

# A TARGETED FLORA SURVEY OF THE NATUREBANK ENVELOPE IN MILLSTREAM CHICHESTER NATIONAL PARK

Submitted by

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To

Tourism section

Parks and Visitor Services  
Department of Parks and Wildlife

October 2013



Department of  
Parks and Wildlife



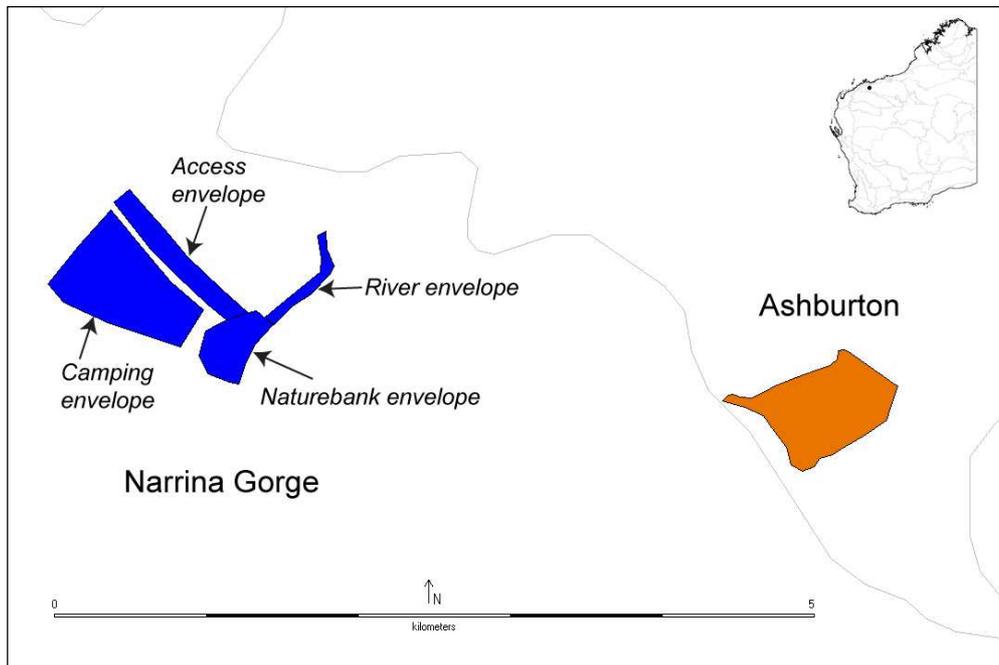
## Summary

A flora survey was undertaken in the Naturebank envelope near Python Pool in Millstream Chichester National Park, Western Australia, in order to identify vascular plant species in the project area and to highlight any of conservation significance. The survey was conducted over 6 days in July and September 2013 in good seasonal conditions and encompassed the Narrina Gorge and associated river and access envelopes, and the Ashburton envelope. A total of 127 taxa were recorded, including 20 new records for the vicinity. The Priority Two conservation-listed species *Trianthera* sp. Python Pool (G.R. Guerin & M.E. Trudgen GG 1023) was identified at the Narrina Gorge Naturebank envelope and associated river and camping envelopes, with scattered individuals observed throughout the general area. The Priority Three taxon *Oldenlandia* sp. Hamersley Station (A.A. Mitchell PRP 1479) may occur in the Ashburton envelope; however, the associated voucher collection may be referable the more common species *O. crouchiana*.

## Introduction

The flora survey outlined herein has been undertaken in response to a proposed Naturebank ecotourism development in Millstream Chichester National Park. This ecologically and culturally significant park, which is dominated by the rugged Chichester Range, is located in the Pilbara bioregion of Western Australia, some 150 kilometres by road south of Karratha. Two areas on the northern edge of the park near Python Pool have been identified as suitable sites for the proposed development (Figure 1), both of which are dominated by hummock (*Triodia* spp.) grassland (Figure 2).

The Narrina Gorge development envelope occurs in the Chichester IBRA Sub-region (Department of the Environment, Water, Heritage and the Arts 2013) and sits on an elevated plain with small, undulating, rocky rises, approximately 8 m above Narrina Creek. The vegetation at this site consists of very open trees (*Corymbia hamersleyana*) and open, tall shrubs (*Acacia pyrifolia*, *Hakea lorea*, *Grevillea wickhamii* and *G. pyramidalis*) over *Triodia epactia*, with sparse herbaceous perennials and forbs (Figure 2). There are three associated development envelopes: an access envelope to enable vehicles into the Narrina Gorge area, a river envelope that runs along the associated creek line, and a camping envelope (Figure 1).



**Figure 1.** The Narrina Gorge and Ashburton development envelopes, with an inset map showing the location of the Python Pool precinct in Millstream Chichester National Park.



**Figure 2.** Landscape views of the Narrina Gorge (L) and Ashburton (R) Naturebank development envelopes. Photographs: Steve Dillon.

The Ashburton development envelope is situated on the south-eastern face of a section of the Chichester Range in the Roebourne IBRA Sub-region (Department of the Environment, Water, Heritage and the Arts 2013). The site is mostly at flood plain level, bounded by a creek bed at the western and eastern margins and sloping upwards at the north-western edge. The vegetation consists of very open sparse trees (*Corymbia hamersleyana*) with tall, sparse shrubs (*Acacia pyrifolia*, *A. inaequilatera*, *Hakea lorea*, *Grevillea wickhamii* and *G. pyramidalis*) over a dominant understorey of *Triodia wiseana*, with sparse herbaceous perennials and forbs (Figure 2).

The aim of this flora survey was to identify species in the proposed Naturebank development envelopes and to highlight any species of conservation significance.

## Methods

Prior to the survey, a preliminary desktop assessment was conducted using *NatureMap* (Department of Environment and Conservation 2007–) and *FloraBase* (Western Australian Herbarium 1998–) to identify the taxa recorded within a 20 km radius of the project area and their conservation status. The list of 410 taxa generated from this preliminary assessment included nine taxa that are currently listed on the *Threatened and Priority Flora list for Western Australia*, none of which are gazetted as Threatened (Table 1).

A reconnaissance field trip was conducted by one of us [RD] between 15–17 July 2013, two weeks subsequent to a prolonged, heavy rainfall event. Using maps provided by DPaW Tourism section and GPS readings, the Narrina Gorge site (including the Narrina Gorge, river, camping and access envelopes) and Ashburton envelope were judiciously traversed on foot to account for subtle changes in vegetation and environment. Some 70 herbarium collections were made at this time and later identified using the resources

available at the Western Australian Herbarium. The project area was revisited from 2–5 September 2013 and extensively traversed by foot by a pair of observers. A further 106 herbarium collections were made and subsequently identified. A subset of voucher specimens has been prepared for lodgement at the Western Australian Herbarium.

**Table 1.** Conservation-listed taxa highlighted during the desktop assessment phase as occurring within a 20 km radius of the proposed Naturebank development envelopes at Millstream Chichester National Park. Listings follow DPaW Conservation Codes for Western Australian flora (Smith 2012; Western Australian Herbarium 1998–).

Taxon	Conservation Code
<i>Oldenlandia</i> sp. Hamersley Station (A.A. Mitchell PRP 1479)	P3
<i>Eragrostis crateriformis</i>	P3
<i>Ipomoea racemigera</i>	P1
<i>Pentalepis trichodesmoides</i> subsp. <i>hispid</i> a	P2
<i>Senna</i> sp. Millstream (E. Leyland s.n. 30/8/1990)	P1
<i>Rhynchosia bungarensis</i>	P4
<i>Trianthema</i> sp. Python Pool (G.R. Guerin & M.E. Trudgen GG 1023)	P2
<i>Swainsona thompsoniana</i>	P3
<i>Paspalidium retiglume</i>	P2

## Results and Discussion

A total of 127 taxa representing 40 families and 85 genera were recorded in the development envelopes (Table 2), including 20 taxa that were new records for the area (i.e. not documented during the desktop assessment phase). The Narrina Gorge envelopes (102 taxa) were more diverse than the Ashburton envelope (73 taxa), with 45 taxa shared between the two areas. The vegetation within the development envelopes was relatively weed free with the exception of the lower end of the river envelope which was heavily infested with weedy grasses, predominantly *Cenchrus setiger* (Birdwood Grass) with a small amount *Cenchrus ciliaris* (Buffel Grass).

One conservation-listed species was recorded for the Narrina Gorge envelope, namely *Trianthema* sp. Python Pool (G.R. Guerin & M.E. Trudgen GG 1023), while another conservation-listed species, *Oldenlandia* sp. Hamersley Station (A.A. Mitchell PRP 1479), may be present in Ashburton envelope (see notes below). *Pentalepis trichodesmoides* subsp. *hispid*a, which is listed as Priority Two under DPaW Conservation Codes for Western Australian Flora (Western Australian Herbarium 1998–), was observed growing between the Narrina Gorge and Ashburton envelopes (geocode: 21° 20' 38.7"S 117° 16' 11.1" E) and a voucher collection was made for the Western Australian Herbarium.

**Table 1.** Vascular plant taxa recorded during survey of the Narrina Gorge and Ashburton Naturebank development envelopes in Millstream Chichester National Park. Conservation-listed taxa are highlighted in grey; weeds are indicated with an asterix.

Taxon	Narrina Gorge	Ashburton
<b>Aizoaceae</b>		
<i>Trianthema triquetra</i>	X	X
<i>Trianthema</i> sp. Python Pool (G.R. Guerin & M.E. Trudgen GG 1023)	X	
<b>Amaranthaceae</b>		
* <i>Aerva javanica</i>	X	X
<i>Alternanthera nodiflora</i>	X	
<i>Amaranthus undulatus</i>	X	
<i>Gomphrena cunninghamii</i>	X	X
<i>Ptilotus astrolasius</i>	X	X
<i>Ptilotus auriculifolius</i>	X	X
<i>Ptilotus axillaris</i>		X
<i>Ptilotus fusiformis</i>	X	
<i>Ptilotus gomphrenoides</i>	X	
<i>Ptilotus nobilis</i>	X	X
<b>Apocynaceae</b>		
<i>Cynanicum floribundum</i>	X	X
<b>Asteraceae</b>		
<i>Calocephalus beardii</i>	X	
* <i>Flaveria trinervia</i>	X	
<i>Pluchea dentax</i>	X	
<i>Pluchea rubelliflora</i>	X	
<i>Pluchea tetranthera</i>	X	
<i>Pterocaulon sphacelatum</i>	X	X
<i>Streptoglossa bubakii</i>	X	
<b>Boraginaceae</b>		
<i>Trichodesma zeylanicum</i>	X	X
<b>Campanulaceae</b>		
<i>Lobelia arnhemiaca</i>	X	
<b>Caryophyllaceae</b>		
<i>Polycarpha longiflora</i>	X	
<b>Chenopodiaceae</b>		
<i>Atriplex codonocarpa</i>	X	
<i>Dysphania plantaginella</i>	X	
<i>Dysphania rhadinostachya</i>		X
<i>Rhagodia eremaea</i>	X	
<b>Cleomaceae</b>		
<i>Cleome viscosa</i>	X	X
<b>Combretaceae</b>		
<i>Terminalia canescens</i>	X	X
<b>Convolvulaceae</b>		
<i>Bonamia erecta</i>		X
<i>Ipomoea muelleri</i>		X
<i>Polymeria ambigua</i>	X	X
<b>Cucurbitaceae</b>		
<i>Cucumis variabilis</i>	X	X
<b>Cyperaceae</b>		
<i>Bulbostylis barbata</i>		X
<i>Cyperus vaginatus</i>	X	
<i>Schoenoplectus subulatus</i>	X	
<b>Euphorbiaceae</b>		
<i>Adriana tomentosa</i> var. <i>tomentosa</i>	X	
<i>Euphorbia careyi</i>	X	X
<i>Euphorbia trigonosperma</i>	X	X
<i>Euphorbia vaccaria</i> subsp. <i>vaccaria</i>		X

Taxon	Narrina Gorge	Ashburton
<b>Fabaceae</b>		
<i>Acacia ancistrocarpa</i>		X
<i>Acacia arida</i>		X
<i>Acacia coriacea</i>	X	X
<i>Acacia inaequilatera</i>	X	X
<i>Acacia pyrifolia</i>		X
<i>Acacia trachycarpa</i>	X	X
<i>Cajanus pubescens</i>	X	
<i>Crotalaria medicaginea</i>	X	X
<i>Crotalaria medicaginea</i> var. <i>neglecta</i>		X
<i>Cullen stipulaceum</i>	X	X
<i>Indigofera colutea</i>		X
<i>Indigofera monophylla</i>	X	X
<i>Lotus australis</i>	X	
<i>Petalostylis labicheoides</i>	X	
<i>Rhynchosia minima</i>	X	
<i>Senna artemisioides</i> subsp. <i>oligophylla</i>	X	X
<i>Senna glutinosa</i>	X	X
<i>Senna glutinosa</i> subsp. <i>pruinosa</i>		X
<i>Senna venusta</i>	X	X
<i>Sesbania cannabina</i>	X	X
<i>Swainsona formosa</i>		X
<i>Swainsona stenodonta</i>	X	X
<i>Tephrosia rosea</i> var. <i>clemantii</i>	X	X
<i>Tephrosia supina</i>	X	X
<i>Tephrosia</i> sp. B Kimberley Flora (C.A. Gardner 7300)		X
<i>Tephrosia</i> sp. Bungaroo Creek (M.E. Trudgen 11601)	X	X
<i>Vigna lanceolata</i>	X	
<b>Gentianaceae</b>		
<i>Schenkia clementii</i>	X	
<b>Goodeniaceae</b>		
<i>Goodenia lamprosperma</i>	X	
<i>Goodenia microptera</i>		X
<i>Goodenia muelleriana</i>	X	X
<b>Haloragaceae</b>		
<i>Myriophyllum verrucosum</i>	X	
<b>Lamiaceae</b>		
<i>Basilicum polystachyon</i>	X	
<i>Clerodendron floribundum</i>	X	X
<b>Lauraceae</b>		
<i>Cassytha capillaris</i>		X
<b>Lythraceae</b>		
<i>Ammannia baccifera</i>	X	
<b>Malvaceae</b>		
<i>Abutilon fraseri</i>	X	
<i>Brachychiton acuminatus</i>	X	
<i>Corchorus laniflorus</i>		X
<i>Corchorus tectus</i>	X	
<i>Gossypium austral</i>	X	
<i>Gossypium robinsonii</i>	X	
<i>Hibiscus austrinus</i> var. <i>austrinus</i>	X	
<i>Hibiscus coatesii</i>		X
* <i>Malvastrum americanum</i>		X
<i>Sida clementii</i>	X	X
<i>Sida fibulifera</i>		X
<i>Sida</i> sp. Pilbara (A.A. Mitchell PRP 1543)	X	X
<i>Triumfetta appendiculata</i>		X
<i>Triumfetta clementii</i>		X

Taxon	Narrina Gorge	Ashburton
<b>Marsileaceae</b>		
<i>Marsilea hirsuta</i>	X	
<b>Menispermaceae</b>		
<i>Tinospora smilacina</i>	X	
<b>Molluginaceae</b>		
<i>Mollugo molluginea</i>	X	X
<b>Moraceae</b>		
<i>Ficus brachypoda</i>	X	
<b>Myrtaceae</b>		
<i>Corymbia hamersleyana</i>	X	X
<i>Eucalyptus camaldulensis</i>	X	
<i>Eucalyptus victrix</i>	X	
<i>Melaleuca glomerata</i>	X	
<i>Melaleuca linophylla</i>	X	
<b>Oleaceae</b>		
<i>Jasminum didymum</i>	X	
<b>Phyllanthaceae</b>		
<i>Flueggea virosa</i>	X	X
<i>Phyllanthus maderaspatensis</i>	X	
<b>Plantaginaceae</b>		
<i>Stemodia grossa</i>	X	X
<b>Poaceae</b>		
* <i>Cenchrus ciliaris</i>	X	X
* <i>Cenchrus setiger</i>	X	
<i>Cymbopogon oblectus</i>	X	
<i>Eragrostis tenellula</i>	X	
<i>Eriachne benthamii</i>	X	X
<i>Eriachne pulchella</i> subsp. <i>dominii</i>		X
<i>Leptochloa fusca</i>	X	
<i>Themeda triandra</i>	X	
<i>Triodia epactia</i>	X	X
<i>Triodia wiseana</i>	X	X
<b>Portulacaceae</b>		
<i>Portulaca cyclophylla</i>	X	
<i>Portulaca oleracea</i>		X
<b>Potamogetonaceae</b>		
<i>Potamogeton tricarinatus</i>	X	
<b>Proteaceae</b>		
<i>Grevillea pyramidalis</i> subsp. <i>leucadendron</i>	X	X
<i>Grevillea wickhamii</i> subsp. <i>hispidula</i>	X	X
<i>Hakea lorea</i>	X	X
<b>Rubiaceae</b>		
<i>Oldenlandia</i> sp. (either <i>O. sp.</i> Hamersley Station (A.A. Mitchell PRP 1479) or <i>O. crouchiana</i> )		X
<b>Scrophulariaceae</b>		
<i>Eremophila longifolia</i>	X	
<b>Stylidiaceae</b>		
<i>Stylidium fluminense</i>	X	
<b>Surinaceae</b>		
<i>Stylobasium spathulatum</i>	X	
<b>Violaceae</b>		
<i>Hybanthus aurantiacus</i>		X
<b>Zygophyllaceae</b>		
<i>Tribulus hirsutus</i>		X
<i>Tribulus macrocarpus</i>	X	X
<i>Tribulus platypterus</i>		X
<b>TOTALS</b>		
<b>127</b>	<b>102</b>	<b>73</b>

***Trianthea* sp. Python Pool (G.R. Guerin & M.E. Trudgen GG 1023)**

*Trianthea* sp. Python Pool is a prostrate or near-prostrate annual herb to 10 cm high with green, pink, mauve or white flowers (Figure 3). It has been recorded flowering from March to May in open patches on spinifex plains. It is similar to *Trianthea kimberleyi* which also has a prostrate habit, flattened leaves, and stamen number of 10, but differs in a number of features including its soft and fleshy (rather than succulent) leaves, inconspicuously (rather than obviously) papillate indumentum, shortly triangular (rather than narrowly acuminate) bracts, and partially ridged (rather than smooth) seeds (G.R. Guerin and M.E. Trudgen, *in litt.*).

*Trianthea* sp. Python Pool is known from only four populations in the Pilbara bioregion of Western Australia, extending from south of Karratha to Millstream Chichester National Park, and is listed as Priority Two under DPaW Conservation Codes for Western Australian Flora (Smith 2012; Western Australian Herbarium 1998–). It was recorded in the Narrina Gorge Naturebank envelope and the associated river and camping envelopes, occurring in scattered patches in open bare areas at the end of small drainage lines. It is thought that these bare patches are subject to sustained periods of flooding (pooling) during the wet season and are therefore unsuitable areas for *Triodia* to colonise.



**Figure 3.** Habit (L) and flowers (R) of *Trianthea* sp. Python Pool (G.R. Guerin & M.E. Trudgen GG 1023). Photographs: Greg Guerin.

### ***Oldenlandia* sp.**

A collection from the Ashburton envelope from the genus *Oldenlandia* (Rubiaceae) could not be confidently identified to species level due to both the poor quality of the collection, which was obtained from the only individual observed during the survey, and taxonomic uncertainty. There are five species of *Oldenlandia* recorded for the Pilbara bioregion (Western Australian Herbarium 1998–) and the collection from the Ashburton site appears referable to either *O. crouchiana* or the putative new species *O. sp.* Hamersley Station (A.A. Mitchell PRP 1479), the latter of which is listed as Priority Three under DPaW Conservation Codes for Western Australian Flora (Smith 2012; Western Australian Herbarium 1998–) and was recorded during the desktop assessment. *Oldenlandia* sp. Hamersley Station is thought to have a larger, more robust growth habit than *O. crouchiana*, however, further research is required since the taxonomic significance of this variation is unclear. *Oldenlandia crouchiana* is relative common in the Pilbara bioregion and extends into the Kimberley, whereas *O. sp.* Hamersley Station is only recorded for the Pilbara, with scattered populations documented from south of Karratha to north-west of Newman (within the known range of *O. crouchiana*).

### **References**

- Department of the Environment, Water, Heritage and the Arts (2013). Interim Biogeographic Regionalisation for Australia (IBRA), Version 7. <http://www.environment.gov.au/parks/nrs/science/bioregion-framework/ibra/index.html> [accessed 9 October 2013].
- Department of Environment and Conservation (2007–). NatureMap: Mapping Western Australia's Biodiversity. <http://naturemap.dec.wa.gov.au/> [accessed June 2013].
- Smith, M.G. (2012). Threatened and Priority Flora list for Western Australia. (Department of Environment and Conservation: Kensington, Western Australia.)
- Western Australian Herbarium (1998–). FloraBase—the Western Australian Flora. Department of Parks and Wildlife. <http://florabase.dpaw.wa.gov.au> [accessed October 2013].

*Acknowledgements.* Steve Dillon is acknowledged for his expert field assistance during the September field survey. Alex Bowlay and Neil Brougham are thanked for help with field work logistics and Millstream accommodation. Russell Barrett kindly confirmed the identity of *Trianthema* sp. Python Pool.