Biota Environmental Sciences

A Vegetation and Flora Survey of the Koodaideri Study Area

Prepared for Rio Tinto

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A Vegetation and Flora Survey of Koodaideri

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1.0 Summary

1.1 Background

Rio Tinto is currently scoping the potential development of a number of iron ore deposits in the Pilbara region of Western Australia. One of the iron ore deposits being investigated is the Koodaideri deposit, approximately 110 km northwest of Newman.

Biota Environmental Sciences (Biota) was commissioned to conduct a seasonal botanical survey of the Koodaideri study area (hereafter refer to as the study area), which covers 11,991 ha. The first phase of the survey was completed in July 2010, with the second phase completed in March and May 2011. This report describes the results of the seasonal survey at Koodaideri (covering the July 2010, March 2011 and May 2011 surveys), with additional consideration of other studies completed in the area and in the broader locality.

1.2 Methodology

During the first survey phase, vegetation types were described and mapped, and 62 standard (50m by 50m) flora sampling quadrats were established. This survey followed a period of low rainfall, and conditions were not optimal for the collection of annual flora species.

The second phase of survey work (resampling) was undertaken following the wet season, and conditions were far better for the collection of annual and cryptic perennial species. During this phase, all 62 quadrats were resampled.

Opportunistic records of rare flora and weeds were collected during both survey phases; however, the entire study area was not systematically searched. Extensive rare flora searches have been conducted previously in the locality by Rio Tinto botanists.

1.3 Vegetation of the Study Area

Twenty-five vegetation units were identified for the study area within two broad landform categories:

- Crests, slopes and footslopes associated with the broad range of hills; and
- Creeks, gullies and gorges.

None of the vegetation units comprised Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs).

One unit of Moderate to High conservation significance was identified:

- **Koodaideri Spring**: this mapping unit comprised a mosaic of riparian vegetation types associated with what appears to be a permanent spring, which is located in a narrow gorge in the central section of the study area. Such features are rare in the locality and uncommon in the broader Hamersley subregion.

Three vegetation units associated with other gullies / gorges and moderate-sized creeklines were considered likely to be of Low to Moderate conservation significance:

- **AprGwCEcTe, ApyGwAThGOrTErCEcTe and Gully Mosaic**: these units comprised the major surface drainage features for the area, and the gorges may also act as refugia for fire sensitive flora species.

1.4 Flora of the Study Area

1.4.1 Overview of Flora

A total of 384 species of native flora from 130 genera and 43 families were recorded over the two phases of the Koodaideri survey. The total number of vascular flora species present was considered to be in the range expected for a study area of this size in this locality.

1.4.2 Flora of Conservation Significance

One Threatened flora species (*Lepidium catapycnon*) was recorded from the northwestern section of the study area. Approximately 360 individuals of this species were recorded from 12 populations, occurring in four broad locations (Map 1, Appendix 2).

Seven Priority species have been recorded from the study area (Table 1.1, Appendix 3).

Table 1.1: Priority flora recorded from the study area.

Species	Status	Records	Individuals
Sida sp. Hamersley Range (K. Newbey 10692)	Priority 1	8	8
Vigna sp. central (M.E. Trudgen 1626) †	Priority 2	1	NA†
Nicotiana umbratica †	Priority 3	1	NA†
Sida sp. Barlee Range (S. van Leeuwen 1642)	Priority 3	11	44
Themeda sp. Hamersley Station (M.E. Trudgen 11431)	Priority 3	1	1
Eremophila magnifica subsp. *magnifica*	Priority 4	3	47
Rhynchosia bungarensis	Priority 4	26	1,329

† These species were recorded in the study area (Pilbara Iron 2007), however only limited information was collected as they were not listed as Priority species at the time of survey.

In addition, a newly recognised species, *Sauropus* sp. Koodaideri detritals (J. Naaykens & J. Hurter JH 11213), was recorded nine times at a single location towards the middle of the study area (Appendix 3). This taxon is currently known only from the Koodaideri locality and represents a species of interest.

1.4.3 Introduced Flora

Thirteen introduced species were recorded, none of which are listed as Declared Plants by the Department of Agriculture and Food. The most serious of these were **Acetosa vesicaria* (Ruby Dock), **Aerva javanica* (Kapok Bush), **Cenchrus ciliaris* (Buffel Grass) and **Cenchrus setiger* (Birdwood Grass), all of which are considered to be serious environmental weeds in the Pilbara.

2.0 Background

2.1 Background to the Project

Rio Tinto is currently scoping the potential development of a number of iron ore deposits in the Pilbara region of Western Australia. One of the iron ore deposits being investigated is the deposit at Koodaideri, located approximately 110 km northwest of Newman, and approximately 20 km northwest of the existing Rio Tinto Yandicoogina operation. The study area is shown in Figure 2.1.

Biota was commissioned to conduct a biological survey of the Koodaideri area, which covers 11,991 ha. This area is referred to as the "study area" throughout this report. The first phase of the survey was completed in July 2010, with the second phase completed in March and May 2011. This report describes the results of the seasonal survey at Koodaideri (covering the July 2010, March 2011 and May 2011 surveys), with additional consideration of other studies completed in the area and in the broader locality.

2.2 Scope and Objectives of this Study

This report summarises the vegetation and flora component of the study. The field survey was planned and implemented as far as practicable in accordance with the Environmental Protection Authority (EPA) Position Statement No. 3 "Terrestrial Biological Surveys as an Element of Biodiversity Protection" (EPA 2002) and Guidance Statement No. 51 "Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia" (EPA 2004).

The objectives of the botanical survey were to:

- describe and map the vegetation types occurring within the study area;
- identify any vegetation types of particular conservation significance in the study area;
- document the suite of flora species occurring within the study area; and
- identify any species of particular conservation significance, including Threatened flora, Priority flora and other flora of interest.

This report outlines the methodology and results of the flora and vegetation survey. It is intended for use as a supporting document to the Environmental Impact Assessment process for the Koodaideri project. The survey itself and this document are subject to certain limitations, outlined in Section 3.7.

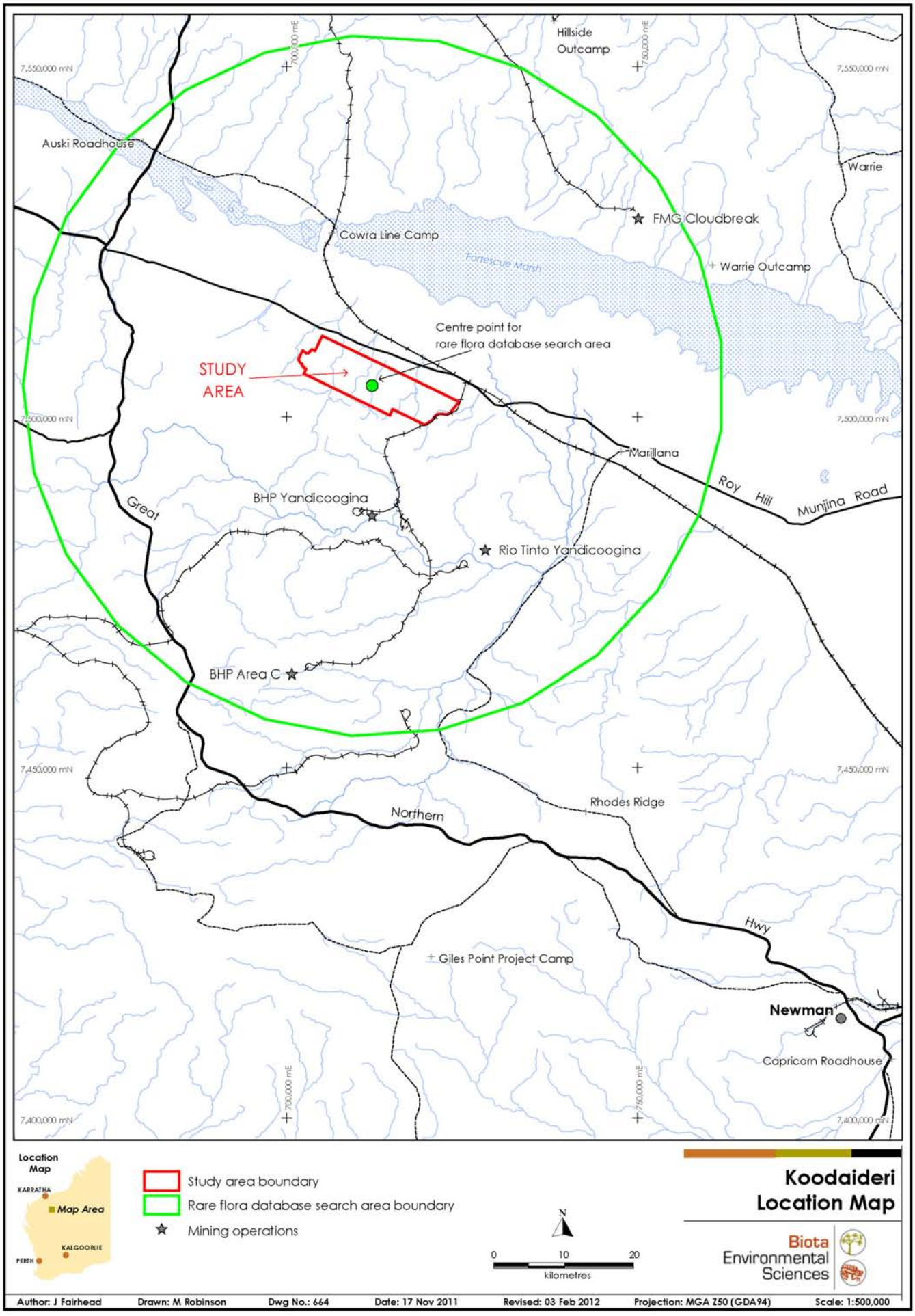

Figure 2.1: Location of the study area.

3.0 Study Methodology

3.1 Desktop Review

3.1.1 Rare Flora Database Searches

A search of the Department of Environment and Conservation (DEC) and WA Herbarium databases was commissioned in November 2010 for Threatened and Priority flora recorded within a 25 km buffer of the study area (Figure 2.1).

The search was centred on the following point:

- Latitude: 22° 33' 11.51"S
- Longitude: 119° 3' 54.63"E

To further investigate Threatened and Priority flora locations in the vicinity of the study area, the results of the search were viewed in Quantum GIS Version 1.6.0.

3.1.2 Review of Relevant Reports

Published and unpublished reports and other data were reviewed to identify botanical features of relevance to the study area.

3.1.2.1 Previous Sampling in the Study Area and Locality

In addition to the surveys conducted for the current study, sections of the study area have been subject to rare flora searches by botanists from Biota and Rio Tinto. These comprised:

- a rare flora and vegetation survey carried out over several field trips between April and September in 2007 (Pilbara Iron 2007), covering a large section of the current study area;
- a rare flora clearance survey for a camp and associated infrastructure areas, completed over several trips between May and October in 2007 (Biota 2008); and
- a rare flora and vegetation survey of a 7 km track which was to be upgraded, completed in March 2010 (Pilbara Iron 2010).

The boundary of the Pilbara Iron (2007) survey is indicated in Figure 3.2. The footprint of the Biota (2008) survey and the Pilbara Iron (2010) survey both lay within this boundary, and were therefore not mapped separately. In total, slightly more than 68% (8,196 ha) of the study area has been systematically searched for rare flora.

Three vegetation surveys completed within 50 km of the study area were also reviewed (Ecologia 1997, Biota 2009, 2010).

3.1.2.2 Regional-scale Information

Various regional-scale reports and datasets were reviewed to indicate botanical features of relevance to the study area, including features of the Interim Biogeographic Regionalisation for Australia (IBRA) bioregions and subregions (Environment Australia 2000; Section 4.1), land systems (Payne et al. 1988, van Vreeswyk et al. 2004; Section 4.3), Beard's vegetation mapping (Beard 1975a; Section 4.4), and TECs and PECs (DEC 2010a, 2010b; Section 4.5).

3.2 Botanical Survey Team and Field Survey Timing

The first phase of the survey was conducted during 5-15 July 2010. Eight botanists undertook the field work, including seven Biota personnel (Prue Anderson, Rachel Butler, Preeti Chukowry, Justin Fairhead, Paul Hoffman, Ellie Ridley and Melinda Trudgen), and one sub-contracted botanical consultant (Brian Morgan). Eighty-eight person days were spent on the field component of the study.

The 2010 survey work included:

- establishment of 62 standard (for the Pilbara bioregion) 50 x 50 m floristic survey quadrats within representative areas, along with two relevés (unbounded flora survey sites);
- description and mapping of vegetation types within the study area; and
- collection of opportunistic records of the locations of flora of conservation significance and weeds, together with an estimate of the number of individuals present.

The second phase of the survey was completed in two site visits. The first was during 9-18 March 2010 by four botanists, including three Biota personnel (Prue Anderson, Chloe Flaherty and Ryan Hooper) and one sub-contracted botanical consultant (Myles Menz). Two Biota personnel (Michi Maier and Cassie Adam) completed the second visit during 6-12 May 2011.

The 2011 survey work included:

- resampling of all 62 floristic survey quadrats established in 2010, given the poor sampling conditions in 2010 (Section 3.2.1); and
- collection of opportunistic records of the locations of flora of conservation significance and weeds, together with an estimate of the number of individuals present.

3.2.1 Seasonal Conditions

Conditions at the time of the field survey in July 2010 were dry and not optimal for the collection of annual and cryptic perennial species. Data from the Marillana recording station (located 24 km east of the study area) indicate that the area received approximately 60% of the long-term average annual rainfall in 2010. The region received 73 mm of rain in the six months prior to the first phase of the survey, only 30% of the long-term monthly average for the area during that time (Figure 3.1).

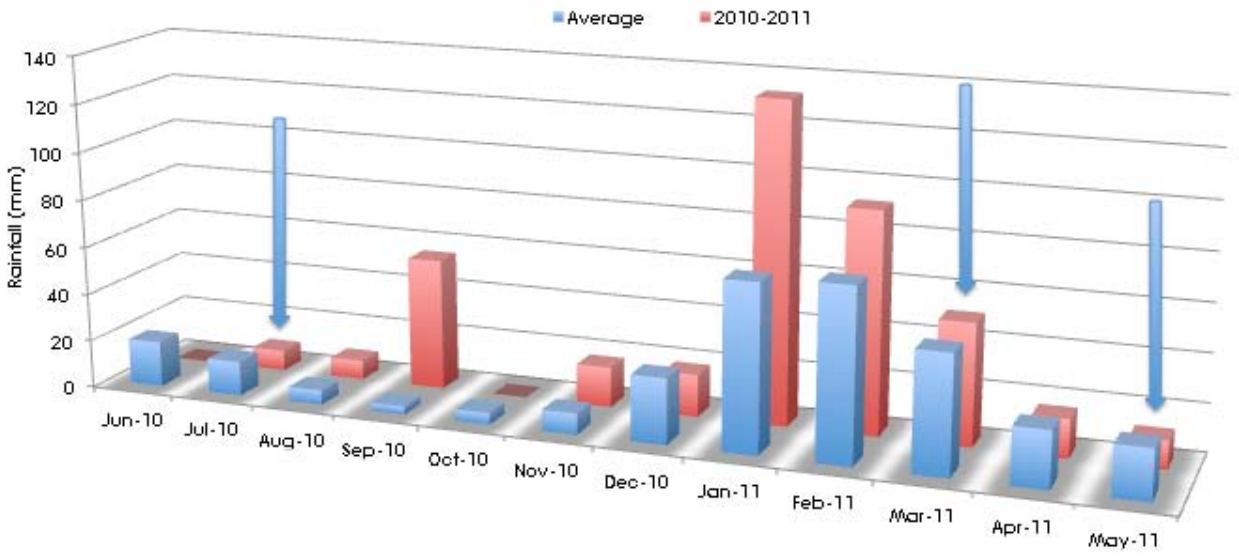

Figure 3.1: Monthly rainfall for the Marillana recording station (station 5009) for 2010-11, compared to the long-term monthly average rainfall. Sampling events indicated by arrows.
(Data from the WA Bureau of Meteorology website; http://www.bom.gov.au, accessed 24/10/2011.)

The resampling phase of the study was completed in two stages in 2011 following above average rainfall during the wet season (November – February). In the six months prior to March 2011, the area received 312 mm (69% greater than the long-term monthly average), while 342 mm was received in the six months prior to May 2011 (30% greater than the long-term monthly average) (Figure 3.1). The timing of both of these trips was optimal for the collection of annual and cryptic perennial flora that may have been absent or unidentifiable during the 2010 survey.

3.3 Assessment of the Floristic Quadrats and Relevés

The locations of the 62 flora recording quadrats assessed for this study were chosen to represent the main vegetation sub-associations occurring within the study area. The quadrats were uniquely numbered, from KOD01 to KOD63 (one number in the sequence was not used). Two relevés (unbounded flora survey sites comprising a similar area to a standard quadrat) were also sampled; these were labelled KOD-JA and KOD-R.

Quadrats were typically 50 m x 50 m or laid out to cover an equivalent area (2500 m^2): this size gives an adequate sample of flora presence in northern Western Australia (Hnatiuk and Kenneally 1981). It also gives an adequate indication of the shrub and grass layer vegetation structure for most vegetation types that occur in 'uniform' habitats (e.g. on plains, where vegetation stands are typically greater than this quadrat size). Quadrat shape and/or size were adjusted as necessary to fit smaller or oddly shaped habitats (e.g. rocky gullies and drainage lines).

Wherever practical quadrats were permanently marked using steel fence droppers at three to four corners of the quadrat. An optical square and measuring tapes were used to ensure that the quadrat sides were correctly positioned.

The following parameters were recorded for each quadrat (Appendix 4):

- Location: UTM coordinates recorded in WGS84 datum (within 1-2 m of GDA94) using a hand-held Global Positioning System (GPS), to an accuracy usually within 5 m; readings taken for all four corners of the quadrat;
- Vegetation Description: Broad description based on the height and estimated cover of dominant species after Aplin's (1979) modification of the vegetation classification system of Specht (1970) (Appendix 1);
- Habitat: Description of landform and habitat;
- Soil: Broad description of soil type and stony surface mantle;
- Disturbance Details: Condition ranked according to the scale developed by Trudgen (1988) as shown in Appendix 1, considering evidence of grazing, physical disturbance, weed invasion, frequent fires etc. Note that fire effects are only considered as a negative impact if they are caused by repeated burning (such as that done for pastoral purposes). Fire is a natural and frequent process in the Pilbara to which the vegetation has adapted, and to categorise areas as being in poor condition simply because they have been recently burnt is misleading; and
- Percentage Foliar Cover: Cover was estimated visually for each species. Estimates were made to the nearest percent where possible, or a range (e.g. 5-10%) was used. '0.1' was used where only occasional individuals were present, providing a cover of considerably less than 1%.

Colour photographs of the vegetation at each site were taken using a digital camera.

3.4 Vegetation Description and Mapping

Vegetation descriptions were based on the height and estimated cover of dominant species using Aplin's (1979) modification of the vegetation classification of Specht (1970) to include a hummock grassland category (Appendix 1). Descriptions were made at each of the floristic survey quadrats and also at relevés (unbounded flora survey sites) (Section 5.2). An additional 183 brief vegetation descriptions (mapping notes) were made and vegetation boundaries were ground-truthed during foot traverses through representative areas. The distribution of the main sampling points utilised in the vegetation mapping is presented in Figure 3.3. Additional notes were recorded during foot traverses to access the quadrat and relevé locations.

The vegetation descriptions were grouped to arrive at vegetation units that were defined on the basis of a shared suite of perennial species with a similar range of cover values. These were listed under the main landform/habitat types in which they were found to occur (Section 5.2.)

The vegetation boundaries were subsequently digitised using the Geographic Information Systems (GIS) software package ArcView 3.2. The resulting shapefiles were "tagged" to provide each polygon with the vegetation sub-association code. The coding system for the vegetation sub-associations incorporated the dominant flora species for the type, organised from tallest strata to lowest strata. Species names were abbreviated to capital letter/s for genus, followed by lower case letter/s for species, with multiple letters used where necessary to avoid confusion (e.g. AiGwTlaTp = dominant species *Acacia inaequilatera*, *Grevillea wickhamii*, *Triodia lanigera* and *T. pungens*). Although this can result in some relatively unwieldy codes, it is considered the most appropriate method to code the digital mapping.

Other point source datasets, such as locations of quadrats, weeds and flora of conservation significance (Appendix 2), were generated into spatial data using MapInfo. These datasets were subsequently saved as separate MapInfo shapefiles. These datasets, in conjunction with other data supplied from other organisations, were used in the production of the vegetation maps contained in this report (Appendix 3). All maps were produced using the MapInfo package version 10.5.

3.5 Searches for Rare Flora and Weeds

A large proportion (68%) of the study area had been systematically searched for rare flora in previous years (Section 3.1.2.1). Opportunistic searches were conducted through the remainder of the study area in 2010/2011 as part of the foot traverses undertaken to gain access to quadrats and for the vegetation mapping. Any flora of potential management concern (i.e. species of conservation significance and weeds) observed opportunistically during 2010/2011 were recorded.

Locations of rare flora were recorded using a hand-held GPS (set in WGS84 datum, zone 50; equivalent to GDA94), together with an indication of the number of individuals present, the habitat and associated plant species. Voucher specimens were also collected for lodgement with the WA Herbarium. Rare Flora Report Forms will be lodged with DEC for all flora of conservation significance collected within the study area.

Introduced flora (weeds) were also recorded in this way, although cover was typically estimated, rather than recording the number of individuals. This was particularly the case for widespread species (e.g. **Cenchrus ciliaris,* which was common within the study area; Section 6.3).

All records of rare flora and weeds are displayed on the mapping in Appendix 2.

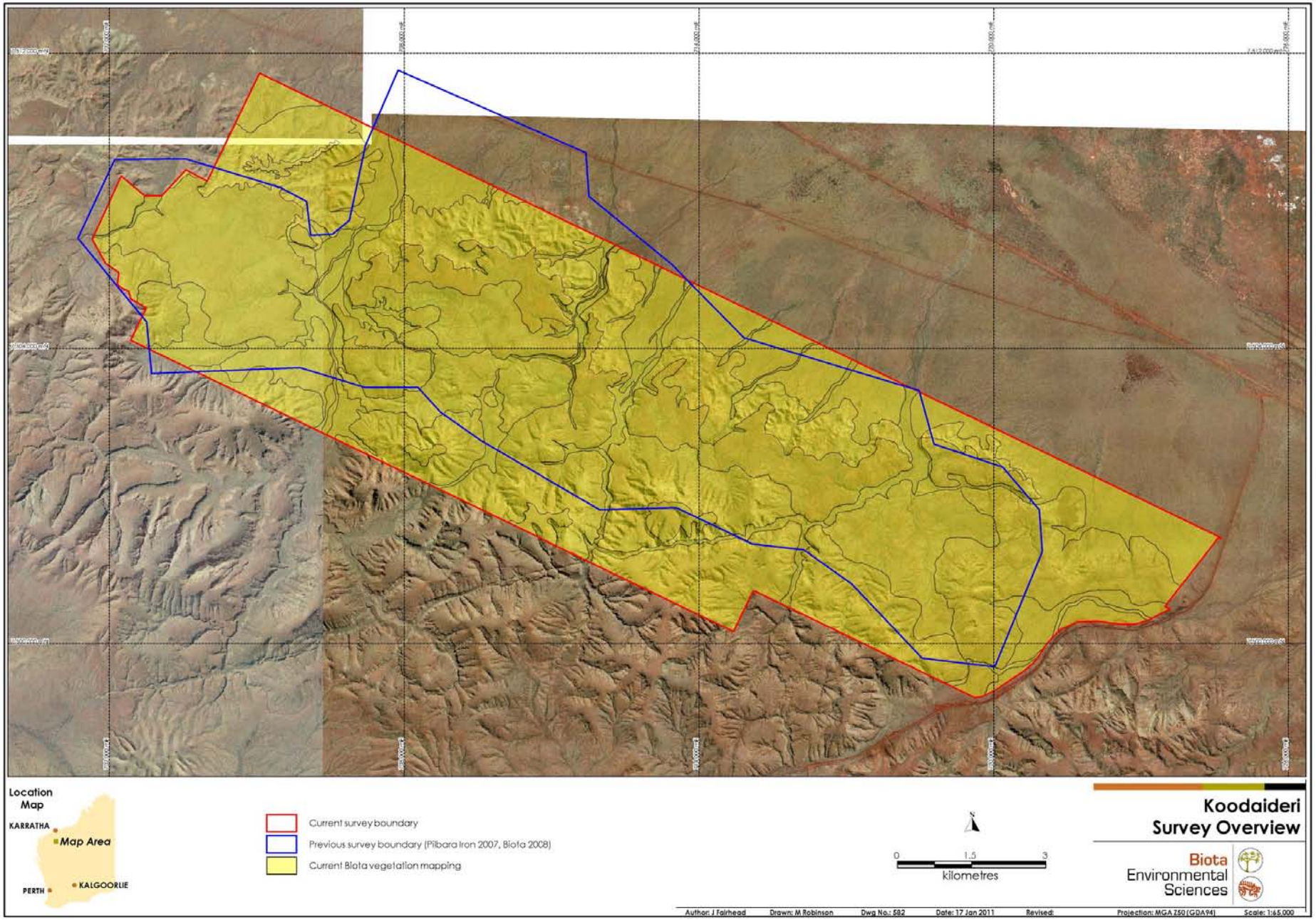

Figure 3.2: Extent of previous biological survey work relative to the current study area.

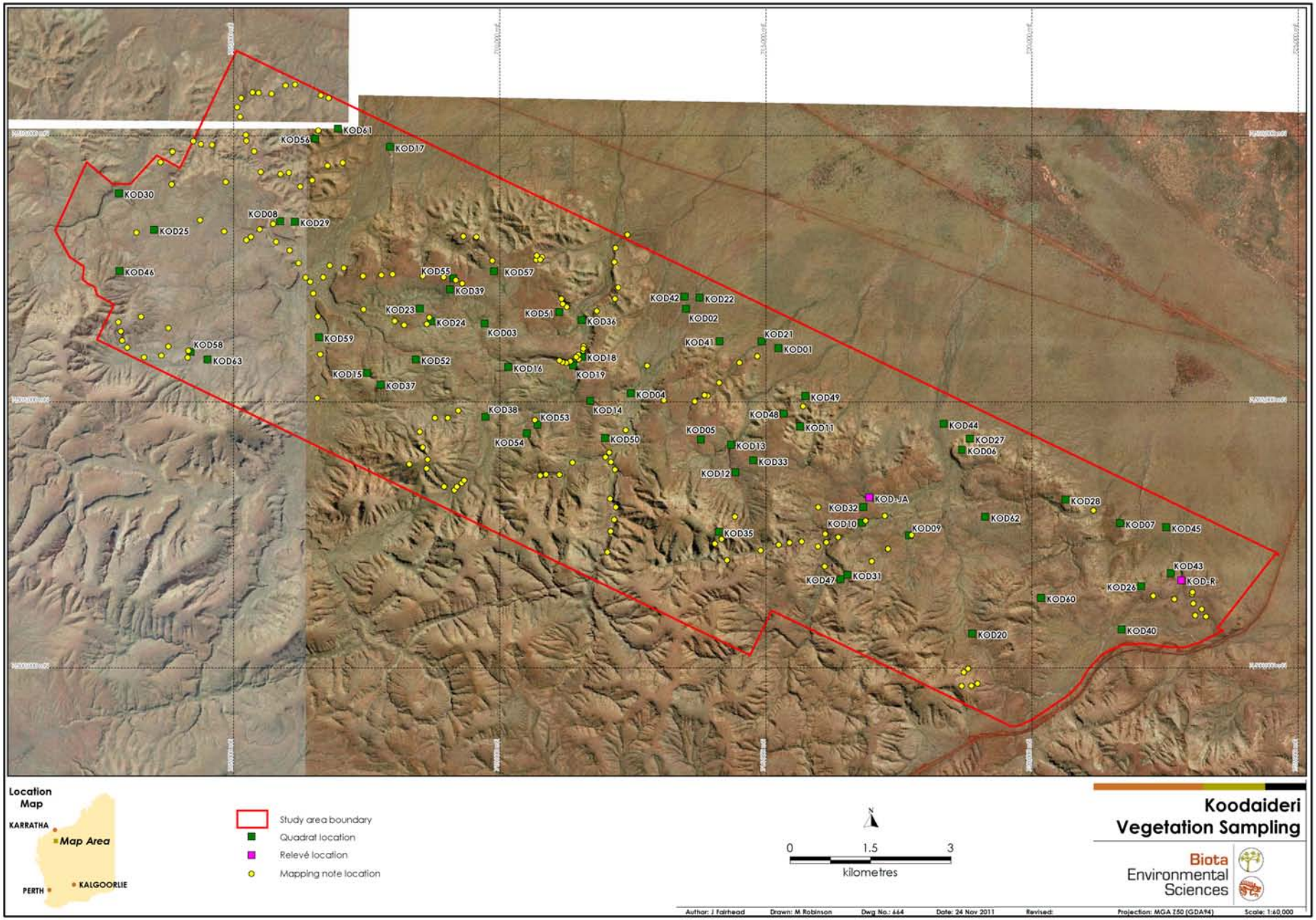

Figure 3.3: Locations of mapping notes recorded to assist with delineation of vegetation unit boundaries (note that opportunistic records and specimen collections were also taken during foot traverses to access quadrat/relevé locations).

3.6 Specimen Identification, Nomenclature and Data Entry

Common species that were well known to the survey botanists were identified in the field. Voucher specimens of all other species were collected and assigned a unique number to facilitate tracking of data. These were pressed in the field, and dried in a drying oven.

These vouchers were then identified by keying out, reference to appropriate publications, use of voucher reference collections and comparison to the collections held at the Western Australian Herbarium. Most specimens were identified by botanists from Biota. Various other specialists were consulted as required, and are gratefully acknowledged for their assistance with this study: these included Mr Malcolm Trudgen of M.E. Trudgen and Associates (for various difficult plant groups including the family Malvaceae and the genus *Tephrosia*), and Mr Johan Hurter of the WA Herbarium (who applied the phrase-name to the new *Sauropus* species).

Nomenclature was checked against the current listing of scientific names recognised by the WA Herbarium and updated as necessary. The main out-dated nomenclature retained was that relating to *Cassia*. This genus is currently recognised as *Senna* (Randell 1988, 1989, 1990); however the older *Cassia* classification (Symon 1966) is perceived by Biota taxonomists to be a more realistic level of separation of the taxa (e.g. with taxa such as *'glutinosa'* and *'pruinosa'* recognised at specific rather than subspecific level, as distinct from Randell 1989). A more detailed discussion of the two *Senna / Cassia* classifications is contained in Trudgen and Casson (1998), while a comparison of the nomenclature under the two classifications is presented in Appendix 5. In addition, taxa belonging to the Mulga (*Acacia aneura*) species complex were unable to be completely resolved during the course of the study. This group has recently been revised by Mr Bruce Maslin of the WA Herbarium, who described several new species. Some of the taxa utilised for this study are no longer recognised to occur in WA (e.g. *Acacia aneura* var. *intermedia*), and/or represent specimens in the Pilbara reference set belonging to Mr Malcolm Trudgen of M.E. Trudgen and Associates (e.g. *Acacia* aff. *aneura* (narrow fine veined; site 1259)).

All data were entered into an Access Vegetation Database structure held internally at Biota, which was developed by Mr Ted Griffin (private consultant) at the request of Mr Malcolm Trudgen.

Specimens will be lodged with the WA Herbarium for all taxa representing flora of conservation significance, undescribed taxa, range extensions or gaps in the known taxa, provided that adequate material is available. Rare Flora Report Forms and vouchers have been issued for the Phase 1 survey to date.

3.7 Limitations of this Study

A number of limitations of the field survey and subsequent conservation assessments are discussed below. These are factors that must be considered when reviewing and applying the results of this study. Despite these limitations, the field study and the subsequent analyses are believed to give a good representation of the flora and vegetation values of the study area.

The main limitations of this study are as follows:

- Fungi and nonvascular flora (e.g. algae, mosses and liverworts) were not systematically sampled, as is typical for surveys of this nature. A discussion of the opportunistically sampled fungi is presented in Section 6.4.
- Some sections of the study area, particularly in the southern half, were not surveyed as they were inaccessible by vehicle.
- The entire survey area was not systematically searched for rare flora as part of the current survey; however, large sections have been subject to rare flora surveys as part of previous studies (Pilbara Iron 2007, Biota 2008). As a result, the species list should be taken as indicative rather than exhaustive.

- The vegetation units for this study were defined based on interpretation of aerial photography signatures combined with the site data and field mapping notes recorded during the field survey. As it was not feasible to traverse the entire study area, some areas of mapping relied solely on the interpretation of aerial photography signatures. In addition, some of the orthophotography supplied was relatively old (2004) and did not show recently constructed infrastructure. Newer photography was extracted where possible from GoogleEarth, however this was not available for all areas. As a result, the mapping provides only a representation of the spatial distribution of mapping units within the study area.
- No clustering analysis has been conducted using the floristic data from the quadrats and relevés from this study, as there is currently limited comparable data available from the locality. An analysis using PRIMER is planned for June 2012, following the completion of additional seasonal survey work in the locality.

4.0 Existing Environment

The following section presents a review of the available broad scale mapping that has been undertaken for the Pilbara bioregion.

4.1 IBRA Bioregions and Subregions

The IBRA recognises 85 bioregions (Environment Australia 2000). The study area lies within the Pilbara bioregion (PIL). With increasing survey work, it is becoming apparent that the Pilbara bioregion is a major centre of biodiversity in Western Australia. This is related to the region's diversity of geological, altitudinal and climatic elements, as well as its location. The Pilbara is a transitional zone between the floras of the Eyrean (central desert) and southern Torresian (tropical) bioclimatic regions, and contains elements of both floras (see van Leeuwen and Bromilow (2002) for a detailed discussion of the significance of the Hamersley Range). Similarly, the Pilbara is also a transitional zone for fauna. In 2003, in recognition of the high species diversity and high levels of endemism in the region, the Pilbara was nominated as one of 15 national biodiversity "hotspots" by the Minister of Environment and Heritage[1].

The Pilbara bioregion is divided into four subregions, described by Environment Australia (2000) as the four major components of the Pilbara Craton. The study area is located at the boundary of the Hamersley and Fortescue Plains subregions:

- Hamersley (PIL 3): mountainous area of Proterozoic ranges and plateaux with Mulga (*Acacia aneura*) low woodland over bunch grasses on fine textured soils, and Snappy Gum (*Eucalyptus leucophloia*) low trees over *Triodia brizoides* hummock grassland on the skeletal sandy soils of the ranges (Kendrick 2003a).
- Fortescue Plains (PIL 2): alluvial plains and river frontages with salt marsh, Mulga-bunch grass and short grass communities on alluvial plains and River Gum (*Eucalyptus camaldulensis*) woodlands fringing drainage lines (Kendrick 2003b).

The study area straddles both of these subregions; however, the majority (approximately 91%) of the study area lies in the Hamersley subregion, with only a narrow section along the northern side within the Fortescue subregion. The vegetation is considered to be typical of the Hamersley subregion rather than the Fortescue subregion.

4.2 Conservation Reserves in the Locality

Currently the Pilbara bioregion has 7.75% of its surface under some form of conservation tenure.

The Hamersley subregion has 14.10% of its area classified as either National Park or Conservation Park (Kendrick 2003a). This includes Karijini National Park and the eastern half of the Cane River Conservation Park.

The Fortescue subregion has 0.79% of its area classified as either National Park or Conservation Park (Kendrick 2003b). This includes small parts of the Millstream–Chichester National Park and Karijini National Park.

The conservation reserves in closest proximity to the study area are:

- Karijini National Park, with the nearest boundary located 22.8 km to the west;
- Mungaroona Range Nature Reserve, located 72 km to the northwest, and
- Millstream-Chichester National Park, located 156 km to the northwest.

[1] http://www.environment.gov.au/biodiversity/hotspots/national-hotspots.html

Any development in the study area would not be expected to directly or indirectly affect these conservation reserves.

The Pilbara bioregion is listed as a medium priority for funding for land purchase under the National Reserves System Co-operative Program due to the limited representation of the area in conservation reserves. Portions of various pastoral leases in the Pilbara region have been nominated for exclusion for public purposes in 2015, when the leases come up for renewal. Many of the submissions for land purchase are from the DEC, with the intention of adding these areas to the existing conservation estate in order to provide a comprehensive, adequate and representative reserve system. A section of Marillana Station is proposed to be excluded to assist with management of the Fortescue Marsh. This overlaps approximately 25% of the central Koodaideri study area, extending from the northern boundary and encompassing the Koodaideri spring.

4.3 Land Systems in the Study Area

Land systems (rangelands) mapping covering the study area has been prepared by the Western Australian Department of Agriculture (van Vreeswyk et al. 2004).

A total of 105 land systems occur in the Pilbara bioregion[2], two of which are intersected by the study area: Boolgeeda and Newman. The study area contains 0.2% of the total amount of Boolgeeda land system and 0.7% of the total amount of Newman land system mapped for the Pilbara bioregion (Table 4.1). It is not considered that any proposed development within the study area would affect the integrity of these land systems as a whole.

Table 4.1: Land systems of relevance to the study area (Payne et al. 1988, van Vreeswyk et al. 2004).

Land System	Description	Total Area of Land System in the Pilbara Bioregion (ha)	Area of Land System in Study Area (ha)	Land System in Study Area as Percentage of Total Mapped for Pilbara (%)
Boolgeeda	Stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands and mulga shrublands. Component landforms include low hills and rises (4%), stony slopes and upper plains (20%), stony lower plains (65%), groves (1%), and narrow drainage and channels (10%)	774,800	1,641	0.2
Newman	Rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands. Component landforms include plateaux, ridges, mountains and hills (70%), lower slopes (20%), stony plains (5%), and narrow drainage floors with channels (5%)	1,458,000	10,350	0.7

[2] This information was obtained by combining land system mapping for the Pilbara (van Vreeswyk et al. 2004) and Ashburton (Payne et al. 1988), and intersecting this with the Pilbara bioregion (Environment Australia 2000) in ArcView 3.2a.

4.4 Beard's Vegetation Mapping

Beard (1975a, 1975b) mapped the vegetation of the Pilbara at a scale of 1:1,000,000. The study area lies within the Fortescue Botanical District of the Eremaean Botanical Province as defined by Beard. The vegetation of this province is typically open, and frequently dominated by spinifex, wattles and occasional eucalypts.

The study area intersects two of Beard's mapping units, "Hamersley 82" and "Fortescue valley 111". These are described as:

- Hamersley 82: Snappy Gum (*Eucalyptus leucophloia*) scattered low trees over *Triodia wiseana* hummock grasslands; and
- Fortescue Valley 111: *Eucalyptus gamophylla* scattered low mallees over Hard Spinifex (*Triodia basedowii*) hummock grasslands.

Given the broad nature of Beard's vegetation mapping, these units are only broadly applicable to the vegetation of the study area (Section 5.2).

4.5 Vegetation of Conservation Significance Known from the Locality

Two TECs and 29 PECs are listed by the DEC for the Pilbara bioregion (Appendix 6). None of these occur within the study area.

The Fortescue Marsh, which is listed as a Priority 1 PEC (DEC 2010b), is located on the Fortescue River east of Mulga Downs, 7.8 km to the north of the study area (Figure 2.1). The area is biologically significant, noted specifically for endemic *Eremophila* species, several near endemic and new to science *Tecticornia* species and a recorded sighting of the critically endangered Night Parrot (*Pezoporus occidentalis*) in 2005. The Fortescue Marsh has also been listed in the Directory of Important Wetlands in Australia (Environment Australia 2001).

The Fortescue Valley Sand Dunes, listed as a Priority 3 PEC (DEC 2010b), occur approximately 5 km northeast of the current study area. This PEC occurs on a small number of sand dunes on the Divide land system, at the junction of the Hamersley Range and the Fortescue Valley. The dunes have a small area of representation in the region, and are considered to be fragile and highly susceptible to weed invasion and erosion processes. These areas are typically vegetated with *Acacia dictyophleba* scattered tall shrubs over *Crotalaria cunninghamii*, *Trichodesma zeylanicum* var. *grandiflorum* open shrubland.

Clearing in the study area would not be expected to directly or indirectly affect the Fortescue Marsh PEC or the Fortescue Valley Sand Dunes PEC.

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5.0 Vegetation of the Study Area

5.1 Overview of Vegetation Condition

Vegetation condition was assessed at each quadrat site according to the ranking scale developed by Trudgen (1988) (Appendix 1).

Sections of the study area have been subject to an exploration drilling program. In general, these comprised cleared access tracks, and areas of approximately 30 x 30 m in size cleared for drill pads. The disturbed sections of the study area were considered to be Completely Degraded. These areas have not been included in the current vegetation mapping for two reasons:

- the disturbed areas were too small to depict at the scale utilised for mapping; and
- the areas were not accurately reflected in the 2004 aerial photography.

Thirteen weed species were recorded in the study area, however dense infestations were only recorded in some creeklines, which were consequently rated as being in Poor to Very Poor condition. Apart from these habitats, the remaining intact vegetation types were generally in Very Good to Excellent condition.

5.2 Description of the Vegetation Sub-Associations

Twenty-five vegetation units were identified within the study area, associated with two broad landform categories:

- Crests, slopes and footslopes associated with the broad range of hills that runs the length of the study area; and
- Creeks, gullies and gorges.

5.2.1 Vegetation of Foothills, Slopes and Hilltops

AanElTspsTHt ***Acacia aneura*[3], *Eucalyptus leucophloia* scattered low trees over *Triodia* sp. Shovelanna Hill open hummock grassland over *Themeda triandra* tussock grassland**

Habitat	This vegetation unit occupied 8.39 ha (0.07% of the study area) in two narrow gullies in the centre of the study area.
Associated species	*Acacia maitlandii*, *A. pruinocarpa*, *Atalaya hemiglauca*, *Corchorus sidoides*, *Corymbia ferriticola*, *Cymbopogon ambiguus*, *Ficus brachypoda*, *Gossypium australe* (Burrup Form), *G. robinsonii*, *Paraneurachne muelleri*, *Petalostylis labicheoides* and *Stylobasium spathulatum*.
Vegetation condition	Excellent
Described from	Opportunistic observations (Plate 5.1)

[3] Given the lack of resolution surrounding the Mulga species complex, *Acacia "aneura"* has been used as a general term to denote species referred to this group.

AarAspTspsTw ***Acacia arida* tall open shrubland over *A. spondylophylla* low shrubland over *Triodia* sp. Shovelanna Hill, *T. wiseana* hummock grassland**

Habitat	This vegetation unit occurred over 445.09 ha (3.73% of the study area) on undulating footslopes in the centre of the study area.
Associated species	*Acacia pyrifolia, Atalaya hemiglauca, Corymbia ferriticola, C. hamersleyana, Cymbopogon procerus, Duperreya commixta, Enteropogon ramosus, Eriachne lanata, E. mucronata, Gossypium robinsonii, Grevillea wickhamii* subsp. *hispidula, Jasminum didymum* subsp. *lineare, Paraneurachne muelleri, Polycarpaea longiflora, Santalum lanceolatum, Tephrosia rosea* var. *glabrior, Themeda triandra* and *Triodia epactia.*
Vegetation condition	Excellent
Described from	Quadrat KOD-05 and opportunistic observations (Plate 5.2)

Plate 5.1: Vegetation unit AanElTspsTHt.

Plate 5.2: Vegetation unit AarAspTspsTw.

AiGwTlaTp ***Acacia inaequilatera*, *Grevillea wickhamii* open shrubland over *Triodia lanigera*, *T. pungens* open hummock grassland**

Habitat	This vegetation unit occupied 1,328.76 ha (11.13% of the study area) on the long footslopes of the northern boundary of the study area.
Associated species	*Aristida holathera*, *Bonamia rosea*, *Corchorus lasiocarpus*, *Cymbopogon ambiguus*, *Eragrostis eriopoda*, *Eucalyptus gamophylla*, *Gossypium australe* (Burrup Form), *Hakea chordophylla*, *Heliotropium pachyphyllum*, *Mollugo molluginea*, *Ptilotus astrolasius*, *P. calostachyus*, *P. exaltatus*, *Sida* sp. Excedentifolia (J.L. Egan 1925) and *Solanum lasiophyllum*.
Vegetation condition	Excellent
Described from	Quadrats KOD-01, KOD-22 and opportunistic observation (Plate 5.3)

AprGwAarAspTsps ***Acacia pruinocarpa*, *Grevillea wickhamii*, *A. arida* tall open scrub over *A. spondylophylla* scattered low shrubs over *Triodia* sp. Shovelanna Hill open hummock grassland**

Habitat	This vegetation unit occupied a long undulating section of low hills extending through the middle of the eastern end of the study area, covering 677.24 ha (5.67% of the total area).
Associated species	*Acacia aneura, Cassia glutinosa*, *Corchorus lasiocarpa*, *Corymbia hamersleyana*, *Eremophila latrobei* subsp. *filiformis*, *Eucalyptus leucophloia*, *Goodenia stobbsiana*, *Grevillea wickhamii*, *Hakea lorea*, *Jasminum didymum* subsp. *lineare*, *Ptilotus calostachyus*, *P. rotundifolius*, *Triodia pungens* and *T. wiseana.*
Vegetation condition	Very Good or Excellent
Described from	Quadrats KOD-12, KOD-32, KOD-33 and opportunistic observations (Plate 5.4)

Plate 5.3: Vegetation unit AiGwTlaTp.

Plate 5.4: Vegetation unit AprGwAarAspTsps.

ChAiGwTsps/Te/Tw ***Corymbia hamersleyana* scattered low trees over *Acacia inaequilatera, Grevillea wickhamii* scattered tall shrubs over *Triodia* sp. Shovelanna Hill or *T. epactia* or *T. wiseana* hummock grassland**

Habitat	This vegetation unit was associated with undulating country in areas of lower relief. It was collectively distributed over 416.04 ha (3.47% of the study area).
Associated species	*Acacia spondylophylla*, *Capparis spinosa* var. *nummularia*, *Cassia oligophylla* x *helmsii*, *Corchorus lasiocarpus*, *Eucalyptus leucophloia* subsp. *leucophloia*, *Goodenia stobbsiana*, *Hakea chordophylla* and *Ptilotus calostachyus*
Vegetation condition	Very Good condition due to the presence of some small disturbed areas
Described from	Quadrat KOD-58 and opportunistic observations (Plate 5.5).

ElAbTwTsps ***Eucalyptus leucophloia* scattered low trees over *Acacia bivenosa* open shrubland over *Triodia wiseana*, *T.* sp. Shovelanna Hill hummock grassland**

Habitat	This vegetation type was widespread in the study area, found mainly in a band on north-facing slopes covering approximately 1,576.47 ha (13.21% of the study area).
Associated species	*Acacia arida*, *A. adsurgens*, *A. dictyophleba*, *A. pyrifolia*, *Aristida* sp., *Bonamia* sp. Dampier (A.A. Mitchell PRP 217), *Corymbia hamersleyana*, *Cullen leucochaites*, *Cymbopogon ambiguus*, *Goodenia microptera*, *Gossypium robinsonii*, *Grevillea wickhamii*, *Heliotropium ovalifolium*, *Mollugo molluginea*, *Pentalepis trichodesmoides*, *Ptilotus calostachyus*, *Solanum horridum*, *S. lasiophyllum*, *S. phlomoides, Tribulus platypterus* and *T. suberosus*
Vegetation condition	Excellent
Described from	Quadrats KOD-11, KOD-27, KOD-49, KOD-56, KOD-61 and opportunistic observations (Plate 5.6).

Plate 5.5: Vegetation unit ChAiGwTsps/Te/Tw.

Plate 5.6: Vegetation unit ElAbTwTsps.

ElAhiAarTspsTe ***Eucalyptus leucophloia* scattered low trees over *Acacia hilliana, A. arida* low shrubland over *Triodia* sp. Shovelanna Hill, *T. epactia* open hummock grassland**

Habitat	This vegetation unit occurred over undulating steep slopes in the southeastern corner of the study area, occupying 493.86 ha (4.14% of the study area).
Associated species	*Acacia pruinocarpa*, *Cassia glutinosa*, *Corchorus lasiocarpus*, *Corymbia ferriticola*, *Cymbopogon ambiguus*, *Dampiera candicans*, *Dodonaea pachyneura*, *Eremophila jucunda*, *Goodenia stobbsiana*, *Gossypium robinsonii*, *Grevillea wickhamii*, *Hakea chordophylla*, *Solanum horridum* and *S. lasiophyllum*.
Vegetation condition	Excellent
Described from	Quadrat KOD-47 and opportunistic observations (Plate 5.7).

ElAspTsps ***Eucalyptus leucophloia* scattered low trees over *Acacia spondylophylla* low open shrubland over *Triodia* sp. Shovelanna Hill hummock grassland**

Habitat	This vegetation unit occurred on the mid-footslopes of the large range of hills in the southeastern corner of the study area. This vegetation type covered approximately 537.94 ha (4.51% of the study area).
Associated species	*Acacia arida*, *A. maitlandii*, *Corchorus* sp., *Dampiera candicans*, *Eriachne mucronata*, *Tribulus suberosus* and *Triodia wiseana*
Vegetation condition	Excellent
Described from	Unit described from opportunistic observations. (This habitat was particularly remote and difficult to explore, resulting in only limited sampling.)

ElChAmTw ***Eucalyptus leucophloia*, *Corymbia hamersleyana* low open woodland over *Acacia maitlandii* low shrubland over *Triodia wiseana* hummock grassland**

Habitat	This vegetation type occurred on the undulating footslopes in the southwestern corner of the study area. This vegetation type covered 340.95 ha (2.86% of the study area).
Associated species	*Acacia arida, A. pruinocarpa, A. spondylophylla, Codonocarpus cotinifolius, Corchorus lasiocarpus, Goodenia stobbsiana, Grevillea wickhamii, Hakea chordophylla, Mirbelia viminalis* and *Petalostylis labicheoides*
Vegetation condition	Excellent
Described from	Quadrat KOD-15 and opportunistic observations (Plate 5.8).

Plate 5.7: Vegetation unit ElAhiAarTspsTe.

Plate 5.8: Vegetation unit ElChAmTw.

ElChGwAprTsps ***Eucalyptus leucophloia*, *Corymbia* hamersleyana scattered low trees over *Grevillea wickhamii, Acacia pruinocarpa* scattered shrubs over *Triodia* sp. Shovelanna Hill hummock grassland**

Habitat	This vegetation type occurred in the westernmost corner of the study area. It was typical of the vegetation occurring on mesa top habitats throughout the locality. This vegetation type covered 904.72 ha (7.58% of the study area).
Associated species	*Acacia adoxa*, *A. dictyophleba, A. elachantha, A. trudgeniana*, *Corymbia deserticola*, *Cymbopogon ambiguus*, *Dampiera candicans*, *Dodonaea coriacea*, *Goodenia stobbsiana*, *Hakea lorea*, *Heliotropium pachyphyllum*, *Ptilotus calostachyus*, *Scaevola parvifolia* and *Solanum horridum*.
Vegetation condition	Excellent
Described from	Quadrat KOD-49 and opportunistic observations.

ElEgEkTw ***Eucalyptus leucophloia* low woodland over *E. gamophylla*, *E. kingsmillii* scattered low mallees over *Triodia wiseana* open hummock grassland**

Habitat	This vegetation unit occurred on high altitude ridges and hilltops covering 131.4 ha (1.1% of the study area).
Associated species	*Acacia adoxa*, *A. hilliana*, *A. pyrifolia*, *Cassia glutinosa*, *Corchorus* sp., *Dampiera candicans*, *Grevillea wickhamii*, *Mirbelia viminalis*, *Petalostylis* sp., *Scaevola browniana* and *Sida cardiophylla*.
Vegetation condition	Excellent
Described from	Quadrat KOD-35 and opportunistic observations (Plate 5.9). This unit may be more widespread than indicated, as it was likely to have been under-sampled due to the inaccessible nature of this habitat.

ElEgHcGwAspAarTspsTw ***Eucalyptus leucophloia*, *E. gamophylla* scattered low trees over *Hakea chordophylla*, *Grevillea wickhamii* tall open scrub over *Acacia spondylophylla*, *A. arida* shrubland over *Triodia* sp. Shovelanna Hill, *T. wiseana* open hummock grassland**

Habitat	This vegetation unit occurred on a high plateau in the centre of the study area and covered approximately 389.4 ha (3.26% of the study area).
Associated species	*Acacia adoxa, A. hilliana, A. pruinocarpa, Amphipogon sericeus*, *Aristida* sp., *Cassia glutinosa*, *Corchorus* sp., *Dampiera candicans*, *Corymbia deserticola, C. hamersleyana*, *Eremophila jucunda*, *Gompholobium* sp. Pilbara (N.F. Norris 908), *Goodenia stobbsiana, Keraudrenia velutina* subsp. *elliptica, Mirbelia viminalis, Mollugo molluginea*, *Ptilotus calostachyus*, *Scaevola browniana*, *Solanum ellipticum*, *S. phlomoides* and *Tephrosia arenicola*
Vegetation condition	Excellent
Described from	Quadrats KOD-08, KOD-37, KOD-51, KOD-52, KOD-53 and KOD-57 (Plate 5.10).

Plate 5.9: Vegetation unit ElEgEkTw.

Plate 5.10: Vegetation unit ElEgHcGwAspAarTspsTw.

ElGwAhiAspTwTsps ***Eucalyptus leucophloia* low woodland over *Grevillea wickhamii* scattered shrubs over *Acacia hilliana, A. spondylophylla* scattered low shrubs over *Triodia* sp. Shovelanna Hill open hummock grassland**

Habitat	This vegetation unit covered a large section of the study area (3,743.33 ha, or 31.36% of the study area), dominating the undulating foothills and high country through the central section of the study area and extending eastward along the southern boundary.
Associated species	*Acacia arida, A. atkinsiana, A. bivenosa, A. tenuissima, Aristida holathera* var. *holathera*, *Corchorus* sp., *Dampiera candicans, Eriachne lanata, Indigofera monophylla, Mirbelia viminalis, Ptilotus calostachyus, P. rotundifolius, Scaevola browniana* and *Tephrosia arenicola*.
Vegetation condition	Excellent
Described from	Quadrats KOD-20, KOD-62 and opportunistic observations (Plate 5.11).

Plate 5.11: Vegetation unit ElGwAhiAspTwTsps.

5.2.2 Vegetation of Creeks, Gullies and Gorges

AiGwTeCEc ***Acacia inaequilatera*, *Grevillea wickhamii* tall shrubland over *Triodia epactia* hummock grassland over **Cenchrus ciliaris* tussock grassland**

Habitat	This vegetation unit was associated with a floodplain habitat in the western quarter of the study area, occupying approximately 146.99 ha (1.23% of the study area).
Associated species	*Atalaya hemiglauca, Clerodendrum floribundum, Corchorus lasiocarpus, Grevillea wickhamii, Ptilotus obovatus* and *Tribulus suberosus*.
Vegetation condition	Good
Described from	Quadrats KOD-01, KOD-40 and opportunistic observations (Plate 5.12).

Plate 5.12: Vegetation unit AiGwTeCEc.

AprApyAThCEc ***Acacia pruinocarpa* scattered trees over *A. pyrifolia*, *Atalaya hemiglauca* shrubland over **Cenchrus ciliaris* tussock grassland**

Habitat	This vegetation unit was restricted to wide floodplains in the southern section of the study area, occupying 61.84 ha (0.52% of the study area).
Associated species	*Cassia oligophylla, Cleome viscosa, Corymbia ferriticola, Cymbopogon ambiguus, Duperreya commixta, Ehretia saligna, Enneapogon lindleyanus, Ficus brachypoda, Hybanthus aurantiacus, Indigofera monophylla, Ptilotus obovatus* and *Tephrosia rosea* var. *glabrior*.
Vegetation condition	Good
Described from	Opportunistic observations

AprGwCEcTe ***Acacia pruinocarpa*, *Grevillea wickhamii* tall shrubland over **Cenchrus ciliaris* tussock grassland over *Triodia epactia* open hummock grassland**

Habitat	This vegetation type was restricted to narrow creeks and flood banks in the study area and represented approximately 86.40 ha (0.72% of the study area).
Associated species	*Atalaya hemiglauca*, *Cassia oligophylla*, *Cleome viscosa*, *Cucumis maderaspatanus*, *Duperreya commixta*, *Enchylaena tomentosa*, *Gossypium australe* (Burrup Form), *G. robinsonii*, *Hakea chordophylla*, *Indigofera monophylla*, *Mollugo molluginea*, *Polycarpaea longiflora*, *Pterocaulon sphaeranthoides*, *Rhagodia eremaea* and *Trichodesma zeylanicum*
Vegetation condition	Good
Described from	Opportunistic observations

ApyGwAThGOrTErCEcTe ***Acacia pyrifolia*, *Grevillea wickhamii*, *Atalaya hemiglauca*, *Gossypium robinsonii* tall open scrub over *Tephrosia rosea* scattered low shrubs over **Cenchrus ciliaris* tussock grassland over *Triodia epactia* open hummock grassland**

Habitat	This vegetation type was widespread within the study area in numerous small drainage lines and covered approximately 399.04 ha (3.34% of the study area).
Associated species	*Acacia pruinocarpa*, *A. elachantha, Amaranthus undulatus, Capparis spinosa* var. *nummularia, Cleome viscosa, Corchorus laniflorus, Cymbopogon ambiguus, Enchylaena tomentosa, Eremophila longifolia, Gomphrena cunninghamii, Gossypium australe* (Burrup Form), *Hakea chordophylla, Indigofera monophylla*, **Malvastrum americanum, Polycarpaea longiflora, Pterocaulon sphaeranthoides, Rhagodia eremaea, Solanum horridum, Tephrosia rosea* var. *glabrior* and *Trichodesma zeylanicum*
Vegetation condition	Good
Described from	Quadrats KOD-02 and KOD-59 and opportunistic observations (Plate 5.13).

AtuAThGwApyTErCEc ***Acacia tumida, Atalaya hemiglauca, Grevillea wickhamii, Acacia pyrifolia* tall open scrub over *Tephrosia rosea* low open shrubland over **Cenchrus ciliaris* tussock grassland**

Habitat	This vegetation unit was restricted to a single occurrence associated with a minor flowline, covering only 35.2 ha (approximately 0.29% of the study area).
Associated species	*Amaranthus undulatus, Aristida contorta, Boerhavia* sp., *Cleome viscosa, Corchorus crozophorifolius, Cymbopogon procerus, Gossypium robinsonii, Heliotropium cunninghamii, Hybanthus aurantiacus, Polycarpaea longiflora, Ptilotus calostachyus* and *Solanum phlomoides*.
Vegetation condition	Good
Described from	Quadrat KOD-17 (Plate 5.14).

Plate 5.13: **Vegetation Unit ApyGwAThGOrTErCEcTe.**

Plate 5.14: **Vegetation unit AtuAThGwApyTErCEc.**

CfElAtuTe ***Corymbia ferriticola*, *Eucalyptus leucophloia* low open forest over *Acacia tumida* tall shrubland *over Triodia epactia* hummock grassland**

Habitat	This vegetation type was restricted to a narrow gully in the centre of the study area and occupied only 5.28 ha (0.04% of the study area).
Associated species	*Cleome viscosa, Cymbopogon ambiguus, Duperreya commixta, Eremophila longifolia, Petalostylis labicheoides, Themeda triandra* and *Trichodesma zeylanicum*
Vegetation condition	Excellent
Described from	Opportunistic observations

ChAtuCEc ***Corymbia hamersleyana* low open forest over *Acacia tumida* var. *pilbarensis* tall shrubland over **Cenchrus ciliaris* tussock grassland**

Habitat	This vegetation unit was restricted to a narrow rocky gorge and its associated floodplain, covering 13.97 ha (0.12% of the study area).
Associated species	*Acacia dictyophleba, Atalaya hemiglauca, Clerodendrum floribundum, Ptilotus incanus* and *Santalum lanceolatum*
Vegetation condition	Excellent
Described from	Opportunistic observations

ChApyJAdTs ***Corymbia hamersleyana* low open woodland over *Acacia pyrifolia, Jasminum didymum* open shrubland over *Triodia schinzii* hummock grassland**

Habitat	This vegetation type was restricted to a gully and floodplain along the western boundary of the study area, covering approximately 17.16 ha (0.14% of the study area).
Associated species	*Acacia inaequilatera, Atalaya hemiglauca, Capparis umbonata, Cassia luerssenii, Cymbopogon* sp., *Eriachne mucronata, Evolvulus alsinoides* var. *decumbens, Gossypium robinsonii, Grevillea wickhamii, Hybanthus aurantiacus, Petalostylis labicheoides, Ptilotus exaltatus, Santalum lanceolatum, Sida arenicola and Solanum* sp.
Vegetation condition	Very Good to Excellent
Described from	Quadrat KOD-30 and opportunistic observations (Plate 5.15).

ChGwCYaCEcTe ***Corymbia hamersleyana* scattered low trees over *Grevillea wickhamii* tall shrubland over *Cymbopogon ambiguus*, **Cenchrus ciliaris* tussock grassland over *Triodia epactia* open hummock grassland**

Habitat	This vegetation unit was restricted to the bed and bank of a large creek system in the western section of the study area, occupying 16.43 ha (0.14% of the study area).
Associated species	*Atalaya hemiglauca, Cassia glutinosa, Clerodendrum floribundum, Duperreya commixta, Enneapogon lindleyanus, Gossypium robinsonii, Polycarpaea longiflora, Rhagodia eremaea* and *Tephrosia rosea* var. *glabrior*
Vegetation condition	Good
Described from	Opportunistic observations

ChApyAtuTErCEc ***Corymbia hamersleyana* scattered low trees over *Acacia pyrifolia*, *A. tumida* tall closed shrubland over *Tephrosia rosea* low open shrubland over **Cenchrus ciliaris* closed tussock grassland**

Habitat	This vegetation unit was restricted to a narrow creekline that drains the main ridge in the northern section of the study area, occupying 15.17 ha (0.13% of the study area).
Associated species	*Atalaya hemiglauca, Cassia glutinosa, Hybanthus aurantiacus, Santalum lanceolatum, Tephrosia rosea* var. *glabrior* and *T.* sp. Bungaroo Creek (M.E. Trudgen 11601).
Vegetation condition	Good
Described from	Quadrat KOD-21 (Plate 5.16).

Plate 5.15: Vegetation unit ChApyJAdTs.

Plate 5.16: Vegetation unit ChApyAtuTErCEc.

5.2.3 Mosaic Units

Two mosaic units were identified from gully habitats:

Koodaideri Springs Area **Mosaic of riparian vegetation types associated with a narrow gorge**

This narrow, deep gorge covering 21.8 ha (0.18% of the study area) contained a variety of vegetation types, including some dominated by phreatophytic species, dependent on what appears to be a permanent spring water source (Plate 5.17). The vegetation units present at this location ranged from *Eucalyptus camaldulensis* forest to closed canopy *Ficus virens* communities.

This area also provided habitat for the Priority 4 species *Rhynchosia bungarensis,* and potentially a number of other Priority flora species. The northernmost sections of this area were invaded by **Cenchrus ciliaris* and were ranked as being in Good condition, whilst the remainder of the area on more rocky substrates was in Excellent condition.

Plate 5.17: Koodaideri spring.

Gully Mosaic

The study area was dissected by several deep gullies occupying a total of 178.54 ha (1.49% of the study area). These contained a number of different microhabitats and corresponding vegetation units at a scale too fine to map individually. Associated species typically included *Acacia pyrifolia, Atalaya hemiglauca, Brachychiton acuminatus, Cajanus* sp., *Capparis spinosa* var. *nummularia, *Cenchrus ciliaris, Clerodendrum floribundum, Corchorus crozophorifolius, C. laniflorus, Corymbia ferriticola, Cymbopogon ambiguus, C. procerus, Gomphrena cunninghamii, Enneapogon lindleyanus, Eucalyptus victrix, Eulalia aurea, Flueggea virosa* subsp. *melanthesoides, Gossypium robinsonii, Grevillea pyramidalis, G. wickhamii, Rhynchosia bungarensis, Santalum lanceolatum* and *Themeda* sp. Mt Barricade (M.E. Trudgen 2471). These gully habitats were in Excellent condition. This vegetation unit was described from opportunistic observations.

5.3 Conservation Significance of the Vegetation Sub-Associations

None of the vegetation types identified for the study area comprise TECs or PECs. The units were therefore assessed in terms of their significance on a subregional or local level, according to the following scale:

- High significance: vegetation type / habitat feature is considered likely to be rare in the subregion; vegetation is relatively intact (i.e. not degraded through clearing).
- Moderate significance: vegetation type / habitat feature is considered likely to be uncommon in the subregion; vegetation is relatively intact.
- Low significance: vegetation type / habitat feature is considered likely to be common and well represented in the subregion; vegetation is relatively intact.
- No significance: vegetation type is completely degraded (areas cleared, or otherwise in extremely poor condition due to extensive weed invasion).

The sections of the study area that have been cleared for exploration drilling are considered to have no conservation significance. Although not mapped separately (Section 5.1), these are readily apparent on site.

There is a natural spring feature (Plate 5.17) within the study area, which occurs in a narrow, deep gorge. This area supports a variety of vegetation types, some of which include phreatophytic species; units range from *Eucalyptus camaldulensis* forest to closed canopy *Ficus virens* communities. Although none of these vegetation types comprise a listed TEC or PEC, it is considered that the vegetation in this area is likely to be of Moderate to High local conservation significance. Other springs in the Hamersley subregion, albeit of considerably larger scale (e.g. Palm Springs), are mentioned as rare features of the region (Kendrick 2003a). While the Koodaideri spring is small in scale, the area has been observed to contain water even during very dry periods (G. Humphreys, Biota, pers. obs,) and phreatophytic species such as *Eucalyptus camaldulensis* are present. Such habitats are rare in the locality and uncommon in the broader Hamersley subregion.

Three vegetation types of other gullies, gorges and moderate-sized creeklines are considered to be of Low to Moderate conservation significance (for a description of the gully mosaic and units AprGwCEcTe and ApyGwAThGOrTErCEcTe, see Section 5.2). These units are of local importance as they represent the major surface drainage features of the area, and the gorges may also act as refugia for fire sensitive flora species (Kendrick 2003a). Clearing of these vegetation units should be avoided where practicable, and otherwise strictly minimised.

The remaining vegetation types are considered to be of Low conservation significance, representing units that are widely distributed and relatively well represented in the Pilbara subregion. Note that this is not intended to imply that these units have no conservation value; it simply indicates that these areas are less of a priority for conservation.

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6.0 Flora of the Study Area

6.1 Overview of the Flora

A total of 384 species of native flora from 130 genera and 43 families were recorded over the two phases of the Koodaideri survey. This included records of one Threatened species (*Lepidium catapycnon*) and three Priority species (*Rhynchosia bungarensis, Sida* sp. Hamersley Range (K. Newbey 10692) and *Eremophila magnifica* subsp. *magnifica*; refer Section 6.2). Previous studies (Pilbara Iron 2007, Biota 2008) have identified three additional Priority flora species within the study area (Section 6.2).

In addition to the above, one family and seven genera were represented in the study area only by introduced (weed) species. Eleven introduced species have been identified in the study area during the current surveys and another two are known to occur from previous studies. Full descriptions of these species are provided in Section 6.3, and Appendix 2 shows known locations and population sizes.

Species richness tends to vary on a logarithmic scale with the size of the study area. In comparison with the study area, which is 11,991 ha in size:

- 247 vascular flora species from 105 genera belonging to 42 families, along with seven introduced species and two fungi, were recorded from the Yandicoogina Billiards study area. This area was 1,514 ha in size, and is located approximately 20 km south of the study area near the junction of the Hamersley and Fortescue subregions (Biota 2009).
- 278 vascular flora species from 105 genera belonging to 42 families were recorded from the Yandicoogina Junction South West Deposit, which was approximately 1,460 ha in size (Biota 2010). The Junction South West Deposit is located near Yandicoogina Billiards, but lies entirely within the Hamersley subregion.
- 382 vascular flora species were recorded from the Hope Downs mine area (Ecologia 1997), which is similar in scale to the current study area at approximately 11,000 ha in size. Hope Downs is located approximately 25 km south of the study area, within the Hamersley subregion.

The total number of vascular flora species recorded from the study area is therefore considered to be within the range expected for an area of this size in this locality.

The families and genera with the greatest number of taxa are shown in Table 6.1 and Table 6.2. These families and genera are those that are typically predominant in the vegetation of the inland areas of the Pilbara bioregion. They usually have the most representatives on flora lists in surveys of this region, due to their prominence in the flora of the Eremaean Botanical Province.

Table 6.1: Most species rich families within the study area.

Family	No. of Native species
Fabaceae (Legume family)	89
Poaceae (Grass family)	59
Malvaceae (Hibiscus family)	53
Amaranthaceae (Amaranth family)	21
Myrtaceae (Myrtle family)	12
Convolvulaceae (Morning Glory family)	11
Goodeniaceae (Fanflower family)	11
Euphorbiaceae (Spurge family)	10
Scrophulariaceae (Figwort family)	9
Solanaceae (Nightshade family)	8

Table 6.2: Most species rich genera within the study area.

Genus	No. of Native species
Acacia (Wattles)	40
Cassia (Cassias / Sennas)	19
Sida (Sidas)	15
Ptilotus (Mulla-mullas)	12
Corchorus	11
Tephrosia	11
Euphorbia (Spurges)	10
Eremophila (Emu bush, Poverty bush)	9
Hibiscus	9
Triodia (Spinifex)	9

6.2 Flora of Conservation Significance

In Western Australia, all native flora species are protected under the *Wildlife Conservation Act 1950-1979,* making it an offence to remove or harm native flora species without approval. In addition to this basic level of statutory protection, a number of plant species are assigned an additional level of conservation significance based on the fact that there are a limited number of known populations, some of which may be under threat. A brief summary of the levels of conservation significance assigned to flora species in Western Australia is outlined in Table 6.3. Appendix 6 provides a full description of the framework of conservation significance for communities and flora species.

Table 6.3: Categories of conservation significance for flora species[4].

T: Threatened Flora (Schedule 1 under the *Wildlife Conservation Act 1950*): Declared Rare Flora – Extant
Taxa that have been adequately searched for and are deemed to be in the wild either rare, in danger of extinction or otherwise in need of special protection.

X: Threatened Flora (Schedule 2 under the *Wildlife Conservation Act 1950*): Declared Rare Flora - Extinct.
Taxa which have been adequately searched for and there is no reasonable doubt that the last individual has died.

Priority 1 - Poorly-known Taxa. Taxa that are known from one or a few collections or sight records (generally less than five), all on lands not managed for conservation and under threat of habitat destruction or degradation.

Priority 2 - Poorly-known Taxa. Taxa that are known from one or a few collections or sight records, some of which are on lands not under imminent threat of habitat destruction or degradation.

Priority 3 - Poorly-known Taxa. Taxa that are known from collections or sight records from several localities not under imminent threat, or from few but widespread localities with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat.

Priority 4 - Rare, Near Threatened and other taxa in need of monitoring.

(a) Rare. Taxa that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.

(b) Near Threatened. Taxa that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.

(c) Taxa that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

Priority 5 – Conservation Dependent taxa. Taxa that are not threatened but are subject to a specific conservation program, the cessation of which would result in the taxa becoming threatened within five years.

One Threatened and seven Priority flora species have been recorded from the study area during the current and previous surveys. Each species is described in Sections 6.2.1 and 6.2.2. Locations

[4] Conservation codes for Western Australian flora sourced from DEC website on 15/11/11; http://www.dec.wa.gov.au/content/view/852/2010/1/1/

for each of these species are summarised in tabular form and presented on the mapping in Appendix 2.

6.2.1 Threatened Flora (Declared Rare Flora – Extant)

There are currently two Threatened flora species in the Pilbara bioregion: *Thryptomene wittweri* (Mountain Thryptomene) and *Lepidium catapycnon* (Hamersley Lepidium). Both of these species are also listed as Threatened flora species under the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999*. *Lepidium catapycnon* was recorded from the northwestern section of the study area. *Thryptomene wittweri* was not recorded in the study area, and would not be expected to occur.

- ***Lepidium catapycnon* (Hamersley Lepidium)**

  This woody perennial is a small, upright plant typically growing between 20-30 cm in height. *Lepidium catapycnon* occurs in hummock grasslands on low, stony hills and occasionally stony plains. This relatively short-lived shrub species is often recorded from areas that have recently been disturbed, apparently persisting for only a few years. Now known from a number of locations in the Hamersley Range, *Lepidium catapycnon* extends broadly from Tom Price across to Newman. There are four historical records of this species within 25 km of the study area, the closest of which is approximately 19 km east of the study area. *Lepidium catapycnon* was recorded from 12 locations in the northwestern section of the study area, comprising four separate populations (Appendix 2). A total of 364 individuals were recorded (Appendix 2).

- ***Thryptomene wittweri* (Mountain Thryptomene)**

  This rounded shrub can reach heights of 2 m and has white flowers in April, June and August. *Thryptomene wittweri* is only known from high-altitude mountaintops in the inland Pilbara, its distribution extending south into the Gascoyne and Little Sandy Desert bioregions. There is no suitable habitat for *Thryptomene wittweri* (mountain crests of >1,000 m elevation) in the study area and this species would not be expected to occur.

6.2.2 Priority Flora

Twenty-three species of Priority flora have been identified as occurring in and around the study area (based on the results of the DEC and WA Herbarium database searches, reviews of previous studies and data collected for the current project). Each of these species is described below along with an assessment of its likelihood of occurring within the study area.

Seven Priority flora species have been recorded within the study area (indicated below by a star; ★), either during the current surveys or in previous studies undertaken in the area. There is suitable habitat within the study area for a further six Priority flora species and, although they have not been recorded to date, it is considered possible that they could occur. The remaining 10 Priority species are considered unlikely to occur in the study area, as they are not typically recorded from the habitats present.

- ***Brachyscome* sp. Wanna Munna Flats (S. van Leeuwen 4662) (Priority 1)**

  This erect annual herb has blue or purple flowers. It grows up to 40 cm in height and occurs on clay loam plains, usually in association with Mulga (*Acacia aneura*) woodlands. There is one record of this species from approximately 20 km southwest of the study area. This species is unlikely to occur in the study area due to the lack of suitable habitat.

- ***Eremophila spongiocarpa* (Priority 1)**

  This compact, succulent-leaved shrub grows to 1 m in height and occurs on weakly saline alluvial plains on the margins of marshlands. There are seven records of this species in the locality, the closest of which is approximately 3.3 km north of the study area. This species would not occur in the study area due to the lack of suitable habitat.

- ***Sida* sp. Hamersley Range (K. Newbey 10692) ★ (Priority 1)**

This low spreading to spindly upright shrub grows to 2 m in height and usually occurs on, or at the base of, steep slopes or hills on skeletal soils. This species was recorded from seven locations in the study area, mainly on rocky hillslopes (Appendix 2).

- ***Tecticornia globulifera*** **(Priority 1)**

  This spreading, moderately dense, perennial, semi-succulent shrub grows to a height of 50 cm and usually occurs on red clayey sand in proximity to water. There is one record of this species approximately 25 km north of the study area. This species would not occur in the study area, due to the lack of suitable habitat.

- ***Adiantum capillus-veneris*** **(Priority 2)**

  This rhizomatous, perennial fern grows to 20 cm high. It has fronds that are 1-2 pinnate and the stem (stipe) is blackish-brown in colour, hard and glossy. It occurs in moist, sheltered sites in gorges and on cliff walls. There is one record of this species approximately 25 km north of the study area. It is possible that this species could occur in the study area; if so, it would only be expected within the gorge associated with the Koodaideri spring.

- ***Stylidium weeliwolli*** **(Priority 2)**

  This small annual herb grows to 25 cm in height and has zygomorphic flowers that are pink or red, occurring from September to August. It most commonly grows at the edge of watercourses in gritty sand or sandy clay. There are records of two distinct populations of this species approximately 25 km east of the study area. This species could occur in the vegetation at the base of the gorge associated with the Koodaideri spring.

- ***Vigna* sp. central (M.E. Trudgen 1626) ★** **(Priority 2)**

  This species was recorded from the Koodaideri area in 2007 (Pilbara Iron 2007). No location coordinates are available, as this species was not listed as a Priority taxon at the time of that survey.

  There is some confusion over the determination of undescribed species of *Vigna*, particularly between *Vigna* sp. central (M.E. Trudgen 1626) and the more common *Vigna* sp. Hamersley Clay (A.A. Mitchell PRP 113), which is not listed as a Priority. According to FloraBase, *Vigna* sp. central (M.E. Trudgen 1626) is known from three widely separated locations in the eastern Pilbara, central southern Pilbara and near Onslow.

- ***Acacia subtiliformis*** **(Priority 3)**

  This spindly, slender shrub grows to 3.5 m in height and has very small phyllodes, with new growth being slightly viscid, resinous and aromatic. It has red peduncles and the inflorescence heads are up to 6 mm in diameter. *Acacia subtiliformis* usually occurs on rocky calcrete plateaus. There are three records of this species within 25 km of the study area: two populations are approximately 20 km south of the study area and one population is approximately 23 km east. This species would not be expected to occur in the study area due to the lack of suitable habitat.

- ***Atriplex flabelliformis*** **(Priority 3)**

  This erect, rounded perennial herb grows to 35 cm in height. It occurs on clay loam or loam and its preferred habitats are saline flats or marshes. There are three records of this species within 25 km of the study area. The closest location is approximately 9 km north of the study area, while two populations are just over 23 km northeast of the study area. This species would not occur in the study area, due to the lack of suitable habitat.

- ***Dampiera metallorum*** **(Priority 3)**

  This rounded, perennial herb grows to 50 cm in height and has bright blue to purple flowers. It occurs on red-brown, skeletal gravelly soil over banded ironstone and its preferred habitats are steep slopes and hill summits. There is one historical record of this species approximately 20 km west of the study area. It is possible that this species could occur in the study area, however this is considered unlikely as it has not been recorded to date.

- ***Glycine falcata*** **(Priority 3)**

  This mat-forming, perennial herb grows to 20 cm high and occurs on black clayey sand along drainage depressions, in crabhole plains and on river floodplains. There is a record of this species approximately 20 km west of the study area. This species would not be expected to occur in the study area due to a lack of suitable habitat.

- ***Goodenia* sp. East Pilbara (A.A. Mitchell PRP 727)** **(Priority 3)**

  This small, annual herb has a basal rosette of leaves, yellow flowers in August and an indumentum of sparse, appressed hairs. It occurs on red-brown clayey soil and calcrete areas on low, undulating or swampy plains. There are two historical records of this species approximately 17 km and 21 km south of the study area. This species is unlikely to occur in the study area due to a lack of suitable habitat.

- ***Iotasperma sessilifolium*** **(Priority 3)**

  This annual daisy has an erect habit and pink flowers. It is usually found at the edge of waterholes or plains, occurring on cracking clay or black loam. There is one record of this species approximately 20 km west of the study area. It would not be expected to occur in the study area due to the lack of suitable substrate.

- ***Nicotiana umbratica*** ★ **(Priority 3)**

  Nicotiana umbratica is a species of native tobacco, growing to 70 cm in height and typically occurring in sheltered areas amongst rocky outcrops. This species was recorded from Koodaideri in 2007 (Pilbara Iron 2007). No location coordinates are available for this record, as the survey was completed prior to the species being listed by DEC as a Priority.

- ***Rostellularia adscendens* var. *latifolia*** **(Priority 3)**

  This herb or shrub grows to 30 cm in height. It has opposite leaves, which are deep green, hairy and shortly lanceolate. This species usually occurs in dense clusters, on ironstone soils near creeks, and on rocky hills. There are two historical records of this species approximately 18 km southwest of the study area. This species could occur in the study area, although it has not been recorded to date despite numerous surveys.

- ***Sida* sp. Barlee Range (S. van Leeuwen 1642)** ★ **(Priority 3)**

  This spreading shrub grows to 50 cm in height and has yellow flowers. It usually occurs on skeletal red soils on steep rocky hillslopes. This species was recorded from 11 locations in the central section of the study area (Map 2, Appendix 2). There is an additional historical record from approximately 5.4 km southwest of the study area.

- ***Tecticornia medusa*** **(Priority 3)**

  This erect, yellow-green shrub grows to 1.2 m in height and occurs on red clayey sand, on flat floodways, lakebeds, saline alluvial plains and drainage sumps. There is one record of this species approximately 25 km north of the study area. This species would not occur in the study area due to the lack of suitable habitat.

- ***Themeda* sp. Hamersley Station (M.E. Trudgen 11431)** ★ **(Priority 3)**

  This perennial tussock grass grows from 1.3 to 1.8 m tall and typically grows in red cracking clay in tussock grasslands or in clayey creeks. It often occurs as scattered individuals but may form dense grasslands over large areas of cracking clay plains. *Themeda* sp. Hamersley Station (M.E. Trudgen 11431) was recorded from one location in the western section of the study area (Map 1, Appendix 2), and there is another historical record approximately 2 km north of the study area.

- ***Acacia bromilowiana*** **(Priority 4)**

  This species grows to a tree or shrub 12 m high. The phyllodes of *Acacia bromilowiana* are glaucous and slightly pruinose. The flowers are typical of wattles, growing in spikes from July to August. This species occurs in red skeletal loam or orange-brown gravel loam over banded ironstone and basalt. These habitats are usually associated with rocky hills and breakaways, gorges or creekbeds. Although *Acacia bromilowiana* could occur in the study area, this is considered unlikely given that this robust shrub has not been recorded to date; it would be expected to have been recorded by at least one of the previous surveys, if present.

- ***Eremophila magnifica* subsp. *magnifica* ★** **(Priority 4)**

  This shrub grows to a height of 1.5 m, producing blue or magenta flowers between August and November. It typically occurs on skeletal soils over ironstone and on rocky screes. This species was recorded from three locations in the central section of the study area (Map 1, Appendix 2).

- ***Eremophila youngii* subsp. *lepidota*** **(Priority 4)**

  This dense, spreading shrub can grow up to 3 m in height. This species occurs on stony red sandy loam, usually on plains, floodplains or sometimes semi-saline areas and clay flats. There is one record of this species approximately 17 km north of the study area. This species would not be expected to occur in the study area due to the lack of suitable habitat.

- ***Goodenia nuda*** **(Priority 4)**

  This species is an erect to ascending, slender herb growing to 50 cm in height, with narrow, pale green to glaucous leaves. The basal leaves are entire or narrowly toothed. This species is typically found growing near creeklines and in wet areas. There are five records of *Goodenia nuda* between 15 and 19 km south of the study area. This species could potentially occur in the study area, particularly in the riparian vegetation in the gorge associated with the Koodaideri spring.

- ***Rhynchosia bungarensis* ★** **(Priority 4)**

  This compact, prostrate shrub grows up to 50 cm in height and has very resinous trifoliate leaves. This species has been recorded growing in pebbly, shingly coarse sand amongst boulders, in flowlines, on floodplains and in rocky gullies. Over 1,300 individuals of *Rhynchosia bungarensis* were recorded from seven broad locations in the study area (Appendix 2).

6.2.3 Other Flora of Conservation Interest in the Study Area

- ***Sauropus* sp. Koodaideri detritals (J. Naaykens & J. Hurter JH 11213) ★**

  While not currently listed as a species of conservation significance, an unnamed species of *Sauropus* collected from the study area represents a species of interest (Plate 6.1 and Plate 6.2). This taxon was originally collected in 2007 and then recollected during the current study. The species is currently undescribed, however further collections have been made to assist with its description and classification. Initial observations suggest that this species occurs in gullies with outcropping rock at an elevation greater than 500 m (J. Naaykens, Rio Tinto, pers. comm. 2011). This species was recorded from a single location towards the centre of the study area (Map 1, Appendix 2), and has been recorded from additional locations to the east by Rio Tinto botanists (J. Naaykens, Rio Tinto, pers. comm. 2011).

Plate 6.1: *Sauropus* sp. habitat and form.

Plate 6.2: *Sauropus* sp. inflorescence.

Images courtesy of J. Naaykens, Rio Tinto, 2011.

6.3 Introduced Flora

Thirteen introduced (weed) species have been recorded from the study area (Appendix 2). This list of introduced species includes records from both the current survey and work completed in the area previously (Pilbara Iron 2007, 2010, Biota 2008).

None of these species are Declared Plants listed under the *Agriculture and Related Protection Act 1976,* however **Cenchrus* species, **Aerva javanica* and **Acetosa vesicaria* are considered to be serious environmental weeds (CALM 1999). The locations and estimates of population sizes for each weed record (where these are available) are listed in Appendix 2.

Each introduced species is discussed briefly below:

- ****Acetosa vesicaria* (Ruby Dock)**

  Ruby Dock is a stout, fleshy plant with broad, triangular leaves and densely clustered fruit enclosed in red to pink valves. A common weed of roadsides and disturbed areas, it is scattered across the State, particularly in the arid zone. This perennial herb was initially introduced to the Pilbara for mine site rehabilitation and has since spread to surrounding areas. It is an aggressive weed that spreads by vegetative material as well as seed. One record of this species was made in a large gully in the central section of the study area (Appendix 2, Map 1).

- ****Aerva javanica* (Kapok Bush)**

  Kapok Bush is a short-lived perennial, which is found amongst tall trees, medium trees (*Eucalyptus* woodland), low trees, low (sclerophyll) shrubland, grassland and spinifex grassland. Its habitat preferences include outcrops, coastal areas, in rocky or stony soil, gravelly soil, sand, loam, clay, occupying sand dunes, floodplains, river-banks, creeklines, drainage-lines and disturbed native vegetation. It is common throughout the Pilbara and Kimberley regions. Seven populations of this species were recorded from three locations in the western section of the study area (Appendix 2, Map 1).

- ****Bidens bipinnata* (Beggars Ticks)**

  **Bidens bipinnata* is a common weed of Mulga vegetation and creeklines of the Pilbara. It has deeply lobed, bipinnate leaves and yellow flowers. This annual daisy may occur in very high densities within suitable habitat and given appropriate conditions, but on its own does not appear to cause exclusion of native flora species. It is distributed across the north of the State from Kununurra to Carnarvon and is scattered throughout the Pilbara and Gascoyne regions. Over 140 populations of this species were recorded throughout the study area (Appendix 2, Maps 1 and 2).

- ****Cenchrus ciliaris* (Buffel Grass) and **Cenchrus setiger* (Birdwood Grass)**

  Buffel Grass was introduced by pastoralists as a fodder species. It has demonstrated allelopathic capacities whereby it releases chemicals that inhibit the growth of other plants (Cheam 1984a, 1984b), and it is an aggressive and effective competitor with native flora species. This perennial grass forms dense tussock grasslands, particularly along creeklines, floodplains and in sandy coastal areas. Infestations of this species are common throughout the Hamersley Range and particularly in major creeklines, and in sandy coastal areas. It is common in the Pilbara, Gascoyne, Carnarvon and Kimberley regions and is also found throughout desert areas in central Western Australia and Perth. Birdwood Grass is less common but occurs in similar habitats. Over 90 populations of **Cenchrus ciliaris* were recorded throughout the study area, primarily in gullies and flowlines (Appendix 2, Maps 1 and 2), while populations of **C. setiger* were recorded in drainage areas in the northwest end of the study area (Appendix 2, Map 1).

- ****Cucumis melo* subsp. *agrestis* (Ulcardo Melon)**

  Ulcardo Melon is a widespread weed throughout the Kimberley, Pilbara and Gascoyne bioregions. The trailing annual herb is bristly or softly hairy, has yellow flowers solitary or in clusters of two to four and is in flower in autumn and spring. The mature fruit is ellipsoid, 2-5 cm

in length, green to yellow in colour and becoming glabrescent with age. A single individual of this species was recorded in the eastern end of the study area (Appendix 2, Map 2).

- ***Flaveria trinervia* (Speedy Weed)**

  Speedy Weed is a common weed of the northwest of WA, from the Kimberley to approximately Carnarvon. This annual daisy is widespread and frequently recorded in the Pilbara, occurring mainly in Mulga vegetation and along creeklines. Although this species can occur in abundant numbers under good conditions, it is a relatively slender herb and does not obviously appear to exclude native species. Speedy Weed was recorded at Koodaideri in 2007 (Pilbara Iron 2007), however no location details were recorded at the time, as this species was only recently determined to be an introduced species by the WA Herbarium. A single individual of this species was recorded in the northeastern section of the study area during the more recent surveys (Appendix 2, Map 2).

- ***Lactuca saligna* (Wild Lettuce)**

  Wild Lettuce is a spindly, erect annual daisy that grows to 1 m high. This species is most common in the South-West region of WA, but is occasionally recorded in the Pilbara. Wild Lettuce is typically encountered in drainage lines and disturbed areas. Five populations of this species were recorded scattered within the Koodaideri spring area (Appendix 2, Map 1).

- ***Lactuca serriola* (Prickly Lettuce)**

  Prickly Lettuce is a spindly, erect annual daisy that grows to 2m high. In the Pilbara, **L. serriola* has been recorded at West Angelas and Jimblebar, near Newman (Biota, unpubl. data) and from the vicinity of a permanent soak in the Bungaroo valley (Biota 2007). It is also found in the Carnarvon, Murchison and Wheatbelt regions but is most common on the Swan Coastal Plain. Flowering from October to February, Prickly Lettuce is encountered on roadsides, gardens and disturbed areas and cultivated sites. One population of this species was recorded in the Koodaideri spring area (Appendix 2, Map 1).

- ***Malvastrum americanum* (Spiked Malvastrum)**

  Spiked Malvastrum is a common weed of Mulga vegetation, hillsides, floodplains and drainage lines. It is an erect, perennial herb or shrub to 1.3 m high, which has yellow or orange flowers produced from April to July. This species is widespread throughout the Kimberley, Pilbara, Gascoyne and Carnarvon bioregions. Thirteen populations of Spiked Malvastrum were recorded in gullies in the western half of the study area (Appendix 2, Map 1).

- ***Portulaca oleracea* (Purslane)**

  Purslane is a very common weed of clayey and stony plains in the Pilbara, but does not appear to compete with native species. Purslane was recorded at Koodaideri in 2007 (Pilbara Iron 2007); location details were not recorded as the species was not recognised by the WA Herbarium as an introduced taxon at the time. Four populations of this species were recorded from the eastern two-thirds of the study area (Appendix 2, Maps 1 and 2).

- ***Setaria verticillata* (Whorled Pigeon Grass)**

  Whorled Pigeon Grass is a common weed of creeklines and Mulga vegetation in the Pilbara, but rarely occurs in large numbers. It is a loosely tufted, annual grass species to 1.3 m high with a dense, spike-like inflorescence. This weed is widespread around the State from Kununurra to Albany. A total of 37 populations of this species were recorded in large gullies scattered throughout the study area (Appendix 2, Maps 1 and 2).

- ***Sigesbeckia orientalis* (Indian Weed)**

  Indian Weed is an erect, slender annual. This cosmopolitan species is a common weed through the southern Pilbara region, typically occurring in mesic areas such as creeklines and floodplains, but is rarely found in high densities. It also occurs in rocky gullies and limestone ranges at Exmouth, and in the South-West region of WA. It grows up to 1 m in height and the yellow flowers are produced all year. Four populations of this species were recorded on rocky slopes in the central section of the study area (Appendix 2, Map 2).

6.4 Fungi

The conservation significance of fungi in inland Western Australia is largely unknown due to a lack of research in this area. No fungi in the Pilbara bioregion (or any other part of arid inland Australia) are currently classified as Threatened or Priority flora under the State listing prepared by the DEC, or listed as Threatened under the Federal *EPBC Act 1999*.

Despite the lack of fungal taxonomic research in the Pilbara, they have an established and important role in Australian ecosystems. Macrofungi play major roles in decomposition and nutrient cycling, contribute to soil structure and health and fruit bodies provide a food source for native fauna (Fitter and Garbaye 1993, Claridge and May 1994, Maser et al. 2008). Some of the prominent plant families in the Pilbara, including the Myrtaceae, Poaceae and Malvaceae (Brundrett 2011), rely on mycorrhizal fungi to enhance water and nutrient uptake (especially phosphorus, zinc and copper). In return, the fungi gain energy from the plants, but can also protect roots in adverse soil conditions such as low pH and high soil temperature (Smith and Read 1997, Brundrett 2004).

Eight species of fungi were recorded opportunistically from the study area, which should not be considered a comprehensive list of taxa present. Two of these fungi are unnamed, potentially new species (Dr Richard Robinson, DEC, pers. comm. 2011). Brief descriptions of the species are provided below:

- ***Crepidotus* sp.**

  This species of shelf fungi is saprophytic, meaning it breaks down dead organic matter. It is usually found growing on dead logs (Plate 6.3). The fruiting body has a white furry upper surface, with light grey gills underneath. It has an irregular semi-circular shape, and is 5-20 mm x 5-10 mm in size.

- ***Ganoderma steyaertanum***

  This species is parasitic on *Acacia* species and is widespread in the north of Western Australia. It has a robust, tough leathery fruiting body. The cap is a shiny dark reddish-brown colour and can be variable in shape but is usually circular. It is approximately 80-200 mm wide, with white or beige pores underneath. The stem is also variable in shape, approximately 20-40 mm wide x 30-80 mm long, and has the appearance of dark reddish-brown lacquered wood (Plate 6.4).

- ***Lycoperdon* sp.**

  This species has a white to grey, ball-like fruit body, approximately 5-15 mm wide, and no stem. It has dark yellow-brown spores, which are released at maturity through an opening on the top of the fruiting body (Plate 6.5).

- ***Perennipora ochroleuca***

  This species of shelf fungi is saprophytic, meaning it breaks down dead organic matter. It is usually found growing on dead logs (Plate 6.6). The leathery cap of the semi-circular fruit body is a light yellow or fawn colour with slightly lighter coloured pores underneath, and is 20-90 mm x 10-50 mm in size.

- ***Phellorinia herculeana***

  This genus has a white stem, which is slightly bulbous at the base. The white elongated fruiting body is similar in shape to that of *Podaxis pistillaris,* although its colour is more persistent with age and the outer layers look very ragged and peeling (Plate 6.7). The stem is approximately 10-15 mm x 80-150 mm and the cap is approximately 20-35 mm x 50-100 mm.

- ***Pisolithus albus***

  This species has a yellow-brown, irregularly shaped ball-like fruit body, approximately 50-150 mm high and 30-80mm wide, tapering to a thick stem at the base. It has dark yellow-brown spores, which are released at maturity when the outer surface (peridium) splits open (Plate 6.8).

- ***Podaxis pistillaris***

  This stalked puffball is one of the most common and persistent fungi found throughout the arid and semi-arid zones of Australia. It has an elongated fruiting body, which peels and sheds its outer layer (peridium) when mature to expose masses of black spores (gleba) (Plate 6.9). The white elongate-oval head is approximately 60-100 mm x 20-40 mm. The whitish fibrous stem is approximately 80-200 mm x 5-15 mm, and continues up through the centre of the gleba.

- ***Pycnoporus coccineus***

  This species of shelf fungi is saprophytic, meaning it breaks down dead organic matter. It is usually found growing on dead wood (Plate 6.10). The leathery cap of the semi-circular fruit body is a dull to bright orange with vivid orange pores underneath, and is 20-100 mm x 10-50 mm in size.

Plate 6.3: ***Crepidotus* sp.**

Plate 6.4: ***Ganoderma steyaertanum*.**

Plate 6.5: ***Lycoperdon* sp.**

Plate 6.6: ***Perennipora ochroleuca*.**

Plate 6.7: ***Phellorinia herculeana*.**

Plate 6.8: ***Pisolithus albus*.**

Plate 6.9: ***Podaxis pistillaris*.**

Plate 6.10: ***Pycnoporus coccineus*.**

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Appendix 1

Vegetation Structural Classification and Condition Ranking Scale

Vegetation Structural Classes*

Stratum	Canopy Cover (%)				
	70-100%	30-70%	10-30%	2-10%	<2%
Trees over 30 m	Tall closed forest	Tall open forest	Tall woodland	Tall open woodland	Scattered tall trees
Trees 10-30 m	Closed forest	Open forest	Woodland	Open woodland	Scattered trees
Trees under 10 m	Low closed forest	Low open forest	Low woodland	Low open woodland	Scattered low trees
Shrubs over 2 m	Tall closed scrub	Tall open scrub	Tall shrubland	Tall open shrubland	Scattered tall shrubs
Shrubs 1-2 m	Closed heath	Open heath	Shrubland	Open shrubland	Scattered shrubs
Shrubs under 1 m	Low closed heath	Low open heath	Low shrubland	Low open shrubland	Scattered low shrubs
Hummock grasses	Closed hummock grassland	Hummock grassland	Open hummock grassland	Very open hummock grassland	Scattered hummock grasses
Grasses, Sedges, Herbs	Closed tussock grassland / bunch grassland / sedgeland / herbland	Tussock grassland / bunch grassland / sedgeland / herbland	Open tussock grassland / bunch grassland / sedgeland / herbland	Very open tussock grassland / bunch grassland / sedgeland / herbland	Scattered tussock grasses / bunch grasses / sedges / herbs

* Based on Muir (1977), and Aplin's (1979) modification of the vegetation classification system of Specht (1970): Aplin T.E.H. (1979). The Flora. Chapter 3 In O'Brien, B.J. (ed.) (1979). *Environment and Science*. University of Western Australia Press; Muir B.G. (1977). Biological Survey of the Western Australian Wheatbelt. Part II: Vegetation and habitat of Bendering Reserve. *Records of the Western Australian Museum*, Suppl. No. 3; Specht R.L. (1970). Vegetation. In: *The Australian Environment*. 4th edn (Ed. G.W. Leeper). Melbourne.

Vegetation Condition Scale for use on Pilbara surveys*

E = Excellent (=Pristine of BushForever)
Pristine or nearly so; no obvious signs of damage caused by the activities of European man.

VG = Very Good (= Excellent of BushForever)
Some relatively slight signs of damage caused by the activities of European man. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds such as **Ursinia anthemoides* or **Briza* spp., or occasional vehicle tracks.

G = Good (= Very Good of BushForever)
More obvious signs of damage caused by the activities of European man, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or by selective logging. Weeds as above, possibly plus some more aggressive ones such as **Ehrharta* spp.

P = Poor (= Good of BushForever)
Still retains basic vegetation structure or ability to regenerate to it after very obvious impacts of activities of European man, such as grazing, partial clearing (chaining) or frequent fires. Weeds as above, probably plus some more aggressive ones such as **Ehrharta* spp.

VP = Very Poor (= Degraded of BushForever)
Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species including very aggressive species.

D = Completely Degraded (= Completely Degraded of BushForever)
Areas that are completely or almost completely without native species in the structure of their vegetation; ie. areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs.

* Based on Trudgen M.E. (1988). A Report on the Flora and Vegetation of the Port Kennedy Area. Unpublished report prepared for Bowman Bishaw and Associates, West Perth.

Appendix 2

Locations of Flora of Conservation Significance and Introduced Flora

Table 1: Locations of flora species of conservation significance recorded within the study area.

Species	Status	Source	Easting (mE, WGS84)	Northing (mN, WGS84)	Individuals
Lepidium catapycnon	Threatened	Biota	704695	7509387	20
		Biota	705679	7509296	20
		Biota	705746	7509280	75
		Biota	705753	7509328	30
		Biota	705829	7509286	135
		Rio Tinto	706259	7509948	1
		Biota	706559	7509930	8
		Biota	706593	7510101	20
		Biota	706611	7510041	1
		Biota	706709	7509427	23
		Biota	706763	7509439	30
		Biota	707051	7509494	1
Sida sp. Hamersley Range (K. Newbey 10692) PN	Priority 1	Biota	706340	7508350	1
		Biota	706558	7509930	1
		Biota	706974	7510103	1
		Biota	714113	7506106	1
		Biota	716404	7501639	1
		Biota	718706	7504077	1
		Biota	720626	7503128	1
		Biota	722516	7502610	1
Vigna sp. central (M.E. Trudgen 1626) †	Priority 2	Rio Tinto	No coordinates recorded		1
Nicotiana umbratica †	Priority 3	Rio Tinto	No coordinates recorded		1
Sida sp. Barlee Range (S. van Leeuwen 1642)	Priority 3	Biota	711437	7505841	1
		Biota	711967	7504318	1
		Biota	712072	7503180	1
		Biota	712180	7503020	1
		Rio Tinto	712561	7504429	1
		Rio Tinto	712585	7504470	1
		Biota	713606	7504954	1
		Biota	714340	7504198	1
		Biota	716901	7502787	20
		Biota	716940	7503203	1
		Biota	717058	7502836	15
Themeda sp. Hamersley Station (M.E. Trudgen 11431)	Priority 3	Rio Tinto	709001	7509228	1
Eremophila magnifica subsp. *magnifica*	Priority 4	Rio Tinto	711546	7503062	45
		Biota	711720	7503633	1
		Rio Tinto	711765	7503224	1
Rhynchosia bungarensis	Priority 4	Rio Tinto	702249	7508264	1
		Biota	709754	7503937	1
		Rio Tinto	711277	7505686	1000
		Biota	711372	7505704	50
		Rio Tinto	711373	7505739	1
		Rio Tinto	711380	7505741	10
		Biota	711383	7505725	4
		Biota	711466	7505782	2
		Biota	711466	7506282	1
		Biota	711482	7505802	106
		Rio Tinto	711508	7505822	35
		Rio Tinto	711508	7505822	40
		Rio Tinto	711523	7505830	15
		Biota	711544	7505864	10
		Biota	711561	7505905	13
		Rio Tinto	711573	7505882	2
		Rio Tinto	711806	7503931	10

Species	Status	Source	Easting (mE, WGS84)	Northing (mN, WGS84)	Individuals
Rhynchosia bungarensis	Priority 4	Biota	712082	7502570	1
		Biota	712148	7502789	1
		Biota	712180	7503020	1
		Biota	714103	7502088	1
		Biota	714268	7502023	10
		Biota	714340	7504198	1
		Rio Tinto	715362	7502368	1
		Rio Tinto	715812	7502532	2
		Rio Tinto	718417	7503730	10
Sauropus sp. Koodaideri detritals (J. Naaykens & J. Hurter JH 11213)	Species of Interest	Rio Tinto	713955	7503216	1
		Rio Tinto	713991	7503212	1
		Rio Tinto	714000	7503271	1
		Rio Tinto	714007	7503235	1
		Rio Tinto	714042	7503293	1
		Rio Tinto	714042	7503293	1
		Rio Tinto	714061	7503172	1
		Rio Tinto	714079	7503209	1
		Rio Tinto	714081	7503209	1

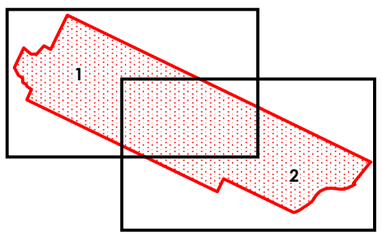
† These species were recorded in the study area (Pilbara Iron 2007) but were not listed as Priority species at the time of survey.

7,512,000 mN
704,000 mE
708,000 mE
712,000 mE
716,000 mE
7,508,000 mN
7,504,000 mN

KOD61
KOD56
KOD17
KOD30
KOD08
KOD29
KOD25
KOD46
KOD57
KOD55
KOD39
KOD42
KOD22
KOD23
KOD51
KOD02
KOD24
KOD03
KOD36
KOD59
KOD21
KOD41
KOD01
KOD58
KOD63
KOD52
KOD18
KOD19
KOD16
KOD15
KOD37
KOD04
KOD49
KOD14
KOD48
KOD38
KOD53
KOD11
KOD54
KOD50
KOD05
KOD13
KOD33
KOD12
KOD35

Location Map

Index to Maps



Priority and Threatened Flora

- *Eremophila magnifica* subsp. *magnifica* (P4)
- *Rhynchosia bungarensis* (P4)
- *Sida* sp. Barlee Range (S. van Leeuwen 1642) (P3)
- *Themeda* sp. Hamersley Station (M.E. Trudgen 11431) (P3)
- *Sida* sp. Hamersley Range (K. Newbey 10692) (P1)
- *Lepidium catapycnon* (DRF)

- Study area boundary
- Quadrat location
- *Sauropus* sp. Koodaideri detritals (flora of interest)

N

0 1 2
kilometres

Koodaideri
Priority Flora Map 1

Biota Environmental Sciences

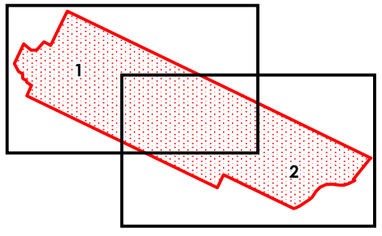
Author: J Fairhead | Drawn: M Robinson | Dwg No.: 664 | Date: 07 Nov 2011 | Revised: 02 Dec 2011 | Projection: MGA Z50 (GDA94) | Scale: 1:40,000

KOD51
KOD02
KOD03
KOD36
KOD41
KOD21
KOD01
KOD18
KOD19
KOD16
KOD04
KOD49
KOD14
KOD48
KOD38
KOD53
KOD11
KOD44
KOD54
KOD50
KOD05
KOD13
KOD27
KOD06
KOD33
KOD12
KOD-JA
KOD28
KOD32
KOD62
KOD10
KOD07
KOD45
KOD35
KOD09
KOD43
KOD31
KOD47
KOD-R
KOD26
KOD60
KOD20
KOD40

712,000 mE
716,000 mE
720,000 mE
724,000 mE
7,504,000 mN
7,500,000 mN

Location Map

Index to Maps



Priority and Threatened Flora

- *Eremophila magnifica* subsp. *magnifica* (P4)
- *Rhynchosia bungarensis* (P4)
- *Sida* sp. Barlee Range (S. van Leeuwen 1642) (P3)
- *Themeda* sp. Hamersley Station (M.E. Trudgen 11431) (P3)
- *Sida* sp. Hamersley Range (K. Newbey 10692) (P1)
- *Lepidium catapycnon* (DRF)

- Study area boundary
- Quadrat location
- *Sauropus* sp. Koodaideri detritals (flora of interest)

N

0 1 2
kilometres

Koodaideri Priority Flora Map 2

Biota Environmental Sciences

Author: J Fairhead | Drawn: M Robinson | Dwg No.: 664 | Date: 07 Nov 2011 | Revised: 02 Dec 2011 | Projection: MGA Z50 (GDA94) | Scale: 1:40,000

Table 2: Locations of introduced flora (weeds) occurring in the study area.

Species	Easting (mE, WGS84)	Northing (mN, WGS84)	Number of Individuals
**Acetosa vesicaria*	712126	7504077	1
**Aerva javanica*	706110	7506588	3
	706321	7506604	5
	711536	7505850	scattered
	711588	7506045	200 (100 on each cliff)
	712296	7505217	20
	712723	7505148	10
	712777	7505012	1
**Bidens bipinnata*	702017	7507980	50
	702848	7508827	50
	704471	7505868	20
	704569	7506009	50
	704622	7505943	100
	704722	7506097	50
	704747	7505953	20
	705122	7508520	20
	705716	7506148	200
	705772	7507174	50
	705866	7506792	500
	705883	7506813	100
	705887	7506634	5
	705921	7506298	200
	705925	7506908	50
	705927	7507050	100
	705930	7507963	100
	705992	7506574	20
	705999	7507106	20
	706045	7507944	100
	706071	7506309	1000
	706112	7506573	20
	706170	7507271	5
	706241	7507037	20
	706243	7507013	20
	706308	7507641	5
	706316	7506562	100
	706350	7507187	20
	706384	7507480	20
	706468	7505910	20
	706475	7506340	100
	706486	7506047	20
	706536	7505684	50
	706545	7506739	1
	706566	7506736	50
	706578	7506476	50
	706615	7506650	10
	706624	7506083	500
	706669	7506129	10
	706672	7506576	100
	706939	7508091	20
	707056	7508471	20
	707622	7506383	50
	707682	7506382	50
	708068	7505664	1
	710785	7507119	100
	710809	7504806	500
	710938	7504779	100
	711019	7504827	10
	711386	7504465	5
	711411	7505680	50
	712264	7504875	50
	712276	7504970	100

Species	Easting (mE, WGS84)	Northing (mN, WGS84)	Number of Individuals
**Bidens bipinnata*	712347	7505288	50
	712507	7504535	5
	712611	7504786	5
	715362	7502368	1000
	715793	7503416	20
	715832	7503118	30
	716757	7502504	10
	716843	7503351	1
	717095	7502769	1
	717320	7502775	scattered
	717360	7503151	15
	717482	7502662	1
	717531	7501882	30
	717697	7502124	2
	717711	7502558	1
	718379	7501030	100
	718458	7503033	1
	718718	7501287	50
	706753	7505821	50
	702017	7507980	50
	702848	7508827	50
	704471	7505868	20
	704569	7506009	50
	704622	7505943	100
	704722	7506097	50
	704747	7505953	20
	705122	7508520	20
	705716	7506148	200
	705772	7507174	50
	705866	7506792	500
	705883	7506813	100
	705887	7506634	5
	705921	7506298	200
	705925	7506908	50
	705927	7507050	100
	705930	7507963	100
	705992	7506574	20
	705999	7507106	20
	706045	7507944	100
	706071	7506309	1000
	706112	7506573	20
	706170	7507271	5
	706241	7507037	20
	706243	7507013	20
	706308	7507641	5
	706316	7506562	100
	706350	7507187	20
	706384	7507480	20
	706468	7505910	20
	706475	7506340	100
	706486	7506047	20
	706531	7505821	50
	706536	7505684	50
	706545	7506739	1
	706566	7506736	50
	706578	7506476	50
	706604	7506212	scattered
	706615	7506650	10
	706624	7506083	500
	706669	7506129	10
	706672	7506576	100
	706939	7508091	20

Species	Easting (mE, WGS84)	Northing (mN, WGS84)	Number of Individuals
**Bidens bipinnata*	707056	7508471	20
	707622	7506383	50
	707682	7506382	50
	708068	7505664	1
	709726	7504718	scattered
	710785	7507119	100
	710809	7504806	500
	710938	7504779	100
	711019	7504827	10
	711386	7504465	5
	711411	7505680	50
	712264	7504875	50
	712276	7504970	100
	712347	7505288	50
	712507	7504535	5
	712611	7504786	5
	715362	7502368	1000
	715793	7503416	20
	715832	7503118	30
	716757	7502504	10
	716843	7503351	1
	717095	7502769	1
	717320	7502775	1
	717360	7503151	15
	717482	7502662	1
	717531	7501882	30
	717697	7502124	2
	717711	7502558	1
	718379	7501030	100
	718458	7503033	1
	718718	7501287	50
**Cenchrus ciliaris*	702843	7508921	scattered
	706054	7507844	scattered
	706222	7507607	70%
	706351	7507339	1
	706484	7506830	1
	706496	7507040	1
	706571	7505069	1
	706581	7506605	1
	706604	7506212	1
	706626	7505896	1
	706804	7507561	1
	707067	7507517	1
	707356	7509505	70%
	707440	7506739	1
	707934	7509791	60%
	708024	7506518	scattered
	708215	7511419	1
	709004	7509228	100+ ind
	709726	7504718	scattered
	710154	7505655	scattered
	711177	7505746	1
	711378	7505683	1
	711478	7505885	1
	711536	7505850	1
	711539	7506538	1
	711561	7505905	1
	711564	7505966	1
	711570	7506000	1
	711576	7506044	1
	711986	7503961	1
	712072	7503180	1

Species	Easting (mE, WGS84)	Northing (mN, WGS84)	Number of Individuals
**Cenchrus ciliaris*	712085	7503872	1
	712397	7508139	1
	712458	7505161	1
	713186	7506522	1000
	713469	7506976	scattered
	713496	7506748	1
	713733	7408906	1
	713748	7506960	1
	713853	7508822	1
	713928	7508790	1
	714122	7505358	1
	714288	7506115	30%
	714340	7504198	1
	714501	7505736	1
	714850	7508400	1
	714916	7506138	1
	715607	7508406	1
	715739	7505111	24 ind.
	716411	7502441	scattered
	716553	7502431	scattered
	716628	7502441	scattered
	716684	7502428	scattered
	716757	7502504	scattered
	716764	7502456	scattered
	716790	7502630	scattered
	716800	7502727	3%
	716874	7502765	scattered
	716952	7502746	dense
	717135	7502767	scattered
	717232	7502857	scattered
	717260	7502767	dense
	717297	7502844	dense
	717353	7503089	scattered
	717354	7502955	scattered
	717362	7503182	scattered
	717424	7503197	scattered
	717450	7503041	scattered
	717451	7502966	dense
	717456	7503157	dense
	717645	7502754	dense
	717670	7503140	dense
	717685	7502494	1
	717708	7502387	scattered
	717711	7502558	dense
	717875	7502930	dense
	717886	7503138	dense
	717930	7503276	dense
	717960	7502644	70%
	718025	7503217	dense
	718026	7503310	dense
	718117	7503306	dense
	718156	7504498	1
	718214	7503316	dense
	718336	7504585	1
	718411	7503189	dense
	718542	7503175	scattered
	718600	7503499	dense
	718642	7503685	50
	721155	7502961	1
	721679	7500725	1
**Cenchrus setiger*	706248	7507057	5000
	707934	7509791	10%

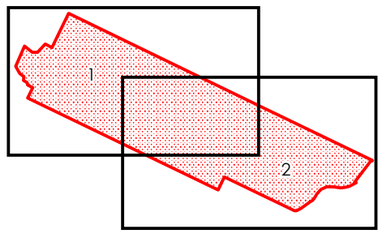
Species	Easting (mE, WGS84)	Northing (mN, WGS84)	Number of Individuals
**Cucumis melo* subsp. *agrestis*	716800	7502727	scattered
**Flaveria trinervia*	722518	7502644	scattered
**Lactuca saligna*	711536	7505850	scattered
	711572	7505995	2
	711576	7506044	1
	711588	7506045	scattered
	723014	7501425	scattered
**Lactuca serriola*	711572	7505995	2
**Malvastrum americanum*	705957	7507050	50
	706002	7507080	10
	706213	7506900	50
	706261	7507591	50
	706385	7506712	5
	706604	7506212	1
	706650	7506605	5
	706666	7507131	10
	706737	7506445	10
	706775	7506975	10
	707161	7508217	50
	707849	7510453	5
	711404	7505690	50
**Portulaca oleracea*	709891	7507456	scattered
	714428	7503676	scattered
	715739	7505111	scattered
	721679	7500725	scattered
**Setaria verticillata*	705749	7507219	50
	705772	7507174	10
	705925	7506908	50
	705934	7506944	20
	706002	7507080	20
	706248	7507057	20
	706319	7507793	10
	706335	7507360	200
	706867	7507880	20
	706886	7507949	50
	707061	7507450	200
	707232	7508171	20
	714641	7503046	1
	714811	7505176	1
	715406	7502484	1
	715861	7502580	scattered
	716411	7502441	dense
	716553	7502431	dense
	716628	7502441	dense
	716684	7502428	60
	716757	7502504	10
	716790	7502630	2
	717135	752767	scattered
	717228	7502744	1
	717297	7502844	scattered
	717320	7502775	5
	717349	7503013	25
	717360	7503151	5
	717670	7503140	scattered
	717697	7502124	scattered
	717711	7502558	scattered
	717886	7503138	scattered
	717930	7503276	scattered
	718025	7503217	20
	718026	7503310	5
	718305	7503378	10
	718732	7501109	1000

Species	Easting (mE, WGS84)	Northing (mN, WGS84)	Number of Individuals
**Sigesbeckia orientalis*	714429	7505268	5
	715848	7502588	2
	715860	7502591	scattered
	715943	7502573	scattered

7,512,000 mN
704,000 mE
708,000 mE
712,000 mE
716,000 mE
7,508,000 mN
7,504,000 mN

Location Map

Index to Maps



Weeds

- *Acetosa vesicaria*
- *Aerva javanica*
- *Bidens bipinnata*
- *Cenchrus ciliaris*
- *Cenchrus setiger*
- *Cucumis melo* subsp. *agrestis*
- *Flaveria trinervia*
- *Lactuca saligna*
- *Lactuca serriola*
- *Malvastrum americanum*
- *Portulaca oleracea*
- *Setaria verticillata*
- *Sigesbeckia orientalis*

Study area boundary

N

0 1 2

kilometres

Koodaideri Weeds Map 1

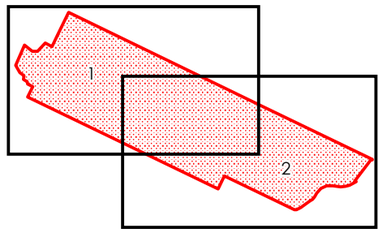
Biota Environmental Sciences

Author: J Fairhead | Drawn: M Robinson | Dwg No.: 664 | Date: 10 Nov 2011 | Revised: 08 Dec 2011 | Projection: MGA Z50 (GDA94) | Scale: 1:40,000

712,000 mE
716,000 mE
720,000 mE
724,000 mE
7,504,000 mN
7,500,000 mN

Location Map

Index to Maps



Weeds

- *Acetosa vesicaria*
- *Aerva javanica*
- *Bidens bipinnata*
- *Cenchrus ciliaris*
- *Cenchrus setiger*
- *Cucumis melo* subsp. *agrestis*
- *Flaveria trinervia*
- *Lactuca saligna*
- *Lactuca serriola*
- *Malvastrum americanum*
- *Portulaca oleracea*
- *Setaria verticillata*
- *Sigesbeckia orientalis*

Study area boundary

N

0 1 2

kilometres

Koodaideri Weeds Map 2

Biota Environmental Sciences

Author: J Fairhead | Drawn: M Robinson | Dwg No.: 664 | Date: 11 Nov 2011 | Revised: 09 Dec 2011 | Projection: MGA Z50 (GDA94) | Scale: 1:40,000

Appendix 3

Vegetation Mapping

7,512,000 mN
7,508,000 mN
7,504,000 mN
704,000 mE
708,000 mE
712,000 mE
716,000 mE

ChAiGwTw
ElAbTwTsps
ElAhiAarTspsTe
ElChGwAprTsps
ElAbTwTsps
ChApyJAdTs
KOD61
KOD56
KOD17
AtuAThGwApyTErCEc
AiGwTlaTp
AiGwTeCEc
KOD30
KOD29
KOD08
KOD25
ElGwAhiAspTwTsps
AiGwTeCEc
ApyGwAThGOrTErCEcTe
ChApyAtuTErCEc
AiGwTlaTp
AprGwCEcTe
ElAbTwTsps
ElChGwAprTsps
ElChAmTw
KOD46
AiGwTeCEc
ChGwCYaCEcTe
ElEgHcGwAspAarTspsTw
KOD57
KOD55
KOD39
ElChAmTw
ChAtuCEc
AanElTspsTHt
KOD42
KOD22
ApyGwAThGOrTErCEcTe
KOD23
ElGwAhiAspTwTsps
KOD51
KOD02
ChApyAtuTErCEc
KOD24
KOD03
KOD36
AiGwTlaTp
KOD59
KOD41
KOD21
ApyGwAThGOrTErCEcTe
AanElTspsTHt
KOD18
KOD18BANK
KOD01
ChAiGwTsps
KOD58
KOD63
ElGwAhiAspTwTsps
ElEgHcGwAspAarTspsTw
KOD52
CfElAtuTe
KOD19
AiGwTlaTp
ElGwAhiAspTwTsps
KOD15
KOD16
AiGwTlaTp
KOD37
KOD04
ElChAmTw
AarAspTspsTw
AarAspTspsTw
KOD14
ElAbTwTsps
KOD49
KOD38
KOD48
KOD53
KOD11
KOD54
KOD50
AprApyAThCEc
Gully
Mosaic
KOD05
KOD13
AprGwCEcTe
ElGwAhiAspTwTsps
ApyGwAThGOrTErCEcTe
KOD33
AprApyAThCEc
KOD12
AprGwAarAspTsps
ElEgEkTw
ElGwAhiAspTwTsps
ElAspTsps
KOD-JA
KOD32
ElEgEkTw
KOD10
ElEgEkTw
KOD35

Location Map

KARRATHA
Map Area
PERTH
KALGOORLIE

Index to Maps

1
2

Priority and Threatened Flora

- *Eremophila magnifica* subsp. *magnifica* (P4)
- *Rhynchosia bungarensis* (P4)
- *Sida* sp. Barlee Range (S. van Leeuwen 1642) (P3)
- *Themeda* sp. Hamersley Station (M.E. Trudgen 11431) (P3)
- *Sida* sp. Hamersley Range (K. Newbey 10692) (P1)
- *Lepidium catapycnon* (DRF)

- Study area boundary
- Quadrat location
- Relevé location
- *Sauropus* sp. Koodaideri detritals (flora of interest)

N

0 1 2
kilometres

Koodaideri Vegetation Map 1

Biota Environmental Sciences

Author: J Fairhead | Drawn: M Robinson | Dwg No.: 664 | Date: 02 Dec 2011 | Revised: 31 Jan 2012 | Projection: MGA Z50 (GDA94) | Scale: 1:40,000

KOD55 KOD57 ElEgHcGwAsp-AarTspsTw KOD39 AanElTspsTHt ElGwAhiAspTwTsps KOD51 KOD36 KOD24 KOD03 AanElTspsTHt KOD18 KOD18BANK KOD19 OD52 KOD16 AarAspTspsTw AarAspTspsTw KOD14 KOD38 KOD53 KOD54 Gully Mosaic KOD50 ApyGwAThGOrTErCEcTe ElGwAhiAspTwTsps ElEgEkTw Gully Mosaic Gully Mosaic ElGwAhiAspTwTsps ElEgEkTw KOD35 ElAspTsps KOD42 KOD22 ApyGwAThGOrTErCEcTe KOD02 AiGwTlaTp AiGwTlaTp ChApyAtuTErCEc KOD41 KOD21 ApyGwAThGOrTErCEcTe KOD01 AiGwTlaTp ApyGwAThGOrTErCEcTe AiGwTlaTp ApyGwAThGOrTErCEcTe KOD04 ElAbTwTsps KOD49 AiGwTlaTp KOD48 KOD11 KOD05 KOD13 KOD33 KOD12 AprGwAarAspTsps KOD-JA KOD32 KOD10 KOD47 KOD31 ElGwAhiAspTwTsps ElAhiAarTspsTe KOD20 ElAbTwTsps KOD44 KOD27 KOD06 AprGwAarAspTsps ElAbTwTsps KOD62 KOD09 KOD28 AiGwTlaTp KOD07 KOD45 KOD43 KOD-R KOD26 KOD60 KOD40 ChAiGwTe ChAiGwTe ApyGwAThGOrTErCEcTe ApyGwAThGOrTErCEcTe ChAiGwTe ElGwAhiAspTwTsps

712,000 mE 716,000 mE 720,000 mE 724,000 mE 7,504,000 mN 7,500,000 mN

Location Map

KARRATHA *Map Area* KALGOORLIE PERTH

Index to Maps

1 2

Priority and Threatened Flora

- *Eremophila magnifica* subsp. *magnifica* (P4)
- *Rhynchosia bungarensis* (P4)
- *Sida* sp. Barlee Range (S. van Leeuwen 1642) (P3)
- *Themeda* sp. Hamersley Station (M.E. Trudgen 11431) (P3)
- *Sida* sp. Hamersley Range (K. Newbey 10692) (P1)
- *Lepidium catapycnon* (DRF)

- Study area boundary
- Quadrat location
- Relevé location
- *Sauropus* sp. Koodaideri detritals (flora of interest)

N

0 1 2 kilometres

Koodaideri Vegetation Map 2

Biota Environmental Sciences

Author: J Fairhead | Drawn: M Robinson | Dwg No.: 664 | Date: 02 Dec 2011 | Revised: 31 Jan 2012 | Projection: MGA Z50 (GDA94) | Scale: 1:40,000

Vegetation of Koodaideri

Vegetation of the Foothills, Slopes and Hilltops

AanElTspsTHt	*Acacia aneura*, *Eucalyptus leucophloia* scattered low trees over *Triodia* sp. Shovelanna Hill open hummock grassland over *Themeda triandra* tussock grassland
AarAspTspsTw	*Acacia arida* tall open shrubland over *Acacia spondylophylla* low shrubland over *Triodia* sp. Shovelanna Hill, *T. wiseana* hummock grassland
AiGwTlaTp	*Acacia inaequilatera*, *Grevillea wickhamii* open shrubland over *Triodia lanigera*, *T. pungens* open hummock grassland
AprGwAarAspTsps	*Acacia pruinocarpa*, *Grevillea wickhamii*, *Acacia arida* tall open scrub over *Acacia spondylophylla* scattered low shrubs over *Triodia* sp. Shovelanna Hill open hummock grassland
ChAiGwTe	*Corymbia hamersleyana* scattered low trees over *Acacia inaequilatera, Grevillea wickhamii* scattered tall shrubs over *Triodia epactia* hummock grassland
ChAiGwTsps	*Corymbia hamersleyana* scattered low trees over *Acacia inaequilatera, Grevillea wickhamii* scattered tall shrubs over *Triodia* sp. Shovelanna Hill hummock grassland
ChAiGwTw	*Corymbia hamersleyana* scattered low trees over *Acacia inaequilatera, Grevillea wickhamii* scattered tall shrubs over *Triodia wiseana* hummock grassland
ElAbTwTsps	*Eucalyptus leucophloia* scattered low trees over *Acacia bivenosa* open shrubland over *Triodia wiseana*, *Triodia* sp. Shovelanna Hill hummock grassland
ElAhiAarTspsTe	*Eucalyptus leucophloia* scattered low trees over *Acacia hilliana, A. arida* low shrubland over *Triodia* sp. Shovelanna Hill, *T. epactia*. open hummock grassland
ElAspTsps	*Eucalyptus leucophloia* scattered low trees over *Acacia spondylophylla* low open shrubland over *Triodia* sp. Shovelanna Hill hummock grassland
ElChAmTw	*Eucalyptus leucophloia*, *Corymbia hamersleyana* low open woodland over *Acacia maitlandii* low shrubland over *Triodia wiseana* hummock grassland
ElChGwAprTsps	*Eucalyptus leucophloia*, *Corymbia hamersleyana* scattered low trees over *Grevillea wickhamii*, *Acacia pruinocarpa* scattered shrubs over *Triodia* sp. Shovelanna Hill hummock grassland
ElEgEkTw	*Eucalyptus leucophloia* low woodland over *E. gamophylla*, *E. kingsmillii* scattered low trees over *Triodia wiseana* open hummock grassland
ElEgHcGwAspAarTspsTw	*Eucalyptus leucophloia*, *E. gamophylla* scattered low trees over *Hakea chordophylla*, *Grevillea wickhamii* tall open scrub over *Acacia spondylophylla*, *A. arida* shrubland over *Triodia* sp Shovelanna Hill, *T. wiseana* open hummock grassland
ElGwAhiAspTwTsps	*Eucalyptus leucophloia* low woodland over *Grevillea wickhamii* scattered shrubs over *Acacia hilliana, A. spondylophylla* scattered low shrubs over *Triodia* sp. Shovelanna Hill open hummock grassland

Vegetation of Koodaideri

Vegetation of the Creeks, Gullies and Gorges

AiGwTeCEc	*Acacia inaequilatera*, *Grevillea wickhamii* tall shrubland over *Triodia epactia* hummock grassland over **Cenchrus ciliaris* tussock grassland
AprApyAThCEc	*Acacia pruinocarpa* scattered trees over *Acacia pyrifolia*, *Atalaya hemiglauca* shrubland over **Cenchrus ciliaris* tussock grassland
AprGwCEcTe	*Acacia pruinocarpa*, *Grevillea wickhamii* tall shrubland over **Cenchrus ciliaris* tussock grassland over *Triodia epactia* open hummock grassland
ApyGwAThGOrTErCEcTe	*Acacia pyrifolia*, *Grevillea wickhamii*, *Atalaya hemiglauca*, *Gossypium robinsonii* tall open scrub over *Tephrosia rosea* scattered low shrubs over **Cenchrus ciliaris* tussock grassland over *Triodia epactia* open hummock grassland
AtuAThGwApyTErCEc	*Acacia tumida, Atalaya hemiglauca, Grevillea wickhamii, Acacia pyrifolia* tall open scrub over *Tephrosia rosea* low open shrubland over **Cenchrus ciliaris* tussock grassland
CfElAtuTe	*Corymbia ferriticola*, *Eucalyptus leucophloia* low open forest over *Acacia tumida* tall shrubland *over Triodia epactia* hummock grassland
ChAtuCEc	*Corymbia hamersleyana* low open forest over *Acacia tumida* tall shrubland over **Cenchrus ciliaris* tussock grassland
ChApyJAdTs	*Corymbia hamersleyana* low open woodland over *Acacia pyrifolia, Jasminum didymum* open shrubland over *Triodia schinzii* hummock grassland
ChGwCYaCEcTe	*Corymbia hamersleyana*, *Grevillea wickhamii* tall shrubland over *Cymbopogon ambiguus*, **Cenchrus ciliaris* tussock grassland over *Triodia epactia* open hummock grassland
ChApyAtuTErCEc	*Corymbia hamersleyana* scattered low trees over *Acacia pyrifolia*, *Acacia tumida* tall closed shrubland over *Tephrosia rosea* low open shrubland over **Cenchrus ciliaris* closed tussock grassland

Mosaic Vegetation Units

Koodaideri Spring	A mosaic of riparian vegetation types associated with a narrow gorge
Gully Mosaic	Deep gullies with different microclimates and corresponding vegetation units at a scale too fine to map individually

Appendix 4

Raw Quadrat Data from the Study Area

Koodaideri Site KOD01
Described (Phase 1) PA/RB **Date (Phase 1)** 06/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) PA/RH **Date (Phase 2)** 11/03/2011
MGA 50 715228 **mE** 7506009 **mN**
Habitat Gently undulating plain at the base of hills
Soil Red brown sandy loam
Rock Type Scattered ironstone
Vegetation (Phase 1) *Acacia inaequilatera, Grevillea wickhamii* subsp. *hispidula, Acacia sericophylla* tall open shrubland over *Triodia lanigera, Triodia pungens* open hummock grassland
Vegetation (Phase 2) *Acacia inaequilatera, Grevillea wickhamii* subsp. *hispidula, Acacia sericophylla* tall open shrubland over *Triodia lanigera, Triodia pungens* open hummock grassland
Veg Condition Excellent
Fire Age Burnt 1-2 years ago
Notes Area within the quadrat is very patchily burnt; some areas remain unburnt

Species (Phase 1)	**Height (cm)**	**Cover (%)**
Acacia inaequilatera	250	1
Acacia pachyacra	200	0.1
Acacia sericophylla	320	1
Aristida holathera var. *holathera*	30	0.1
Bonamia rosea	30	0.1
Cassia oligophylla x *helmsii*	80	0.1
Cymbopogon ambiguus	80	0.1
Eragrostis setifolia	30	0.1
Gossypium australe (Whim Creek form)	30	0.1
Grevillea wickhamii subsp. *hispidula*	200	1
Heliotropium pachyphyllum	20	0.1
Hibiscus sp. (inadequate material sp. not determined)	20	0.1
Hybanthus aurantiacus	40	0.1
Keraudrenia sp. (inadequate material sp. not determined)	20	0.1
Mollugo molluginea	15	0.1
Ptilotus calostachyus	60	0.1
Ptilotus obovatus var. *obovatus*	30	0.1
Sida aff. *pilbarensis* (EOB46-01B)	50	0.1
Sida arenicola	60	0.1
Tephrosia sp. Bungaroo Creek (M.E. Trudgen 11601)	20	0.1
Triodia lanigera	30	15
Triodia pungens	30	1

Species (Phase 2)	**Height (cm)**	**Cover (%)**
Acacia inaequilatera	350	1
Acacia pachyacra	150	0.1
Acacia sericophylla	350	2
Aristida holathera var. *holathera*	50	1
Bonamia rosea	50	3
Cassia oligophylla	120	0.1
Cleome viscosa	30	0.1
Dicrastylis cordifolia	60	0.1
Goodenia microptera	10	0.1
Gossypium australe (Whim Creek form)	60	0.1
Grevillea wickhamii subsp. *hispidula*	150	1
Heliotropium pachyphyllum	20	0.1
Hybanthus aurantiacus	80	0.1
Indigofera monophylla	20	0.1
Mollugo molluginea	15	0.1
Polygala isingii	5	0.1
Ptilotus calostachyus	100	0.1
Ptilotus exaltatus var. *exaltatus*	30	0.1
Sida arenicola	60	0.1
Sida cardiophylla	50	0.1
Trianthema pilosa	15	0.1
Tribulus hirsutus	5	0.1
Triodia lanigera	50	10
Triodia pungens	60	1

Koodaideri Site KOD02
Described (Phase 1) PA/RB **Date (Phase 1)** 06/07/2010 **Type** Quadrat 100 x 25
Described (Phase 2) PA/RH **Date (Phase 2)** 11/03/2011
MGA 50 713496**mE** 7506748**mN**
Habitat Moderate creek and banks (encompasses ~4 m of bank on either side)
So Red brown clay loam on creek banks, skeletal soil in creek bed
Rock Type Alluvial, ironstone, riverstone
Vegetation (Phase 1) *Acacia pyrifolia, Grevillea wickhamii* subsp. *hispidula, Atalaya hemiglauca*, *Gossypium robinsonii* tall open scrub over *Tephrosia rosea* var. *glabrior* scattered low shrubs over **Cenchrus ciliaris* open tussock grassland
Vegetation (Phase 2) *Acacia pyrifolia, Grevillea wickhamii* subsp. *hispidula, Gossypium robinsonii* tall open shrubland over *Tephrosia rosea* var. *glabrior, Cleome viscosa, Indigofera monophylla* open shrubland over *Gomphrena cunninghamii* scattered herbs, **Cenchrus ciliaris* tussock grassland
Veg Condition Good-Very Good
Fire Age No sign of recent fire
Notes Elevation 478 m asl. 25% (Phase1) and 40% (Phase 2) weed cover of **Cenchrus ciliaris*. *Pentalepis trichodesmoides* just outside of the quadrat

Species (Phase 1)	Height (cm)	Cover (%)
Acacia elachantha	130	0.1
Acacia pyrifolia	250	25
Amaranthus undulatus	50	0.1
Atalaya hemiglauca	220	1
Capparis spinosa var. *nummularia*	140	0.1
Cassia oligophylla	120	0.1
Cenchrus ciliaris	250	25
Cleome viscosa	70	0.1
Corchorus incanus subsp. *lithophilus*	40	0.1
Enneapogon lindleyanus	30	0.1
Gomphrena cunninghamii	20	0.1
Gossypium australe (Whim Creek form)	100	0.1
Gossypium robinsonii	400	1
Grevillea wickhamii subsp. *hispidula*	300	13
Indigofera monophylla (small leaflet form)	60	0.1
Polycarpaea longiflora	20	0.1
Ptilotus obovatus var. *obovatus*	120	0.1
Tephrosia rosea var. *glabrior*	40	2
Triodia pungens	25	0.1

Species (Phase 2)	Height (cm)	Cover (%)
Acacia pyrifolia	450	6
Atalaya hemiglauca	300	0.1
Boerhavia coccinea	5	0.1
Cassia oligophylla	0.1	120
Cenchrus ciliaris	100	40
Cleome viscosa	120	2
Corchorus laniflorus	0.1	100
Cucumis maderaspatanus	0.1	10
Enneapogon lindleyanus	0.1	60
Euphorbia biconvexa	0.1	60
Gomphrena cunninghamii	1	30
Gossypium australe (Whim Creek form)	100	0.1
Gossypium robinsonii	300	1
Grevillea wickhamii subsp. hispidula	450	3
Indigofera monophylla	80	1
Indigofera monophylla	0.1	70
Notoleptopus decaisnei	0.1	15
Podaxis pistillaris	0.1	10
Polycarpaea longiflora	20	0.1
Ptilotus exaltatus var. *exaltatus*	20	0.1
Ptilotus obovatus var. *obovatus*	100	0.1
Tephrosia rosea var. *glabrior*	100	3
Trichodesma zeylanicum var. *zeylanicum*	0.1	60
Triodia pungens	0.1	50

Koodaideri Site KOD03
Described (Phase 1) PA/RB **Date (Phase 1)** 06/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) MM **Date (Phase 2)** 07/05/2011
MGA 50 709714**mE** 7506473**mN**
Habitat West facing hillslope
Soil Red brown clay loam
Rock Type Continuous ironstone
Vegetation (Phase 1) *Grevillea wickhamii* subsp. *hispidula, Acacia inaequilatera* tall open shrubland over *Acacia spondylophylla, (Acacia hilliana*) low open shrubland over *Triodia brizoides* hummock grassland
Vegetation (Phase 2) *Acacia inaequilatera, Grevillea wickhamii* subsp. *hispidula* tall open shrubland over *Acacia spondylophylla* low open shrubland over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) hummock grassland
Veg Condition Excellent
Fire Age Burnt 1-2 years ago

Species (Phase 1)	Height (cm)	Cover (%)
Acacia hilliana	30	1
Acacia inaequilatera	330	4
Acacia spondylophylla	40	5
Acacia tenuissima	170	0.1
Acacia tumida var. *pilbarensis*	130	0.1
Cassia oligophylla x *helmsii*	80	0.1
Corchorus lasiocarpus subsp. *parvus*	70	0.1
Eriachne lanata	50	0.1
Eucalyptus gamophylla	250	0.1
Gompholobium sp. Pilbara (N.F. Norris 908) PN	50	0.1
Goodenia stobbsiana	30	0.1
Grevillea wickhamii subsp. *hispidula*	300	4
Hakea chordophylla	300	0.1
Mollugo molluginea	10	0.1
Scaevola browniana subsp. *browniana*	40	0.1
Sida arenicola	120	0.1
Solanum phlomoides	170	0.1
Triodia brizoides	15	40
Triodia wiseana	20	0.1

Species (Phase 2)	Height (cm)	Cover (%)
Acacia hilliana	40	0.1
Acacia inaequilatera	220	2
Acacia spondylophylla	50	3
Acacia tenuissima	120	0.1
Bulbostylis barbata	3	0.1
Cassia ferraria	60	0.1
Cassia oligophylla	50	0.1
Corchorus lasiocarpus subsp. *lasiocarpus*	70	0.1
Eriachne lanata	40	0.1
Eriachne pulchella subsp. *dominii*	5	0.1
Eucalyptus gamophylla	95	0.1
Fimbristylis simulans	25	0.1
Gompholobium sp. Pilbara (N.F. Norris 908) PN	45	0.1
Goodenia stobbsiana	40	0.1
Grevillea wickhamii subsp. *hispidula*	250	1
Hakea chordophylla	160	0.1
Mollugo molluginea	15	0.1
Ptilotus calostachyus	70	0.1
Scaevola browniana subsp. *browniana*	40	0.1
Sida arenicola	70	0.1
Solanum phlomoides	45	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	35	35
Triodia wiseana	35	0.1

Koodaideri Site KOD04
Described (Phase 1) PA/RB **Date (Phase 1)** 07/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) CFMyM **Date (Phase 2)** 11/03/2011
MGA 50 712458**mE** 7505161**mN**
Habitat Broad drainage area (valley) between large hills
Soil Red brown clay loam
Rock Type Ironstone, pebbles scattered across the surface
Vegetation (Phase 1) *Acacia pyrifolia, Hakea lorea* subsp. *lorea, (Santalum lanceolatum*) tall open scrub over **Cenchrus ciliaris* tussock grassland with *Triodia pungens* scattered hummock grasses
Vegetation (Phase 2) *Acacia pyrifolia, Gossypium robinsonii* tall open scrub over *Scaevola spinescens* scattered low shrubs over *Triodia pungens* scattered hummock grasses, **Cenchrus ciliaris* closed tussock grassland
Veg Condition Good-Very Good (Phase 1) and Poor (Phase 2)
Fire Age No sign of recent fire
Notes Weed cover of 60% (Phase 1) and 75% (Phase 2) **Cenchrus ciliaris* tussock grassland

Species (Phase 1)	Height (cm)	Cover (%)
Acacia pyrifolia	4	55
Atalaya hemiglauca	200	0.1
Cassia helmsii	60	0.1
Cassia oligophylla	50	0.1
Cenchrus ciliaris	60	60
Cucumis maderaspatanus	100	0.1
Gossypium robinsonii	300	0.1
Hakea lorea subsp. *lorea*	400	2
Indigofera monophylla	35	0.1
Jasminum didymum subsp. *lineare*	110	0.1
Pentalepis trichodesmoides	100	0.1
Ptilotus obovatus var. *obovatus*	120	0.1
Santalum lanceolatum	300	1
Scaevola spinescens (broad form)	80	0.1
Sida aff. *fibulifera*	20	0.1
Solanum phlomoides	120	0.1
Tephrosia rosea var. *glabrior*	100	0.1
Triodia pungens	60	1

Species (Phase 2)	Height (cm)	Cover (%)
Abutilon lepidum	100-120	0.1
Acacia pyrifolia	600	35
Atalaya hemiglauca	150	0.1
Boerhavia coccinea	15	0.1
Cassia helmsii	100	0.1
Cassia oligophylla	80	0.1
Cenchrus ciliaris	60	75
Cucumis maderaspatanus	60	0.1
Gossypium robinsonii	300	1
Hakea lorea subsp. *lorea*	600	0.1
Indigofera monophylla	50	0.1
Jasminum didymum subsp. *lineare*	100	0.1
Ptilotus obovatus var. *obovatus*	70	0.1
Santalum lanceolatum	200	0.1
Scaevola spinescens	50	1
Tephrosia rosea var. *glabrior*	60	0.1
Triodia pungens	50	1

Koodaideri Site KOD05
Described (Phase 1) PA/RB **Date (Phase 1)** 07/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) PA/RH **Date (Phase 2)** 11/03/2011
MGA 50 713773 **mE** 7504293 **mN**
Habitat South facing hillslope
Soil Red brown clay loam
Rock Type Continuous ironstone
Vegetation (Phase 1) *Grevillea wickhamii* subsp. *hispidula* tall open shrubland over *Acacia arida, Tephrosia arenicola, Acacia spondylophylla* shrubland over *Gompholobium* sp. Pilbara (N.F. Norris 908) PN scattered low shrubs over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia pungens* open hummock grassland
Vegetation (Phase 2) *Grevillea wickhamii* subsp. *hispidula* scattered tall shrubs over *Acacia arida, Acacia spondylophylla, Tephrosia arenicola* shrubland over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia pungens* open hummock grassland
Veg Condition Excellent
Fire Age Burnt 3-5 years ago
Notes Patchily burnt within the quadrat area

Species (Phase 1)	Height (cm)	Cover (%)
Acacia arida	130	10
Acacia pruinocarpa	180	0.1
Acacia spondylophylla	80	5
Calytrix carinata	100	0.1
Corchorus lasiocarpus subsp. *parvus*	70	0.1
Eremophila latrobei subsp. *filiformis*	80	0.1
Gompholobium sp. Pilbara (N.F. Norris 908) PN	60	2
Goodenia stobbsiana	60	0.1
Gossypium robinsonii	200	0.1
Grevillea wickhamii subsp. *hispidula*	250	3
Scaevola browniana subsp. *browniana*	25	0.1
Solanum phlomoides	80	0.1
Tephrosia arenicola	200	4
Triodia pungens	40	2
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	30	25

Species (Phase 2)	Height (cm)	Cover (%)
Acacia arida	150	6
Acacia pruinocarpa	300	4
Acacia spondylophylla	80	2
Bulbostylis barbata	6	0.1
Calytrix carinata	110	0.1
Cassia ferraria x *? glaucifolia*	150	0.1
Corchorus lasiocarpus subsp. *lasiocarpus*	60	0.1
Eremophila latrobei subsp. *filiformis*	110	0.1
Eriachne pulchella subsp. *dominii*	10	0.1
Fimbristylis dichotoma	15-25	0.1
Gompholobium sp. Pilbara (N.F. Norris 908) PN	80	0.1
Goodenia stobbsiana	20	0.1
Goodenia triodiophila	35	0.1
Gossypium robinsonii	150	0.1
Grevillea wickhamii subsp. hispidula	300	1
Hybanthus aurantiacus	25	0.1
Scaevola browniana subsp. *browniana*	40	0.1
Solanum phlomoides	60	0.1
Tephrosia arenicola	150	3
Triodia pungens	60	4
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	30	15

Koodaideri Site KOD06
Described (Phase 1) PA/RB **Date (Phase 1)** 08/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) MM **Date (Phase 2)** 09/05/2011
MGA 50 718681 **mE** 7504100 **mN**
Habitat Stony hillcrest
Soil Skeletal red brown clay loam
Rock Type Ironstone and quartz pebbles, cobbles, gravel. Bedrock showing at the surface in
Vegetation (Phase 1) *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) open hummock grassland
Vegetation (Phase 2) *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Acacia bivenosa* scattered shrubs over *Ptilotus calostachyus* scattered low shrubs over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) open hummock grassland
Veg Condition Excellent
Fire Age Burnt 1-2 years ago
Notes Pre-fire vegetation type would be a hummock grassland

Species (Phase 1)	Height (cm)	Cover (%)
Acacia bivenosa	50	0.1
Acacia pachyacra	40	0.1
Acacia pyrifolia	20	0.1
Cassia glutinosa	45	0.1
Cassia notabilis	40	0.1
Cullen leucochaites	30	0.1
Dampiera candicans	40	0.1
Eucalyptus leucophloia subsp. *leucophloia*	600	2
Goodenia stobbsiana	20	0.1
Grevillea wickhamii subsp. *hispidula*	80	0.1
Hakea chordophylla	100	0.1
Ptilotus calostachyus	120	0.1
Ptilotus obovatus var. *obovatus*	20	0.1
Ptilotus rotundifolius	100	0.1
Sida pilbarensis (ferruginous form)	40	0.1
Solanum phlomoides	100	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	20	20

Species (Phase 2)	Height (cm)	Cover (%)
Acacia bivenosa	100	1
Acacia pachyacra	40	0.1
Acacia pyrifolia	35	0.1
Aristida holathera var. *holathera*	40	0.1
Cassia glutinosa	110	0.1
Cassia luerssenii	70	0.1
Cullen leucochaites	55	0.1
Dampiera candicans	45	0.1
Eriachne aristidea	30	0.1
Eucalyptus leucophloia subsp. *leucophloia*	430	1
Fimbristylis simulans	20	0.1
Gomphrena affinis subsp. *pilbarensis*	10	0.1
Gomphrena cunninghamii	5	0.1
Goodenia microptera	40	0.1
Grevillea wickhamii subsp. hispidula	110	0.1
Hakea chordophylla	100	0.1
Ptilotus calostachyus	80	2
Ptilotus exaltatus var. *exaltatus*	6	0.1
Ptilotus obovatus var. *obovatus*	50	0.1
Ptilotus rotundifolius	90	0.1
Sida sp. Hamersley Range (K. Newbey 10692) PN	40	0.1
Solanum phlomoides	50	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	20	15

Koodaideri Site KOD07
Described (Phase 1) PA/RB **Date (Phase 1)** 08/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) CFMyM **Date (Phase 2)** 11/03/2011
MGA 50 721654 **mE** 7502721**mN**
Habitat Gently NE facing foothills
Soil Skeletal red-brown clay loam with surface layer of small ironstone pebbles
Rock Type Continuous ironstone
Vegetation (Phase1) *Eucalyptus gamophylla* scattered low trees over *Grevillea wickhamii* subsp. *hispidula* open shrubland over *Acacia spondylophylla* low open shrubland over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia pungens* open hummock grassland
Vegetation (Phase 2) *Eucalyptus gamophylla* scattered low trees over *Grevillea wickhamii* subsp. *hispidula* tall open shrubland over *Acacia spondylophylla* low open shrubland over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia pungens* open hummock grassland
Veg Condition Excellent
Fire Age Burnt 1-2 years ago

Species (Phase 1)	Height (cm)	Cover (%)
Acacia pruinocarpa	30	0.1
Acacia spondylophylla	40	6
Aristida sp. (inadequate material sp. not determined)	30	0.1
Calytrix carinata	70	0.1
Corchorus lasiocarpus subsp. *parvus*	30	0.1
Corymbia hamersleyana	250	0.1
Eriachne lanata	35	0.1
Eucalyptus gamophylla	200	1
Eucalyptus leucophloia subsp. *leucophloia*	150	0.1
Goodenia stobbsiana	20	0.1
Grevillea wickhamii subsp. *hispidula*	160	9
Ptilotus calostachyus	50	0.1
Scaevola browniana subsp. *browniana*	30	0.1
Solanum phlomoides	50	0.1
Tephrosia arenicola	60	0.1
Triodia pungens	15	2
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	10	10

Species (Phase 2)	Height (cm)	Cover (%)
Acacia adsurgens	30	0.1
Acacia pruinocarpa	70	0.1
Acacia spondylophylla	40	6
Acacia tetragonophylla	20	0.1
Aristida holathera var. *holathera*	35	0.1
Bonamia sp. Dampier (A.A. Mitchell PRP 217)	15	0.1
Calytrix carinata	30	0.1
Cassia glutinosa x *luerssenii*	80	0.1
Corchorus lasiocarpus subsp. *lasiocarpus*	50	0.1
Corymbia hamersleyana	400	0.1
Dampiera candicans	40	0.1
Eriachne lanata	30	0.1
Eriachne mucronata	40	0.1
Eriachne pulchella	30	0.1
Eucalyptus gamophylla	250	1
Eucalyptus leucophloia subsp. *leucophloia*	150	0.1
Goodenia stobbsiana	20	0.1
Goodenia triodiophila	30	0.1
Grevillea wickhamii subsp. hispidula	230	8
Keraudrenia nephrosperma	30	0.1
Paraneurachne muelleri	50	0.1
Ptilotus calostachyus	80	0.1
Scaevola browniana subsp. *browniana*	20	0.1
Sida arenicola	40	0.1
Solanum phlomoides	20	0.1
Tephrosia arenicola	70	0.1
Tephrosia uniovulata	15	0.1
Triodia pungens	35	2
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	20	15

Koodaideri Site KOD08
Described (Phase 1) PCBRM **Date (Phase 1)** 09/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) MyMR **Date (Phase 2)** 16/03/2011
MGA 50 705874 **mE** 7508394 **mN**
Habitat Flat to gently-domed crest of high ridge
Soil Gravelly, pebbly red brown loamy sand, 60% coarse ironstone fragments
Rock Type Ironstone/ironstone laterite
Vegetation (Phase 1) *Hakea chordophylla*, *Grevillea wickhamii* subsp. *hispidula* scattered tall shrubs over *Corchorus lasiocarpus* subsp. *parvus* scattered low shrubs over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) hummock grassland
Vegetation (Phase 2) *Hakea chordophylla*, *Grevillea wickhamii* subsp. *hispidula* tall open shrubland over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) hummock grassland
Veg Condition Excellent
Fire Age Burnt 3-5 years ago

Species (Phase 1)	Height (cm)	Cover (%)
Acacia hilliana	30	0.1
Acacia spondylophylla	40	0.1
Aristida sp. (inadequate material sp. not determined)	20	0.1
Cassia oligophylla x *helmsii*	45	0.1
Corchorus aff. *lasiocarpus* subsp. *parvus*	30	0.1
Dampiera candicans	25	0.1
Gompholobium sp. Pilbara (N.F. Norris 908) PN	60	0.1
Grevillea wickhamii subsp. *hispidula*	200	0.1
Hakea chordophylla	350	0.1
Ptilotus calostachyus	40	0.1
Ptilotus rotundifolius	90	0.1
Scaevola browniana subsp. browniana	30	0.1
Solanum phlomoides	60	0.1
Triodia sp. (epactia/pungens)	40	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	40	40

Species (Phase 2)	Height (cm)	Cover (%)
Acacia hilliana	40	0.1
Acacia spondylophylla	80	0.1
Aristida contorta	30	0.1
Cassia glaucifolia	15	0.1
Cassia oligophylla x *helmsii*	80	0.1
Corchorus lasiocarpus subsp. *parvus*	80	0.1
Dampiera candicans	60	0.1
Eriachne aristidea	25	0.1
Euphorbia sp. (inadequate material sp. not determined)	5	0.1
Goodenia stobbsiana	15	0.1
Grevillea wickhamii subsp. hispidula	200	1
Hakea chordophylla	400	1
Polycarpaea holtzei	2	0.1
Ptilotus calostachyus	30	0.1
Ptilotus fusiformis	40	0.1
Ptilotus rotundifolius	120	0.1
Scaevola browniana subsp. *browniana*	30	0.1
Schizachyrium fragile	10	0.1
Trachymene oleracea subsp. *oleracea*	15	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	25	55
Triodia wiseana	40	0.1

Koodaideri Site KOD09
Described (Phase 1) PCBRM **Date (Phase 1)** 10/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) CEFRH **Date (Phase 2)** 15/03/2011
MGA 50 717685 **mE** 7502494**mN**
Habitat Gently sloping, north facing floodplain between two minor creeklines and low hills
Soil Dark red-brown sandy loam/clayey sand. 1OR 3/6, 40% coarse ironstone fragments
Rock Type Gravelly, pebbly ironstone
Vegetation(Phase 1) *Acacia pyrifolia* open shrubland over *Triodia pungens* hummock grassland and **Cenchrus ciliaris* open tussock grassland
Vegetation (Phase 2) *Acacia pyrifolia* scattered shrubs over *Cassia oligophylla x helmsii* scattered low shrubs over *Triodia pungens* open hummock grassland, **Cenchrus ciliaris* open tussock grassland
Veg Condition Good
Fire Age Burnt 3-5 years ago
Notes **Cenchrus ciliaris* weed cover 5% (Phase 1) and 15% (Phase 2), and cattle tracks through quadrat. Could not find *Rhagodia eremaea, Cymbopogon ambiguus, Tephrosia* aff. *densa* in second phase

Species (Phase 1)	Height (cm)	Cover (%)
Acacia pyrifolia	180	5
Acacia tumida var. *pilbarensis*	70	0.1
Aristida contorta	20	0.1
Aristida holathera var. *holathera*	30	0.1
Atalaya hemiglauca	60	0.1
Boerhavia coccinea		0.1
Cassia oligophylla	50	0.1
Cassia oligophylla x *helmsii*	40	0.1
Cenchrus ciliaris	80	5
Cleome viscosa	50	0.1
Corchorus lasiocarpus subsp. *parvus*	25	0.1
Corchorus sp. (inadequate material sp. not determined)	20	0.1
Cymbopogon ambiguus	70	0.1
Duperreya commixta		0.1
Euphorbia sp. (inadequate material sp. not determined)	40	0.1
Evolvulus alsinoides var. *decumbens*	15	0.1
Gossypium robinsonii	200	0.1
Grevillea wickhamii subsp. *hispidula*	45	0.1
Hakea lorea subsp. *lorea*	30	0.1
Hybanthus aurantiacus	40	0.1
Indigofera monophylla	35	0.1
Polymeria aff. *ambigua* (MET12,302)		0.1
Ptilotus obovatus var. *obovatus*	40	0.1
Rhagodia eremaea	100	0.1
Solanum ellipticum	20	0.1
Solanum lasiophyllum	25	0.1
Tephrosia aff. *densa* (P8T-018)	60	0.1
Trianthema pilosa	15	0.1
Trichodesma zeylanicum var. *zeylanicum*	70	0.1
Triodia pungens	50	30

Species (Phase 2)	Height (cm)	Cover (%)
Abutilon otocarpum	60	0.1
Acacia pyrifolia	150	1
Acacia tumida var. *pilbarensis*	60	0.1
Aristida holathera var. *holathera*	60-70	0.1
Atalaya hemiglauca	60	0.1
Boerhavia coccinea	20-40	0.1
Bulbostylis barbata	20	0.1
Cassia helmsii	40	0.1
Cassia oligophylla	100	0.1
Cassia oligophylla x *helmsii*	60	2
Cenchrus ciliaris	60	15
Cleome viscosa	30	0.1
Corchorus lasiocarpus subsp. *lasiocarpus*	60	0.1
Corchorus tridens	30	0.1
Crotalaria medicaginea var. *neglecta*	10	0.1
Duperreya commixta	45	0.1
Enneapogon polyphyllus	70	0.1
Eragrostis eriopoda	60	0.1
Eriachne mucronata	50	0.1
Eriachne pulchella subsp. *dominii*	50	0.1
Euphorbia aff. *australis*	10	0.1
Euphorbia biconvexa	50	0.1
Euphorbia tannensis subsp. eremophila	60	0.1
Evolvulus alsinoides var. *villosicalyx*	60	0.1
Gomphrena affinis subsp. *pilbarensis*	50	0.1
Gossypium robinsonii	130	0.1
Grevillea wickhamii subsp. hispidula	220	0.1
Hybanthus aurantiacus	100	0.1
Indigofera colutea	40	0.1
Indigofera monophylla	50-70	0.1
Mollugo molluginea	20	0.1
Paspalidium clementii	45	0.1
Perotis rara	10	0.1
Polymeria ambigua	30	0.1
Ptilotus exaltatus var. *exaltatus*	45	0.1
Ptilotus obovatus var. *obovatus*	60	0.1
Ptilotus polystachyus	90	0.1
Rhynchosia minima	30	0.1
Sida aff. *fibulifera*	25	0.1
Solanum sp.	80	0.1
Trachymene oleracea subsp. *oleracea*	30	0.1
Trianthema pilosa	20-40	0.1
Tribulus macrocarpus	20	0.1
Triodia pungens	80	25

Koodaideri Site KOD10
Described (Phase 1) PCBRM **Date (Phase 1)** 10/07/2010 **Type** Quadrat 200 x 10
Described (Phase 2) PAMym **Date (Phase 2)** 15/03/2011
MGA 50 716800 **mE** 7502727**mN**
Habitat Creekbanks of broad stony creekline
Soil Red-brown sand
Rock Type Ironstone gravel, pebbles and cobbles
Vegetation (Phase 1) *Acacia tumida, Acacia pyrifolia, Grevillea wickhamii* subsp. *hispidula, Gossypium robinsonii* tall shrubland over *Tephrosia rosea* var. *glabrior, Corchorus laniflorus*, *Ptilotus obovatus, Indigofera monophylla* low open shrubland to low shrubland over **Cenchrus ciliaris, Cymbopogon ambiguus* very open tussock grassland and *Triodia epactia, Triodia wiseana* scattered hummock grasses
Vegetation (Phase 2) *Acacia pyrifolia, Grevillea wickhamii* subsp. *hispidula, Acacia tumida* var. *pilbarensis* tall open shrubland over *Tephrosia rosea* var. *glabrior, Indigofera monophylla* low open shrubland over **Cenchrus ciliaris* very open tussock grassland
Veg Condition Very Good
Fire Age No sign of recent fire
Notes Quadrat search confined to *Acacia tumida*, *Acacia pyrifolia* bank vegetation and creekbed. Quadrat follows the natural curves of the creekline. Weeds (**Cenchrus ciliaris*) and signs of cattle within quadrat

Species (Phase 1)	Height (cm)	Cover (%)
Acacia pyrifolia	400	3
Acacia tumida var. *pilbarensis*	500	7
Atalaya hemiglauca	350	0.1
Cassia oligophylla	90	0.1
Cassia venusta	120	0.1
Cenchrus ciliaris	60	1
Cleome viscosa	80	0.1
Clerodendrum floribundum var. *angustifolium*	90	0.1
Corchorus laniflorus	90	0.1
Corchorus lasiocarpus subsp. *parvus*	50	0.1
Cymbopogon ambiguus	110	1
Duperreya commixta	300	0.1
Dysphania melanocarpa forma leucocarpa	30	0.1
Enneapogon lindleyanus	35	0.1
Flueggea virosa subsp. *melanthesoides*	200	0.1
Gomphrena cunninghamii	10	0.1
Gossypium robinsonii	180	0.1
Grevillea wickhamii subsp. *hispidula*	400	3
Hybanthus aurantiacus	25	0.1
Indigofera monophylla (small leaflet form)	40	0.1
Jasminum didymum subsp. *lineare*	100	0.1
Lepidium muelleri-ferdinandii	15	0.1
Polycarpaea longiflora	30	0.1
Ptilotus obovatus var. *obovatus*	30-80	0.1
Rhagodia eremaea	90	0.1
Solanum lasiophyllum	50	0.1
Tephrosia rosea var. *glabrior*	80	35
Triodia epactia	50	0.1
Triodia wiseana	30	0.1

Species (Phase 2)	Height (cm)	Cover (%)
Abutilon lepidum	150	0.1
Acacia pyrifolia	500	7
Acacia tumida var. *pilbarensis*	450	1
Aristida burbidgeae	60	0.1
Aristida holathera var. *holathera*	40	0.1
Atalaya hemiglauca	300	0.1
Boerhavia coccinea	6	0.1
Cassia glutinosa	120	0.1
Cassia oligophylla	120	0.1
Cenchrus ciliaris	80	3
Cleome viscosa	100	0.1
Corchorus laniflorus	120	0.1
Cucumis maderaspatanus	200	0.1
Cucumis melo subsp. *agrestis*	60	0.1
Cymbopogon ambiguus	70	0.1
Digitaria brownii	20	0.1
Duperreya commixta	100	0.1
Enneapogon lindleyanus	60	0.1
Enneapogon polyphyllus	50	0.1
Eriachne pulchella subsp. *dominii*	25	0.1
Euphorbia biconvexa	20	0.1
Euphorbia wheeleri	60	0.1
Gomphrena cunninghamii	30	0.1
Gossypium robinsonii	400	0.1
Grevillea wickhamii subsp. *hispidula*	500	2
Hybanthus aurantiacus	70	0.1
Indigofera monophylla	60-110	1
Notoleptopus decaisnei	10	0.1
Polycarpaea longiflora	20	0.1
Ptilotus exaltatus var. *exaltatus*	40	0.1
Ptilotus obovatus var. *obovatus*	150	0.1
Rhagodia eremaea	150	0.1
Sida arenicola	60	0.1
Tephrosia rosea var. *glabrior*	100	3
Trichodesma zeylanicum var. *zeylanicum*	80	0.1
Triodia epactia	60	0.1
Triodia wiseana	50	0.1

Koodaideri Site KOD11
Described (Phase 1) PCBRM **Date (Phase 1)** 10/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) PA/RH **Date (Phase 2)** 03/12/2011
MGA 50 715634 **mE** 7504540 **mN**
Habitat South-facing, moderately steep slope of a high ridge spur, surrounded by high hills/ridges
Soil Brown loam
Rock Type Blue shale and chert
Vegetation (Phase 1) *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Acacia bivenosa*, *Corchorus lasiocarpus* subsp. *parvus* low open shrubland over *Triodia wiseana* very open hummock grassland
Vegetation (Phase 2) *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Acacia bivenosa*, *Corchorus lasiocarpus* subsp. *parvus, Ptilotus auriculifolius* low shrubland over *Triodia wiseana* open hummock grassland
Veg Condition Excellent
Fire Age Burnt 3-5 years ago

Species (Phase 1)	Height (cm)	Cover (%)
Acacia adsurgens	35	0.1
Acacia arida	30	0.1
Acacia bivenosa	50	6
Acacia pachyacra	35	0.1
Acacia pyrifolia	160	0.1
Bonamia sp. Dampier (A.A. Mitchell PRP 217)	2	0.1
Cassia glutinosa	100	0.1
Corchorus aff. *lasiocarpus* subsp. *parvus*	40	2
Corymbia hamersleyana	350	0.1
Cucumis maderaspatanus		0.1
Cullen leucochaites	50	0.1
Eriachne mucronata	20	0.1
Eucalyptus leucophloia subsp. *leucophloia*	210	0.5
Gossypium robinsonii	70	0.1
Grevillea wickhamii subsp. *hispidula*	160	0.1
Heliotropium ovalifolium	25	0.1
Hibiscus aff. *coatesii* (site 733)	80	0.1
Hibiscus sp.	30	0.1
Pentalepis trichodesmoides	50	0.1
Ptilotus astrolasius	30	0.1
Ptilotus calostachyus	90	0.1
Ptilotus exaltatus var. *exaltatus*	40	0.1
Ptilotus obovatus var. *obovatus*	30	0.1
Solanum phlomoides	50	0.1
Solanum sp.	20	0.1
Tribulus platypterus	35	0.1
Tribulus suberosus	80	0.1
Triodia wiseana	20	10
Triumfetta maconochieana	40	0.1

Species (Phase 2)	Height (cm)	Cover (%)
Acacia arida	30	0.1
Acacia bivenosa	70	5
Acacia pyrifolia	180	0.1
Aristida holathera var. *holathera*	40	0.1
Bonamia sp. Dampier (A.A. Mitchell PRP 217)	5	0.1
Cassia glutinosa	120	0.1
Cassia oligophylla	30	0.1
Cassia pruinosa	40	0.1
Cleome viscosa	40	0.1
Corchorus lasiocarpus subsp. *parvus*	30-60	5
Corymbia hamersleyana	250	0.1
Eriachne mucronata	40	0.1
Eucalyptus leucophloia subsp. *leucophloia*	310	1
Goodenia triodiophila	25	0.1
Gossypium robinsonii	100	0.1
Grevillea wickhamii subsp. hispidula	180	0.1
Heliotropium pachyphyllum	20	0.1
Hibiscus coatesii	25	0.1
Oldenlandia crouchiana	20	0.1
Paraneurachne muelleri	60	0.1
Ptilotus astrolasius	50	0.1
Ptilotus auriculifolius	40	1
Ptilotus calostachyus	60	0.1
Ptilotus exaltatus var. *exaltatus*	30	0.1
Ptilotus obovatus var. *obovatus*	50	0.1
Solanum phlomoides	60	0.1
Tribulus hirsutus	10	0.1
Tribulus platypterus	40	0.1
Tribulus suberosus	70	0.1
Triodia wiseana	30	11
Triumfetta maconochieana	40	0.1

Koodaideri Site KOD12
Described (Phase 1) PCBRM **Date (Phase 1)** 11/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) CFMyM **Date (Phase 2)** 11/03/2011
MGA 50 714428 **mE** 7503676 **mN**
Habitat Moderate west facing mid to lower slope
Soil Red-brown sandy loam
Rock Type Ironstone gravels and pebbles
Vegetation (Phase 1) *Acacia aptaneura* MS, *Acacia pruinocarpa* low woodland over *Eremophila latrobei* subsp. *filiformis* scattered shrubs over *Triodia pungens*, *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) hummock grassland
Vegetation (Phase 2) *Acacia aptaneura* MS, *Acacia pruinocarpa*, *Acacia incurvaneura* MS, *Corymbia ferriticola* low woodland over *Eremophila latrobei* subsp. *filiformis* scattered low shrubs over *Triodia pungens, Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) open hummock grassland
Veg Condition Very good/Excellent
Fire Age No sign of recent fire

Species (Phase 1)	Height (cm)	Cover (%)
Acacia aptaneura MS	500	12
Acacia pruinocarpa	300	6
Cassia glaucifolia	60	0.1
Cassia glutinosa	160	0.1
Cassia oligophylla x *helmsii*	25	0.1
Cheilanthes sieberi subsp. *sieberi*	12	0.1
Corchorus aff. *lasiocarpus* subsp. *parvus*	45	0.1
Corchorus lasiocarpus subsp. *parvus*	70	0.1
Corymbia ferriticola	500	1
Eremophila latrobei subsp. *filiformis*	160	1
Ptilotus obovatus var. *obovatus*	25	0.1
Solanum phlomoides	35	0.1
Tribulus suberosus	80	0.1
Triodia pungens	40	25
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	25	2

Species (Phase 2)	Height (cm)	Cover (%)
Acacia aptaneura MS	500	12
Acacia incurvaneura MS	350	1
Acacia pruinocarpa	250	6
Bulbostylis barbata	5	0.1
Cassia glutinosa x *luerssenii*	120-130	0.1
Cheilanthes sieberi subsp. *sieberi*	30	0.1
Corchorus lasiocarpus subsp. *lasiocarpus*	60-100	0.1
Corymbia ferriticola	600	1
Eremophila latrobei subsp. *filiformis*	80	1
Eriachne pulchella subsp. *dominii*	10	0.1
Fimbristylis dichotoma	10-20	0.1
Hibiscus burtonii	50	0.1
Mollugo molluginea	20	0.1
Paspalidium clementii	60	0.1
Portulaca oleracea	10	0.1
Ptilotus obovatus var. *obovatus*	40	0.1
Solanum ellipticum	15	0.1
Tribulus suberosus	80	0.1
Triodia pungens	40	20
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	25	3
Tripogon loliiformis	10	0.1

Koodaideri Site KOD13
Described (Phase 1) PCBRM **Date (Phase 1)** 11/07/2010 **Type** Quadrat 200 x 10
Described (Phase 2) MM **Date (Phase 2)** 11/05/2011
MGA 50 714340 **mE** 7504198 **mN**
Habitat Deep, rocky gorge
Soil Sand
Rock Type Ironstone gravel, pebbles, cobbles and boulders
Vegetation (Phase 1) *Corymbia ferriticola, (Eucalyptus leucophloia* subsp. *leucophloia*) woodland over *Acacia tumida* var. pilbarensis (Acacia hamersleyensis) tall shrubland over *Dodonaea pachyneura* scattered tall shrubs over *Eriachne mucronata, Cymbopogon ambiguus*, *Themeda* sp. Mt Barricade (M.E. Trudgen 2471) very open tussock grasses
Vegetation (Phase 2) *Corymbia ferriticola, Eucalyptus leucophloia* subsp. *leucophloia* low woodland over *Acacia tumida* var. *pilbarensis, Acacia hamersleyensis, Ficus brachypoda*, *Gossypium robinsonii, Grevillea wickhamii* subsp. *hispidula, Dodonaea pachyneura* tall open scrub over *Triodia pungens* scattered hummock grasses
Veg Condition Excellent
Fire Age Very long unburnt
Notes Quadrat winds in between two cliff faces. One **Cenchrus ciliaris* individual present in Phase 2

Species (Phase 1)	Height (cm)	Cover (%)
Abutilon dioicum	80	0.1
Acacia arida	40	0.1
Acacia hamersleyensis	600	1
Acacia pruinocarpa	400	0.1
Acacia pyrifolia	30	0.1
Acacia tumida var. *pilbarensis*	700	30
Aristida burbidgeae	60	0.1
Aristida holathera var. *holathera*	60	0.1
Atalaya hemiglauca	350	0.1
Bonamia sp. Dampier (A.A. Mitchell PRP 217)	3	0.1
Capparis spinosa var. *nummularia*	80	0.1
Cassia glutinosa	50	0.1
Cassia venusta	120	0.1
Clerodendrum floribundum var. *angustifolium*	50	0.1
Corchorus lasiocarpus subsp. *parvus*	70-120	0.1
Corymbia ferriticola	300	29
Cymbopogon ambiguus	80	1
Dodonaea pachyneura	80	1
Duperreya commixta		0.1
Eremophila longifolia	60	0.1
Eriachne mucronata	40	4
Eucalyptus leucophloia subsp. *leucophloia*	800	1
Euphorbia wheeleri	25	0.1
Ficus brachypoda	350	0.1
Gompholobium sp. Pilbara (N.F. Norris 908) PN	80	0.1
Gossypium robinsonii	180	0.1
Grevillea wickhamii subsp. *hispidula*	250	0.1
Hibiscus aff. *coatesii* (site 733)	40	0.1
Indigofera monophylla (small leaflet form)	40	0.1
Jasminum didymum subsp. *lineare*	40	0.1
Mirbelia viminalis	70	0.1
Paraneurachne muelleri	20	0.1
Rhynchosia bungarensis	60	0.1
Santalum lanceolatum	250	0.1
Sida sp. Articulation below (A.A. Mitchell PRP 1605)	250	0.1
Sida sp. Barlee Range (S. van Leeuwen 1642)	50	0.1
Solanum gabrielae	25	0.1
Stylobasium spathulatum	170	0.1

Species (Phase 2)	Height (cm)	Cover (%)
Abutilon dioicum	100	0.1
Acacia hamersleyensis	600	1
Acacia pruinocarpa	500	0.1
Acacia tumida var. *pilbarensis*	500	30
Amaranthus undulatus	80	0.1
Aristida burbidgeae	70	0.1
Aristida holathera var. *holathera*	50	0.1
Atalaya hemiglauca	200	0.1
Bulbostylis barbata	15	0.1
Capparis spinosa var. *nummularia*	60	0.1
Cassia glutinosa	130	0.1
Cassia venusta	150	0.1
Cenchrus ciliaris	70	0.1
Cleome viscosa	60	0.1
Clerodendrum floribundum var. *angustifolium*	40	0.1
Corchorus laniflorus	100	0.1
Corchorus lasiocarpus subsp. *parvus*	50	0.1
Corymbia ferriticola	800	29
Cucumis maderaspatanus	50	0.1
Cymbopogon ambiguus	100	0.1
Dodonaea pachyneura	220	1
Duperreya commixta	250	0.1
Enneapogon polyphyllus	50	0.1
Eremophila longifolia	60	0.1
Eriachne mucronata	40	0.1
Eucalyptus leucophloia subsp. *leucophloia*	800	1
Ficus brachypoda	600	3
Gompholobium sp. Pilbara (N.F. Norris 908) PN	80	0.1
Gossypium robinsonii	200	1
Grevillea wickhamii subsp. *hispidula*	300	1
Hibiscus goldsworthii	45	0.1
Hybanthus aurantiacus	40	0.1
Nicotiana benthamiana	20	0.1
Paraneurachne muelleri	50	0.1
Paspalidium clementii	20	0.1
Paspalidium tabulatum	40	0.1
Pterocaulon sphacelatum	2	0.1
Rhynchosia bungarensis	20	0.1

Species (Phase 1)	Height (cm)	Cover (%)
Tephrosia aff. *densa* (P8T-018)	100	0.1
Themeda sp. Mt Barricade (M.E. Trudgen 2471)	50	1
Triodia pungens	45	0.1
Triumfetta leptacantha	35	0.1
Triumfetta maconochieana	25	0.1

Species (Phase 2)	Height (cm)	Cover (%)
Sida sp. Articulation below (A.A. Mitchell PRP 1605)	260	0.1
Sida sp. Barlee Range (S. van Leeuwen 1642)	50	0.1
Solanum gabrielae	60	0.1
Stylobasium spathulatum	140	0.1
Tephrosia densa	60	0.1
Themeda sp. Mt Barricade (M.E. Trudgen 2471)	50	0.1
Tinospora smilacina	15	0.1
Trachymene oleracea subsp. *oleracea*	30	0.1
Trichodesma zeylanicum var. *zeylanicum*	40	0.1
Triodia pungens	50	1
Triumfetta leptacantha	40	0.1

Koodaideri Site KOD14
Described (Phase 1) PCBRM **Date (Phase 1)** 11/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) MM **Date (Phase 2)** 11/03/2011
MGA 50 711697 **mE** 7505022 **mN**
Habitat Moderate, NW-facing lower slope of ridge
Soil Red-brown sandy loam
Rock Type Ironstone gravel and pebbles
Vegetation (Phase 1) *Grevillea wickhamii* subsp. *hispidula* scattered tall shrubs over *Acacia arida, Mirbelia viminalis, Gompholobium* sp. Pilbara, *Tephrosia arenicola* low open shrubland over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) open hummock grassland and *Eriachne lanata* scattered tussock grasses
Vegetation (Phase 2) *Acacia arida* scattered shrubs over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) open hummock grassland and *Eriachne lanata* scattered tussock grasses
Veg Condition Excellent
Fire Age No sign of recent fire

Species (Phase 1)	Height (cm)	Cover (%)
Acacia arida	60	2
Acacia spondylophylla	35	0.1
Amphipogon sericeus	35	0.1
Bonamia sp. Dampier (A.A. Mitchell PRP 217)	6	0.1
Calytrix carinata	70	0.1
Corchorus aff. *lasiocarpus* subsp. *parvus*	60	0.1
Dampiera candicans	40	0.1
Eriachne lanata	35	3
Gompholobium sp. Pilbara (N.F. Norris 908) PN	40	3
Goodenia stobbsiana	35	0.1
Grevillea wickhamii subsp. *hispidula*	250	2
Hakea chordophylla	300	0.1
Heliotropium tenuifolium	25	0.1
Mirbelia viminalis	50	3
Ptilotus calostachyus	60	0.1
Scaevola browniana subsp. *browniana*	30	0.1
Sida sp.	45	0.1
Solanum phlomoides	45-60	0.1
Tephrosia arenicola	150	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	20	35
Triodia pungens	35	0.1

Species (Phase 2)	Height (cm)	Cover (%)
Acacia arida	100	1
Acacia spondylophylla	50	0.1
Amphipogon sericeus	25	0.1
Bonamia sp. Dampier (A.A. Mitchell PRP 217)	5	0.1
Calytrix carinata	40	0.1
Corchorus lasiocarpus subsp. *parvus*	70	0.1
Eriachne lanata	60	2
Gompholobium sp. Pilbara (N.F. Norris 908) PN	55	0.1
Goodenia stobbsiana	45	0.1
Goodenia triodiophila	25	0.1
Grevillea wickhamii subsp. *hispidula*	350	0.1
Hakea chordophylla	380	0.1
Hybanthus aurantiacus	10	0.1
Mirbelia viminalis	130	0.1
Mollugo molluginea	20	0.1
Ptilotus calostachyus	55	0.1
Scaevola browniana subsp. *browniana*	45	0.1
Solanum phlomoides	60	0.1
Tephrosia arenicola	130	0.1
Triodia pungens	40	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	45	30

Koodaideri Site KOD15
Described (Phase 1) RB/PC **Date (Phase 1)** 12/07/2010 **Type** Quadrat 100 x 25
Described (Phase 2) MM **Date (Phase 2)** 10/05/2011
MGA 50 707509 **mE** 7505542 **mN**
Habitat Rocky gully
Soil Red-brown sand
Rock Type Gravelly, pebbly, cobbly ironstone
Vegetation (Phase 1) *Eucalyptus leucophloia* subsp. *leucophloia* low open woodland over *Grevillea wickhamii* subsp. *hispidula, Acacia tumida* var. *pilbarensis* tall shrubland over *Acacia maitlandii* open shrubland over *Triodia wiseana* open hummock grassland and *Eriachne mucronata* scattered tussock grasses
Vegetation (Phase 2) *Eucalyptus leucophloia* subsp. *leucophloia* low open woodland over *Grevillea wickhamii* subsp. *hispidula, Acacia maitlandii, Acacia tumida* var. *pilbarensis, Acacia spondylophylla* tall open scrub over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia wiseana* open hummock grassland
Veg Condition Excellent
Fire Age Very long unburnt
Notes Quadrat follows the shape of the gully; pegged at both ends

Species (Phase 1)	Height (cm)	Cover (%)
Acacia arida	90	0.1
Acacia hilliana	60	0.1
Acacia maitlandii	160	7
Acacia spondylophylla	60	0.1
Acacia tumida var. *pilbarensis*	350	3
Cassia glutinosa	170	0.1
Cassia oligophylla x *helmsii*	120	0.1
Corchorus lasiocarpus subsp. *parvus*	45	0.1
Corymbia hamersleyana	400	0.1
Cymbopogon ambiguus	80	0.1
Dampiera candicans	50	0.1
Dodonaea petiolaris	40	0.1
Eriachne mucronata	60	1
Eucalyptus leucophloia subsp. leucophloia	400	3
Euphorbia sp. (HD195-16)	20	0.1
Gossypium robinsonii	300	0.1
Grevillea wickhamii subsp. *hispidula*	300	25
Hakea chordophylla	200	0.1
Hibiscus aff. *coatesii* (site 733)	20	0.1
Mirbelia viminalis	60	0.1
Paraneurachne muelleri	50	0.1
Santalum lanceolatum	150	0.1
Sida aff. *arenicola*	300	0.1
Tephrosia rosea var. *glabrior*	10	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	40	0.1
Triodia wiseana	60	25

Species (Phase 2)	Height (cm)	Cover (%)
Acacia maitlandii	220	10
Acacia spondylophylla	70	1
Acacia tumida var. *pilbarensis*	300	2
Aristida holathera var. *holathera*	60	0.1
Aristida ingrata	110	0.1
Bulbostylis barbata	20	0.1
Cassia glutinosa	140	0.1
Cassia oligophylla	90	0.1
Clerodendrum floribundum var. *angustifolium*	200	0.1
Cymbopogon ambiguus	120	0.1
Enneapogon polyphyllus	45	0.1
Eragrostis eriopoda	50	0.1
Eriachne aristidea	30	0.1
Eriachne mucronata	40	0.1
Eucalyptus leucophloia subsp. *leucophloia*	300	5
Euphorbia boophthona	30	0.1
Gossypium robinsonii	300	0.1
Grevillea wickhamii subsp. *hispidula*	300	25
Hakea chordophylla	200	0.1
Jasminum didymum subsp. *lineare*	40	0.1
Mirbelia viminalis	60	0.1
Paraneurachne muelleri	40	0.1
Paspalidium clementii	40	0.1
Perotis rara	10	0.1
Polycarpaea longiflora	45	0.1
Ptilotus fusiformis	40	0.1
Santalum lanceolatum	200	0.1
Schizachyrium fragile	45	0.1
Sida sp. Articulation below (A.A. Mitchell PRP 1605)	50	0.1
Stackhousia intermedia	20	0.1
Tephrosia virens	180	0.1
Trachymene oleracea subsp. *oleracea*	2	0.1
Triodia epactia	40	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	20	2
Triodia wiseana	50	15

Koodaideri Site KOD16
Described (Phase 1) RB/PC **Date (Phase 1)** 12/07/2010 **Type** Quadrat 200 x 12.5
Described (Phase 2) PA/RH **Date (Phase 2)** 12/03/2011
MGA 50 710154 **mE** 7505655**mN**
Habitat Rocky creek leading to gully
Soil Red brown sand with fine gravel
Rock Type Ironstone, gravel, pebbles, cobbles and boulders
Vegetation (Phase 1) *Corymbia hamersleyana, Corymbia ferriticola* scattered low trees over *Acacia tumida* var. *pilbarensis*, *Petalostylis labicheoides, (Grevillea wickhamii* subsp. *hispidula*) tall shrubland over *Themeda triandra, Cymbopogon procerus, Eriachne mucronata* (typical form) very open tussock grasses
Vegetation (Phase 2) *Corymbia ferriticola* scattered low trees over *Acacia tumida* var. *pilbarensis*, *Petalostylis labicheoides, Grevillea wickhamii* subsp. *hispidula* tall shrubland over Triodia wiseana scattered hummock grasses over Themeda triandra, *Cymbopogon procerus, Eriachne mucronata, Paraneurachne muelleri* very open tussock grasses
Veg Condition Excellent/Very Good
Fire Age No sign of recent fire
Notes Quadrat shape follows creekline to capture the creek vegetation. Single **Cenchrus* in quadrat in Phase 2

Species (Phase 1)	Height (cm)	Cover (%)
Acacia arida	30	0.1
Acacia pyrifolia	80	0.1
Acacia tumida var. *pilbarensis*	450	10
Atalaya hemiglauca	50	0.1
Cleome viscosa	40	0.1
Clerodendrum floribundum var. *angustifolium*	40	0.1
Corchorus lasiocarpus subsp. *parvus*	70	0.1
Corymbia ferriticola	400	1
Corymbia hamersleyana	800	1
Cymbopogon ambiguus	45	0.1
Cymbopogon procerus	150	1
Duperreya commixta	200	0.1
Enteropogon ramosus	100	0.1
Eriachne lanata	35	0.1
Eriachne mucronata	65	1
Ficus brachypoda	250	0.1
Gossypium robinsonii	300	0.1
Grevillea wickhamii subsp. *hispidula*	350	1
Indigofera monophylla (brown calyx form)	40	0.1
Jasminum didymum subsp. *lineare*	100	0.1
Paraneurachne muelleri	60	0.1
Petalostylis labicheoides	400	5
Polycarpaea longiflora	20	0.1
Santalum lanceolatum	250	0.1
Tephrosia rosea var. *glabrior*	50	0.1
Themeda triandra	70	5
Triodia pungens	60	0.1

Species (Phase 2)	Height (cm)	Cover (%)
Abutilon dioicum	200	0.1
Acacia arida	150	0.1
Acacia pruinocarpa	150	0.1
Acacia pyrifolia	450	0.1
Acacia tenuissima	130	0.1
Acacia tumida var. *pilbarensis*	700	10
Amaranthus cuspidifolius	40	0.1
Amaranthus undulatus	100	0.1
Aristida contorta	40	0.1
Aristida holathera var. *holathera*	50	0.1
Aristida inaequiglumis	120	0.1
Bulbostylis barbata	15	0.1
Cassia glutinosa	150	0.1
Cassia notabilis	40	0.1
Cassia oligophylla	20	0.1
Cenchrus ciliaris	100	0.1
Cheilanthes sieberi subsp. *sieberi*	10	0.1
Cleome viscosa	20	0.1
Clerodendrum floribundum var. *angustifolium*	250	0.1
Corymbia ferriticola	400	1
Crotalaria medicaginea var. *neglecta*	100	0.1
Cucumis maderaspatanus	100	0.1
Cymbopogon ambiguus	120	0.1
Cymbopogon procerus	120	1
Cyperus cunninghamii subsp. *cunninghamii*	20	0.1
Digitaria brownii	70	0.1
Dodonaea pachyneura	100	0.1
Duperreya commixta	150	0.1
Dysphania rhadinostachya (subsp. not determined)	20	0.1
Enneapogon caerulescens	70	0.1
Enneapogon lindleyanus		
Eragrostis cumingii	30	0.1
Eriachne mucronata	50	1
Eriachne pulchella subsp. *dominii*	20	0.1
Euphorbia biconvexa	60	0.1
Evolvulus alsinoides var. *villosicalyx*	20	0.1
Ficus brachypoda	600-700	0.1
Fimbristylis simulans	15	0.1
Ganoderma steyaertanum	10	0.1
Gomphrena cunninghamii	10	0.1
Gossypium robinsonii	250	0.1
Grevillea wickhamii subsp. *hispidula*	500	1
Hybanthus aurantiacus	40	0.1

Species (Phase 1)	Height (cm)	Cover (%)

Species (Phase 2)	Height (cm)	Cover (%)
Indigofera monophylla	40	0.1
Notoleptopus decaisnei	25	0.1
Paraneurachne muelleri	60	1
Paspalidium clementii	30	0.1
Petalostylis labicheoides	400	5
Polycarpaea longiflora	20	0.1
Polymeria ambigua	10	0.1
Ptilotus exaltatus var. *exaltatus*	30	0.1
Pycnoporus coccineus	5	0.1
Rulingia luteiflora	350	0.1
Santalum lanceolatum	400	0.1
Setaria surgens	40	0.1
Sida sp. Articulation below (A.A. Mitchell PRP 1605)	20	0.1
Stylobasium spathulatum	200	0.1
Tephrosia arenicola	160	0.1
Tephrosia rosea var. *glabrior*	100	0.1
Themeda triandra	120	1
Trichodesma zeylanicum var. *zeylanicum*	10	0.1
Triodia pungens	120	0.1
Triodia wiseana	100	1

Koodaideri Site KOD17
Described (Phase 1) RB/PC **Date (Phase 1)** 13/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) PA/RH **Date (Phase 2)** 10/03/2011
MGA 50 707934 **mE** 7509791 **mN**
Habitat Broad floodplain intersected by minor drainage lines
Soil Red brown silty loam (4% coarse fragments 30-50mm)
Rock Type Ironstone gravel, pebbles and boulders (scattered riverstone)
Vegetation (Phase 1) *Acacia tumida* var. *pilbarensis, Atalaya hemiglauca*, *Grevillea wickhamii* subsp. *hispidula* tall open shrubland over *Acacia pyrifolia* scattered shrubs over *Tephrosia rosea* var. *glabrior* low open shrubland over **Cenchrus ciliaris*, *(Cymbopogon procerus*) tussock grassland
Vegetation (Phase 2) *Acacia tumida* var. *pilbarensis, Grevillea wickhamii* subsp. *hispidula, Gossypium robinsonii* tall open shrubland over *Tephrosia rosea* var. *glabrior*, *Acacia pyrifolia* open shrubland over **Cenchrus* spp. closed tussock grassland
Veg Condition Poor
Fire Age Burnt 3-5 years ago
Notes Dense **Cenchrus*; very few plants with flowering material

Species (Phase 1)	Height (cm)	Cover (%)
Acacia pyrifolia	150	1
Acacia tumida var. *pilbarensis*	350	5
Amaranthus sp.	45	0.1
Aristida contorta	30	0.1
Atalaya hemiglauca	210	5
Boerhavia coccinea		0.1
Cenchrus ciliaris	70	35
Cleome viscosa	45	0.1
Corchorus crozophorifolius	120	0.1
Cymbopogon procerus	140	2
Gomphrena cunninghamii	5	0.1
Gossypium robinsonii	300	0.1
Grevillea wickhamii subsp. *hispidula*	300	1
Heliotropium cunninghamii	25-30	0.1
Hybanthus aurantiacus	40	0.1
Indigofera monophylla (small leaflet form)	40	0.1
Pentalepis trichodesmoides	80	0.1
Polycarpaea longiflora	15	0.1
Ptilotus calostachyus	50	0.1
Ptilotus obovatus var. *obovatus*	60	0.1
Solanum phlomoides	70	0.1
Tephrosia rosea var. *glabrior*	70	2
Trichodesma zeylanicum var. *zeylanicum*	8	0.1

Species (Phase 2)	Height (cm)	Cover (%)
Acacia pyrifolia	150	1
Acacia tumida var. *pilbarensis*	450	6
Amaranthus interruptus	30	0.1
Atalaya hemiglauca	260	0.1
Boerhavia coccinea	15-20	0.1
Cassia oligophylla	50	0.1
Cenchrus ciliaris	100	61
Cenchrus setiger	120	10
Cleome viscosa	150	0.1
Clerodendrum floribundum var. *angustifolium*	250	0.1
Corchorus crozophorifolius	75	0.1
Cucumis maderaspatanus	60	0.1
Eriachne pulchella subsp. *dominii*	20	0.1
Gomphrena cunninghamii	10	0.1
Gossypium robinsonii	450	1
Grevillea wickhamii subsp. *hispidula*	300	2
Hybanthus aurantiacus	80	0.1
Indigofera monophylla	50	0.1
Ipomoea muelleri	20	1
Notoleptopus decaisnei	20	0.1
Pentalepis trichodesmoides	80	0.1
Podaxis pistillaris	10	0.1
Polycarpaea longiflora	15	0.1
Ptilotus exaltatus var. *exaltatus*	35	0.1
Ptilotus obovatus var. *obovatus*	140	0.1
Salsola australis	50	0.1
Solanum lasiophyllum	90	0.1
Tephrosia rosea var. *glabrior*	110	6
Trachymene oleracea subsp. *oleracea*	25	0.1
Tribulus macrocarpus	15	0.1
Trichodesma zeylanicum var. *zeylanicum*	80	0.1
Triodia epactia	100	0.1

Koodaideri Site KOD18
Described (Phase 1) RB/PC **Date (Phase 1)** 13/07/2010 **Type** R 200 x 12.5
Described (Phase 2) PACEF **Date (Phase 2)** 16/03/2011
MGA 50 711536 **mE** 7505850 **mN**
Habitat Rocky creek with permanent water
Soil Red-brown alluvial sandy loam
Rock Type Ironstone cobbles
Vegetation (Phase 1) *Eucalyptus camaldulensis* subsp. *refulgens* open forest over *Ficus virens* var. *virens* low open woodland over *Typha domingensis, Cyperus vaginatus* closed sedgeland
Vegetation (Phase 2) *Eucalyptus camaldulensis* closed forest over *Ficus virens* var. *virens* low open woodland *over Typha domingensis, Cyperus vaginatus* closed sedgeland over *Eulalia aurea, Themeda triandra, Cenchrus ciliaris* very open tussock grassland
Veg Condition Very good
Fire Age No sign of recent fire
Notes **Lactuca serriola* and **Cenchrus ciliaris* throughout creek. Cover estimates are based on the entire creek community including the water body, which accounted for ~15%. Vegetation split into creek (KOD18) and bank (KOD18b) to capture both distinct vegetation units. Creek vegetation varied from 3-10 m wide

Species (Phase 1)	Height (cm)	Cover (%)
Acacia tumida var. *pilbarensis*	100	0.1
Clerodendrum floribundum var. *angustifolium*	250-300	0.1
Crotalaria novae-hollandiae subsp. *novae-hollandiae*	10	0.1
Cyperus vaginatus	130	55
Duperreya commixta	60	0.1
Eucalyptus camaldulensis subsp. *refulgens*	1200	65
Eulalia aurea	70	0.1
Ficus virens var. *virens*	250	5
Lactuca saligna	100	0.1
Phyllanthus reticulatus	140	0.1
Tinospora smilacina	50	0.1
Tylophora flexuosa	20	0.1
Typha domingensis	220	30

Species (Phase 2)	Height (cm)	Cover (%)
Abutilon dioicum	120	0.1
Abutilon lepidum	100	0.1
Acacia bivenosa	100	0.1
Acacia pruinocarpa	100	0.1
Acacia pyrifolia	250	0.1
Acacia tumida var. *pilbarensis*	500	0.1
Atalaya hemiglauca	300	0.1
Capparis spinosa var. *nummularia*	60	0.1
Cenchrus ciliaris	60	1
Clerodendrum floribundum var. *angustifolium*	70	0.1
Corchorus lasiocarpus subsp. *parvus*	100	0.1
Crotalaria novae-hollandiae subsp. *novae-hollandiae*	120	0.1
Cucumis maderaspatanus	20	0.1
Cymbopogon ambiguus	200	0.1
Cyperus vaginatus	120	75
Duperreya commixta	120	0.1
Eucalyptus camaldulensis subsp. *refulgens*	2500	72
Eulalia aurea	130	1
Euphorbia biconvexa	20	0.1
Ficus virens var. virens	700-1000	0.1
Gossypium robinsonii	350	0.1
Jasminum didymum subsp. *lineare*	130	0.1
Lactuca serriola	150	0.1
Petalostylis labicheoides	200	0.1
Phyllanthus maderaspatensis	40	0.1
Phyllanthus reticulatus	300	0.1
Rhynchosia bungarensis	50	0.1
Rhynchosia minima	25	0.1
Stylobasium spathulatum	70	0.1
Tephrosia rosea var. *glabrior*	50	0.1
Themeda triandra	60	1
Tinospora smilacina	20	0.1
Triodia epactia	40	0.1
Tylophora flexuosa	50	0.1
Typha domingensis	300	8

Koodaideri Site KOD18B
Described (Phase 1) RB/PC **Date (Phase 1)** 13/07/2010 **Type** R 200 x 12.5
Described (Phase 2) MyMR **Date (Phase 2)** 16/03/2011
MGA 50 711536 **mE** 7505850 **mN**
Habitat Bank of creek (site KOD18) with permanent water
Soil Red-brown sandy clay
Rock Type Ironstone
Vegetation (Phase 1) *Eucalyptus camaldulensis* subsp. *refulgens* open forest over *Acacia tumida* var. *pilbarensis* tall open shrubland over *Cyperus vaginatus* open sedgeland and *Eulalia aurea* scattered tussock grasses
Vegetation (Phase 2) *Eucalyptus camaldulensis, Corymbia hamersleyana* woodland over *Acacia tumida* var. *pilbarensis* scattered tall shrubs over *Abutilon lepidum* scattered low shrubs over *Cyperus vaginatus* very open sedgeland and *Cenchrus ciliaris, Themeda triandra, Eulalia aurea*, *Cymbopogon ambiguus* closed tussock grassland
Veg Condition Very good
Fire Age No sign of recent fire
Notes **Lactuca serriola* and **Cenchrus ciliaris* present. See notes on KOD18 datasheet: this bank vegetation is from the same location as KOD18 - split into creek and bank vegetation. Bank vegetation (both sides combined) varied from 1-6 m in width

Species (Phase 1)	Height (cm)	Cover (%)
Abutilon dioicum	50	0.1
Acacia pruinocarpa	100	0.1
Acacia tumida var. *pilbarensis*	200	2
Atalaya hemiglauca	200	0.1
Brachychiton acuminatus	160	0.1
Capparis spinosa var. *nummularia*	45	0.1
Cenchrus ciliaris	60	0.1
Cleome viscosa	60	0.1
Cymbopogon procerus	140	0.1
Cyperus vaginatus	70	15
Enteropogon ramosus	70	0.1
Eucalyptus camaldulensis subsp. *refulgens*	1500	70
Eulalia aurea	70	1
Euphorbia alsiniflora	40	0.1
Ficus brachypoda	40	0.1
Gossypium robinsonii	300	0.1
Jasminum didymum subsp. *lineare*	120	0.1
Lactuca saligna	100	0.1
Petalostylis labicheoides	150	0.1
Phyllanthus reticulatus	1.3	0.1
Pluchea rubelliflora	35	0.1
Polymeria aff. *ambigua* (MET12,302)		0.1
Rhynchosia bungarensis	50	0.1
Stylobasium spathulatum	100	0.1
Themeda sp. Mt Barricade (M.E. Trudgen 2471)	70	0.1
Tylophora flexuosa	50	0.1

Species (Phase 2)	Height (cm)	Cover (%)
Abutilon dioicum		
Abutilon lepidum	80	1
Acacia ancistrocarpa	300	0.1
Acacia bivenosa	180	0.1
Acacia coriacea subsp. *pendens*	200	0.1
Acacia inaequilatera	350	0.1
Acacia pruinocarpa	200	0.1
Acacia pyrifolia	90	0.1
Acacia spondylophylla	120	0.1
Acacia tumida var. *pilbarensis*	400	0.1
Achyranthes aspera	60	0.1
Aerva javanica	80	0.1
Amaranthus undulatus	30	0.1
Atalaya hemiglauca	120	0.1
Capparis spinosa var. *nummularia*	20	0.1
Cassia glutinosa	60	0.1
Cenchrus ciliaris	70	70
Cleome viscosa	30	0.1
Clerodendrum floribundum var. *angustifolium*	350	0.1
Corchorus laniflorus	70	0.1
Corchorus lasiocarpus subsp. *lasiocarpus*	70	0.1
Corymbia hamersleyana	600	5
Cucumis maderaspatanus	80	0.1
Cullen lachnostachys	250	0.1
Cymbopogon ambiguus	130	2
Cyperus vaginatus	100	5
Dodonaea pachyneura	70	0.1
Duperreya commixta	80	0.1
Enneapogon lindleyanus	30	0.1
Enteropogon ramosus	80	0.1
Eucalyptus camaldulensis subsp. *refulgens*	1200	20
Eulalia aurea	80	5
Euphorbia biconvexa	25	0.1
Evolvulus alsinoides var. *decumbens*	30	0.1
Ficus brachypoda	200	0.1
Glycine canescens	100	0.1
Gossypium australe	100	0.1
Gossypium robinsonii	300	0.1
Hakea lorea subsp. *lorea*	300	0.1
Hibiscus goldsworthii	30	0.1
Jasminum didymum subsp. *lineare*	60	0.1
Melhania oblongifolia	30	0.1
Paraneurachne muelleri	60	0.1
Paspalidium clementii	10	0.1
Petalostylis labicheoides	120	0.1

Species (Phase 1)	Height (cm)	Cover (%)

Species (Phase 2)	Height (cm)	Cover (%)
Ptilotus obovatus var. *obovatus*	50	0.1
Rhagodia eremaea	100	0.1
Rhynchosia bungarensis	60	3
Rhynchosia minima	20	0.1
Santalum lanceolatum	150	0.1
Sida fibulifera	20	0.1
Solanum phlomoides	40	0.1
Solanum sp.	50	0.1
Stylobasium spathulatum	400	0.1
Tephrosia densa	100	0.1
Themeda triandra	50	10
Trichodesma zeylanicum var. *zeylanicum*	20	0.1
Triodia epactia	50	0.1
Tylophora flexuosa	40	0.1
Typha domingensis	300	0.1
Waltheria indica	60	0.1

Koodaideri Site KOD19
Described (Phase 1) BCMT **Date (Phase 1)** 13/07/2010 **Type** Quadrat 45 x 55
Described (Phase 2) PACEF **Date (Phase 2)** 16/03/2011
MGA 50 711378 **mE** 7505683 **mN**
Habitat Rocky gorge with permanent water
Soil Dark brown clay loam (not gritty); soil forms ribbons that snap
Rock Type Ironstone
Vegetation (Phase 1) *Eucalyptus camaldulensis* subsp. *refulgens* open forest over *Ficus virens* var. *virens* low closed forest over *Cyperus vaginatus* open sedgeland
Vegetation (Phase 2) *Eucalyptus camaldulensis* subsp. *refulgens, Ficus virens* closed forest
Veg Condition Very good/Excellent
Fire Age No sign of recent fire
Notes Some **Cenchrus ciliaris*. Surface material at southern end of quadrat consists of sand and rock; at the northern end of the quadrat, the surface material is exposed rock with no soil

Species (Phase 1)	Height (cm)	Cover (%)
Aristida burbidgeae	30	0.1
Atalaya hemiglauca	90	0.1
Capparis lasiantha	40	0.1
Capparis spinosa var. *nummularia*	60	0.1
Cenchrus ciliaris	40	0.1
Clerodendrum floribundum var. *angustifolium*	35-200	0.1
Cymbopogon procerus	90	0.1
Cyperus vaginatus	70	20
Dodonaea pachyneura	120	0.1
Duperreya commixta		0.1
Eriachne mucronata	30	0.1
Eucalyptus camaldulensis subsp. *refulgens*	1500	45
Ficus virens var. *virens*	250-600	80
Jasminum didymum subsp. *lineare*	50	0.1
Melaleuca sp.	10	0.1
Phyllanthus reticulatus	350	0.1
Tinospora smilacina	500	0.1
Tylophora flexuosa	10	0.1
Typha domingensis	170	0.1

Species (Phase 2)	Height (cm)	Cover (%)
Aristida burbidgeae	35	0.1
Atalaya hemiglauca	300	0.1
Capparis spinosa var. *nummularia*	100	0.1
Cassia glutinosa	130	0.1
Cenchrus ciliaris	100	0.1
Clerodendrum floribundum var. *angustifolium*	100	0.1
Cyperus vaginatus	100	0.1
Eucalyptus camaldulensis subsp. *refulgens*	2000	50
Ficus virens var. *virens*	1200	40
Phyllanthus reticulatus	300	0.1
Pycnoporus coccineus		
Tinospora smilacina	800	0.1
Typha domingensis	200	0.1

Koodaideri Site KOD20
Described (Phase 1) RBJCF **Date (Phase 1)** 14/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) MM **Date (Phase 2)** 09/05/2011
MGA 50 718874 **mE** 7500649 **mN**
Habitat West-facing middle slope of a moderate hill
Soil Skeletal red-brown clay loam
Rock Type Ironstone gravel, pebbles and cobbles
Vegetation (Phase 1) *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Acacia arida*, *A. hilliana, A. spondylophylla* low shrubland over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia* sp. (*epactia/pungens*) open hummock grassland
Vegetation (Phase 2) *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Acacia arida*, *A. spondylophylla, A. hilliana* low shrubland over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia* sp. (*epactia/pungens*) open hummock grassland
Veg Condition Excellent
Fire Age Burnt 3-5 years ago
Notes *Triodia* sp. (*epactia/pungens*) material insufficient to identify further (M.E. Trudgen)

Species (Phase 1)	Height (cm)	Cover (%)
Acacia arida	40	10
Acacia hilliana	20	5
Acacia spondylophylla	45	5
Aristida holathera var. *holathera*	30	0.1
Corchorus lasiocarpus subsp. *lasiocarpus*	50	0.1
Dampiera candicans	35	0.1
Eriachne lanata	40	0.1
Eriachne mucronata	40	0.1
Eucalyptus leucophloia subsp. *leucophloia*	500	2
Goodenia stobbsiana	35	0.1
Grevillea wickhamii subsp. hispidula	130	0.1
Mirbelia viminalis	0.1	45
Ptilotus calostachyus	120	0.1
Scaevola browniana subsp. *browniana*	35	0.1
Sida arenicola	110	0.1
Solanum phlomoides	60	0.1
Tephrosia arenicola	50	0.1
Triodia sp. *(epactia/pungens)*	25	1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	20	10

Species (Phase 2)	Height (cm)	Cover (%)
Acacia arida	50	10
Acacia hilliana	35	5
Acacia spondylophylla	50	5
Aristida holathera var. *holathera*	20	0.1
Corchorus lasiocarpus subsp. *lasiocarpus*	40	0.1
Dampiera candicans	50	0.1
Dysphania sp.	2	0.1
Eriachne lanata	40	0.1
Eriachne mucronata	50	0.1
Eriachne pulchella subsp. *dominii*	10	0.1
Eucalyptus leucophloia subsp. *leucophloia*	400	2
Fimbristylis simulans	20	0.1
Goodenia stobbsiana	12	0.1
Goodenia triodiophila	30	0.1
Grevillea wickhamii subsp. *hispidula*	160	0.1
Mirbelia viminalis	50	0.1
Ptilotus calostachyus	90	0.1
Ptilotus exaltatus var. *exaltatus*	5	0.1
Scaevola browniana subsp. *browniana*	40	0.1
Sida arenicola	100	0.1
Sida pilbarensis (ferruginous form)	40	0.1
Solanum phlomoides	35	0.1
Tephrosia arenicola	60	0.1
Triodia sp. *(epactia/pungens)*	50	1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	20	10

Koodaideri Site KOD21
Described (Phase 1) JCFER **Date (Phase 1)** 06/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) CFMyM **Date (Phase 2)** 11/03/2011
MGA 50 714916 **mE** 7506138 **mN**
Habitat Broad creekline formed by the convergence of two creeklines
Soil Red-brown clay loam
Rock Type Scattered ironstone pebbles
Vegetation (Phase 1) *Corymbia hamersleyana* scattered low trees over *Acacia pyrifolia, Acacia tumida* var. *pilbarensis* tall closed scrub over *Tephrosia rosea* var. *glabrior, Indigofera monophylla* (brown calyx form) open shrubland over *Cenchrus ciliaris* closed tussock grassland
Vegetation (Phase 2) *Corymbia hamersleyana* scattered low trees over *Acacia pyrifolia, Acacia tumida* tall open scrub over *Tephrosia rosea* var. *glabrior* open shrubland over **Cenchrus ciliaris* tussock grassland
Veg Condition Good to Poor
Fire Age No sign of recent fire
Notes Elevation 450 m asl. Relatively dense cover of **Cenchrus ciliaris*

Species (Phase 1)	Height (cm)	Cover (%)
Acacia pyrifolia	300	72
Acacia tumida var. *pilbarensis*	250	15
Atalaya hemiglauca	250	0.1
Cassia glutinosa x *luerssenii*	150	0.1
Cassia oligophylla	100	0.1
Cenchrus ciliaris	75	60
Corymbia hamersleyana	600	1
Eremophila longifolia	160	0.1
Euphorbia wheeleri	10	0.1
Evolvulus alsinoides var. *villosicalyx*	20	0.1
Gossypium robinsonii	300	0.1
Hybanthus aurantiacus	40	0.1
Indigofera monophylla (brown calyx form)	100	5
Indigofera monophylla (small leaflet form)	60	0.1
Santalum lanceolatum	200	0.1
Tephrosia rosea var. *glabrior*	120	5
Triodia epactia	40	0.1

Species (Phase 2)	Height (cm)	Cover (%)
Abutilon dioicum	40-200	0.1
Acacia pyrifolia	200	25
Acacia tumida var. *pilbarensis*	300	15
Aristida holathera var. *holathera*	50	0.1
Atalaya hemiglauca	300	0.1
Bonamia erecta	40	0.1
Cassia glutinosa x *luerssenii*	120	0.1
Cassia oligophylla	120	0.1
Cenchrus ciliaris	100	40
Corchorus sp.	40	0.1
Corchorus lasiocarpus subsp. lasiocarpus	40	0.1
Corymbia hamersleyana	550	1
Duperreya commixta	200	0.1
Ehretia saligna var. *saligna*	120	0.1
Eremophila longifolia	180	0.1
Gossypium australe	80	0.1
Gossypium robinsonii	250	0.1
Hibiscus sturtii var. *platychlamys*	60	0.1
Hybanthus aurantiacus	30	0.1
Indigofera monophylla	60-120	0.1
Polymeria ambigua	50	0.1
Santalum lanceolatum	200	0.1
Sida arenicola	130	0.1
Tephrosia rosea var. *glabrior*	100	10
Triodia epactia	50	0.1

Koodaideri Site KOD22
Described (Phase 1) JCFER **Date (Phase 1)** 06/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) MM **Date (Phase 2)** 11/03/2011
MGA 50 713748 **mE** 7506960 **mN**
Habitat Broad plain hills to the south
Soil Red brown clay loam
Rock Type Ironstone rocks and pebbles
Vegetation (Phase 1) *Acacia inaequilatera* open shrubland over *Triodia lanigera* open hummock grassland
Vegetation (Phase 2) *Acacia inaequilatera* scattered tall shrubs over *Bonamia rosea* scattered low shrubs over *Triodia lanigera* open hummock grassland
Veg Condition Very Good
Fire Age Burnt 3-5 years ago
Notes Elevation 477 m asl. One **Cenchrus ciliaris* individual in Phase 2

Species (Phase 1)	Height (cm)	Cover (%)
Acacia inaequilatera	190	2
Bonamia rosea	30	0.1
Cassia oligophylla x *helmsii*	50	0.1
Eragrostis setifolia	20	0.1
Eucalyptus gamophylla	180	0.1
Gossypium australe (Burrup Peninsula form)	30	0.1
Grevillea wickhamii subsp. *hispidula*	180	0.1
Hakea chordophylla	180	0.1
Heliotropium pachyphyllum	30	0.1
Ptilotus astrolasius	40	0.1
Ptilotus calostachyus	100	0.1
Ptilotus exaltatus var. *exaltatus*	30	0.1
Sida arenicola	30	0.1
Sida sp.	40	0.1
Solanum lasiophyllum	40	0.1
Triodia lanigera	30	20

Species (Phase 2)	Height (cm)	Cover (%)
Acacia inaequilatera	320	1
Aristida holathera var. *holathera*	35	0.1
Bonamia rosea	70	1
Bonamia sp.	6	0.1
Cassia helmsii	30	0.1
Cassia luerssenii	100	0.1
Cassia oligophylla x *helmsii*	50	0.1
Cenchrus ciliaris	60	0.1
Cleome viscosa	55	0.1
Eragrostis eriopoda	50	0.1
Eriachne aristidea	12	0.1
Eucalyptus gamophylla	180	0.1
Gomphrena affinis subsp. *pilbarensis*	40	0.1
Gomphrena cunninghamii	20	0.1
Goodenia microptera	40	0.1
Goodenia stobbsiana	10	0.1
Gossypium australe (Burrup Peninsula form)	60	0.1
Grevillea wickhamii subsp. *hispidula*	170	0.1
Hakea chordophylla	240	0.1
Heliotropium pachyphyllum	30	0.1
Hibiscus sturtii var. *platychlamys*	25	0.1
Indigofera monophylla	40	0.1
Mollugo molluginea	25	0.1
Ptilotus astrolasius	40	0.1
Ptilotus calostachyus	70	0.1
Ptilotus exaltatus var. *exaltatus*	40	0.1
Ptilotus helipteroides	40	0.1
Ptilotus polystachyus	20	0.1
Sida arenicola	130	0.1
Sida echinocarpa	60	0.1
Tephrosia sp. Bungaroo Creek (M.E. Trudgen 11601)	20	0.1
Tribulus hirsutus	6	0.1
Triodia lanigera	45	20

Koodaideri Site KOD23
Described (Phase 1) ERBM **Date (Phase 1)** 06/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) MM **Date (Phase 2)** 06/05/2011
MGA 50 708498 **mE** 7506751 **mN**
Habitat Hillcrest
Rock Type Ironstone pebbles and rocks
Vegetation (Phase 1) *Acacia arida* tall open shrubland over *Acacia spondylophylla* low shrubland, *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia wiseana* hummock grassland
Vegetation (Phase 2) *Acacia arida* open shrubland over *Acacia spondylophylla* low open shrubland over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia wiseana* hummock grassland
Veg Condition Excellent
Fire Age No sign of recent fire

Species (Phase 1)	Height (cm)	Cover (%)
Acacia arida	180	10
Acacia hilliana	30	0.1
Acacia spondylophylla	70	12
Corymbia deserticola subsp. *deserticola*	300	
Corymbia hamersleyana	350	0.1
Eriachne lanata	30	0.1
Gompholobium sp. Pilbara (N.F. Norris 908) PN	50	0.1
Goodenia stobbsiana	10	0.1
Grevillea wickhamii subsp. *hispidula*	400	0.1
Hakea chordophylla	300	0.1
Ptilotus calostachyus	40	0.1
Scaevola browniana subsp. *browniana*	30	0.1
Solanum phlomoides	100	0.1
Tephrosia arenicola	140	
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	40	50
Triodia wiseana	30	5

Species (Phase 2)	Height (cm)	Cover (%)
Acacia arida	120	10
Acacia hilliana	40	0.1
Acacia spondylophylla	80	8
Corchorus lasiocarpus subsp. *parvus*	20	0.1
Corymbia deserticola subsp. *deserticola*	300	0.1
Eriachne lanata	40	0.1
Gompholobium sp. Pilbara (N.F. Norris 908) PN	80	0.1
Goodenia stobbsiana	4	0.1
Goodenia triodiophila	30	0.1
Grevillea wickhamii subsp. *hispidula*	300	0.1
Hakea chordophylla	240	0.1
Ptilotus calostachyus	60	0.1
Scaevola browniana subsp. *browniana*	35	0.1
Solanum phlomoides	12	0.1
Tephrosia arenicola	140	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	40	50
Triodia wiseana	45	5

Koodaideri Site KOD24
Described (Phase 1) ERBM **Date (Phase 1)** 07/07/2010 **Type** Quadrat 200 x 10
Described (Phase 2) MM **Date (Phase 2)** 07/05/2011
MGA 50 708709 **mE** 7506513**mN**
Habitat Bed of broad, shallow creekline/flowline
Soil Gravelly, red-brown loamy sand
Rock Type Ironstone
Vegetation (Phase 1) *Corymbia hamersleyana, Eucalyptus xerothermica* scattered low trees/low open woodland over *Acacia tumida* var. *pilbarensis* tall closed scrub over *Petalostylis labicheoides (Gossypium robinsonii*) tall shrubland over *Triodia pungens* very open hummock grassland
Vegetation (Phase 2) *Acacia tumida* var. *pilbarensis, Corymbia hamersleyana*, *Eucalyptus xerothermica*, *Eucalyptus gamophylla* low closed forest over *Petalostylis labicheoides*, *Acacia tenuissima, Acacia monticola* tall shrubland over *Triodia pungens* very open hummock grassland
Veg Condition Excellent
Fire Age No sign of recent fire
Notes Very thick creekline vegetation; peg distance set using GPS (tapes not run out). Dense overstorey, sparse understorey

Species (Phase 1)	Height (cm)	Cover (%)
Acacia monticola	250	1
Acacia pruinocarpa	700	0.1
Acacia spondylophylla	180	0.1
Acacia tenuissima	150	1
Acacia tumida var. *pilbarensis*	500	85
Aristida sp.	25	0.1
Atalaya hemiglauca	450	0.1
Cassia glutinosa	60	0.1
Cassia oligophylla x *helmsii*	150-180	0.1
Chrysopogon fallax	40	0.1
Corymbia hamersleyana	600	5
Cymbopogon ambiguus	60	0.1
Duperreya commixta	300	0.1
Eriachne mucronata	40	0.1
Eucalyptus gamophylla	200	0.1
Eucalyptus xerothermica	600	2
Goodenia stobbsiana	20	0.1
Gossypium robinsonii	350	0.1
Grevillea wickhamii subsp. hispidula	160	0.1
Indigofera monophylla (brown calyx form)	60	0.1
Indigofera monophylla (small leaflet form)	30	0.1
Isotropis atropurpurea	50	0.1
Jasminum didymum subsp. *lineare*	300	0.1
Mirbelia viminalis	100	0.1
Paraneurachne muelleri	20	0.1
Petalostylis labicheoides	200	15
Santalum lanceolatum	160	0.1
Sida sp. spiciform panicles (E. Leyland s.n. 14/8/90)	190	0.1
Themeda triandra	50	0.1
Triodia pungens	60	3

Species (Phase 2)	Height (cm)	Cover (%)
Abutilon lepidum	45-60	0.1
Acacia arida	120	0.1
Acacia monticola	300	1
Acacia pruinocarpa	60	0.1
Acacia spondylophylla	140	0.1
Acacia tenuissima	200	1
Acacia tumida var. *pilbarensis*	450	85
Aristida holathera var. *holathera*	45	0.1
Aristida ingrata	70	0.1
Atalaya hemiglauca	400	0.1
Bonamia rosea	30	0.1
Bonamia sp. Dampier (A.A. Mitchell PRP 217)	4	0.1
Bulbostylis barbata	8	0.1
Cassia glutinosa x *luerssenii*	100	0.1
Cassia notabilis	5	0.1
Cassia oligophylla	90	0.1
Clerodendrum floribundum var. *angustifolium*	30	0.1
Corchorus lasiocarpus subsp. *lasiocarpus*	60	0.1
Corchorus lasiocarpus subsp. *parvus*	30	0.1
Corymbia hamersleyana	600	5
Cucumis maderaspatanus	60	0.1
Cymbopogon procerus	150	0.1
Dicrastylis cordifolia	60	0.1
Digitaria brownii	120	0.1
Duperreya commixta	200	0.1
Dysphania rhadinostachya subsp. *rhadinostachya*	25	0.1
Enneapogon caerulescens	35	0.1
Enneapogon polyphyllus	45	0.1
Eriachne aristidea	40	0.1
Eriachne mucronata	40	0.1
Eucalyptus gamophylla	400	1
Eucalyptus xerothermica	550	2
Eulalia aurea	70	0.1
Euphorbia aff. *schultzii*	25	0.1
Euphorbia boophthona	35	0.1
Euphorbia tannensis subsp. *eremophila*	40	0.1
Evolvulus alsinoides var. *decumbens*	20	0.1
Goodenia stobbsiana	5	0.1
Gossypium robinsonii	180	0.1
Grevillea wickhamii subsp. *hispidula*	300	0.1
Hibiscus coatesii	40	0.1

Species (Phase 1)	Height (cm)	Cover (%)

Species (Phase 2)	Height (cm)	Cover (%)
Hibiscus coatesii	20	0.1
Hybanthus aurantiacus	50	0.1
Indigofera monophylla	45	0.1
Isotropis atropurpurea	60	0.1
Jasminum didymum subsp. *lineare*	220	0.1
Notoleptopus decaisnei var. *orbicularis*	20	0.1
Paraneurachne muelleri	40	0.1
Paspalidium clementii	35	0.1
Paspalidium rarum	30	0.1
Petalostylis labicheoides	200	15
Ptilotus clementii	40	0.1
Ptilotus polystachyus	55	0.1
Rhyncharrhena linearis		0.1
Rhynchosia minima	40	0.1
Santalum lanceolatum	190	0.1
Scaevola parvifolia subsp. *pilbarae*		0.1
Sida aff. *fibulifera*	40	0.1
Sida arenicola	25	0.1
Sida sp. Articulation below (A.A. Mitchell PRP 1605)	25	0.1
Sida sp. spiciform panicles (E. Leyland s.n. 14/8/90)	25	0.1
Solanum phlomoides	30-35	0.1
Tephrosia rosea var. *glabrior*	16	0.1
Themeda triandra	90	0.1
Trachymene oleracea subsp. *oleracea*	120	0.1
Trichodesma zeylanicum var. *zeylanicum*	60	0.1
Triodia pungens	40	5
Triodia wiseana	35	0.1

Koodaideri Site KOD25
Described (Phase 1) ERBM **Date (Phase 1)** 07/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) MM **Date (Phase 2)** 08/05/2011
MGA 50 703506 **mE** 7508232 **mN**
Habitat Gently sloping north-east facing valley floor
Soil Red-brown sandy loam
Rock Type Ironstone, continuous pebbles, gravel
Vegetation (Phase 1) *Corymbia deserticola* subsp. *deserticola* scattered low trees over *Grevillea wickhamii*, *Ptilotus calostachyus* open shrubland over *Triodia* sp. Shovelanna Hill (S. van Leeuwen3835) open hummock grassland
Vegetation (Phase 2) *Corymbia deserticola* scattered low trees over *Grevillea wickhamii* subsp. *hispidula* tall open shrubland over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) open hummock grassland
Veg Condition Very good/Excellent
Fire Age Burnt 2-3 years ago
Notes Old track running through northern corner of quadrat. Post-fire colonising species present (*Grevillea wickhamii* and *Ptilotus calostachyus*)

Species (Phase 1)	Height (cm)	Cover (%)
Acacia adoxa var. *adoxa*	30	0.1
Acacia adsurgens	30-60	0.1
Acacia dictyophleba	130	0.1
Acacia elachantha	100	0.1
Acacia spondylophylla	20	0.1
Acacia tenuissima	40	0.1
Acacia trudgeniana	150	0.1
Aristida holathera var. *holathera*	10	0.1
Corchorus lasiocarpus subsp. *parvus*	20	0.1
Corymbia deserticola subsp. *deserticola*	350	1
Cymbopogon obtectus	40	0.1
Dampiera candicans	20	0.1
Dodonaea coriacea	35	0.1
Goodenia stobbsiana	15	0.1
Grevillea wickhamii subsp. *hispidula*	180	7
Hakea lorea subsp. *lorea*	50	0.1
Heliotropium pachyphyllum	15	0.1
Indigofera monophylla	25	0.1
Paraneurachne muelleri	50	0.1
Ptilotus calostachyus	140	1
Scaevola parvifolia subsp. *pilbarae*	40	0.1
Sida arenicola	40	0.1
Solanum phlomoides	20	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	10	15

Species (Phase 2)	Height (cm)	Cover (%)
Acacia adoxa var. *adoxa*	35	0.1
Acacia adsurgens	60	0.1
Acacia dictyophleba	140	0.1
Acacia elachantha	70	0.1
Acacia spondylophylla	60	0.1
Acacia tenuissima	40	0.1
Acacia trudgeniana	240	0.1
Amphipogon sp.	40	0.1
Aristida holathera var. *holathera*	60	0.1
Bonamia rosea	50	0.1
Corchorus lasiocarpus subsp. *lasiocarpus*	120	0.1
Corymbia deserticola subsp. *deserticola*	300	1
Cymbopogon procerus	60	0.1
Dampiera candicans	60	0.1
Dodonaea coriacea	50	0.1
Enneapogon polyphyllus	40	0.1
Eriachne mucronata	40	0.1
Goodenia stobbsiana	30	0.1
Grevillea wickhamii subsp. *hispidula*	220	3
Hakea lorea subsp. *lorea*	70	0.1
Heliotropium pachyphyllum	20	0.1
Hibiscus sturtii var. *campylochlamys*	60	0.1
Hybanthus aurantiacus	45	0.1
Indigofera monophylla	40	0.1
Paraneurachne muelleri	60	0.1
Ptilotus calostachyus	100	0.1
Rhyncharrhena linearis	120	0.1
Scaevola parvifolia subsp. *pilbarae*	40	0.1
Sida arenicola	140	0.1
Solanum phlomoides	45	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	40	15

Koodaideri Site KOD26
Described (Phase 1) ERBM **Date (Phase 1)** 08/07/2010 **Type** Quadrat 70 x 30
Described (Phase 2) MM **Date (Phase 2)** 09/05/2011
MGA 50 722051 **mE** 7501538 **mN**
Habitat Crest of higher ridge
Soil Gravelly, pebbly red-brown loamy sand
Rock Type Ironstone
Vegetation (Phase 1) *Eucalyptus leucophloia* scattered low trees over *Grevillea wickhamii* subsp. *hispidula* scattered shrubs over *Acacia spondylophylla, Tephrosia arenicola* low open shrubland over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) very open hummock grassland and *Eriachne lanata* scattered tussock grasses
Vegetation (Phase 2) *Acacia spondylophylla* scattered low shrubs over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) very open hummock grassland
Veg Condition Very good/Excellent
Fire Age Burnt 3-5 years ago
Notes Elevation 524 m asl. Vehicle track close to quadrat (as close as 3 m at SE corner. Quadrat 70 x 30 m to fit in the hillcrest vegetation type. Pre- fire vegetation was likely to be: *Eucalyptus leucophloia* scattered low trees over *Grevillea wickhamii* scattered tall shrubs over *Acacia spondylophylla, Tephrosia arenicola* low open shrubland over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) hummock grassland and *Eriachne lanata* very open tussock grassland

Species (Phase 1)	Height (cm)	Cover (%)
Acacia adsurgens	35	0.1
Acacia bivenosa	10	0.1
Acacia hilliana	40	0.1
Acacia spondylophylla	30	3
Bonamia sp. Dampier (A.A. Mitchell PRP 217)	3	0.1
Calytrix carinata	40	0.1
Cassia glutinosa	150	0.1
Cassia oligophylla x *helmsii*	120	0.1
Corchorus lasiocarpus subsp. *parvus*	30-35	0.1
Corymbia hamersleyana	200	0.1
Dampiera candicans	30	0.1
Eriachne lanata	40	0.1
Eriachne mucronata	20	0.1
Eucalyptus leucophloia subsp. *leucophloia*	400	0.1
Goodenia stobbsiana	20	0.1
Grevillea wickhamii subsp. *hispidula*	170	0.1
Hakea lorea subsp. *lorea*	100	0.1
Keraudrenia velutina subsp. *elliptica*	40	0.1
Mirbelia viminalis	40	1
Ptilotus calostachyus	40	0.1
Scaevola browniana subsp. *browniana*	15-30	0.1
Sida arenicola	120	0.1
Sida pilbarensis (ferruginous form)	40	0.1
Solanum phlomoides	20-40	0.1
Tephrosia arenicola	50	1
Tribulus suberosus	50	0.1
Triodia epactia	20	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	20	7

Species (Phase 2)	Height (cm)	Cover (%)
Acacia adsurgens	45	0.1
Acacia hilliana	30	0.1
Acacia spondylophylla	50	2
Amphipogon sp.	30	0.1
Aristida holathera var. *holathera*	20	0.1
Calytrix carinata	50	0.1
Cassia glutinosa	90	0.1
Cassia oligophylla	40	0.1
Corchorus lasiocarpus subsp. *parvus*	40	0.1
Corymbia hamersleyana	220	0.1
Dampiera candicans	60	0.1
Eriachne lanata	50	0.1
Eriachne mucronata	40	0.1
Eriachne pulchella subsp. *dominii*	2	0.1
Eucalyptus leucophloia subsp. *leucophloia*	300	0.1
Goodenia stobbsiana	12	0.1
Goodenia triodiophila	20	0.1
Grevillea wickhamii subsp. *hispidula*	150	0.1
Hakea lorea subsp. *lorea*	80	0.1
Keraudrenia velutina subsp. *elliptica*	20	0.1
Mirbelia viminalis	45	0.1
Ptilotus calostachyus	60	0.1
Ptilotus exaltatus var. *exaltatus*	5	0.1
Scaevola browniana subsp. *browniana*	20	0.1
Sida arenicola	80	0.1
Tephrosia arenicola	70	0.1
Tribulus suberosus	50	0.1
Triodia epactia	40	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	20	7

Koodaideri Site KOD27
Described (Phase 1) ERBM **Date (Phase 1)** 08/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) CEFRH **Date (Phase 2)** 14/03/2011
MGA 50 718831 **mE** 7504309 **mN**
Habitat Moderate north-facing lower slope of colluvial spur of high ridge
Soil Skeletal dark reddish brown (2.5YR 3/4) clay loam
Rock Type Ironstone coarse fragments approx. 60%
Vegetation (Phase 1) *Grevillea wickhamii* scattered shrubs over *Cassia glutinosa, Cassia pruinosa, Sida pilbarensis* (ferruginous form) scattered low shrubs over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), (*Triodia wiseana*) open hummock grassland
Vegetation (Phase 2) *Grevillea wickhamii* subsp. *hispidula* scattered shrubs over *Cassia pruinosa* scattered shrubs over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia wiseana* open hummock grassland
Veg Condition Excellent
Fire Age Burnt 2-3 years ago
Notes No weeds present. Scattered *Eucalyptus leucophloia* just north of quadrat (on midslope)

Species (Phase 1)	Height (cm)	Cover (%)
Acacia bivenosa	40	0.1
Acacia dictyophleba	35	0.1
Acacia inaequilatera	40	0.1
Acacia pyrifolia	60	0.1
Aristida sp.	20	0.1
Bonamia sp. Dampier (A.A. Mitchell PRP 217)	3	0.1
Cassia glutinosa	70	0.1
Cassia luerssenii	100	0.1
Cassia oligophylla x *helmsii*	30	0.1
Cassia pruinosa	60	0.1
Cymbopogon obtectus	35	0.1
Eriachne sp.	35	0.1
Gomphrena sp.	30	0.1
Goodenia microptera	30	0.1
Goodenia stobbsiana	30	0.1
Gossypium australe (Burrup Peninsula form)	30	0.1
Gossypium robinsonii	70	0.1
Grevillea wickhamii subsp. *hispidula*	110	0.1
Mollugo molluginea	20	0.1
Paraneurachne muelleri	30	0.1
Ptilotus calostachyus	70	0.1
Ptilotus exaltatus var. *exaltatus*	45	0.1
Sida arenicola	40	0.1
Sida pilbarensis (ferruginous form)	25-30	0.1
Solanum phlomoides	15-35	0.1
Tephrosia aff. *supina* (HD133-20)	3	0.1
Tribulus suberosus	50	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	15	15
Triodia wiseana	10	0.1

Species (Phase 2)	Height (cm)	Cover (%)
Acacia aptaneura MS	15	0.1
Acacia bivenosa	80	0.1
Acacia inaequilatera	60	0.1
Aristida holathera var. *holathera*	30	0.1
Boerhavia coccinea	20	0.1
Bonamia sp. Dampier (A.A. Mitchell PRP 217)	10	0.1
Cassia glutinosa	35-110	0.1
Cassia glutinosa x *luerssenii*	110	0.1
Cassia oligophylla	30	0.1
Cassia pruinosa	150	1
Cleome viscosa	30	0.1
Corchorus sidoides subsp. *sidoides*	15	0.1
Eriachne pulchella subsp. *dominii*	25	0.1
Fimbristylis simulans	25	0.1
Gomphrena canescens subsp. *canescens*	15	0.1
Gomphrena cunninghamii	20	0.1
Gossypium australe	70	0.1
Gossypium robinsonii	120	0.1
Grevillea wickhamii subsp. *hispidula*	200	1
Heliotropium pachyphyllum	30	0.1
Mollugo molluginea	15	0.1
Oldenlandia crouchiana	10	0.1
Paspalidium clementii	10	0.1
Ptilotus calostachyus	60	1
Ptilotus clementii	40	0.1
Ptilotus exaltatus var. *exaltatus*	20-30	0.1
Sida arenicola	80	0.1
Sida cardiophylla	40	0.1
Solanum phlomoides	100	0.1
Tephrosia aff. *supina*	10	0.1
Tephrosia arenicola	40	0.1
Tribulus hirsutus	10	0.1
Tribulus suberosus	80	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	20-30	20
Triodia wiseana	40	5

Koodaideri Site KOD28
Described (Phase 1) ERBM **Date (Phase 1)** 08/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) CFMyM **Date (Phase 2)** 17/03/2011
MGA 50 720631 **mE** 7503163 **mN**
Habitat Hillcrest along a high ridge
Soil Red-brown sandy loam
Rock Type Ironstone rocks and pebbles
Vegetation (Phase 1) *Acacia pruinocarpa, Grevillea wickhamii* subsp. *hispidula* scattered shrubs over *Acacia bivenosa* scattered low shrubs over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) very open hummock grassland
Vegetation (Phase 2) *Grevillea wickhamii* subsp. *hispidula* scattered shrubs over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), (*Triodia wiseana*) open hummock grassland
Veg Condition Excellent/Very Good
Fire Age Burnt 2-3 years ago

Species (Phase 1)	Height (cm)	Cover (%)
Acacia bivenosa	30	0
Acacia pruinocarpa	130	1
Acacia spondylophylla	30	0.1
Acacia tenuissima	40	0.1
Aristida sp.	60	0.1
Cassia glutinosa	50	0.1
Cassia luerssenii	40	0.1
Cassia oligophylla x *helmsii*		0.1
Cassia pruinosa	30	0.1
Codonocarpus cotinifolius	30	0.1
Corchorus lasiocarpus subsp. *parvus*	30	0.1
Dampiera candicans	30	0.1
Goodenia stobbsiana	30	0.1
Grevillea wickhamii subsp. *hispidula*	180	0.1
Hakea chordophylla	180	0.1
Ptilotus calostachyus	130	0.1
Ptilotus rotundifolius	100	0.1
Sida arenicola	10-45	0.1
Sida pilbarensis (ferruginous form)	40	0.1
Solanum phlomoides	10-40	0.1
Tephrosia arenicola	20	0.1
Trianthema glossostigma	3	0.1
Tribulus suberosus	40	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	10	7

Species (Phase 2)	Height (cm)	Cover (%)
Acacia adsurgens	20-80	0.1
Acacia bivenosa	40	0.1
Acacia pruinocarpa	90	0.1
Acacia spondylophylla	30	0.1
Acacia tenuissima	30	0.1
Aristida holathera var. *holathera*	40	0.1
Cassia glutinosa	70	0.1
Cassia glutinosa x *luerssenii*	70-120	0.1
Cassia notabilis	5	0.1
Cassia oligophylla x *helmsii*	60	0.1
Cassia pruinosa	150	0.1
Codonocarpus cotinifolius	50	0.1
Corchorus lasiocarpus subsp. *lasiocarpus*	50	0.1
Dampiera candicans	60	0.1
Eriachne mucronata	70	0.1
Fimbristylis simulans	20	0.1
Goodenia stobbsiana	30	0.1
Grevillea wickhamii subsp. *hispidula*	180	1
Hakea chordophylla	160	0.1
Hibiscus coatesii	25	0.1
Hibiscus sturtii var. *campylochlamys*	15	0.1
Paspalidium clementii	25	0.1
Ptilotus calostachyus	40	0.1
Ptilotus rotundifolius	120	0.1
Sida arenicola	50-100	0.1
Sida cardiophylla	30	0.1
Sida sp. Hamersley Range (K. Newbey 10692) PN	60	0.1
Solanum phlomoides	10	0.1
Tephrosia arenicola	20	0.1
Trianthema glossostigma	10	0.1
Tribulus suberosus	60	0.1
Triodia wiseana	40	0.1
Triumfetta maconochieana	40	0.1

Koodaideri Site KOD29
Described (Phase 1) ERMST **Date (Phase 1)** 09/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) MyMR **Date (Phase 2)** 16/03/2011
MGA 50 706148 **mE** 7508387 **mN**
Habitat South-facing rocky hillslope
Soil Reddish brown 2.5YR 4/6 sandy clay; 60% coarse frags, ironstone
Rock Type Ironstone rocks, pebbles and some outcropping
Vegetation (Phase 1) *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Acacia bivenosa*, *Cassia pruinosa* scattered shrubs over *Triodia wiseana* hummock grassland
Vegetation (Phase 2) *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Triodia wiseana* hummock grassland
Veg Condition Excellent
Fire Age Burnt 3-5 years ago

Species (Phase 1)	Height (cm)	Cover (%)
Abutilon lepidum	60	0.1
Acacia bivenosa	130	0.1
Acacia elachantha	20	0.1
Acacia pruinocarpa	60	0.1
Acacia pyrifolia	130	0.1
Cassia glutinosa	50	0.1
Cassia oligophylla x *helmsii*	60	0.1
Cassia pruinosa	100	0.1
Cassia sp.	15	0.1
Codonocarpus cotinifolius	40	0.1
Corchorus lasiocarpus subsp. *parvus*	20-30	0.1
Cymbopogon ambiguus	40	0.1
Eremophila latrobei subsp. aff. *filiformis*	50	0.1
Eriachne mucronata	10-40	0.1
Eucalyptus leucophloia subsp. *leucophloia*	750	2
Euphorbia wheeleri	10	0.1
Goodenia cusackiana	15	0.1
Goodenia stobbsiana	30	0.1
Gossypium australe (Whim Creek form)	55	0.1
Gossypium robinsonii	300	0.1
Grevillea wickhamii subsp. *hispidula*	40	0.1
Hakea lorea subsp. *lorea*	40	0.1
Heliotropium heteranthum	10	0.1
Heliotropium pachyphyllum	20	0.1
Hibiscus aff. *coatesii* (MET 16,542)	30	0.1
Jasminum didymum subsp. *lineare*	150	0.1
Lepidium pedicellosum	40	0.1
Paraneurachne muelleri	40	0.1
Pterocaulon sphacelatum	20	0.1
Ptilotus calostachyus	120	0.1
Ptilotus exaltatus var. *exaltatus*	40	0.1
Ptilotus obovatus var. *obovatus*	30	0.1
Ptilotus rotundifolius	50	0.1
Sida pilbarensis (ferruginous form)	30	0.1
Sida sp.	150	0.1
Solanum phlomoides	30-40	0.1
Streptoglossa decurrens	30	0.1
Tephrosia aff. *supina* (HD133-20)	25	0.1
Themeda sp. Mt Barricade (M.E. Trudgen 2471)	50	0.1
Tribulus suberosus	30	0.1
Trichodesma zeylanicum var. *zeylanicum*	50	0.1
Triodia wiseana	20	65

Species (Phase 2)	Height (cm)	Cover (%)
Acacia bivenosa	100	0.1
Acacia pruinocarpa	55	0.1
Acacia pyrifolia	130	0.1
Bonamia sp. Dampier (A.A. Mitchell PRP 217)	5	0.1
Cassia glutinosa	120	0.1
Cassia oligophylla	40	0.1
Cassia pruinosa	100	0.1
Cenchrus ciliaris	70	0.1
Codonocarpus cotinifolius	65	0.1
Corchorus lasiocarpus subsp. *parvus*	50	0.1
Cymbopogon ambiguus	70	0.1
Eremophila latrobei subsp. aff. *filiformis*	105	0.1
Eriachne mucronata	40	0.1
Eucalyptus leucophloia subsp. *leucophloia*	700	2
Euphorbia careyi	6	0.1
Goodenia cusackiana	20	0.1
Goodenia stobbsiana	5	0.1
Gossypium australe (Whim Creek form)	50	0.1
Gossypium robinsonii	280	0.1
Grevillea wickhamii subsp. hispidula	35	0.1
Hakea chordophylla	70	0.1
Hibiscus aff. *coatesii*	20	0.1
Jasminum didymum subsp. *lineare*	150	0.1
Lepidium pedicellosum	25-55	0.1
Paraneurachne muelleri	35	0.1
Ptilotus astrolasius	30	0.1
Ptilotus clementii	35	0.1
Ptilotus exaltatus var. *exaltatus*	6	0.1
Ptilotus obovatus var. *obovatus*	50	0.1
Ptilotus rotundifolius	110	0.1
Sida echinocarpa	50	0.1
Sida sp. Hamersley Range (K. Newbey 10692) PN	30	0.1
Solanum phlomoides	50	0.1
Tephrosia aff. *supina*	3	0.1
Tribulus suberosus	50	0.1
Triodia wiseana	30	40

Koodaideri Site KOD30
Described (Phase 1) ERMST **Date (Phase 1)** 09/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) CFMyM **Date (Phase 2)** 10/03/2011
MGA 50 702843 **mE** 7508921 **mN**
Habitat Broad floodplain
Soil Colluvial brown silty loam
Rock Type Ironstone, rocks and pebbles
Vegetation (Phase 1) *Corymbia hamersleyana* low open woodland over *Capparis umbonata, Acacia pyrifolia* mixed open shrubland over *Triodia pungens* hummock grassland
Vegetation (Phase 2) *Corymbia hamersleyana* scattered low trees over *Acacia pyrifolia, Capparis umbonata* shrubland over *Triodia pungens* hummock grassland
Veg Condition Excellent
Fire Age Burnt 3-5 years ago
Notes One small patch of **Cenchrus ciliaris* in Phase 2

Species (Phase 1)	Height (cm)	Cover (%)
Acacia inaequilatera	220	0.1
Acacia pyrifolia	180	7
Acacia sp.	10	0.1
Atalaya hemiglauca	100	0.1
Capparis umbonata	120-160	4
Cassia glutinosa	130	0.1
Cassia sp.	30	0.1
Cassia sp.	45	0.1
Corchorus lasiocarpus subsp. *parvus*	30	0.1
Corymbia hamersleyana	950	2
Cymbopogon ambiguus	100	0.1
Eriachne mucronata	40	0.1
Evolvulus alsinoides var. *decumbens*	30	0.1
Goodenia stobbsiana	30	0.1
Gossypium robinsonii	130	0.1
Grevillea wickhamii subsp. *hispidula*	220	0.1
Heliotropium pachyphyllum	20	0.1
Hibiscus sp.	35	0.1
Hybanthus aurantiacus	40	0.1
Indigofera monophylla	400	0.1
Mollugo molluginea	20	0.1
Petalostylis labicheoides	50	0.1
Polymeria aff. *ambigua* (MET12,302)	15	0.1
Ptilotus exaltatus var. *exaltatus*	50	0.1
Salsola australis	40	0.1
Santalum lanceolatum	200	0.1
Sida aff. fibulifera	25	0.1
Solanum phlomoides	30	0.1
Tribulus suberosus	60	0.1
Triodia pungens	50	40

Species (Phase 2)	Height (cm)	Cover (%)
Acacia adsurgens	20	0.1
Acacia hamersleyensis	80	0.1
Acacia pyrifolia	180	7
Aristida holathera var. *holathera*	45	0.1
Atalaya hemiglauca	100	0.1
Boerhavia coccinea	15	0.1
Bulbostylis barbata	20	0.1
Capparis umbonata	160	4
Cassia glutinosa	130	0.1
Cassia oligophylla	150	0.1
Cenchrus ciliaris	120	0.1
Corchorus lasiocarpus subsp. *parvus*	30	0.1
Corymbia hamersleyana	950	2
Crotalaria medicaginea var. *neglecta*	40	0.1
Duperreya commixta	20	0.1
Enneapogon polyphyllus	120	0.1
Eriachne mucronata	40	0.1
Eriachne pulchella subsp. *dominii*	30	0.1
Euphorbia tannensis subsp. *eremophila*	60	0.1
Evolvulus alsinoides var. *villosicalyx*	15	0.1
Gossypium australe	80	0.1
Gossypium robinsonii	130	0.1
Grevillea wickhamii subsp. *hispidula*	220	0.1
Hibiscus coatesii	80	0.1
Hybanthus aurantiacus	40	0.1
Indigofera monophylla	100	0.1
Jasminum didymum subsp. *lineare*	120	0.1
Mollugo molluginea	20	0.1
Notoleptopus decaisnei var. *decaisnei*	50	0.1
Petalostylis labicheoides	50	0.1
Polymeria ambigua	2-25	0.1
Salsola australis	40	0.1
Santalum lanceolatum	200	0.1
Sida aff. *fibulifera*	25-30	0.1
Tephrosia densa	120	0.1
Tribulus suberosus	60	0.1
Trichodesma zeylanicum var. *zeylanicum*	20	0.1
Triodia pungens	50	40
Yakirra australiensis var. *australiensis*	20	0.1

Koodaideri Site KOD31
Described (Phase 1) ERMST **Date (Phase 1)** 10/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) MM/PA **Date (Phase 2)** 14/03/2011
MGA 50 716527 **mE** 7501752 **mN**
Habitat Hillcrest
Soil Red-brown clay loam
Rock Type Ironstone rocks, outcropping pebble and gravel
Vegetation (Phase 1) *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Acacia arida* low shrubland over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 38), *Triodia epactia* hummock grassland
Vegetation (Phase 2) *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Acacia pruinocarpa, Grevillea wickhamii* scattered tall shrubs over *Corchorus lasiocarpus* subsp. *lasiocarpus, Acacia arida, Dampiera candicans, Solanum phlomoides* low open shrubland over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia epactia* open hummock grassland
Veg Condition Excellent
Fire Age Burnt 2-3 years ago

Species (Phase 1)	Height (cm)	Cover (%)
Acacia arida	40-60	10
Acacia pruinocarpa	300	0.1
Acacia tumida var. *pilbarensis*	50	0.1
Bonamia sp. Dampier (A.A. Mitchell PRP 217)	4	0.1
Calytrix carinata	30	0.1
Cassia luerssenii	10	0.1
Corchorus lasiocarpus subsp. *parvus*	40	0.1
Dampiera candicans	30	0.1
Eriachne lanata	30	0.1
Eriachne mucronata	15	0.1
Eucalyptus leucophloia subsp. *leucophloia*	300	1
Goodenia stobbsiana	20	0.1
Grevillea wickhamii subsp. *hispidula*	180	0.1
Hakea lorea subsp. *lorea*	130	0.1
Hibiscus aff. *coatesii* (site 733)	30	0.1
Ptilotus calostachyus	30	0.1
Ptilotus rotundifolius	50	0.1
Pycnoporus coccineus	5	0.1
Scaevola browniana subsp. *browniana*	15-20	0.1
Solanum phlomoides	40	
Triodia epactia	30	20
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	20	25

Species (Phase 2)	Height (cm)	Cover (%)
Acacia arida	50	2
Acacia pruinocarpa	400	1
Acacia tumida var. *pilbarensis*	100	0.1
Bonamia sp. Dampier (A.A. Mitchell PRP 217)	10	0.1
Bulbostylis barbata	5	0.1
Calytrix carinata	40	0.1
Cassia glutinosa x *luerssenii*	20	0.1
Corchorus lasiocarpus subsp. *lasiocarpus*	70	2
Dampiera candicans	40	1
Eriachne lanata	60	0.1
Eriachne mucronata	40	0.1
Eriachne pulchella subsp. dominii	5	0.1
Eucalyptus leucophloia subsp. *leucophloia*	500	2
Goodenia stobbsiana	20	0.1
Gossypium australe (Burrup Peninsula form)	30	0.1
Grevillea wickhamii subsp. *hispidula*	200	1
Hakea lorea subsp. *lorea*	400	0.1
Hibiscus coatesii	20	0.1
Ptilotus calostachyus	60	0.1
Ptilotus fusiformis	20	0.1
Ptilotus rotundifolius	50	0.1
Scaevola browniana subsp. *browniana*	30	0.1
Sida arenicola	30	0.1
Sida cardiophylla	60	0.1
Solanum phlomoides	100	2
Tephrosia arenicola	70	0.1
Triodia epactia	50	3
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	20	10

Koodaideri Site KOD32
Described (Phase 1) ERMST **Date (Phase 1)** 10/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) MM **Date (Phase 2)** 12/05/2011
MGA 50 716828 **mE** 7503027 **mN**
Habitat Gentle south-east facing slope
Soil Red-brown clay loam
Rock Type Ironstone. Continuous rocks and pebbles on the surface
Vegetation (Phase 1) *Acacia aneura* var. *intermedia*, *Acacia pruinocarpa* low open woodland over *Acacia arida* scattered shrubs over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) open hummock grassland
Vegetation (Phase 2) *Eucalyptus leucophloia* subsp. *leucophloia, Acacia aneura* var. *intermedia. Acacia aneura* aff. var. *intermedia* low open woodland over *Acacia pruinocarpa* scattered tall shrubs over *Acacia arida* scattered shrubs over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) hummock grassland
Veg Condition Very good/Excellent
Fire Age Very long unburnt

Species (Phase 1)	Height (cm)	Cover (%)
Acacia aff. *aneura* (narrow fine veined; site 1259)	350	0.1
Acacia aneura (grey bushy form; MET 15 732)	300	0.1
Acacia aneura var. *intermedia*	550	5
Acacia arida	150	1
Acacia pruinocarpa	600	3
Acacia tenuissima	70	0.1
Anthobolus leptomerioides	200	0.1
Cassia glaucifolia	120	0.1
Cassia glutinosa x *luerssenii*	130	0.1
Cassia luerssenii	150	0.1
Corchorus lasiocarpus subsp. *parvus*	30	0.1
Eremophila latrobei subsp. aff. *filiformis*	120	0.1
Eriachne mucronata	25	0.1
Eucalyptus leucophloia subsp. *leucophloia*	450	0.1
Grevillea berryana	160	0.1
Grevillea wickhamii subsp. hispidula	300	0.1
Ptilotus calostachyus	100	0.1
Ptilotus rotundifolius	140	0.1
Scaevola browniana subsp. *browniana*	40	0.1
Solanum phlomoides	30	0.1
Tribulus suberosus	40	0.1
Triodia epactia	40-130	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	40	29
Triodia wiseana	40	0.1

Species (Phase 2)	Height (cm)	Cover (%)
Acacia aff. *aneura* (long, flat, recurved; FMR 35.3)	350	0.1
Acacia aneura aff. var. *intermedia*	270	1
Acacia aneura var. *intermedia*	500	4
Acacia arida	140	1
Acacia pruinocarpa	500	2
Acacia rhodophloia	130	0.1
Acacia tenuissima	70	0.1
Anthobolus leptomerioides	200	0.1
Aristida holathera var. *holathera*	30	0.1
Bulbostylis barbata	2	0.1
Cassia glaucifolia	110	0.1
Cassia glutinosa x *luerssenii*	90-110	0.1
Cassia helmsii	35	0.1
Cassia luerssenii	120	0.1
Cheilanthes sieberi subsp. *sieberi*	20	0.1
Duperreya commixta	20	0.1
Eremophila latrobei subsp. aff. *filiformis*	160	0.1
Eriachne mucronata	30	0.1
Eriachne pulchella subsp. *dominii*	15	0.1
Eucalyptus leucophloia subsp. *leucophloia*	380	1
Goodenia microptera	30	0.1
Goodenia stobbsiana	10	0.1
Goodenia triodiophila	45	0.1
Grevillea berryana	350	0.1
Grevillea wickhamii subsp. *hispidula*	250	0.1
Hakea chordophylla	210	0.1
Ptilotus calostachyus	55	0.1
Ptilotus rotundifolius	140	0.1
Ptilotus schwartzii var. *schwartzii*	30	0.1
Scaevola browniana subsp. *browniana*	40	0.1
Schizachyrium fragile	30	0.1
Solanum lasiophyllum	55	0.1
Tribulus suberosus	50	0.1
Trichodesma zeylanicum var. *zeylanicum*	20	0.1
Triodia epactia	60	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	40	33
Triodia wiseana	60	0.1

Koodaideri Site KOD33
Described (Phase 1) ERMST **Date (Phase 1)** 10/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) MyMR **Date (Phase 2)** 17/03/2011
MGA 50 714759 **mE** 7503901 **mN**
Habitat North-facing hillslope
Soil Red-brown clay-loam, 4/4; 60% coarse ironstone fragments
Rock Type Ironstone
Vegetation (Phase 1) *Acacia pruinocarpa, Grevillea wickhamii* subsp. *hispidula* tall open shrubland over *Acacia arida, Acacia spondylophylla* open shrubland over *Triodia pungens, Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) hummock grassland
Vegetation (Phase 2) *Corymbia hamersleyana* scattered low trees over *Acacia arida, Acacia pruinocarpa*, *Grevillea wickhamii* subsp. *hispidula* tall shrubland over *Acacia spondylophylla* scattered low shrubs over *Triodia pungens*, *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) open hummock grassland
Veg Condition Very good/Excellent
Fire Age No sign of recent fire
Notes Vehicle track and fauna pit line close to quadrat

Species (Phase 1)	Height (cm)	Cover (%)
Acacia arida	110	4
Acacia pruinocarpa	50	1
Acacia spondylophylla	50	4
Acacia tumida var. *pilbarensis*	180	0.1
Cassia glutinosa x *luerssenii*	140	0.1
Corchorus lasiocarpus subsp. *parvus*	40	0.1
Corymbia hamersleyana	700	0.1
Goodenia stobbsiana	20	0.1
Grevillea wickhamii subsp. *hispidula*	350	1
Hakea chordophylla	180	0.1
Indigofera monophylla	80	0.1
Jasminum didymum subsp. *lineare*	200	0.1
Paraneurachne muelleri	45	0.1
Ptilotus calostachyus	130	0.1
Triodia pungens	120	25
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	30	35

Species (Phase 2)	Height (cm)	Cover (%)
Acacia arida	250	15
Acacia pruinocarpa	500	4
Acacia spondylophylla	90	1
Acacia tumida var. pilbarensis	150	0.1
Bulbostylis barbata	5	0.1
Cassia glutinosa x *luerssenii*	100-180	0.1
Corchorus lasiocarpus subsp. lasiocarpus	20	0.1
Corymbia hamersleyana	800	1
Cucumis maderaspatanus	10	0.1
Eriachne pulchella	5	0.1
Goodenia stobbsiana	15	0.1
Goodenia triodiophila	30	0.1
Grevillea wickhamii subsp. hispidula	400	1
Hakea chordophylla	100	0.1
Indigofera monophylla	30	0.1
Jasminum didymum subsp. lineare	200	0.1
Ptilotus calostachyus	60	0.1
Ptilotus exaltatus var. exaltatus	20	0.1
Scaevola browniana subsp. browniana	30	0.1
Trachymene oleracea subsp. oleracea	15	0.1
Triodia pungens	80	20
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	30	7

Koodaideri Site KOD35
Described (Phase 1) MTRB **Date (Phase 1)** 11/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) CFMyM **Date (Phase 2)** 12/03/2011
MGA 50 714113 **mE** 7502558 **mN**
Habitat Hillcrest of very large hill. Plateau to the north, gully to the south
Soil Skeletal red-brown clay loam
Rock Type Ironstone surface gravel, pebbles and cobbles
Vegetation (Phase 1) *Eucalyptus gamophylla*, *Eucalyptus kingsmillii*, (*Eucalyptus leucophloia* subsp. *leucophloia*) low open woodland over *Acacia hilliana, Acacia adoxa* low open shrubland over *Triodia wiseana, Triodia* sp. Shovelanna Hill open hummock grassland
Vegetation (Phase 2) *Eucalyptus gamophylla, Eucalyptus kingsmillii, (Eucalyptus leucophloia*) low open woodland over *Acacia hilliana*, *Acacia adoxa* var. *adoxa* low open shrubland over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835*), Triodia wiseana* open hummock grassland
Veg Condition Excellent
Fire Age Burnt 3-5 years ago
Notes Elevation 762 m asl

Species (Phase 1)	Height (cm)	Cover (%)
Acacia adoxa var. *adoxa*	30	1
Acacia hilliana	25	1
Acacia pruinocarpa	40	0.1
Acacia pyrifolia	45	0.1
Cassia glutinosa	50	0.1
Corchorus lasiocarpus subsp. *parvus*	50	0.1
Dampiera candicans	30	0.1
Eucalyptus gamophylla	200	5
Eucalyptus kingsmillii subsp. *kingsmillii*	160	3
Eucalyptus leucophloia subsp. *leucophloia*	220	1
Grevillea wickhamii subsp. *hispidula*	120	0.1
Hakea chordophylla	90	0.1
Mirbelia viminalis	35	0.1
Petalostylis labicheoides	150	0.1
Scaevola browniana subsp. *browniana*	35	0.1
Sida aff. *pilbarensis* (EOB46-01B)	25	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	20	15
Triodia wiseana	20	15

Species (Phase 2)	Height (cm)	Cover (%)
Acacia adoxa var. *adoxa*	30	5
Acacia hilliana	30	5
Acacia pyrifolia	40	0.1
Cassia glutinosa	150	0.1
Cassia pruinosa	160	0.1
Cleome viscosa	20	0.1
Corchorus lasiocarpus subsp. *parvus*	50	0.1
Dampiera candicans	40	0.1
Eucalyptus gamophylla	250	10
Eucalyptus kingsmillii subsp. *kingsmillii*	200	1
Eucalyptus leucophloia subsp. *leucophloia*	300	1
Gomphrena cunninghamii	10	0.1
Goodenia stobbsiana	30	0.1
Goodenia triodiophila	15	0.1
Grevillea wickhamii subsp. *hispidula*	80	0.1
Hakea chordophylla	80	0.1
Mirbelia viminalis	60	0.1
Oldenlandia crouchiana	15	0.1
Paspalidium clementii	15	0.1
Petalostylis labicheoides	150	0.1
Ptilotus appendiculatus	15	0.1
Ptilotus exaltatus var. *exaltatus*	10	0.1
Scaevola browniana subsp. *browniana*	20	0.1
Schizachyrium fragile	30	0.1
Sida cardiophylla	30	0.1
Sida sp. Excedentifolia (J.L. Egan 1925)	30	0.1
Solanum phlomoides	50	0.1
Trachymene oleracea subsp. *oleracea*	15	0.1
Trichodesma zeylanicum var. *zeylanicum*	15	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	20	20
Triodia wiseana	30	1

Koodaideri Site KOD36
Described (Phase 1) MTRB **Date (Phase 1)** 11/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) CEFRH **Date (Phase 2)** 14/03/2011
MGA 50 711539 **mE** 7506538 **mN**
Habitat Broad flat creekline, drainage depression leading into Koodaideri springs
Soil Dark reddish brown (5 Y/R 3/6) sandy clay loam with 50% gravel
Rock Type Occasional small-medium ironstone rocks
Vegetation (Phase 1) *Corymbia hamersleyana, Hakea lorea, (Atalaya hemiglauca*) low open woodland over *Acacia pyrifolia* tall open shrubland over **Cenchrus ciliaris* closed tussock grassland
Vegetation (Phase 2) *Corymbia hamersleyana, Hakea lorea* low open woodland over *Acacia pyrifolia* tall open shrubland over **Cenchrus ciliaris* tussock grassland
Veg Condition Very poor to poor
Fire Age No sign of recent fire
Notes Elevation 491 m asl. 70-75% *Cenchrus ciliaris.* Approximately 10% of trees appear to be dying back

Species (Phase 1)	Height (cm)	Cover (%)
Abutilon dioicum	140	0.1
Acacia pyrifolia	400	8
Acacia tumida var. *pilbarensis*	160	0.1
Atalaya hemiglauca	500	1
Cassia oligophylla	80	0.1
Cenchrus ciliaris	50	75
Clerodendrum floribundum var. *angustifolium*	130	0.1
Corchorus lasiocarpus subsp. *parvus*	120	0.1
Corymbia hamersleyana	1	850
Cymbopogon procerus	140	0.1
Gossypium robinsonii	350	0.1
Grevillea wickhamii subsp. *hispidula*	250	0.1
Hakea lorea subsp. *lorea*	550	3
Indigofera monophylla (small leaflet form)	50	0.1
Jasminum didymum subsp. *lineare*	100	0.1
Petalostylis labicheoides	210	0.1
Ptilotus obovatus var. *obovatus*	60	0.1
Tephrosia rosea var. *glabrior*	70	0.1
Themeda triandra	60	0.1

Species (Phase 2)	Height (cm)	Cover (%)
Abutilon dioicum	110	0.1
Acacia pyrifolia	550	5
Acacia tumida var. *pilbarensis*	120	0.1
Atalaya hemiglauca	100	0.1
Boerhavia coccinea	15	0.1
Cassia oligophylla	120	0.1
Cenchrus ciliaris	80	70
Clerodendrum floribundum var. *angustifolium*	130	0.1
Corchorus lasiocarpus subsp. *parvus*	70	0.1
Corymbia hamersleyana	750	2
Cymbopogon procerus	60	0.1
Enneapogon lindleyanus	30	0.1
Gossypium robinsonii	400	0.1
Grevillea wickhamii subsp. *hispidula*	200	0.1
Hakea lorea subsp. *lorea*	600	2
Hibiscus goldsworthii	30	0.1
Hybanthus aurantiacus	40	0.1
Indigofera monophylla	30	0.1
Jasminum didymum subsp. *lineare*	100	0.1
Petalostylis labicheoides	300	0.1
Pisolithus albus	10	0.1
Ptilotus obovatus var. *obovatus*	70	0.1
Rhynchosia minima	20	0.1
Tephrosia rosea var. *glabrior*	50	0.1
Themeda triandra	60	0.1
Triodia pungens	40	0.1

Koodaideri Site KOD37
Described (Phase 1) PHBM **Date (Phase 1)** 12/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) MM **Date (Phase 2)** 10/05/2011
MGA 50 707761 **mE** 7505326 **mN**
Habitat Moderate south-facing hillslope
Soil Skeletal red brown sandy loam
Rock Type Ironstone and shale
Vegetation (Phase 1) *Eucalyptus leucophloia* scattered low trees over *Gompholobium* sp. Pilbara, *Mirbelia viminalis, Keraudrenia velutina* subsp. *elliptica* low shrubland over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) open hummock grassland and *Amphipogon sericeus* very open tussock grassland
Vegetation (Phase 2) *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Gompholobium* sp. Pilbara (N.F. Norris 908) scattered shrubs over *Keraudrenia velutina* subsp. *elliptica*, *Acacia hilliana* low shrubland over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) open hummock grassland
Veg Condition Excellent
Fire Age Burnt 3-5 years ago

Species (Phase 1)	Height (cm)	Cover (%)
Acacia adoxa var. *adoxa*	30	1
Acacia hilliana	30	3
Amphipogon sericeus	50	3
Aristida holathera var. *holathera*	50	0.1
Cassia glutinosa	100	0.1
Cassia pruinosa	150	0.1
Corymbia deserticola subsp. *deserticola*	150	0.1
Corymbia hamersleyana	500	0.1
Cymbopogon ambiguus	70	0.1
Eriachne mucronata	70	0.1
Eucalyptus leucophloia subsp. *leucophloia*	450	2
Gompholobium sp. Pilbara (N.F. Norris 908) PN	60	8
Goodenia stobbsiana	40	0.1
Goodenia triodiophila	20	0.1
Goodenia triodiophila		
Grevillea wickhamii subsp. *hispidula*	100	0.1
Hakea chordophylla	200	0.1
Keraudrenia velutina subsp. *elliptica*	70	15
Mirbelia viminalis	100	2
Solanum phlomoides	50	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	50	25
Triodia wiseana	60	0.1

Species (Phase 2)	Height (cm)	Cover (%)
Acacia adoxa var. *adoxa*	30	0.1
Acacia hilliana	15	2
Amphipogon sp.	25	0.1
Aristida holathera var. *holathera*	25	0.1
Cassia glutinosa	70	0.1
Cassia pruinosa	90	0.1
Corymbia deserticola subsp. *deserticola*	110	0.1
Corymbia hamersleyana	500	0.1
Eriachne lanata	6	0.1
Eriachne mucronata	40	0.1
Eriachne pulchella subsp. *dominii*	20	0.1
Eucalyptus leucophloia subsp. *leucophloia*	430	2
Fimbristylis simulans	30	0.1
Gompholobium sp. Pilbara (N.F. Norris 908) PN	110	1
Goodenia triodiophila	20	0.1
Grevillea wickhamii subsp. *hispidula*	180	0.1
Hakea chordophylla	240	0.1
Hibiscus sturtii var. *campylochlamys*	25	0.1
Hybanthus aurantiacus	70	0.1
Indigofera monophylla (brown calyx form)	30	0.1
Keraudrenia velutina subsp. *elliptica*	60	25
Mirbelia viminalis	115	0.1
Ptilotus calostachyus	70	0.1
Ptilotus exaltatus var. *exaltatus*	8	0.1
Ptilotus fusiformis	20	0.1
Schizachyrium fragile	35	0.1
Solanum phlomoides	40	0.1
Stackhousia intermedia	20	0.1
Tribulus suberosus	15	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	25	25
Triodia wiseana	40	0.1

Koodaideri Site KOD38
Described (Phase 1) PHBM **Date (Phase 1)** 12/07/2010 **Type** Quadrat 30 x 70
Described (Phase 2) CEF **Date (Phase 2)** 12/03/2011
MGA 50 709726 **mE** 7504718 **mN**
Habitat Gently sloping, NE facing narrow floodplain between creeks
Soil Gravels and pebbles and cobbly red-brown loamy sand
Rock Type Mixed; including ironstone from BIF
Vegetation (Phase 1) *Corymbia hamersleyana* scattered low trees over *Acacia pyrifolia, (Acacia tumida, Grevillea wickhamii* subsp. *hispidula)* tall shrubland over *Triodia pungens* hummock grassland
Vegetation (Phase 2) *Acacia pyrifolia, Acacia tumida, Grevillea wickhamii* subsp. *hispidula* tall shrubland over *Cassia oligophylla* scattered low shrubs over *Triodia pungens* hummock grassland
Veg Condition Excellent/Very good
Fire Age No sign of recent fire
Notes Quadrat is a tight fit in between creeks, therefore there is a small amount of the *Acacia tumida* creek bank scrub within boundaries; this was not included within the search. Few **Bidens bipinnata, *Cenchrus ciliaris* individuals present

Species (Phase 1)	Height (cm)	Cover (%)
Acacia monticola	100	0.1
Acacia pyrifolia	300	12
Acacia tumida var. *pilbarensis*	120	1
Atalaya hemiglauca	180	0.1
Cassia oligophylla x helmsii	45-60	0.1
Corchorus lasiocarpus subsp. *parvus*	45	0.1
Corymbia hamersleyana	500	0.1
Cymbopogon obtectus	130	0.1
Enneapogon lindleyanus	50	0.1
Gossypium robinsonii	190	0.1
Grevillea wickhamii subsp. *hispidula*	160	1
Hybanthus aurantiacus	45	0.1
Ptilotus astrolasius	30	0.1
Santalum lanceolatum	180	0.1
Sida sp.	35	0.1
Tephrosia rosea var. *glabrior*	45	0.1
Tribulus suberosus	60	0.1
Triodia pungens	40	60

Species (Phase 2)	Height (cm)	Cover (%)
Abutilon lepidum	50	0.1
Acacia pruinocarpa	300	0.1
Acacia pyrifolia	200	10
Acacia tumida var. *pilbarensis*	220	1
Amaranthus undulatus	50	0.1
Atalaya hemiglauca	230	0.1
Bidens bipinnata	30	0.1
Boerhavia coccinea	10	0.1
Bulbostylis barbata	10	0.1
Cassia helmsii	50	0.1
Cassia oligophylla	100	2
Cenchrus ciliaris	60	0.1
Cleome viscosa	40	0.1
Corchorus lasiocarpus subsp. *parvus*	60	0.1
Corchorus tridens	20	0.1
Corymbia hamersleyana	600	0.1
Crotalaria medicaginea var. *neglecta*	20	0.1
Digitaria ctenantha	130	0.1
Duperreya commixta	30	0.1
Enneapogon lindleyanus	80	0.1
Eriachne pulchella subsp. *dominii*	50	0.1
Euphorbia biconvexa		0.1
Euphorbia alsiniflora	40	0.1
Euphorbia tannensis subsp. *eremophila*	110	0.1
Fimbristylis simulans	20	0.1
Gossypium australe	30	0.1
Gossypium robinsonii	150	0.1
Grevillea wickhamii subsp. *hispidula*	200	1
Hybanthus aurantiacus	40	0.1
Indigofera monophylla	20-50	0.1
Ipomoea polymorpha	30	0.1
Melhania oblongifolia	30	0.1
Mollugo molluginea	10	0.1
Notoleptopus decaisnei	20	0.1
Paspalidium clementii	50	0.1
Perotis rara	40	0.1
Polymeria ambigua	25	0.1
Ptilotus astrolasius	50	0.1
Ptilotus exaltatus var. *exaltatus*	30	0.1
Rhynchosia minima	40	0.1
Santalum lanceolatum	200	0.1
Tribulus suberosus	70	0.1
Trichodesma zeylanicum var. *zeylanicum*	60	0.1
Triodia pungens	70	65
Triodia sp.	15	0.1

Koodaideri Site KOD39
Described (Phase 1) PHBM **Date (Phase 1)** 12/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) PACEF **Date (Phase 2)** 16/03/2011
MGA 50 709061 **mE** 7507112 **mN**
Habitat Moderate southwest facing colluvial midslope
Soil Red-brown sandy loam
Rock Type Gravelly, pebbly ironstone. Some outcropping
Vegetation (Phase 1) *Eucalyptus leucophloia* low woodland over *Acacia arida*, *Santalum lanceolatum* tall open shrubland over *Acacia spondylophylla* shrubland *over Triodia wiseana, Triodia* sp. Shovelanna Hill hummock grassland
Vegetation (Phase 2) *Eucalyptus leucophloia* subsp. *leucophloia* low open woodland over *Acacia arida*, *Santalum lanceolatum, Grevillea wickhamii* subsp. *hispidula* tall open shrubland over *Acacia spondylophylla* scattered shrubs over *Triodia wiseana, Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) open hummock grassland
Veg Condition Excellent
Fire Age No sign of recent fire
Notes A very old drill pad lies in the center of the quadrat; not noticed during the initial inspection. 594 m asl

Species (Phase 1)	Height (cm)	Cover (%)
Acacia arida	250	6
Acacia pruinocarpa	400	1
Acacia spondylophylla	60	20
Acacia tumida var. *pilbarensis*	250	0.1
Cymbopogon ambiguus	60	0.1
Eremophila jucunda subsp. *pulcherrima*	30	0.1
Eucalyptus leucophloia subsp. *leucophloia*	700	17
Gompholobium sp. Pilbara (N.F. Norris 908) PN	50	0.1
Goodenia stobbsiana	30	0.1
Grevillea wickhamii subsp. *hispidula*	380	0.1
Santalum lanceolatum	250	2
Scaevola browniana subsp. *browniana*	30	0.1
Solanum ellipticum	10	0.1
Tephrosia arenicola	30	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	30	15
Triodia wiseana	70	30

Species (Phase 2)	Height (cm)	Cover (%)
Acacia arida	220	1
Acacia pruinocarpa	400	0.1
Acacia spondylophylla	110	2
Acacia tumida var. *pilbarensis*	200	0.1
Aristida holathera var. *holathera*	20	0.1
Aristida inaequiglumis	120	0.1
Bulbostylis barbata	10	0.1
Clerodendrum floribundum var. *angustifolium*	30	0.1
Corchorus lasiocarpus subsp. *parvus*	15	0.1
Cucumis maderaspatanus	100	0.1
Enneapogon polyphyllus	20	0.1
Eremophila jucunda subsp. *pulcherrima*	40	0.1
Eriachne pulchella subsp. *dominii*	25	0.1
Eucalyptus leucophloia subsp. *leucophloia*	700	5
Gompholobium sp. Pilbara (N.F. Norris 908) PN	100	0.1
Goodenia microptera	15	0.1
Goodenia stobbsiana	15	0.1
Goodenia triodiophila	50	0.1
Grevillea wickhamii subsp. *hispidula*	200	1
Hybanthus aurantiacus	45	0.1
Oldenlandia crouchiana	15	0.1
Ptilotus calostachyus	25	0.1
Santalum lanceolatum	350	1
Scaevola browniana subsp. browniana	30	0.1
Solanum ellipticum	10	0.1
Tephrosia arenicola	150	0.1
Tribulus suberosus	40	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	30	12
Triodia wiseana	60	15

Koodaideri Site KOD40
Described (Phase 1) BMMST **Date (Phase 1)** 14/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) PA/RH **Date (Phase 2)** 17/03/2011
MGA 50 721679 **mE** 7500725 **mN**
Habitat Very gently sloping broad floodplain intersected by minor flowlines
Soil Dark reddish brown (2.5 YR 3/6) silty loam with 60% rock fragments (approx. 60-80mm)
Rock Type Scattered ironstone gravel, pebbles and cobbles
Vegetation (Phase 1) *Corymbia hamersleyana* scattered low trees over *Acacia inaequilatera* (on stony rises), *Grevillea wickhamii* subsp. *hispidula* scattered tall shrubs over *Triodia pungens* hummock grassland
Vegetation (Phase 2) *Corymbia hamersleyana* scattered low trees over *Acacia inaequilatera, Grevillea wickhamii* subsp. *hispidula* scattered tall shrubs over *Triodia pungens* open hummock grassland and **Cenchrus ciliaris* scattered tussock grasses
Veg Condition Very good/Good
Fire Age Burnt 2-3 years ago
Notes 2-3% **Cenchrus ciliaris* cover. Elevation 493 asl. In quadrat, *Acacia inaequilatera* occurs mostly on low stony rises; low-lying areas at this site have more *Acacia pyrifolia* and **Cenchrus ciliaris*

Species (Phase 1)	Height (cm)	Cover (%)
Abutilon otocarpum	45	0.1
Acacia dictyophleba	35	0.1
Acacia inaequilatera	300	0.1
Acacia pyrifolia	130	0.1
Atalaya hemiglauca	190	0.1
Boerhavia coccinea	15	0.1
Cassia oligophylla x helmsii	35-50	0.1
Cenchrus ciliaris	40	3
Cleome viscosa	40	0.1
Corchorus sp.	35	0.1
Corymbia hamersleyana	500	1
Cullen leucochaites	90	0.1
Eremophila sp.	40	0.1
Evolvulus alsinoides var. *villosicalyx*	15	0.1
Grevillea wickhamii subsp. *hispidula*	90	0.1
Hakea lorea subsp. *lorea*	180	0.1
Heliotropium pachyphyllum	20	0.1
Indigofera monophylla (small leaflet form)	20	0.1
Jasminum didymum subsp. *lineare*	70	0.1
Mollugo molluginea	15	0.1
Ptilotus obovatus var. *obovatus*	40	0.1
Solanum phlomoides	20	0.1
Tephrosia aff. *densa* (P8T-018)	70	0.1
Trichodesma zeylanicum var. *zeylanicum*	30	0.1
Triodia pungens	30	35

Species (Phase 2)	Height (cm)	Cover (%)
Acacia inaequilatera	300	1
Acacia pyrifolia	150	0.1
Atalaya hemiglauca	180	0.1
Boerhavia coccinea	5-20	0.1
Bulbostylis barbata	5	0.1
Cassia helmsii	50	0.1
Cassia oligophylla	110	0.1
Cenchrus ciliaris	100	2
Cleome viscosa	15	0.1
Corchorus lasiocarpus subsp. *lasiocarpus*	10	0.1
Corymbia hamersleyana	500	1
Crotalaria medicaginea var. *neglecta*	30	0.1
Grevillea wickhamii subsp. *hispidula*	150	1
Hakea lorea subsp. *lorea*	150	0.1
Indigofera monophylla	50	0.1
Jasminum didymum subsp. *lineare*	100	0.1
Mollugo molluginea	10	0.1
Polycarpaea corymbosa var. *corymbosa*	10	0.1
Portulaca oleracea	5	0.1
Ptilotus calostachyus	70	0.1
Ptilotus exaltatus var. *exaltatus*	20	0.1
Ptilotus obovatus var. *obovatus*	100	0.1
Rhynchosia minima	10	0.1
Tephrosia densa	50	0.1
Trachymene oleracea subsp. *oleracea*	5	0.1
Trianthema pilosa	15	0.1
Tribulus macrocarpus	15	0.1
Triodia lanigera	15	0.1
Triodia pungens	100	25

Koodaideri Site KOD41
Described (Phase 1) BMMST **Date (Phase 1)** 06/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) MM **Date (Phase 2)** 07/05/2011
MGA 50 714124 **mE** 7506140 **mN**
Habitat Gentle, NE-facing slope of colluvial spur
Soil Red-brown loamy sand (gravelly, pebbly)
Rock Type A continuous mantle of blocky, small-medium ironstone rocks
Vegetation (Phase 1) *Grevillea wickhamii* subsp. *hispidula* scattered shrubs over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) very open hummock grassland
Vegetation (Phase 2) *Grevillea wickhamii* subsp. *hispidula* scattered tall shrubs over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) open hummock grassland
Veg Condition Very good
Fire Age Burnt 3-5 years ago
Notes Pre-fire *Triodia* cover is estimated to be 30-70%. This vegetation type potentially includes scattered *Eucalyptus leucophloia*, although none were located within the quadrat

Species (Phase 1)	Height (cm)	Cover (%)
Acacia bivenosa	60	0.1
Bonamia sp. Dampier (A.A. Mitchell PRP 217)	3	0.1
Cassia luerssenii	60	0.1
Cassia oligophylla x helmsii	40	0.1
Cassia pruinosa	50	0.1
Corchorus lasiocarpus subsp. *parvus*	25	0.1
Gomphrena sp.	10	0.1
Grevillea wickhamii subsp. *hispidula*	180	2
Heliotropium ovalifolium	20	0.1
Hibiscus sp.	15	0.1
Mollugo molluginea	20	0.1
Ptilotus astrolasius	35	0.1
Ptilotus calostachyus	120	0.1
Ptilotus exaltatus var. *exaltatus*	20	0.1
Sida aff. *pilbarensis* (EOB46-01B)	45	0.1
Solanum lasiophyllum	35	0.1
Solanum phlomoides	20-35	0.1
Tephrosia sp. Cathedral Gorge (F.H. Mollemans 2420)	10	0.1
Triodia pungens	25	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	10	15

Species (Phase 2)	Height (cm)	Cover (%)
Abutilon lepidum	10	0.1
Acacia bivenosa	80	0.1
Aristida holathera var. *holathera*	25	0.1
Bonamia rosea	40	0.1
Bonamia sp.	4	0.1
Cassia glutinosa x luerssenii	100	0.1
Cassia oligophylla x helmsii	40	0.1
Cassia pruinosa	70	0.1
Cleome viscosa	50	0.1
Corchorus lasiocarpus subsp. *lasiocarpus*	40	0.1
Fimbristylis simulans	20	0.1
Gomphrena affinis subsp. *pilbarensis*	4	0.1
Gomphrena cunninghamii	20	0.1
Grevillea wickhamii subsp. *hispidula*	230	1
Heliotropium pachyphyllum	20	0.1
Hibiscus coatesii	80	0.1
Hibiscus sturtii var. *campylochlamys*	30	0.1
Mollugo molluginea	20	0.1
Oldenlandia crouchiana	2	0.1
Polycarpaea holtzei	6	0.1
Polygala aff. *isingii*	2	0.1
Ptilotus astrolasius	40	0.1
Ptilotus auriculifolius	40	0.1
Ptilotus calostachyus	70	3
Ptilotus exaltatus var. *exaltatus*	60	1
Sida sp. Hamersley Range (K. Newbey 10692) PN	40	0.1
Solanum phlomoides	20	0.1
Tephrosia sp. Cathedral Gorge (F.H. Mollemans 2420) PN	2	0.1
Tribulus hirsutus	4	0.1
Triodia pungens	40	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	20	15

Koodaideri Site KOD42
Described (Phase 1) BMMST **Date (Phase 1)** 06/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) CFMyM **Date (Phase 2)** 11/03/2011
MGA 50 713469 **mE** 7506976 **mN**
Habitat Very gently sloping NE facing alluvial plain with small 'flow' depressions
Soil red brown sandy loam
Rock Type gravel, pebbles and cobbles
Vegetation (Phase 1) *Grevillea wickhamii* subsp. *hispidula, Acacia inaequilatera* scattered tall shrubs over *Cassia oligophylla x helmsii, Corchorus incanus* subsp. *incanus* scattered low shrubs over *Triodia lanigera* hummock grassland
Vegetation (Phase 2) *Acacia inaequilatera, Grevillea wickhamii* subsp. *hispidula* tall open shrubland over *Bonamia erecta* scattered low shrubs over *Triodia lanigera* hummock grassland
Veg Condition Very good
Fire Age 3-5 years ago
Notes Quadrat had *Acacia pyrifolia* in lower shallow depression areas - veg unit a bit mixed. **Cenchrus ciliaris* present in Phase 2

Species (Phase 1)	Height (cm)	Cover (%)
Acacia dictyophleba	40	0.1
Acacia inaequilatera	400	0.1
Acacia pachyacra	90	0.1
Acacia pyrifolia	300	0.1
Aristida holathera var. *holathera*	35	0.1
Aristida sp.	30	0.1
Bonamia rosea	20	0.1
Cassia glutinosa	100	0.1
Cassia oligophylla (thinly sericeous MET 15,035)	45	0.1
Cassia oligophylla x helmsii	80	0.1
Corchorus incanus subsp. *incanus*	30	0.1
Eragrostis setifolia	30	0.1
Eriachne mucronata	35	0.1
Gossypium australe (Burrup Peninsula form)	80	0.1
Gossypium robinsonii	110	0.1
Grevillea wickhamii subsp. *hispidula*	300	2
Hakea chordophylla	230	0.1
Heliotropium ovalifolium	20	0.1
Indigofera monophylla (small leaflet form)	45	0.1
Mollugo molluginea	20	0.1
Ptilotus astrolasius	30	0.1
Ptilotus calostachyus	70	0.1
Ptilotus exaltatus var. *exaltatus*	40	0.1
Sida arenicola	45	0.1
Solanum lasiophyllum	40	0.1
Tephrosia sp. Bungaroo Creek (M.E. Trudgen 11601)	15	0.1
Triodia pungens	45	0.1
Triodia lanigera	50	40

Species (Phase 2)	Height (cm)	Cover (%)
Acacia adsurgens	60	0.1
Acacia dictyophleba	20	0.1
Acacia inaequilatera	250	2
Acacia pachyacra	20	0.1
Aristida holathera var. *holathera*	20	0.1
Bonamia erecta	40	1
Cassia glutinosa	100	0.1
Cassia oligophylla	60	0.1
Cassia oligophylla	120	0.1
Cenchrus ciliaris	30	0.1
Cleome viscosa	30	0.1
Corchorus incanus subsp. *incanus*		0.1
Cymbopogon sp.	30	0.1
Enneapogon polyphyllus	50	0.1
Eragrostis eriopoda	60	0.1
Eriachne aristidea	40	0.1
Eriachne pulchella subsp. *dominii*	10	0.1
Euphorbia aff. *australis*	20	0.1
Gomphrena cunninghamii	45	0.1
Gossypium australe	40	0.1
Gossypium robinsonii	130	0.1
Grevillea wickhamii subsp. *hispidula*	250	1
Hakea chordophylla	300	0.1
Hibiscus sturtii var. *platychlamys*	50	0.1
Indigofera monophylla	40	0.1
Mollugo molluginea	15	0.1
Paspalidium basicladium	50	0.1
Paspalidium clementii	60	0.1
Phyllanthus erwinii	20	0.1
Ptilotus astrolasius	30	1
Ptilotus calostachyus	20	0.1
Ptilotus exaltatus var. *exaltatus*	5	0.1
Ptilotus helipteroides	30	0.1
Sida arenicola	70	0.1
Solanum lasiophyllum	40	0.1
Tribulus platypterus	20	0.1
Trichodesma zeylanicum var. *zeylanicum*	20	0.1
Triodia lanigera	60	50
Triodia pungens	60	0.1

Koodaideri Site KOD43
Described (Phase 1) JF/MT **Date (Phase 1)** 08/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) MM **Date (Phase 2)** 09/05/2011
MGA 50 722607 **mE** 7501779 **mN**
Habitat Rocky north facing hillslope
Soil Skeletal red brown clay loam
Rock Type Outcropping ironstone, continuous surface pebbles and boulders
Vegetation (Phase 1) *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Grevillea wickhamii* subsp. *hispidula, Acacia spondylophylla* open shrubland over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) open hummock grassland
Vegetation (Phase 2) *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Grevillea wickhamii* subsp. *hispidula* scattered shrubs over *Acacia spondylophylla* scattered low shrubs over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) open hummock grassland
Veg Condition Excellent
Fire Age 3-5 years ago

Species (Phase 1)	Height (cm)	Cover (%)
Acacia ancistrocarpa	15	0.1
Acacia pruinocarpa		0.1
Acacia spondylophylla	40	3
Acacia tenuissima	40	0.1
Cassia pruinosa	40	0.1
Corchorus lasiocarpus subsp. *parvus*	50	0.1
Corymbia hamersleyana	80	0.1
Dampiera candicans	50	0.1
Dodonaea coriacea	60	0.1
Eremophila jucunda subsp. *pulcherrima*	40	0.1
Eriachne mucronata	40	0.1
Eucalyptus leucophloia subsp. *leucophloia*	500	1
Grevillea wickhamii subsp. *hispidula*	120	1
Hakea lorea subsp. *lorea*	210	0.1
Ptilotus calostachyus	120	0.1
Sida arenicola	130	0.1
Sida pilbarensis (ferruginous form)	35-40	0.1
Solanum phlomoides	35-60	0.1
Tephrosia arenicola		0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	15	25
Triodia epactia	30	0.1

Species (Phase 2)	Height (cm)	Cover (%)
Acacia elachantha	60	0.1
Acacia pruinocarpa	70	0.1
Acacia pyrifolia	80	0.1
Acacia spondylophylla	50	2
Acacia tumida var. *pilbarensis*	40	0.1
Amphipogon sericeus	40	0.1
Aristida holathera var. *holathera*	50	0.1
Bonamia sp. Dampier (A.A. Mitchell PRP 217)	5	0.1
Calytrix carinata	60	0.1
Cassia glutinosa x *luerssenii*	85	0.1
Cassia pruinosa	60	0.1
Corchorus lasiocarpus subsp. *parvus*	40	0.1
Corymbia hamersleyana	170	0.1
Dampiera candicans	40	0.1
Dysphania rhadinostachya (subsp. not determined)	6	0.1
Eremophila jucunda subsp. *pulcherrima*	50	0.1
Eriachne lanata	45	0.1
Eriachne mucronata	50	0.1
Eriachne pulchella subsp. *dominii*	20	0.1
Eucalyptus leucophloia subsp. *leucophloia*	420	1
Fimbristylis simulans	20	0.1
Goodenia triodiophila	40	0.1
Grevillea wickhamii subsp. *hispidula*	200	2
Hakea lorea subsp. *lorea*	190	0.1
Polygala aff. *isingii*	4	0.1
Ptilotus calostachyus	80	0.1
Ptilotus exaltatus var. *exaltatus*	5	0.1
Scaevola browniana subsp. *browniana*	40	0.1
Sida pilbarensis (ferruginous form)	60	0.1
Solanum phlomoides	20	0.1
Tephrosia arenicola	50	0.1
Trianthema glossostigma	1	0.1
Triodia epactia	45	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	30	20

Koodaideri Site KOD44
Described (Phase 1) JF/MT **Date (Phase 1)** 08/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) CEFRH **Date (Phase 2)** 13/03/2011
MGA 50 718336 **mE** 7504585 **mN**
Habitat Very gently sloping plain dissected by shallow flowlines
Soil Dark red-brown loamy sand (25% coarse fragments)
Rock Type Ironstone small to medium rocks
Vegetation (Phase 1) *Corymbia hamersleyana* scattered low trees over *Acacia inaequilatera* scattered tall shrubs over *Triodia pungens* open hummock grassland and **Cenchrus ciliaris* very open tussock grassland
Vegetation (Phase 2) *Corymbia hamersleyana* scattered low trees over *Acacia inaequilatera, Hakea lorea* subsp. *lorea* tall open shrubland over *Triodia pungens* open hummock grassland over **Cenchrus ciliaris, Aristida contorta* tussock grassland
Veg Condition Very good/Good
Fire Age 3-5 years ago

Species (Phase 1)	Height (cm)	Cover (%)
Abutilon aff. *hannii*	50	0.1
Acacia inaequilatera	350	2
Atalaya hemiglauca	120	0.1
Cassia luerssenii	40	0.1
Cassia oligophylla x helmsii	35-100	0.1
Cenchrus ciliaris	45	10
Cleome viscosa	25	0.1
Corchorus sp.	40	0.1
Corymbia hamersleyana	700	1
Duperreya commixta	170	0.1
Euphorbia tannensis subsp. *eremophila*	60	0.1
Hakea lorea subsp. *lorea*	400	0.1
Hibiscus sp.	50	0.1
Mollugo molluginea	20	0.1
Ptilotus astrolasius	55	0.1
Ptilotus calostachyus	45	0.1
Rhagodia eremaea	60	0.1
Sida sp.	25	0.1
Solanum phlomoides	30	0.1
Trichodesma zeylanicum var. *zeylanicum*	35	0.1
Triodia pungens	30	25

Species (Phase 2)	Height (cm)	Cover (%)
Abutilon dioicum	30	0.1
Abutilon lepidum	50	0.1
Acacia inaequilatera	300	4
Aristida contorta	45	8
Atalaya hemiglauca	250	0.1
Boerhavia coccinea	20	0.1
Cassia glutinosa x luerssenii	120-150	0.1
Cassia helmsii	40	0.1
Cassia oligophylla	110	0.1
Cassia oligophylla x helmsii	60	0.1
Cenchrus ciliaris	60	25
Cleome viscosa	70	0.1
Corchorus sidoides subsp. *sidoides*	25-60	0.1
Corymbia hamersleyana	500	2
Crotalaria medicaginea var. *neglecta*	20	0.1
Duperreya commixta	250	0.1
Enneapogon polyphyllus	70	0.1
Eriachne aristidea	70	0.1
Euphorbia aff. *australis*	20	0.1
Euphorbia tannensis subsp. *eremophila*	80	0.1
Gomphrena canescens subsp. *canescens*	40	0.1
Goodenia microptera	60	0.1
Gossypium robinsonii	150	0.1
Hakea lorea subsp. *lorea*	550	1
Hibiscus burtonii	60	0.1
Mollugo molluginea	40	0.1
Polymeria ambigua	20	0.1
Ptilotus astrolasius	50	0.1
Ptilotus calostachyus	80	0.1
Ptilotus exaltatus var. *exaltatus*	60	0.1
Ptilotus helipteroides	60	0.1
Ptilotus obovatus var. *obovatus*	60	2
Ptilotus polystachyus	80	0.1
Rhagodia eremaea	120	0.1
Rhynchosia minima	30	0.1
Streptoglossa decurrens	40	0.1
Synaptantha tillaeacea var. *tillaeacea*	30	0.1
Trianthema pilosa	30	0.1
Tribulus macrocarpus	20	0.1
Trichodesma zeylanicum var. *zeylanicum*	40	0.1
Triodia pungens	50	25

Koodaideri Site KOD45
Described (Phase 1) RBJCF **Date (Phase 1)** 09/07/201 **Type** Quadrat 50 x 50
Described (Phase 2) PA/RH **Date (Phase 2)** 17/03/2011
MGA 50 722518 **mE** 7502644 **mN**
Habitat Broad flat plain at base of moderate hills
Soil Dark reddish brown (2.5 YR 3/6) loamy sand with 18% coarse fragments (30-60 mm)
Rock Type Scattered ironstone pebbles and gravel
Vegetation (Phase 1) *Acacia inaequilatera, Grevillea wickhamii* subsp. *hispidula* tall open shrubland over *Triodia lanigera* hummock grassland
Vegetation (Phase 2) *Acacia inaequilatera, Grevillea wickhamii* subsp. *hispidula* scattered tall shrubs over *Triodia lanigera* hummock grassland
Veg Condition Excellent/Very good
Fire Age No sign of recent fire
Notes **Flaveria trinervia* individuals present in Phase 2. *Acacia inaequilatera* showing quite severe dieback (insect galling)

Species (Phase 1)	Height (cm)	Cover (%)
Acacia inaequilatera	200	2
Acacia tenuissima	100	0.1
Cassia oligophylla x helmsii	50	0.1
Cassytha capillaris	50	0.1
Cymbopogon ambiguus	80	0.1
Grevillea wickhamii subsp. *hispidula*	300	1
Paraneurachne muelleri	40	0.1
Ptilotus obovatus var. *obovatus*	70	0.1
Scaevola sp.	100	0.1
Tribulus suberosus	120	0.1
Triodia lanigera	50	40

Species (Phase 2)	Height (cm)	Cover (%)
Acacia inaequilatera	250	1
Acacia tenuissima	110	0.1
Aristida holathera var. *holathera*	80	0.1
Bonamia rosea	40	0.1
Cassia notabilis	20	0.1
Cassia oligophylla x helmsii	15	0.1
Cleome viscosa	30	0.1
Corchorus lasiocarpus subsp. *lasiocarpus*	20	0.1
Cucumis maderaspatanus	100	0.1
Dicrastylis cordifolia	80	0.1
Dysphania rhadinostachya (subsp. not determined)	15	0.1
Eriachne aristidea	30	0.1
Eucalyptus gamophylla	250	0.1
Euphorbia aff. *schultzii*	20	0.1
Flaveria trinervia	30	0.1
Gomphrena canescens subsp. *canescens*	25	0.1
Gomphrena cunninghamii	15	0.1
Grevillea wickhamii subsp. *hispidula*	300	1
Hybanthus aurantiacus	30	0.1
Indigofera monophylla	80	0.1
Paraneurachne muelleri	80	0.1
Paspalidium clementii	25	0.1
Phyllanthus erwinii	30	0.1
Ptilotus calostachyus	50	0.1
Ptilotus exaltatus var. *exaltatus*	30	0.1
Ptilotus obovatus var. *obovatus*	80	0.1
Ptilotus polystachyus	60	0.1
Scaevola parvifolia subsp. *pilbarae*	30	0.1
Sida sp. Hamersley Range (K. Newbey 10692) PN	20	0.1
Solanum aff. *lucani*	10	0.1
Solanum gabrielae	25	0.1
Trianthema pilosa	10	0.1
Tribulus hirsutus	10	0.1
Tribulus suberosus	80	0.1
Trichodesma zeylanicum var. *zeylanicum*	20	0.1
Triodia lanigera	80	35
Yakirra australiensis var. *australiensis*	25	0.1

Koodaideri Site KOD46
Described (Phase 1) RBJCF **Date (Phase 1)** 09/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) PA/RH **Date (Phase 2)** 10/03/2011
MGA 50 702853 **mE** 7507460 **mN**
Habitat East facing rocky slope
Soil Skeletal red brown clay loam
Rock Type Outcropping ironstone with continuous surface layer of pebbles and boulders
Vegetation (Phase 1) *Eucalyptus leucophloia* subsp. *leucophloia* low open woodland over *Grevillea wickhamii* subsp. *hispidula, Petalostylis labicheoides* open shrubland over *Acacia spondylophylla, Acacia arida* low shrubland over *Triodia wiseana* open hummock grassland
Vegetation (Phase 2) *Eucalyptus leucophloia* subsp. *leucophloia* low open woodland over *Grevillea wickhamii* subsp. *hispidula, Petalostylis labicheoides* open shrubland over *Acacia spondylophylla, Acacia arida, Tephrosia arenicola, Dampiera candicans* low shrubland over *Triodia wiseana* very open hummock grassland
Veg Condition Excellent
Fire Age 3-5 years ago

Species (Phase 1)	Height (cm)	Cover (%)
Acacia arida	60	7
Acacia maitlandii	30	0.1
Acacia pruinocarpa	100	0.1
Acacia pyrifolia	210	0.1
Acacia spondylophylla	70	15
Codonocarpus cotinifolius	110	0.1
Corchorus lasiocarpus subsp. *parvus*		0.1
Eriachne lanata	45	0.1
Eucalyptus gamophylla	220	0.1
Eucalyptus leucophloia subsp. *leucophloia*	500	5
Goodenia stobbsiana	30	0.1
Grevillea wickhamii subsp. *hispidula*	110	2
Hakea chordophylla	120	0.1
Heliotropium skeleton	60	0.1
Mirbelia viminalis	40	0.1
Petalostylis labicheoides	150	2
Ptilotus calostachyus	120	0.1
Ptilotus exaltatus var. *exaltatus*	30	0.1
Solanum phlomoides		0.1
Tephrosia arenicola	50	0.1
Triodia wiseana	20	20

Species (Phase 2)	Height (cm)	Cover (%)
Acacia arida	50	2
Acacia pruinocarpa	120	0.1
Acacia pyrifolia	220	0.1
Acacia spondylophylla	50	10
Aristida inaequiglumis	100	0.1
Codonocarpus cotinifolius	200	0.1
Corchorus lasiocarpus subsp. *parvus*	70	0.1
Dampiera candicans	30	1
Eriachne lanata	30	0.1
Eriachne mucronata	40	0.1
Eucalyptus gamophylla	200	0.1
Eucalyptus leucophloia subsp. *leucophloia*	500	6
Goodenia stobbsiana	30	0.1
Goodenia triodiophila	30	0.1
Grevillea wickhamii subsp. *hispidula*	200	2
Heliotropium pachyphyllum	20	0.1
Mirbelia viminalis	100	0.1
Mollugo molluginea	10	0.1
Paraneurachne muelleri	30	0.1
Petalostylis labicheoides	150	1
Pisolithus albus	0.1	
Ptilotus calostachyus	30	0.1
Ptilotus exaltatus var. *exaltatus*	10	0.1
Scaevola browniana subsp. *browniana*	20	0.1
Sida cardiophylla	20	0.1
Solanum phlomoides	110	0.1
Tephrosia arenicola	100	1
Tephrosia sp. Cathedral Gorge (F.H. Mollemans 2420) PN	10	0.1
Triodia wiseana	25	7

Koodaideri Site KOD47
Described (Phase 1) JCFPA **Date (Phase 1)** 10/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) MM **Date (Phase 2)** 12/05/2011
MGA 50 716400 **mE** 7501671 **mN**
Habitat Steep southeast facing hillslope
Soil Skeletal red brown clay loam
Rock Type Continuous solid ironstone
Vegetation (Phase 1) *Eucalyptus leucophloia* subsp. *leucophloia, Corymbia ferriticola* scattered low trees over *Acacia pruinocarpa* scattered tall shrubs over *Acacia arida, (Solanum phlomoides), Corchorus lasiocarpus* subsp. *parvus* low shrubland over *Triodia epactia*, *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) open hummock grassland
Vegetation (Phase 2) *Corymbia ferriticola, Eucalyptus leucophloia* subsp. *leucophloia, Acacia pruinocarpa* low open woodland over *Acacia arida* open shrubland over *Corchorus lasiocarpus* subsp. *parvus* low open shrubland over *Triodia epactia, Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) open hummock grassland
Veg Condition Excellent
Fire Age No sign of recent fire

Species (Phase 1)	Height (cm)	Cover (%)
Acacia adsurgens	30	0.1
Acacia arida	60	10
Acacia pruinocarpa	450	1
Cassia glutinosa	40	0.1
Corchorus lasiocarpus subsp. *parvus*	50	2
Corymbia ferriticola	450	1
Cymbopogon ambiguus	80	0.1
Dampiera candicans	40	0.1
Dodonaea pachyneura	130	0.1
Eremophila jucunda subsp. *pulcherrima*	110	0.1
Eriachne lanata	40	0.1
Eriachne mucronata	20	0.1
Eucalyptus leucophloia subsp. *leucophloia*	400	1
Goodenia stobbsiana	40	0.1
Gossypium robinsonii	160	0.1
Grevillea wickhamii subsp. *hispidula*	160	0.1
Hakea chordophylla	200	0.1
Ptilotus calostachyus	60	0.1
Solanum horridum	15	0.1
Solanum phlomoides	100	1
Triodia epactia	25	20
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	15	5

Species (Phase 2)	Height (cm)	Cover (%)
Acacia adsurgens	50	0.1
Acacia arida	130	3
Acacia pruinocarpa	450	1
Acacia tenuissima	90	0.1
Amaranthus cuspidifolius	55	0.1
Cassia glutinosa	80	0.1
Cassia luerssenii	60	0.1
Cassia oligophylla x ferraria	50	0.1
Cassytha capillaris	20	0.1
Corchorus lasiocarpus subsp. *parvus*	60	3
Corymbia ferriticola	450	1
Cymbopogon ambiguus	100	0.1
Dampiera candicans	40	0.1
Dodonaea pachyneura	35	0.1
Duperreya commixta	40	0.1
Eremophila jucunda subsp. *pulcherrima*	120	0.1
Eriachne lanata	50	0.1
Eriachne mucronata	45	0.1
Eriachne pulchella subsp. *dominii*	15	0.1
Eucalyptus leucophloia subsp. *leucophloia*	400	1
Goodenia stobbsiana	20	0.1
Gossypium robinsonii	170	0.1
Grevillea wickhamii subsp. *hispidula*	250	0.1
Hakea chordophylla	220	0.1
Keraudrenia nephrosperma	70	0.1
Paraneurachne muelleri	40	0.1
Ptilotus calostachyus	60	0.1
Ptilotus exaltatus var. *exaltatus*	25	0.1
Sida sp. Hamersley Range (K. Newbey 10692) PN	40	0.1
Solanum phlomoides	80	0.1
Triodia epactia	50	20
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	25	5
Triumfetta leptacantha	40	0.1

Koodaideri Site KOD48
Described (Phase 1) JCFPA **Date (Phase 1)** 10/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) MM **Date (Phase 2)** 12/05/2011
MGA 50 715335 **mE** 7504783 **mN**
Habitat Hill top
Soil Skeletal red brown clay loam
Rock Type continuous ironstone pebbles, stones and gravel
Vegetation (Phase 1) *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Acacia pruinocarpa* scattered tall shrubs over *Acacia arida* open shrubland *over Triodia* sp. Shovelanna Hill open hummock grassland
Vegetation (Phase 2) *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Acacia pruinocarpa* scattered tall shrubs over *Acacia arida* open shrubland over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) open hummock grassland
Veg Condition Excellent
Fire Age Burnt 3-5 years ago

Species (Phase 1)	Height (cm)	Cover (%)
Acacia arida	170	11
Acacia bivenosa	25	0.1
Acacia pruinocarpa	300	1
Corchorus lasiocarpus subsp. *parvus*	40	0.1
Corymbia ferriticola	200	0.1
Dampiera candicans	30	0.1
Eremophila jucunda subsp. *pulcherrima*	110	0.1
Eucalyptus leucophloia subsp. *leucophloia*	350	1
Grevillea berryana	40	0.1
Grevillea wickhamii subsp. *hispidula*	100	0.1
Ptilotus calostachyus	70	0.1
Scaevola browniana subsp. *browniana*	30	0.1
Sida pilbarensis (ferruginous form)	35	0.1
Solanum phlomoides	60	0.1
Tephrosia arenicola	60	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	15	15

Species (Phase 2)	Height (cm)	Cover (%)
Acacia arida	180	3
Acacia bivenosa	40	0.1
Acacia pruinocarpa	250	1
Aristida holathera var. *holathera*	30	0.1
Bonamia sp. Dampier (A.A. Mitchell PRP 217)	3	0.1
Bulbostylis barbata	4	0.1
Cassia glutinosa	70	0.1
Cassia oligophylla	7	0.1
Corchorus lasiocarpus subsp. *parvus*	50	0.1
Corymbia ferriticola	200	0.1
Dampiera candicans	40	0.1
Eremophila jucunda subsp. *pulcherrima*	80	0.1
Eriachne pulchella subsp. *dominii*	10	0.1
Eucalyptus leucophloia subsp. *leucophloia*	700	1
Fimbristylis dichotoma	30	0.1
Goodenia triodiophila	30	0.1
Grevillea berryana	60	0.1
Grevillea wickhamii subsp. *hispidula*	130	0.1
Heliotropium pachyphyllum	20	0.1
Ptilotus calostachyus	75	0.1
Ptilotus exaltatus var. *exaltatus*	4	0.1
Ptilotus fusiformis	20	0.1
Scaevola browniana subsp. *browniana*	20	0.1
Sida arenicola	65	0.1
Solanum phlomoides	70	0.1
Tephrosia arenicola	50	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	30	12
Triumfetta maconochieana	40	0.1

Koodaideri Site KOD49
Described (Phase 1) JCFPA **Date (Phase 1)** 11/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) PAMyM **Date (Phase 2)** 13/03/2011
MGA 50 715739 **mE** 7505111 **mN**
Habitat North and south facing hillslopes with small spur in middle
Soil skeletal red brown clay loam
Rock Type continuously outcropping brown and white coffee rock
Vegetation (Phase 1) *Corymbia hamersleyana*, *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Acacia inaequilatera* scattered shrubs over *Acacia arida, Acacia bivenosa*, *Corchorus lasiocarpus* subsp. *parvus* low open shrubland over *Triodia wiseana* open hummock grassland
Vegetation (Phase 2) *Corymbia hamersleyana, Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Acacia arida, Corchorus lasiocarpus* subsp. *lasiocarpus, Ptilotus auriculifolius* low open shrubland over *Triodia wiseana* very open hummock grassland
Veg Condition Excellent
Fire Age Burnt 1-2 years ago

Species (Phase 1)	Height (cm)	Cover (%)
Acacia arida	70	2
Acacia bivenosa	60	1
Acacia inaequilatera	150	1
Corchorus lasiocarpus subsp. *parvus*	30	1
Corymbia hamersleyana	200	1
Enneapogon lindleyanus	30	0.1
Eriachne mucronata	30	0.1
Eucalyptus leucophloia subsp. *leucophloia*	250	1
Euphorbia wheeleri	20	0.1
Grevillea wickhamii subsp. *hispidula*	40	0.1
Hibiscus aff. *coatesii* (site 733)	25	0.1
Paraneurachne muelleri	40	0.1
Pentalepis trichodesmoides	100	0.1
Solanum phlomoides	50	0.1
Stylobasium spathulatum	130	0.1
Themeda triandra	30	0.1
Triodia wiseana	15	15

Species (Phase 2)	Height (cm)	Cover (%)
Acacia arida	50	3
Acacia bivenosa	50	0.1
Acacia inaequilatera	150	0.1
Aristida holathera var. *holathera*	60	0.1
Bonamia sp. Dampier (A.A. Mitchell PRP 217)	5	0.1
Cassia glutinosa	40	0.1
Cassia helmsii	5	0.1
Cassia luerssenii	150	0.1
Cassia notabilis	2	0.1
Cenchrus ciliaris	30	0.1
Cleome viscosa	80	0.1
Corchorus lasiocarpus subsp. *lasiocarpus*	70	2
Corymbia hamersleyana	150	1
Duperreya commixta	50	0.1
Dysphania rhadinostachya subsp. *rhadinostachya*	30	0.1
Enneapogon caerulescens	40	0.1
Enneapogon lindleyanus	30	0.1
Enneapogon polyphyllus	20	0.1
Eriachne aristidea	30	0.1
Eriachne mucronata	30	0.1
Eucalyptus leucophloia subsp. *leucophloia*	400	1
Euphorbia careyi	5	0.1
Gomphrena canescens subsp. *canescens*	20	0.1
Gomphrena cunninghamii	25	0.1
Grevillea wickhamii subsp. *hispidula*	70	0.1
Notoleptopus decaisnei	20	0.1
Oldenlandia crouchiana	15	0.1
Pentalepis trichodesmoides	100	0.1
Portulaca oleracea	5	0.1
Ptilotus auriculifolius	40	2
Ptilotus exaltatus var. *exaltatus*	25	0.1
Ptilotus obovatus var. *obovatus*	30	0.1
Solanum phlomoides	50	0.1
Stylobasium spathulatum	100	0.1
Trianthema pilosa	15	0.1
Tribulus hirsutus	10	0.1
Tribulus platypterus	60	0.1
Trichodesma zeylanicum var. *zeylanicum*	25	0.1
Triodia sp.	40	0.1
Triodia wiseana	40	5
Triumfetta maconochieana	60	0.1

Koodaideri Site KOD50
Described (Phase 1) JCFPA **Date (Phase 1)** 11/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) PAMyM **Date (Phase 2)** 15/03/2011
MGA 50 711976 **mE** 7504318 **mN**
Habitat Upper hill slope and crest
Soil Skeletal red brown clay loam
Rock Type Continuous ironstone gravel pebbles and stones
Vegetation (Phase 1) *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Hakea chordophylla* open shrubland over *Acacia bivenosa, Gompholobium* sp. Pilbara (N.F. Norris 908) PN low open shrubland over *Dampiera candicans* scattered herbs over *Triodia* sp. Shovelanna Hill open hummock grassland
Vegetation (Phase 1) *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Hakea chordophylla* scattered tall shrubs over *Grevillea wickhamii* subsp. *hispidula* scattered shrubs over *Acacia bivenosa* scattered low shrubs over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) open hummock grassland and *Fimbristylis simulans* scattered sedges
Veg Condition Excellent
Fire Age Burnt 1-2 years ago

Species (Phase 1)	Height (cm)	Cover (%)
Acacia bivenosa	60	1
Acacia inaequilatera	30	0.1
Acacia spondylophylla	30	0.1
Aristida burbidgeae	30	0.1
Cassia glutinosa	100	0.1
Cassia sp.	180	0.1
Corchorus lasiocarpus	40	0.1
Dampiera candicans	40	1
Dodonaea coriacea	30	0.1
Eriachne mucronata	30	0.1
Eucalyptus leucophloia subsp. *leucophloia*	500	1
Gompholobium sp. Pilbara (N.F. Norris 908) PN	25	1
Goodenia stobbsiana	15	0.1
Grevillea wickhamii subsp. *hispidula*	100	0.1
Hakea chordophylla	150	2
Mirbelia viminalis	30	0.1
Ptilotus calostachyus	60	0.1
Sida sp. Articulation below (A.A. Mitchell PRP 1605)	50	0.1
Solanum phlomoides	30	0.1
Themeda sp. Mt Barricade (M.E. Trudgen 2471)	40	0.1
Triodia sp. *(epactia/pungens)*	20	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	15	12

Species (Phase 2)	Height (cm)	Cover (%)
Acacia arida	40	0.1
Acacia bivenosa	60	1
Acacia spondylophylla	40	0.1
Amphipogon sericeus	30	0.1
Bonamia sp. Dampier (A.A. Mitchell PRP 217)	5	0.1
Cassia glutinosa	100	0.1
Cassia glutinosa x luerssenii	100	0.1
Cassia oligophylla	200	0.1
Cassia pruinosa	80	0.1
Corchorus lasiocarpus (subsp. not determined)	50	0.1
Dampiera candicans	60	0.1
Dodonaea coriacea	80	0.1
Eriachne lanata	40	0.1
Eucalyptus leucophloia subsp. *leucophloia*	600	1
Fimbristylis simulans	15	1
Gompholobium sp. Pilbara (N.F. Norris 908) PN	80	0.1
Gomphrena cunninghamii	5	0.1
Goodenia stobbsiana	20	0.1
Goodenia triodiophila	30	0.1
Grevillea wickhamii subsp. *hispidula*	150	1
Hakea chordophylla	400	1
Mirbelia viminalis	50	0.1
Ptilotus calostachyus	50	0.1
Sida sp. Articulation below (A.A. Mitchell PRP 1605)	70	0.1
Sida sp. Barlee Range (S. van Leeuwen 1642)	30	0.1
Tephrosia arenicola	25	0.1
Tephrosia sp. Cathedral Gorge (F.H. Mollemans 2420) PN	10	0.1
Triodia sp. *(epactia/pungens)*	30	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	20	11

Koodaideri Site KOD51
Described (Phase 1) JCFPA **Date (Phase 1)** 11/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) MM **Date (Phase 2)** 11/05/2011
MGA 50 711118 **mE** 7506686 **mN**
Habitat Hill crest
Soil Skeletal red-brown
Rock Type Continuous ironstone, pebbles and stones
Vegetation (Phase 1) *Eucalyptus leucophloia* subsp. *leucophloia, Hakea chordophylla* low woodland over *Grevillea wickhamii* tall open shrubland over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), (*Triodia epactia*) very open hummock grassland
Vegetation (Phase 2) *Eucalyptus leucophloia* subsp. *leucophloia, Hakea chordophylla* low woodland over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) hummock grassland
Veg Condition Excellent
Fire Age No sign of recent fire

Species (Phase 1)	Height (cm)	Cover (%)
Acacia arida	110	0.1
Acacia bivenosa	110	0.1
Acacia pruinocarpa	300	0.1
Calytrix carinata	20	0.1
Cassia pruinosa	140	0.1
Corchorus lasiocarpus subsp. *parvus*	120	0.1
Corymbia ferriticola	170	0.1
Dampiera candicans	40	0.1
Eriachne mucronata	30	0.1
Eucalyptus leucophloia subsp. *leucophloia*	600	10
Gompholobium sp. Pilbara (N.F. Norris 908) PN	170	0.1
Goodenia stobbsiana	20	0.1
Grevillea wickhamii subsp. *hispidula*	350	4
Hakea chordophylla	500	5
Jasminum didymum subsp. *lineare*	210	0.1
Lepidium pedicellosum	70	0.1
Ptilotus calostachyus	90	0.1
Scaevola browniana subsp. *browniana*	40	0.1
Solanum phlomoides	110	0.1
Triodia pungens	40	1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	35	4

Species (Phase 2)	Height (cm)	Cover (%)
Acacia arida	120	0.1
Acacia bivenosa	80	0.1
Acacia pruinocarpa	300	0.1
Bonamia sp. Dampier (A.A. Mitchell PRP 217)	10	0.1
Bulbostylis barbata	3	0.1
Calytrix carinata	30	0.1
Cassia glutinosa	45	0.1
Cassia pruinosa	130	0.1
Corchorus lasiocarpus subsp. *lasiocarpus*	80	0.1
Corymbia hamersleyana	50	0.1
Dampiera candicans	55	0.1
Eriachne mucronata	30	0.1
Eucalyptus leucophloia subsp. *leucophloia*	600	9
Goodenia stobbsiana	30	0.1
Goodenia triodiophila	50	0.1
Grevillea wickhamii subsp. *hispidula*	320	0.1
Hakea chordophylla	380	2
Jasminum didymum subsp. *lineare*	210	0.1
Ptilotus astrolasius	40	0.1
Ptilotus calostachyus	40	0.1
Ptilotus obovatus var. *obovatus*	50	0.1
Scaevola browniana subsp. *browniana*	50	0.1
Solanum phlomoides	100	0.1
Tephrosia arenicola	140	0.1
Triodia pungens	40	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	40	40

Koodaideri Site KOD52
Described (Phase 1) JCFPA **Date (Phase 1)** 12/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) MM **Date (Phase 2)** 10/05/2011
MGA 50 708420 **mE** 7505797 **mN**
Habitat Gentle north-facing upper hillslope (573 m elevation)
Soil Red-brown clay loam
Rock Type Continuous surface layer of ironstone pebbles and gravel
Vegetation (Phase 1) *Eucalyptus leucophloia* subsp. *leucophloia*, (*Corymbia hamersleyana*) low open woodland over *Grevillea wickhamii* subsp. *hispidula* scattered tall shrubs over *Acacia arida* open shrubland over *Acacia spondylophylla* low open shrubland over *Triodia* sp. Shovelanna Hill, *Triodia wiseana* open hummock grassland
Vegetation (Phase 2) *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Grevillea wickhamii* subsp. *hispidula* scattered tall shrubs over *Acacia arida* scattered shrubs over *Acacia spondylophylla* low open shrubland over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia wiseana* very open hummock grassland
Veg Condition Excellent
Fire Age Burnt 3-5 years ago

Species (Phase 1)	Height (cm)	Cover (%)
Acacia arida	160	6
Acacia spondylophylla	50	4
Corchorus lasiocarpus subsp. *parvus*	110	0.1
Corymbia hamersleyana	300	0.1
Eucalyptus leucophloia subsp. *leucophloia*	300	2
Gompholobium sp. Pilbara (N.F. Norris 908) PN	45	0.1
Goodenia stobbsiana	20	0.1
Grevillea wickhamii subsp. *hispidula*	250	1
Mollugo molluginea	20	0.1
Ptilotus calostachyus	60	0.1
Scaevola browniana subsp. *browniana*	20	0.1
Solanum phlomoides	100	0.1
Tephrosia arenicola	150	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	20	10
Triodia wiseana	50	5

Species (Phase 2)	Height (cm)	Cover (%)
Acacia arida	140	2
Acacia spondylophylla	60	4
Bonamia sp. Dampier (A.A. Mitchell PRP 217)	5	0.1
Bulbostylis barbata	4	0.1
Corchorus lasiocarpus subsp. *parvus*	50	0.1
Corymbia hamersleyana	340	0.1
Eriachne pulchella	6	0.1
Eucalyptus leucophloia subsp. *leucophloia*	250	2
Gompholobium sp. Pilbara (N.F. Norris 908) PN	45	0.1
Goodenia stobbsiana	6	0.1
Goodenia triodiophila	30	0.1
Grevillea wickhamii subsp. *hispidula*	240	1
Mollugo molluginea	20	0.1
Ptilotus calostachyus	60	0.1
Scaevola browniana subsp. *browniana*	40	0.1
Solanum phlomoides	45	0.1
Tephrosia arenicola	130	0.1
Tephrosia sp. Cathedral Gorge (F.H. Mollemans 2420) PN	15	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	30	6
Triodia wiseana	40	1

Koodaideri Site KOD53
Described (Phase 1) JCFPA **Date (Phase 1)** 12/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) MM **Date (Phase 2)** 10/05/2011
MGA 50 710703 **mE** 7504574 **mN**
Habitat North-facing slope (elevation 593 m)
Soil Skeletal red-brown clay loam
Rock Type Continuous Ironstone pebbles. Some outcropping ironstone.
Vegetation (Phase 1) *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Grevillea wickhamii* subsp. *hispidula, Acacia pruinocarpa* open shrubland over *Acacia arida* open heath over *Triodia wiseana* open hummock grassland
Vegetation (Phase 1) *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Acacia arida, Acacia pruinocarpa, Grevillea wickhamii* subsp. *hispidula* tall open scrub over *Triodia wiseana* open hummock grassland
Veg Condition Excellent
Fire Age Very long unburnt

Species (Phase 1)	Height (cm)	Cover (%)
Acacia arida	180	40
Acacia pruinocarpa	250	2
Acacia spondylophylla	80	0.1
Corchorus lasiocarpus subsp. *parvus*	50	0.1
Eremophila jucunda subsp. *pulcherrima*	20-40	0.1
Eucalyptus leucophloia subsp. *leucophloia*	800	1
Grevillea wickhamii subsp. *hispidula*	300	2
Ptilotus calostachyus	100	0.1
Solanum phlomoides	60	0.1
Tephrosia arenicola	150	0.1
Triodia wiseana	70	29

Species (Phase 2)	Height (cm)	Cover (%)
Acacia arida	120	35
Acacia pruinocarpa	240	1
Acacia spondylophylla	70	0.1
Amphipogon sp.	25	0.1
Aristida holathera var. *holathera*	30	0.1
Bulbostylis barbata	6	0.1
Cassia pruinosa	65	0.1
Clerodendrum floribundum var. *angustifolium*	100	0.1
Corchorus lasiocarpus subsp. *parvus*	40	0.1
Diplatia grandibractea	40	0.1
Eremophila jucunda subsp. *pulcherrima*	55	0.1
Eriachne pulchella subsp. *dominii*	10	0.1
Eucalyptus leucophloia subsp. *leucophloia*	700	1
Grevillea wickhamii subsp. *hispidula*	240	1
Solanum phlomoides	40	0.1
Tephrosia arenicola	80	0.1
Triodia wiseana	50	20

Koodaideri Site KOD54
Described (Phase 1) JCFPA **Date (Phase 1)** 12/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) MM **Date (Phase 2)** 10/05/2011
MGA 50 710507 **mE** 7504408 **mN**
Habitat West-facing very steep slope down to creekline (590 m elevation)
Soil Skeletal red-brown clay loam
Rock Type Continuous ironstone outcropping and cliffs
Vegetation (Phase 1) *Corymbia ferriticola, Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Grevillea wickhamii* subsp. *hispidula, Petalostylis labicheoides*, *Acacia arida* open shrubland over *Acacia spondylophylla, (Corchorus lasiocarpus*) low open shrubland over *Triodia wiseana* open hummock grassland
Vegetation (Phase 2) *Eucalyptus leucophloia* subsp. *leucophloia, Corymbia ferriticola* low open woodland over *Grevillea wickhamii* subsp. *hispidula* scattered tall shrubs over *Petalostylis labicheoides* scattered shrubs over *Acacia spondylophylla, Acacia arida, Corchorus lasiocarpus* subsp. *lasiocarpus* low shrubland over *Triodia wiseana, Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) open hummock grassland
Veg Condition Excellent
Fire Age Half of quadrat has been burnt 2-3 years ago, reminder shows no sign of recent fire

Species (Phase 1)	Height (cm)	Cover (%)
Acacia arida	130	1
Acacia dictyophleba	100	0.1
Acacia maitlandii	60	0.1
Acacia pruinocarpa	100	0.1
Acacia spondylophylla	30	8
Aristida sp.	30	0.1
Cassia sp.	120	0.1
Cassia venusta	180	0.1
Cheilanthes sieberi subsp. *sieberi*	20	0.1
Clerodendrum floribundum var. *angustifolium*	120	0.1
Corchorus lasiocarpus	70	3
Corymbia ferriticola	300	1
Corymbia hamersleyana	150	0.1
Cymbopogon ambiguus	70	0.1
Dampiera candicans	15	0.1
Eriachne mucronata	30	0.1
Eucalyptus leucophloia subsp. *leucophloia*	500	1
Euphorbia wheeleri	15	0.1
Ficus brachypoda	40	0.1
Gompholobium sp. Pilbara (N.F. Norris 908) PN	40	0
Goodenia stobbsiana	10	0.1
Gossypium robinsonii	100	0.1
Grevillea wickhamii subsp. *hispidula*	350	1
Jasminum didymum subsp. *lineare*	50	0.1
Mirbelia viminalis	20	0.1
Paraneurachne muelleri	30	0.1
Petalostylis labicheoides	200	1
Ptilotus calostachyus	60	0.1
Santalum lanceolatum	200	0.1
Sida sp. Articulation below (A.A. Mitchell PRP 1605)	200	0.1
Solanum phlomoides	20	0.1
Triodia wiseana	60	25
Triumfetta leptacantha	30	0.1

Species (Phase 2)	Height (cm)	Cover (%)
Acacia adoxa var. *adoxa*	30	0.1
Acacia arida	50	1
Acacia dictyophleba	80	0.1
Acacia maitlandii	100	0.1
Acacia pruinocarpa	40	0.1
Acacia spondylophylla	60	8
Aristida holathera var. *holathera*	45	0.1
Bonamia sp. Dampier (A.A. Mitchell PRP 217)	2	0.1
Bulbostylis barbata	20	0.1
Cassia glutinosa	100	0.1
Cassia luerssenii	70	0.1
Cassia pruinosa	110	0.1
Cassia venusta	20	0.1
Clerodendrum floribundum var. *angustifolium*	100	0.1
Corchorus lasiocarpus subsp. *lasiocarpus*	50	2
Corymbia ferriticola	350	1
Corymbia hamersleyana	800	0.1
Cymbopogon ambiguus	50	0.1
Dampiera candicans	50	0.1
Dysphania rhadinostachya (subsp. not determined)	15	0.1
Enneapogon polyphyllus	45	0.1
Eriachne mucronata	50	0.1
Eriachne pulchella	10	0.1
Eucalyptus leucophloia subsp. *leucophloia*	790	2
Ficus brachypoda	50	0.1
Gompholobium sp. Pilbara (N.F. Norris 908) PN	60	0.1
Goodenia stobbsiana	20	0.1
Gossypium robinsonii	120	0.1
Grevillea wickhamii subsp. *hispidula*	320	1
Hibiscus sturtii var. *campylochlamys*	30	0.1
Indigofera monophylla (brown calyx form)	30	0.1
Jasminum didymum subsp. *lineare*	40	0.1
Oldenlandia crouchiana	2	0.1
Paraneurachne muelleri	40	0.1
Paspalidium clementii	20	0.1
Petalostylis labicheoides	200	1
Polycarpaea longiflora	30	0.1
Ptilotus calostachyus	40	0.1
Ptilotus fusiformis	50	0.1
Santalum lanceolatum	180	0.1
Schizachyrium fragile	50	0.1

Species (Phase 1)	Height (cm)	Cover (%)

Species (Phase 2)	Height (cm)	Cover (%)
Cassia ferraria	150	0.1
Sida sp. Articulation below (A.A. Mitchell PRP 1605)	150	0.1
Solanum phlomoides		
Tephrosia uniovulata	80	0.1
Trichodesma zeylanicum var. *zeylanicum*	40	0.1
Triodia epactia	35	1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	30	1
Triodia wiseana	40	23
Triumfetta leptacantha	40	0.1

Koodaideri Site KOD55
Described (Phase 1) JCFPA **Date (Phase 1)** 12/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) CFMyM **Date (Phase 2)** 12/03/2011
MGA 50 709121 **mE** 7507322 **mN**
Habitat Flat hilltop
Soil Skeletal red-brown clay loam
Rock Type Some outcropping ironstone, continuous surface layer of ironstone pebbles, gravel, cobbles and boulders
Vegetation (Phase 1) *Eucalyptus leucophloia* subsp. *leucophloia, Eucalyptus gamophylla, Hakea chordophylla* scattered low trees over *Grevillea wickhamii* subsp. *hispidula* tall open shrubland over *Acacia spondylophylla, Acacia arida, Tephrosia arenicola* shrubland over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), (*Triodia wiseana*) open hummock grassland
Vegetation (Phase 2) *Eucalyptus gamophylla* low open woodland over *Grevillea wickhamii* subsp. *hispidula* scattered tall shrubs over *Acacia arida, Acacia spondylophylla* open heath over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) hummock grassland
Veg Condition Excellent
Fire Age No sign of recent fire

Species (Phase 1)	Height (cm)	Cover (%)
Acacia arida	150	10
Acacia pruinocarpa	100	0.1
Acacia spondylophylla	100	19
Acacia tenuissima	0.1	0.1
Cassia pruinosa	150	0.1
Corymbia hamersleyana	450	0.1
Eriachne lanata		0.1
Eucalyptus gamophylla	400	1
Eucalyptus leucophloia subsp. *leucophloia*	500	1
Gompholobium sp. Pilbara (N.F. Norris 908) PN	60	0.1
Grevillea wickhamii subsp. *hispidula*	300	4
Hakea chordophylla	400	1
Keraudrenia velutina subsp. *elliptica*	40	0.1
Scaevola browniana subsp. *browniana*	40	0.1
Tephrosia arenicola	120	1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	15	15
Triodia wiseana	25	10

Species (Phase 2)	Height (cm)	Cover (%)
Acacia arida	40	25
Acacia pruinocarpa	120	0.1
Acacia spondylophylla	40	7
Bonamia sp. Dampier (A.A. Mitchell PRP 217)	20	0.1
Cassia pruinosa	150	0.1
Clerodendrum floribundum var. *angustifolium*	5	0.1
Corymbia hamersleyana	450	0.1
Duperreya commixta	100	0.1
Eriachne pulchella subsp. *dominii*	30	0.1
Eucalyptus gamophylla	600	2
Eucalyptus leucophloia subsp. *leucophloia*	600	0.1
Gompholobium sp. Pilbara (N.F. Norris 908) PN	80	0.1
Goodenia triodiophila	60	0.1
Grevillea wickhamii subsp. *hispidula*	250	1
Hakea chordophylla	450	0.1
Keraudrenia velutina subsp. *elliptica*	50	0.1
Ptilotus calostachyus	10	0.1
Scaevola browniana subsp. *browniana*	30	0.1
Tephrosia arenicola	180	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	25	35
Triodia wiseana	40	0.1

Koodaideri Site KOD56
Described (Phase 1) PA/ER **Date (Phase 1)** 13/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) PAMyM **Date (Phase 2)** 13/03/2011
MGA 50 706529 **mE** 7509948 **mN**
Habitat West-facing steep hillslope
Soil Skeletal red-brown
Rock Type Ironstone
Vegetation (Phase 1) *Eucalyptus leucophloia* scattered low trees over *Acacia bivenosa* shrubland over *Triodia wiseana* open hummock grassland
Vegetation (Phase 2) *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Acacia bivenosa* open shrubland over *Triodia wiseana* open hummock grassland
Veg Condition Excellent
Fire Age No sign of recent fire and burnt 1-2 years ago
Notes 50% of quadrat was burnt 1-2 years ago; remainder has no sign of recent fire

Species (Phase 1)	Height (cm)	Cover (%)
Acacia bivenosa	160	25
Acacia pyrifolia	40	0.1
Aristida latifolia	15	0.1
Bonamia sp. Dampier (A.A. Mitchell PRP 217)	2	0.1
Cassia glutinosa	30	0.1
Cassia oligophylla x helmsii	20	0.1
Cassia pruinosa	60	0.1
Corchorus lasiocarpus subsp. *parvus*	10	0.1
Eucalyptus leucophloia subsp. *leucophloia*	400	1
Goodenia stobbsiana	20	0.1
Grevillea wickhamii subsp. *hispidula*	170	0.1
Heliotropium ovalifolium	20	0.1
Hibiscus aff. *coatesii* (site 733)	50	0.1
Lepidium catapycnon	40	0.1
Mollugo molluginea	10	0.1
Paraneurachne muelleri	40	0.1
Pluchea dunlopii	130	0.1
Ptilotus astrolasius	60	0.1
Ptilotus calostachyus	70	0.1
Ptilotus obovatus var. *obovatus*	60	0.1
Ptilotus rotundifolius	130	0.1
Sida sp.		0.1
Sida pilbarensis (ferruginous form)	50	0.1
Solanum phlomoides	40	0.1
Tribulus suberosus	120	0.1
Triodia wiseana	50	25

Species (Phase 2)	Height (cm)	Cover (%)
Acacia bivenosa	150	5
Acacia pyrifolia	40	0.1
Bulbostylis barbata	10	0.1
Cassia glutinosa	50	0.1
Cassia oligophylla x helmsii	50	0.1
Cassia pruinosa	100	0.1
Corchorus lasiocarpus subsp. *lasiocarpus*	30	0.1
Eriachne aristidea	10	0.1
Eriachne pulchella	20	0.1
Eucalyptus leucophloia subsp. *leucophloia*	400	1
Gomphrena cunninghamii	10	0.1
Goodenia muelleriana	25	0.1
Goodenia stobbsiana	15	0.1
Gossypium australe	40	0.1
Grevillea wickhamii subsp. *hispidula*	150	0.1
Heliotropium pachyphyllum	20	0.1
Heliotropium tenuifolium	50	0.1
Hibiscus coatesii	25	0.1
Lepidium catapycnon	30	0.1
Mollugo molluginea	20	0.1
Paraneurachne muelleri	40	0.1
Pluchea dunlopii	60	0.1
Polycarpaea holtzei	5	0.1
Polygala sp. Prostrate (P.K. Latz 4900)	5	0.1
Ptilotus astrolasius	40	0.1
Ptilotus calostachyus	50	0.1
Ptilotus clementii	30	0.1
Ptilotus exaltatus var. *exaltatus*	30	0.1
Ptilotus obovatus var. *obovatus*	25	0.1
Ptilotus rotundifolius	60	0.1
Sida sp. Hamersley Range (K. Newbey 10692) PN	30	0.1
Solanum phlomoides	50	0.1
Tephrosia aff. *supina*	15	0.1
Tribulus hirsutus	5	0.1
Tribulus suberosus	120	0.1
Triodia wiseana	60	15

Koodaideri Site KOD57
Described (Phase 1) PA/ER **Date (Phase 1)** 13/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) PACEF **Date (Phase 2)** 16/03/2011
MGA 50 709891 **mE** 7507456 **mN**
Habitat Gentle southeast sloping broad drainage area that begins from the plain on the hilltop and heads towards the lower hillslopes
Soil Red-brown clay loam with continuous surface layer of ironstone pebbles
Rock Type Continuous ironstone stones and pebbles
Vegetation (Phase 1) *Corymbia hamersleyana*, (*Eucalyptus leucophloia* subsp. *leucophloia*) low open woodland over *Acacia arida, (Acacia pruinocarpa*) tall open shrubland over *Triodia wiseana, Triodia* sp. Shovelanna Hill open hummock grassland
Vegetation (Phase 2) *Corymbia hamersleyana, Eucalyptus leucophloia* subsp. *leucophloia* low open woodland over *Acacia arida, Acacia pruinocarpa* tall open shrubland over *Triodia wiseana, Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) very open hummock grassland
Veg Condition Excellent
Fire Age Very long unburnt
Notes *Eucalyptus gamophylla* also in the area

Species (Phase 1)	Height (cm)	Cover (%)
Acacia arida	230	5
Acacia pruinocarpa	450	2
Acacia spondylophylla	80	0.1
Cassia glutinosa	50	0.1
Corchorus lasiocarpus subsp. *parvus*	50	0.1
Corymbia hamersleyana	450	2
Eremophila latrobei subsp. *filiformis*	200	0.1
Eucalyptus leucophloia subsp. *leucophloia*	550	1
Goodenia stobbsiana	10	0.1
Grevillea wickhamii subsp. *hispidula*	230	0.1
Hybanthus aurantiacus	20	0.1
Mirbelia viminalis	110	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	30	10
Triodia wiseana	60	15

Species (Phase 2)	Height (cm)	Cover (%)
Acacia arida	260	5
Acacia pruinocarpa	450	2
Acacia spondylophylla	90	0.1
Aristida holathera var. *holathera*	50	0.1
Bulbostylis barbata	5	0.1
Cassia glutinosa x *luerssenii*	180	0.1
Cassia notabilis	5	0.1
Cheilanthes sieberi subsp. *sieberi*	25	0.1
Corchorus lasiocarpus subsp. *parvus*	15	0.1
Corymbia hamersleyana	500	3
Cucumis maderaspatanus	20	0.1
Dodonaea petiolaris	180	0.1
Duperreya commixta	40	0.1
Eremophila latrobei subsp. *filiformis*	200	0.1
Eriachne aristidea	20	0.1
Eriachne pulchella subsp. *dominii*	25	0.1
Eucalyptus leucophloia subsp. *leucophloia*	500	1
Euphorbia aff. *australis*	25	0.1
Fimbristylis dichotoma	30	0.1
Goodenia stobbsiana	30	0.1
Goodenia triodiophila	60	0.1
Gossypium robinsonii	60	0.1
Grevillea wickhamii subsp. *hispidula*	250	0.1
Hybanthus aurantiacus	30	0.1
Mirbelia viminalis	80	0.1
Mollugo molluginea	15	0.1
Panicum effusum	15	0.1
Perennipora ochroleuca	15	0.1
Polycarpaea holtzei	5	0.1
Portulaca oleracea	3	0.1
Psydrax latifolia	60	0.1
Ptilotus calostachyus	15	0.1
Ptilotus polystachyus	15	0.1
Solanum aff. *lucani*	8-15	0.1
Trachymene oleracea subsp. *oleracea*	10	0.1
Trichodesma zeylanicum var. *zeylanicum*	20	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	35	2
Triodia wiseana	60	7

Koodaideri Site KOD58
Described (Phase 1) PA/ER **Date (Phase 1)** 13/07/2010 **Type** Quadrat 65 m x 40
Described (Phase 2) MM **Date (Phase 2)** 08/05/2011
MGA 50 704193 **mE** 7505940 **mN**
Habitat Calcrete spur of low hills
Soil Red-brown clay loam
Rock Type Scattered ironstone and calcrete stone gravel; some calcrete outcropping.
Vegetation (Phase 1) *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Hakea chordophylla, Acacia inaequilatera* tall open shrubland over *Triodia wiseana* hummock grassland
Vegetation (Phase 2) *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Hakea chordophylla* scattered tall shrubs over *Triodia wiseana* open hummock grassland
Veg Condition Very good
Fire Age No sign of recent fire
Notes Old track nearby. Quadrat in isolated calcrete area; quite different to surrounding vegetation. Approximately 32 sqm cleared in northwest corner

Species (Phase 1)	Height (cm)	Cover (%)
Acacia inaequilatera	400	2
Acacia sericophylla	120	0.1
Acacia spondylophylla	140	0.1
Acacia tenuissima	10	0.1
Capparis spinosa var. *nummularia*	60	0.1
Cassia oligophylla x helmsii	100	0.1
Corchorus lasiocarpus subsp. *parvus*	10	0.1
Corymbia hamersleyana	50	0.1
Eragrostis setifolia	20	0.1
Eucalyptus leucophloia subsp. *leucophloia*	350	1
Goodenia stobbsiana	10	0.1
Grevillea wickhamii subsp. *hispidula*	200	0.1
Hakea chordophylla	600	3
Ptilotus calostachyus	70	0.1
Tephrosia arenicola	130	0.1
Triodia wiseana	100	35

Species (Phase 2)	Height (cm)	Cover (%)
Acacia inaequilatera	220	0.1
Acacia spondylophylla	130	0.1
Cassia ferraria	35	0.1
Cassia oligophylla x helmsii	40	0.1
Corchorus lasiocarpus subsp. *lasiocarpus*	70	0.1
Corymbia hamersleyana	70	0.1
Dysphania kalpari	6	0.1
Eucalyptus leucophloia subsp. *leucophloia*	300	1
Goodenia stobbsiana	30	0.1
Goodenia triodiophila	40	0.1
Grevillea wickhamii subsp. *hispidula*	230	0.1
Hakea chordophylla	350	1
Mollugo molluginea	20	0.1
Ptilotus astrolasius	50	0.1
Ptilotus calostachyus	15	0.1
Ptilotus clementii	50	0.1
Solanum phlomoides	60	0.1
Tephrosia arenicola	130	0.1
Tribulus hirsutus	0.1	
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	20	0.1
Triodia wiseana	70	25

Koodaideri Site KOD59
Described (Phase 1) PA/ER **Date (Phase 1)** 14/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) PA/RH **Date (Phase 2)** 13/03/2011
MGA 50 706604 **mE** 7506212 **mN**
Habitat Broad depression
Soil Very dark reddish brown (10R 2/3) silty loam with rock fragments 40-50mm at 30%
Rock Type Ironstone
Vegetation (Phase 1) *Acacia pyrifolia, Grevillea wickhamii* subsp. *hispidula, (Acacia pruinocarpa*) tall open shrubland over *Ptilotus obovatus, Atalaya hemiglauca, Eremophila longifolia* open shrubland over **Cenchrus ciliaris* open tussock grassland and *Triodia pungens* open hummock grassland
Vegetation (Phase 2) *Grevillea wickhamii* subsp. *hispidula, Acacia pyrifolia, Acacia pruinocarpa* tall shrubland over *Indigofera monophylla, Ptilotus obovatus, Cassia oligophylla x helmsii* open shrubland over *Triodia pungens* open hummock grassland and *Cenchrus ciliaris* open tussock grassland
Veg Condition Good-Very Good: **Cenchrus ciliaris* present (25% Phase 1 and 10% Phase 2); *Malvastrum americanum* present (0.1% in both phases).
Fire Age No sign of recent fire

Species (Phase 1)	Height (cm)	Cover (%)
Acacia arida	30	0.1
Acacia pruinocarpa	400	1
Acacia pyrifolia	650	35
Acacia tenuissima	220	0.1
Atalaya hemiglauca	200	1
Cassia helmsii	100	0.1
Cassia oligophylla	120	0.1
Cenchrus ciliaris	50	25
Corchorus crozophorifolius	120	0.1
Corchorus lasiocarpus subsp. *parvus*	120	0.1
Cucumis maderaspatanus	100	0.1
Cymbopogon ambiguus	150	2
Duperreya commixta	140	0.1
Enchylaena tomentosa var. *tomentosa*	130	0.1
Enneapogon lindleyanus	30	0.1
Eremophila longifolia	200	1
Gossypium australe (Burrup Peninsula form)	160	0.1
Gossypium robinsonii	200	0.1
Grevillea wickhamii subsp. *hispidula*	600	15
Hakea lorea subsp. *lorea*	200	0.1
Indigofera monophylla (long, sparse hairs form)	60	0.1
Malvastrum americanum	50	0.1
Mollugo molluginea	15	0.1
Polycarpaea longiflora	50	0.1
Pterocaulon serrulatum	40	0.1
Pterocaulon sphacelatum	50	0.1
Ptilotus obovatus var. *obovatus*	120	1
Rhagodia eremaea	150	0.1
Solanum horridum	20	0.1
Tephrosia aff. *densa* (P8T-018)	100	0.1
Trichodesma zeylanicum var. *zeylanicum*	150	0.1
Triodia pungens	60	20

Species (Phase 2)	Height (cm)	Cover (%)
Acacia pruinocarpa	400	1
Acacia pyrifolia	500	1
Acacia tenuissima	220	0.1
Amaranthus cuspidifolius	30	0.1
Aristida contorta	30	0.1
Aristida inaequiglumis	1.2	0.1
Atalaya hemiglauca	220	1
Bidens bipinnata	100	0.1
Boerhavia coccinea	15	0.1
Bulbostylis barbata	10	0.1
Cassia helmsii	100	0.1
Cassia oligophylla	200	0.1
Cassia oligophylla x helmsii	120	1
Cenchrus ciliaris	100	12
Cheilanthes sieberi subsp. *sieberi*	20	0.1
Cleome viscosa	35	0.1
Corchorus crozophorifolius	120	0.1
Corchorus lasiocarpus subsp. *lasiocarpus*	50-60	0.1
Corchorus tridens	30	0.1
Crotalaria medicaginea var. *neglecta*	25	0.1
Cucumis maderaspatanus	80	0.1
Cymbopogon ambiguus	150	0.1
Enneapogon lindleyanus	60	0.1
Enneapogon polyphyllus	35	0.1
Eremophila longifolia	250	0.1
Eriachne mucronata	45	0.1
Eulalia aurea	70	0.1
Euphorbia aff. *australis*	10	0.1
Euphorbia tannensis subsp. *eremophila*	100	0.1
Evolvulus alsinoides var. *villosicalyx*	20	0.1
Gossypium australe	200	0.1
Gossypium robinsonii	180	0.1
Grevillea wickhamii subsp. *hispidula*	450	8
Hakea lorea subsp. *lorea*	250	0.1
Hybanthus aurantiacus	60	0.1
Indigofera monophylla	100-120	2
Malvastrum americanum	30	0.1
Mollugo molluginea	15	0.1
Notoleptopus decaisnei	30	0.1
Perotis rara	20	0.1
Polycarpaea corymbosa var. *corymbosa*	15	0.1
Polycarpaea longiflora	30	0.1
Polymeria ambigua	15	0.1

Species (Phase 1)	Height (cm)	Cover (%)

Species (Phase 2)	Height (cm)	Cover (%)
Ptilotus astrolasius	40	0.1
Ptilotus obovatus var. *obovatus*	110-150	2
Ptilotus polystachyus	80	0.1
Rhagodia eremaea	1.6	0.1
Sida aff. *fibulifera*	20	0.1
Sida echinocarpa	80	0.1
Sida sp. spiciform panicles (E. Leyland s.n. 14/8/90)	200	0.1
Solanum horridum	30	0.1
Tephrosia densa	110	0.1
Trachymene oleracea subsp. *oleracea*	10	0.1
Tribulus suberosus	80	0.1
Trichodesma zeylanicum var. *zeylanicum*	50	0.1
Triodia pungens	60	25

Koodaideri Site KOD60
Described (Phase 1) PA/ER **Date (Phase 1)** 14/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) MM **Date (Phase 2)** 09/05/2011
MGA 50 720168 **mE** 7501320 **mN**
Habitat Northeast-facing upper hillslope
Soil Skeletal red-brown clay loam
Rock Type Continuous outcropping ironstone
Vegetation (Phase 1) *Eucalyptus leucophloia* subsp. *leucophloia* low open woodland over *Grevillea wickhamii* subsp. *hispidula* tall open shrubland over *Acacia spondylophylla, (Mirbelia viminalis*) open shrubland over *Eriachne lanata* open tussock grassland over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), (*Triodia* sp. (*epactia/pungens*)) open hummock grassland
Vegetation (Phase 2) *Eucalyptus leucophloia* subsp. *leucophloia* low open woodland over *Grevillea wickhamii* subsp. *hispidula* scattered tall shrubs over *Acacia spondylophylla* low open shrubland over *Eriachne lanata* very open tussock grassland and *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia* sp. (*epactia/pungens*) open hummock grassland
Veg Condition Excellent
Fire Age No sign of recent fire
Notes *Triodia* sp. (*epactia/pungens*) material was insufficient to identify further (M.E. Trudgen)

Species (Phase 1)	Height (cm)	Cover (%)
Acacia hilliana	45	0.1
Acacia pruinocarpa	200	0.1
Acacia spondylophylla	100	5
Acacia tumida var. *pilbarensis*	120	0.1
Bonamia sp. Dampier (A.A. Mitchell PRP 217)	6	0.1
Calytrix carinata	40	0.1
Cassia glaucifolia	200	0.1
Cassia glutinosa	70	0.1
Corchorus lasiocarpus subsp. *parvus*	40	0.1
Eremophila jucunda subsp. *pulcherrima*	80-100	0.1
Eriachne lanata	40	7
Eucalyptus leucophloia subsp. *leucophloia*	600	5
Goodenia stobbsiana	10	0.1
Grevillea wickhamii subsp. *hispidula*	300	2
Hakea chordophylla	170	0.1
Mirbelia viminalis	100	1
Ptilotus calostachyus	60	0.1
Scaevola browniana subsp. *browniana*	40	0.1
Sida sp. Articulation below (A.A. Mitchell PRP 1605)	175	0.1
Solanum phlomoides	60	0.1
Tephrosia arenicola	200	0.1
Triodia sp. *(epactia/pungens)*	40	5
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	30	15

Species (Phase 2)	Height (cm)	Cover (%)
Acacia hilliana	40	0.1
Acacia pruinocarpa	160	0.1
Acacia spondylophylla	70	5
Acacia tumida var. *pilbarensis*	140	0.1
Amphipogon sp.	25	0.1
Aristida ingrata	60	0.1
Bonamia sp. Dampier (A.A. Mitchell PRP 217)	4	0.1
Calytrix carinata	40	0.1
Cassia glutinosa	65	0.1
Cassia glutinosa x luerssenii	130	0.1
Cassia hamersleyensis	210	0.1
Cleome viscosa	20	0.1
Corchorus lasiocarpus subsp. *parvus*	50	0.1
Dampiera candicans	40	0.1
Dodonaea coriacea	25	0.1
Dysphania rhadinostachya subsp. *rhadinostachya*	15	0.1
Eremophila jucunda	100	0.1
Eriachne lanata	50	4
Eriachne mucronata	45	0.1
Eriachne pulchella subsp. *dominii*	8	0.1
Eucalyptus leucophloia subsp. *leucophloia*	500	10
Goodenia stobbsiana	5	0.1
Goodenia triodiophila	30	0.1
Grevillea wickhamii subsp. *hispidula*	320	1
Hakea chordophylla	140	0.1
Mirbelia viminalis	120	0.1
Ptilotus calostachyus	70	0.1
Scaevola browniana subsp. *browniana*	20	0.1
Sida aff. *pilbarensis* (EOB46-01B)	20	0.1
Sida arenicola	60	0.1
Sida sp. Articulation below (A.A. Mitchell PRP 1605)	140	0.1
Solanum phlomoides	8	0.1
Tephrosia arenicola	100	0.1
Tribulus suberosus	100	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	35	10
Triodia sp. *(epactia/pungens)*	70	5

Koodaideri Site KOD61
Described (Phase 1) PH/J **Date (Phase 1)** 13/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) MM **Date (Phase 2)** 08/05/2011
MGA 50 706958 **mE** 7510132 **mN**
Habitat South-west facing slope
Soil Red-brown skeletal sandy loam
Rock Type Ironstone
Vegetation (Phase 1) *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Acacia bivenosa* low shrubland over *Triodia wiseana* hummock grassland
Vegetation (Phase 2) *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Acacia bivenosa* open shrubland over *Triodia wiseana, Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) hummock grassland
Veg Condition Excellent
Fire Age Burnt 3-5 years ago
Notes Elevation 509 m asl. South-west corner of the quadrat is located in a gully habitat: two species associated with this gully were ignored (*Gossypium robinsonii, Eucalyptus leucophloia*)

Species (Phase 1)	Height (cm)	Cover (%)
Acacia bivenosa	100	10
Amphipogon sericeus	30	0.1
Bonamia sp. Dampier (A.A. Mitchell PRP 217)	10	0.1
Cassia glutinosa	100	0.1
Corchorus lasiocarpus	30	0.1
Dodonaea coriacea	40	0.1
Enneapogon lindleyanus	50	0.1
Eucalyptus leucophloia subsp. *leucophloia*	350	2
Goodenia cusackiana	25	0.1
Goodenia stobbsiana	20	0.1
Gossypium australe (Burrup Peninsula form)	30	0.1
Grevillea wickhamii subsp. *hispidula*	230	0.1
Heliotropium pachyphyllum	30	0.1
Isotropis atropurpurea	30	0.1
Ptilotus calostachyus	100	0.1
Ptilotus rotundifolius	100	0.1
Scaevola browniana subsp. *browniana*	50	0.1
*Sida pilbarensis (*ferruginous form)	40	0.1
Solanum ellipticum	40	0.1
Tribulus suberosus	50	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	20	0.1
Triodia wiseana	20	35

Species (Phase 2)	Height (cm)	Cover (%)
Acacia bivenosa	100	8
Aristida holathera var. *holathera*	35	0.1
Bonamia sp. Dampier (A.A. Mitchell PRP 217)	5	0.1
Cassia glutinosa x luerssenii	130	0.1
Corchorus lasiocarpus subsp. *parvus*	40	0.1
Eragrostis eriopoda	40	0.1
Eriachne aristidea	40	0.1
Eucalyptus leucophloia subsp. *leucophloia*	400	2
Eulalia aurea	50	0.1
Fimbristylis simulans	20	0.1
Gomphrena cunninghamii	12	0.1
Goodenia cusackiana	25	0.1
Goodenia muelleriana	30	0.1
Goodenia stobbsiana	45	0.1
Grevillea wickhamii subsp. *hispidula*	170	0.1
Hakea chordophylla	100	0.1
Heliotropium pachyphyllum	20	0.1
Heliotropium tenuifolium	35	0.1
Hibiscus sturtii var. *campylochlamys*	40	0.1
Isotropis atropurpurea	40	0.1
Mollugo molluginea	20	0.1
Paraneurachne muelleri	40	0.1
Ptilotus astrolasius	50	0.1
Ptilotus calostachyus	70	0.1
Ptilotus clementii	5	0.1
Ptilotus rotundifolius	110	0.1
Sida sp. Hamersley Range (K. Newbey 10692) PN	40	0.1
Solanum phlomoides	30	0.1
Tephrosia sp. Cathedral Gorge (F.H. Mollemans 2420) PN	3	0.1
Tribulus suberosus	45	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	25	10
Triodia wiseana	40	25

Koodaideri Site KOD62
Described (Phase 1) PH/J **Date (Phase 1)** 13/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) MM/PA **Date (Phase 2)** 13/03/2011
MGA 50 719121 **mE** 7502843 **mN**
Habitat Gently undulating plain on mesa (hill) top
Soil Red-brown clay loam with a continuous surface layer of ironstone pebbles and stones
Rock Type Some ironstone outcropping
Vegetation (Phase 1) *Eucalyptus leucophloia* subsp. *leucophloia* low woodland over *Grevillea wickhamii* subsp. *hispidula* scattered shrubs over *Acacia hilliana* scattered low shrubs over *Triodia* sp. Shovelanna Hill open hummock grassland
Vegetation (Phase 2) *Eucalyptus leucophloia* subsp. *leucophloia* low open woodland over *Acacia hilliana* scattered low shrubs over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) very open hummock grassland
Veg Condition Excellent/Very good
Fire Age Burnt 3-5 years ago
Notes

Species (Phase 1)	Height (cm)	Cover (%)
Acacia arida	40	0.1
Acacia atkinsiana	50	0.1
Acacia bivenosa	5	0.1
Acacia hilliana	20	1
Acacia spondylophylla	20	0.1
Acacia tenuissima	90	0.1
Corchorus lasiocarpus	100	0.1
Eucalyptus leucophloia subsp. *leucophloia*	600	10
Goodenia stobbsiana	40	0.1
Grevillea wickhamii subsp. *hispidula*	130	1
Indigofera monophylla (small leaflet form)	20	0.1
Ptilotus calostachyus	70	0.1
Ptilotus rotundifolius	100	0.1
Scaevola browniana subsp. *browniana*	20	0.1
Sida arenicola	100	0.1
Solanum ellipticum	50	0.1
Tephrosia arenicola	60	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	20	20

Species (Phase 2)	Height (cm)	Cover (%)
Acacia adsurgens	80	0.1
Acacia arida	50	0.1
Acacia bivenosa	130	0.1
Acacia hamersleyensis	110	0.1
Acacia hilliana	20	2
Acacia incurvaneura MS	150	0.1
Acacia pruinocarpa	20	0.1
Acacia pyrifolia	40	0.1
Acacia spondylophylla	40	0.1
Acacia tenuissima	130	0.1
Aristida contorta	20	0.1
Bonamia sp. Dampier (A.A. Mitchell PRP 217)	15	0.1
Calytrix carinata	15	0.1
Cassia glutinosa x luerssenii	120	0.1
Cassia helmsii	10	0.1
Cassia oligophylla x helmsii	30	0.1
Codonocarpus cotinifolius	100	0.1
Corchorus lasiocarpus subsp. *parvus*	80	0.1
Corchorus sidoides subsp. *sidoides*	25	0.1
Cucumis maderaspatanus	10	0.1
Duperreya commixta	100	0.1
Eucalyptus leucophloia subsp. *leucophloia*	600	2
Gompholobium sp. Pilbara (N.F. Norris 908) PN	50	0.1
Goodenia stobbsiana	50	0.1
Goodenia triodiophila	25	0.1
Grevillea wickhamii subsp. *hispidula*	150	0.2
Hakea chordophylla	150	0.1
Heliotropium pachyphyllum	20	0.1
Hibiscus sturtii var. *campylochlamys*	30	0.1
Indigofera monophylla	35	0.1
Keraudrenia nephrosperma	110	0.1
Ptilotus calostachyus	60	0.1
Ptilotus rotundifolius	110	0.1
Scaevola browniana subsp. *browniana*	30	0.1
Sida arenicola	110	0.1
Sida cardiophylla	50	0.1
Solanum phlomoides	150	0.1
Tephrosia arenicola	100	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	20	5

Koodaideri Site KOD63
Described (Phase 1) PH/J **Date (Phase 1)** 13/07/2010 **Type** Quadrat 50 x 50
Described (Phase 2) PA/RH **Date (Phase 2)** 10/03/2011
MGA 50 704509 **mE** 7505796 **mN**
Habitat Moderate, north-facing colluvial slope
Soil Red-brown clay loam
Rock Type Continuous surface of ironstone gravel, pebbles and stones
Vegetation (Phase 1) *Grevillea wickhamii* subsp. *hispidula, Acacia pyrifolia* tall open shrubland over *Triodia* sp. Shovelanna Hill hummock grassland
Vegetation (Phase 2) *Grevillea wickhamii* subsp. *hispidula* open shrubland over *Acacia tenuissima* scattered low shrubs over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) open hummock grassland
Veg Condition Excellent
Fire Age Burnt 3-5 years ago
Notes Very old track near northwest corner

Species (Phase 1)	Height (cm)	Cover (%)
Acacia arida	40	0.1
Acacia pyrifolia	350	1
Acacia tenuissima	50	0.1
Cassia glutinosa	120	0.1
Corchorus lasiocarpus	90	0.1
Eucalyptus gamophylla	110	0.1
Goodenia stobbsiana	50	0.1
Grevillea wickhamii subsp. *hispidula*	250	5
Hakea chordophylla	400	0.1
Heliotropium pachyphyllum	15	0.1
Ptilotus calostachyus	120	0.1
Sida arenicola	250	0.1
Solanum ellipticum	50	0.1
Tephrosia arenicola	120	0.1
Tephrosia sp. Bungaroo Creek (M.E. Trudgen 11601)	15	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	20	31

Species (Phase 2)	Height (cm)	Cover (%)
Acacia inaequilatera	250	0.1
Acacia pyrifolia	250	0.1
Acacia tenuissima	100	1
Aristida holathera var. *holathera*	60	0.1
Bonamia sp. Dampier (A.A. Mitchell PRP 217)	5	0.1
Cassia glutinosa	100	0.1
Cassia glutinosa x luerssenii	130	0.1
Cassia oligophylla	100	0.1
Codonocarpus cotinifolius	100	0.1
Corchorus lasiocarpus subsp. *lasiocarpus*	100	0.1
Dampiera candicans	30	0.1
Eriachne pulchella subsp. *dominii*	20	0.1
Eucalyptus gamophylla	200	0.1
Fimbristylis simulans	20	0.1
Goodenia stobbsiana	15	0.1
Grevillea wickhamii subsp. *hispidula*	200	6
Hakea chordophylla	250	0.1
Hibiscus sturtii var. *campylochlamys*	120	0.1
Hibiscus sturtii var. *platychlamys*	60	0.1
Ptilotus calostachyus	60	0.1
Scaevola parvifolia subsp. *pilbarae*	20	0.1
Sida arenicola	40	0.1
Tephrosia sp. Bungaroo Creek (M.E. Trudgen 11601)	30	0.1
Tribulus hirsutus	5	0.1
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)	15	15

Appendix 5

List of Vascular Flora Recorded from the Study Area by Biota in 2010 and 2011

NB. As per the limitations discussed in the main report, this species list should be regarded as comprehensive but not exhaustive.

* denotes an introduced (weed) species.

The use of the genus *Cassia* has been retained in favour of *Senna*, as it is felt to reflect a more realistic separation of taxa. All other nomenclature reflects current scientific names accepted by the Western Australian Herbarium. Correspondence of *Cassia* / *Senna* nomenclature is given below:

Cassia ferraria	=	*Senna ferraria*
Cassia glaucifolia	=	*Senna glaucifolia*
Cassia glutinosa	=	*Senna glutinosa* subsp. *glutinosa*
Cassia hamersleyensis	=	*Senna hamersleyensis*
Cassia helmsii	=	*Senna artemisioides* subsp. *helmsii*
Cassia luerssenii	=	*Senna glutinosa* subsp. x *luerssenii*
Cassia notabilis	=	*Senna notabilis*
Cassia oligophylla	=	*Senna artemisioides* subsp. *oligophylla*
Cassia pruinosa	=	*Senna glutinosa* subsp. *pruinosa*
Cassia sericea	=	*Senna sericea*
Cassia stricta	=	*Senna stricta*
Cassia venusta	=	*Senna venusta*

Family: Aizoaceae

Trianthema glossostigma

Trianthema pilosa

Zaleya galericulata

Family: Amaranthaceae

Achyranthes aspera

**Aerva javanica*

Amaranthus cuspidifolius

Amaranthus interruptus

Amaranthus undulatus

Amaranthus sp. (inadequate material sp. not determined)

Gomphrena affinis subsp. *pilbarensis*

Gomphrena canescens subsp. *canescens*

Gomphrena cunninghamii

Gomphrena sp. (inadequate material sp. not determined)

Ptilotus appendiculatus

Ptilotus astrolasius

Ptilotus auriculifolius

Ptilotus calostachyus

Ptilotus clementii

Ptilotus exaltatus var. *exaltatus*

Ptilotus fusiformis

Ptilotus helipteroides

Ptilotus obovatus var. *obovatus*

Ptilotus polystachyus

Ptilotus rotundifolius

Ptilotus schwartzii var. *schwartzii*

Family: Apocynaceae

Cynanchum pedunculatum

Rhyncharrhena linearis

Sarcostemma viminale subsp. *australe*

Tylophora flexuosa

Family: Araliaceae

Astrotricha hamptonii

Trachymene oleracea subsp. *oleracea*

Family: Asteraceae

**Bidens bipinnata*
**Flaveria trinervia*
**Lactuca saligna*
**Lactuca serriola*
Pentalepis trichodesmoides
Pluchea dunlopii
Pluchea rubelliflora
Pterocaulon serrulatum
Pterocaulon sphacelatum
Pterocaulon sphaeranthoides
Streptoglossa decurrens
Wedelia sp. Hamersley (A.S. Weston 8444)

Family: Boraginaceae

Ehretia saligna var. *saligna*
Heliotropium cunninghamii
Heliotropium heteranthum
Heliotropium ovalifolium
Heliotropium pachyphyllum
Heliotropium skeleton
Heliotropium tenuifolium
Trichodesma zeylanicum var. *zeylanicum*

Family: Brassicaceae

Lepidium catapycnon
Lepidium muelleri-ferdinandii
Lepidium pedicellosum
Lepidium platypetalum

Family: Capparaceae

Capparis lasiantha
Capparis spinosa var. *nummularia*
Capparis umbonata

Family: Caryophyllaceae

Polycarpaea corymbosa var. *corymbosa*
Polycarpaea holtzei
Polycarpaea longiflora

Family: Celastraceae

Maytenus sp. Mt Windell (S. van Leeuwen 846)
Stackhousia intermedia

Family: Chenopodiaceae

Dysphania kalpari
Dysphania melanocarpa forma leucocarpa
Dysphania rhadinostachya (subsp. not determined)
Dysphania rhadinostachya subsp. *rhadinostachya*
Dysphania sp. (inadequate material; sp. not determined*)*
Enchylaena tomentosa var. *tomentosa*
Rhagodia eremaea
Salsola australis

Family: Cleomaceae

Cleome viscosa

Family: Convolvulaceae

Bonamia erecta
Bonamia rosea
Bonamia sp. Dampier (A.A. Mitchell PRP 217)
Bonamia sp. (inadequate material sp. not determined)
Duperreya commixta
Evolvulus alsinoides var. *decumbens*
Evolvulus alsinoides var. *villosicalyx*
Ipomoea muelleri
Ipomoea polymorpha
Polymeria ambigua
Polymeria aff. ambigua (MET12,302)

Family: Cucurbitaceae

Cucumis maderaspatanus
**Cucumis melo* subsp. *agrestis*

Family: Cyperaceae

Bulbostylis barbata
Cyperus cunninghamii subsp. *cunninghamii*
Cyperus vaginatus
Fimbristylis dichotoma
Fimbristylis simulans

Family: Euphorbiaceae

Euphorbia alsiniflora
Euphorbia aff. *australis*
Euphorbia biconvexa
Euphorbia boophthona
Euphorbia careyi
Euphorbia aff. *schultzii*
Euphorbia tannensis subsp. *eremophila*
Euphorbia wheeleri
Euphorbia sp. (inadequate material sp. not determined)
Euphorbia sp. (HD195-16)

Family: Fabaceae

Acacia adoxa var. *adoxa*
Acacia adsurgens
Acacia ancistrocarpa
Acacia aneura (grey bushy form; MET 15 732)
Acacia aneura (narrow fine veined Site 1259)
Acacia aneura var. *intermedia*
Acacia aneura aff. var. *intermedia*
Acacia aff. *aneura* (long, flat, recurved; FMR 35.3)
Acacia aff. *aneura* (narrow fine veined; site 1259)
Acacia aff. *aneura* (subterete long; site 1245)
Acacia aptaneura MS
Acacia arida
Acacia atkinsiana
Acacia ayersiana
Acacia bivenosa
Acacia citrinoviridis
Acacia coriacea subsp. pendens
Acacia dictyophleba

Acacia elachantha
Acacia eriopoda
Acacia fuscaneura MS
Acacia hamersleyensis
Acacia hilliana
Acacia inaequilatera
Acacia incurvaneura MS
Acacia kempeana
Acacia maitlandii
Acacia monticola
Acacia pachyacra
Acacia pruinocarpa
Acacia pyrifolia
Acacia rhodophloia
Acacia sericophylla
Acacia spondylophylla
Acacia synchronicia
Acacia tenuissima
Acacia tetragonophylla
Acacia trudgeniana
Acacia tumida var. *pilbarensis*
Acacia sp. (inadequate material; sp. not determined)
Cajanus cinereus
Cassia ferraria
Cassia ferraria x ? *glaucifolia*
Cassia glaucifolia
Cassia glutinosa
Cassia glutinosa x *luerssenii*
Cassia hamersleyensis
Cassia helmsii
Cassia luerssenii
Cassia notabilis
Cassia oligophylla
Cassia oligophylla (thinly sericeous MET 15,035)
Cassia oligophylla x *ferraria*
Cassia oligophylla x *glutinosa*
Cassia oligophylla x *helmsii*
Cassia pruinosa
Cassia sericea
Cassia stricta
Cassia venusta
Cassia sp. (inadequate material sp. not determined)
Crotalaria medicaginea var. *neglecta*
Crotalaria novae-hollandiae subsp. *novae-hollandiae*
Cullen lachnostachys
Cullen leucochaites
Glycine canescens
Gompholobium sp. Pilbara (N.F. Norris 908) PN
Indigofera colutea
Indigofera fractiflexa
Indigofera monophylla (form not determined)

Indigofera monophylla (brown calyx form)
Indigofera monophylla (long, sparse hairs form)
Indigofera monophylla (small leaflet form)
Isotropis atropurpurea
Mirbelia viminalis
Petalostylis labicheoides
Rhynchosia bungarensis
Rhynchosia minima
Tephrosia arenicola
Tephrosia densa
Tephrosia aff. *densa* (P8T-018)
Tephrosia rosea var. *glabrior*
Tephrosia supina
Tephrosia aff. *supina* (HD133-20)
Tephrosia aff. *supina* (inadequate material; no further determination possible)
Tephrosia uniovulata
Tephrosia virens
Tephrosia sp. Bungaroo Creek (M.E. Trudgen 11601)
Tephrosia sp. Cathedral Gorge (F.H. Mollemans 2420) PN

Family: Goodeniaceae

Dampiera candicans
Goodenia cusackiana
Goodenia microptera
Goodenia muelleriana
Goodenia stobbsiana
Goodenia triodiophila
Scaevola browniana subsp. *browniana*
Scaevola parvifolia subsp. *pilbarae*
Scaevola spinescens
Scaevola spinescens (broad form)
Scaevola sp. (inadequate material sp. not determined)

Family: Gyrostemonaceae

Codonocarpus cotinifolius

Family: Lamiaceae

Clerodendrum floribundum (var. not determined)
Clerodendrum floribundum var. *angustifolium*
Dicrastylis cordifolia
Newcastelia sp. Hamersley Range (S. van Leeuwen 4264)
Prostanthera albiflora

Family: Lauraceae

Cassytha capillaris

Family: Loranthaceae

Diplatia grandibractea
Lysiana casuarinae

Family: Malvaceae

Abutilon dioicum
Abutilon aff. *hannii*
Abutilon lepidum
Abutilon otocarpum
Abutilon sp. (inadequate material sp. not determined)
Brachychiton acuminatus

Corchorus crozophorifolius
Corchorus incanus subsp. *incanus*
Corchorus incanus subsp. *lithophilus*
Corchorus laniflorus
Corchorus lasiocarpus (subsp. not determined)
Corchorus lasiocarpus subsp. *lasiocarpus*
Corchorus lasiocarpus subsp. *parvus*
Corchorus aff. *lasiocarpus* subsp. *parvus*
Corchorus sidoides subsp. *sidoides*
Corchorus tridens
Corchorus sp. (inadequate material sp. not determined)
Gossypium australe (form not determined)
Gossypium australe (Burrup Peninsula form)
Gossypium australe (Whim Creek form)
Gossypium robinsonii
Hibiscus burtonii
Hibiscus coatesii
Hibiscus aff. coatesii (MET 16,542)
Hibiscus aff. coatesii (site 733)
Hibiscus aff. coatesii (inadequate material; no further determination possible)
Hibiscus goldsworthii
Hibiscus sturtii var. *campylochlamys*
Hibiscus sturtii var. *platychlamys*
Hibiscus sp. (inadequate material; sp. not determined)
Keraudrenia nephrosperma
Keraudrenia velutina subsp. *elliptica*
Keraudrenia sp. (inadequate material; sp. not determined)
**Malvastrum americanum*
Melhania oblongifolia
Rulingia luteiflora
Sida arenicola
Sida aff. arenicola
Sida cardiophylla
Sida echinocarpa
Sida fibulifera
Sida aff. fibulifera
Sida "pilbarensis" (ferruginous form)
Sida aff. "pilbarensis" (EOB46-01B)
Sida rohlenae subsp. *rohlenae*
Sida sp. Articulation below (A.A. Mitchell PRP 1605)
Sida sp. Barlee Range (S. van Leeuwen 1642)
Sida sp. Excedentifolia (J.L. Egan 1925)
Sida sp. Hamersley Range (K. Newbey 10692) PN
Sida sp. Spiciform panicles (E. Leyland s.n. 14/8/90)
Sida sp. (inadequate material; sp. not determined)
Triumfetta leptacantha
Triumfetta maconochieana
Waltheria indica

Family: Menispermaceae

Tinospora smilacina

Family: Molluginaceae

Mollugo molluginea

Family: Moraceae

Ficus brachypoda

Ficus virens var. *virens*

Family: Myrtaceae

Calytrix carinata

Corymbia deserticola subsp. *deserticola*

Corymbia ferriticola

Corymbia hamersleyana

Eucalyptus camaldulensis subsp. *refulgens*

Eucalyptus gamophylla

Eucalyptus kingsmillii subsp. *kingsmillii*

Eucalyptus leucophloia subsp. *leucophloia*

Eucalyptus trivalva

Eucalyptus victrix

Eucalyptus xerothermica

Melaleuca sp. (inadequate material; sp. not determined)

Family: Nyctaginaceae

Boerhavia coccinea

Family: Oleaceae

Jasminum didymum subsp. *lineare*

Family: Phyllanthaceae

Flueggea virosa subsp. *melanthesoides*

Notoleptopus decaisnei (var. not determined)

Notoleptopus decaisnei var. *decaisnei*

Notoleptopus decaisnei var. *orbicularis*

Phyllanthus erwinii

Phyllanthus maderaspatensis

Phyllanthus reticulatus

Sauropus sp. Koodaideri detritals (J. Naaykens & J. Hurter JH 11213)

Family: Poaceae

Acrachne racemosa

Amphipogon sericeus

Amphipogon sp. (inadequate material sp. not determined)

Aristida burbidgeae

Aristida contorta

Aristida holathera var. *holathera*

Aristida inaequiglumis

Aristida ingrata

Aristida latifolia

Aristida sp. (inadequate material sp. not determined)

Bothriochloa ewartiana

Brachyachne prostrata

**Cenchrus ciliaris*

**Cenchrus setiger*

Chrysopogon fallax

Cymbopogon ambiguus

Cymbopogon obtectus

Cymbopogon procerus

Cymbopogon sp. (inadequate material sp. not determined)

Digitaria brownii
Digitaria ctenantha
Enneapogon caerulescens
Enneapogon lindleyanus
Enneapogon polyphyllus
Enteropogon ramosus
Eragrostis cumingii
Eragrostis eriopoda
Eragrostis leptocarpa
Eragrostis setifolia
Eriachne aristidea
Eriachne lanata
Eriachne mucronata
Eriachne obtusa
Eriachne pulchella (inadequate material; subsp. not determined)
Eriachne pulchella subsp. *dominii*
Eriachne sp. (inadequate material sp. not determined)
Eulalia aurea
Panicum effusum
Panicum sp. (inadequate material sp. not determined)
Paraneurachne muelleri
Paspalidium basicladium
Paspalidium clementii
Paspalidium rarum
Paspalidium tabulatum
Perotis rara
Schizachyrium fragile
Setaria surgens
**Setaria verticillata*
Themeda triandra
Themeda sp. Mt Barricade (M.E. Trudgen 2471)
Themeda sp. (inadequate material sp. not determined)
Triodia brizoides
Triodia epactia
Triodia lanigera
Triodia pungens
Triodia schinzii
Triodia wiseana
Triodia sp. Shovelanna Hill (S. van Leeuwen 3835)
Triodia sp. (*epactia/pungens*)
Triodia sp. (inadequate material sp. not determined)
Tripogon loliiformis
Yakirra australiensis var. *australiensis*

Family: Polygalaceae

Polygala aff. *isingii* (may be equivalent to *Polygala* sp. Prostrate (P.K. Latz 4900))
Polygala sp. Prostrate (P.K. Latz 4900)

Family: Portulacaceae

**Portulaca oleracea*

Family: Proteaceae

Grevillea berryana
Grevillea wickhamii subsp. *hispidula*

Hakea chordophylla
Hakea lorea subsp. *lorea*

Family: Pteridaceae

Cheilanthes brownii
Cheilanthes sieberi subsp. *sieberi*

Family: Rubiaceae

Oldenlandia crouchiana
Pomax rupestris
Psydrax latifolia
Synaptantha tillaeacea var. *tillaeacea*

Family: Santalaceae

Anthobolus leptomerioides
Santalum lanceolatum

Family: Sapindaceae

Atalaya hemiglauca
Dodonaea coriacea
Dodonaea pachyneura
Dodonaea petiolaris
Dodonaea sp. (inadequate material; seedling)

Family: Scrophulariaceae

Eremophila cuneifolia
Eremophila jucunda (subsp. not determined)
Eremophila jucunda subsp. pulcherrima
Eremophila latrobei (subsp. not determined)
Eremophila latrobei subsp. *filiformis*
Eremophila latrobei subsp. aff. *filiformis*
Eremophila longifolia
Eremophila magnifica subsp. *magnifica*
Eremophila sp. (inadequate material; sp. not determined)

Family: Solanaceae

Nicotiana benthamiana
Solanum ellipticum
Solanum gabrielae
Solanum horridum
Solanum lasiophyllum
Solanum phlomoides
Solanum aff. *lucani*
Solanum sp. (inadequate material sp. not determined)

Family: Surianaceae

Stylobasium spathulatum

Family: Typhaceae

Typha domingensis

Family: Violaceae

Hybanthus aurantiacus

Family: Zygophyllaceae

Tribulus hirsutus
Tribulus macrocarpus
Tribulus platypterus
Tribulus suberosus

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Appendix 6

Framework for Conservation Significance Ranking of Communities and Flora Species

A. Definitions, Categories and Criteria for Threatened and Priority Ecological Communities

1. General Definitions

Ecological Community
A naturally occurring biological assemblage that occurs in a particular type of habitat.

Note: The scale at which ecological communities are defined will often depend on the level of detail in the information source, therefore no particular scale is specified.

A **threatened ecological community** (TEC) is one which is found to fit into one of the following categories; "presumed totally destroyed", "critically endangered", "endangered" or "vulnerable".

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

An **assemblage** is a defined group of biological entities.

Habitat is defined as the areas in which an organism and/or assemblage of organisms lives. It includes the abiotic factors (eg. substrate and topography), and the biotic factors.

Occurrence: a discrete example of an ecological community, separated from other examples of the same community by more than 20 metres of a different ecological community, an artificial surface or a totally destroyed community.

By ensuring that every discrete occurrence is recognised and recorded future changes in status can be readily monitored.

Adequately Surveyed is defined as follows:
"An ecological community that has been searched for thoroughly in most likely habitats, by relevant experts."

Community structure is defined as follows:
"The spatial organisation, construction and arrangement of the biological elements comprising a biological assemblage" (eg. Eucalyptus salmonophloia woodland over scattered small shrubs over dense herbs; structure in a faunal assemblage could refer to trophic structure, e.g. dominance by feeders on detritus as distinct from feeders on live plants).

Definitions of **Modification** and **Destruction** of an ecological community:

Modification: "changes to some or all of ecological processes (including abiotic processes such as hydrology), species composition and community structure as a direct or indirect result of human activities. The level of damage involved could be ameliorated naturally or by human intervention."

Destruction: "modification such that reestablishment of ecological processes, species composition and community structure within the range of variability exhibited by the original community is unlikely within the foreseeable future even with positive human intervention."

Note: Modification and destruction are difficult concepts to quantify, and their application will be determined by scientific judgement. Examples of modification and total destruction are cited below:

Modification of ecological processes: The hydrology of Toolibin Lake has been altered by clearing of the catchment such that death of some of the original flora has occurred due to dependence on fresh water. The system may be bought back to a semblance of the original state by redirecting saline runoff and pumping waters of the rising underground water table away to restore the hydrological balance. Total destruction of downstream lakes has occurred due to hydrology being altered to the point that few of the original flora or fauna species are able to tolerate the level of salinity and/or water logging.

Modification of structure: The understorey of a plant community may be altered by weed invasion due to nutrient enrichment by addition of fertiliser. Should the additional nutrients be removed from the system the balance may be restored, and the original plant species better able to compete. Total destruction may occur if additional nutrients continue to be added to the system causing the understorey to be completely replaced by weed species, and death of overstorey species due to inability to tolerate high nutrient levels.

Modification of species composition: Pollution may cause alteration of the invertebrate species present in a freshwater lake. Removal of pollutants may allow the return of the original inhabitant species. Addition of residual highly toxic substances may cause permanent changes to water quality, and total destruction of the community.

Threatening processes are defined as follows:
"Any process or activity that threatens to destroy or significantly modify the ecological community and/or affect the continuing evolutionary processes within any ecological community."

Examples of some of the continuing threatening processes in Western Australia include: general pollution; competition, predation and change induced in ecological communities as a result of introduced animals; competition and displacement of native plants by introduced species; hydrological changes; inappropriate fire regimes; diseases resulting from introduced micro-organisms; direct human exploitation and disturbance of ecological communities.

Restoration is defined as returning an ecological community to its pre-disturbance or natural state in terms of abiotic conditions, community structure and species composition.

Rehabilitation is defined as the re-establishment of ecological attributes in a damaged ecological community although the community will remain modified.

2. Definitions and Criteria for Presumed Totally Destroyed, Critically Endangered, Endangered and Vulnerable Ecological Communities

ECOLOGICAL COMMUNITIES

Presumed Totally Destroyed (PD)
An ecological community that has been adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future.

An ecological community will be listed as presumed totally destroyed if there are no recent records of the community being extant and either of the following applies (A or B):

A) Records within the last 50 years have not been confirmed despite thorough searches of known or likely habitats or

B) All occurrences recorded within the last 50 years have since been destroyed

Critically Endangered (CR)
An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated.

An ecological community will be listed as Critically Endangered when it has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future. This will be determined on the basis of the best available information, by it meeting any one or more of the following criteria (A, B or C):

A) The estimated geographic range, and/or total area occupied, and/or number of discrete occurrences since European settlement have been reduced by at least 90% and either or both of the following apply (i or ii):

   i) geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is imminent (within approximately 10 years);

   ii) modification throughout its range is continuing such that in the immediate future (within approximately 10 years) the community is unlikely to be capable of being substantially rehabilitated.

B) Current distribution is limited, and one or more of the following apply (i, ii or iii):

   i) geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the immediate future (within approximately 10 years);

      ii) there are very few occurrences, each of which is small and/or isolated and extremely vulnerable to known threatening processes;

iii) there may be many occurrences but total area is very small and each occurrence is small and/or isolated and extremely vulnerable to known threatening processes.

C) The ecological community exists only as highly modified occurrences that may be capable of being rehabilitated if such work begins in the immediate future (within approximately 10 years).

Endangered (EN)
An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future.

An ecological community will be listed as Endangered when it has been adequately surveyed and is not Critically Endangered but is facing a very high risk of total destruction in the near future. This will be determined on the basis of the best available information by it meeting any one or more of the following criteria (A, B, or C):

A) The geographic range, and/or total area occupied, and/or number of discrete occurrences have been reduced by at least 70% since European settlement and either or both of the following apply (i or ii):

   i) the estimated geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is likely in the short term future (within approximately 20 years);

   ii) modification throughout its range is continuing such that in the short term future (within approximately 20 years) the community is unlikely to be capable of being substantially restored or rehabilitated.

B) Current distribution is limited, and one or more of the following apply (i, ii or iii):

   i) geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the short term future (within approximately 20 years);

   ii) there are few occurrences, each of which is small and/or isolated and all or most occurrences are very vulnerable to known threatening processes;

   iii) there may be many occurrences but total area is small and all or most occurrences are small and/or isolated and very vulnerable to known threatening processes.

C) The ecological community exists only as very modified occurrences that may be capable of being substantially restored or rehabilitated if such work begins in the short-term future (within approximately 20 years).

Vulnerable (VU)
An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range.

An ecological community will be listed as Vulnerable when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing a high risk of total destruction or significant modification in the medium to long-term future. This will be determined on the basis of the best available information by it meeting any one or more of the following criteria (A, B or C):

A) The ecological community exists largely as modified occurrences that are likely to be capable of being substantially restored or rehabilitated.

B) The ecological community may already be modified and would be vulnerable to threatening processes, is restricted in area and/or range and/or is only found at a few locations.

C) The ecological community may be still widespread but is believed likely to move into a category of higher threat in the medium to long term future because of existing or impending threatening processes.

3. Definitions and Criteria for Priority Ecological Communities

PRIORITY ECOLOGICAL COMMUNITY LIST
Possible threatened ecological communities that do not meet survey criteria or that are not adequately defined are added to the Priority Ecological Community Lists under Priorities 1, 2 and 3. These three categories are ranked in order of priority for survey and/or definition of the community, and evaluation of conservation status, so that consideration can be given to their declaration as threatened ecological communities. Ecological Communities that are adequately known, and are rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list, are placed in Priority 4. These ecological communities require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5.

Priority One: Poorly-known ecological communities
Ecological communities with apparently few, small occurrences, all or most not actively managed for conservation (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) and for which current threats exist. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.

Priority Two: Poorly-known ecological communities
Communities that are known from few small occurrences, all or most of which are actively managed for conservation (e.g. within national parks, conservation parks, nature reserves, State forest, unallocated Crown land, water reserves, etc.) and not under imminent threat of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.

Priority Three: Poorly known ecological communities

(i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or:

(ii) communities known from a few widespread occurrences, which are either large or within significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat, or;

(iii) communities made up of large, and/or widespread occurrences, that may or not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, and inappropriate fire regimes.

Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.

Priority Four: Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring.

(a) Rare. Ecological communities known from few occurrences that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These communities are usually represented on conservation lands.

(b) Near Threatened. Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.

(c) Ecological communities that have been removed from the list of threatened communities during the past five years.

Priority Five: Conservation Dependent ecological communities
Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

Reference: Department of Environment and Conservation 2007
(sourced from http://www.dec.wa.gov.au/content/view/849/2017/)

B. Conservation Codes for Western Australian Flora

In Western Australia, all native flora species are protected under the *Wildlife Conservation Act 1950,* making it an offence to remove or harm native flora species without approval. In addition to this basic level of statutory protection, a number of plant species are assigned an additional level of conservation significance based on the fact that there are a limited number of known populations, some of which may be under threat.

B1: Threatened Flora

Under the *Wildlife Conservation Act 1950*, the Minister for the Environment may declare species of flora to be protected if they are considered to be in danger of extinction, rare or otherwise in need of special protection. Schedules 1 and 2 deal with those species that are threatened and those that are presumed extinct, respectively.

T: Threatened Flora (Declared Rare Flora — Extant)

Taxa which have been adequately searched for and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such (Schedule 1 under the *Wildlife Conservation Act 1950*).

Threatened Flora (Schedule 1) are further ranked by the DEC according to their level of threat using IUCN Red List criteria:

- CR: Critically Endangered – considered to be facing an extremely high risk of extinction in the wild;
- EN: Endangered – considered to be facing a very high risk of extinction in the wild; or
- VU: Vulnerable – considered to be facing a high risk of extinction in the wild.

X: Presumed Extinct Flora (Declared Rare Flora — Extinct)

Taxa which have been adequately searched for and there is no reasonable doubt that the last individual has died, and have been gazetted as such (Schedule 2 under the *Wildlife Conservation Act 1950*).

B2: Priority Flora

Taxa that have not yet been adequately surveyed to be listed under Schedule 1 or 2 are added to the Priority Flora List under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status, so that consideration can be given to their declaration as threatened flora. Taxa that are adequately known, are rare but not threatened, or meet criteria for Near Threatened, or that have been recently removed from the threatened list for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring. Conservation Dependent species are placed in Priority 5.

- **P1: Priority One – Poorly-known taxa**: taxa that are known from one or a few collections or sight records (generally <5), all of which are on lands not managed for conservation (e.g. agricultural or pastoral lands, urban areas, Shire, Westrail and Main Roads WA road, gravel and soil reserves, and active mineral leases, etc.), or are under threat of habitat destruction or degradation. Taxa may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes.
- **P2: Priority Two – Poorly-known taxa**: taxa that are known from one or a few collections or sight records (generally <5), at least some of which are on lands not under imminent threat of habitat destruction or degradation (e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc.). Taxa may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes.
- **P3: Priority Three – Poorly-known taxa**: taxa that are known from collections or sight records from several localities, at least some of which are not under imminent threat; or from few but widespread localities with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Taxa may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and known threatening processes exist that could affect them.
- **P4: Priority Four - Rare taxa, Near Threatened taxa and other taxa in need of monitoring**:
    a) Rare. Taxa that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.
    b) Near Threatened. Taxa that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.

c) Taxa that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

- **P5: Priority Five: Conservation Dependent taxa:** taxa that are not threatened but are subject to a specific conservation program, the cessation of which would result in the taxon becoming threatened within five years.

Note that of the above classifications, only Threatened flora have statutory standing. The Priority flora classifications are employed by the DEC to manage and classify their database of species considered potentially rare or at risk, but these categories have no legislative status. Note also that proposals that appear likely to affect Threatened flora require formal written approval from the Minister for the Environment under Section 23(f) of the *Wildlife Conservation Act 1950* in addition to the requirements of the *Environmental Protection (Native Vegetation Clearing) Regulations 2004*.

References:

DEC website: http://www.dec.wa.gov.au/content/view/852/2010/1/1/