | 1   |                     |                     |
| <i>Polymeria calycina</i>       | 2   |                     |                     |
| <i>Setaria sphacelata</i>       | 2   |                     |                     |
| <i>Themeda australis</i>        | 3   |                     |                     |

Braun-Blanquet scale (% crown cover): 1 = <1%, 2 = 1-5%, 3 = 5-25%, 4 = 25-50%, 5 = 50-75%, 6 = 75-100%.

## Landscape monitoring site 10 – Landscape Planting treatment

| Date                             | Site no.  | Stake 1 coordinates | Stake 2 coordinates |
|----------------------------------|---|---------------------|---------------------|
| 20/12/2022                       | 10  | 491650, 6598045     | 491599, 6598037     |
| Plant species                    | Braun-Blanquet scale of cover abundance (% crown cover) |                     |                     |
| <i>Acacia irrorata</i>           | 1   |                     |                     |
| <i>Aster subulatus</i>           | 1   |                     |                     |
| <i>Baumea articulata</i>         | 2   |                     |                     |
| <i>Carex appressa</i>            | 1   |                     |                     |
| <i>Conyza bonariensis</i>        | 2   |                     |                     |
| <i>Cyperus polystachyos</i>      | 2   |                     |                     |
| <i>Cyclosorus interruptus</i>    | 1   |                     |                     |
| <i>Hypolepis muelleri</i>        | 2   |                     |                     |
| <i>Juncus ursitatus</i>          | 2   |                     |                     |
| <i>Ludwigia peploides</i>        | 2   |                     |                     |
| <i>Maundia triglochinosoides</i> | 1   |                     |                     |
| <i>Nymphaea capensis</i>         | 2   |                     |                     |
| <i>Panicum obseptum</i>          | 1   |                     |                     |
| <i>Paspalum distichum</i>        | 1   |                     |                     |
| <i>Paspalum mandicanum</i>       | 2   |                     |                     |
| <i>Paspalum urvillei</i>         | 3   |                     |                     |
| <i>Persicaria lapathifolia</i>   | 1   |                     |                     |
| <i>Persicaria strigosa</i>       | 5   |                     |                     |
| <i>Schoenoplectus vallidus</i>   | 2   |                     |                     |
| <i>Setaria sphacelata</i>        | 3   |                     |                     |
| <i>Sida rhombifolia</i>          | 1   |                     |                     |
| <i>Typha orientalis</i>          | 2   |                     |                     |
| <i>Verbena bonariensis</i>       | 1   |                     |                     |

Braun-Blanquet scale (% crown cover): 1 = <1%, 2 = 1-5%, 3 = 5-25%, 4 = 25-50%, 5 = 50-75%, 6 = 75-100%.

## Landscape monitoring site 11 – Landscape Planting treatment

| Date                               | Site no.  | Stake 1 coordinates | Stake 2 coordinates |
|------------------------------------|---|---------------------|---------------------|
| 20/12/2022                         | 11  | 490895, 6596807     | 490897, 6596754     |
| Plant species                      | Braun-Blanquet scale of cover abundance (% crown cover) |                     |                     |
| <i>Acacia fimbriata</i>            | 2   |                     |                     |
| <i>Acacia irrorata</i>             | 1   |                     |                     |
| <i>Acacia longifolia</i>           | 2   |                     |                     |
| <i>Ageratum houstonianum</i>       | 2   |                     |                     |
| <i>Ambrosia psilostachya</i>       | 1   |                     |                     |
| <i>Aster subulatus</i>             | 1   |                     |                     |
| <i>Axonopus affinis</i>            | 1   |                     |                     |
| <i>Baccharis halimifolia</i>       | 1   |                     |                     |
| <i>Baumea articulata</i>           | 2   |                     |                     |
| <i>Carex appressa</i>              | 1   |                     |                     |
| <i>Casuarina cunninghamii</i>      | 1   |                     |                     |
| <i>Ciclospermum leptophyllum</i>   | 1   |                     |                     |
| <i>Conyza bonariensis</i>          | 2   |                     |                     |
| <i>Crassocephalum crepidoides</i>  | 1   |                     |                     |
| <i>Cynodon dactylon</i>            | 2   |                     |                     |
| <i>Cyperus polystachyos</i>        | 2   |                     |                     |
| <i>Dodonaea triquetra</i>          | 1   |                     |                     |
| <i>Eleocharis acuta</i>            | 3   |                     |                     |
| <i>Isachne globosa</i>             | 2   |                     |                     |
| <i>Juncus prismatocarpus</i>       | 2   |                     |                     |
| <i>Juncus usitatus</i>             | 2   |                     |                     |
| <i>Lantana camara</i>              | 1   |                     |                     |
| <i>Leptospermum polygalifolium</i> | 1   |                     |                     |
| <i>Lomandra hysteryx</i>           | 2   |                     |                     |
| <i>Lomandra longifolia</i>         | 1   |                     |                     |
| <i>Ludwigia peploides</i>          | 2   |                     |                     |
| <i>Microlaena stipoides</i>        | 2   |                     |                     |
| <i>Myriophyllum aquaticum</i>      | 2   |                     |                     |
| <i>Nymphaea capensis</i>           | 1   |                     |                     |
| <i>Paspalum mandiocanum</i>        | 2   |                     |                     |
| <i>Paspalum urvillei</i>           | 2   |                     |                     |
| <i>Persicaria strigosa</i>         | 4   |                     |                     |
| <i>Rubus sp.</i>                   | 1   |                     |                     |
| <i>Sacciolepis indica</i>          | 1   |                     |                     |
| <i>Senecio madagascariensis</i>    | 1   |                     |                     |
| <i>Setaria sphacilata</i>          | 3   |                     |                     |
| <i>Tradescantia fluminensis</i>    | 1   |                     |                     |
| <i>Themeda australis</i>           | 1   |                     |                     |
| <i>Verbena bonariensis</i>         | 1   |                     |                     |

Braun-Blanquet scale (% crown cover): 1 = <1%, 2 = 1-5%, 3 = 5-25%, 4 = 25-50%, 5 = 50-75%, 6 = 75-100%.



## Landscape monitoring site 12 – Landscape Planting treatment

| Date                            | Site no.  | Stake 1 coordinates | Stake 2 coordinates |
|---------------------------------|---|---------------------|---------------------|
| 20/12/2022                      | 12  | 489789, 6594939     | 489789, 6594909     |
| Plant species                   | Braun-Blanquet scale of cover abundance (% crown cover) |                     |                     |
| <i>Acacia fimbriata</i>         | 3   |                     |                     |
| <i>Acacia irrorata</i>          | 2   |                     |                     |
| <i>Cirsium vulgare</i>          | 1   |                     |                     |
| <i>Conyza bonariensis</i>       | 2   |                     |                     |
| <i>Cyperus sp.</i>              | 1   |                     |                     |
| <i>Gahnia aspera</i>            | 1   |                     |                     |
| <i>Geitonoplesium cymosum</i>   | 1   |                     |                     |
| <i>Hypocheirus radicata</i>     | 2   |                     |                     |
| <i>Juncus ursitatus</i>         | 1   |                     |                     |
| <i>Lantana camara</i>           | 1   |                     |                     |
| <i>Lomandra hysteryx</i>        | 2   |                     |                     |
| <i>Lomandra longifolia</i>      | 2   |                     |                     |
| <i>Paspalum dilatatum</i>       | 2   |                     |                     |
| <i>Paspalum mandiocanum</i>     | 2   |                     |                     |
| <i>Paspalum urvillei</i>        | 2   |                     |                     |
| <i>Phytolacca octandra</i>      | 2   |                     |                     |
| <i>Senecio madagascariensis</i> | 2   |                     |                     |
| <i>Setaria sphacelata</i>       | 4   |                     |                     |

Braun-Blanquet scale (% crown cover): 1 = <1%, 2 = 1-5%, 3 = 5-25%, 4 = 25-50%, 5 = 50-75%, 6 = 75-100%.



**Site 1:** southern end, Summer 2022



**Site 1:** northern end, Summer 2022



**Site 2:** northern end, Summer 2022



**Site 2:** northern end, Summer 2022



**Site 3:** southern end, Summer 2022



**Site 3:** northern end, Summer 2022



**Site 4:** southern end, Summer 2022



**Site 4:** northern end, Summer 2022



**Site 5:** southern end, Summer 2022



**Site 5:** northern end, Summer 2022



**Site 6:** southern end, Summer 2022



**Site 6:** northern end, Summer 2022



**Site 7:** southern end, Summer 2022



**Site 7:** northern end, Summer 2022





**Site 8:** southern end,  
Summer 2022

**Site 8:** northern end, Summer 2022





**Site 9:** southern end, Summer 2022





Site 10, eastern end, Summer 2022



Site 10, western end, Summer 20

*Maundia triglochinoides*

Site 10

Summer 2022



Maundia off footprint at Site 10  
within road reserve

Summer 2022



**Site 11, northern end, Summer 2022**



**Site 11, southern end, Summer 2022**



**Site 12**, southern end, Summer 2022



**Site 12**, northern end, Summer 2022