






















Table 5.8 – Descriptions of Priority Flora Recorded in the Project Area

Species, Family and Rank	Description	Typical Habitat	No of Locations Recorded by <i>ecologia</i>	No of Plants Recorded by <i>ecologia</i>	Distribution	Photographs
<p><i>Acacia lineolata</i> subsp. <i>multilineata</i> (FABACEAE) Priority 1</p>	<p>A dense, rounded shrub growing from 0.5 m to 2 m in height. Its phyllodes are erect and the yellow, globular flowers are produced from June to August.</p> <p>(Photograph on right by S.J. Patrick. Image used with the permission of the Western Australian Herbarium, Department of Environment and Conservation (http://florabase.dec.wa.gov.au/help/copyright). Accessed on Thursday, 3 December 2009) and growth habit again (right) (Photography: <i>ecologia</i>).</p>	Sandplains.	1	1	Mullewa, east of Mingenew, Arrino and the locality of Yuna.	 
<p><i>Chamelaucium</i> sp. Yalgoo (Y. Chadwick 1816) (MYRTACEAE) Priority 1</p>	<p>A bushy low shrub to 1.5 m high. This species produces white/pink/purple flowers during August and September.</p>	Granite outcrops.	2	3	73 km south of Yalgoo, near Blue Hills, along Morawa-Yalgoo Road, and Wurarga.	 
<p><i>Euphorbia sarcostemmoides</i> (EUPHORBIACEAE) Priority 1</p>	<p>An upright, leafless, semi-succulent herb that grows to between 0.4 and 1 m, although it has been recorded as growing to 2 m. The stems are light green, and have a bluish-grey waxy light covering. When broken a white sap is exuded from the stems. The rarely present leaves are narrow, lanceolate, opposite and are held horizontally. The flowers are produced at the top of the branches, are green and look like a ball and cup. The fruit are green to reddish and when split open have pinkish brown seeds.</p>	Sandstone and quartzite hills but has been located on flat plains at Weld Range.	67	254	Robinson Ranges, Mount Augustus Station. Also East Chewing Ranges, Mount Giles and George Gill Range in N.T.	  






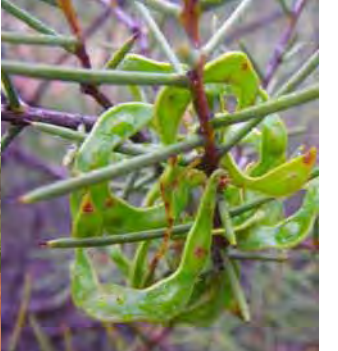
Species, Family and Rank	Description	Typical Habitat	No of Locations Recorded by <i>ecologia</i>	No of Plants Recorded by <i>ecologia</i>	Distribution	Photographs
<i>Gunniopsis divisa</i> (AIZOACEAE) Priority 1	An annual herb, growing to between 0.05 to 0.1 m in height. The base of the plant is often thickened. The leaves are opposite, green and fleshy looking and pale yellow to white flowers are produced between August and October.	Loamy soils and quartz. The species is also common along roadsides.	1	1000	Jack Hills, Blue Hills Range, Mullewa-Carnarvon Road and Mullewa-Gascoyne Junction Road.	
<i>Lepidosperma</i> sp. Moresby Range (R.J. Cranfield 2751) (CYPERACEAE) Priority 1	A tufted herb growing to 0.5 m high. The stems are flat, sticky to touch along the margins and have a prominent midrib, especially towards the base of the plant. The stem bases are yellow becoming red-brown. The flowering heads are dense, ovate and there are between 4-9 clumps per stalk that are sometimes sticky. The stalks are green and rounded but become flattened at the base of the flower heads. The flower bracts are brown with an obvious light brown or cream margin. The seeds are olive green.	Western end of the Moresby Range where it occurs in <i>Acacia</i> – <i>Melaleuca radula</i> dominated heaths or shrublands on laterite slopes or breakaways.	28	149	Moresby Range.	
<i>Melaleuca huttensis</i> (MYRTACEAE) Priority 1	An upright shrub growing to a height of approximately 3 m. This species has grey to white gnarled bark and from June to September produces cream to yellow flowers.	Sandy to gravelly soil and on undulating coastal plains.	1	1	Geraldton, Coronation Beach Road, Northampton and Waggrakine.	

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<p><i>Mirbelia ternata</i> (FABACEAE) Priority 1</p>	A low shrub growing to 0.5 m in height.	Yellow Sand.	3	3	10.8 km from Morawa and 4.9 km north of Morawa.	
<p><i>Petrophile vana</i> (PROTEACEAE) Priority 1</p>	An upright shrub growing to 1.5 m tall. Mature branches have smooth barked while juvenile branches have long white hairs on them. The terete leaves are 30 to 60 mm in length, 1 to 1.5 mm in diameter and are alternate, sessile, erect and curve inwards towards the branches. The upper surface of the leaves also has a shallow groove. White/cream flowers are produced along the branches in September and are approximately 10 mm long and 3 to 4 mm wide (Cranfield, & Macfarlane, 2007).	Soil pockets of white gritty clay on laterite / sandstone and breakaways (Cranfield, & Macfarlane, 2007).	16	145	Mount Magnet, Burnerbinmah Station and Malangata Station.	
<p><i>Sauropus</i> sp. Woolgorong (M. Officer s.n. 10/8/94) (EUPHORBIACEAE) Priority 1</p>	A low shrub that grows 0.3 m to 1 m and generally produces tiny yellow flowers in June. The leaves are obovate with a notched tip, are a light to medium green, and are approximately 0.5-2 cm long and 0.2-0.8 cm wide.	Grows on red sand plains in open <i>Acacia</i> – <i>Eremophila</i> woodlands, but has been found on moderately rocky hill crests and slopes on the Weld Range.	18	43	Weld Range, Woolgorong Homestead and Pinegrove Homestead.	




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<p><i>Scholtzia</i> sp. Binnu (M.E. Trudgen 2218) (MYRTACEAE) Priority 1</p>	<p><i>Scholtzia</i> sp. Binnu (M.E. Trudgen 2218) is an open shrub that grows to 2 m high. Its pink flowers are produced in September.</p> <p>The identity of the specimen collected could not be confirmed, as there was no flowering or fruiting material on it. However, the specimen collected closely matches <i>Scholtzia</i> sp. Binnu (M.E. Trudgen 2218).</p> <p>(Photography M. Kealley. Image used with the permission of the Western Australian Herbarium, Department of Environment and Conservation (http://florabase.dec.wa.gov.au/help/copyright). Accessed on Thursday, 3 December 2009).</p>	Yellow sand dunes.	1	20	Binnu East Road, Indarra Reserve, 60 km north-east of Northampton and 40 km east of Binnu.	 
<p><i>Thryptomene</i> sp. Wandana (M.E. Trudgen MET 22016) (MYRTACEAE) Priority 1</p>	<p>A shrub that typically grow to between 0.75 m and 1.2 m high, and its pink flowers are produced from July to September.</p>	Yellow sand or red clay sand dunes.	3	80	Binnu East Road, Eurardy Station, Wandana Nature Reserve, McGuaran Nature Reserve, Coolcalalaya Road, Ninghan District and south-west of Yuna.	 
<p><i>Frankenia confusa</i> (FRANKENIACEAE) Priority 2</p>	<p>A low, diffuse shrub that grows to 0.75 m in height and produces pink flowers in September.</p>	Banks of rivers and waterholes, and on river floodplains on wet, pale brown sands, brown clay and grey soil.	14	245	Kalbarri, Port Gregory, 7 Mile Crossing, Galena, Meeberrie Station and along the Gascoyne and Yalgar Rivers.	 

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<p><i>Homalocalyx inerrabundus</i> (MYRTACEAE) Priority 2</p>	<p>A shrub that grows to 0.5 m in height. The violet/pink flowers of this species is produced from September to November.</p>	<p>Yellow sand and sandy loam soil.</p>	<p>16</p>	<p>151</p>	<p>Bindoo Hill Nature Reserve, East Yuna Reserve, Geraldton and Mount Magnet.</p>	
<p><i>Leucopogon borealis</i> (ERICACEAE) Priority 2</p>	<p>An erect, lignotuberous shrub growing to approximately 1.2 m in height. White flowers are produced from July to October.</p>	<p>Rocky sandy loam over limestone on the rangelands.</p>	<p>2</p>	<p>10</p>	<p>Waggrakine Cutting, Moresby Conservation Park, Oakabella Nature Reserve, Oakajee, Bella Vista Nature Reserve.</p>	<p>NO PHOTO AVAILABLE</p>
<p><i>Leucopogon</i> sp. Howatharra (D. & N. McFarland 1046) (ERICACEAE) Priority 2</p>	<p>A compact, dense shrub growing to 0.6 m in height. This species produces white flowers in June.</p>	<p>Brown sandy loams on midslopes of valleys.</p>	<p>7</p>	<p>52</p>	<p>Moresby Conservation Park, Moresby Ranges and Howatharra Hill Reserve.</p>	

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<p><i>Scholtzia</i> sp. East Yuna (A.C. Burns 6) (MYRTACEAE) Priority 2</p>	<p>A shrub that typically grows to 2 m high. The pink flowers are produced in August.</p>	<p>Clay breakaway screes.</p>	4	23	<p>East Yuna Nature Reserve and north of Murchison River.</p>	
<p><i>Thryptomene</i> sp. East Yuna (J.W. Green 4639) (MYRTACEAE) Priority 2</p>	<p>A shrub that grows between 0.6 m and 1 m in height. The white/pink flowers are produced from August to November.</p>	<p>Yellow sand.</p>	2	3	<p>Indarra Springs Nature Reserve, Bindoo Hill Nature Reserve, East Yuna Nature Reserve and west of Mullewa.</p>	
<p><i>Thryptomene stenophylla</i> (MYRTACEAE) Priority 2</p>	<p>A spreading shrub that grows from 0.3 m to 2 m high. The pink to purple flowers are produced from June to August. (Photography B.L. Rye. Image used with the permission of the Western Australian Herbarium, Department of Environment and Conservation (http://florabase.dec.wa.gov.au/help/copyright). Accessed on Thursday, 3 December 2009).</p>	<p>Limestone hills and sandplains comprising red to yellow sand or loamy soil.</p>	2	2	<p>Chapman River Regional Park, Mount Rennie, Moonyoonooka, Giles Road, Scott Road and Spalding Park Reserve.</p>	







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<p><i>Acacia leptospermoides</i> subsp. <i>psammophila</i> (FABACEAE) Priority 3</p>	<p>A spreading shrub growing from 0.3 m to 1.5 m in height. The globular flowers are yellow and are produced in August. The phyllodes are 5 mm long, small, fleshy and thick.</p> <p>(Photography S.J. Patrick. Image used with the permission of the Western Australian Herbarium, Department of Environment and Conservation (http://florabase.dec.wa.gov.au/help/copyright). Accessed on Thursday, 3 December 2009).</p>	<p>Yellow or red sand to gravelly soils of sandplains.</p>	4	4	<p>Yuna, Eradu, East Yuna Nature Reserve, Station Valentine Road and Bindoo Hill Nature Reserve.</p>	 
<p><i>Acacia speckii</i> (FABACEAE) Priority 3</p>	<p>A bushy, rounded shrub or gnarled tree, growing to between 1.5 m to 3.0 m in height with grey and fissured bark on the main branches. The phyllodes are light green, rigid and erect, circular in cross-section, and have a hardened brown tip. The pod is light brown, narrow and compressed between each seed.</p>	<p>Rocky soils over granite, basalt or dolerite, and has been located on the rocky hills and rises of Weld Range.</p>	101	256	<p>Weld Range, Mount Magnet, Meekatharra and Yalgoo.</p>	 
<p><i>Acacia subsessilis</i> (FABACEAE) Priority 3</p>	<p>A rounded, straggly, pungent shrub that grows from 1 m to 2 m in height. Its yellow cylindrical flowers are produced from July to August.</p>	<p>Red sand or stony gravel over ironstone rocky hills.</p>	17	48	<p>Along Yalgoo to Ninghan Road, near State Barrier Fence, Wadgingarra, Paynes Find to Yalgoo Road, Edamurta Range, Buddadoo Range and Mugga Mugga Hill.</p>	 




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<p><i>Acanthocarpus parviflorus</i> (DASYPOGONACEAE) Priority 3</p>	<p>A tufted, perennial herb ranging from 15 cm to 40 cm in height. This species produces small white flowers from May to June.</p>	<p>Coastal habitats of sandy soil over limestone or sandstone.</p>	6	15	<p>Kalbarri, Kalbarri National Park, Murchison House Station, Moresby Ranges, Shark Bay and The Loop along the Murchison River.</p>	
<p><i>Blackallia nudiflora</i> (F. Muell) Rye & Kellerman (RHAMNACEAE) Priority 3</p>	<p>A low, perennial shrub growing to approximately 30 cm in height. This species produces white to pink or deep pink to red-brown small, flowers from July to August.</p>	<p>Moist, sandy locations on flats, drainage channels, slopes, and breakaways near rivers.</p>	1	22	<p>Along Chapman River, Bishops Gully Road, Ogilvie East and West Road and North West Coastal Highway.</p>	
<p><i>Calytrix erosipetala</i> (MYRTACEAE) Priority 3</p>	<p>A low shrub that grows from 0.3 m to 0.7 m in height. The leaves are erect to spreading, obovate in outline, and club shaped. Its white or pink flowers are produced between September and October.</p>	<p>Rocky sandstone or granite breakaways.</p>	10	79	<p>Cue, Agnew, Lake Barlee, Mount Richardson, Yakabindie Station, Mount Mason, Booylgoo Range and Windimurra Homestead.</p>	




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<p><i>Calytrix formosa</i> (MYRTACEAE) Priority 3</p>	<p>A shrub that grows between 0.3 m and 0.8 m in height. The pink/yellow flowers are produced from September to November.</p> <p>(Photography on right by D. & B. Bellairs. Image used with the permission of the Western Australian Herbarium, Department of Environment and Conservation (http://florabase.dec.wa.gov.au/help/copyright). Accessed on Wednesday, 20 January 2010)</p>	White or yellow sandplains.	2	3	Wandana Reserve, Eurardy Station, Kalbarri National Park and Bindoo Hill Nature Reserve.	
<p><i>Calytrix uncinata</i> (MYRTACEAE) Priority 3</p>	<p>A low shrub that grows from 0.3 m to 0.7 m in height. The leaves are erect to spreading, oblong to linear obovate in outline, with a straight to recurved tip that is unique to the genus. Its white/yellow flowers are produced from August to November.</p>	Granite and sandstone breakaways, in addition to stony rises in the Murchison and Yalgoo regions of Western Australia.	6	18	Wanjarri Nature Reserve, Leinster, Yalgoo, Gullewa, Yakabindie Station, Booylgoo Range, Joyners Find and the Blue Hills Ranges.	
<p><i>Calytrix verruculosa</i> (MYRTACEAE) Priority 1</p>	<p>A compact, evergreen shrub growing to approximately 40 cm to 75 cm in height, and has minutely verrucose (warty) branchlets. It contains small, terete, bright green whorled leaves, predominantly occurring at the tip of the stipules and bearing aromatic essential oils. It produces scattered pink to white flowers from August to October. The petals are up to 14 mm long and are usually bright pink. The calyx segments are joined at the base and have ovate blades and awns to 20 mm long.</p>	Shallow hardpan plains with sparse mulga or brown, clayey sand in open scrub.	68	860	Jack Hills, Weld Range, Noonie Hills and Meekatharra.	

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<p><i>Dicrastylis linearifolia</i> (LAMIACEAE) Priority 3</p>	<p>A multi-branched shrub, growing to between 1 m and 3 m in height. The upper surface of the leaves is hairy, and the braches are often rust-coloured. Its white, woolly flowers are produced from November to December.</p>	<p>Red sand and open sandplains.</p>	<p>28</p>	<p>274</p>	<p>Mount Mulgine, Warriedar Station, Shark Bay, Muggon Station, Eurardy Station, Burnerbinmah Station, Toolonga Nature Reserve and Meka Station.</p>	
<p><i>Dodonaea amplisemina</i> (SAPINDACEAE) Priority 3</p>	<p>A multi-stemmed open shrub, on which the branchlets sometimes becoming spiny. The two leaf forms (linear or narrow spear shaped) have blunt tips and are often clumped together. The flowers are inconspicuous, but the mature fruits (produced from late August to October) are pink-brown with three incurving horns.</p>	<p>Open shrubland with <i>Acacia</i>, <i>Eremophila</i> and other low shrubs on red-brown sandy clay soils over basalt or banded ironstone. One population has been recorded on quartzite.</p>	<p>27</p>	<p>106</p>	<p>Mount Magnet, Weld Range, Cue and Buddadoo Range.</p>	
<p><i>Eremophila arachnoides</i> subsp. <i>arachnoides</i> (MYOPORACEAE) Priority 3</p>	<p>An open shrub growing to 3.5 m in height. The stems and leaves have a whitish-green appearance (due to a covering of microscopic white scales), and the stems have rows of tiny round warts along their lengths. The leaves are linear, upright and have a hooked tip. The flowers may be white to mauve, and the inside of the flowers can have yellow or purple spots.</p>	<p>Open mulga woodland in shallow loams over limestone.</p>	<p>1</p>	<p>1</p>	<p>Jilyili Hills, Yarrabubba Homestead and Lake Mason Homestead.</p>	

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<p><i>Eremophila muelleriana</i> (MYOPORACEAE) Priority 3</p>	<p>A shrub or tree generally growing from 0.5 m to 2.8 m in height and sometimes from 0.3 m to 4m in height. The red/purple flowers are produced from August to October.</p> <p>(Photography on right by A.P. Brown & B. Buirchell. Image used with the permission of the Western Australian Herbarium, Department of Environment and Conservation (http://florabase.dec.wa.gov.au/help/copyright). Accessed on Tuesday, 19 January 2010)</p>	Granitic soils.	195	560	Carnarvon-Mullewa Road, Jingemarra Station, Mount Narryer, Mileura Station, Kalli Station and Weld Range.	
<p><i>Geleznowia verrucosa</i> subsp. Kalbarri (L.M. Broadhurst 123) (RUTACEAE) Priority 3</p>	<p>A branching shrub growing up to 1.5 m in height. The vivid inflorescences have 10-15 or more florets at the end of each erect branch, and have lime-yellow with yellow to orange anthers and sometimes brown to red or green bracts.</p>	Undulating coastal habitats with sandy or gravelly soils where there is laterite, sandstone or limestone.	1	1	Kalbarri National Par, Kalbarri, Northampton, Chapman Regional Park, Meanarra Hill and Kalbarri-Ajana Road.	
<p><i>Grevillea stenostachya</i> (PROTEACEAE) Priority 3</p>	<p>A dense, spiky shrub growing from 0.6 m to 1.5 m in height. The leaves resemble fine green sticks - each of which is dissected into a number of segments which each terminates in a sharp tip. The flowers are a greenish/creamy yellow colour on a cylindrical inflorescence, and are generally produced from July to September.</p>	Red sand or sandy loams in open shrublands and mallee.	132	235	Toolonga Nature Reserve, Woolgorong Station, Carnarvon and Belele Station.	

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<i>Grevillea triloba</i> (PROTEACEAE) Priority 3	A tall, spreading shrub that sometimes grows to more than 2.5 m in height, although generally ranges between 1 m and 1.5 m tall. This species produces pink or white flowers from June to October in upright, loose clusters, supported by elongated peduncles.	Coastal habitats with sandy loam over sandstone or limestone and lateritic soils.	139	2444	North West Coastal Highway road reserve, near Oakajee Port, Nature reserve 8937, Moresby Conservation Park, Oakajee Nature Reserve and Waggrakine.	 
<i>Hemigenia tysonii</i> (LAMIACEAE) Priority 3	A dense, finely-branched, mint bush that grows to 0.6 m in height. The small leaves are a grey-green, stiff, 4-7 mm long and 1-3 mm wide. They are arranged opposite one another or are occasionally grouped on the stem. The flowers are purple/light pink, with white spots inside, and they are produced from May to December.	Red sand, sandy clay and lateritic sand on flats, sand dunes and hills.	161	3189	Mount Hale, Noonie Hills and Muggon Station.	 
<i>Hemigenia virescens</i> [syn. sp. Bebele Station (A.L. Payne 80)] (LAMIACEAE) Priority 3	A perennial, erect and compact mint shrub, that grows to between 0.4 m and 0.6 m in height. The leaves do not have petioles, are erect and often pressed back along the stem. The purple to pale lilac flowers are tubular, 8.5 to 18 mm in length and are produced from July to August.	Sand and lateritic gravel.	117	2306	Meekatharra, Annean Station, Bebele Station and Bryah.	 







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<p><i>Homalocalyx echinulatus</i> (MYRTACEAE) Priority 3</p>	<p>A shrub that grows to between 0.45 to 1.0 m high. Its flowers are pink and are produced between June and September. The leaves are small and are approximately 2 to 4 mm long and 1 to 2 mm wide.</p>	<p>Laterite and on breakaways and sandstone hills.</p>	13	187	<p>Jack Hills, Weld Range, Wiluna, Doolgunna Station, Princess Range, Lake Way Station, Booylgoo Range, Longreach and Windidda.</p>	
<p><i>Indigofera gilesii</i> subsp. <i>gilesii</i> (FABACEAE) Priority 3</p>	<p>A shrub growing to 1.5 m in height. The leaves consist of 10-12 pairs of leaflets, with a dark gland at each leaflet base. The purple to pink flowers are produced from May to August. The pods are narrow, cylindrical and red-brown.</p>	<p>Pebbly loam amongst boulders and outcrops of hills. Along drainage channels and creeklines.</p>	1	1	<p>Ophthalmia Range and Hamersley Range.</p>	
<p><i>Microcorys tenuifolia</i> (LAMIACEAE) Priority 3</p>	<p>A shrub that grows between 0.5 m and 1.8 m in height. The white/blue/purple flowers are produced from either October to December or from March to April.</p>	<p>Red/brown sand, lateritic gravelly soils. Undulating plains</p>	5	5	<p>Eurardy Bush Heritage Reserve, Mullewa, East Yuna Reserve, Kalbarri National Park and north west of Wongan Hills.</p>	


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<p><i>Petrophile pauciflora</i> (PROTEACEAE) Priority 3</p>	<p>A compact shrub that grows to 1 m in height. Its leaves are erect, sparse and terete and are divided into three forked segments. Its globular, yellow flowers are produced in September and grow on stalks towards the end of the branchlets.</p>	<p>Low, very open heath on decaying and dissected granite breakaways.</p>	16	64	<p>Damperwah Hills, Karara Station, Lochada Station, Mount Magnet, Woolgorong Station, Pindarburra Station, Bimbij Station and Mileura Station.</p>	
<p><i>Prostanthera petrophila</i> (LAMIACEAE) Priority 3</p>	<p>A spreading shrub that grows from 0.6 m to 2 m in height. Its young stems are covered in white-grey hairs and the leaves are opposite and elliptic in shape. The white flowers have purple to violet striations and are produced in August.</p>	<p>Rocky banded ironstone outcrops and lateritic soils.</p>	27	151	<p>Weld Range, Woolgorong Homestead, Mount Barloweerie and Cue.</p>	
<p><i>Ptilotus beardii</i> (AMARANTHACEAE) Priority 3</p>	<p>A many-branched, rigid shrub growing from 0.15 m to 0.5 m in height. The leaves are often clustered along the stem and are small, linear, and have tiny sharp points. Pale pink/red flowers grow on the ends of branchlets and the inflorescences are open, and head-shaped to cylindrical in outline. Flowering occurs from August to October.</p>	<p>Clayey soils, on saline flats and on low breakaways.</p>	52	2272	<p>Yalalong Station, Weld Range, Muggon Station, Crystal Hill and Mount Narryer Homestead.</p>	

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<p><i>Serichonus gracilipes</i> (Diels) K.R.Thiele (RHAMNACEAE) Priority 3</p>	<p>An evergreen shrub that grows to between 0.2 m to 0.7 m in height. This species produces pink or white flowers from August to September.</p> <p>(Photography S.J. Patrick. Image used with the permission of the Western Australian Herbarium, Department of Environment and Conservation (http://florabase.dec.wa.gov.au/help/copyright). Accessed on Friday, 4 December 2009).</p>	<p>Rock crevices, rock gullies, and margins of summits, basal slopes of mesas and rocky outcrops. Generally found growing in sandy clay over granite, laterite gravel and yellow-brown sandy loam over sandstone.</p>	6	11	Mount Rennie, Ballatarra Hill, Northampton, Moresby Ranges and near Sugar Loaf Peak.	
<p><i>Thryptomene</i> sp. Moresby Range (A.S. George 14873) (MYRTACEAE) Priority 3</p>	<p>A spreading shrub that grows from 0.3 m to 1 m high. Its pink flowers are produced from June to August and they have long red flower stalks extending from the stems.</p>	<p>Light brown loam, clay loam, sandy clay or sandstone hillsides or summits.</p>	18	334	Moresby Range, Moresby Conservation Reserve, Bella Vista Nature Reserve, Mount Rennie, Howatharra Nature Reserve, Wokatherra Hill and Chapman Valley.	
<p><i>Verticordia chrysostachys</i> var. <i>pallida</i> (MYRTACEAE) Priority 3</p>	<p>An erect to spreading shrub that grows between 0.6 to 2 m in height. The yellow/cream flowers are produced from September to January.</p> <p>(Photography G. Byrne & E.A. George. Image used with the permission of the Western Australian Herbarium, Department of Environment and Conservation (http://florabase.dec.wa.gov.au/help/copyright). Accessed on Friday, 19 January 2010).</p>	<p>Yellow sandplains and sand dunes.</p>	4	5	Valentine Road, Erangy Springs Road, south-east of Yuna, Mullewa, Beacon Hill and East Yuna Nature Reserve.	

Species, Family and Rank	Description	Typical Habitat	No of Locations Recorded by <i>ecologia</i>	No of Plants Recorded by <i>ecologia</i>	Distribution	Photographs
<p><i>Verticordia densiflora</i> var. <i>rosteostella</i> (MYRTACEAE) Priority 3</p>	<p>An open shrub that grows between 0.4 m and 1.5 m in height. The pink/white flowers are produced from September to December.</p>	<p>Sandy gravelly soils.</p>	<p>3</p>	<p>7</p>	<p>Eneabba, Yerina Springs Nature Reserve, Wicherina, Chapman River Regional Wildlife Corridor, Chapman Park and Weelawadji Lake.</p>	
<p><i>Verticordia jamiesonii</i> (MYRTACEAE) Priority 3</p>	<p>A small, irregularly branched rounded shrub growing sometimes to 60 cm in height, but more commonly to 20 cm. It has tiny leaves, mostly crowded on short, lateral branchlets and flowers that are initially creamish-white turning pink with maturity. The flower buds are shiny and pale to bright red and flowering occurs from September to October.</p>	<p>Sandy clay soils on lateritic breakaways.</p>	<p>9</p>	<p>31</p>	<p>Mt Hale, Noonie Hills, Cue, Yalgoo and South Warburton.</p>	
<p><i>Acacia guinetii</i> (FABACEAE) Priority 4</p>	<p>A spreading to straggly shrub or erect and spindly shrub that generally grows to between 0.3 m and 2 m in height but can sometimes grow up to 2.5 m high. The yellow cylindrical flowers are produced from June to September.</p>	<p>Rocky loam and lateritic gravelly soils of stony hills.</p>	<p>33</p>	<p>121</p>	<p>Bella Vista Nature Reserve, Moresby Conservation Park, Moresby Range, Wokatherra Hill and Wells Park.</p>	

Species, Family and Rank	Description	Typical Habitat	No of Locations Recorded by <i>ecologia</i>	No of Plants Recorded by <i>ecologia</i>	Distribution	Photographs
<p><i>Baeckea</i> sp. <i>Melita Station</i> (H. Pringle 2738) (MYRTACEAE) Priority 4</p>	<p>An upright shrub that grows to a between 2.0 to 2.5 m. The leaves are round in cross section, 3 to 5 mm long, approximately 1 mm in diameter and are hooked at their tips.</p>	<p>Shallow, red rocky soil over ironstone amongst mulga shrubs.</p>	13	75	<p>Sandstone and more commonly to the east of the Goldfields Hwy between Wiluna and Kalgoorlie.</p>	
<p><i>Diuris recurva</i> (ORCHIDACEAE) Priority 4</p>	<p>A tuberous perennial herb that grows to between 0.2 m and 0.3 m high. The yellow and brown flowers are produced from July to August.</p>	<p>Loamy winter wet areas.</p>	6	5	<p>Eurardy Station, Drummond Nature Reserve, Moorajin Nature Reserve, Howatherra Hill Nature Reserve and Yandan Hill Reserve.</p>	
<p><i>Goodenia berringbinensis</i> (GOODENIACEAE) Priority 4</p>	<p>A prostrate to ascending herb growing to 0.3 m in height. The basal leaves are spoon-shaped and up to 6 cm long while the stem leaves are usually up to 3 cm long. The flowers are yellow and peak flowering occurs in October.</p>	<p>Along watercourses in red sandy loams.</p>	3	70	<p>Noonie Hills, Killara Station, Nallan Lake and Belele Station.</p>	

Species, Family and Rank	Description	Typical Habitat	No of Locations Recorded by ecologia	No of Plants Recorded by ecologia	Distribution	Photographs
<i>Grevillea inconspicua</i> (PROTEACEAE) Priority 4	An intricately branched, often messy looking spreading shrub that grows to between 0.6 m and 2 m in height. The leaves are linear, flat, silvery green, bend downwards from the stem and have an obvious hardened point. Its white/pink flowers are generally produced from June to August.	Along drainage lines, on rocky outcrops and creeklines, and tends to favour loamy soils with a gravel surface.	3	3	Weld Range, Sandstone, Mount Magnet and Booylgoo Range.	 
<i>Jacksonia velutina</i> (FABACEAE) Priority 4	An erect broom-like shrub that grows between 0.3 m to 1.5m in height. The fruit of this species is hairy. Its orange/red flowers are generally produced from August to September.	Yellow sandplains and sand hills.	1	1	Mullewa, Yuna, Eurardy Station, Kalbarri and Wandana Reserve.	 
<i>Verticordia capillaris</i> (MYRTACEAE) Priority 4	A corymbose shrub growing from 0.3 m to 1.5 m in height. The creamy-white flowers are produced from October to November.	Yellow sand, sandy loam and sandy clay sand plains.	71	197	Eurardy Station, Murchison House Station, along Kalbarri to Ajana Road, McGaurans Nature Reserve and East Yuna Nature Reserve.	 

Species, Family and Rank	Description	Typical Habitat	No of Locations Recorded by <i>ecologia</i>	No of Plants Recorded by <i>ecologia</i>	Distribution	Photographs
<p><i>Verticordia penicillaris</i> (MYRTACEAE) Priority 4</p>	<p>A low shrub growing to 30 cm high and approximately 1 m wide. From September to October this species produces cream to yellow flowers that have long red to brown styles.</p>	<p>Gravelly or rocky shallow soils sometimes on granite outcrops.</p>	<p>104</p>	<p>2698</p>	<p>Three Springs, Arrino, 14 km west of Mullewa, Caron Reserve, Wilson Nature Reserve, Ogilvie East Road, 45 km south of Mingenew and Tardun.</p>	

Note: Unless otherwise noted, photography by ecologia.

5.3.6 Priority Flora Recorded During the *ecologia* Regional Surveys

ecologia has surveyed previously proposed OPR rail corridor / alignment alternatives in the mid-west in the vicinity of the Project Area. During these earlier surveys, conducted in the Pastoral lands only, 15 Priority Flora were recorded, 14 of these were also recorded in the Project Area. These Priority Flora are listed in Table 5.9 below, the coordinates are provided in Table M.1, Appendix M and are mapped in Figure 5.3.

Table 5.9 – Priority Flora Taxa Recorded During the *ecologia* Regional Surveys

Code	Taxa	Number of Records	Recorded During the Current Survey
Priority 1	<i>Petrophile vana</i>	2	Yes
	<i>Ptilotus luteolus</i>	1	No
	<i>Sauropus</i> sp. Woolgorong (M. Officer s.n. 10/8/94)	4	Yes
Priority 3	<i>Acacia speckii</i>	9	Yes
	<i>Calytrix erosipetala</i>	1	Yes
	<i>Calytrix verruculosa</i>	2	Yes
	<i>Dicrastylis linearifolia</i>	2	Yes
	<i>Dodonaea amplisemina</i>	5	Yes
	<i>Grevillea stenostachya</i>	10	Yes
	<i>Hemigenia tysonii</i>	10	Yes
	<i>Petrophile pauciflora</i>	4	Yes
	<i>Prostanthera petrophila</i>	1	Yes
	<i>Ptilotus beardii</i>	5	Yes
<i>Verticordia jamiesonii</i>	4	Yes	
Priority 4	<i>Goodenia berringbinensis</i>	1	Yes



5.3.7 Range Extensions Recorded in the Project Area

Based on records lodged at the WA Herbarium (WAHERB, January 2010), 29 species located within the Project Area represent significant range extensions for the species. These are listed in Table 5.10.
















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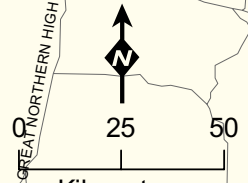
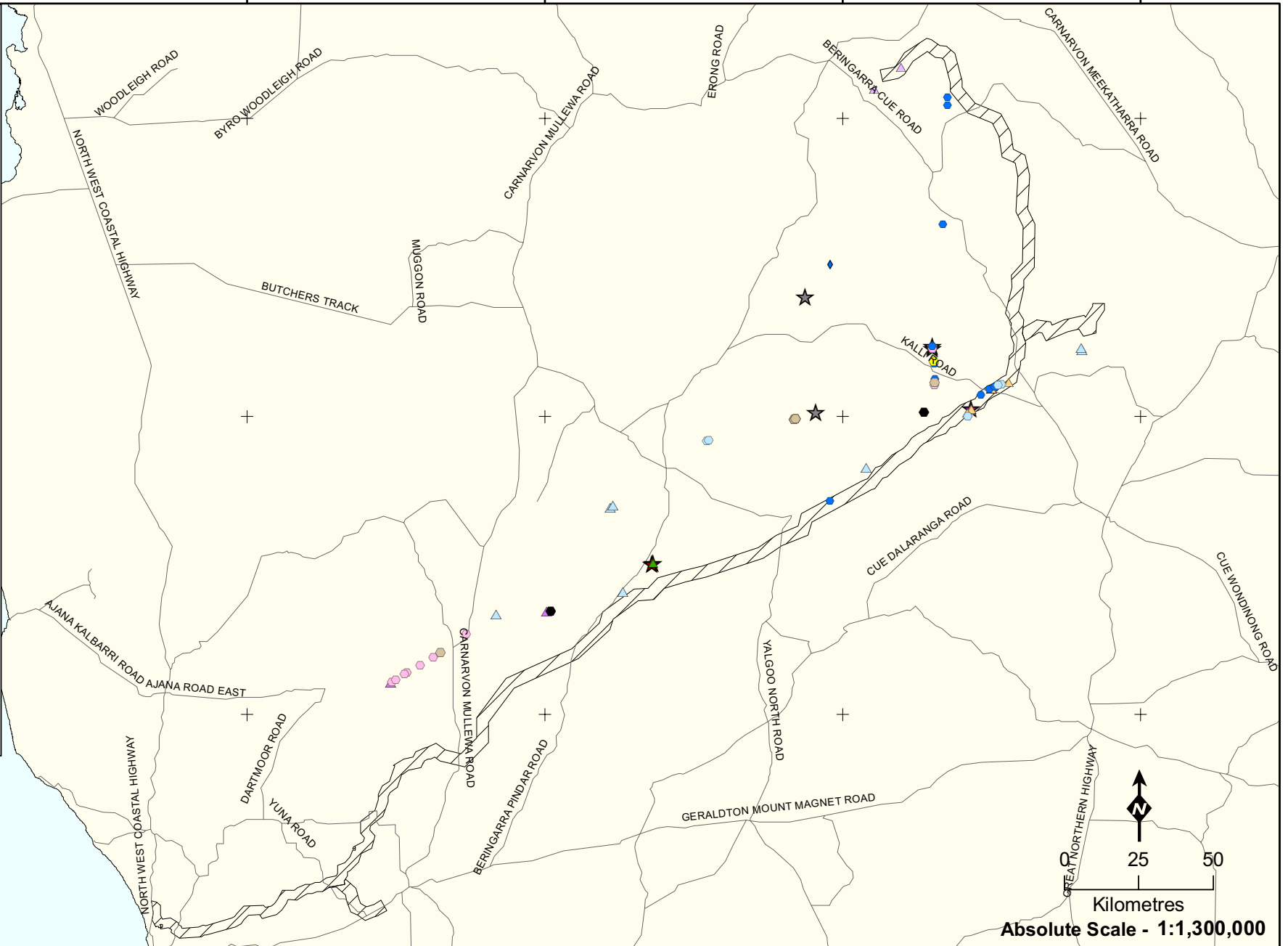
710000
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Legend

-  Main roads
-  OPR Rail Corridor

Regional Priority Flora

-  *Petrophile vana* (P1)
-  *Ptilotus luteolus* (P1)
-  *Sauropous* sp. Woolgorong (P1)
-  *Acacia speckii* (P3)
-  *Calytrix erosipetala* (P3)
-  *Calytrix verruculosa* (P3)
-  *Dicrasyllis linearifolia* (P3)
-  *Dodonaea amplisemina* (P3)
-  *Grevillea stenostachya* (P3)
-  *Hemigenia tysonii* (P3)
-  *Petrophile pauciflora* (P3)
-  *Prostanthera petrophila* (P3)
-  *Ptilotus beardii* (P3)
-  *Verticordia jamiesonii* (P3)
-  *Goodenia berringbinensis* (P4)



Absolute Scale - 1:1,300,000



Priority Flora Locations of the Old Rail Corridor Alignments (overview)

Figure: 5.3
Project ID: 1131

Drawn: AH
Date: 19/01/2010

Coordinate System
Name: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Datum: GDA 1994

Unique Map ID: A103

Table 5.10 – Range Extensions Recorded in the Project Area

Family	Taxa	Approximate Location in Project Area	Bioregional Distribution	Range Extension Details
FABACEAE	<i>Acacia subsessilis</i> (Priority 3)	Freehold	Central Yalgoo and couple records from western Murchison.	A small range extension of approximately 100 km west of the nearest collection record at Mugga Mugga Hill.
FABACEAE	<i>Acacia wiseana</i>	Jack Hills & Freehold	Throughout Carnarvon and Little Sandy Desert.	A range extension of approximately 200 km to the east of its nearest named collection at Muggon Station.
POACEAE	* <i>Arundo donax</i>	Freehold	Scattered populations through W.A.; records from Swan Coastal Plain and Carnarvon are closest.	A range extension of approximately 425 km to the south of the nearest named collection of Carnarvon.
CHENOPODIACEAE	<i>Atriplex spongiosa</i>	Wandina Section	Widespread throughout southern half of W.A. Most records in Murchison and Coolgardie.	A large range extension of approximately 340 km to the west-north west of the nearest named collection of Youangarra Outstation.
ASTERACEAE	<i>Brachyscome glandulosa</i>	Freehold	Avon Wheatbelt, Jarrah Forest, Swan Coastal Plain, Geraldton Sandplains and Esperance Plains.	A range extension of approximately 200 km to the north of the nearest named collection 7 km west of Brand Highway on Jurien Road.
CYPERACEAE	<i>Cyperus ixiocarpus</i>	Jack Hills	Throughout Pilbara and Carnarvon.	A large range extension of approximately 400 km south-east of the nearest collection record at Rocky Pool on the Gascoyne River.
ACANTHACEAE	<i>Diclanthera forrestii</i>	Jack Hills	Pilbara, Gascoyne and Carnarvon and two Murchison records.	A small range extension of approximately 50 km south of the nearest collection record at Mount Gould Station.
DROSERACEAE	<i>Drosera microphylla</i>	Freehold	Avon Wheatbelt, Jarrah Forest, Esperance Plains, southern Geraldton Sandplains and Swan Coastal Plain.	A large range extension of approximately 210 km to the north of the nearest named collection of Mount Lesueur.
SCROPHULARIACEAE	<i>Eremophila stronglylophylla</i>	Wandina Section	Murchison, Gascoyne, Pilbara and Carnarvon.	A range extension of approximately 140 km to the north-east of the nearest named location of Champion Bay.
SCROPHULARIACEAE	<i>Eremophila tietkensis</i>	Central portion of the proposed OPR rail alignment	Central Ranges in the east and Carnarvon in the west.	A range extension of approximately 300 km to the south of the nearest named collection record at Williambury Station in the Gascoyne.
MYRTACEAE	<i>Eucalyptus sargentii</i> subsp. <i>sargentii</i>	Freehold	Widespread throughout Avon Wheatbelt and Mallee. Couple of records in Carnarvon.	A range extension of approximately 170 km to the south-east of the nearest named collection of Woollberoo.

Family	Taxa	Approximate Location in Project Area	Bioregional Distribution	Range Extension Details
FABACEAE	<i>Gompholobium aristatum</i>	Freehold	Geraldton Sandplains, Jarrah Forrest and Swan Coastal Plain.	A range extension of approximately 170 km to the north of the nearest named collection 25 km south of Eneabba.
GOODENIACEAE	<i>Goodenia maideniana</i>	Jack Hills Section	Most records in Murchison.	A range extension of approximately 150 km to the north-west of the nearest named collection of Nannine.
GOODENIACEAE	<i>Goodenia triodiophila</i>	Jack Hills Section	Widespread throughout W.A. A few records in Murchison.	A large range extension of approximately 240 km to the west-north west of the nearest named collection of Joyner's Find.
PROTEACEAE	<i>Grevillea haplantha</i>	Wandina Section	Avon Wheatbelt.	A large range extension of approximately 450 km to the north-west of the nearest named collection of Merredin
AIZOACEAE	<i>Gunniopsis glabra</i>	Wandina Section	Coolgardie, Avon Wheatbelt, Mallee and Yalgoo.	A range extension of approximately 150 km to the north of the nearest named collection of Mount Narryer.
AIZOACEAE	<i>Gunniopsis intermedia</i>	Freehold	Avon Wheatbelt, Mallee, Coolgardie and two records from southern Murchison.	A range extension of approximately 240 km to the north of the nearest named collection north of Jibberding.
DILLENIACEAE	<i>Hibbertia glomerata</i>	Freehold	Avon Wheatbelt, Jarrah Forest, Swan Coastal Plain and Warren.	A large range extension of approximately 430 km to the north of the nearest named collection of Alcoa-DEC study site west of Admiral Road.
FABACEAE	<i>Indigofera gilesii</i> subsp. <i>gilesii</i> (Priority 3)	Murgoo Section	Pilbara.	A large range extension of approximately 600 km to the north-east of the nearest named collection of Ophthalmia Range.
PROTEACEAE	<i>Isopogon teretifolius</i>	Freehold	Geraldton Sandplains, Avon Wheatbelt, Jarrah Forrest, Swan Coastal Plain, Mallee and Esperance Plains.	A range extension of approximately 180 km to the north of the nearest named collection of Warradarge.
MYRTACEAE	<i>Melaleuca tuberculata</i>	Freehold	Geraldton Sandplains, Avon Wheatbelt, Jarrah Forrest, Swan Coastal Plain, Mallee and Esperance Plains.	A range extension of approximately 170 km to the north of the nearest named collection of Alexander - Morrisson National Park.
RUTACEAE	<i>Philotheca brucei</i> subsp. <i>brevifolia</i>	Wandina Section	Murchison and Yalgoo.	A range extension of approximately 200 km to the north-west of the nearest named collection of Charles Darwin Reserve.
THYMELAEACEAE	<i>Pimelea subvillifera</i>	Freehold	Murchison, Coolgardie, Great Victoria Desert, Yalgoo and Esperance Plains.	A large range extension of approximately 300 km to the east-south east of the nearest named location of Paynes Find.

Family	Taxa	Approximate Location in Project Area	Bioregional Distribution	Range Extension Details
ASTERACEAE	<i>Pluchea rubelliflora</i>	Freehold	Widespread throughout Northern Half of W.A. Small number of records for Murchison and Yalgoo. No records for Avon Wheatbelt and Geraldton Sandplains.	A range extension of approximately 100 km to the south-west south of the nearest named collection of Galena Bridge along the Murchison River.
ASTERACEAE	<i>Rhodanthe sterilesceus</i>	Freehold	Scattered throughout Murchison and Gascoyne. Records from Pilbara, Little Sandy Desert and couple records from Avon Wheatbelt.	A range extension of approximately 215 km to the south-west of the nearest named collection of Walga Rock.
LAMIACEAE	<i>Spartothamnella teucriflora</i>	Freehold	Widespread throughout Murchison and Carnarvon. Records also for Yalgoo, Gascoyne, Central Ranges, Gibson Desert and Great Victoria Desert.	A range extension of approximately 110 km to the west of the nearest named collection of Buddadoo Range.
STYLIDIACEAE	<i>Stylidium arenicola</i>	Jack Hills	Coolgardie, Avon Wheatbelt and small number of collections in south-eastern corner of the Murchison.	A large range extension of approximately 500 km to the north-west of the nearest named collection at Walling Rock Homestead.
STYLIDIACEAE	<i>Stylidium bulbiferum</i>	Freehold	Avon Wheatbelt, Jarrah Forest and Swan Coastal Plain.	A large range extension of approximately 380 km to the north of the nearest named collection of Yancheep.
FABACEAE	<i>Swainsona oroboides</i>	Murgoo Section	Widespread throughout W.A. Coolgardie, Central Ranges, Gascoyne, Gibson Desert, Great Victoria Desert, Murchison, Pilbara and Yalgoo.	A range extension of approximately 150 km to the south-east of the nearest named location of Burnerbinmah Station.

5.3.8 Other Flora of Interest Recorded in the Project Area

Two species of interest: *Acacia* aff. *rhodophloia* and *Philotheca* sp. nov. (aff. *tubiflora*), were recorded during phase one and these are described below.

***Acacia* aff. *rhodophloia* [P 59] (FABACEAE) - Species of Interest**

This species is similar to *Acacia rhodophloia*, but has been poorly collected previously and appears to represent a unique taxon (B Maslin 2009, pers. comm.) (Plate 5.4). The phyllode and general inflorescence characters are similar to *Acacia rhodophloia*, but it is a tree rather than a shrub, and grows to around 8 m high. It has a grey, flaky bark stocking 1 to 2 m from the base and red mini-ritchie bark above (similar to *Acacia cyperophylla*).

It grows as a tree on and surrounding granite outcrops located (approximately) between Meka and Twin Peaks stations (but it is possibly more widespread).

Further work is required to fully determine the taxonomic status of this apparently undescribed species. Flowering and fruiting material is needed to be able to fully describe the taxon.

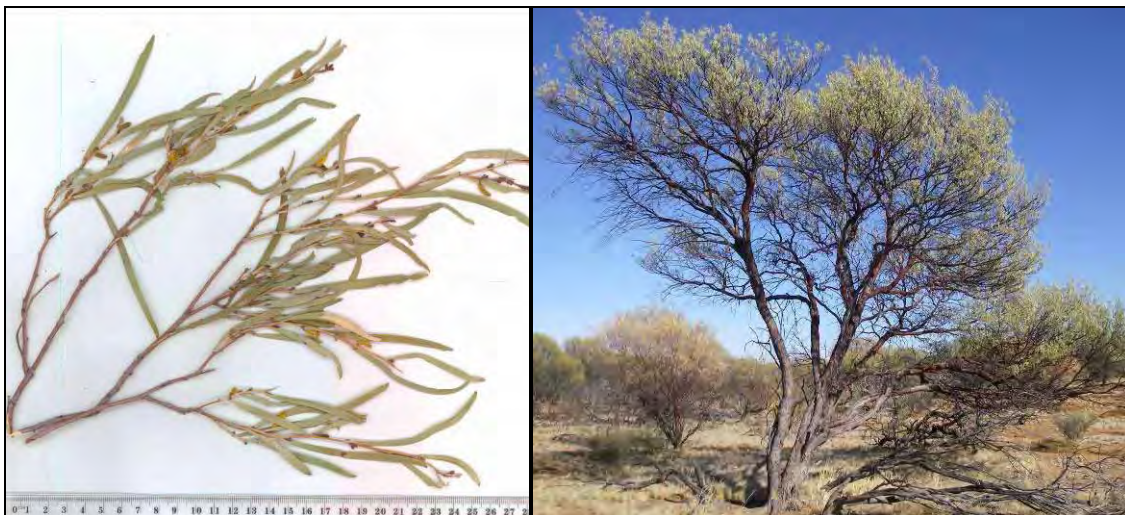


Plate 5.4 – *Acacia* aff. *rhodophloia* (photography: ecologia)

***Philotheca* sp. nov. (aff. *tubiflora*) (RUTACEAE) - Species of Interest**

Philotheca sp. nov. (aff. *tubiflora*) is a shrub that grows to 0.5 m tall. The stems have minute hairs (bristles) which are often bent downwards (retorse) (Plate 5.5). The leaves usually grow on the ends of branchlets, are small (approximately 1 mm long), club-shaped and sometimes have bristles along their margins. When crushed the leaves smell of citrus and creosote. No flowers or fruits were on the specimens collected.

This taxon was found on lateritic and granite breakaways north of Weld Range. It resembles *Philotheca tubiflora*, a shrubby species that is restricted to the Laverton area; however, the leaves differ in that they are semi-circular and much bigger than *P. tubiflora*'s (approximately 3 mm long).



Plate 5.5 – *Philotheca* aff. *tubiflora* (photography: *ecologia*)

Two additional species of interest; *Eremophila* aff. *forrestii* and *Acacia* aff. *incongesta*, were recorded during the transect survey and their coordinates are listed in Table G.2 (Appendix G).

5.4 INTRODUCED FLORA

Two hundred and eighty three species of weeds are currently known to occur in the Geraldton Sandplains regions, 73 in the Yalgoo region and 104 in the Murchison region (WAHERB, January 2010).

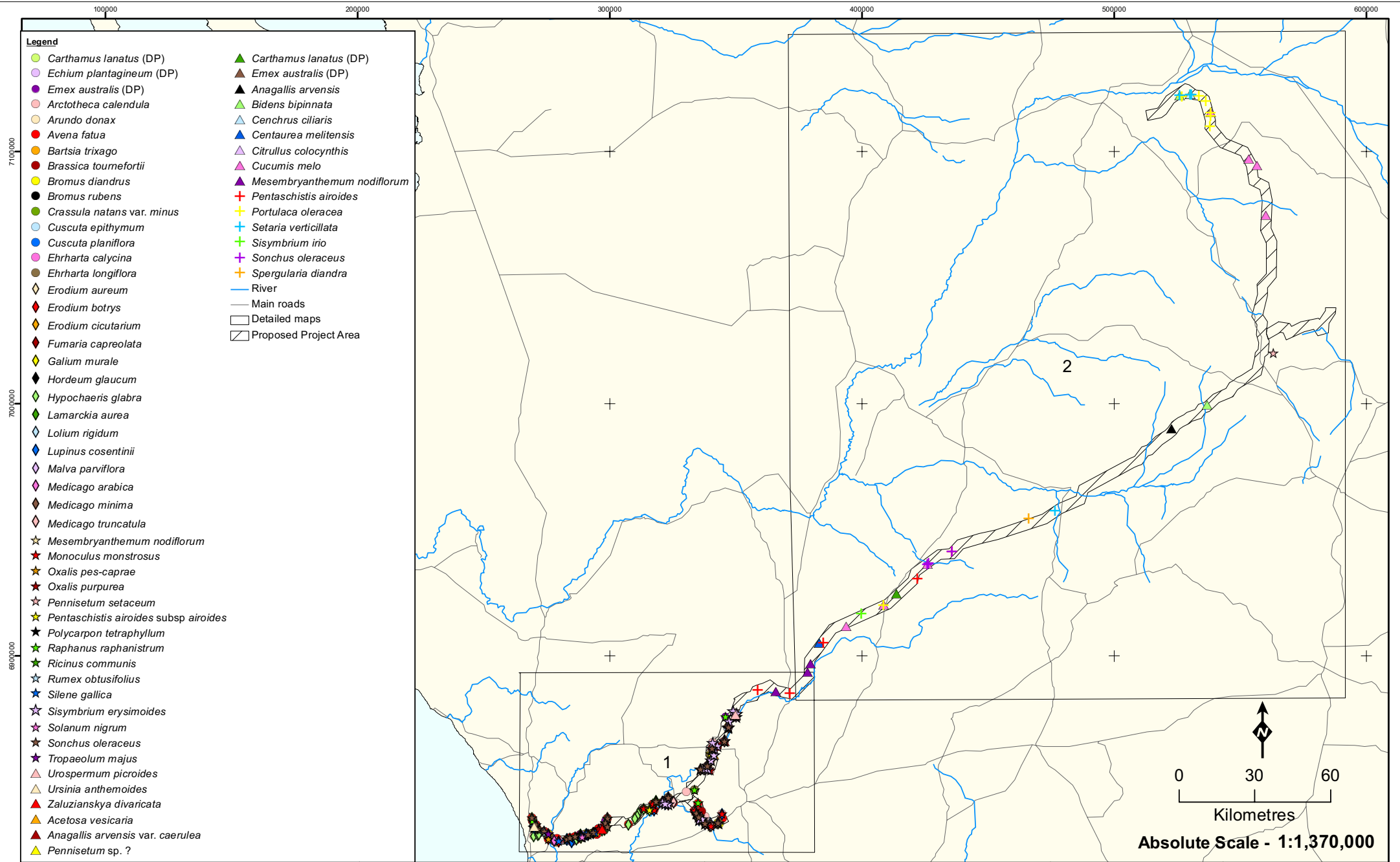
Sixty-two introduced flora taxa (weeds) were recorded within the Project Area at 466 locations: 51 weed species were recorded at 423 locations within the Freehold land area and 15 weed species were recorded from 43 locations within the Pastoral land area. Four of these species were recorded in both areas.

The list of weeds and numbers recorded during in the Project Area are listed in Table 5.11, have been mapped in Figure 5.4 to Figure 5.6 and the coordinates are listed in Table N.1, Appendix N.

Table 5.11 – Introduced Flora Taxa Recorded in the Project Area

Taxa	Freehold Records	Pastoral Records	Taxa	Freehold Records	Pastoral Records	Taxa	Freehold Records	Pastoral Records
?* <i>Pennisetum</i> sp.	1	-	* <i>Erodium aureum</i>	1	-	* <i>Ricinus communis</i>	3	-
* <i>Acetosa vesicaria</i>	7	-	* <i>Erodium botrys</i>	2	-	* <i>Rumex obtusifolius</i>	1	-
* <i>Anagallis arvensis</i>	-	1	* <i>Erodium cicutarium</i>	2	-	* <i>Setaria verticillata</i>	-	4
* <i>Anagallis arvensis</i> var. <i>caerulea</i>	1	-	* <i>Fumaria capreolata</i>	2	-	* <i>Silene gallica</i>	7	-
* <i>Arctotheca calendula</i>	48	-	* <i>Galium murale</i>	2	-	* <i>Sisymbrium erysimoides</i>	29	-
* <i>Arundo donax</i>	1	-	* <i>Hordeum glaucum</i>	15	-	* <i>Sisymbrium irio</i>	-	1
* <i>Avena fatua</i>	53	-	* <i>Hypochaeris glabra</i>	29	-	* <i>Solanum nigrum</i>	3	-
* <i>Bartsia trixago</i>	2	-	* <i>Lamarckia aurea</i>	5	-	* <i>Sonchus oleraceus</i>	30	3
* <i>Bidens bipinnata</i>	-	3	* <i>Lolium rigidum</i>	1	-	* <i>Spergularia diandra</i>	-	1
* <i>Brassica tournefortii</i>	11	-	* <i>Lupinus cosentinii</i>	17	-	* <i>Tropaeolum majus</i>	1	-
* <i>Bromus diandrus</i>	10	-	* <i>Malva parviflora</i>	1	-	* <i>Urospermum picroides</i>	1	-
* <i>Bromus rubens</i>	2	-	* <i>Medicago arabica</i>	1	-	* <i>Ursinia anthemoides</i>	1	-
* Carthamus lanatus (DP)	1	2	* <i>Medicago minima</i>	1	-	* <i>Zaluzianskya divaricata</i>	1	-
* <i>Cenchrus ciliaris</i>	-	2	* <i>Medicago truncatula</i>	20	-	* <i>Ricinus communis</i>	3	-
* <i>Centaurea melitensis</i>	-	1	* <i>Mesembryanthemum nodiflorum</i>	2	3			
* <i>Citrullus colocynthis</i>	-	1	* <i>Monoculus monstrosus</i>	28	-			
* <i>Crassula natans</i> var. <i>minus</i>	2	-	* <i>Oxalis pes-caprae</i>	10	-			
* <i>Cucumis melo</i>	-	7	* <i>Oxalis purpurea</i>	3	-			
* <i>Cuscuta epithymum</i>	1	-	* <i>Pennisetum setaceum</i>	1	-			
* <i>Cuscuta planiflora</i>	2	-	* <i>Pentaschistis airoides</i>	-	5			
* Echium plantagineum (DP)	8	-	* <i>Pentaschistis airoides</i> subsp. <i>airoides</i>	5	-			
* <i>Ehrharta calycina</i>	2	-	* <i>Polycarpon tetraphyllum</i>	1	-			
* <i>Ehrharta longiflora</i>	9	-	* <i>Portulaca oleracea</i>	-	8			
* Emex australis (DP)	4	1	* <i>Raphanus raphanistrum</i>	29	-			

Note: * indicates weed species and DP indicates a Declared Plant.



Introduced Flora of the Project Area (overview)




Figure: 5.4
Project ID: 1131

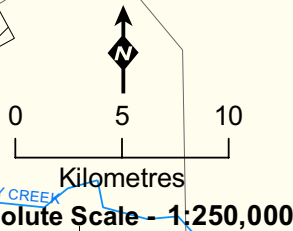
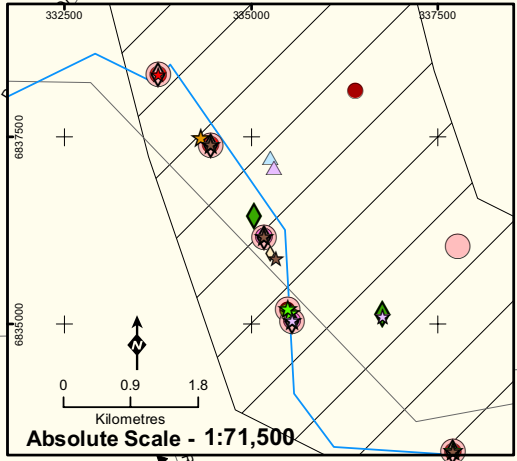
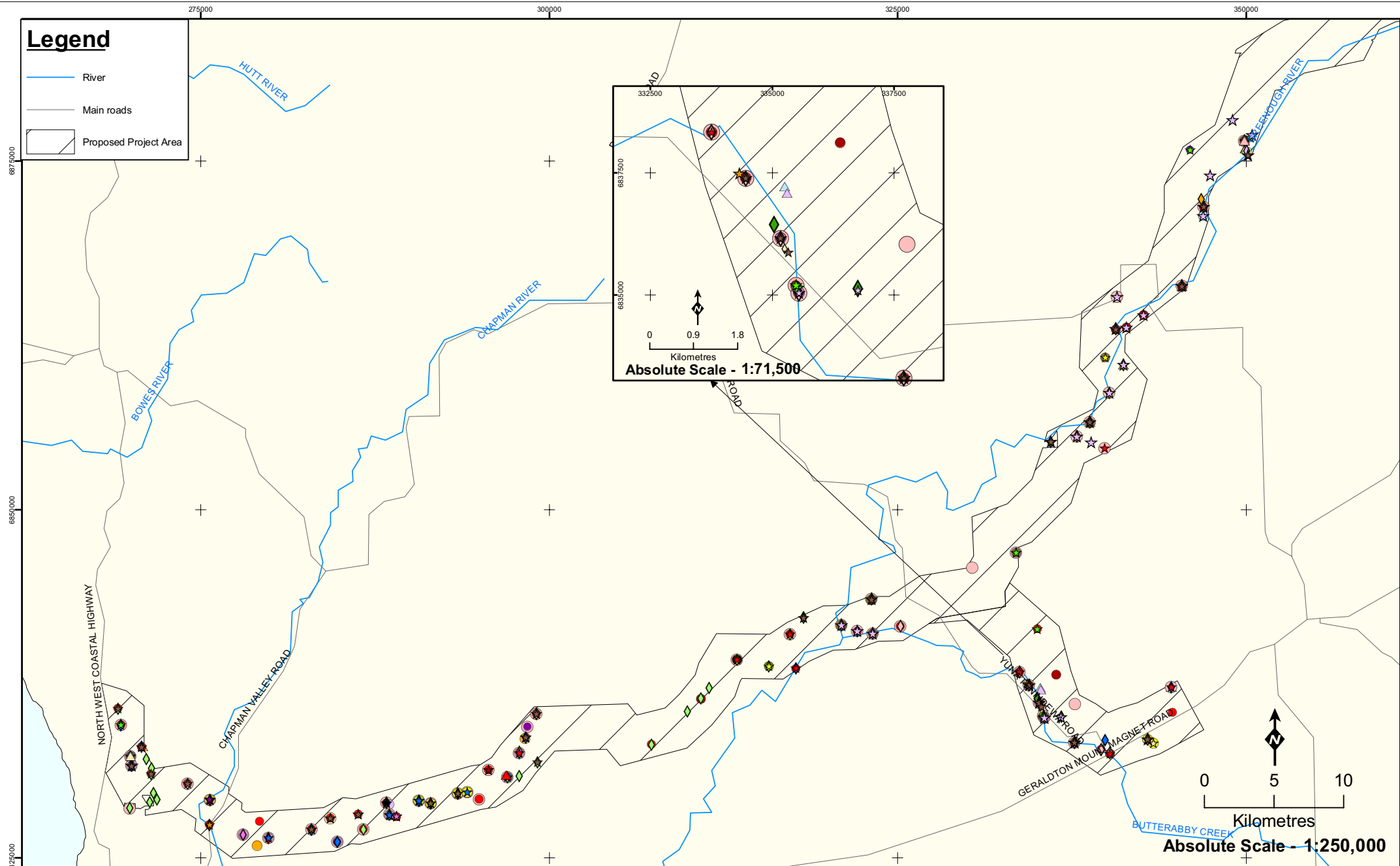
Drawn: AH
Date: 20/01/2010

Coordinate System
Name: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Datum: GDA 1994

Unique Map ID: A110

Legend

-  River
-  Main roads
-  Proposed Project Area






**Introduced Flora
of the Project Area
(Map 1)**

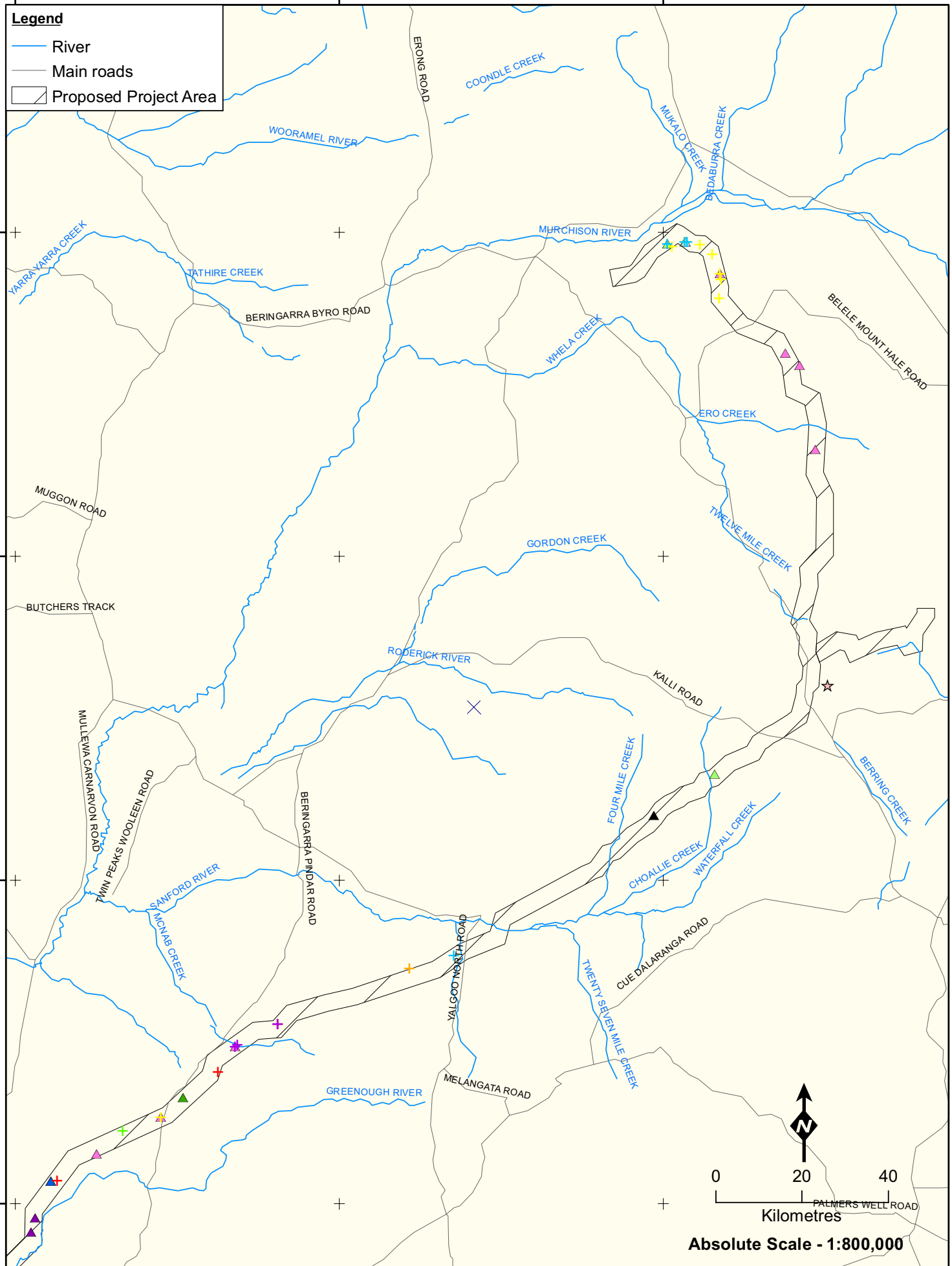
Figure: 5.5
Project ID: 1131

Drawn: AH
Date: 20/01/2010

Coordinate System
Name: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Datum: GDA 1994

Unique Map ID: A110

- Legend**
-  River
 -  Main roads
 -  Proposed Project Area



Absolute Scale - 1:800,000



**Introduced Flora
of the Project Area
(Map 2)**

Figure: 5.6
Project ID: 1131

Drawn: AH
Date: 20/01/10

Coordinate System
Name: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Datum: GDA 1994

Unique Map ID: A111

5.4.1 Declared Plants

Weeds that are, or have the potential to become, pests to agriculture can be declared formally under the *Agriculture and Related Resources Protection Act 1976 (ARRP Act)* as declared plants. Weeds listed under this Act are listed with Standard Control Codes that outline the requirements for their control. Five priority groupings exist (P1, P2, P3, P4 or P5) and more than one priority may be assigned to a weed species, and different municipal districts can use different priority levels. Details of these codes are included in Table O.1 (Appendix I). Landholders having declared plants on their property are obliged to control them at their own expense, and are encouraged to follow the standard control codes. Information regarding the status of Declared Plants can be viewed at the Department of Agriculture and Food's (DAF) website:

<http://agspsrv95.agric.wa.gov.au/dps/version02/01plantsearch.asp>.

A search was conducted of the Declared Plants listed under the *ARRP Act* (DAF, January 2010) for any Declared Plants that potentially could be found in the Geraldton, Mullewa and Cue regions. The search listed 82 Declared Plants for each region, 81 of which are Declared Plants State-wide.

Three Declared Plants listed under the *ARRP Act* were recorded during the survey, the biological characteristics, known distributions and photographs of **Carthamus lanatus*, **Echium plantagineum* and **Emex australis* are provided below. Locations are provided in Table N.1, Appendix N and are mapped in Figure 5.4 to Figure 5.6.

****Carthamus lanatus* (ASTERACEAE) – Declared Plant**

**Carthamus lanatus* (Saffron Thistle) is an erect, spiny annual growing to 70 cm in height (WAHERB, December 2009). The leaves are rigid and have spiny lobes, and the yellow flower heads (produced from spring to summer) are surrounded by spiny bracts and are borne in terminal clusters (Plate 5.6). Originating from southern Europe, it is now distributed in Western Australia from the south coast to Geraldton, and inland to Kalgoorlie (Hussey *et al.*, 2007). This species was recorded twice in the Pastoral land area and once in the Freehold land area.

**Carthamus lanatus* is listed as a Priority 1 Declared Plant in Western Australia, which prohibits the movement of plants or their seeds within the State. It is also listed as a Priority 4 weed in the Murchison region; this listing aims to prevent the infestation spreading beyond existing boundaries (DAF, 2009). The Priority 4 requirements state that the infested area must be managed in such a way as to prevent the spread of seeds or plant parts within and from the property.



Plate 5.6 – **Carthamus lanatus*

(Photography by S. Williamson & R. Knox. Image used with the permission of the Western Australian Herbarium, Department of Environment and Conservation (<http://florabase.dec.wa.gov.au/help/copyright>). Accessed on Saturday, 5 December 2009).

****Echium plantagineum* (POLYGONACEAE) – Declared Plant**

**Echium plantagineum* (Paterson’s Curse) is an erect, bristly annual, growing to 0.1 m to 0.6 m in height (WAHERB, December 2009). The numerous flowers are produced from September to January and are generally blue or purple, but can also be pink and white. The deep-veined, hairy and broad leaves form rosettes, and in late winter to spring a branched shoot system forms which carries the flowers (Plate 5.7). Originating from southern Europe, it is now widely distributed throughout agricultural land in south-west Australia particularly in the Geraldton Sandplains, Avon Wheatbelt and Swan Coastal Plain Bioregions (Hussey *et al.*, 2007). This species was recorded at seven locations in the Freehold land area.

**Echium plantagineum* is listed as a Priority 1 Declared Plant in Western Australia and this prohibits the movement of plants or their seeds within the State. It is also listed as a Priority 3 and Priority 4 weed in the wheatbelt, and these listings respectively aim to control an infestation by reducing the area and/or density of the infestation and to prevent the infestation from spreading beyond the existing boundaries of the infestation (DAF, December 2009). The Priority 3 and Priority 4 requirements state that the infested area must be managed in such a way as to prevent the spread of seeds or plant parts within and from the property. .



Plate 5.7 – **Echium plantagineum*

(Photography by J. Dodd & R. Knox. Image used with the permission of the Western Australian Herbarium, Department of Environment and Conservation (<http://florabase.dec.wa.gov.au/help/copyright>). Accessed on Saturday, 5 December 2009).

****Emex australis* (BORAGINACEAE) – Declared Plant**

**Emex australis* (Doublegee) is a hairless, prostrate annual plant, growing to 0.1 m to 0.6 m in height (WAHERB, December 2009). The green flowers are produced in winter as clusters in the leaf axils. The woody fruit has three rigid spines and the leaves are ovate (Plate 5.8). Originating from South Africa, it is now widely distributed throughout agricultural and waste land in south-west Australia particularly in the Geraldton Sandplains and Avon Wheatbelt (Hussey *et al.*, 2007; WAHERB, December 2009). This species was recorded at seven locations in the Freehold land area.

**Emex australis* is listed as a Priority 1 Declared Plant in certain regions in the south-west of Western Australia, which prohibits the movement of plants or their seeds within those regions. It is also listed as a Priority 3 and Priority 4 weed, and these listings respectively aim to control an infestation by reducing the area and/or density of the infestation and to prevent the infestation from spreading beyond the existing boundaries of the infestation (DAF, December 2009). The Priority 3 and 4 requirements state that the infested area must be managed in such a way as to prevent the spread of

seeds or plant parts within and from the property. The Priority 5 requirements state that infestations on public land must be controlled.



Plate 5.8 – **Emex australis*

(Photography by J. Dodd, R. Knox & Anon. Image used with the permission of the Western Australian Herbarium, Department of Environment and Conservation (<http://florabase.dec.wa.gov.au/help/copyright>). Accessed on Saturday, 5 December 2009).

5.4.2 Weeds of National Significance

The Australian Weeds Strategy (Australian Weeds Committee, 2006) defines a weed as “a plant that requires some form of action to reduce the harmful effects on the economy, the environment, human health and amenity”. Weeds that have proliferated in bushland without direct human intervention or assistance are also referred to as naturalised alien species.

The Weed Plan for Western Australia (State Weed Plan Steering Group, 2001) outlines 20 Weeds of National Significance. None of these species were recorded in the Project Area.

6 SURVEY LIMITATIONS AND CONSTRAINTS

According to the EPA Guidance Statement for Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia (EPA, 2004a), vegetation and flora surveys may be constrained by several aspects.

- Scope (i.e. the influence in terms of reference, such as what life forms etc. were sampled);
- Proportion of flora collected and identified (based on sampling, timing and intensity);
- Sources of information (i.e. pre-existing background versus new material);
- The proportion of the task achieved and further work which might be needed;
- Timing, weather, season and cycle;
- Disturbances (e.g. fire, flood, accidental human intervention, etc.);
- Intensity (i.e. in retrospect, was the intensity adequate?);
- Completeness (e.g. was the relevant area fully surveyed?);
- Resources (e.g. degree of expertise available in plant identification to taxon level);
- Access problems;
- Availability of contextual information; and
- Experience levels.

These constraints are addressed with regards to the Project Area in Table 6.1 overleaf.

Table 6.1 – Survey Limitations and Constraints

Aspect	Constraint	Comment
Sources of information and availability of contextual information (i.e. pre-existing background versus new material)	Negligible	Beard (1976) and Beard & Burn's (1976) mapped the vegetation of the Project Area at a scale of 1:000,000 and 1:250,000 respectively, however, at this scale the mapping is not very detailed. More recently the land systems (Curry <i>et al.</i> , 1994; Payne <i>et al.</i> , 1998) and soil-landscape systems (Rogers, 1996) have been mapped and these provide a good source of regional information. Other surveys that have been conducted close to the Project Area include EIA surveys at Weld Range, Jack Hills, Oakajee Port and Central Talling Land System (Section 2.8); however, these surveys have focused on landforms that are not common along the Project Area. Large sections of the Project Area have not been surveyed in detail before, and this report provides baseline vegetation and flora information on these areas.
The scope (i.e. what life forms were sampled)	None	The vascular flora of the Project Area was sampled. The survey scope was prepared in consultation with the relevant government agencies (via OPR), and was designed to comply with EPA requirements.
Proportion of flora collected and identified (based on sampling, timing and intensity)	None	6,864 specimens were collected during the survey of the Project Area (3430 specimens were collected from the Pastoral section and 2199 from the Freehold section during the quadrat survey, with a further 1,235 collected during the threatened flora survey) and the following identifications were made from these specimens. Taxa identified to species, subspecies and variety: 1015, of these 220 (21.7%) were annuals. Identified to family only: 8, Identified to genus only: 52. A species accumulation curve analysis indicates 110% of the total flora was recorded in the Freehold land area and 98% in the Pastoral land area.
Completeness and further work which might be needed (e.g. was the relevant area fully surveyed)	Moderate	Aerial photographs were used to select quadrat locations. This ensured that all areas displaying potentially different or unique vegetation units were visited during the survey. In addition, the botanists undertaking the survey ground-truthed the vegetation associations occurring in the sites chosen from the aerial photographs, and added or removed sites depending on the vegetation encountered while traversing the Project Area. Given the length and width of the Project Area, and that the quadrats were targeted in the vegetation units along the centreline, it is likely that small uncommon vegetation units, indistinguishable from aerial photography, and occurring away from the proposed alignment will not have been sampled. While targeted threatened flora surveys were carried out along most of the length of the Project Area, a 100 km long section has not been surveyed, as access to the land was not granted at the time of the survey. The Project Area incorporates some of the hilly areas at both Weld Range and Jack Hills. The vegetation units in these areas are probably more diverse than what has been mapped, but as the rail is unlikely to impact the hills, quadrats were not focused in these areas making it difficult to accurately map them. However, these areas have been intensely surveyed and mapped by other EIA surveys carried out by the respective mine proponents.
Mapping reliability	Negligible	Good aerial imagery was used to select sites and to reliably map the vegetation of most of the Project Area. However, aerial imagery available for a 40 km section of the Project Area through Yuin station was of poor quality and the mapping reliability will be slightly lower in this section. One quadrat per linear kilometre was pre selected before each field survey. This number is believed to be adequate to determine the vegetation of the 4 km wide corridor in the Pastoral and 3.2 km wide corridor in the Freehold, as the vegetation is relatively uniform along most of the Project Area. The areas that were more diverse (e.g. Moresby Range and salt lake communities) were more intensely surveyed. Also, any uncommon vegetation communities, that were not visible on the aerial photographs, and that were encountered during the survey were opportunistically sampled.

Aspect	Constraint	Comment
Timing/weather/season / cycle	None	<p>Rainfall recorded at Meekatharra in the six months preceding the phase one quadrat survey along Sections 1 and 2 in the Pastoral land area (June 2009) was 70 mm; this was 78.6 mm less than the long-term mean for the same six months. However, during 2008, 28% more rain than the long-term mean was recorded at Meekatharra Airport. Rainfall in the six months preceding the phase two transect survey for section 1 (September 2009) was 55.6 mm, 81.6 mm below the long-term mean for those months.</p> <p>Rainfall recorded at Mullewa in the six months preceding the phase one quadrat survey along Sections 2 and 4 in the Pastoral land area (April/May 2009) was 51.1 mm; this was 28.1 mm less than the long-term mean for the same six months. However, during 2008, 14% more rain than the long-term mean was recorded at Mullewa. Rainfall in the six months preceding the phase two transect survey for section 3 (September 2009) was 235.1 mm, 20.4 mm below the long-term mean for those months and section 4 (October, 2009) was 265.2 mm, 7.1 mm above the long-term mean for those months.</p> <p>Rainfall recorded at Geraldton Airport in the six months preceding the phase one quadrat survey along the Freehold section (Section 1, August 2009) was 251.4 mm; this is 62.5 mm less than the long-term mean for the same six months. During 2008, 22% less rain than the long-term mean was recorded at Geraldton Airport. Rainfall in the six months preceding the phase two transect survey for section 5 (October 2009) was 357.8 mm, 26.2 mm less the long-term mean for those months.</p>
Disturbances (e.g. fire, flood, accidental human intervention)	None	Farming has affected the condition of the vegetation in the Freehold section of the Project Area. Factors affecting the vegetation condition include; clearing of land, the introduction of weeds and the proliferation of species that are resistant to grazing and salinity. As a result, remnants in good condition were targeted in this section of the Project Area. Recent, low intensity and localised fires had occurred in small patches of vegetation. This did not affect the vegetation mapping, as nearby, unburnt patches of similar vegetation were surveyed.
Intensity (in retrospect, was the intensity adequate?)	None	Approximately one quadrat per 0.91 km was surveyed along the length of the Project Area (605 <i>ecologia</i> quadrats and 9 Weld Range quadrats over approximately 560 km). This was adequate to map the vegetation communities of the Project Area.
Resources	None	Resources were adequate for the botanical survey, as 141 person days were invested in the field during the quadrat surveys and 85 person days during the targeted threatened flora surveys.
Access problems	Moderate	<p>All sections of the Project Area were accessible on foot; however, some areas of the Moresby Range were very densely vegetated and they were impenetrable.</p> <p>One patch of remnant vegetation in the Freehold section of the Project Area could not be surveyed as the owners denied access to the property. While aerial photographs indicate that similar vegetation occurs in the quadrats surveyed close by, the actual species composition is not known. A property in the Pastoral land area, spanning approximately 150 km, was not surveyed during the threatened flora survey as the owners denied access to the property (indicated by Section 2 in Figure 3.1).</p>
Experience levels (e.g. degree of expertise in plant identification to taxon level)	None	The field botanists on the surveys had between one and four years of experience in conducting botanical surveys of this type and in the Gascoyne and Murchison bioregions. Plant specimens were collected from each quadrat surveyed for verification by a plant taxonomist. The plant taxonomists have had between 2 and 15 years of experience of identifying the flora of Western Australia, and challenging specimens were identified with the help of experts at the Western Australian Herbarium. The project was overseen by the principle botanist with 19 years of experience in surveys of this kind.

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7 VEGETATION COMMUNITIES CONSERVATION ASSESSMENT

The significance of the vegetation of the Project Area has been assessed at four spatial scales; national, state, regional and local.

Conservation significance is being calculated for the whole Project Area. The actual impact from the proposed rail alignment will be discussed in a separate document in the OPR Rail Public Environmental Review.

7.1 VEGETATION OF NATIONAL SIGNIFICANCE

National significance refers to those features of the environment which are recognised under legislation as being of importance to the Australian community. TECs listed under the *EPBC Act* are regarded as nationally significant.

No TECs of national significance were recorded in the Project Area.

7.2 VEGETATION OF STATE SIGNIFICANCE

State significance refers to those features of the environment that are recognised under State legislation as being of importance to the Western Australian community, in particular, communities listed as PECs. Ecological communities with insufficient information available to be considered a TEC, or which are rare but not currently threatened, are placed on the Priority list and referred to as PECs; four Priority 1 state-listed PECs were recorded in the Project Area and are of state significance.

A Priority 1 PEC is defined as a poorly known ecological community with apparently few and small occurrences, with all or most not actively managed for conservation (e.g. within agricultural or Pastoral lands, urban areas and 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. The PECs recorded in the Project Area include:

1. Jack Hills vegetation complexes (Banded Ironstone Formation); associated with vegetation communities; Mh1, Mh2, Mh3, Mh4 and Mc3. These communities are restricted to Jack Hills and are significant.
2. Plant assemblages of the Moresby Range system; associated with vegetation communities; Gh1, Gh2 and Gh3. These communities are restricted to the Moresby Range and are significant.
3. Tallering Peak vegetation complexes; associated with vegetation communities Yh1 and Yp2. Yh1 is restricted to the Tallering land system and is significant, whereas Yp2 is more widespread in the local area and is not significant.
4. Weld Range vegetation complexes (Banded Ironstone Formation); associated with vegetation communities; Mh5, Mh6, Mh7, Mh8, Mc3 and Mc4. These communities were restricted to the Weld Range and are significant.

7.3 VEGETATION OF REGIONAL SIGNIFICANCE

Regional significance addresses the representation of species and habitats at a biogeographic regional level. Species or habitat types that are endemic to the Geraldton Sandplains, Yalgoo and Murchison bioregions and whose distributions are limited or unknown are considered regionally significant.

Regional conservation significance of the vegetation communities of the Project Area has been assessed based upon two sources of information; land systems and Beards vegetation mapping of the Project Area. These are the only wide scale mapping projects that have been carried out in Western Australia and are a means of determining regional significance.

7.3.1 Land System and Soil-Landscape System Analysis

The Project Area has been mapped into 30 land systems and 10 soil-landscape systems. As the vegetation communities, though not always restricted to, are associated with certain land systems, the extent of each in Western Australia gives a reasonably accurate measure to determine vegetation communities that are not widespread and are therefore significant in the Project Area.

In the discussion below, a density of number of Priority Flora records is provided as a means to compare the number of records of each Priority Flora taxon between each system to determine if it is significant habitat for these species. High numbers of Priority Flora counts are often seen in large systems only because it covers a large area and not because it provides suitable habitat and providing a density shows if a large system is significant or not. For every Priority Flora taxon listed below, a percentage is given to represent the percent of the total records for each Priority Flora taxon in each system e.g. a percentage of 80% indicates that 80% of the records for that taxon occurred in that particular system. Only *ecologia* records are used in this section and one record means one GPS location. A matrix showing which Priority Flora taxa were recorded in each system is provided in Table P.1, Appendix P and a summary table for each land system is provided in Table 7.1.

In summary; systems that are considered significant because they have a low regional distribution and have a large area of the total system in the Project Area include; the Millex, Tallering, Weld, Yarrameedie and Yewin land systems and the Binnu, Casuarina, Dartmoor, Eradu, Greenough, Moresby and Northampton soil-landscape systems.

Systems considered significant because they provide significant habitat for Priority Flora include; the Kalli (18.8% of Priority Flora at 1 record / 50.1 ha), Moresby (15% of Priority Flora at 1 record / 8.3 ha), Northampton (14% of Priority Flora at 1 record / 19.9 ha), Sherwood (6.9% of Priority Flora at 1 record / 81.7 ha), Binnu (6.1% of Priority Flora at 1 record / 86 ha) and Weld (2.7% of Priority Flora at 1 record / 78.3 ha) systems.

Land System Analysis

Belele is a large, widespread land system characterised by hardpan wash plains and sandy banks and has 0.75% of its total area occurring within the Project Area. Two patches of the Belele system are mapped immediately south of Jack Hills making up 1.93% or 4,352 ha of the Project Area. Four Priority Flora taxa including; *Euphorbia sarcostemmoides* (31%), *Calytrix verruculosa* (73%), *Hemigenia tysonii* (9%) and *Hemigenia virescens* (9%) were recorded. Belele contained 5.5% of the total Priority Flora (1 record per 46.3 ha), which was a high density in the system. The Belele system has 1% of the total area classified as severely degraded and eroded. Belele is associated with vegetation communities; Mr1 and Mc5.

Beringarra is a small to moderate, averagely widespread land system characterised by major riverine plains and floodplains with 0.54% of its total area occurring within the Project Area. One small area of the Beringarra system is mapped at Jack Hills and another small area is mapped south of Weld Range, making up 0.63% or 1,422 ha of the Project Area. No Priority Flora was recorded. The Beringarra system is the most degraded system in the Pastoral land area, with 27% of its total area classified as severely degraded and eroded. Beringarra is associated with vegetation communities; Yf3 and Mc1.

Challenge is a very large, widespread land system characterised by sandy plains, granite outcrops and minor breakaways and has 1.7% of its total area occurring within the Project Area. Many patchy areas of the Challenge system were mapped south of Weld Range, making up 7.63% or 17,211 ha, the third largest system in the Project Area. Nine Priority Flora taxa, including; *Chamelaucium* sp. Yalgoo (Y. Chadwick 1816) (100%), *Euphorbia sarcostemmoides* (3%), *Petrophile vana* (44%), *Sauropus* sp. Woolgorong (M. Officer s.n. 10/8/94) (6%), *Acacia speckii* (14%), *Calytrix erosipetala* (30%), *Eremophila muelleriana* (24%), *Petrophile pauciflora* (13%) and *Verticordia jamiesonii* (44%) were recorded. The Challenge system contained 4.7% of the total Priority Flora (1 record per 212.5 ha), which was a low density in the system. No areas in the Challenge system were classified as severely degraded and eroded. Challenge is associated with vegetation communities; Yh3, Yp6, Mh11, Mh17, Mh18, Mp9 and Mc6.

Cunyu is a moderate to large and widespread land system characterised by calcreted drainage zones and calcreted platforms with 0.47% of its total area occurring within the Project Area. One small patch of the Cunyu system was mapped at Weld Range, making up 0.69% or 1,545 ha of the Project Area. No Priority Flora was recorded. The Cunyu system has 1% of the total area classified as severely degraded and eroded. Cunyu is associated with vegetation community; Mp6.

Ero is small to moderate and restricted land system characterised by tributary floodplains on hardpan plains and has 1.82% of its total area occurring within the Project Area. Four small areas of the Ero land system were mapped from Jack Hills to south of Weld Range, making up 1.73% or 3,907 ha of the Project Area. Four Priority Flora taxa, including; *Euphorbia sarcostemmoides* (1%), *Sauropus* sp. Woolgorong (M. Officer s.n. 10/8/94) (6%), *Eremophila arachnoides* subsp. *arachnoides* (100%) and *Ptilotus beardii* (6%) were recorded. The Ero system contained 0.4% of the total Priority Flora (1 record per 651.2 ha), which was a very low density in the system. The Ero system has 13% of the total area classified as severely degraded and eroded, the second most degraded system in the Pastoral land area. Ero is associated with vegetation communities; Yf2, Yc2, Mp3, Mc5, Mc6 and Mc8.

Flood is a small to moderate and restricted land system characterised by hardpan wash plains and sand banks and has 1.8% of its total area occurring within the Project Area. One area of the Flood system was mapped at Jack Hills making up 1.33% or 2,999 ha of the Project Area. One Priority taxon, *Euphorbia sarcostemmoides* (13%) was recorded. The Flood system contained 0.5% of the total Priority Flora (1 record per 333 ha), which was a low density in the system. No areas in the

Flood system are classified as severely degraded and eroded. Flood is associated with vegetation community; Mc3

Gabanintha is a small to moderate and restricted land system characterised by volcanic ridges, hills and footslopes and has 1.07% of its total area occurring within the Project Area. Four small areas of the Gabanintha system were mapped from immediately south of Weld Range to near the Freehold land area making up 1.19% or 2,688 ha of the Project Area. Six Priority Flora taxa, including; *Euphorbia sarcostemmoides* (4%), *Acacia speckii* (2%), *Acacia subsessilis* (6%), *Grevillea stenostachya* (1%), *Hemigenia virescens* (2%) and *Grevillea inconspicua* (33%) were recorded. The Gabanintha system contained 0.6% of the total Priority Flora (1 record per 268.8 ha), which was a low density in the system. No areas in the Gabanintha system are classified as severely degraded and eroded. Gabanintha is associated with vegetation communities; Yh3, Mh15 and Mh16.

Joseph is a moderate to large and widespread land system characterised by undulating yellow sandplains and has 0.17% of its total area occurring within the Project Area. One small area of the Joseph system was mapped on the border of the Freehold land area, making up 0.36% or 809 ha of the Project Area. No Priority Flora was recorded. No areas in the Joseph system are classified as severely degraded and eroded. Joseph is associated with vegetation community; Yp3

Jundee is a large, widespread land system characterised by hardpan plains and ironstone gravel mantles and has 0.66% of its total area occurring within the Project Area. A few small patches of the Jundee system were mapped around Weld Range, making up 1.94% or 4,363 ha of the total Project Area. No Priority Flora was recorded. No areas in the Jundee system are classified as severely degraded and eroded. Jundee is associated with vegetation communities; Mp8 and Mc4.

Kalli is a very large and widespread land system characterised by red sandplains and has 1.44% of its total area occurring within the Project Area. Many patches of the Kalli system were mapped across the Murchison and Yalgoo bio-regions, making up 7.15% or 16,124 ha, the fourth most widespread system in the Project Area. Thirteen Priority Flora taxa, including; *Euphorbia sarcostemmoides* (9%), *Petrophile vana* (6%), *Sauropus* sp. Woolgorong (M. Officer s.n. 10/8/94) (72%), *Acacia subsessilis* (6%), *Calytrix erosipetala* (10%), *Dicrasyllis linearifolia* (86%), *Eremophila muelleriana* (1%), *Grevillea stenostachya* (88%), *Hemigenia tysonii* (50%), *Hemigenia virescens* (59%), *Prostanthera petrophila* (81%), *Baeckea* sp. Melita Station (H. Pringle 2738) (38%) and *Goodenia berringbinensis* (33.3%) were recorded. The Kalli system contained 18.8% of the total Priority Flora (1 record per 50 ha), which was the highest density in any system in the Project Area. No areas in the Kalli system are classified as severely degraded and eroded. Kalli is associated with vegetation communities; Yy1 and Mr2.

Koonmarra is a large, widespread land system characterised by stony quartzite plains and low rises and has 2.11% of its total area occurring in the Project Area. The Koonmarra system is mapped south of Jack Hills, making up 5.32% or 11,997 ha and the sixth most widespread system in the Project Area. Five Priority Flora taxa, including; *Euphorbia sarcostemmoides* (10%), *Calytrix verruculosa* (15%), *Dodonaea amplisemina* (19%), *Grevillea stenostachya* (1%) and *Hemigenia virescens* (2%) were recorded. The Koonmarra system contained 1.5% of the total Priority Flora (1 record per 480 ha) which was a low density in the system. No areas in the Koonmarra system are classified as severely degraded and eroded. Koonmarra is associated with vegetation communities; Mp1, Mp2, Mc2 and Mc5.

Mileura is a small to moderate and restricted land system characterised by saline and non-saline calcreted river plains and has 0.56% of its total area occurring in the Project Area. One small patch of the Mileura system was mapped at Weld Range, making up 0.65% or 1,454 ha of the Project Area. One Priority Flora taxon; *Goodenia berringbinensis* (33.3%) was recorded. Mileura contained 0.1% of the total Priority Flora (1 record per 1,455 ha), which was a very low density in the system. The Mileura system has 3% of the total area classified as severely degraded and eroded. Mileura is associated with vegetation communities; Mf1, Mf2 and Mf3.

Millex is a small and very restricted land system characterised by plains overlying granite and sandy banks, with a significant 6% of its total area occurring in the Project Area. One small patch of the Millex system is mapped south of Weld Range, making up 1.27% or 2,867 ha of the Project Area. Three Priority Flora taxa, including; *Acacia speckii* (1%), *Ptilotus beardii* (2%) and *Verticordia jamiesonii* (11%) were recorded. Millex contained 0.2% of the total Priority Flora (1 record per 956 ha) which was a low density in the system. No areas in the Millex system are classified as severely degraded and eroded. Millex is associated with vegetation communities; Mp7 and Mp9.

Millrose is a small to moderate and restricted land system characterised by stony plains on hardpan and granite, with irregularly distributed sand banks and has 1.2% of its total area occurring in the Project Area. A few small patches are mapped north of Weld Range, making up 0.58% or 1,317 ha of the Project Area. Six Priority Flora taxa, including; *Euphorbia sarcostemmoides* (1%), *Sauropus* sp. Woolgorong (M. Officer s.n. 10/8/94) (6%), *Calytrix uncinata* (17%), *Grevillea stenostachya* (7%), *Hemigenia tysonii* (14%) and *Hemigenia virescens* (2%) were recorded. Millrose contained 2% of the total Priority Flora (1 record per 39 ha) which was a high density in the system. No areas in the Millrose system are classified as severely degraded and eroded. Millrose is associated with vegetation communities; Mh10 and Mh14.

Mindura is a moderate to large and widespread land system characterised by low hills, ridges and outcrops of granite and has 0.72% of its total area occurring within the Project Area. Small patches of the Mindura system are mapped south of Jack Hills, making up 1.4% or 3,156 ha of the Project Area. Five Priority Flora taxa, including; *Euphorbia sarcostemmoides* (4%), *Acacia speckii* (8%), *Calytrix verruculosa* (3%), *Dodonaea amplisemina* (48%) and *Ptilotus beardii* (6%) were recorded. Mindura contained 1.7% of the total Priority Flora (1 record per 109 ha) which was a high density in the system. No areas in the Mindura system are classified as severely degraded and eroded. Mindura is associated with vegetation communities; Mh9, Mh10, Mp5 and Mc5.

Mulline is a very small and very restricted land system characterised by greenstone hills and has 0.45% of its total area occurring within the Project Area. One small area of the Mulline system is mapped near the Freehold as 0.04% or 89 ha of the total Project Area. No Priority Flora was recorded. No areas in the Mulline system are classified as severely degraded and eroded.

Nerramyne is a small to moderate and fairly widespread land system characterised by undulating sandy and gravelly plains with low plateaus and breakaways and has 2.29% of its total area in the Project Area. Large patches of the Nerramyne system are mapped immediately north of the Freehold, making up 2.55% or 5,752 ha of the Project Area. Three Priority Flora taxa, including; *Frankenia confusa* (7%), *Dicrastylis linearifolia* (11%) and *Petrophile pauciflora* (6%) were recorded. Nerramyne contained 0.3% of the total Priority Flora (1 record per 1,150 ha) at one of the lowest densities in the Project Area. No areas in the Nerramyne system are classified as severely degraded and eroded. Nerramyne is associated with vegetation communities; Yh2, Yp1, Yp2 and Yp5.

Norie is a small to moderate and fairly widespread land system characterised by granite hills, exfoliating domes and extensive tor fields and has 1.13% of its total area in the Project Area. Small patches of the Norie system is mapped throughout the Pastoral land area, making up 1.06% or 2,393 ha of the Project Area. Four Priority Flora taxa; *Petrophile vana* (25%), *Acacia speckii* (1%), *Dicrastylis linearifolia* (4%) and *Eremophila muelleriana* (8%) were recorded. Norie contained 1.3% of the total Priority Flora (1 record per 109 ha), which was a high density in the system. No areas in the Norie system are classified as severely degraded and eroded. Norie is associated with vegetation communities; Mh11, Mh12, Mh17 and Mp10.

Pindar is a small to moderate and restricted land system characterised by loamy and sandy plains and has 0.43% of its total area in the Project Area. One small area of the Pindar system was mapped near the Freehold, making up 0.29% or 646 ha of the Project Area. One Priority Flora taxon; *Acacia subsessilis* (12%) was recorded. Pindar contained 0.1% of the total Priority Flora (1 record per

323 ha) which was a medium density in the system. No areas in the Pindar system are classified as severely degraded and eroded. Pindar is associated with vegetation community; Yp4.

Sherwood is a very large and widespread land system characterised by saline footslopes of laterised breakaways and outcrops of weathered rock and has 0.61% of its total area in the Project Area. Large areas of the Sherwood system are mapped between Weld Range and Jack Hills, making up 4.27% or 9,636 ha of the Project Area. Twelve Priority Flora taxa, including; *Euphorbia sarcostemmoides* (6%), *Sauropus* sp. Woolgorong (M. Officer s.n. 10/8/94) (6%), *Acacia speckii* (38%), *Calytrix uncinata* (83%), *Dodonaea amplisemina* (4%), *Grevillea stenostachya* (1%), *Hemigenia tysonii* (2%), *Hemigenia virescens* (1%), *Petrophile pauciflora* (69%), *Ptilotus beardii* (85%), *Verticordia jamiesonii* (44%) and *Baeckea* sp. Melita Station (H. Pringle 2738) (38%) were recorded. The Sherwood system contained 6.9% of the total Priority Flora (1 record per 82 ha), which was a high density in the system. The Sherwood system has 2% of the total area classified as severely degraded and eroded. Sherwood is associated with vegetation communities; Mh13, Mp5, Mp6 and Mc5.

Tallering is a small and restricted land system characterised by prominent ridges and hills of BIF, dolerite and sedimentary rocks and has 3.17% of its total area in the Project Area. Two small areas of the Tallering system are mapped close to the border of the Freehold, making up 0.46% or 1,045 ha of the Project Area. No Priority Flora was recorded. No areas in the Tallering system are classified as severely degraded and eroded. Tallering is associated with vegetation communities; Yh1 and Yp2.

Tindalarra is a large, widespread land system characterised by hardpan plains with sparse drainage lines and has 4.1% of its total area in the Project Area. The Tindalarra system is very common near the Freehold boundary, making up 12.97% or 29,231 ha, the second most widespread of the Project Area. Eight Priority Flora taxa, including; *Euphorbia sarcostemmoides* (3%), *Gunniopsis divisa* (100%), *Frankenia confusa* (14%), *Acacia speckii* (3%), *Eremophila muelleriana* (41%), *Grevillea stenostachya* (1%), *Indigofera gilesii* subsp. *gilesii* (100%) and *Petrophile pauciflora* (13%) were recorded. The Tindalarra system contained 4.9% of the total Priority Flora (1 record per 321 ha) which was a low density in the system. The Tindalarra system has 4.3% of the total area classified as severely degraded and eroded. Tindalarra is associated with vegetation communities; Yp2, Yp5, Yf1, Yf2, Yf3, Yc1 and Yc2.

Violet is a large, widespread land system characterised by undulating stony and gravelly plains with low rises and has 0.34% of its total area in the Project Area. The Violet system is mapped in one area immediately south of Weld Range, making up 0.88% or 1,981 ha of the Project Area. Two Priority Flora taxa, including; *Dodonaea amplisemina* (4%) and *Grevillea inconspicua* (33%) were recorded. Violet contained 0.1% of the total Priority Flora (1 record per 991 ha) which was a low density in the system. No areas in the Violet system are classified as severely degraded and eroded. Violet is associated with vegetation community; Mp8.

Waguin is a moderate to large, widespread land system characterised by low breakaways with short stony and sandy plains, and has 0.18% of its total area in the Project Area. The Waguin system is mapped in one small area near the Freehold, making up 0.26% or 586 ha of the Project Area. Three Priority Flora taxa, including; *Petrophile vana* (19%), *Calytrix erosipetala* (60%) and *Baeckea* sp. Melita Station (H. Pringle 2738) (23%) were recorded. The Waguin system contained 0.7% of the total Priority Flora (1 record per 48.9 ha) which was a high density in the system. No areas in the Waguin system are classified as severely degraded and eroded. Waguin is associated with vegetation community; Mh18.

Weld is a small and restricted land system characterised by rugged ranges and ridges of BIF and has a significant 9.68% of its total area in the Project Area. The Weld system includes the Weld Range and Jack Hills, making up 1.6% or 3,604 ha of the Project Area. Seven Priority Flora taxa, including; *Sauropus* sp. Woolgorong (M. Officer s.n. 10/8/94) (6%), *Acacia speckii* (30%), *Calytrix verruculosa* (1%), *Dodonaea amplisemina* (27%), *Homalocalyx echinulatus* (8%), *Prostanthera petrophila* (19%)

and *Grevillea inconspicua* (33%) were recorded. The Weld system contained 2.7% of the total Priority Flora (1 record per 78.3 ha) which was a high density in the system. No areas in the Weld system are classified as severely degraded and eroded. Weld is associated with vegetation communities; Mh1, Mh2, Mh3, Mh4, Mh5, Mh6, Mc3 and Mc4.

Wiluna is a small to moderate and widespread land system characterised by low greenstone hills and lateritic breakaways, with lower saline stony plains and has 0.31% of its total area in the Project Area. The Wiluna system is mapped in one small area immediately south of Weld Range, making up 0.36% or 814 ha of the Project Area. No Priority Flora was recorded. No areas in the Wiluna system are classified as severely degraded and eroded. Wiluna is associated with vegetation community; Mh15.

Yandil is a moderate to large and widespread land system characterised by flat hardpan wash plains, and has 0.62% of its total area in the Project Area. The Yandil system is mapped in one area immediately south of Weld Range and one south of Jack Hills, making up 1.36% or 3,055 ha of the Project Area. Two Priority Flora taxa, including; *Calytrix verruculosa* (4%) and *Hemigenia tysonii* (4%) were recorded. Yandil contained 0.6% of the total Priority Flora (1 record per 305 ha) which were recorded at a low density in the system. The Yandil system has 3% of the total area classified as severely degraded and eroded. Yandil is associated with vegetation communities; Mr3, Mp2, Mp3, Mp4, Mp5, Mp8, Mp9, Mp11, Mp12 and Mc5.

Yanganoo is a very large land system characterised by flat hardpan wash plains and has 1.75% of its total area in the Project Area. Large areas of Yanganoo system are mapped along most of the Pastoral land area, making up 15.72% or 35,446 ha the most widespread system in the Project Area. Eight Priority Flora taxa, including; *Euphorbia sarcostemmoides* (6%), *Petrophile vana* (6%), *Acacia speckii* (2%), *Eremophila muelleriana* (8%), *Grevillea stenostachya* (2%), *Hemigenia tysonii* (20%), *Hemigenia virescens* (26%) and *Goodenia berringbinensis* (1%) were recorded. The Yanganoo system contained 5.3% of the total Priority Flora (1 record per 394 ha) which was a low density in the system. The Yanganoo system has 1% of the total area classified as severely degraded and eroded. Yanganoo is associated with vegetation communities; Yp5, Yc2, Mp7, Mc5, Mc6, Mc7, Mc8.

Yarrameedie is a small, restricted land system characterised by undulating stony interfluves and foot hill plains and has a significant 10.31% of its total area in the Project Area. Large areas of the Yarrameedie system are mapped below the major ranges seen in the Weld system, making up 3.13% or 7,045 ha of the Project Area. Four Priority Flora taxa, including; *Euphorbia sarcostemmoides* (6%), *Calytrix verruculosa* (4.4%), *Hemigenia tysonii* (0.6%) and *Homalocalyx echinulatus* (92%) were recorded. The Yarrameedie system contained 1.2% of the total Priority Flora (1 record per 352 ha) which was a low density in the system. No areas in the Yarrameedie system are classified as severely degraded and eroded. Yarrameedie is associated with vegetation communities; Mh3, Mh5 and Mh7.

Yewin is a small, restricted land system characterised by flat saline floodplains on the Greenough and Sanford Rivers and has 3.7% of its total area in the Project Area. One area of the Yewin system is mapped near the Freehold around the Greenough River, making up 0.73% or 1,692 ha of the Project Area. One Priority Flora taxon: *Frankenia confusa* (50%) was recorded. The Yewin system contained 0.4% of the total Priority Flora (1 record per 242 ha) which was a low density in the system. The Yewin system has 3% of the total area classified as severely degraded and eroded. Yewin is associated with vegetation communities; Yf4 and Yf5.

Soil-landscape System Analysis

The soil-landscape systems are mapped in the Freehold land area only. All of these systems are significant as they have largely been cleared for agriculture and most of the native vegetation remains as small patches of remnant bushland.

Binnu is a small to moderate and fairly restricted soil-landscape system characterised by gently undulating yellow sandplains with numerous dune ridges and has 6.44% of its total area in the

Project Area. A large area of the Binnu system is mapped to the eastern end of the Freehold, making up 3.97% or 8,947 ha of the Project Area, however of this total only 16.8% is native vegetation and the rest has been cleared. Fourteen Priority Flora taxa, including: *Acacia lineolata* subsp. *multilineata* (100%), *Mirbelia ternata* (67%), *Scholtzia* sp. Binnu (M.E. Trudgen 2218) (100%), *Thryptomene* sp. Wandana (M.E. Trudgen MET 22016) (67%), *Homalocalyx inerrabundus* (100%), *Scholtzia* sp. East Yuna (A.C. Burns 6) (75%), *Thryptomene* sp. East Yuna (J.W. Green 4639) (50%), *Acacia leptospermoides* subsp. *psammophila* (50%), *Acacia speckii* (2%), *Acacia subsessilis* (24%), *Calytrix formosa* (50%), *Grevillea asparagoides* (100%), *Jacksonia velutina* (100%) and *Verticordia capillaris* (96%) were recorded. The Binnu system contained a significant 6.1% of the total Priority Flora (1 record per 35 ha), which was a high density in the system. Binnu is associated with vegetation communities; Gy2 and Gp2.

Casuarina is a small and restricted soil-landscape system characterised by a level to gently undulating grey to pale brown sandplain and has 0.61% of its total area in the Project Area. Scattered small patches of the Casuarina system are mapped in the centre of the Freehold, making up 0.19% or 430 ha of the Project Area, however of this total 2.3% is native vegetation and the rest has been cleared. No Priority Flora was recorded. Casuarina is associated with vegetation community; Gp1.

Dartmoor is a small to moderate and fairly restricted soil-landscape system characterised by an undulating drainage network and has 13.63% of its total area in the Project Area. Large areas of the Dartmoor system are mapped towards the east of the Freehold land area, making up 6.9% or 15,678 ha of the Project Area, however of this total 19.1% is native vegetation and the rest has been cleared. Eleven Priority Flora taxa, including; *Mirbelia ternata* (33%), *Thryptomene* sp. Wandana (M.E. Trudgen MET 22016) (33%), *Frankenia confusa* (29%), *Thryptomene* sp. East Yuna (J.W. Green 4639) (50%), *Acacia leptospermoides* subsp. *psammophila* (50%), *Acacia subsessilis* (41%), *Calytrix formosa* (50%), *Grevillea triloba* (1%), *Microcorys tenuifolia* (100%), *Ptilotus beardii* (2%) and *Verticordia capillaris* (4%) were recorded. The Dartmoor system contained 1.6% of the total Priority Flora (1 record per 560 ha) which was a low density in the system. Dartmoor is associated with vegetation communities; Gp1, Gf1 and Gf2.

Eradu is a small to moderate and fairly restricted soil-landscape system characterised by level to gently undulating sand plains and has 4.95% of its total area in the Project Area. A large section in the middle of the Freehold is mapped as the Eradu system, making up 3.19% or 7,183 ha of the Project Area, however of this total 7% is native vegetation and the rest has been cleared. One Priority Flora taxon; *Verticordia chrysostachys* var. *pallida* (100%) was recorded. The Eradu system contained 0.3% of the total Priority Flora (1 record per 1437 ha), which was a low density over the system. Eradu is associated with vegetation community; Gy1.

Greenough is a very small and restricted soil-landscape system characterised by the river beds and alluvial flats of the Greenough River and has a significant 25.7% of its total area in the Project Area. The Greenough system loosely follows the Project Area corridor and crosses back and forth a number of times in the Freehold, making up 2.05% or 4,620 ha of the Project Area, however of this total 42% is native vegetation and the rest has been cleared. Three Priority Flora taxa, including; *Scholtzia* sp. East Yuna (A.C. Burns 6) (25%), *Acacia subsessilis* (12%) and *Eremophila muelleriana* (19%) were recorded. The Greenough system contained 2.3% of the total Priority Flora (1 record per 115 ha) which was a high density in the system. Greenough is associated with vegetation communities; Gp1 and Gc1.

Moresby is a very small and restricted soil-landscape system characterised by flat topped ranges and isolated mesas and it has a significant 8.03% of its total area in the Project Area. The Moresby system is mapped in one large area at the western end of the Freehold, making up 0.95% or 2,144 ha of the Project Area, however of this total 33% is native vegetation and the rest has been cleared. The footslopes and tops of some of the larger mesas have been cleared for crop and the steeper sides are

commonly un-cleared. Two DRF taxa: *Caladenia hoffmanii* (100%) and *Eucalyptus blaxellii* (58%) and 12 Priority Flora taxa, including; *Lepidosperma* sp. Moresby Range (R.J. Cranfield 2751) (39%), *Melaleuca huttensis* (100%), *Leucopogon borealis* (100%), *Leucopogon* sp. Howatharra (D. & N. McFarland 1046) (100%), *Thryptomene stenophylla* (50%), *Acanthocarpus parviflorus* (17%), *Grevillea triloba* (45%), *Serichonus gracilipes* (100%), *Thryptomene* sp. Moresby Range (A.S. George 14873) (100%), *Acacia guinetii* (100%), *Diuris recurva* (100%) and *Verticordia penicillaris* (25%) were recorded. The Moresby system contained 15% of the total Priority Flora (1 record per 8 ha), which was the highest density for a system in the Project Area. Moresby is associated with vegetation communities; Gh1, Gh2, Gh3 and Gp1.

Mt Horner is a very small and restricted soil-landscape system characterised by lateritic breakaways with spillway sands and has 1.34% of its total area in the Project Area. The Mount Horner system is mapped in a small area in the middle of the Freehold making up 0.18% or 395 ha of the Project Area, however of this total 45.8% is native vegetation and the rest has been cleared. No Priority Flora was recorded. Mt Horner is associated with vegetation community; Gp1.

Northampton is a small and restricted soil-landscape system characterised by narrow valleys, low rolling rises and hills, with an integrated drainage pattern and has 5.73% of its total area in the Project Area. A large section of the Northampton system is mapped at the western edge of the Freehold, making up 2.12% or 4,780 ha of the Project Area, however of this total 20% is native vegetation and the rest has been cleared for agriculture, with native vegetation only left on the steeper slopes of the drainage lines. One DRF taxon; *Eucalyptus blaxellii* (42%) and eight Priority Flora taxa, including; *Lepidosperma* sp. Moresby Range (R.J. Cranfield 2751) (61%), *Thryptomene stenophylla* (50%), *Acanthocarpus parviflorus* (83%), *Blackallia nudiflora* (100%), *Geleznovia verrucosa* subsp. Kalbarri (L.M. Broadhurst 123) (100%), *Grevillea triloba* (53%), *Verticordia densiflora* var. *roseostella* (100%) and *Verticordia penicillaris* (75%) were recorded. The Northampton system contained 14% of the total Priority Flora (1 record per 20 ha), which was the second highest density for a system in the Project Area. Northampton is associated with vegetation communities; Gp1 and Gc2.

Sugarloaf is a small and restricted soil-landscape system characterised by undulating rolling rises and has 3.51% of its total area in the Project Area. An area of the Sugarloaf system is mapped to the east of the Moresby Ranges, making up 0.90% or 2,021 ha of the Project Area, however of this total 16.5% is native vegetation and the rest has been cleared. No Priority Flora was recorded. Sugarloaf is associated with vegetation community; Gp1.

Tamala is a very small and restricted soil-landscape system characterised by low limestone hills that run parallel to the coast and has <0.01% of its total area in the Project Area. A small area of the Tamala system is mapped on the far western boundary of the Project Area. This is a very insignificant amount (0.15 ha) and does not relate to the conservation significance of the Project Area. The conservation significance of the Tamala system is discussed in the Oakajee Port Vegetation and Flora survey.

Table 7.1 – Land System and Soil-Landscape System Conservation Significance Assessment

	Land or Soil Landscape System	Area in WA (ha)	% of the Total System	Area in Project Area (ha)	% in the Project Area	% of Native Vegetation Remaining Within the Project Area	% With No to Minor erosion	% With Moderate to Severe Erosion	% That is Severely Degraded & Eroded	No of Priority Flora Recorded	% of Priority Flora Records	Density of Priority Flora Records (ha)	Vegetation Communities Associated With the System
Soil-landscape System	Binnu	138,843	6.4	8,947.3	4.0	16.8	-	-	-	13	6.1	86.0	Gy2, Gp2
	Casuarina	70,117	0.6	429.5	0.2	2.3	-	-	-	-	-	-	Gp1
	Dartmoor	115,013	13.6	15,677.5	7.0	19.1	-	-	-	11	1.6	559.9	Gp1, Gf1, Gf2
	Eradu	145,118	4.9	7,183.1	3.2	7.0	-	-	-	1	0.3	1436.6	Gy1
	Greenough	17,976	25.7	4,619.7	2.0	42.0	-	-	-	3	2.3	115.5	Gp1, Gc1
	Moresby	26,697	8.0	2,144.3	1.0	33.0	-	-	-	14	15.0	8.3	Gh1, Gh2, Gh3, Gp1
	Mt Horner	29,451	1.3	394.9	0.2	45.8	-	-	-	-	-	-	Gp1
	Northampton	83,467	5.7	4,780.0	2.1	20.0	-	-	-	9	14.0	19.9	Gp1, Gc2
	Sugarloaf	57,582	3.5	2,021.0	0.9	16.5	-	-	-	-	-	-	Gp1
	Tamala	7,274	0.0	0.2	0.0	n/a	-	-	-	-	-	-	n/a
Land System	Belele	578,300	0.8	4,352.4	1.9	-	96.0	4.0	0.6	4	5.5	46.3	Mr1, Mc5
	Beringarra	262,436	0.5	1,422.4	0.6	-	63.0	37.0	26.8	-	-	-	Yf3, Mc1
	Challenge	1,010,000	1.7	17,210.7	7.6	-	98.0	2.0	0.0	9	4.7	212.5	Yh3, Yp6, Mh11, Mh17, Mh18, Mp9, Mc6
	Cunyu	329,933	0.5	1,545.1	0.7	-	95.0	5.0	1.1	-	-	-	Mp6
	Ero	215,007	1.8	3,907.4	1.7	-	73.0	27.0	13.3	4	0.4	651.2	Yf2, Yc2, Mp3, Mc5, Mc6, Mc8

	Land or Soil Landscape System	Area in WA (ha)	% of the Total System	Area in Project Area (ha)	% in the Project Area	% of Native Vegetation Remaining Within the Project Area	% With No to Minor erosion	% With Moderate to Severe Erosion	% That is Severely Degraded & Eroded	No of Priority Flora Recorded	% of Priority Flora Records	Density of Priority Flora Records (ha)	Vegetation Communities Associated With the System
Land System	Flood	159,252	1.9	2,998.7	1.3	-	100.0	-	0.0	1	0.5	333.2	Mc3
	Gabanintha	251,455	1.1	2,688.3	1.2	-	99.0	1.0	0.1	6	0.6	268.8	Yh3, Mh15, Mh16
	Joseph	464,045	0.2	808.9	0.4	-	100.0	-	-	-	-	-	Yp3
	Jundee	660,224	0.7	4,363.0	1.9	-	98.0	2.0	-	-	-	-	Mp8, Mc4
	Kalli	1,115,901	1.4	16,124.0	7.2	-	100.0	-	-	13	18.8	50.1	Yy1, Mr2
	Koonmarra	569,874	2.1	11,996.7	5.3	-	100.0	-	-	5	1.5	479.9	Mp1, Mp2, Mc2, Mc5
	Mileura	261,223	0.6	1,454.5	0.6	-	93.0	7.0	2.7	1	0.1	1454.5	Mf1, Mf2, Mf3
	Millex	47,825	6.0	2,867.5	1.3	-	95.0	5.0	-	3	0.2	955.8	Mp7, Mp9
	Millrose	109,649	1.2	1,317.4	0.6	-	96.0	4.0	-	6	2.0	38.7	Mh10, Mh14
	Mindura	440,593	0.7	3,156.0	1.4	-	100.0	-	-	5	1.7	108.8	Mh9, Mh10, Mp5, Mc5
	Mulline	19,688	0.5	89.0	<0.1	-	100.0	-	-	-	-	-	n/a
	Nerramyne	250,958	2.3	5,751.9	2.6	-	93.0	7.0	0.4	3	0.3	1150.4	Yh2, Yp1, Yp2, Yp5
	Norie	211,177	1.1	2,392.7	1.1	-	100.0	-	-	4	1.3	108.8	Mh11, Mh12, Mh17, Mp10
	Pindar	151,876	0.4	646.3	0.3	-	100.0	-	-	1	0.1	323.2	Yp4
	Sherwood	1,579,691	0.6	9,636.0	4.3	-	89.0	11.0	2.1	12	6.9	81.7	Mh13, Mp5, Mp6, Mc5
Tallerig	32,949	3.2	1,045.3	0.5	85.4	100.0	-	-	-	-	-	Yh1, Yp2	
Tindalarra	713,173	4.1	29,231.3	13.0	-	96.0	4.0	1.6	8	5.3	321.2	Yp2, Yp5, Yf1, Yf2, Yf5, Yc1, Yc2	

	Land or Soil Landscape System	Area in WA (ha)	% of the Total System	Area in Project Area (ha)	% in the Project Area	% of Native Vegetation Remaining Within the Project Area	% With No to Minor erosion	% With Moderate to Severe Erosion	% That is Severely Degraded & Eroded	No of Priority Flora Recorded	% of Priority Flora Records	Density of Priority Flora Records (ha)	Vegetation Communities Associated With the System
Land System	Violet	584,096	0.3	1,981.2	0.9	-	98.0	2.0	0.2	2	0.1	990.6	Mp8
	Waguin	317,146	0.2	586.3	0.3	-	99.0	1.0	-	3	0.7	48.9	Mh18
	Weld	37,235	9.7	3,603.5	1.6	-	100.0	-	-	7	2.7	78.3	Mh1, Mh2, Mh3, Mh4, Mh5, Mh6, Mh8, Mc3, Mc4
	Wiluna	258,978	0.3	813.8	0.4	-	99.0	1.0	-	-	-	-	Mh15
	Yandil	494,525	0.6	3,054.9	1.4	-	95.0	5.0	3.2	2	0.6	305.5	Mr3, Mp2, Mp3, Mp4, Mp5, Mp8, Mp9, Mp11, Mp12, Mc5
	Yanganoo	2,019,907	1.8	35,445.7	15.7	-	98.0	2.0	0.8	8	5.3	393.8	Yp5, Yc2, Mp7, Mc5, Mc6, Mc7, Mc8
	Yarrameedie	68,324	10.3	7,045.3	3.1	-	100.0	-	-	4	1.2	352.3	Mh3, Mh5, Mh7
	Yewin	45,709	3.7	1,692.3	0.8	-	89.0	11.0	3.4	1	0.4	241.8	Yf4, Yf5

7.3.2 Beard Mapping Analysis

Assessment of the significance at a state level of the vegetation of the Project Area is constrained by the lack of mapping across the state at a scale comparable to the mapping during the current survey. The only source of vegetation mapping available across the state is that conducted by Beard (1976) and Beard & Burns (1976) at a scale of 1:1000000, with areas of the south-west mapped at 1:250,000. The vegetation of the Project Area was mapped as 28 communities by Beard (1976) and Beard & Burns (1976). As this mapping was completed at a large scale, it does not accurately represent the mapped communities in the Project Area. Quite often one or a number of the vegetation communities mapped during the current survey can be attributed to a Beard vegetation unit, where it becomes a useful tool to loosely determine the potential extent of this community in the region.

As the Beard mapping was completed at a high scale many minor details including drainage channels, creeklines and low hill slopes are not mapped and cannot be related to the Beard mapping. As this mapping was completed in 1976 old species names used by Beard could be referring to a newly described species.

A summary table for each Beard unit is provided in Table 7.2 and are further described below;

The Beard mapping has been completed as if it was pre-European settlement, therefore the areas in the Freehold section of the Project Area are inaccurate as they don't take any land clearing into consideration. Areas of remnant vegetation in the Geraldton Sandplains region have been mapped and overlain over the Beard vegetation map to give an idea of the amount of each remaining (Table 7.3).

a1,14Si: *Acacia aneura* and *Acacia quadrimarginea* scrub.

a1,14Si is a moderate to large and widespread Beard unit that is mapped as 1.1% of the Project Area. Of the total area of the Beard unit, 0.6% occurs within the Project Area. The vegetation communities related to this unit include those associated with the Jack Hills PEC; Mh1, Mh2, Mh3, Mh4 and Mc3 and those associated with the Weld Range PEC; Mh5, Mh6, Mh7, Mh8, Mc3 and Mc4. The distribution of this vegetation unit includes many of the BIF ranges in Western Australia and because the vegetation communities vary substantially between each BIF range, it does not accurately represent the potential distribution of these *ecologia* vegetation communities.

a1,8Sr k1,2Ci: *Acacia aneura* and *Acacia sclerosperma* with *Atriplex* and *Maireana* spp. succulent steppe.

a1,8Sr k1,2Ci is a small to moderate and restricted Beard unit that is mapped as 1.5% of the Project Area. Of the total area of the Beard unit, 1.6% occurs within the Project Area. The vegetation communities related to this unit include those associated with the salt lake floodplains near Weld Range: Mf1, Mf2 and Mf3. The distribution of the Beard unit in Western Australia includes the floodplains from a number of different land systems and because these vary substantially, it is unlikely to be an indicator for the regional distribution of the *ecologia* communities. It does however indicate areas with the potential for these vegetation units to occur, which shows that there is not much in Western Australia and are therefore significant.

a1,9Li: *Acacia aneura*, *Acacia ramulosa* var. *ramulosa* and *Acacia ramulosa* var. *linophylla* low woodland.

a1,9Li is a small and restricted Beard unit that is mapped as 3% of the Project Area. Of the total area of the Beard unit, 7.3% occurs within the Project Area. The vegetation communities related to this unit include those associated with the red sandplains, Mr2. The distribution of

this vegetation unit is not an accurate representation of the potential distribution of the *ecologia* vegetation community.

a10,11Si k1,2Ci: *Acacia victoriae*, *Acacia xiphophylla* and *Acacia eremaea* with *Atriplex* and *Maireana* spp. succulent steppe.

a10,11Si k1,2Ci is a small and restricted Beard unit that is mapped as 1% of the Project Area. Of the total area of the Beard unit, 3% occurs within the Project Area. The vegetation communities related to this unit include; Yf3 and Mc1. The distribution of this vegetation unit loosely represents the potential distribution of the *ecologia* vegetation communities and shows that they are represented out side of the Project Area.

a14Si: *Acacia quadrimarginea* scrub.

a14Si is a very small and restricted Beard unit that is mapped as 0.1% of the Project Area. Of the total area of the Beard unit, 3% occurs within the Project Area. The vegetation communities related to this unit include that associated with the Tallering Peak PEC, Yh1. The distribution of this vegetation unit represents the potential distribution of the *ecologia* vegetation community, showing that it is very restricted and uncommon locally and regionally.

a1Li: *Acacia aneura* low woodland.

a1Li is the largest and most widespread Beard unit that is mapped as 24% of the Project Area. Of the total area of the Beard unit, 0.2% occurs within the Project Area. The *ecologia* vegetation communities related to this unit include those recorded on the hardpan plains across the Yalgoo and Murchison bioregions, including; Mp6, Mp9, Mp11, Mp12, Mc5, Mr3, Mh5, Mp5, Mh9, Mh10, Mh14, Mp1, Mp2 and Mp8. The large area covered by this vegetation unit shows that the potential distribution of the *ecologia* vegetation communities associated with it are widespread and common in Western Australia.

a1Li a9,17Si: *Acacia aneura* low woodland with understory of *Acacia ramulosa* var. *ramulosa*, *Acacia ramulosa* var. *linophylla* and *Acacia grasbyi*.

a1Li a9,17Si is a very large and widespread Beard unit that is mapped as 13.4% of the Project Area. Of the total area of the Beard unit, 2.7% occurs within the Project Area. The vegetation communities related to this unit include those associated with floodplains of the Yalgoo region, including; Yp5 and Yp6. The large area covered by this vegetation unit shows that the potential distribution of the *ecologia* vegetation communities associated with it are widespread and common in Western Australia.

a1Lp: *Acacia aneura*, trees in groves or patches.

a1Lp is a very large and widespread Beard unit that is mapped as 16.3% of the Project Area. Of the total area of the Beard unit, 0.5% occurs within the Project Area. The vegetation communities related to this unit include those associated with the sandy plains in the Murchison region, including; Mp2, Mp3, Mp4, Mr1, Mr2, Mr3. The distribution of this vegetation unit shows that the common *ecologia* vegetation communities represent a large potential distribution in Western Australia.

a1Si: *Acacia aneura* scrub.

a1Si is a very large and widespread Beard unit that is mapped as 3.5% of the Project Area. Of the total area of the Beard unit, 0.1% occurs within the Project Area. The vegetation communities related to this unit include those associated with rockier areas, including; Mh10, Mh11, Mh12, Mh15, Mh16, Mp6, Mp9 and Mp10. The distribution of this vegetation unit shows that these *ecologia* communities have the potential to occur over a large area in Western Australia and are not significant.

a33Sc: *Acacia rostelifera* thicket.

a33Sc is a very small and restricted Beard unit that is mapped as 0.5% of the Project Area. Of the total area of the Beard unit, 35.9% occurs within the Project Area. The vegetation community related to this unit include; Gc2. Gc2 is therefore very significant in the Project Area as such a large percentage of its total is mapped. This is therefore a very significant vegetation community, as it was more than likely locally abundant as mapped by Beard, but is now largely cleared. Based on the known current extent of this vegetation unit in the Geraldton Sandplains region, 75% occurs within the Project Area. This unit has half of its known distribution in the Geraldton Sandplains region and is moderately endemic.

a8,9Sr k1,2Ci: *Acacia sclerosperma*, *Acacia ramulosa* var. *ramulosa* and *Acacia ramulosa* var. *linophylla* with *Atriplex* and *Maireana* spp. succulent steppe.

a8,9Sr k1,2Ci is a small to moderate and restricted Beard unit that is mapped as 0.05% of the Project Area. Of the total area of the Beard unit, 0.1% occurs within the Project Area. It therefore is not widespread in the Project Area and any impact to this unit is unlikely.

a8Sr k1,2Ci: *Acacia sclerosperma* with *Atriplex* and *Maireana* spp. succulent steppe.

a8Sr k1,2Ci is a small and restricted Beard unit that is mapped as 0.8% of the Project Area. Of the total area of the Beard unit, 11.9% occurs within the Project Area. The vegetation communities related to this unit include those associated with major creeklines in the Yalgoo area and include; Yc1, Yf4 and Yf5. The distribution of this vegetation unit shows that the potential distribution of the associated *ecologia* vegetation communities in Western Australia is limited and are therefore significant.

a9,19Si: *Acacia ramulosa* var. *ramulosa*, *Acacia ramulosa* var. *linophylla* and *Acacia acuminata* scrub.

a9,19Si is a large and widespread Beard unit that is mapped as 1.6% of the Project Area. Of the total area of the Beard unit, 0.5% occurs within the Project Area. The vegetation communities related to this unit include those associated with hardpan plains, including; Yp2 and Yp6. The distribution of this Beard vegetation unit shows that these *ecologia* communities have the potential to occur over a large area in Western Australia and are not significant.

a9,20Si: *Acacia ramulosa* var. *ramulosa*, *Acacia ramulosa* var. *linophylla* and *Acacia murrayana* scrub.

a9,20Si is a moderate to large and fairly widespread Beard unit that is mapped as 1.4% of the Project Area. Of the total area of the Beard unit, 1.5% occurs within the Project Area. The vegetation communities related to this unit include those associated with hardpan plains and sandy plains; Yp2 and Yy1. The distribution of this Beard vegetation unit shows that these *ecologia* communities have the potential to occur over a large area in Western Australia and are not significant.

a9Si: *Acacia ramulosa* var. *ramulosa* and *Acacia ramulosa* var. *linophylla* scrub.

a9Si is a very large and widespread Beard unit that is mapped as 3.4% of the Project Area. Of the total area of the Beard unit, 0.6% occurs within the Project Area. The vegetation communities related to this unit include those associated with sandy plains of the Yalgoo and Murchison regions; Yy1 and Mr2. The distribution of this Beard vegetation unit shows that these *ecologia* communities have the potential to occur over a large area in Western Australia and are not significant.

acSc: *Acacia - Casuarina* spp. thicket.

acSc is a moderate to large and widespread Beard unit that is mapped as 0.2% of the Project Area. Of the total area of the Beard unit, 0.1% occurs within the Project Area. The vegetation communities related to this unit include those associated with floodplains and includes; Yp3 and Gf2. The distribution of this Beard vegetation unit shows that these *ecologia* communities have the potential to occur over a large area in Western Australia and are not significant, however as it is such a small area within the Project Area, this Beard unit was not seen in *ecologia's* communities. Based on the known current extent of this vegetation unit in the Geraldton Sandplains region, only 1% occurs within the Project Area.

anSi: Mixed *Acacia* spp. scrub.

anSi is a moderate to large and widespread Beard unit that is mapped as 8.1% of the Project Area. Of the total area of the Beard unit, 4.9% occurs within the Project Area. The vegetation communities related to this unit include those associated with the sandy-clay plains and includes; Yp1, Yp2, Yp5 and Yf5. The distribution of this Beard vegetation unit shows that these *ecologia* communities have the potential to occur over a large area in Western Australia and are not significant.

ceLr a9Si: *Acacia ramulosa* var. *ramulosa* and *Acacia ramulosa* var. *linophylla* scrub with *Callitris columellaris* and *Eucalyptus* spp.

ceLr a9Si is a large and widespread Beard unit that is mapped as 1.3% of the Project Area. Of the total area of the Beard unit, 0.6% occurs within the Project Area. The vegetation communities related to this unit include those associated with sandy plains and includes; Yp2 and Yp3, however based on the known current extent of this vegetation unit in the Geraldton Sandplains region, none remains in the Project Area.

e6,8Mi: *Eucalyptus loxophleba* and *Eucalyptus salmonophloia* sclerophyll woodland.

e6,8Mi is a large and widespread Beard unit that is mapped as 0.1% of the Project Area. Of the total area of the Beard unit, 0.04% occurs within the Project Area. The vegetation community that is related to this unit is associated with red sandy plains and includes; Gy2. The distribution of this Beard unit shows that the *ecologia* community has the potential to occur over a large area in Western Australia and is not significant. Based on the known current extent of this vegetation unit in the Geraldton Sandplains region, 36% occurs within the Project Area, however this unit is not endemic to this region (0.28% of the total area is in the Geraldton Sandplains), the actual impact is likely to be a lot less.

e6c5Mr a9,19Si: *Acacia ramulosa* var. *ramulosa*, *Acacia ramulosa* var. *linophylla* and *Acacia acuminata* scrub with scattered *Eucalyptus loxophleba* and *Casuarina huegeliana*.

e6c5Mr a9,19Si is a small and restricted Beard unit that is mapped as 2.7% of the Project Area. Of the total area of the Beard unit, 10.8% occurs within the Project Area. The vegetation community related to this unit include that associated with floodplains of the Geraldton Sandplains region and includes; Gf2. The distribution of this Beard unit represents the potential distribution of the *ecologia* vegetation community, showing that it is very restricted and is likely to be uncommon locally and regionally. Based on the known current extent of this vegetation unit in the Geraldton Sandplains region, 24% occurs within the Project Area, however this unit is not endemic to this region (31% of the total area is in the Geraldton Sandplains) and the actual impact is likely to be a lot less.

e6Mr a19Si: *Acacia acuminata* scrub with scattered *Eucalyptus loxophleba*.

e6Mr a19Si is a small to moderate and fairly restricted Beard unit that is mapped as 3.8% of the Project Area. Of the total area of the Beard unit, 4.7% occurs within the Project Area. The vegetation communities related to this unit include those with floodplain of the Geraldton Sandplains region and includes; Gp1 and Gf2. The distribution of this vegetation unit represents the potential distribution of the *ecologia* vegetation community, showing that it is very restricted and is likely to be uncommon locally and regionally and is endemic to the Geraldton Sandplains region. Based on the known current extent of this vegetation unit in the Geraldton Sandplains region, 4% occurs within the Project Area.

e6Mr eaSi: *Eucalyptus* spp. (mallee) and *Acacia* spp. scrub with scattered *Eucalyptus loxophleba*.

e6Mr eaSi is a small and restricted Beard unit that is mapped as 3.6% of the Project Area. Of the total area of the Beard unit, 8.3% occurs within the Project Area. The vegetation communities related to this unit include those associated with floodplains of the Geraldton Sandplains region and includes; Gp1, Gf1 and Gf2. The distribution of this vegetation unit represents the potential distribution of the *ecologia* vegetation community, showing that it is very restricted and is likely to be uncommon locally and regionally and is almost endemic (99%) to the Geraldton Sandplains region. Based on the known current extent of this vegetation unit in the Geraldton Sandplains region, 10% occurs within the Project Area.

k1,3Ci: *Atriplex* spp., *Tecticornia* spp. and other samphires succulent steppe.

k1,3Ci is a small and restricted Beard unit that is mapped as 0.2% of the Project Area. Of the total area of the Beard unit, 0.7% occurs within the Project Area. The vegetation communities related to this unit include those associated with floodplain of the Yalgoo region and include; Yf4. The distribution of this vegetation unit represents the potential distribution of the *ecologia* vegetation community, showing that it is very restricted and is likely to be uncommon locally and regionally. Based on the known current extent of this vegetation unit in the Geraldton Sandplains region, 14% occurs within the Project Area. This unit is not endemic to the Geraldton Sandplains region (7% of its total is in the Geraldton Sandplains region).

k3Ci: *Tecticornia* spp. and other samphires succulent steppe.

k3Ci is a very large and widespread Beard unit that is mapped as 0.01% of the Project Area. Of the total area of the Beard unit, <0.01% occurs within the Project Area. It is therefore an insignificant Beard unit.

mhSc: *Melaleuca* - *Hakea* spp. thicket.

mhSc is a small and restricted Beard unit that is mapped as 0.9% of the Project Area. Of the total area of the Beard unit, 4% occurs within the Project Area. The vegetation communities related to this unit include those associated the Moresby Range PEC; Gh1, Gh2 and Gh3. The distribution of this vegetation unit represents the potential distribution of the *ecologia* vegetation communities, showing that they are very restricted and is uncommon locally and is regionally endemic to the Geraldton Sandplains region. Based on the known current extent of this vegetation unit in the Geraldton Sandplains region, 4% occurs within the Project Area.

x2SZc: Scrub heath coastal association.

x2SZc is a moderate to large and widespread Beard unit that is mapped as 2.9% of the Project Area. Of the total area of the Beard unit, 2% occurs within the Project Area. The vegetation community related to this unit include those associated with the yellow sandy plains and includes; Gy1. The distribution of this Beard vegetation unit shows that this *ecologia* community has the potential to occur over a large area in Western Australia, however as this

area has been extensively cleared is locally rare. Based on the known current extent of this vegetation unit in the Geraldton Sandplains region, 1% occurs within the Project Area. This unit is endemic to the Geraldton Sandplains region.

x3SZc: Scrub heath inland association.

x3SZc is a large and widespread Beard unit that is mapped as 1.7% of the Project Area. Of the total area of the Beard unit, 0.6% occurs within the Project Area. The vegetation communities related to this unit include those associated with floodplains and sandy plains; Yp3 and Gf2. The distribution of this Beard vegetation unit shows that this *ecologia* community has the potential to occur over a large area in Western Australia and are not significant. Based on the known current extent of this vegetation unit in the Geraldton Sandplains region, 1% occurs within the Project Area. This unit is highly endemic to the Geraldton Sandplains region (87% of its total area).

x3SZc/acSc: *Acacia - Casuarina* spp. thicket with scrub heath inland association.

x3SZc/acSc is a small and restricted Beard unit that is mapped as 2.6% of the Project Area. Of the total area of the Beard unit, 7.1% occurs within the Project Area. The vegetation communities related to this unit include those associated with yellow sand plains, including; Gy2 and Gp2. The distribution of this vegetation unit represents the potential distribution of the *ecologia* vegetation communities, showing that they are very restricted and are likely to be uncommon locally and regionally. Based on the known current extent of this vegetation unit in the Geraldton Sandplains region, 9% occurs within the Project Area. This unit is endemic to the Geraldton Sandplains region and only has 11% of the original extent of its total remaining.

Table 7.2 – Beard Vegetation Units Conservation Significance Assessment

Beard Vegetation Unit	Description	Total Area of Unit in WA (Ha)	% of The Total Vegetation Unit	Total Area in Project Area (Ha)	% of Project Area
a1,14Si	<i>Acacia aneura</i> and <i>Acacia quadrimarginea</i> scrub.	448,700	0.56	2,525	1.12
a1,8Sr k1,2Ci	<i>Acacia aneura</i> and <i>Acacia sclerosperma</i> with <i>Atriplex</i> and <i>Maireana</i> spp. succulent steppe.	199,534	1.65	3,290	1.46
a1,9Li	<i>Acacia aneura</i> , <i>Acacia ramulosa</i> var. <i>ramulosa</i> and <i>Acacia ramulosa</i> var. <i>linophylla</i> low woodland.	94,031	7.29	6,851	3.04
a10,11Si k1,2Ci	<i>Acacia victoriae</i> , <i>Acacia xiphophylla</i> and <i>Acacia ermaea</i> with <i>Atriplex</i> and <i>Maireana</i> spp. succulent steppe.	65,169	3.50	2,279	1.01
a14Si	<i>Acacia quadrimarginea</i> scrub.	10,387	3.10	322	0.14
a1Li	<i>Acacia aneura</i> low woodland.	24,751,239	0.22	53,891	23.90
a1Li a9,17Si	<i>Acacia aneura</i> low woodland with understorey of <i>Acacia ramulosa</i> var. <i>ramulosa</i> , <i>Acacia ramulosa</i> var. <i>linophylla</i> and <i>Acacia grasbyi</i> .	1,136,021	2.67	30,281	13.43
a1Lp	<i>Acacia aneura</i> , trees in groves or patches.	7,914,567	0.46	36,772	16.31
a1Si	<i>Acacia aneura</i> scrub.	6,666,951	0.12	7,909	3.51
a33Sc	<i>Acacia rostelifera</i> thicket.	3,478	35.88	1,248	0.55
a8,9Sr k1,2Ci	<i>Acacia sclerosperma</i> , <i>Acacia ramulosa</i> var. <i>ramulosa</i> and <i>Acacia ramulosa</i> var. <i>linophylla</i> with <i>Atriplex</i> and <i>Maireana</i> spp. succulent steppe.	119,058	0.10	121	0.05
a8Sr k1,2Ci	<i>Acacia sclerosperma</i> with <i>Atriplex</i> and <i>Maireana</i> spp. succulent steppe.	15,539	11.92	1,852	0.82
a9,19Si	<i>Acacia ramulosa</i> var. <i>ramulosa</i> , <i>Acacia ramulosa</i> var. <i>linophylla</i> and <i>Acacia acuminata</i> scrub.	756,674	0.47	3,519	1.56
a9,20Si	<i>Acacia ramulosa</i> var. <i>ramulosa</i> , <i>Acacia ramulosa</i> var. <i>linophylla</i> and <i>Acacia murrayana</i> scrub.	206,457	1.54	3,170	1.41
a9Si	<i>Acacia ramulosa</i> var. <i>ramulosa</i> and <i>Acacia ramulosa</i> var. <i>linophylla</i> scrub.	1,331,779	0.58	7,768	3.45
acSc	<i>Acacia - Casuarina</i> spp. thicket.	495,385	0.08	381	0.17
anSi	Mixed <i>Acacia</i> spp. scrub.	368,979	4.95	18,282	8.11
ceLr a9Si	<i>Acacia ramulosa</i> var. <i>ramulosa</i> and <i>Acacia ramulosa</i> var. <i>linophylla</i> scrub with <i>Callitris columellaris</i> and <i>Eucalyptus</i> spp.	511,008	0.59	2,992	1.33
e6,8Mi	<i>Acacia ramulosa</i> var. <i>ramulosa</i> , <i>Acacia ramulosa</i> var. <i>linophylla</i> and <i>Acacia acuminata</i> scrub with scattered <i>Eucalyptus loxophleba</i> and <i>Casuarina huegeliana</i> .	796,448	0.04	340	0.15
e6c5Mr a9,19Si	<i>Eucalyptus loxophleba</i> and <i>Eucalyptus salmonophloia</i> sclerophyll woodland.	56,427	10.85	6,120	2.71

Beard Vegetation Unit	Description	Total Area of Unit in WA (Ha)	% of The Total Vegetation Unit	Total Area in Project Area (Ha)	% of Project Area
e6Mr a19Si	<i>Acacia acuminata</i> scrub with scattered <i>Eucalyptus loxophleba</i> .	184,571	4.71	8,692	3.86
e6Mr eaSi	<i>Eucalyptus</i> spp. (mallee) and <i>Acacia</i> spp. scrub with scattered <i>Eucalyptus loxophleba</i> .	97,368	8.26	8,038	3.57
k1,3Ci	<i>Atriplex</i> spp., <i>Tecticornia</i> spp. and other samphires succulent steppe.	64,719	0.72	463	0.21
k3Ci	<i>Tecticornia</i> spp. and other samphires succulent steppe.	2,078,904	0.00	23	0.01
mhSc	<i>Melaleuca</i> - <i>Hakea</i> spp. thicket.	51,880	4.00	2,077	0.92
x2SZc	Scrub heath coastal association.	328,738	2.01	6,593	2.92
x3SZc	Scrub heath inland association.	580,547	0.65	3,778	1.68
x3SZc/acSc	<i>Acacia</i> - <i>Casuarina</i> spp. thicket with scrub heath inland association.	82,081	7.15	5,868	2.60

Table 7.3 – Extent of Beard Vegetation Units Remaining in the Geraldton Sandplains Bioregion

Code	Description	Pre-European Extent in WA	Pre-European Extent in the Geraldton Sandplains	% of total Pre-European in the Geraldton Sandplains (Degree of Endemism)	Current Extent in the Geraldton Sandplains Region	% of Original Vegetation Extent Remaining (Degree of Clearing)	Area of the Current Extent Impacted by Project Area	% of Current Extent Impacted
a33Sc	<i>Acacia rostellifera</i> thicket.	3,478	1,749	50	370	21	279	75
acSc	<i>Acacia - Casuarina</i> spp. thicket.	495,385	118,103	24	6,422	5	59	1
ceLr a9Si	<i>Acacia ramulosa</i> var. <i>ramulosa</i> and <i>Acacia ramulosa</i> var. <i>linophylla</i> scrub with <i>Callitris columellaris</i> and <i>Eucalyptus</i> spp.	511,008	1,248	0.24	0	0	0	0
e6,8Mi	<i>Acacia ramulosa</i> var. <i>ramulosa</i> , <i>Acacia ramulosa</i> var. <i>linophylla</i> and <i>Acacia acuminata</i> scrub with scattered <i>Eucalyptus loxophleba</i> and <i>Casuarina huegeliana</i> .	796,448	2,194	0.28	117	5	42	36
e6c5Mr a9,19Si	<i>Eucalyptus loxophleba</i> and <i>Eucalyptus salmonophloia</i> sclerophyll woodland.	56,427	17,554	31	4,617	26	1,108	24
e6Mr a19Si	<i>Acacia acuminata</i> scrub with scattered <i>Eucalyptus loxophleba</i> .	184,571	184,571	100	31,410	17	1,259	4
e6Mr eaSi	<i>Eucalyptus</i> spp. (mallee) and <i>Acacia</i> spp. scrub with scattered <i>Eucalyptus loxophleba</i> .	97,368	96,821	99	7,470	8	778	10
k1,3Ci	<i>Atriplex</i> spp., <i>Tecticornia</i> spp. and other samphires succulent steppe.	64,719	4,454	7	1,145	26	165	14
mhSc	<i>Melaleuca - Hakea</i> spp. thicket.	51,880	51,880	100	14,221	27	621	4
x2SZc	Scrub heath coastal association.	328,738	328,739	100	43,126	13	443	1
x3SZc	Scrub heath inland association.	580,547	507,874	87	52,364	10	782	1
x3SZc/acSc	<i>Acacia - Casuarina</i> spp. thicket with scrub heath inland association.	82,081	82,081	100	9,276	11	845	9

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7.4 VEGETATION OF LOCAL SIGNIFICANCE

Vegetation of local significance is confined to a specialised habitat type that is not common in the local area and whose disturbance or removal may lead to local extinction of that community type.

The local conservation assessment of the vegetation communities recorded in the Project Area has been assessed using a number of factors as discussed below. The vegetation communities have been assigned a conservation significance rating of; very high, high, moderate or low and are listed below;

Very high	Gh1, Gh2, Gh3, Gy1, Gy2, Mh6, Mf2.
High	Gp2, Gc1, Gc2, Yh1, Yf4, Mh1, Mh2, Mh3, Mh4, Mh7, Mh8, Mh13, Mh18, Mf1, Mf3, Mc3.
Moderate	Gf1, Gf2, Yp3, Mh10, Mh11, Mh12, Mr1, Mr2, Mp6, Mp7, Mp10, Mc2.
Low	Gp1, Yh2, Yh3, Yy1, Yp1, Yp2, Yp4, Yp5, Yp6, Yf1, Yf2, Yf3, Yf5, Yc1, Yc2, Mh9, Mh14, Mh15, Mh16, Mh17, Mr3, Mp1, Mp2, Mp3, Mp4, Mp5, Mp8, Mp11, Mc1, Mc5, Mc6, Mc7, Mc8.

A matrix showing which Priority Flora taxa were recorded in each vegetation community is provided in Table P.2, Appendix P and a summary table for each community is provided in Table 7.4.

Gh1: Isolated *Eucalyptus loxophleba* subsp. *loxophleba* low mallee trees, over *Melaleuca megacephala* and *Hakea pycnoneura* closed mid shrubland, over *Hibbertia hypericoides*, *Acacia lasiocarpa* var. *lasiocarpa*, *Gastrolobium plicatum*, *Gastrolobium triangulare* sparse low shrubland, over *Lepidosperma tenue* open sedgeland.

Gh1 was restricted to the mesa mid slopes and flat tops of the Moresby system and is part of the Moresby Range PEC. The Moresby system is very restricted in the Project Area (0.95%) and Western Australia, with a significant 8.03% of its total area occurring in the Project Area. The Moresby system has been extensively cleared and only 33% of native vegetation remains. Gh1 is mapped as a very small area in the Project (129 ha, 0.06%) and provides habitat for the endangered DRF taxon, *Eucalyptus blaxellii* and 10 Priority Flora taxa (Table P.2) of which 3 were only recorded in Gh1. Gh1 therefore has very high conservation significance, as it is restricted in the Project Area and in Western Australia, provides habitat for threatened flora and is part of the Moresby Range PEC.

Gh2: Mixed *Acacia* spp. and *Melaleuca* spp. sparse to open tall shrubs, over *Verticordia chrysanthella* and *Gastrolobium plicatum* low shrubland.

Gh2 was restricted to the lower mesa footslopes of the Moresby system and is part of the Moresby Range PEC. The Moresby system is very restricted in the Project Area (0.95%) and Western Australia, with a significant 8.03% of its total area occurring in the Project Area. The Moresby system has been extensively cleared and only 33% of native vegetation remains. Gh2 is mapped as a small area in the Project (587 ha, 0.26%) and provides habitat for the vulnerable DRF taxon, *Caladenia hoffmanii*, the endangered DRF taxon, *Eucalyptus blaxellii* and nine Priority Flora taxa (Table P.2). Gh2 therefore has very high conservation significance, as it is restricted in the Project Area and in Western Australia and provides habitat for threatened flora and is part of the Moresby Range PEC.

Gh3: *Allocasuarina campestris* closed tall to mid shrubland, over *Lepidosperma tenue* sparse sedgeland.

Gh3 was restricted to the mesa midslopes, lower footslopes and flat tops of the Moresby system and is part of the Moresby Range PEC. The Moresby system is very restricted in the Project Area (0.95%) and in Western Australia, with a significant 8.03% of its total area occurring in the Project Area. The Moresby system has been extensively cleared and only 33% of native vegetation remains. Gh3 is mapped as a very small area in the Project (88 ha, 0.04%)

and provides habitat for the vulnerable DRF taxon, *Caladenia hoffmanii*, the endangered DRF taxon, *Eucalyptus blaxellii* and four Priority Flora taxa (Table P.2). Gh3 therefore has very high conservation significance, as it is restricted in the Project Area and in Western Australia and provides habitat for threatened flora and is part of the Moresby Range PEC.

Gy1: *Eucalyptus* spp., *Xylomelum angustifolium*, *Actinostrobus arenarius* and *Banksia* spp. sparse to open low woodland, over mixed Myrtaceae spp. open low to mid shrubland.

Gy1 was restricted to the yellow-brown sandy plains of the Eradu system. The Eradu system is relatively widespread in the Project Area (3.19%) but is fairly restricted in Western Australia, with 4.95% of its total area occurring in the Project Area. The Eradu system has been extensively cleared and has only 7% of native vegetation remaining in the Project Area and therefore is extremely restricted. Gy1 is mapped as a very small area in the Project (489 ha, 0.22%) and provides habitat for one Priority Flora taxon (Table P.2), which was only recorded in Gy1. Gy1 therefore has very high conservation significance, as it is restricted in the Project Area and in Western Australia.

Gy2: Mixed *Eucalyptus* spp. open low woodland, over *Acacia* spp. and *Melaleuca* spp. sparse mid shrubland.

Gy2 was restricted to the yellow sand plains and dunes of the Binnu soil-landscape system. The Binnu system is relatively widespread in the Project Area (3.97%) but is fairly restricted in Western Australia, with a significant 6.44% of its total area occurring in the Project Area. The Binnu system has been extensively cleared and has only 16.8% of native vegetation remaining in the Project Area and is therefore very restricted. Gy2 is mapped as a very small area in the Project (1755 ha, 0.78%) and provides habitat for 13 Priority Flora taxa (Table P.2). Of these 13 Priority Flora taxa, 7 were only recorded in Gy2. Gy2 therefore has very high conservation significance, as it is restricted in the Project Area and in Western Australia and provides significant Priority Flora habitat.

Gp1: *Acacia tetragonophylla* and *Hakea recurva* subsp. *recurva* (+/-*Eucalyptus loxophleba* subsp. *loxophleba*, *Acacia acuminata* and *Acacia burkittii*) low woodland, over *Ptilotus obovatus* sparse low shrubland, over **Avena fatua* and **Bromus diandrus* tussock grassland.

Gp1 was a degraded vegetation community, dominated by species that increase in disturbed areas and is widespread across many habitat types and soil-landscape systems in the Freehold, including; the Casuarina, Dartmoor, Greenough, Moresby, Mt Horner, Northampton and Sugarloaf systems. Gp1 is mapped as a small area in the Project Area (924 ha, 0.41%) and provides habitat for four Priority Flora taxa (Table P.2). These Priority Flora taxa were recorded in low numbers and were not endemic to Gp1. Gp1 therefore has very low conservation significance as it is widespread in the Project Area and not restricted to any systems or habitats and is likely to be widespread in the region.

Gp2: *Melaleuca adnata* sparse low woodland, over *Calothamnus quadrifidus* and *Acacia acuminata* open tall to mid shrubland, over *Ptilotus obovatus* open low shrubland, over *Amphipogon caricinus* var. *caricinus* open tussock grassland.

Gp2 was restricted to the red sand plains of the Binnu soil-landscape system. The Binnu system is relatively widespread in the Project Area (3.97%) but is fairly restricted in Western Australia, with a significant 6.44% of its total area occurring in the Project Area. The Binnu system has been extensively cleared and has only 16.8% of native vegetation remaining in the Project Area and is therefore very restricted. Gp2 is mapped as a very small area in the Project (39 ha, 0.02%) and no Priority Flora were recorded. Because of the small area mapped. Gp2 therefore has high conservation significance as it is restricted in the Project Area and in Western Australia.

Gf1: Isolated *Hakea preissii* tall shrubs, over *Tecticornia indica* subsp. *bidens* and *Atriplex amnicola* (+/- *Tecticornia lepidosperma*, *Tecticornia pergranulata* subsp. *pergranulata* and *Frankenia setosa*) low Chenopod shrubland, over **Avena fatua* and *Eragrostis dielsii* sparse tussock grassland.

Gf1 was restricted to the floodplains near the Mullewa link in the Dartmoor soil-landscape system. The Dartmoor system is widespread in the Project Area (6.95%) and in Western Australia and has a significant 13.6% of its total area occurring in the Project Area. The Dartmoor system has been extensively cleared and has only 19.1% of native vegetation remaining. Gf1 is mapped as a very small area in the Project (753 ha, 0.33%) and provides habitat for two Priority Flora taxa (Table P.2). Gf1 therefore has moderate conservation significance as it is restricted in the Project Area, but is likely to be widespread in the region.

Gf2: *Eucalyptus loxophleba* subsp. *loxophleba* open low woodland, over *Acacia acuminata* and *Acacia burkittii* sparse tall shrubland, over *Acacia tetragonophylla* and *Enchylaena tomentosa* sparse mid shrubland, over *Acacia andrewsii* and *Ptilotus obovatus* sparse low shrubland.

Gf2 was restricted to the floodplains of the Freehold land area of the Dartmoor soil-landscape system. The Dartmoor system is widespread in the Project Area (6.95%) and in Western Australia and has a significant 13.6% of its total area occurring in the Project Area. The Dartmoor system has been extensively cleared and has only 19.1% of native vegetation remaining. Gf2 is mapped as a very small area in the Project (2,292 ha, 1.02%) and provides habitat for seven Priority Flora taxa (Table P.2). Gf2 therefore has moderate conservation significance as it is restricted in the Project Area, but is likely to be widespread in the region.

Gc1: *Eucalyptus camaldulensis* var. *obtusata* mid to low woodland (+/- *Casuarina obesa* and *Melaleuca raphiophylla*) isolated to open tall shrubland, over *Atriplex amnicola* and *Chenopodium gaudichaudianum* sparse low shrubland, over *Cyperus gymnocaulos* sparse sedgeland and **Avena fatua* and **Bromus diandrus* tussock grassland.

Gc1 was restricted to the major creeklines of the Greenough soil-landscape system. The Greenough system is moderately widespread in the Project Area (2.05%), but is very restricted in Western Australia with a significant 25.7% of its total area occurring in the Project Area and of which 42% of native vegetation remains. Gc1 is mapped as a very small area in the Project (996 ha, 0.44%) and provides habitat for two Priority Flora taxa (Table P.2), of which one was only recorded in Gc1 therefore has high conservation significance as it is restricted to the Greenough system of which a considerable amount of the total area is mapped in the Project Area and it is not likely to be widespread in the region.

Gc2: *Grevillea* spp., *Acacia* spp. and *Melaleuca* spp. tall shrubland.

Gc2 was restricted to a creek bank and floodplain of the Northampton soil-landscape system, in one area on the far western boundary of the Project Area. The Northampton system is fairly widespread in the Project Area (2.12%), but restricted in Western Australia and has 5.73% of its total area occurring in the Project Area. The Northampton system has been extensively cleared and now has only 20% of native vegetation remaining. Gc2 is very restricted in the Project Area (13 ha, 0.01%) and provides habitat for four Priority Flora taxa (Table P.2), of which two were only recorded in Gc2. Gc2 therefore has high conservation significance as it is very restricted in the Project Area and is likely to be restricted in the region. Gc2 is restricted as it only just nicks the western edge of the Project Area and has been mapped further in the Oakajee Port Vegetation and Flora survey.

Yh1: *Allocasuarina dielsiana* sparse mid woodland, over *Acacia quadrimarginea* and *Acacia ramulosa* var. *linophylla* sparse tall shrubland, over *Ptilotus obovatus* sparse low shrubland.

Yh1 was restricted to the low rocky hill slopes of the Tallering land system and is part of the Tallering Peak PEC. The Tallering system is restricted in the Project Area (0.46%) and in Western Australia, with 3.17% of its total area occurring in the Project Area. The Tallering system is the only system in the Pastoral land area that has had any significant vegetation cleared and has 85.4% of native vegetation remaining. Yh1 is mapped as a very small area in the Project (928 ha, 0.41%) and it contained no Priority Flora. Yh1 therefore has high conservation significance as it is restricted in the Project Area and in Western Australia and is part of the Tallering Peak PEC.

Yh2: *Acacia ramulosa* var. *linophylla* sparse tall shrubland, over isolated *Thryptomene decussata*, *Eremophila latrobei* subsp. *latrobei* and *Sida ectogama* mid shrubs, over *Eriachne pulchella* subsp. *pulchella* and *Aristida contorta* sparse tussock grassland.

Yh2 was restricted to the low gravelly hill slopes and plains of the Nerramyne land system. The Nerramyne system is widespread in the Project Area (2.55%) and in Western Australia, with 2.29% of its total area occurring in the Project Area. Yh2 is mapped as a very small area in the Project (58 ha, 0.03%) and does not contain Priority Flora. Yh2 therefore has low conservation significance as it is restricted in the Project Area but likely to be widespread in the region.

Yh3: Isolated *Acacia aneura*, *Acacia ramulosa* var. *linophylla*, *Acacia quadrimarginea* and *Acacia grasbyi* low trees, over *Thryptomene costata* and *Thryptomene decussata* open mid to low shrubland, over *Aristida contorta* open tussock grassland.

Yh3 was recorded on the low gravelly hills and plains of the Challenge and Gabanintha land systems. The Challenge system is one of the most common systems in the Project Area and is very widespread across both Western Australia and the Project Area. Although the Challenge system is mapped as 7.63% of the Project Area, only 1.7% of the total area of the system is mapped within it. The Gabanintha system is moderately widespread in the Project Area (1.19%) and in Western Australia, with 1.07% of its total area occurring in the Project Area. Yh3 is mapped as a very small area in the Project (112 ha, 0.05%) and provides habitat for one Priority Flora taxon (Table P.2). Yh3 therefore has low conservation significance as it is restricted in the Project Area but likely to be widespread in the region.

Yy1: *Acacia ramulosa* var. *linophylla* and *Acacia ramulosa* var. *ramulosa* open tall shrubland.

Yy1 was restricted to the yellow sand plains of the Kalli land system. The Kalli system is one of the most common in the Project Area and is widespread across both Western Australia and the Project Area. Although the Kalli system is mapped as 7.15% of the Project Area, only 1.44% of the total area of the system is mapped within it. Yy1 is mapped as a very small area in the Project (4,923 ha, 2.18%) and provides habitat for four Priority Flora taxa (Table P.2). Yy1 therefore has low conservation significance as it is widespread in the Project Area and is likely to be widespread in the region.

Yp1: *Acacia coolgardiensis* tall shrubland to low woodland, over isolated *Eremophila forrestii* mid to low shrubs.

Yp1 was restricted to the red-sandy clay plains of the Nerramyne land system. The Nerramyne system is moderately widespread in the Project Area (2.55%) and in Western Australia, with 2.29% of its total area occurring in the Project Area. Yp1 is mapped as a very small area in the Project (231 ha, 0.1%) and provides habitat for one Priority Flora taxon (Table P.2). Yp1 therefore has low conservation significance as it is restricted in the Project Area but likely to be widespread in the region.

Yp2: *Acacia ramulosa* var. *linophylla* (+/- *Acacia ramulosa* var. *ramulosa* and *Acacia tetragonophylla*) tall to mid shrubland, over *Enchylaena tomentosa* var. *tomentosa* sparse low shrubland.

Yp2 was a widespread vegetation community recorded on the red sand plains of the Project Area, occurring over a number of land systems, including the Tindalarra, Tallering and Nerramyne systems. The Tindalarra system is widespread in Western Australia and the Project Area contained 4.1% of the total area of the system. The Tindalarra system is the second most common and covers 12.97% of the Project Area, the Tallering system is not widespread in Western Australia and the Project Area contained a significant 3.17% of the total area of the system and the Nerramyne system is moderately widespread in the Yalgoo region of Western Australia and the Project Area contained 2.29% of the total area of the system. Yp2 is mapped as a moderate area in the Project (5,164 ha, 2.29%) and provides habitat for five Priority Flora taxa (Table P.2). Yp2 therefore has low conservation significance as it is widespread in the Project Area and is likely to be widespread in the region.

Yp3: Mixed *Eucalyptus* spp. low woodland, over sparse *Acacia* spp. mid shrubland.

Yp3 was restricted to the yellow sand plains of the Joseph land system. The Joseph system is restricted in the Project Area (0.36%), but is widespread in Western Australia, with a low 0.17% of its total area occurring in the Project Area. Yp3 is mapped as a very small area in the Project (1,078 ha, 0.48%) and provides habitat for three Priority Flora taxa (Table P.2), of which one is only recorded in Yp3. Yp3 therefore has moderate conservation significance as it is restricted in the Project Area, but is likely to be widespread in the region.

Yp4: *Eucalyptus kochii* subsp. *amaryssia* open mid woodland, over isolated *Acacia ramulosa* var. *ramulosa* tall shrubs, over isolated *Acacia andrewsii*, *Ptilotus obovatus* and *Maireana* spp. low shrubs, over isolated *Eriachne helmsii* tussock grasses.

Yp4 was restricted to the sand plains of the Pindar land system. The Pindar system is restricted in the Project Area (0.29%) and is moderately widespread in Western Australia, with 0.49% of its total area occurring in the Project Area. Yp4 is mapped as a very small area in the Project (851 ha, 0.38%) and provides habitat for one Priority Flora taxon (Table P.2). Yp4 therefore has low conservation significance as it is restricted in the Project Area but likely to be widespread in the region.

Yp5: *Acacia ramulosa* var. *linophylla*, *Acacia grasbyi*, *Acacia burkittii* and *Acacia aneura* open tall shrubland.

Yp5 was the most widespread vegetation community in the Project Area. It mainly falls on three large and widespread land systems including; the Tindalarra, Yanganoo and Nerramyne systems. The Yanganoo and Tindalarra systems are respectively the first and second most widespread, covering 15.72% and 12.97% of the total Project Area. The Nerramyne system is less widespread in the Project Area (2.29%). Yp5 is mapped as a large area in the Project (28,448 ha, 12.61%) and provides habitat for seven Priority Flora taxa (Table P.2), of which two were only recorded in Yp5. Yp5 therefore has low conservation significance as it is very widespread in the Project Area and is likely to be very widespread in the region.

Yp6: *Acacia burkittii*, *Acacia quadrimarginea*, *Acacia aneura* (+/- *Acacia* aff. *rhodophloia*) over isolated *Hakea preissii* and *Senna* spp. mid shrubs, over *Ptilotus obovatus* and *Acacia scleroclada* sparse low shrubland, over *Cymbopogon ambiguus* and *Aristida contorta* open tussock grassland.

Yp6 was restricted to the stony plains of the Challenge land system. The Challenge system is one of the most widespread systems in the Project Area and is widespread across Western Australia. Although the Challenge system is mapped as 7.63% of the Project Area, only 1.7% of

the total area of the system is mapped within it. Yp6 is mapped as a moderately sized area in the Project (4,006 ha, 1.78%) and provides habitat for six Priority Flora taxa (Table P.2). Yp6 therefore has low conservation significance as it is very widespread in the Project Area and is likely to be very widespread in the region.

Yf1: *Acacia burkittii* and *Acacia grasbyi* and (+/- *Acacia ramulosa* var. *linophylla*) sparse tall shrubland over *Acacia tetragonophylla* sparse tall to mid shrubland, over *Ptilotus obovatus* sparse low shrubland, over *Aristida contorta* sparse tussock grassland.

Yf1 was restricted to the floodplains of the Tindalarra system, which is widespread in Western Australia and the Project Area contained a significant 4.1% of the total area of the system. The Tindalarra system is the second most common and covers 12.97% of the Project Area. Yf1 is mapped as a moderately sized area in the Project (5,460 ha, 2.42%) and provides habitat for three Priority Flora taxa (Table P.2), of which one was only recorded in Yf1. Yf1 therefore has low conservation significance as it is very widespread in the Project Area and is likely to be very widespread in the region.

Yf2: Isolated *Acacia synchronicia* tall shrubs, over isolated *Senna* sp. Meekatharra (E. Bailey 1-26), *Acacia synchronicia*, *Acacia tetragonophylla* and *Eremophila galeata* mid shrubs, over *Aristida contorta* tussock grassland.

Yf2 was restricted to the floodplains of the Tindalarra and Ero land systems. The Tindalarra system is widespread in Western Australia and the Project Area contained 4.1% of the total area of the system. The Tindalarra system is the second most common and covers 12.97% of the Project Area. The Ero system is moderately widespread in Western Australia and the Project Area contained 1.82% of the total area of the system and is mapped as 1.73% of the Project Area. Yf2 is mapped as a very small area in the Project (856 ha, 0.38%) and no Priority Flora were recorded (Table P.2). Yf2 therefore has low conservation significance as it is restricted in the Project Area but likely to be widespread in the region.

Yf3: *Acacia victoriae* sparse tall shrubland, over *Atriplex bunburyana* open mid shrubland, over *Atriplex bunburyana* sparse low shrubland, over *Aristida contorta* and *Eragrostis dielsii* sparse tussock grassland.

Yf3 was restricted to the floodplains of the Beringarra land system. The Beringarra system is restricted in the Project Area (0.63%), but moderately widespread in Western Australia, with 0.54% of its total area occurring in the Project Area. Yf3 is mapped as a very small area in the Project (403 ha, 0.18%) and no Priority Flora were recorded. Yf3 therefore has low conservation significance as it is restricted in the Project Area but likely to be widespread in the region.

Yf4: *Tecticornia disarticulata*, *Rhagodia eremaea*, *Frankenia laxiflora*, *Sclerolaena cuneata* and *Cratystylis subspinescens* low shrubland.

Yf4 was restricted to the floodplains of the Yewin land system. The Yewin system is restricted in the Project Area (0.75%) and Western Australia, with a significant 3.7% of its total area occurring in the Project Area. Yf4 is mapped as a very small area in the Project (63 ha, 0.03%) and no Priority Flora were recorded. Yf4 therefore has high conservation significance as it is restricted in the Project Area, and is likely to be restricted in the region.

Yf5: *Acacia eremaea* sparse tall shrubland, over mixed Chenopod spp. low shrubland.

Yf5 was restricted to the floodplains of the Yewin and Tindalarra land systems. The Yewin system is not widespread in the Project Area (0.75%) or Western Australia, with 3.7% of its total area occurring in the Project Area. The Tindalarra system is very widespread in the Project Area (0.75%) and Western Australia, with 4.1% of its total area occurring in the Project

Area. Yf5 is mapped as a moderate area in the Project (8,049 ha, 3.57%) and provides habitat for eight Priority Flora taxa (Table P.2). Yf5 therefore has low conservation significance as it is widespread in the Project Area and is likely to be widespread in the region.

Yc1: *Casuarina obesa* open to sparse low forest, over *Duboisia hopwoodii* sparse tall shrubland, over *Atriplex amnicola*, *Tecticornia indica* subsp. *bidens* and *Tecticornia lepidosperma* open low Chenopod shrubland, over **Hordeum glaucum* and **Avena fatua* tussock grassland.

Yc1 was restricted to the major creeklines of the Tindalarra land system. The Tindalarra system is the second most common and covers 12.97% of the Project Area. Yc1 is mapped as a very small area in the Project (532 ha, 0.24%) and provides habitat for one Priority Flora taxon (Table P.2). Yc1 therefore has low conservation significance as it is restricted in the Project Area but likely to be widespread in the region.

Yc2: *Acacia burkittii* (+/-*Acacia acuminata*) mid woodland, over *Acacia burkittii*, *Hakea preissii* and *Acacia tetragonophylla* low woodland to sparse tall shrubland, over *Ptilotus obovatus* sparse low shrubland, over *Cyperus bifax* sparse sedgeland, over *Monachather paradoxus* and **Setaria verticillata* tussock grassland.

Yc2 was restricted to the minor creeklines or drainage channels of the Yanganoo, Tindalarra and Ero land systems. The Yanganoo and Tindalarra systems are respectively the first and second most widespread, covering 15.72% and 12.97% of the total Project Area. The Ero system is moderately widespread in the Project Area (1.73%) or Western Australia, with 1.82% of its total area occurring in the Project Area. Yc2 is mapped as a very small area in the Project (2,712 ha, 1.20%) and provides habitat for four Priority Flora taxa (Table P.2), one of which was only recorded in Yc2. Yc2 therefore has low conservation significance as it is widespread in the Project Area and is likely to be widespread in the region.

Mh1: *Acacia rhodophloia*, *Acacia ramulosa* var. *linophylla* and *Acacia cuthbertsonii* subsp. *cuthbertsonii* open tall shrubland, over *Eriachne aristidea* sparse tussock grassland.

Mh1 was restricted to the Jack Hills, mid slope drainage channels of the Weld land system and is part of the Jack Hills PEC. The Weld system is moderately widespread in the Project Area (1.60%) and is restricted in Western Australia, with 9.68% of its total area occurring in the Project Area. Mh1 is mapped as a small area in the Project (384 ha, 0.17%) and no Priority Flora were recorded. Mh1 therefore has high conservation significance as it is restricted in the Project Area and the region and is part of the Jack Hills PEC.

Mh2: Sparse *Acacia aneura* and/or *Acacia rhodophloia* low woodland, over *Ptilotus obovatus* sparse low shrubland.

Mh2 was restricted to the Jack Hills, mid slopes and ridgetops of the Weld land system and is part of the Jack Hills PEC. The Weld system is moderately widespread in the Project Area (1.60%) and is restricted in Western Australia, with 9.68% of its total area occurring in the Project Area. Mh2 is mapped as a small area in the Project (225 ha, 0.10%) and no Priority Flora were recorded. Mh2 therefore has high conservation significance as it is restricted in the Project Area and the region and is part of the Jack Hills PEC.

Mh3: Isolated *Acacia aneura* (+/- *Acacia ramulosa* var. *linophylla* and *Acacia cuthbertsonii* subsp. *cuthbertsonii*) low trees, over isolated *Aristida contorta* tussock grasses.

Mh3 was restricted to lower foot slopes at Jack Hills of the Weld and Yarrameedie land system and is part of the Jack Hills PEC. The Weld system is moderately widespread in the Project Area (1.60%) and is restricted in Western Australia, with 9.68% of its total area occurring in the Project Area. The Yarrameedie system is not widespread in Western Australia and the Project Area contains 10.31% of the total area of the system. The Yarrameedie system is mapped as

3.13% of the Project Area. Mh3 is mapped as a moderate area in the Project (3,632 ha, 1.61%) and provides habitat for three Priority Flora taxa (Table P.2), one of which was only recorded in Mh3. Mh3 therefore has high conservation significance as it is moderately widespread in the Project Area but is restricted in the region and is part of the Jack Hills PEC.

Mh4: *Acacia aneura* and *Acacia citrinoviridis* open low woodland, over *Acacia ramulosa* var. *linophylla* sparse tall shrubland, over *Sida cardiophylla* and *Ptilotus obovatus* open low shrubland, over isolated *Monachather paradoxus* tussock grasses.

Mh4 was restricted to the Jack Hills on a low quartzite hill of the Weld land system and is part of the Jack Hills PEC. The Weld system is moderately widespread in the Project Area (1.60%) and is restricted in Western Australia, with 9.68% of its total area occurring in the Project Area. Mh4 is mapped as a small area in the Project (426 ha, 0.19%) and provides habitat for one Priority Flora taxon (Table P.2). Mh4 therefore has high conservation significance as it is restricted in the Project Area and the region.

Mh5: *Acacia aneura* (+/- *Acacia ramulosa* var. *linophylla*) sparse to open low woodland, over mixed *Eremophila* spp. mid shrubland.

Mh5 was restricted to midslopes and lower foot slopes at Weld Range of the Weld and Yarrameedie land system and is part of the Weld Range PEC. The Weld system is moderately widespread in the Project Area (1.60%) and is restricted in Western Australia, with 9.68% of its total area occurring in the Project Area. The Yarrameedie system is not widespread in Western Australia and the Project Area contains 10.31% of the total area of the system. The Yarrameedie system is mapped as 3.13% of the Project Area. Mh5 is mapped as a moderately sized area in the Project (4,298 ha, 1.91%) and two Priority Flora taxa were recorded (Table P.2). Mh5 therefore has high conservation significance as it is moderately widespread in the Project Area but is restricted in the region and is part of the Weld Range PEC.

Mh6: Isolated *Acacia pruinocarpa* low trees, over *Acacia aneura* sparse tall shrubland, over *Thryptomene decussata* (+/- *Prostanthera petrophila*, *Dodonaea petiolaris*, *Eremophila latrobei* subsp. *latrobei* and *Philothea brucei* subsp. *brucei*) mid shrubland, over *Ptilotus obovatus* low shrubland, over *Eriachne mucronata* and *Cymbopogon ambiguus* sparse tussock grassland.

Mh6 was restricted to the Weld Range BIF ridge tops of the Weld land system and is part of the Weld Range PEC. The Weld system is moderately widespread in the Project Area (1.60%) and is restricted in Western Australia, with 9.68% of its total area occurring in the Project Area. Mh6 is mapped as a very small area in the Project (71 ha, 0.03%) and provides habitat for two Priority Flora taxa (Table P.2). Mh6 therefore has very high conservation significance as it is very restricted in the Project Area and in Western Australia and provides significant Priority Flora habitat.

Mh7: *Acacia* sp. Weld Range (A. Markey & S. Dillon 1994) and *Acacia aneura* open tall shrubland, over *Eremophila macmillaniana* and *Senna artemisioides* subsp. *helmsii* open mid shrubland, over *Ptilotus obovatus* open low shrubland.

Mh7 was restricted to a lower granite and basalt hill slope at Weld Range of the Yarrameedie land system and is part of the Weld Range PEC. The Yarrameedie system is restricted in Western Australia and the Project Area contained 10.31% of its total area. The Yarrameedie system is mapped as 3.13% of the Project Area. Mh7 is mapped as a very small area in the Project (94 ha, 0.04%) and no Priority Flora were recorded. Mh7 therefore has high conservation significance as it is restricted in the Project Area and the region and is part of the Weld Range PEC.

Mh8: *Acacia aneura* open low woodland, over *Eremophila macmillaniana* open mid shrubland, over *Sida* sp. dark green fruits (S. van Leeuwen 2260) scattered low shrubs, over *Aristida contorta* open tussock grassland.

Mh8 was restricted to the Weld Range BIF mid slopes of the Weld land system and is part of the Weld Range PEC. The Weld system is moderately widespread in the Project Area (1.60%) and is restricted in Western Australia, with 9.68% of its total area occurring in the Project Area. Mh8 is mapped as a very small area in the Project (750 ha, 0.33%) and provides habitat for three Priority Flora taxa (Table P.2). Mh8 therefore has high conservation significance as it is restricted in the Project Area and the region and is part of the Weld Range PEC.

Mh9: *Acacia aneura* open low woodland, over *Grevillea obliquistigma* subsp. *obliquistigma* and *Eremophila spathulata* sparse mid shrubland, over *Eremophila latrobei* subsp. *latrobei* sparse low shrubland, over *Eriachne pulchella* subsp. *pulchella* sparse tussock grassland.

Mh9 was restricted to the low quartzite hill slopes of the Mindura land system. The Mindura system is widespread in the Project Area (1.4%) and Western Australia, with 0.72% of its total area occurring in the Project Area. Mh9 is mapped as a very small area in the Project (115 ha, 0.05%) and it does not contain Priority Flora. Mh9 therefore has low conservation significance as it is restricted in the Project Area but likely to be widespread in the region.

Mh10: *Acacia* spp., sparse tall shrubland, over *Eremophila* spp. sparse mid shrubland.

Mh10 was restricted to the granite ridgetops and outcrops of the Mindura and Millrose land systems. The Mindura system is widespread in the Project Area (1.4%) and Western Australia, with 0.72% of its total area occurring in the Project Area. The Millrose system is moderately widespread in the Project Area (1.4%) and Western Australia with 1.2% of its total area occurring in the Project Area. Mh10 is mapped as a very small area in the Project (29 ha, 0.01%) and provided habitat for two Priority Flora taxa. Mh10 therefore has moderate conservation significance as it is restricted in the Project Area and although it is likely to be widespread in the region, corresponds to a less common characteristic of the land systems and is likely to be rare.

Mh11: *Acacia* aff. *rhodophloia* open tall shrubland, over *Dodonaea petiolaris* sparse mid shrubland, over *Ptilotus obovatus*, *Pluchea dentex*, *Stemodia viscosa*, *Solanum lasiophyllum* and *Hibiscus coatesii* sparse low shrubland, over *Aristida contorta* and *Cymbopogon ambiguus* tussock grassland.

Mh11 was restricted to the bases of granite outcrops and boulders of the Norie and Challenge land systems. The Norie system is not widespread in Western Australia, and is mapped as 1.06% of the Project Area. The Challenge system is very widespread in Western Australia, and is mapped as 7.63% of the Project Area. Mh11 is mapped as a very small area in the Project (746 ha, 0.33%) and provides habitat for one Priority Flora taxon. Mh11 therefore has moderate conservation significance as it is restricted in the Project Area and although it is likely to be widespread in the region, corresponds to a less common characteristic of the land systems and is likely to be rare.

Mh12: *Eremophila platycalyx* subsp. *platycalyx* and *Acacia tetragonophylla* sparse tall shrubland, over isolated *Dodonaea viscosa* subsp. *spatulata* low shrubs, over *Cymbopogon ambiguus* sparse tussock grassland.

Mh12 was restricted to the bases of granite outcrops and boulders of the Norie and Challenge land systems. The Norie system is not very widespread in Western Australia, and is mapped as 1.06% of the Project Area. The Challenge system is very widespread in Western Australia, and is mapped as 7.63% of the Project Area. Mh12 is mapped as a very small area in the Project (1,094 ha, 0.49%) and did not contain any Priority Flora. Mh12 therefore has moderate

conservation significance as it is restricted in the Project Area and although it is likely to be widespread in the region, corresponds to a less common characteristic of the land systems and is likely to be rare.

Mh13: *Acacia* sp. Weld Range (A. Markey & S. Dillon 2994) sparse mid shrubland, over *Dodonaea pachyneura* and *Philothea* aff. *tubiflora* sparse low shrubland, over isolated *Eragrostis* sp. tussock grasses.

Mh13 was restricted to the lateritic breakaways of the Sherwood land system. The Sherwood system is widespread in the Project Area (4.27%) and Western Australia, with 0.61% of its total area occurring in the Project Area. Mh13 is mapped as a very small area in the Project (526 ha, 0.23%) and it provides habitat for five Priority Flora taxa (Table P.2). Mh13 therefore has high conservation significance as it is restricted in the Project Area and although it is likely to be widespread in the region, corresponds to a less common characteristic of the land systems and is likely to be rare and provides habitat for many Priority Flora taxa.

Mh14: Isolated *Acacia aneura* low trees, over *Thryptomene decussata* sparse mid to low shrubland, over isolated *Monachather paradoxus* tussock grasses.

Mh14 was restricted to the low gravelly hill slopes of the Millrose land system. The Millrose system is not widespread in the Project Area (0.58%) and is moderately widespread in Western Australia, with 1.2% of its total area occurring in the Project Area. Mh14 is mapped as a very small area in the Project (159 ha, 0.07%) and it provides habitat for three Priority Flora taxa (Table P.2). Mh14 therefore has low conservation significance as it is restricted in the Project Area but likely to be widespread in the region.

Mh15: *Acacia aneura* open low woodland, over *Sida* spp. and *Ptilotus obovatus* sparse low shrubland.

Mh15 was restricted to the low lateritic hill slopes of the Wiluna and Gabanintha land system. The Wiluna system is moderately widespread in Western Australia, and is mapped as 0.36% of the Project Area. The Gabanintha system is moderately widespread in Western Australia, and is mapped as 1.19% of the Project Area. Mh15 is mapped as a very small area in the Project (1,814 ha, 0.80%) and it provides habitat for two Priority Flora taxa (Table P.2). Mh15 therefore has low conservation significance as it is restricted in the Project Area but likely to be widespread in the region.

Mh16: *Acacia aneura* open low woodland, over *Acacia synchronicia* and *Acacia tetragonophylla* sparse tall shrubland, over *Maireana triptera* and *Ptilotus obovatus* sparse low shrubland, over *Aristida contorta* open tussock grassland.

Mh16 was restricted to the lateritic footslopes of the Gabanintha land system. The Gabanintha system is moderately widespread in the Project Area (1.19%) or Western Australia, with 1.07% of its total area occurring in the Project Area. Mh16 is mapped as a very small area in the Project (718 ha, 0.32%) and it does not contain any Priority Flora taxa. Mh16 therefore has low conservation significance as it is restricted in the Project Area but likely to be widespread in the region.

Mh17: *Acacia aneura* open low woodland, over *Acacia ramulosa* var. *linophylla* open tall shrubland, over *Aluta aspera* subsp. *hesperia* or *Eremophila forrestii* open mid shrubland, over *Monachather paradoxus* sparse tussock grassland.

Mh17 was restricted to the low gravelly hill slope of the Norie and Challenge land systems. The Norie system is moderately widespread in Western Australia and is mapped as 1.06% of the Project Area. The Challenge system is very widespread in Western Australia and is mapped as 7.63% of the Project Area. Mh17 is mapped as a very small area in the Project (1,876 ha,

0.86%) and it provides habitat for two Priority Flora taxa (Table P.2). Mh17 therefore has low conservation significance as it is restricted in the Project Area but likely to be widespread in the region.

Mh18: *Acacia* spp. sparse tall shrubland, over *Eremophila latrobei* subsp. *latrobei* and mixed Myrtaceae spp. open low shrubland.

Mh18 was restricted to the lateritic and calcreted breakaways of the Challenge and Waguin land systems. The Challenge system is very widespread in Western Australia, and is mapped as 7.63% of the Project Area. The Waguin land system is also very widespread in Western Australia, and is mapped as 0.26% of the Project Area. Mh18 is mapped as a very small area in the Project (103 ha, 0.05%) and it provides habitat for four Priority Flora taxa (Table P.2). Mh18 therefore has high conservation significance as it is restricted in the Project Area and although it is likely to be widespread in the region, corresponds to a less common characteristic of the land systems and is likely to be rare.

Mr1: *Acacia aneura* (+/- *Acacia ramulosa* var. *linophylla*) sparse low woodland, over *Eremophila compacta* subsp. *compacta* mid shrubland, over *Mirbelia rhagodioides* and (+/- *Hemigenia virescens*) sparse low shrubland, over *Aristida holathera* var. *holathera* and *Eriachne aristidea* tussock grassland.

Mr1 was restricted to the red sand plains of the Belele and Flood land systems. The Belele system is widespread in Western Australia, and is mapped as 1.93% of the Project Area. The Flood land system is moderately widespread in Western Australia, and is mapped as 1.33% of the Project Area. Mr1 is mapped as a large area in the Project (7,239 ha, 3.21%) and it provides habitat for four Priority Flora taxa (Table P.2). Mr1 therefore has moderate conservation significance as it is widespread in the Project Area and likely to be widespread in the region, but provides significant habitat for Priority Flora.

Mr2: *Acacia aneura* open low woodland, over *Acacia ramulosa* var. *linophylla* open tall shrubland, over *Eremophila forrestii* (+/- *Eremophila simulans* subsp. *simulans*) open mid shrubland, over *Eriachne helmsii* and *Monachather paradoxus* open tussock grassland.

Mr2 was restricted to the orange-yellow sand plains of the Kalli land system. The Kalli system is very widespread in the Project Area (7.15%) and Western Australia, with 1.44% of its total area occurring in the Project Area. Mr2 is mapped as a large area in the Project (10,661 ha, 4.73%) and it provides habitat for seven Priority Flora taxa (Table P.2). Mr2 therefore has moderate conservation significance as it is widespread in the Project Area and likely to be widespread in the region, but provides significant habitat for Priority Flora.

Mr3: *Acacia aneura* open tall shrubland, over *Eremophila forrestii* (+/- *Eremophila fraseri* and *Senna* spp.) open mid shrubland, over *Ptilotus obovatus* open low shrubland, over *Monachather paradoxus* open tussock grassland.

Mr3 was restricted to the red sand plains of the Yandil land system. The Yandil system is widespread in the Project Area (1.36%) and Western Australia, with 0.62% of its total area occurring in the Project Area. Mr3 is mapped as a very small area in the Project (2,487 ha, 1.1%) and it provides habitat for two Priority Flora taxa (Table P.2). Mr3 therefore has low conservation significance as it is widespread in the Project Area and is likely to be widespread in the region.

Mp1: *Eremophila spathulata* and/or *Eremophila macmillaniana* sparse mid shrubland.

Mp1 was restricted to the stony quartzite plains of the Koonmarra land system. The Koonmarra system is widespread in the Project Area (5.32%) and Western Australia, with 2.11% of its total area occurring in the Project Area. Mp1 is mapped as a large area in the

Project (10,634 ha, 4.71%) and it provides habitat for six Priority Flora taxa (Table P.2). Mp1 therefore has low conservation significance as it is widespread in the Project Area and is likely to be widespread in the region.

Mp2: *Acacia aneura* sparse low woodland, over *Eremophila fraseri* (+/- *Eremophila macmillaniana*) and *Senna artemisioides* subsp. *helmsii* open mid shrubland, over *Ptilotus obovatus* sparse low shrubland, over *Eriachne pulchella* subsp. *pulchella* and *Aristida contorta* sparse tussock grassland.

Mp2 was restricted to the hard clay plains of the Koonmarra and Yandil land system. The Koonmarra land system is widespread in Western Australia, and is mapped as 5.32% of the Project Area and the Yandil system is also widespread in Western Australia, and mapped as 1.36% of the Project Area. Mp2 is mapped as a large area in the Project (7,562 ha, 3.35%) and it provides habitat for six Priority Flora taxa (Table P.2). Mp2 therefore has low conservation significance as it is widespread in the Project Area and is likely to be widespread in the region.

Mp3: Isolated *Acacia aneura* low trees, over open *Senna artemisioides* subsp. *helmsii*, *Senna glaucifolia* and *Senna* sp. Meekatharra (E. Bailey 1-26) mid shrubland, over *Ptilotus obovatus* sparse low shrubland, over *Aristida contorta* sparse tussock grassland.

Mp3 was restricted to the hardpan plains of the Ero and Yandil land systems. The Ero land system is moderately widespread in Western Australia, and is mapped as 1.73% of the Project Area. The Yandil system is widespread in Western Australia, and is mapped as 1.36% of the Project Area. Mp3 is mapped as a moderate area in the Project (2,771 ha, 1.23%) and it provides habitat for two Priority Flora taxa (Table P.2). Mp3 therefore has low conservation significance as it is fairly widespread in the Project Area and is likely to be widespread in the region.

Mp4: Isolated *Acacia pruinocarpa* low trees, over *Acacia aneura* and *Acacia craspedocarpa* x *aneura* sparse tall shrubland, over isolated *Eremophila fraseri* mid shrubs, over *Ptilotus obovatus* sparse low shrubland.

Mp4 was restricted to the hardpan plains of the Yandil land system. The Yandil system is widespread in the Project Area (1.36%) and Western Australia, with 0.62% of its total area occurring in the Project Area. Mp4 is mapped as a very small area in the Project (2,783 ha, 1.23%) and it provides habitat for three Priority Flora taxa (Table P.2). Mp4 therefore has low conservation significance as it is fairly widespread in the Project Area and is likely to be widespread in the region.

Mp5: *Acacia aneura* open low woodland, over isolated *Acacia demissa* tall shrubs, over *Senna artemisioides* subsp. *helmsii* sparse mid shrubland, over *Ptilotus obovatus* sparse low shrubland.

Mp5 was restricted to the hardpan plains with outcropping granite of the Sherwood, Yandil and Mindura land systems. The Sherwood system is very widespread in Western Australia and is mapped as 4.27% of the Project Area, the Yandil system is widespread in Western Australia and is mapped as 1.36% of the Project Area and the Mindura system is widespread in Western Australia and is mapped as 1.4% of the Project Area. Mp5 is mapped as a moderate area in the Project (4,103 ha, 1.82%) and it provides habitat for eight Priority Flora taxa (Table P.2). Mp5 therefore has low conservation significance as it is fairly widespread in the Project Area and is likely to be widespread in the region.

Mp6: Isolated *Acacia aneura* low trees, over *Ptilotus obovatus* and mixed *Maireana* spp. low shrubland.

Mp6 was restricted to the clay pans of the Cunyu and Sherwood land system. The Cunyu system is restricted in the Project Area (0.69%) and widespread in Western Australia, with 0.47% of its total area occurring in the Project Area. The Sherwood system is widespread in

the Project Area (4.27%) and in Western Australia, with 0.61% of its total area occurring in the Project Area. Mp6 is mapped as a moderate area in the Project (4,070 ha, 1.8%) and it provides habitat for nine Priority Flora taxa (Table P.2). Mp6 therefore has moderate conservation significance as it is fairly widespread in the Project Area and likely to be widespread in the region, but provides significant habitat for Priority Flora.

Mp7: *Acacia aneura* sparse low woodland, over *Acacia craspedocarpa* tall shrubland, over *Acacia tetragonophylla* sparse mid shrubland, over *Eremophila punicea*, *Solanum lasiophyllum* and *Ptilotus obovatus* sparse low shrubland, over *Aristida contorta* sparse tussock grassland.

Mp7 was recorded on the hardpan clay plains of the Yanganoo and Millex land systems. The Yanganoo system is very widespread in Western Australia, and is mapped as 15.72% of the Project Area. The Millex system is restricted in Western Australia, and is mapped as 1.27% of the Project Area. Mp7 is mapped as a large area in the Project (6,315 ha, 2.8%) and it provides habitat for four Priority Flora taxa (Table P.2). Mp7 therefore has moderate conservation significance as it is widespread in the Project Area and likely to be widespread in the region, but provides significant habitat for Priority Flora.

Mp8: *Acacia aneura* isolated low trees to open woodland, (+/-*Acacia tetragonophylla*, *Acacia craspedocarpa* and *Acacia ramulosa* var. *linophylla*) tall shrubs, over *Eremophila fraseri*, *Ptilotus obovatus* and *Solanum lasiophyllum* sparse low shrubland, over *Aristida contorta* open tussock grassland.

Mp8 was restricted to the hard clay pans of the Jundee, Violet and Yandil land systems. The Jundee system is widespread in Western Australia, and is mapped as 1.94% of the Project Area, the Violet system is widespread in Western Australia and is mapped as 1.36% of the Project Area and the Yandil system is widespread in Western Australia, and is mapped as 1.36% of the Project Area. Mp8 is mapped as a moderate area in the Project (4,914 ha, 2.18%) and does not contain any Priority Flora taxa (Table P.2). Mp8 therefore has low conservation significance as it is widespread in the Project Area and is likely to be widespread in the region.

Mp9: Isolated *Acacia aneura* and *Eremophila platycalyx* low trees, over *Eremophila fraseri* subsp. *fraseri*, *Eremophila platycalyx*, *Senna artemisioides* subsp. *helmsii* and *Senna* sp. Meekatharra (E. Bailey 1-26) open mid shrubland, over *Ptilotus obovatus* sparse low shrubland, over *Aristida contorta* sparse tussock grassland.

Mp9 was restricted to the hardpan plains of the Challenge, Millex and Yandil land systems. The Challenge system is very widespread in Western Australia, and is mapped as 7.63% of the Project Area, the Millex system is not very widespread in Western Australia, and is mapped as 1.27% of the Project Area and the Yandil system is widespread in Western Australia, and is mapped as 1.36% of the Project Area. Mp9 is mapped as a large area in the Project (9,900 ha, 4.39%) and it provides habitat for three Priority Flora taxa (Table P.2). Mp9 therefore has low conservation significance as it is widespread in the Project Area and is likely to be widespread in the region.

Mp10: *Aristida holathera* var. *holathera*, *Eragrostis cumingii*, *Eriachne flaccida*, *Eriachne pulchella* subsp. *pulchella* and *Eragrostis setifolia* tussock grassland, over *Bulbostylis barbata* and *Fimbristylis dichotoma* sedgeland.

Mp10 was restricted to the shallow soils on granite of the Norie land system. The Norie system is not very widespread in the Project Area (1.06%) and is moderately widespread in Western Australia, with 1.13% of its total area occurring in the Project Area. Mp10 is mapped as a very small area in the Project (92 ha, 0.04%) and no Priority Flora were recorded. Mp10 therefore has moderate conservation significance as it is restricted in the Project Area and

although it is likely to be widespread in the region, corresponds to a less common characteristic of the system and is likely to be rare.

Mp11: *Acacia aneura* sparse to open low woodland, over *Eremophila forrestii*, *Eremophila fraseri* and *Senna* spp. sparse mid shrubland, over *Aristida contorta* tussock grassland.

Mp11 was restricted to the hardpan plains of the Yandil land system. The Yandil system is moderately widespread in the Project Area (1.36%) and in Western Australia, with 0.62% of its total area occurring in the Project Area. Mp11 is mapped as a large area in the Project (13,342 ha, 5.91%) and it provides habitat for three Priority Flora taxa (Table P.2). Mp11 therefore has low conservation significance as it is widespread in the Project Area and is likely to be widespread in the region.

Mp12: *Acacia aneura* low woodland, over *Acacia aneura* x *craspedocarpa* and *Acacia tetragonophylla* open tall shrubland, over isolated *Eremophila forrestii* and *Eremophila fraseri* mid shrubs, over *Aristida contorta* and *Eragrostis dielsii* open tussock grassland.

Mp12 was restricted to the hardpan plains of the Yandil land system. The Yandil system is widespread in the Project Area (1.36%) and Western Australia, with 0.62% of its total area occurring in the Project Area. Mp12 is mapped as a moderate area in the Project (4,573 ha, 2.03%) and it provides habitat for one Priority Flora taxon (Table P.2). Mp12 therefore has low conservation significance as it is widespread in the Project Area and is likely to be widespread in the region.

Mf1: *Melaleuca stereophloia* open to closed mid shrubland, over mixed *Chenopod* spp. low shrubland.

Mf1 was restricted to the floodplains bordering the salt lakes of the Mileura land system. The Mileura system is not widespread in the Project Area (0.65%) or Western Australia, with 0.56% of its total area occurring in the Project Area. Mf1 was mapped as a very small area in the Project (529 ha, 0.23%) and it provided habitat for one Priority Flora taxon (Table P.2). Mf1 therefore has high conservation significance as it is restricted in the Project Area and the region, was recorded at Weld Range and likely to be different to other salt lake vegetation communities in the area.

Mf2: *Eucalyptus striatocalyx* subsp. *striatocalyx* and *Eucalyptus trivalva* open mid to low forest, over *Maireana georgei*, *Frankenia laxiflora* and *Atriplex bunburyana* sparse low shrubland.

Mf2 was restricted to the floodplains bordering salt lakes of the Mileura land system. The Mileura system is not widespread in the Project Area (0.65%) or Western Australia, with 0.56% of its total area occurring in the Project Area. Mf2 was mapped as a very small area in the Project (20 ha, 0.01%). No Priority Flora was recorded. Mf2 therefore has very high conservation significance as it is very restricted in the Project Area and the region, was recorded at Weld Range and likely to be different to other salt lake vegetation communities in the area.

Mf3: *Tecticornia pruinosa* low shrubland, over *Fimbristylis dichotoma* and *Eragrostis pergracilis* open tussock grassland.

Mf3 was restricted to the dry salt lake beds of the Mileura land system. The Mileura system is not widespread in the Project Area (0.65%) or Western Australia, with 0.56% of its total area occurring in the Project Area. Mf3 is mapped as a very small area in the Project (20 ha, 0.01%) and no Priority Flora were recorded. Mf3 therefore has high conservation significance as it is restricted in the Project Area and the region, was recorded at Weld Range and likely to be different to other salt lake vegetation communities in the area.

Mc1: *Casuarina pauper* sparse low woodland, over *Tecticornia* spp. low shrubland.

Mc1 was restricted to the creeklines and minor channels of the Beringarra land system. The Beringarra system is restricted in the Project Area (0.63%) and moderately widespread in Western Australia, with 0.54% of its total area occurring in the Project Area. Mc1 is mapped as a very small area in the Project (263 ha, 0.12%) and no Priority Flora were recorded. Mc1 therefore has low conservation significance as it is restricted in the Project Area but likely to be widespread in the region.

Mc2: *Eucalyptus victrix* open mid woodland, over *Acacia burkittii* and *Acacia aneura* sparse low woodland, over *Acacia burkittii* and *Dodonaea viscosa* subsp. *spatulata* open mid shrubland, over *Cyperus bifax* sparse sedgeland and *Eriachne helmsii* and *Themeda triandra* sparse tussock grassland.

Mc2 was restricted to the creeklines of the Koonmarra land system. The Koonmarra system is widespread in the Project Area (5.32%) and Western Australia, with 2.11% of its total area occurring in the Project Area. Mc2 is mapped as a very small area in the Project (326 ha, 0.14%) and it provides habitat for two Priority Flora taxa (Table P.2). Mc2 therefore has moderate conservation significance as it is restricted in the Project Area and although it is likely to be widespread in the region, corresponds to a less common characteristic of the land systems and is likely to be rare.

Mc3: *Eucalyptus victrix* and *Acacia cyperophylla* var. *cyperophylla* closed low to mid woodland.

Mc3 was restricted to the major creeklines at Jack Hills of the Weld and Flood land systems. The Weld system is not widespread in Western Australia and is mapped as 1.6% of the Project Area and the Flood system is not widespread in Western Australia and is mapped as 1.33% of the Project Area. Mc3 was mapped as a very small area in the Project (424 ha, 0.19%) and no Priority Flora were recorded. Mc3 therefore has high conservation significance as it is restricted in the Project Area and the region and is part of the Jack Hills PEC.

Mc4: *Acacia aneura* and *Acacia ramulosa* var. *linophylla* open to closed low woodland, over mixed *Eremophila* spp. open mid shrubland, over *Ptilotus* spp. sparse low shrubland.

Mc4 was restricted to the major creeklines at Weld Range of the Weld and Jundee land systems. The Weld system is not widespread in Western Australia and is mapped as 1.6% of the Project Area and the Jundee system is widespread in Western Australia and is mapped as 1.94% of the Project Area. Mc4 is mapped as a small area in the Project (1,094 ha, 0.48%) and no Priority Flora were recorded. Mc4 therefore has moderate conservation significance as it is restricted in the Project Area, is likely to be widespread in the region but is part of the Weld Range PEC.

Mc5: *Acacia aneura* and *Acacia tetragonophylla* (+/- *Acacia kempeana*) low woodland.

Mc5 was restricted to the minor drainage channels and creeklines of many land systems in the Murchison region, including the; Sherwood, Yanganoo, Ero, Koonmarra, Mindura, Yandil and Belele systems. Mc5 was mapped as a moderately sized area in the Project (3,141 ha, 1.39%) and provides habitat for four Priority Flora taxa (Table P.2). Mc5 therefore has low conservation significance as it is widespread in the Project Area and is likely to be widespread in the region, across many different land systems.

Mc6: Mixed *Acacia aneura*, *Acacia ramulosa* var. *ramulosa* and *Acacia tetragonophylla* low woodland.

Mc6 was restricted to the minor drainage channels and creeklines of many land systems in the Murchison region, including the; Yanganoo, Challenge and Ero systems. Mc6 is mapped as a

small area in the project (891 ha, 0.4%) and no Priority Flora were recorded. Mc6 therefore has low conservation significance as it is restricted in the Project Area, but likely to be widespread in the region across many different land systems.

Mc7: *Acacia ramulosa* var. *ramulosa* open low woodland, over *Acacia burkittii* and *Acacia craspedocarpa* x *aneura* sparse low woodland, over *Acacia tetragonophylla* sparse mid shrubland, over *Monachather paradoxus*, *Eragrostis leptocarpa* and *Eriachne flaccida* sparse tussock grassland.

Mc7 is restricted to the minor drainage channels and creeklines of the Yanganoo land system. The Yanganoo system is very widespread in the Project Area (15.72%) and Western Australia, with 1.75% of its total area occurring in the Project Area. Mc7 is mapped as a very small area in the Project (43 ha, 0.02%) and no Priority Flora were recorded. Mc6 is mapped as a small area in the project (891 ha, 0.4%) and no Priority Flora were recorded. Mc6 therefore has low conservation significance as it is restricted in the Project Area, but likely to be widespread in the region across many different land systems.

Mc8: *Acacia acuminata* and *Acacia aneura* open low woodland (+/-*Casuarina pauper*), over *Acacia acuminata*, *Grevillea obliquistigma* subsp. *obliquistigma*, *Callistemon phoeniceus* and *Senna artemisioides* subsp. x *artemisioides* open tall to mid shrubland, over *Cyperus* spp. sparse sedgeland.

Mc8 is restricted to the minor drainage channels and creeklines of the Yanganoo and Ero land systems. The Yanganoo system is very widespread in Western Australia and mapped as 15.72% of the Project Area and the Ero system is not very widespread in Western Australia and mapped as 1.73% of the Project Area. Mc8 was mapped as a very small area in the Project (455 ha, 0.20%) and no Priority Flora were recorded. Mc8 therefore has low conservation significance as it is restricted in the Project Area, but likely to be widespread in the region across different land systems.

Table 7.4 – Vegetation Communities Conservation Significance Assessment

Veg Com	Vegetation Description	Assigned Cons Sig	Area Mapped in Project Area (ha)	% of Project Area	Associated System (s)	No of Priority Flora Recorded	No of Endemic Priority Flora	% of Priority Flora Records	Vegetation Condition	Species Richness	Part of a PEC?
Gh1	Isolated <i>Eucalyptus loxophleba</i> subsp. <i>loxophleba</i> low mallee trees, over <i>Melaleuca megacephala</i> and <i>Hakea pycnoneura</i> closed mid shrubland, over <i>Hibbertia hypericoides</i> , <i>Acacia lasiocarpa</i> var. <i>lasiocarpa</i> , <i>Gastrolobium plicatum</i> , <i>Gastrolobium triangulare</i> sparse low shrubland, over <i>Lepidosperma tenue</i> open sedgeland.	Very High	129	0.06	Moresby	11	3	3.6	Excellent	19.2	Moresby Range
Gh2	Mixed <i>Acacia</i> spp. and <i>Melaleuca</i> spp. sparse to open tall shrubs, over <i>Verticordia chrysanthella</i> and <i>Gastrolobium plicatum</i> low shrubland.	Very High	587	0.26	Moresby	11	-	20.7	Excellent	38.4	Moresby Range
Gh3	<i>Allocasuarina campestris</i> closed tall to mid shrubland, over <i>Lepidosperma tenue</i> sparse sedgeland.	Very High	88	0.04	Moresby	6	-	1.1	Good	9	Moresby Range
Gy1	<i>Eucalyptus</i> spp., <i>Xylomelum angustifolium</i> , <i>Actinostrobos arenarius</i> and <i>Banksia</i> spp. sparse to open low woodland, over mixed Myrtaceae spp. open low to mid shrubland.	Very High	489	0.22	Eradu	1	1	0.3	Good	38.4	-
Gy2	Mixed <i>Eucalyptus</i> spp. open low woodland, over <i>Acacia</i> spp. and <i>Melaleuca</i> spp. sparse mid shrub land.	Very High	1,755	0.78	Binnu	13	7	6.1	Excellent	21.3	-
Gp1	<i>Acacia tetragonophylla</i> and <i>Hakea recurva</i> subsp. <i>recurva</i> (+/- <i>Eucalyptus loxophleba</i> subsp. <i>loxophleba</i> , <i>Acacia acuminata</i> and <i>Acacia burkittii</i>) low woodland, over <i>Ptilotus obovatus</i> sparse low shrubland, over <i>*Avena fatua</i> and <i>*Bromus diandrus</i> tussock grassland.	Low	924	0.41	Casuarina, Dartmoor, Greenough, Moresby, Mt Horner, Northampton, Sugarloaf	4	-	1.1	Poor	17.9	-
Gp2	<i>Melaleuca adnata</i> sparse low woodland, over <i>Calothamnus quadrifidus</i> and <i>Acacia acuminata</i> open tall to mid shrubland, over <i>Ptilotus obovatus</i> open low shrubland, over <i>Amphipogon caricinus</i> var. <i>caricinus</i> open tussock grassland.	High	39	0.02	Binnu	-	-	-	Excellent	30	-
Gf1	Isolated <i>Hakea preissii</i> tall shrubs, over <i>Tecticornia indica</i> subsp. <i>bidens</i> and <i>Atriplex amnicola</i> (+/- <i>Tecticornia lepidosperma</i> , <i>Tecticornia pergranulata</i> subsp. <i>pergranulata</i> and <i>Frankenia setosa</i>) low chenopod shrubland, over <i>*Avena fatua</i> and <i>Eragrostis dielsii</i> sparse tussock grassland.	Moderate	753	0.33	Dartmoor	2	-	0.2	Good	15.6	-

Veg Com	Vegetation Description	Assigned Cons Sig	Area Mapped in Project Area (ha)	% of Project Area	Associated System (s)	No of Priority Flora Recorded	No of Endemic Priority Flora	% of Priority Flora Records	Vegetation Condition	Species Richness	Part of a PEC?
Gf2	<i>Eucalyptus loxophleba</i> subsp. <i>loxophleba</i> open low woodland, over <i>Acacia acuminata</i> and <i>Acacia burkittii</i> sparse tall shrubland, over <i>Acacia tetragonophylla</i> and <i>Enchylaena tomentosa</i> sparse mid shrubland, over <i>Acacia andrewsii</i> and <i>Ptilotus obovatus</i> sparse low shrubland.	Moderate	2292	1.02	Dartmoor	7	-	3.6	Good	24.6	-
Gc1	<i>Eucalyptus camaldulensis</i> var. <i>obtusata</i> mid to low woodland (+/- <i>Casuarina obesa</i> and <i>Melaleuca raphiophylla</i>) isolated to open tall shrubland, over <i>Atriplex amnicola</i> and <i>Chenopodium gaudichaudianum</i> sparse low shrubland, over <i>Cyperus gymnocaulos</i> sparse sedgeland and * <i>Avena fatua</i> and * <i>Bromus diandrus</i> tussock grassland.	High	996	0.44	Greenough	2	1	0.2	Poor	11.5	-
Gc2	<i>Grevillea</i> spp., <i>Acacia</i> spp. and <i>Melaleuca</i> spp. tall shrubland.	High	13	0.01	Northampton	4	2	1.1	Good	N/A	-
Yh1	<i>Allocasuarina dielsiana</i> sparse mid woodland, over <i>Acacia quadrimarginea</i> and <i>Acacia ramulosa</i> var. <i>linophylla</i> sparse tall shrubland, over <i>Ptilotus obovatus</i> sparse low shrubland.	High	928	0.41	Tallering	-	-	-	Good	8	Tallering
Yh2	<i>Acacia ramulosa</i> var. <i>linophylla</i> sparse tall shrubland, over isolated <i>Thryptomene decussata</i> , <i>Eremophila latrobei</i> subsp. <i>latrobei</i> and <i>Sida ectogama</i> mid shrubs, over <i>Eriachne pulchella</i> subsp. <i>pulchella</i> and <i>Aristida contorta</i> sparse tussock grassland.	Low	58	0.03	Nerramyne	-	-	-	Good	13	-
Yh3	Isolated <i>Acacia aneura</i> , <i>Acacia ramulosa</i> var. <i>linophylla</i> , <i>Acacia quadrimarginea</i> and <i>Acacia grasbyi</i> low trees, over <i>Thryptomene costata</i> and <i>Thryptomene decussata</i> open mid to low shrubland, over <i>Aristida contorta</i> open tussock grassland.	Low	112	0.05	Challenge, Gabanintha	1	-	0.1	Good	16	-
Yy1	<i>Acacia ramulosa</i> var. <i>linophylla</i> and <i>Acacia ramulosa</i> var. <i>ramulosa</i> open tall shrubland.	Low	4,923	2.18	Kalli	4	-	1.5	Good	11.7	-
Yp1	<i>Acacia coolgardiensis</i> tall shrubland to low woodland, over isolated <i>Eremophila forrestii</i> subsp. <i>hastieana</i> mid to low shrubs.	Low	231	0.10	Nerramyne	1	-	0.1	Good	8.5	-
Yp2	<i>Acacia ramulosa</i> var. <i>linophylla</i> (+/- <i>Acacia ramulosa</i> var. <i>ramulosa</i> and <i>Acacia tetragonophylla</i>) tall to mid shrubland, over <i>Enchylaena tomentosa</i> var. <i>tomentosa</i> sparse low shrubland.	Low	5,164	2.29	Tindalarra, Tallering, Nerramyne	5	-	0.5	Good	10.6	Tallering
Yp3	Mixed <i>Eucalyptus</i> spp. low woodland, over sparse <i>Acacia</i> spp. mid shrubland.	Moderate	1,078	0.48	Joseph	3	1	0.7	Excellent	23.9	-
Yp4	<i>Eucalyptus kochii</i> subsp. <i>amaryssia</i> open mid woodland, over isolated <i>Acacia ramulosa</i> var. <i>ramulosa</i> tall shrubs, over isolated <i>Acacia andrewsii</i> , <i>Ptilotus obovatus</i> and <i>Maireana</i> spp. low shrubs, over isolated <i>Eriachne helmsii</i> tussock grasses.	Low	851	0.38	Pindar	1	-	0.1	Poor	9	-

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Yp5	<i>Acacia ramulosa</i> var. <i>linophylla</i> , <i>Acacia grasbyi</i> , <i>Acacia burkittii</i> and <i>Acacia aneura</i> open tall shrubland.	Low	28,448	12.61	Tindalarra, Yanganoo, Nerramyne	7	2	8.4	Good	12.3	-
Yp6	<i>Acacia burkittii</i> , <i>Acacia quadrimarginea</i> , <i>Acacia aneura</i> (+/- <i>Acacia</i> aff. <i>rhodophloia</i>) over isolated <i>Hakea preissii</i> and <i>Senna</i> spp. mid shrubs, over <i>Ptilotus obovatus</i> and <i>Acacia scleroclada</i> sparse low shrubland, over <i>Cymbopogon ambiguus</i> and <i>Aristida contorta</i> open tussock grassland.	Low	4,006	1.78	Challenge	6	-	1.0	Good	15.4	-
Yf1	<i>Acacia burkittii</i> and <i>Acacia grasbyi</i> and (+/- <i>Acacia ramulosa</i> var. <i>linophylla</i>) sparse tall shrubland over <i>Acacia tetragonophylla</i> sparse tall to mid shrubland, over <i>Ptilotus obovatus</i> sparse low shrubland, over <i>Aristida contorta</i> sparse tussock grassland.	Low	5,460	2.42	Tindalarra	3	1	0.2	Poor	11.1	-
Yf2	Isolated <i>Acacia synchronicia</i> tall shrubs, over isolated <i>Senna</i> sp. Meekatharra (E. Bailey 1-26), <i>Acacia synchronicia</i> , <i>Acacia tetragonophylla</i> and <i>Eremophila galeata</i> mid shrubs, over <i>Aristida contorta</i> tussock grassland.	Low	856	0.38	Tindalarra, Ero	-	-	-	Degraded	10.2	-
Yf3	<i>Acacia victoriae</i> sparse tall shrubland, over <i>Atriplex bunburyana</i> open mid shrubland, over <i>Atriplex bunburyana</i> sparse low shrubland, over <i>Aristida contorta</i> and <i>Eragrostis dielsii</i> sparse tussock grassland.	Low	403	0.18	Beringarra	-	-	-	Poor	7	-
Yf4	<i>Tecticornia disarticulata</i> , <i>Rhagodia eremaea</i> , <i>Frankenia laxiflora</i> , <i>Sclerolaena cuneata</i> and <i>Cratystylis subspinescens</i> low shrubland.	High	63	0.03	Yewin	-	-	-	Good	6	-
Yf5	<i>Acacia eremaea</i> sparse tall shrubland, over mixed <i>chenopod</i> spp. low shrubland.	Low	8,049	3.57	Yewin, Tindalarra	7	-	1.4	Good	11.7	-
Yc1	<i>Casuarina obesa</i> open to sparse low forest, over <i>Duboisia hopwoodii</i> sparse tall shrubland, over <i>Atriplex amnicola</i> , <i>Tecticornia indica</i> subsp. <i>bidens</i> and <i>Tecticornia lepidosperma</i> open low chenopod shrubland, over * <i>Hordeum glaucum</i> and * <i>Avena fatua</i> tussock grassland.	Low	532	0.24	Tindalarra	1	-	0.3	Poor	17.9	-
Yc2	<i>Acacia burkittii</i> (+/- <i>Acacia acuminata</i>) mid woodland, over <i>Acacia burkittii</i> , <i>Hakea preissii</i> and <i>Acacia tetragonophylla</i> low woodland to sparse tall shrubland, over <i>Ptilotus obovatus</i> sparse low shrubland, over <i>Cyperus bifax</i> sparse sedgeland, over <i>Monachather paradoxus</i> and * <i>Setaria verticillata</i> tussock grassland.	Low	2,712	1.20	Yanganoo, Tindalarra, Ero	4	1	1.0	Poor	19.3	-
Mh1	<i>Acacia rhodophloia</i> , <i>Acacia ramulosa</i> var. <i>linophylla</i> and <i>Acacia cuthbertsonii</i> subsp. <i>cuthbertsonii</i> open tall shrubland, over <i>Eriachne aristidea</i> sparse tussock grassland.	High	384	0.17	Weld	-	-	-	Excellent	12	Jack Hills

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Mh2	Sparse <i>Acacia aneura</i> and/or <i>Acacia rhodophloia</i> low woodland, over <i>Ptilotus obovatus</i> sparse low shrubland.	High	225	0.10	Weld	-	-	-	Good	8.2	Jack Hills
Mh3	Isolated <i>Acacia aneura</i> (+/- <i>Acacia ramulosa</i> var. <i>linophylla</i> and <i>Acacia cuthbertsonii</i> subsp. <i>cuthbertsonii</i>) low trees, over isolated <i>Aristida contorta</i> tussock grasses.	High	3,632	1.61	Weld, Yarrameedie	3	1	1.0	Good	15	Jack Hills
Mh4	<i>Acacia aneura</i> and <i>Acacia citrinoviridis</i> open low woodland, over <i>Acacia ramulosa</i> var. <i>linophylla</i> sparse tall shrubland, over <i>Sida cardiophylla</i> and <i>Ptilotus obovatus</i> open low shrubland, over isolated <i>Monachather paradoxus</i> tussock grasses.	High	426	0.19	Weld	1	-	0.2	Good	12	Jack Hills
Mh5	<i>Acacia aneura</i> (+/- <i>Acacia ramulosa</i> var. <i>linophylla</i>) sparse to open low woodland, over mixed <i>Eremophila</i> spp. mid shrubland.	High	4,298	1.91	Weld, Yarrameedie	2	-	0.1	Poor	6.5	Weld Range
Mh6	Isolated <i>Acacia pruinocarpa</i> low trees, over <i>Acacia aneura</i> sparse tall shrubland, over <i>Thryptomene decussata</i> (+/- <i>Prostanthera petrophila</i> , <i>Dodonaea petiolaris</i> , <i>Eremophila latrobei</i> subsp. <i>latrobei</i> , <i>Philothea brucei</i> subsp. <i>brucei</i>) mid shrubland, over <i>Ptilotus obovatus</i> low shrubland, over <i>Eriachne mucronata</i> and <i>Cymbopogon ambiguus</i> sparse tussock grassland.	Very High	71	0.03	Weld	2	-	0.1	Good	13	Weld Range
Mh7	<i>Acacia</i> sp. Weld Range (A. Markey & S. Dillon 2994) and <i>Acacia aneura</i> open tall shrubland, over <i>Eremophila macmillaniana</i> and <i>Senna artemisioides</i> subsp. <i>helmsii</i> , open mid shrubland, over <i>Ptilotus obovatus</i> open low shrubland.	High	94	0.04	Yarrameedie	-	-	-	Good	17	Weld Range
Mh8	<i>Acacia aneura</i> open low woodland, over <i>Eremophila macmillaniana</i> open mid shrubland, over <i>Sida</i> sp. dark green fruits (S. van Leeuwen 2260) scattered low shrubs, over <i>Aristida contorta</i> open tussock grassland.	High	750	0.33	Weld	3	-	2.1	Good	14	Weld Range
Mh9	<i>Acacia aneura</i> open low woodland, over <i>Grevillea obliquistigma</i> subsp. <i>obliquistigma</i> and <i>Eremophila spathulata</i> sparse mid shrubland, over <i>Eremophila latrobei</i> subsp. <i>latrobei</i> sparse low shrubland, over <i>Eriachne pulchella</i> subsp. <i>pulchella</i> sparse tussock grassland.	Low	115	0.05	Mindura	2	-	0.2	Good	9	-
Mh10	<i>Acacia</i> spp., sparse tall shrubland, over <i>Eremophila</i> spp. sparse mid shrubland.	Moderate	29	0.01	Mindura, Millrose	2	-	0.1	Excellent	12.8	-
Mh11	<i>Acacia</i> aff. <i>rhodophloia</i> open tall shrubland, over <i>Dodonaea petiolaris</i> sparse mid shrubland, over <i>Ptilotus obovatus</i> , <i>Pluchea dentex</i> , <i>Stemodia viscosa</i> , <i>Solanum lasiophyllum</i> and <i>Hibiscus coatesii</i> sparse low shrubland, over <i>Aristida contorta</i> and <i>Cymbopogon ambiguus</i> tussock grassland.	Moderate	746	0.33	Norie, Challenge	1	-	0.1	Good	18.1	-

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Mh12	<i>Eremophila platycalyx</i> subsp. <i>platycalyx</i> and <i>Acacia tetragonophylla</i> sparse tall shrubland, over isolated <i>Dodonaea viscosa</i> subsp. <i>spatulata</i> low shrubs, over <i>Cymbopogon ambiguus</i> , sparse tussock grassland.	Moderate	1,094	0.49	Norie, Challenge	-	-	-	Poor	8.3	-
Mh13	<i>Acacia</i> sp. Weld Range (A. Markey & S. Dillon 2994) sparse mid shrubland, over <i>Dodonaea pachyneura</i> and <i>Philothea</i> aff. <i>tubiflora</i> sparse low shrubland, over isolated <i>Eragrostis</i> sp. tussock grasses.	High	526	0.23	Sherwood	5	-	1.2	Excellent	11	-
Mh14	Isolated <i>Acacia aneura</i> low trees, over <i>Thryptomene decussata</i> sparse mid to low shrubland, over isolated <i>Monachather paradoxus</i> tussock grasses.	Low	159	0.07	Millrose	3	-	1.1	Good	12	-
Mh15	<i>Acacia aneura</i> open low woodland, over <i>Sida</i> spp. and <i>Ptilotus obovatus</i> sparse low shrubland.	Low	1,814	0.80	Wiluna, Gabanintha	2	-	0.2	Good	13.5	-
Mh16	<i>Acacia aneura</i> open low woodland, over <i>Acacia synchronicia</i> and <i>Acacia tetragonophylla</i> sparse tall shrubland, over <i>Maireana triptera</i> and <i>Ptilotus obovatus</i> sparse low shrubland, over <i>Aristida contorta</i> open tussock grassland.	Low	718	0.32	Gabanintha	-	-	-	Good	14	-
Mh17	<i>Acacia aneura</i> open low woodland, over <i>Acacia ramulosa</i> var. <i>linophylla</i> open tall shrubland, over <i>Aluta aspera</i> subsp. <i>hesperia</i> or <i>Eremophila forrestii</i> open mid shrubland, over <i>Monachather paradoxus</i> sparse tussock grassland.	Low	1,876	0.83	Norie, Challenge	2	-	0.9	Good	18.5	-
Mh18	<i>Acacia</i> spp. sparse tall shrubland, over <i>Eremophila latrobei</i> subsp. <i>latrobei</i> and mixed Myrtaceae spp. open low shrubland.	High	103	0.05	Challenge, Waguin	4	-	0.7	Excellent	12.2	-
Mr1	<i>Acacia aneura</i> (+/- <i>Acacia ramulosa</i> var. <i>linophylla</i>) sparse low woodland, over <i>Eremophila compacta</i> subsp. <i>compacta</i> mid shrubland, over <i>Mirbelia rhagodioides</i> and (+/- <i>Hemigenia virescens</i>) sparse low shrubland, over <i>Aristida holathera</i> var. <i>holathera</i> and <i>Eriachne aristidea</i> tussock grassland.	Moderate	7,239	3.21	Belele, Flood	4	-	5.6	Good	13.6	-
Mr2	<i>Acacia aneura</i> open low woodland, over <i>Acacia ramulosa</i> var. <i>linophylla</i> open tall shrubland, over <i>Eremophila forrestii</i> (+/- <i>Eremophila simulans</i> subsp. <i>simulans</i>) open mid shrubland, over <i>Eriachne helmsii</i> and <i>Monachather paradoxus</i> open tussock grassland.	Moderate	10,661	4.73	Kalli	7	-	16.8	Excellent	14.2	-
Mr3	<i>Acacia aneura</i> open tall shrubland, over <i>Eremophila forrestii</i> (+/- <i>Eremophila</i> and <i>Senna</i> spp.) open mid shrubland, over <i>Ptilotus obovatus</i> open low shrubland, over <i>Monachather paradoxus</i> open tussock grassland.	Low	2,487	1.10	Yandil	2	-	1.9	Good	15.2	-

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Mp1	<i>Eremophila spathulata</i> and/or <i>Eremophila macmillaniana</i> sparse mid shrubland.	Low	10,634	4.71	Koonmarra	6	-	1.0	Good	9.9	-
Mp2	<i>Acacia aneura</i> sparse low woodland, over <i>Eremophila fraseri</i> (+/- <i>Eremophila macmillaniana</i>) and <i>Senna artemisioides</i> subsp. <i>helmsii</i> open mid shrubland, over <i>Ptilotus obovatus</i> sparse low shrubland, over <i>Eriachne pulchella</i> subsp. <i>pulchella</i> and <i>Aristida contorta</i> sparse tussock grassland.	Low	7,562	3.35	Koonmarra, Yandil	6	-	2.1	Good	12.6	-
Mp3	Isolated <i>Acacia aneura</i> low trees, over open <i>Senna artemisioides</i> subsp. <i>helmsii</i> , <i>Senna glaucifolia</i> and <i>Senna</i> sp. Meekatharra (E. Bailey 1-26) mid shrubland, over <i>Ptilotus obovatus</i> sparse low shrubland, over <i>Aristida contorta</i> sparse tussock grassland.	Low	2,771	1.23	Ero, Yandil	2	-	0.2	Good	10.1	-
Mp4	Isolated <i>Acacia pruinocarpa</i> low trees, over <i>Acacia aneura</i> and <i>Acacia craspedocarpa</i> x <i>aneura</i> sparse tall shrubland, over isolated <i>Eremophila fraseri</i> mid shrubs, over <i>Ptilotus obovatus</i> sparse low shrubland.	Low	2,783	1.23	Yandil	3	-	1.0	Excellent	12.7	-
Mp5	<i>Acacia aneura</i> open low woodland, over isolated <i>Acacia demissa</i> tall shrubs, over <i>Senna artemisioides</i> subsp. <i>helmsii</i> sparse mid shrubland, over <i>Ptilotus obovatus</i> sparse low shrubland.	Low	4,103	1.82	Sherwood, Yandil, Mindura	8	-	2.6	Good	11.4	-
Mp6	Isolated <i>Acacia aneura</i> low trees, over <i>Ptilotus obovatus</i> and mixed <i>Maireana</i> spp. low shrubland.	Moderate	4,070	1.80	Cunyu, Sherwood	9	-	5.3	Good	11.8	-
Mp7	<i>Acacia aneura</i> sparse low woodland, over <i>Acacia craspedocarpa</i> tall shrubland, over <i>Acacia tetragonophylla</i> sparse mid shrubland, over <i>Eremophila punicea</i> , <i>Solanum lasiophyllum</i> and <i>Ptilotus obovatus</i> sparse low shrubland, over <i>Aristida contorta</i> sparse tussock grassland.	Moderate	6,315	2.80	Yanganoo, Millex	4	-	0.5	Good	11.9	-
Mp8	<i>Acacia aneura</i> isolated low trees to open woodland, (+/- <i>Acacia tetragonophylla</i> , <i>Acacia craspedocarpa</i> and <i>Acacia ramulosa</i> var. <i>linophylla</i>) tall shrubs, over <i>Eremophila fraseri</i> , <i>Ptilotus obovatus</i> and <i>Solanum lasiophyllum</i> sparse low shrubland, over <i>Aristida contorta</i> open tussock grassland.	Low	4,914	2.18	Jundee, Violet, Yandil	-	-	-	Good	12	-
Mp9	Isolated <i>Acacia aneura</i> and <i>Eremophila platycalyx</i> low trees, over <i>Eremophila fraseri</i> subsp. <i>fraseri</i> , <i>Eremophila platycalyx</i> , <i>Senna artemisioides</i> subsp. <i>helmsii</i> and <i>Senna</i> sp. Meekatharra (E. Bailey 1-26) open mid shrubland, over <i>Ptilotus obovatus</i> sparse low shrubland, over <i>Aristida contorta</i> sparse tussock grassland.	Low	9,900	4.39	Challenge, Millex, Yandil	3	-	0.6	Poor	11.5	-

Veg Com	Vegetation Description	Assigned Cons Sig	Area Mapped in Project Area (ha)	% of Project Area	Associated System (s)	No of Priority Flora Recorded	No of Endemic Priority Flora	% of Priority Flora Records	Vegetation Condition	Species Richness	Part of a PEC?
Mp10	<i>Aristida holathera</i> var. <i>holathera</i> , <i>Eragrostis cumingii</i> , <i>Eriachne flaccida</i> , <i>Eriachne pulchella</i> subsp. <i>pulchella</i> and <i>Eragrostis setifolia</i> tussock grassland, over <i>Bulbostylis barbata</i> and <i>Fimbristylis dichotoma</i> sedgeland.	Moderate	92	0.04	Norie	-	-	-	Excellent	16	-
Mp11	<i>Acacia aneura</i> sparse to open low woodland, over <i>Eremophila forrestii</i> , <i>Eremophila fraseri</i> and <i>Senna</i> spp. sparse mid shrubland, over <i>Aristida contorta</i> tussock grassland.	Low	13,342	5.91	Yandil	3	-	0.3	Poor	9.7	-
Mp12	<i>Acacia aneura</i> low woodland, over <i>Acacia aneura</i> x <i>craspedocarpa</i> and <i>Acacia tetragonophylla</i> open tall shrubland, over isolated <i>Eremophila forrestii</i> and <i>Eremophila fraseri</i> mid shrubs, over <i>Aristida contorta</i> and <i>Eragrostis dielsii</i> open tussock grassland.	Low	4,573	2.03	Yandil	1	-	0.1	Poor	9.3	-
Mf1	<i>Melaleuca stereophloia</i> open to closed mid shrubland, over mixed <i>Chenopod</i> spp. low shrubland.	High	529	0.23	Mileura	1	-	0.1	Good	11.4	-
Mf2	<i>Eucalyptus striatocalyx</i> subsp. <i>striatocalyx</i> and <i>Eucalyptus trivalva</i> open mid to low forest, over <i>Maireana georgei</i> , <i>Frankenia laxiflora</i> and <i>Atriplex bunburyana</i> sparse low shrubland.	Very High	20	0.01	Mileura	-	-	-	Poor	12	-
Mf3	<i>Tecticornia pruinosa</i> low shrubland, over <i>Fimbristylis dichotoma</i> and <i>Eragrostis pergracilis</i> open tussock grassland.	High	568	0.25	Mileura	-	-	-	Good	3.5	-
Mc1	<i>Casuarina pauper</i> sparse low woodland, over <i>Tecticornia</i> spp. low shrubland.	Low	263	0.12	Beringarra	-	-	-	Poor	12.5	-
Mc2	<i>Eucalyptus victrix</i> open mid woodland, over <i>Acacia burkittii</i> and <i>Acacia aneura</i> sparse low woodland, over <i>Acacia burkittii</i> and <i>Dodonaea viscosa</i> subsp. <i>spatulata</i> open mid shrubland, over <i>Cyperus bifax</i> sparse sedgeland and <i>Eriachne helmsii</i> and <i>Themeda triandra</i> sparse tussock grassland.	Moderate	326	0.14	Koonmarra	2	-	0.1	Good	22.7	-
Mc3	<i>Eucalyptus victrix</i> and <i>Acacia cyperophylla</i> var. <i>cyperophylla</i> closed low to mid woodland.	High	424	0.19	Weld, Flood	-	-	-	Good	28.5	Jack Hills
Mc4	<i>Acacia aneura</i> and <i>Acacia ramulosa</i> var. <i>linophylla</i> open to closed low woodland, over mixed <i>Eremophila</i> spp. open mid shrubland, over <i>Ptilotus</i> spp. sparse low shrubland.	Moderate	1,094	0.48	Weld, Jundee	-	-	-	Good	15.8	Weld Range
Mc5	<i>Acacia aneura</i> and <i>Acacia tetragonophylla</i> (+/- <i>Acacia kempeana</i>) low woodland.	Low	3,141	1.39	Sherwood, Yanganoo, Ero, Koonmarra, Mindura, Yandil, Bebele	4	-	0.5	Good	17.6	-
Mc6	Mixed <i>Acacia aneura</i> , <i>Acacia ramulosa</i> var. <i>ramulosa</i> and <i>Acacia tetragonophylla</i> low woodland.	Low	891	0.40	Yanganoo, Challenge, Ero	-	-	-	Good	15.3	-

Veg Com	Vegetation Description	Assigned Cons Sig	Area Mapped in Project Area (ha)	% of Project Area	Associated System (s)	No of Priority Flora Recorded	No of Endemic Priority Flora	% of Priority Flora Records	Vegetation Condition	Species Richness	Part of a PEC?
Mc7	<i>Acacia ramulosa</i> var. <i>ramulosa</i> open low woodland, over <i>Acacia burkittii</i> and <i>Acacia craspedocarpa</i> x <i>aneura</i> sparse low woodland, over <i>Acacia tetragonophylla</i> sparse mid shrubland, over <i>Monachather paradoxus</i> , <i>Eragrostis leptocarpa</i> and <i>Eriachne flaccida</i> sparse tussock grassland.	Low	43	0.02	Yangaroo	-	-	-	Good	9	-
Mc8	<i>Acacia acuminata</i> and <i>Acacia aneura</i> open low woodland (+/- <i>Casuarina pauper</i>), over <i>Acacia acuminata</i> , <i>Grevillea obliquistigma</i> subsp. <i>obliquistigma</i> , <i>Callistemon phoeniceus</i> and <i>Senna artemisioides</i> subsp. x <i>artemisioides</i> open tall to mid shrubland, over <i>Cyperus</i> spp. sparse sedgeland.	Low	455	0.20	Yangaroo, Ero	-	-	-	Excellent	12.3	-

8 FLORA CONSERVATION ASSESSMENT

The conservation significance of the flora of the Project Area has been assessed at four spatial scales; national, state, regional and local. A number of sources have been used to determine an estimate of total abundance and distribution for each species that were recorded in the Project Area, both from the current survey and the other sources, including;

1. The current survey of the Project Area (indicated by bold font in Table 8.2);
2. *ecologia* regional survey (Section 5.3.6);
3. Oakajee Vegetation and Flora Survey (*ecologia*, 2009);
4. Ecoscape Vegetation and Flora survey (Ecoscape, 2009);
5. Weld Range Vegetation and Flora survey and Threatened Flora survey (*ecologia*, 2009a);
6. GHD Jack Hills to Weld Range Proposed Haul Route Ecological Survey (GHD, 2009);
7. Jack Hills Vegetation and Flora Survey (*ecologia*, 2009b Draft); and the
8. Government database searches.

The government records vary considerably in the amount of detail, regarding abundance that is available ranging from accurate counts or general abundance descriptions to no detail at all. Where multiple records at the same location were available, the highest numeric estimate was utilised. Where descriptions of abundance only were available, numbers were inferred according to Table 8.1. Where no estimate of abundance was available, it was assumed only one plant was present. The latter assumption is likely to be an underestimate in many instances, and hence the final estimates of total abundance of each species are likely to be very conservative.

In some instances estimates of cover only was available for collections from quadrats surveyed during the 2006 *ecologia* survey. The number of plants assumed from these cover estimates is also detailed below (Table 8.1).

Table 8.1 – Number of Plants Assumed for Records Where Only Descriptions or % Cover was Available

Abundance Inferred From Descriptions or Percentage Cover	No. of Plants Assumed
no indication	1
very rare	1
several	3
infrequent, uncommon, scarce, one small group, a few scattered	5
occasional, moderately common, locally frequent, very localised	10
common here, locally common, locally frequent, locally abundant	20
frequent, common, plentiful, abundant, dominant	50
>2% cover	5
2-10 % cover	10
10-30 % cover	20
30-70 % cover	30
70-100 % cover	40

Two DRF and 55 Priority Flora were recorded by the current *ecologia* survey and an additional two DRF and 32 Priority Flora were recorded by other sources and are listed in Table 8.2.

Table 8.2 summarises the known distribution and abundance of each conservation significant species occurring within the Project Area. The number of *locations (clusters of plants recorded more than 50 m distant from each other) and □populations (clusters of plants recorded more than 500 m distant) both inside the current Project Area and in the region are detailed. The distribution of each taxon is provided as a means to determine if the species is locally restricted or widespread in the region and a kilometre value is given which represents the two farthest locations from one another. Large outliers are also provided in Table 8.2.

Each taxon has been assigned a conservation significance of; Very High, High(a), High(b), Moderate, Low(a) or Low(b) (Table 8.2).

Very High: The percentage of the taxon impacted is high as it is only common in the local area and is locally significant.

High(a): It is a poorly known and collected taxon that has been recorded from few locations that are widespread in the region, but because of the low total numbers, a high total percentage is within the Project Area, however as it is unknown any impact could be significant.

High(b): It is a poorly known and collected taxon that has only been recorded in the local area, but because the species is undescribed it is likely to be more widespread than what is known, however as this is unknown, any impact could be significant.

Moderate: >10% of the total individuals were recorded in the Project area, but is likely to be widespread as the current collections indicate this.

Low(a): <10% of the total individuals were recorded in the Project Area.

Low(b): Large percentages of the total population have been recorded in the Project Area but this is due to the targeted survey which has increased the total known numbers within the Project Area substantially and these taxa are therefore likely to be very common in the region also.

Table 8.2 – Conservation Assessment of DRF and Priority Flora Taxa Recorded in the Project Area

Code	Taxa	Assigned Cons Sig	Regional Information				Conservation Estate		Local Information (Project Area)					
			Total No ♦Locations	Total No □Populations	Total No Plants	Known Distribution (km)	% of ♦Locations Within Conservation Estate in the Project Area	% of ♦Locations Within Conservation Estate Outside the Project Area	No ♦Locations Recorded Within the Project Area	No □Populations Recorded Within the Project Area	No Plants Recorded Within Project Area	% All ♦Locations Within the Project Area	% All □Populations Within the Project Area	% Total No Plants Within Project Area
DRF	<i>Caladenia hoffmanii</i>	Nationally significant	38	19	285	50 (outlier to 70 km)	-	1.5	28	12	149	74	63	52
DRF	<i>Drummondita ericoides</i>	Nationally significant	12	9	212	42	-	0.9	4	5	4	33	56	2
DRF	<i>Eucalyptus blaxellii</i>	Nationally significant	169	120	2,885	68 (outlier to 170 km)	-	7.6	64	49	472	38	41	16
DRF	<i>Philotheca wonganensis</i>	Nationally significant	8	7	135	30 (outlier to 300 km)	-	12.6	2	3	11	25	43	8
P1	<i>Acacia lineolata</i> subsp. <i>multilineata</i>	Moderate	16	15	85	135	-	-	1	1	10	6	7	12
P1	<i>Acacia</i> sp. <i>Jack Hills</i>	Low(a)	95	53	1,320	15 (outlier to 40 km)	-	-	1	1	1	1	2	<0.1
P1	<i>Baeckea staminosa</i>	High(b)	5	5	5	55 km	-	-	1	1	1	20	20	20
P1	<i>Chamelaucium</i> sp. <i>Yalgoo</i>	Moderate	7	7	22	184	10.0	4.5	2	2	3	29	29	14
P1	<i>Eremophila</i> sp. <i>Tallering</i>	High(b)	9	7	123	75	-	-	2	1	22	22	14	18
P1	<i>Euphorbia sarcostemmoides</i>	Low(b)	60	45	302	400	-	-	57	42	217	95	93	72
P1	<i>Goodenia lyrata</i>	High(a)	10	10	56	620	-	-	3	3	40	30	30	71
P1	<i>Gunniopsis divisa</i>	High(a)	9	9	1,168	125	-	0.5	1	3	1,000	11	33	86
P1	<i>Harperia ferruginipes</i>	High(b)	7	7	31	33 (outlier to 160 km)	-	-	3	3	3	43	43	10
P1	<i>Lepidobolus basiflorus</i>	Low(a)	2	2	52	6	-	-	1	1	1	50	50	2
P1	<i>Lepidosperma</i> sp. <i>Moresby Range</i>	Very High	22	14	176	20	-	0.6	16	10	97	73	71	55
P1	<i>Leucopogon psammophilus</i>	Moderate	13	11	72	110	-	-	1	1	10	8	9	14
P1	<i>Melaleuca huttensis</i>	Low(a)	170	87	1,698	45 (outlier to 85 km)	-	-	2	2	52	1	2	3
P1	<i>Mirbelia ternata</i>	High(a)	5	5	7	128	-	-	3	3	3	60	60	43

Code	Taxa	Assigned Cons Sig	Regional Information				Conservation Estate		Local Information (Project Area)					
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P1	<i>Petrophile vana</i>	High(a)	14	13	230	100 (outlier to 150 km)	26.5	23.9	8	4	68	57	31	30
P1	<i>Ptilotus luteolus</i>	Low(a)	22	16	589	600	-	3.4	1	2	10	5	13	2
P1	<i>Ptilotus tetrandrus</i>	High(a)	4	4	7	350	-	-	2	2	2	50	50	29
P1	<i>Sauropus sp. Woolgorong</i>	Low(b)	25	19	167	283	-	-	15	12	42	60	63	25
P1	<i>Scholtzia sp. Binnu</i>	Low(a)	7	6	212	94	-	23.6	1	2	20	14	33	9
P1	<i>Scholtzia sp. Valentine Road</i>	High(a)	2	1	12	<1	-	-	2	1	11	100	100	92
P1	<i>Thryptomene sp. Wandana</i>	Moderate	17	17	283	130 (outlier at 330 km)	-	0.4	3	4	220	18	24	78
P1	<i>Tricoryne sp. Geraldton</i>	High(b)	4	3	27	30	-	55.6	1	2	10	25	67	37
P1	<i>Vittadinia cervicularis var. occidentalis</i>	High(a)	5	5	6	40 (outlier at 150 km)	-	-	1	1	1	20	20	17
P2	<i>Acacia megacephala</i>	Low(a)	20	19	162	90	-	63.0	1	3	1	5	16	1
P2	<i>Dicrastylis incana</i>	Low - A	12	11	56	70	-	-	2	2	3	17	18	5
P2	<i>Frankenia confusa</i>	Low(b)	21	15	476	500	-	1.5	11	6	239	52	40	50
P2	<i>Homalocalyx inerrabundus</i>	Moderate	13	5	253	500	-	-	9	2	39	69	40	15
P2	<i>Leucopogon borealis</i>	Very High	43	28	418	35	-	12.4	24	15	169	56	54	40
P2	<i>Leucopogon sp. Howatharra</i>	Very High	6	3	91	20	-	-	4	1	38	67	33	42
P2	<i>Malleostemon sp. Moonyoonooka</i>	High(a)	1	1	51	1	-	-	1	1	1	100	100	2
P2	<i>Scholtzia sp. East Yuna</i>	High(b)	6	6	52	115	-	-	4	4	50	67	67	96
P2	<i>Thryptomene sp. East Yuna</i>	Low(a)	17	16	141	60	-	88.7	3	4	4	18	25	3
P2	<i>Thryptomene sp. Yuna Reserve</i>	Low(a)	7	7	12	30 (outlier at 50 km)	-	16.7	1	3	1	14	43	8
P2	<i>Thryptomene stenophylla</i>	Low(a)	35	26	685	25	-	-	10	5	18	29	19	3
P2	<i>Verticordia aereiflora</i>	High(b)	3	3	53	40	-	1.9	1	2	50	33	67	94
P3	<i>Acacia leptospermoides subsp. psammophila</i>	Low(a)	34	30	280	50 (outlier to 85 km)	-	42.5	5	8	23	15	27	8

Code	Taxa	Assigned Cons Sig	Regional Information				Conservation Estate		Local Information (Project Area)					
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P3	<i>Acacia speckii</i>	Low(b)	223	138	1,338	410	0.2	2.9	124	75	384	56	54	29
P3	<i>Acacia subsessilis</i>	Low(a)	40	32	882	150	-	21.9	14	14	40	35	44	5
P3	<i>Acanthocarpus parviflorus</i>	Low(a)	72	34	715	330	-	21.4	3	13	4	4	38	1
P3	<i>Arnocrinum drummondii</i>	Low(a)	7	7	101	600	-	88.1	1	5	10	14	71	10
P3	<i>Baeckea</i> sp. Walkaway	Low(a)	29	28	1,206	117	-	83.8	2	5	2	7	18	<0.1
P3	<i>Blackallia nudiflora</i>	Low(a)	28	25	2,069	85 (outlier to 340 km)	-	0.5	1	3	22	4	12	1
P3	<i>Calytrix erosipetala</i>	Low(a)	44	38	2,116	550	2.7	3.4	10	4	106	23	11	5
P3	<i>Calytrix formosa</i>	Low(a)	24	23	201	230	-	42.3	2	8	3	8	35	1
P3	<i>Calytrix uncinata</i>	Low(a)	49	46	1,252	530	-	4.5	6	8	18	12	17	1
P3	<i>Calytrix verruculosa</i>	Low(b)	62	44	1,091	160	-	-	51	33	730	82	75	67
P3	<i>Dicrastylis linearifolia</i>	Low(a)	39	31	1,720	420	1.2	73.6	15	10	107	38	32	6
P3	<i>Dodonaea amplisemina</i>	Low(b)	135	70	1,121	480	-	1.4	62	30	298	46	43	27
P3	<i>Eremophila arachnoides</i> subsp. <i>arachnoides</i>	Moderate	8	8	261	580	-	19.2	2	3	40	25	38	15
P3	<i>Eremophila muelleriana</i>	Low(b)	129	33	593	300	0.2	-	119	23	321	92	70	54
P3	<i>Gastrolobium propinquum</i>	Low(a)	26	21	375	80 (outlier to 130 km)	-	-	1	1	1	4	5	<0.1
P3	<i>Gastrolobium rotundifolium</i>	Low(a)	30	25	387	650	-	-	5	1	7	17	4	2
P3	<i>Geleznovia verrucosa</i> subsp. <i>Kalbarri</i>	Moderate	31	25	403	355	-	1.2	5	6	57	16	24	14
P3	<i>Gnephosis cassiniana</i>	Low(a)	13	10	12,042	130 (outlier to 284 km)	-	0.8	2	2	2	15	20	<0.1
P3	<i>Grevillea candicans</i>	Moderate	28	25	75	165 (outlier to 400 km)	-	6.7	3	3	8	11	12	11
P3	<i>Grevillea stenostachya</i>	Low(b)	221	125	654	360	-	2.4	157	85	276	71	68	42
P3	<i>Grevillea triloba</i>	Low(b)	423	155	15,130	110	-	28.8	313	106	4024	74	68	27
P3	<i>Hemigenia tysonii</i>	Low(b)	254	161	7,579	282	-	1.3	173	106	3554	68	66	47
P3	<i>Hemigenia virescens</i>	Low(b)	83	43	2,573	330	-	1.9	76	37	1478	92	86	57
P3	<i>Homalocalyx echinulatus</i>	Moderate	51	39	862	620	-	0.7	11	11	204	22	28	24

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P3	<i>Indigofera gilesii</i> subsp. <i>gilesii</i>	Low(a)	16	16	123	581	0.8	-	1	1	1	6	6	1
P3	<i>Lasiopetalum oppositifolium</i>	Low(a)	40	24	393	115 (outlier to 560 km)	-	9.2	1	7	9	3	29	2
P3	<i>Lepidium scandens</i>	Low(a)	5	5	55	60 (outlier to 400 km)	-	-	1	1	1	20	20	2
P3	<i>Microcorys tenuifolia</i>	Low(a)	17	14	200	400	-	51.0	6	5	6	35	36	3
P3	<i>Micromyrtus placoides</i>	Low(a)	80	35	3,958	180	-	-	4	3	7	5	9	<0.1
P3	<i>Petrophile pauciflora</i>	Low(a)	29	29	429	400	-	2.5	8	13	31	28	45	7
P3	<i>Prostanthera petrophila</i>	Low(a)	104	62	1,606	260	-	0.4	26	19	124	25	31	8
P3	<i>Ptilotus beardii</i>	Low(b)	74	64	3,798	230	-	1.6	39	40	1671	53	63	44
P3	<i>Scaevola oldfieldii</i>	Low(a)	12	11	162	160	-	67.3	1	3	1	8	27	1
P3	<i>Serichonus gracilipes</i>	High C	21	15	76	50	-	6.6	13	9	36	62	60	47
P3	<i>Stenanthemum divaricatum</i>	Low(a)	12	12	17	500	-	23.5	1	5	1	8	42	6
P3	<i>Tecticornia cymbiformis</i>	Moderate	8	7	66	290	-	1.5	2	2	11	25	29	17
P3	<i>Thryptomene</i> sp. Moresby Range	Very High	58	25	1,808	30	-	1.3	38	16	940	66	64	52
P3	<i>Verticordia chrysostachys</i> var. <i>pallida</i>	Moderate	35	30	262	180	-	-	8	4	86	23	13	33
P3	<i>Verticordia densiflora</i> var. <i>roseostella</i>	Moderate	50	38	378	250	-	18.3	15	8	56	30	21	15
P3	<i>Verticordia jamiesonii</i>	Low(a)	37	34	590	350	0.3	8.8	6	6	26	16	18	4
P4	<i>Acacia guinetii</i>	Low(a)	52	34	363	40	-	19.3	19	14	35	37	41	10
P4	<i>Baeckea</i> sp. Melita Station	Low(a)	77	59	1,317	540	0.5	9.4	13	12	76	17	20	6
P4	<i>Diuris recurva</i>	Low(a)	28	27	732	450	-	2.5	2	5	20	7	19	3
P4	<i>Eucalyptus ebbanoensis</i> subsp. <i>photina</i>	Moderate	25	23	216	145	-	-	4	4	51	16	17	24
P4	<i>Goodenia berringbinensis</i>	Low(a)	10	10	28,191	520	-	0.4	2	3	50	20	30	<0.1
P4	<i>Grevillea inconspicua</i>	Low(a)	71	65	2,199	560	-	9.2	7	11	7	10	17	<0.1

Code	Taxa	Assigned Cons Sig	Regional Information				Conservation Estate		Local Information (Project Area)					
			Total No *Locations	Total No □Populations	Total No Plants	Known Distribution (km)	% of *Locations Within Conservation Estate in the Project Area	% of *Locations Within Conservation Estate Outside the Project Area	No *Locations Recorded Within the Project Area	No □Populations Recorded Within the Project Area	No Plants Recorded Within Project Area	% All *Locations Within the Project Area	% All □Populations Within the Project Area	% Total No Plants Within Project Area
P4	<i>Jacksonia velutina</i>	Low(a)	35	33	390	200 (outliers to 400 km)	-	52.6	1	10	1	3	30	<0.1
P4	<i>Lechenaultia longiloba</i>	Low(a)	15	15	264	80	-	-	1	1	1	7	7	<0.1
P4	<i>Verticordia capillaris</i>	Low(b)	83	56	558	300	-	28.0	42	28	118	51	50	21
P4	<i>Verticordia penicillaris</i>	Low(b)	121	59	5,337	190	-	23.5	77	28	2135	64	47	40
P4	<i>Verticordia polytricha</i>	Low(a)	26	25	859	200 (outlier to 475 km)	-	82.5	1	11	6	4	44	1

*Locations are defined as records of occurrence separated by more than 50 metres.

□Populations are defined as records of occurrence separated by more than 500 metres.

Bold font indicates species recorded by *ecologia* during the current survey of the Project Area.

8.1 FLORA OF NATIONAL AND STATE CONSERVATION SIGNIFICANCE

National significance refers to those features of the environment which are recognised under legislation as being of importance to the Australian community; in particular, species listed under the *EPBC Act* are regarded as nationally significant. State significance refers to those features of the environment that are recognised under State legislation as being of importance to the Western Australian community, in particular, species listed as DRF under the *WC Act* are of state significance.

During the current survey, two flora species of national and state significance were recorded in the Project Area: *Caladenia hoffmanii* (Endangered, DRF) and *Eucalyptus blaxellii* (Vulnerable, DRF). During the database searches, an additional two flora species of national and state significance were recorded in the Project Area; *Drummondita ericoides* (Endangered, DRF) and *Philothea wonganensis* (Endangered, DRF). The significance of these species is discussed below.

Caladenia hoffmanii is listed as Endangered under the *EPBC Act* and as DRF under the *WC Act*. It is endemic to the Geraldton Sandplains bioregion as shown by the current WA HERB distribution for *C. hoffmanii* in Figure 8.1 below.

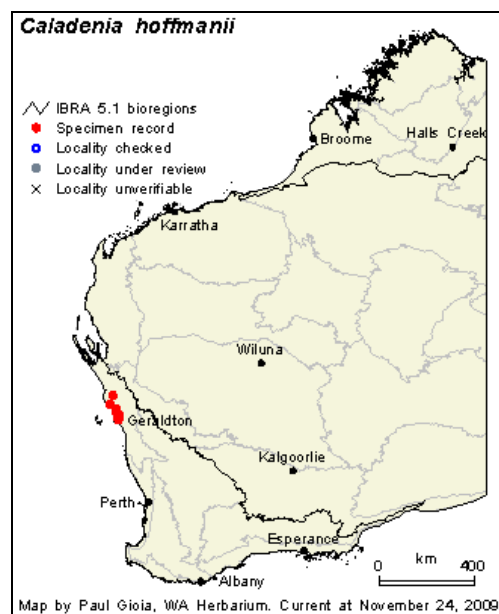


Figure 8.1 – Distribution of *Caladenia hoffmanii*

Using the information provided in Table 8.2, this species is known from 285 individuals at 38 ✦locations and 19 □populations. Of these 52.3% of the total number of plants were inside the Project Area and 1.5% were in conservation reserves.

Caladenia hoffmanii grows in clay or sandy-clay on laterite rocky hill sides and ridges, or in winter wet flats. A disjunct occurrence is recorded 600 km south-east of the Geraldton area in the Pinharing area, growing around large granite outcrops. These habitats are not widespread in the Project Area and the region and the large percentage of total individuals (52.3%) recorded in the Project Area indicates a high local endemism for this species.

The known populations of *C. hoffmanii* are severely fragmented and the quality of habitat for many populations is in decline (Pers. com. Murray Baker, DEC, 2009). The *EPBC Act* conservation advice lists the main threats to *C. hoffmanii* as fire and grazing by feral pigs and rabbits.

Due to the fragmentation of the populations, decrease in habitat quality, the small distribution of known occurrences (50 km with one outlier to 70 km), the high percentage of the total population in

the Project Area and the likelihood that it is locally endemic to the area, it is considered that *C. hoffmanii* has high local significance in the Project Area.

Eucalyptus blaxellii is listed as Vulnerable under the *EPBC Act* and as DRF under the *WC Act*. It has been recorded in the Geraldton Sandplains and Avon Wheatbelt bioregions as shown by the current WA HERB distribution of *E. blaxellii* in Figure 8.2 below.

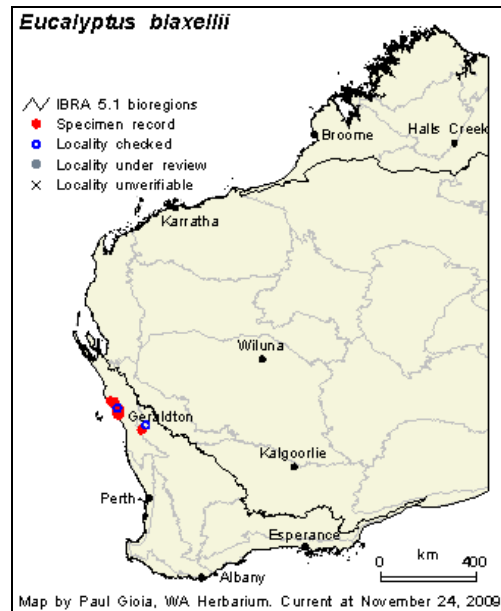


Figure 8.2 – Distribution of *Eucalyptus blaxellii*

Using the information provided in Table 8.2, this species is known from 2,885 individuals at 169 locations and 12 populations. Of these 16.4% of the total number of plants were recorded inside the Project Area and 7.6% were in conservation reserves.

The *EPBC Act* conservation advice states the main threat to *E. blaxellii* is inappropriate fire regimes, however most known populations are secure as they occur in areas that are unsuitable for farming due to the inaccessibility of the steep slope.

Eucalyptus blaxellii grows in sand over laterite, or brown clay on sandstone hills or creek flats which is widespread at the Western end of the Project Area. As these habitats are moderately widespread in the region and as the percentage of total individuals is moderate (16.4%) in the Project Area, it indicates a low to moderate local endemism for this species. *E. blaxellii* does not appear to be locally restricted with records spanning 70 km and one outlier to 170 km.

A nomination to remove this species from the listing of DRF was submitted to the Threatened Species Scientific Community earlier in 2009 which has yet to get a decision from the Minister; however it is likely that *E. blaxellii*'s conservation status maybe altered to a Priority 4 (Pers. com. Murray Baker, DEC, 2009).

Because of the large population numbers, longevity, disturbance recovery abilities and the DECs recommendation to remove *E. blaxellii* from the listing as vulnerable (*EPBC Act*) and DRF (*WC Act*), it is considered that *E. blaxellii* has low conservation significance in the Project Area.

Drummondita ericoides is listed as Endangered under the *EPBC Act* and as DRF under the *WC Act*. It is endemic to the Geraldton Sandplains bioregion as shown by the current WA HERB distribution of *D. ericoides* subsp. *cracens* in Figure 8.3 below.

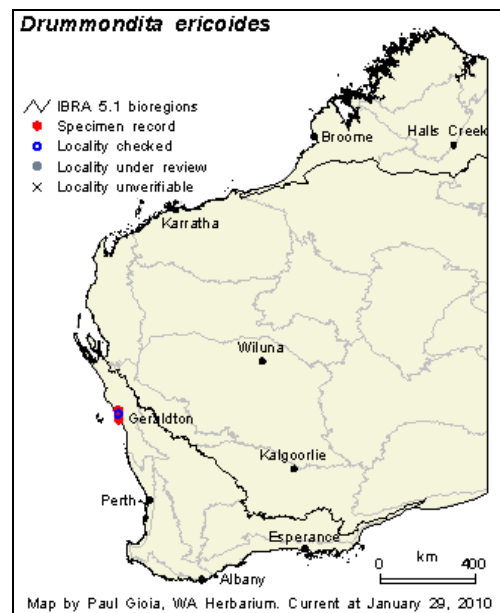


Figure 8.3 – Distribution of *Drummondita ericoides*

Using the information provided in Table 8.2, this species is known from 212 individuals at 12 ✱locations and nine □populations. Of these 1.9% of the total numbers of plants were recorded inside the Project Area and 0.9% were in conservation reserves.

The DEC's Moresby Range *Drummondita* Interim Recovery Plan (DEC, 2004) for *D. ericoides* states that the main threats include inappropriate fire regimes and high levels of human activity.

Drummondita ericoides grows on low heath on sandstone and laterite slopes, ridges and gullies of the Moresby Range in brown loam or sandy loam and clay soils in areas not suitable for agriculture and so has not been so highly cleared.

Drummondita ericoides appears to be locally restricted with all known records spanning 40 km and therefore has high local significance in the Project Area.

Philothea wonganensis is listed as Endangered under the *EPBC Act* and as DRF under the *WC Act*. It has been recorded in the Geraldton Sandplains and Avon Wheatbelt bioregions as shown by the current WA HERB distribution of *P. wonganensis* in Figure 8.4 below

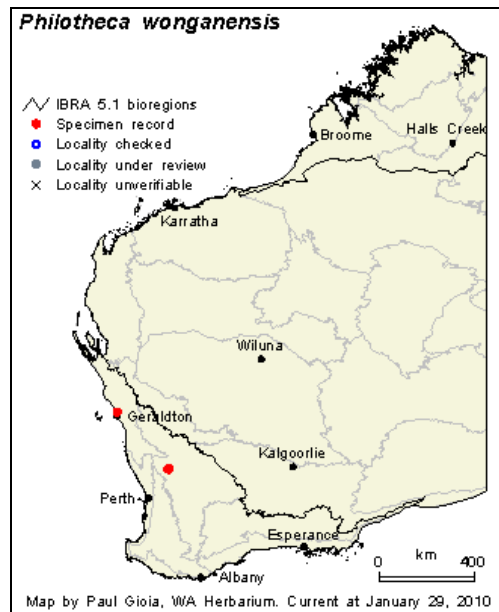


Figure 8.4 – Distribution of *Philothea wonganensis*

Using the information provided in Table 8.2, this species is known from 135 individuals at eight *locations and seven □populations. Of these 8.1% of the total number of individuals were recorded inside the Project Area and 12.6% were in conservation reserves.

Philothea wonganensis grows in red sandy soils over fractured greenstone. These habitats are not very widespread in the region, and the percentage of total individuals (8.1%) recorded in the Project Area indicates a high local endemism for this species. *P. wonganensis* appears to be locally restricted with most of the known records spanning 30 km, with one outlier to 300 km.

Because of the low known population numbers and as 8.1% of the total known individuals were recorded in the Project Area, impact to the species could result in a significant loss and despite the large percentage (12.6%) of individuals in conservation reserves *P. wonganensis* has high local conservation significance in the Project Area.

8.1 FLORA OF REGIONAL SIGNIFICANCE

Regional significance addresses the representation of habitats at a biogeographic regional level. Priority Flora taxa that are endemic to the Geraldton Sandplains, Yalgoo and Murchison bioregions and whose distributions are limited or unknown are considered regionally significant.

Fifty-five Priority Flora taxa were recorded during the current survey of the Project Area and an additional 32 were recorded by the DEC searches or other sources as listed in Section 8.

Species that are endemic (using information provided from the WA Herb) to one bioregion include the following;

Avon Wheatbelt: *Mirbelia ternata* (P1)

Geraldton Sandplains: *Baeckea staminosa* (P1), *Chamelaucium* sp. Yalgoo (P1), *Harperia ferruginipes* (P1), *Lepidobolus basiflorus* (P1), *Lepidosperma* sp. Moresby Range (P1), *Leucopogon psammophilus* (P1), *Melaleuca huttensis* (P1), *Scholtzia* sp. Binu (P1), *Scholtzia* sp. Valentine Road (P1), *Thryptomene* sp. Wandana (P1), *Tricoryne* sp. Geraldton (P1), *Acacia megacephala* (P2), *Dicrasyllis incana* (P2), *Leucopogon borealis* (P2), *Leucopogon* sp. Howatharra (P2), *Malleostemon* sp. Moonyoonooka (P2), *Scholtzia* sp. East Yuna (P2), *Thryptomene* sp. Yuna Reserve (P2), *Thryptomene stenophylla* (P2), *Verticordia aereiflora* (P2), *Acacia leptospermoides* subsp. *psammophila* (P3), *Blackallia nudiflora* (P3), *Geleznovia verrucosa* subsp. Kalbarri (P3), *Grevillea triloba* (P3), *Lasiopetalum oppositifolium* (P3), *Scaevola oldfieldii* (P3), *Serichonus gracilipes* (P3), *Thryptomene* sp. Moresby Range (P3), *Acacia guinetii* (P4) and *Lechenaultia longiloba* (P4).

Murchison: *Acacia* sp. Jack Hills (P1), *Calytrix verruculosa* (P3), *Eremophila muelleriana* (P3) and *Grevillea inconspicua* (P4).

Pilbara: *Indigofera gilesii* subsp. *gilesii* (P3).

8.2 FLORA OF LOCAL SIGNIFICANCE

Priority Flora are of local significance when their presence is confined to a specialised habitat type that is not common in the local area and whose disturbance or removal may lead to local extinction.

Table 8.2 shows the total known distribution and abundance for each species recorded and the subsequent percentage of this total in the Project Area. The conservation significance of each species recorded in the Project Area is discussed below.

Priority 1 Flora

Acacia lineolata subsp. *multilineata* has been recorded in the Geraldton Sandplains and Avon Wheatbelt bioregions and is known from 85 individuals at 16 *locations and 15 □populations, none of which are in conservation reserves. In the Project Area, ten individuals were recorded at one location (12% of the total known individuals). This species is not a widely known species and has a moderate amount of the total known individuals in the Project Area. However, as this species has been recorded in two bioregions, and its distribution spans 135 km, it is not locally endemic and it has moderate local conservation significance.

Acacia sp. Jack Hills has only been recorded in the Murchison bioregion and is known from 1,320 individuals at 95 *locations and 53 □populations, none of which are in conservation reserves. In the Project Area, one individual was recorded at one location (<1% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Baeckea staminosa has only been recorded in the Geraldton Sandplains bioregion and is known from five individuals at five *locations and five □populations, none of which are in conservation reserves.

In the Project Area, one individual was recorded at one location (20% of the total known individuals). *Baeckea staminosa* is not a widely known species (the total known distribution spans 55 km) and a large amount of the known population is recorded in the Project Area. Any impact could have a significant result on the species and therefore has high(b) conservation significance.

Chamelaucium sp. Yalgoo has only been recorded in the Geraldton Sandplains bioregion and is known from 22 individuals at seven *locations and seven □populations, of this total 14% are in conservation reserves. In the Project Area, three individuals were recorded at two locations (14% of the total known individuals). *Chamelaucium* sp. Yalgoo is not a widely known species and a large amount of the known population is recorded in the Project Area. Any impact could have a significant result to the species and therefore has moderate conservation significance. As this is not a fully described species, it is possible that it is not a rare in the local area (the total known distribution spans 185 km), but poorly collected, however as this is not known the former should be assumed.

Eremophila sp. Tallering has been recorded in the Geraldton Sandplains and Yalgoo bioregions and is known from 123 individuals at nine *locations and seven □populations, none of which are in conservation reserves. In the Project Area, 22 individuals were recorded at two locations (18% of the total known individuals). *Eremophila* sp. Tallering is not a widely known species and a large amount of the known population is recorded in the Project Area. Any impact could have a significant result to the species and therefore has high(b) conservation significance. As this is not a fully described species, it is possible that it is not a rare in the local area (the total known distribution spans 75 km), but poorly collected, however as this is not known the former should be assumed.

Euphorbia sarcostemmoides has been recorded in the Murchison and Gascoyne bioregions and is known from 302 individuals at 60 *locations and 45 □populations, none of which are in conservation reserves. In the Project Area, 217 individuals were recorded at 57 locations (72% of the total known individuals). This species was widely recorded across the Project Area and because of this, despite the large percentage of the total species population in the Project Area; it is likely to be poorly collected, rather than locally endemic (the total known distribution spans 400 km) and therefore has low(b) conservation significance.

Goodenia lyrata has been recorded in the Murchison, Gibson Desert and Pilbara bioregions and is known from 56 individuals at 10 *locations and 10 □populations, none of which are in conservation reserves. In the Project Area, 40 individuals were recorded at three locations (71% of the total known individuals). *Goodenia lyrata* is not a widely known species and a very large amount of the known population is recorded in the Project Area. However, as this species has been recorded in three bioregions, it is likely that it is more widespread than what is known (the total known distribution spans 620 km) and is not locally endemic. It therefore has high(a) conservation significance.

Gunniopsis divisa has been recorded in the Murchison and Yalgoo bioregions and is known from 1,168 individuals at nine *locations and nine □populations, of which 0.5% are in conservation reserves. In the Project Area, 1000 individuals were recorded at one location (86% of the total known individuals). *Gunniopsis divisa* is not a widely known species (the total known distribution spans 125 km) and a very large amount of the known population is recorded in the Project Area and any impact could have a significant result to the species and therefore has high(a) conservation significance.

Harperia ferruginipes has been recorded in the Geraldton Sandplains bioregion and is known from 31 individuals at seven *locations and seven □populations, none of which are in conservation reserves. In the Project Area, three individuals were recorded at three locations (10% of the total known individuals). *Harperia ferruginipes* is not a widely known species (the total known distribution spans 33 km, with an outlier to 160 km) and a large amount of the known population is recorded in the

Project Area. Any impact could have a significant result to the species and therefore has high(b) conservation significance.

Lepidobolus basiflorus has been recorded in the Geraldton Sandplains bioregion and is known from 52 individuals at two *locations and two □populations, none of which are in conservation reserves. In the Project Area, one individual was recorded at one location (2% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Lepidosperma sp. Moresby Range has been recorded in the Geraldton Sandplains bioregion and is known from 176 individuals at 22 *locations and 14 □populations, of which 0.6% are in conservation reserves. In the Project Area, 97 individuals were recorded at 16 locations (55% of the total known individuals). This species appears to be restricted to the Moresby Range area, and the large percentage of total population within the Project Area in this case likely indicates a high local endemism in this area (the total known distribution spans 20 km). Any Impact to this species is likely to significantly affect species numbers and therefore has high(c) conservation significance.

Leucopogon psammophilus has been recorded in the Geraldton Sandplains bioregion and is known from 72 individuals at 13 *locations and 11 □populations, none of which are in conservation reserves. In the Project Area, 10 individuals were recorded at one location (14% of the total known individuals). *Leucopogon psammophilus* is not a widely known species (the total known distribution spans 110 km) and a large amount of the known population is recorded in the Project Area. Any impact could have a significant result to the species and therefore has moderate conservation significance.

Melaleuca huttensis has been recorded in the Geraldton Sandplains bioregion and is known from 1698 individuals at 170 *locations and 87 □populations, none of which are in conservation reserves. In the Project Area, 52 individuals were recorded at two locations (3% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Mirbelia ternata has been recorded in the Avon Wheatbelt bioregion and is known from seven individuals at five *locations and five □populations, none of which are in conservation reserves. In the Project Area, three individuals were recorded at three locations (43% of the total known individuals). *Mirbelia ternata* is not a widely known species (the total known distribution spans 128 km) and a very large amount of the known population is recorded in the Project Area. Any impact could have a significant result to the species and therefore has high(a) conservation significance.

Petrophile vana has been recorded in the Murchison and Yalgoo bioregions and is known from 230 individuals at 14 *locations and 13 □populations, of which 50.4% are in conservation reserves. In the Project Area, 68 individuals were recorded at eight locations (30% of the total known individuals). *Petrophile vana* is not a widely known species (the total known distribution spans 100 km) and a large amount of the known population is recorded in the Project Area. Any impact could have a significant result to the species and therefore has high(a) conservation significance.

Ptilotus luteolus has been recorded in the Murchison and Gascoyne bioregions and is known from 589 individuals at 22 *locations and 16 □populations, of which 3.4% are in conservation reserves. In the Project Area, 10 individuals were recorded at one location (2% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Ptilotus tetrandrus has been recorded in the Murchison and Little Sandy Desert bioregions and is known from seven individuals at four *locations and four □populations, none of which are in conservation reserves. In the Project Area, two individuals were recorded at two locations (29% of

the total known individuals). *Ptilotus tetrandrus* is not a widely known species (the total known distribution spans 350 km) and a very large amount of the known population is recorded in the Project Area. Any impact could have a significant result to the species and therefore has high(a) conservation significance.

Sauropus sp. Woolgorong has been recorded in the Murchison and Yalgoo bioregions and is known from 167 individuals at 25 *locations and 19 □populations, none of which are in conservation reserves. In the Project Area, 42 individuals were recorded at 15 locations (25% of the total known individuals). This species was widely recorded across the Project Area and because of this, despite the large percentage of the total species population in the Project Area; it is likely to be poorly collected, rather than locally endemic (the total known distribution spans 280 km) and therefore has low(b) conservation significance.

Scholtzia sp. Binu has been recorded in the Geraldton Sandplains bioregion and is known from 212 individuals at seven *locations and six □populations, of which 23.6% are in conservation reserves. In the Project Area, 20 individuals were recorded at one location (9% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Scholtzia sp. Valentine Road has been recorded in the Geraldton Sandplains bioregion and is known from 12 individuals at two *locations and one □population, none of which are in conservation reserves. In the Project Area, 11 individuals were recorded at two locations (92% of the total known individuals). *Scholtzia* sp. Valentine Road is not a widely known species (only one record is known) and almost all of the known individuals have been recorded in the Project Area. Any impact could have a significant result to the species and therefore has high(a) conservation significance. As this is not a fully described species, it is possible that it is not a rare in the local area, but poorly collected, however as this is not known, the former should be assumed.

Thryptomene sp. Wandana has been recorded in the Geraldton Sandplains bioregion and is known from 283 individuals at 17 *locations and 17 □populations, of which 0.4% are in conservation reserves. In the Project Area, 220 individuals were recorded at three locations (78% of the total known individuals). *Thryptomene* sp. Wandana is not a widely known species (the total known distribution spans 150 km) and almost all of the known populations are recorded in the Project Area. Any impact could have a significant result to the species and therefore has moderate conservation significance. As this is not a fully described species, it is possible that it is not a rare in the local area, but poorly collected, however as this is not known, the former should be assumed.

Tricoryne sp. Geraldton has been recorded in the Geraldton Sandplains bioregion and is known from 27 individuals at four *locations and three □populations, of which 55.6% are in conservation reserves. In the Project Area, 10 individuals were recorded at one location (37% of the total known individuals). *Tricoryne* sp. Geraldton is not a widely known species (the total known distribution spans 30 km) and a large amount of the known population is recorded in the Project Area. Any impact could have a significant result to the species and therefore has high(b) conservation significance. As this is not a fully described species, it is possible that it is not a rare in the local area, but poorly collected, however as this is not known, the former should be assumed.

Vittadinia cervicalis var. *occidentalis* has been recorded in the Geraldton Sandplains and Avon Wheatbelt bioregions and is known from six individuals at five *locations and five □populations, none of which are in conservation reserves. In the Project Area, one individual was recorded at one location (17% of the total known individuals). *Vittadinia cervicalis* var. *occidentalis* is not a widely known species (the total known distribution spans 40 km, with an outlier to 150 km) and a large amount of the known population is recorded in the Project Area. Any impact could have a significant result to the species and therefore has high(a) conservation significance.

Priority 2 Flora

Acacia megacephala has been recorded in the Geraldton Sandplain bioregion and is known from 162 individuals at 20 *locations and 19 □populations, of which 63% are in conservation reserves. In the Project Area, one individual was recorded at one location (1% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Dicrastylis incana has been recorded in the Geraldton Sandplain bioregion and is known from 56 individuals at 12 *locations and 11 □populations, none of which are in conservation reserves. In the Project Area, three individuals were recorded at two locations (5% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Frankenia confusa has been recorded in the Murchison, Gascoyne and Geraldton Sandplains bioregions and is known from 476 individuals at 21 *locations and 15 □populations, of which 1.5% are in conservation reserves. In the Project Area, 239 individuals were recorded at 11 locations (50% of the total known individuals). Despite the high number of the total population recorded in the Project Area, it is a widespread species that is distributed widely in Western Australia (the total known distribution spans 500 km). It therefore has low(b) conservation significance in the Project Area.

Homalocalyx inerrabundus has been recorded in the Murchison and Geraldton Sandplains bioregions and is known from 253 individuals at 13 *locations and five □populations, none of which are in conservation reserves. In the Project Area, 39 individuals were recorded at nine locations (15% of the total known individuals). *Homalocalyx inerrabundus* is not a widely known species, however as the total known distribution spans 500 km and a significant amount of the known population was recorded in the Project Area because of the transect survey, it has low(b) conservation significance.

Leucopogon borealis has been recorded in the Geraldton Sandplain bioregion and is known from 418 individuals at 43 *locations and 28 □populations, of which 12.4% are in conservation reserves. In the Project Area, 169 individuals were recorded at 24 locations (40% of the total known individuals). This species appears to be restricted in the local area, and the large percentage of total population within the Project Area in this case likely indicates a high local endemism in this area (the total known distribution spans 35 km). Any Impact to this species is likely to significantly affect species numbers and therefore has high(c) conservation significance.

Leucopogon sp. Howatharra has been recorded in the Geraldton Sandplain bioregion and is known from 91 individuals at six *locations and three □populations, none of which are in conservation reserves. In the Project Area, 38 individuals were recorded at four locations (42% of the total known individuals). This species appears to be restricted in the local area, and the large percentage of total population within the Project Area in this case likely indicates a high local endemism in this area (the total known distribution spans 20 km). Any Impact to this species is likely to significantly affect species numbers and therefore has high(c) conservation significance.

Malleostemon sp. Moonyoonooka has been recorded in the Geraldton Sandplains bioregion and is known from 51 individuals at one *location and one □population, none of which are in conservation reserves. The one known record is located within the Project Area (100% of the total known individuals). *Malleostemon* sp. Moonyoonooka is not a widely known species and any impact could have a significant result to the species and therefore has high(a) conservation significance. As this is not a fully described species, it is possible that it is not a rare in the local area, but poorly collected, however as this is not known, the former should be assumed.

Scholtzia sp. East Yuna has been recorded in the Geraldton Sandplains bioregion and is known from 52 individuals at six *locations and six □populations, none of which are in conservation reserves. In

the Project Area, 50 individuals were recorded at four locations (96% of the total known individuals). *Scholtzia* sp. East Yuna is not a widely known species (the total known distribution spans 115 km) and almost all of the known population is recorded in the Project Area. Any impact could have a significant result to the species and therefore has high(b) conservation significance. As this is not a fully described species, it is possible that it is not a rare in the local area, but poorly collected, however as this is not known, the former should be assumed.

Thryptomene sp. East Yuna (J.W. Green 4639) has been recorded in the Geraldton Sandplains and Avon Wheatbelt bioregions and is known from 141 individuals at 17 *locations and 16 □populations, of which 88.7% are in conservation reserves. In the Project Area, four individuals were recorded at three locations (3% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Thryptomene sp. Yuna Reserve (A.C. Burns 100) has been recorded in the Geraldton Sandplains bioregion and is known from 12 individuals at seven *locations and seven □populations, of which 16.7% are in conservation reserves. In the Project Area, one individual was recorded at one location (8% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Thryptomene stenophylla has been recorded in the Geraldton Sandplains bioregion and is known from 685 individuals at 35 *locations and 26 □populations, none of which are in conservation reserves. In the Project Area, 18 individuals were recorded at 10 locations (3% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Verticordia aereiflora has been recorded in the Geraldton Sandplains bioregion and is known from 53 individuals at three *locations and three □populations, of which 1.9% are in conservation reserves. In the Project Area, 50 individuals were recorded at one location (94% of the total known individuals). *Verticordia aereiflora* is not a widely known species (the total known distribution spans 40 km) and almost all of the known population is recorded in the Project Area. Any impact could have a significant result to the species and therefore has high(b) conservation significance.

Acacia leptospermoides subsp. *psammophila* has been recorded in the Geraldton Sandplains bioregion and is known from 280 individuals at 34 *locations and 30 □populations, of which 42.5% are in conservation reserves. In the Project Area, 23 individuals were recorded at five locations (8% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Priority 3 Flora

Acacia speckii has been recorded in the Murchison, Yalgoo and Gascoyne bioregions and is known from 1338 individuals at 223 *locations and 138 □populations, of which 3.1% are in conservation reserves. In the Project Area, 384 individuals were recorded at 124 locations (29% of the total known individuals). This species was widely recorded across the Project Area (the total known distribution spans 410 km) and because of this, despite the large percentage of the total species population in the Project Area; it is likely to be poorly collected, rather than locally endemic and therefore has low(b) conservation significance.

Acacia subsessilis has been recorded in the Murchison and Yalgoo bioregions and is known from 882 individuals at 40 *locations and 32 □populations, of which 21.9% are in conservation reserves. In the Project Area, 40 individuals were recorded at 14 locations (5% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Acanthocarpus parviflorus has been recorded in the Carnarvon and Geraldton Sandplains bioregions and is known from 715 individuals at 72 *locations and 34 □populations, 21.4% of which are in conservation reserves. In the Project Area, four individuals were recorded at three locations (1% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Arnocrinum drummondii has been recorded in the Geraldton Sandplains and Avon Wheatbelt bioregions and is known from 101 individuals at seven *locations and seven □populations, of which 88.1% are in conservation reserves. In the Project Area, 10 individuals were recorded at one location (10% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance, especially as a large proportion of the known population is located within a conservation reserve.

Baeckea sp. Walkaway has been recorded in the Geraldton Sandplains and Avon Wheatbelt bioregions and is known from 1206 individuals at 29 *locations and 28 □populations, of which 83.8% are in conservation reserves. In the Project Area, two individuals were recorded at two locations (<1% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Blackallia nudiflora has been recorded in the Geraldton Sandplains bioregion and is known from 2069 individuals at 28 *locations and 25 □populations, of which 0.5% are in conservation reserves. In the Project Area, 22 individuals were recorded at one location (1% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Calytrix erosipetala has been recorded in the Murchison and Yalgoo bioregions and is known from 2,116 individuals at 44 *locations and 38 □populations, of which 6.1% are in conservation reserves. In the Project Area, 106 individuals were recorded at 10 locations (5% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Calytrix formosa has been recorded in the Yalgoo, Geraldton Sandplains and Carnarvon bioregions and is known from 201 individuals at 24 *locations and 23 □populations, of which 42.3% are in conservation reserves. In the Project Area, three individuals were recorded at two locations (1% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Calytrix uncinata has been recorded in the Murchison and Yalgoo bioregions and is known from 1,252 individuals at 49 *locations and 46 □populations, of which 4.5% are in conservation reserves. In the Project Area, 18 individuals were recorded at six locations (1% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Calytrix verruculosa has been recorded in the Murchison bioregion and is known from 1,091 individuals at 62 *locations and 44 □populations, none of which are in conservation reserves. In the Project Area, 730 individuals were recorded at 51 locations (67% of the total known individuals). This species was widely recorded across the Project Area and because of this, despite the large percentage of the total species population in the Project Area; it is likely to be poorly collected, rather than locally endemic and therefore has low(b) conservation significance.

Dicrastylis linearifolia has been recorded in the Murchison, Yalgoo, Geraldton Sandplains, Gascoyne and Carnarvon bioregions and is known from 1720 individuals at 39 *locations and 31 □populations, of which 74.8% are in conservation reserves. In the Project Area, 107 individuals were recorded at 15

locations (6% of the total known individuals). This species was relatively common in the Project Area, but as the numbers recorded outside the Project Area are rather well known and widespread, and the percentage of total numbers is low, this species has low(a) conservation significance in the Project Area.

Dodonaea amplisemina has been recorded in the Murchison, Yalgoo, Gascoyne and Avon Wheatbelt bioregions and is known from 1121 individuals at 135 *locations and 70 □populations, of which 1.4% are in conservation reserves. In the Project Area, 298 individuals were recorded at 62 locations (27% of the total known individuals). This species was relatively common in the Project Area, but as the numbers recorded outside the Project Area are rather well known and widespread, and the percentage of total numbers is low, this species has low(b) conservation significance in the Project Area.

Eremophila arachnoides subsp. *arachnoides* has been recorded in the Murchison and Little Sandy Desert bioregions and is known from 261 individuals at eight *locations and eight □populations, of which 19.2% are in conservation reserves. In the Project Area, 40 individuals were recorded at two locations (15% of the total known individuals). This species is moderately common in the Project Area and is likely to be widespread over bioregions, therefore impact to it will not result in any significant loss to the species, and it has moderate conservation significance.

Eremophila muelleriana has been recorded in the Murchison bioregion and is known from 593 individuals at 129 *locations and 33 □populations, of which 0.2% are in conservation reserves. In the Project Area, 321 individuals were recorded at 119 locations (54% of the total known individuals). This species was widely recorded across the Project Area and because of this, despite the large percentage of the total species population in the Project Area; it is likely to be poorly collected, rather than locally endemic and therefore has low(b) conservation significance.

Gastrolobium propinquum has been recorded in the Geraldton Sandplains and Avon Wheatbelt bioregions and is known from 375 individuals at 26 *locations and 21 □populations, none of which are in conservation reserves. In the Project Area, one individual was recorded at one location (<1% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Gastrolobium rotundifolium has been recorded in the Geraldton Sandplains and Avon Wheatbelt bioregions and is known from 387 individuals at 30 *locations and 25 □populations, none of which are in conservation reserves. In the Project Area, seven individuals were recorded at five locations (2% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Geleznovia verrucosa subsp. Kalbarri has been recorded in the Geraldton Sandplains bioregion and is known from 403 individuals at 31 *locations and 25 □populations, 1.2% of which are in conservation reserves. In the Project Area, 57 individuals were recorded at five locations (14% of the total known individuals). *Geleznovia verrucosa* subsp. Kalbarri is not a widely known species and any impact could have a significant result to the species and therefore has moderate conservation significance. As this is not a fully described species, it is possible that it is not a rare in the local area, but poorly collected, however as this is not known the former should be assumed.

Gnephosis cassiniana has been recorded in the Yalgoo, Geraldton Sandplains and Avon Wheatbelt bioregions and is known from 12,042 individuals at 13 *locations and 10 □populations, of which 0.8% are in conservation reserves. In the Project Area, two individuals were recorded at two locations (<1% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Grevillea candicans has been recorded in the Geraldton Sandplains and Avon Wheatbelt bioregions and is known from 75 individuals at 28 *locations and 25 □populations, of which 6.7% are in conservation reserves. In the Project Area, eight individuals were recorded at three locations (11% of the total known individuals). *Grevillea candicans* is not a widely known species and a moderate amount of the known population is recorded in the Project Area. Any impact could have a significant result to the species and therefore has moderate conservation significance

Grevillea stenostachya has been recorded in the Murchison, Yalgoo, Geraldton Sandplains and Carnarvon bioregions and is known from 654 individuals at 221 *locations and 125 □populations, of which 2.4% are in conservation reserves. In the Project Area, 276 individuals were recorded at 157 locations (42% of the total known individuals). This species was relatively common in the Project Area, but as the numbers recorded outside the Project Area are rather well known and widespread, and the percentage of total numbers is low, this species has low(b) conservation significance in the Project Area.

Grevillea triloba has been recorded in the Geraldton Sandplains bioregion and is known from 15,130 individuals at 423 *locations and 155 □populations, of which 28.8% are in conservation reserves. In the Project Area, 4,024 individuals were recorded at 106 locations (27% of the total known individuals). This species was relatively common in the Project Area, but as the numbers recorded outside the Project Area are rather well known and widespread, and the percentage of total numbers is low, this species has low(b) conservation significance in the Project Area.

Hemigenia tysonii has been recorded in the Murchison, Geraldton Sandplains, Gascoyne and Carnarvon bioregions and is known from 7,579 individuals at 254 *locations and 161 □populations, of which 1.3% are in conservation reserves. In the Project Area, 3,554 individuals were recorded at 173 locations (47% of the total known individuals). This species was widely recorded across the Project Area and because of this, despite the large percentage of the total species population in the Project Area; it is likely to be poorly collected, rather than locally endemic and therefore has low(b) conservation significance.

Hemigenia virescens has been recorded in the Murchison and Gascoyne bioregions and is known from 2,573 individuals at 83 *locations and 43 □populations, of which 1.9% are in conservation reserves. In the Project Area, 1,478 individuals were recorded at 76 locations (57% of the total known individuals). This species was widely recorded across the Project Area and because of this, despite the large percentage of the total species population in the Project Area; it is likely to be poorly collected, rather than locally endemic and therefore has low(b) conservation significance.

Homalocalyx echinulatus has been recorded in the Murchison and Gascoyne bioregions and is known from 862 individuals at 51 *locations and 39 □populations, of which 0.7% are in conservation reserves. In the Project Area, 204 individuals were recorded at 11 locations (24% of the total known individuals). This species was widely recorded across the Project Area and because of this, despite the large percentage of the total species population in the Project Area; it is likely to be poorly collected, rather than locally endemic and therefore has moderate conservation significance.

Indigofera gilesii subsp. gilesii has been recorded in the Pilbara bioregion and is known from 123 individuals at 16 *locations and 16 □populations, of which 0.8% are in conservation reserves. In the Project Area, one individual was recorded at one location (1% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Lasiopetalum oppositifolium has been recorded in the Geraldton Sandplains bioregion and is known from 393 individuals at 40 *locations and 24 □populations, of which 9.2% are in conservation reserves. In the Project Area, nine individuals were recorded at one location (2% of the total known

individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Lepidium scandens has been recorded in the Murchison and Carnarvon bioregions and is known from 55 individuals at five *locations and five □populations, none of which are in conservation reserves. In the Project Area, one individual was recorded at one location (2% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Microcorys tenuifolia has been recorded in the Geraldton Sandplains and Avon Wheatbelt bioregions and is known from 200 individuals at 17 *locations and 14 □populations, of which 51% are in conservation reserves. In the Project Area, six individuals were recorded at six locations (3% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Micromyrtus placoides has been recorded in the Murchison and Yalgoo bioregions and is known from 3,958 individuals at 80 *locations and 35 □populations, none of which are in conservation reserves. In the Project Area, seven individuals were recorded at four locations (<1% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Petrophile pauciflora has been recorded in the Murchison and Yalgoo bioregions and is known from 429 individuals at 29 *locations and 29 □populations, of which 2.5% are in conservation reserves. In the Project Area, 31 individuals were recorded at eight locations (7% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low conservation significance.

Prostanthera petrophila has been recorded in the Murchison and Yalgoo bioregions and is known from 1,606 individuals at 104 *locations and 62 □populations, of which 0.4% are in conservation reserves. In the Project Area, 124 individuals were recorded at 26 locations (8% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Ptilotus beardii has been recorded in the Murchison and Yalgoo bioregions and is known from 3,798 individuals at 74 *locations and 64 □populations, of which 1.6% are in conservation reserves. In the Project Area, 1,671 individuals were recorded at 39 locations (44% of the total known individuals). This species was widely recorded across the Project Area and because of this, despite the large percentage of the total species population in the Project Area; it is likely to be poorly collected, rather than locally endemic (the total known distribution spans 230 km) and therefore has low(b) conservation significance.

Scaevola oldfieldii has been recorded in the Geraldton Sandplains bioregion and is known from 162 individuals at 12 *locations and 11 □populations, 67.3 of which are in conservation reserves. In the Project Area, one individual was recorded at one location (1% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Serichonus gracilipes has been recorded in the Geraldton Sandplains bioregion and is known from 76 individuals at 21 *locations and 15 □populations, of which 6.6% are in conservation reserves. In the Project Area, 36 individuals were recorded at 13 locations (47% of the total known individuals). This species appears to be restricted in the local area, and the large percentage of total population within the Project Area in this case likely indicates a high local endemism in this area (the total known distribution spans 50 km). Any Impact to this species is likely to significantly affect species numbers and therefore has high(c) conservation significance.

Stenanthemum divaricatum has been recorded in the Geraldton Sandplains and Carnarvon bioregions and is known from 17 individuals at 12 *locations and 12 □populations, of which 23.5% are in conservation reserves. In the Project Area, one individual was recorded at one location (6% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Tecticornia cymbiformis has been recorded in the Murchison and Yalgoo bioregions and is known from 66 individuals at eight *locations and seven □populations, of which 1.5% are in conservation reserves. In the Project Area, 11 individuals were recorded at two locations (17% of the total known individuals). This species is not very common in the Project Area and impact to it will result in a moderate loss to the species, it therefore has moderate conservation significance.

Thryptomene sp. Moresby Range has been recorded in the Geraldton Sandplains bioregion and is known from 1,808 individuals at 58 *locations and 25 □populations, of which 1.3% are in conservation reserves. In the Project Area, 940 individuals were recorded at 38 locations (52% of the total known individuals). This species appears to be restricted in the local area, and the large percentage of total population within the Project Area in this case likely indicates a high local endemism in this area (the total known distribution spans 30 km). Any Impact to this species is likely to significantly affect species numbers and therefore has high(c) conservation significance.

Verticordia chrysostachys var. *pallida* has been recorded in the Geraldton Sandplains and Avon Wheatbelt bioregions and is known from 262 individuals at 35 *locations and 30 □populations, none of which are in conservation reserves. In the Project Area, 86 individuals were recorded at eight locations (33% of the total known individuals). This species is not very common in the Project Area and impact to it will result in a moderate loss to the species, but as its known distribution spans 180 km it therefore has moderate conservation significance.

Verticordia densiflora var. *roseostella* has been recorded in the Geraldton Sandplains and Avon Wheatbelt bioregions and is known from 378 individuals at 50 *locations and 38 □populations, of which 18.3% are in conservation reserves. In the Project Area, 56 individuals were recorded at 15 locations (15% of the total known individuals). This species is not very common in the Project Area and impact to it will result in a moderate loss to the species, but as its known distribution spans 250 km it therefore has moderate conservation significance.

Verticordia jamiesonii has been recorded in the Murchison, Yalgoo and Gibson Desert bioregions and is known from 590 individuals at 37 *locations and 34 □populations, of which 9.1% are in conservation reserves. In the Project Area, 26 individuals were recorded at six locations (4% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Priority 4 Flora

Acacia guinetii has been recorded in the Geraldton Sandplains bioregion and is known from 363 individuals at 52 *locations and 34 □populations, of which 19.3% are in conservation reserves. In the Project Area, 35 individuals were recorded at 19 locations (10% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Baeckea sp. *Melita Station* (*H. Pringle 2738*) has been recorded in the Murchison and Yalgoo bioregions and is known from 1,317 individuals at 77 *locations and 59 □populations, of which 9.9% are in conservation reserves. In the Project Area, 76 individuals were recorded at 13 locations (6% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Diuris recurva has been recorded in the Geraldton Sandplains, Avon Wheatbelt and Jarrah Forest bioregions and is known from 732 individuals at 28 *locations and 27 □populations, of which 2.5%

are in conservation reserves. In the Project Area, 20 individuals were recorded at two locations (3% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Eucalyptus ebbanoensis subsp. photina has been recorded in the Geraldton Sandplains and Avon Wheatbelt bioregions and is known from 216 individuals at 25 *locations and 23 □populations, none of which are in conservation reserves. In the Project Area, 51 individuals were recorded at four locations (24% of the total known individuals). This species is not very common in the Project Area and impact to it will result in a moderate loss to the species, but as its known distribution spans 145 km and it therefore has moderate conservation significance.

Goodenia berringbinensis has been recorded in the Murchison, Yalgoo and Gascoyne bioregions and is known from 28,191 individuals at 10 *locations and 10 □populations, of which 0.4% are in conservation reserves. In the Project Area, 50 individuals were recorded at two locations (<1% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Grevillea inconspicua has been recorded in the Murchison bioregion and is known from 2,199 individuals at 71 *locations and 65 □populations, of which 9.2% are in conservation reserves. In the Project Area, seven individuals were recorded at seven locations (<1% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Jacksonia velutina has been recorded in the Geraldton Sandplains and Avon Wheatbelt bioregions and is known from 390 individuals at 35 *locations and 33 □populations, of which 52.6% are in conservation reserves. In the Project Area, one individual was recorded at one location (<1% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Lechenaultia longiloba has been recorded in the Geraldton Sandplains bioregion and is known from 264 individuals at 15 *locations and 5 □populations, none of which are in conservation reserves. In the Project Area, one individual was recorded at one location (<1% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

Verticordia capillaris has been recorded in the Geraldton Sandplains and Avon Wheatbelt bioregions and is known from 558 individuals at 83 *locations and 56 □populations, of which 28% are in conservation reserves. In the Project Area, 118 individuals were recorded at 42 locations (21% of the total known individuals). High numbers of individuals have been recorded inside and outside the Project Area, which indicate that the species is not locally endemic (the total known distribution spans 300 km) and therefore conservation significance is low(b).

Verticordia penicillaris has been recorded in the Geraldton Sandplains and Avon Wheatbelt bioregions and is known from 5,537 individuals at 121 *locations and 59 □populations, of which 23.5% are in conservation reserves. In the Project Area, 2,135 individuals were recorded at 77 locations (40% of the total known individuals). High numbers of individuals have been recorded inside and outside the Project Area, which indicate that the species is not locally endemic (the total known distribution spans 190 km) and therefore conservation significance is low(b).

Verticordia polytricha has been recorded in the Geraldton Sandplains, Yalgoo and Jarrah Forest bioregions and is known from 859 individuals at 26 *locations and 25 □populations, of which 82.5% are in conservation reserves. In the Project Area, six individuals were recorded at one location (1% of the total known individuals). This species is not very common in the Project Area and impact to it will not result in any significant loss to the species, it therefore has low(a) conservation significance.

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9 STUDY TEAM

The vegetation and flora assessment described in this document was planned, coordinated and executed by:

Project Staff and Qualifications		
Christina Cox	PhD	Manager Botany
Melissa Hay	BSc. (Hons)	Senior Botanist, Project Manager
Marisa Milne	BSc.	Botanist
Rochelle Haycock	BSc.	Botanist
Zoe Benham	BSc. (Hons)	Botanist
Scott Hitchcock	BSc.	Senior Botanist
Tamara Ainsworth	BSc.	Botanist
Carmel Winton	BSc.	Botanist
Conrad Slee	BSc. (Hons)	Botanist/Taxonomist
Palitha Jayasekara	PhD	Botanist/Taxonomist
Peter Jobson	MSc.	Taxonomist

Licences - "Licence to Take Flora for Scientific Purposes"		
The vegetation and flora assessment described in this report was conducted under the authorisation of the following licences issued by the DEC:		
	Permit Number	Valid Until
Melissa Hay	SL008100	30 th April, 2009
	SL008528	30 th April, 2010
Scott Hitchcock	SL008095	30 th April, 2009
	SL008530	30 th April, 2010
Conrad Slee	SL008098	30 th April, 2009
	SL008535	30 th April, 2010
Carmel Winton	SL008099	30 th April, 2009
	SL008536	30 th April, 2010
Palitha Jayasekara	SL008354	30 th April, 2009
	SL008531	30 th April, 2010
Marisa Milne	SL008183	30 th April, 2009
	SL008533	30 th April, 2010

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**APPENDIX A DEFINITION OF CODES FOR THREATENED AND
PRIORITY ECOLOGICAL COMMUNITIES**