

Gunnedah Solar Farm Regrowth Investigation

262 Hunts Road Gunnedah, NSW, 2713

NCA24P170173

9/08/2024



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EXECUTIVE SUMMARY

This report contains the results of an inspection of the 'new Development Application area' (a 50m x 60 m area and associated access road) within Lot 2 Deposited Plan (DP) 814689 following a request from the client, Fortitude Renewables (on behalf of NSW Community Renewables), to assess the area to investigate the regrowth of vegetation since March 2020. The purpose of this review is to determine whether regrowth vegetation would be commensurate with a Threatened Ecological Community (TEC) under the NSW *Biodiversity Conservation Act 2016* (BC Act) and / or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

This report has been prepared by a Biodiversity Assessment Method (BAM) accredited ecologist (Accreditation number BAAS22016).

To assess the vegetation in the new DA area, the following survey effort was performed:

- One 20m x 50m floristic Biodiversity Assessment Method (BAM) plot within the proposed development site.
- Two adapted 5m x 40m rapid assessment plots were undertaken to evaluate the potential impacts associated with the placement of site entry onto the subject site and to investigate the potential for Category 1 and/or Category 2 lands under the NSW *Local Land Services Act 2013* (LLS Act).

Results from this ecological assessment have determined the following:

- No TECs have been identified upon the subject site.
- Vegetative regrowth onsite is not considered to belong to any Endangered Ecological Community (EEC) under the BC Act and / or EPBC Act.
- No threatened flora species were identified during surveys.
- No area of critical habitat occurs at the subject site.
- No impacts on a declared area of outstanding biodiversity value will occur as part of the proposed development.
- The contribution the regrowth has or could be attributing to critical habitat is nil.
- The regrowth that has occurred since a clearing event in 2017 is limited in composition by historic clearing, burning, tillage and grazing onsite.
- A review of the NSW Environment and Heritage Group (EHG) *Draft Native Vegetation Regulatory Map* should be sought as there is an obvious error in relation to the mapping on the subject site. The site was cleared of native vegetation prior to 1 January 1990. A landholder review of the *Draft Native Vegetation Regulatory Map* is appropriate as the subject site should be considered Category 1 – exempt lands rather than Category 2 – regulated lands under the LLS Act.



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1 INTRODUCTION

1.1 SCOPE

Fortitude Renewables, on behalf of NSW Community Renewables (Gunnedah) Pty Ltd (NSW Community Renewables), are proposing a new Development Application (DA) at Lot 2 Deposited Plan (DP) 814689, 262 Hunts Road, Gunnedah NSW 2380. It is understood that the proposed DA consists of a 50m x 60 m area and associated access road from Black Jack Road to the west. The proposed DA is located west of an existing DA for which the vegetation was surveyed in 2020.

The proposed DA relates to the construction of a Battery Energy Storage System (BESS), with associated ancillary infrastructure (e.g. water tanks, inverter, batteries), carparking and access from Black Jack Road.

Fortitude Renewables requested Kleinfelder attend the subject site to investigate vegetation regrowth that has occurred on the site since March 2020. NSW Community Renewables is seeking to answer the following request from council:

“Consideration of vegetation occurring onsite in accordance with Biodiversity Conservation Act 2016 and State Environmental Planning Policy (Biodiversity and Conservation) 2021. Since the previous assessment indicated on 04 March 2020 significant regrowth [h]as occurred onsite. Provide comments regarding if regrowth is of a vegetation type which is an endangered ecological community or could be attributing to critical habitat.”

A Flora and Fauna Assessment Report (FFAR) was prepared over the subject site in May 2020. At the time, vegetation onsite had been largely cleared, with limited regrowth and indications of recent soil disturbance (possible tilling). As a result of the site conditions present at the time of the previous survey, one vegetation survey plot was previously performed using Biodiversity Assessment Method (BAM) methodology. Due to the lack of habitat for native plant species present within the associated subject site at the time, the NSW Guide to Surveying Threatened Plants (OEH 2016) was not considered to be applicable for onsite surveys under the FFAR.

To assess the vegetation in the for the proposed DA, the following survey effort was requested:

- One 20m x 50m floristic BAM plot within the proposed development site .
- Two 20m x 20m plots and one 100m linear transect within the access area to assess grasslands under the formerly NSW Office of Environment and Heritage (OEH) *Interim Grassland and Groundcover Assessment Method* (2018) (IGGAM) to investigate the potential for Category 1 or Category 2 lands under the NSW *Local Land Services Act 2013* (LLS Act). Due to the narrow roadside verge and lack of native groundcover vegetation, two adapted 5 x 40 metre rapid assessment plots were undertaken to evaluate the potential impacts associated with the placement of site entry onto the subject site and to investigate the potential for Category 1 and/or Category 2 lands.

1.2 STUDY AREA

The subject site is located 5.7 kilometres south-west of Gunnedah within the Brigalow Belt South IBRA region – Liverpool Plains IBRA Subregion. Three (3) unnamed drainage lines traverse the property from Black Jack Road and Bushs Lane. The study area has no mapped Biodiversity Values on the NSW DCCEEW *Biodiversity Values Map and Threshold Tool*. The NSW Environment and Heritage Group (EHG) *Draft native vegetation regulatory map* shows areas of both Category 1 – exempt lands (draft) and Category 2 – regulated lands (draft) as occurring on the subject site. The NSW DCCEEW *NSW State Vegetation Type Map* maps Plant Community Type (PCT) 101, *Poplar Box - Yellow Box - Western Grey Box grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion*, as occurring within the western end of the subject site, intersecting the proposed DA footprint (<https://www.seed.nsw.gov.au/>) (**Figure 1**).

The following terms are used throughout this report to describe the areas that pertain to the current assessment:

- **Study area** – defined as the western portion of Lot 2 DP 814689.
- **Subject site (Proposed Development Area)** – areas of the study area proposed for development.
- **Locality** – land within a 1500 metre radius of the study area.



2 METHODS

2.1 EXPERIENCE

The botanist undertaking these surveys has over 35 years of experience with assessing biodiverse vegetation communities including rainforests, Eucalypt forests/woodlands, grasslands and flora species of NSW generally. The botanist is currently an accredited Biodiversity Assessment Method assessor (Accreditation number BAAS22016). The assessor states that there is no direct or indirect, perceived or otherwise, conflict of interest regarding this assessment and development.

2.2 FIELD SURVEY

2.2.1 Familiarisation

An initial one-hour inspection was made of the development footprint to confirm the vegetation onsite. A random meander inspection of all vegetation was undertaken including along the adjoining Bushes Lane and Black Jack Road.

2.2.2 Site inspection

All strata of vegetation were examined. Larger trees and shrubs and their location on site were noted to enable their potential assignment as part of a naturally occurring PCT. An additional five-hour inspection to record all vegetation on the subject site undertaken to further inform this study.

2.2.3 Floristic plot - Vegetation communities

One 20 x 50 metre floristic, structural BAM plot was undertaken (**Table 1**). The floristic plot recorded all species present along with their cover and abundance, expressed as percentage and their numerical abundance based upon visual estimations. Digital photographs were taken from the north-western and north-eastern corner of the plot. A handheld GPS unit, (Garmin Oregon 750T) was used to record locations of start and finish points of linear transects, and, the north-east and north-western corner of plots, with accuracy being generally <5 metres. All locations were recorded in Geodetic Datum of Australia (GDA) 1994 Map Grid of Australia (MGA) Zone 55.

2.2.4 Category 1 – exempt lands

Section 60H(1)(a) of the LLS Act, **Category 1-exempt land mapping** states the following regarding classification of Category 1 – exempt land mapping:

(1) *Land is to be designated as category 1-exempt land if the Environment Agency Head reasonably believes that —*

(a) *the land was cleared of native vegetation as at 1 January 1990.*

Section 60J(2) of the LLS Act, **Matters relating to determination of mapped category of land** provides a framework for assessing whether and is taken to have been 'cleared' under Section 60H(1)(a), stating:

60J(2) *Native vegetation that comprises grasslands or other non-woody vegetation is taken to have been cleared if the native vegetation was significantly disturbed or modified.*

Examination of historical aerial imagery was undertaken to examine historic and ongoing agricultural utilisation of the site (Historical Imagery Search and Discovery| © Spatial Services | Department of Customer Service).

2.2.5 Category 2 – Regulated lands

The adjoining area along Bushes Land and Black Jack Road easements has recently been categorised as Category 2 – regulated land under the LLS Act. The proposed use of the *Interim Grasslands and Groundcover Assessment Method* (IGGAM) for the examination of grasslands was not deemed applicable to the site conditions with a shrub and tree layer present precluding its use. Adaptive 5 x 40 metre rapid assessment plots were undertaken to evaluate the potential impacts associated with the placement of site entry onto the subject site.



2.3 PLANT IDENTIFICATION

All flora species noted were recorded to field data sheets and later transcribed to spreadsheet (**Table 1**). All flora species encountered with suitable flowering or vegetative material were photographed, collected, and pressed. Any species unable to be identified in the field was sampled and later identified using flora identification keys (NSW Plantnet Flora Online; Harden 1990, 1992, 1993, 2000 & 2002; Jacobs et al 2023). Specimens, where necessary to identify to genera or species level, were examined with tweezers, scalpel, a 10x hand lens and a TOMLOV DM602 Digital Microscope with 10-inch HDMI LCD monitor at 200 x zoom.



3 RESULTS AND DISCUSSION

3.1 CONDITION OF THE STUDY AREA

Surveys were conducted with reasonable levels of vegetative growth and flowering being apparent in the Study Area to identify all taxa present to species level. No conditions of drought were apparent with vegetation being in active growth, largely in good condition and, for the most part, presenting flowering. No recent or longer-term fire conditions were evident. Evidence of recent widespread grazing by domestic goats and cattle was noted.

3.2 GEOLOGY

Mapped geology for the subject site includes Permian-Triassic Basins - Gunnedah Basin Siltstone. These sediments were deposited in a shallow marine environment and are siliciclastic in nature and range in age from Permian 251.9 mya (base) to Lopingian 298.9 mya (top).

3.3 MITCHELL LANDSCAPES

Two (2) named Mitchell landscapes are mapped to occur across parts of the subject site.

- Landscape Name: Liverpool Alluvial Plains - Over Cleared Status: Over-cleared: Percentage cleared estimate of landscape 84%
- Landscape Name: Breeza Hills Sandstone-Shale Slopes. Over Cleared Status: N/A: Percentage cleared estimate of landscape 53%

3.4 LAND USE

The subject site has been historically fully cleared of native vegetation as recently as 2017. A single-story residential building occurs within the eastern portion of Lot 2 DP 814689, outside the proposed DA footprint. Several sheds occur at Lot 2 DP 814689. Grazing by domestic stock also occurs.

3.5 SPECIES DIVERSITY

Random meander and plot-based surveys upon the subject site discerned 43 species with 28 native species and 15 exotic species. Random meander and plot-based surveys upon the roadside reserve within the proposed access road area discerned an additional 18 species with 8 native species and 10 exotic species (**Table 1**).

3.6 THREATENED SPECIES

No threatened flora species were noted to occur upon the subject site. The vulnerable species; Grey-crowned babbler (eastern subspecies) (*Pomatostomus temporalis temporalis*) was filmed utilising the roadside reserve and subject site.

3.7 HIGH THREAT WEEDS

Five (5) risk weighted high threat weeds from the BAM were noted on the subject site; *Bidens pilosa*, *Hyparrhenia hirta*, *Opuntia stricta* var. *stricta*, *Paspalum dilatatum* and *Solanum elaeagnifolium*. One (1) manageable high threat weed from the BAM, *Lycium ferocissimum*, was noted on the crown road of Bushs Lane and Black Jack Road.

3.8 PLANT COMMUNITY TYPES AND CONDITION

Previous survey effort (Kleinfelder 2020) classified the vegetation within the site as predominantly 'Cleared Agricultural Lands' with a small amount of PCT 458: *White Cypress Pine – Buloke – White Box shrubby open forest on hills in the Liverpool Plains – Dubbo region, Brigalow Belt Southern Region*.



This author is of the opinion, from random meander, plot and linear surveys, that the vegetation on site best fits PCT 101. PCT 101 is mapped to occur on the subject site (see **Section 1.2**) and on the verges of the adjacent Bushs Lane and Black Jack Road (<https://www.seed.nsw.gov.au/>) (**Figure 1**). Please note that the Plot to PCT Assignment Tool (<https://bionet.shinyapps.io/vegplot/>) is not considered suitable for use in this IBRA region.

- **PCT 101 Grassy Woodlands; Floodplain Transition Woodlands: Poplar Box - Yellow Box - Western Grey Box grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion (<https://www.seed.nsw.gov.au/>)**

The condition of PCT 101 varied considerably between vegetation on the road reserve and that examined within the subject site. Selective grazing by goats was an obvious impact within the subject site, degrading the quality of the vegetation. Palatable species were removed from the study area and were being replaced by annual exotic weeds.

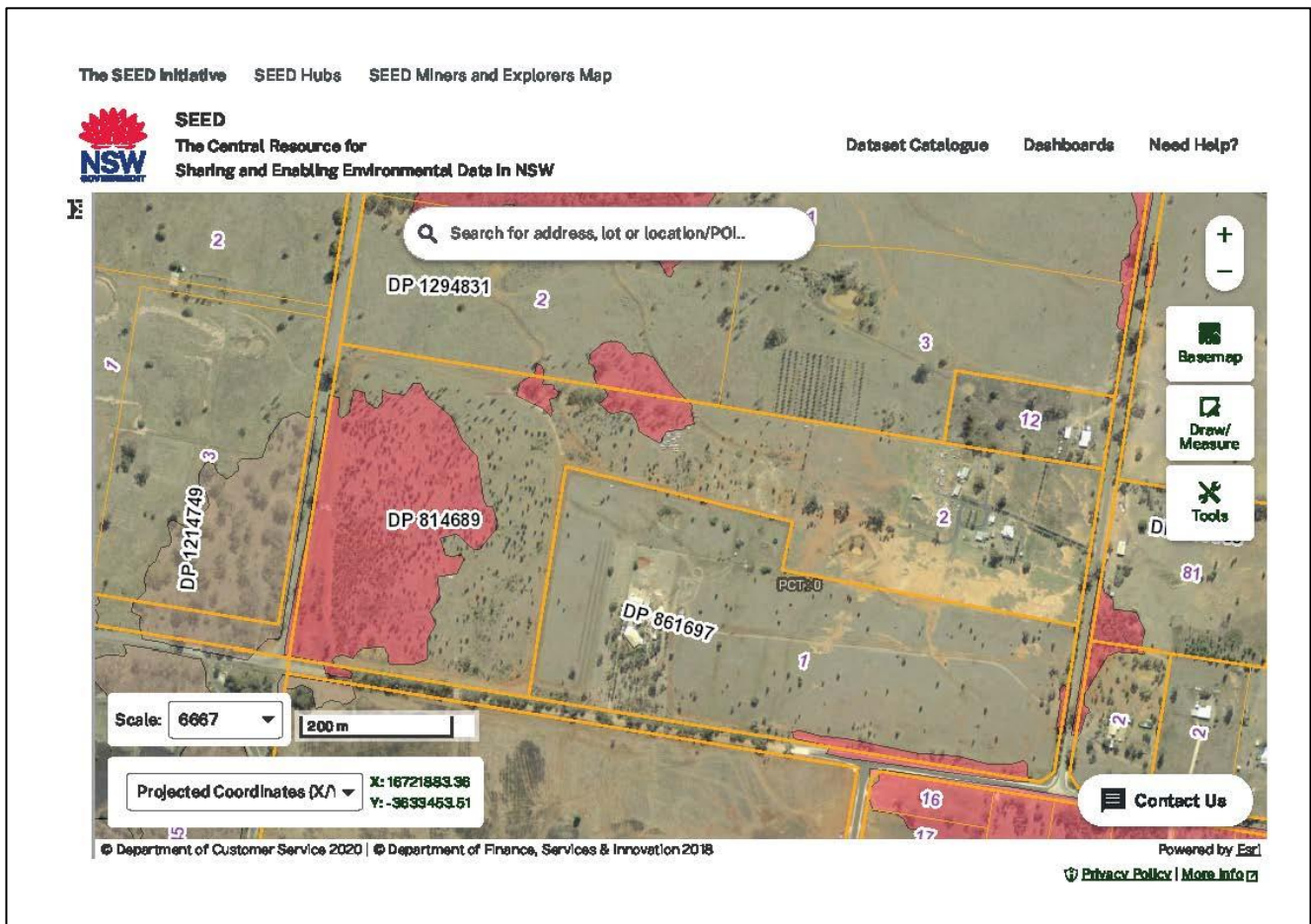


Figure 1: SEED State Extant Vegetation Type Map - PCT vegetation mapping excerpt (2023, identifying PCT 101 by the red polygon).

3.9 THREATENED ECOLOGICAL COMMUNITIES

PCT 101 has known associations with several threatened ecological communities. The community “Poplar Box Grassy Woodland on Alluvial Plains” listed under the EPBC Act represents the closest fit to the vegetation on the subject site and surrounding roadside reserves. The definition and title of this community relates to its occurrence as a “Grassy Woodland” and its position upon “Alluvial Plains”. Neither of these conditions are met at this site. PCT 101 on this site occurs upon mapped Permian Triassic siltstones approximately 2 kilometres from the nearest mapped alluvium and has a dense shrub understorey.



4 CONCLUSIONS

No threatened ecological communities occur upon the subject site. The regrowth that has occurred onsite is not considered to belong to any EEC.

No threatened flora species were identified during surveys.

No area of critical habitat is listed for the subject site. No impacts on a declared area of outstanding biodiversity value will occur. The contribution the regrowth has or could be attributing to critical habitat is nil.

The regrowth that has occurred since 2017 is limited in composition by historic clearing, burning, tillage and grazing. The regrowth on site was noted to provide limited ground foraging habitat for the Grey-crowned babbler but no roosting or nesting habitat. Roosting and nesting habitat was limited to remnant vegetation on the roadside reserve.

A review of the NSW EHG *Draft Native Vegetation Regulatory Map* should be sought as there is an obvious error in relation to the mapping on the subject site. The site was cleared of native vegetation as of 1 January 1990 and prior. A landholder review of the Draft Native Vegetation Regulatory Map is appropriate as the subject site should be considered category 1 – exempt lands rather than category 2 – regulated lands under the LLS Act.



Table 1: Species recorded and plot locations.

Family	Binomial	Name	Random Meander	Subject Site		Plot 1	Plot 1	BESS 1	BESS 1	BESS 2	BESS 2
						Easting	Northing	Easting	Northing	Easting	Northing
						20m X 20m		5m X 40m		5m X 40m	
					NW	805877	6565149	805870	6565206	805860	6565160
					NE	805896	6565146	805875	6565206	805865	6565159
Family	Binomial	Name	Random Meander	Subject Site	Roadside	% cover	Abundance	% cover	Abundance	% cover	Abundance
Native Species											
Trees.											
BORAGINACEAE	<i>Ehretia acuminata</i> var. <i>acuminata</i>	Koda			*					1	5
CUPPRESSACEAE	<i>Callitris glaucophylla</i>	White Cypress Pine		*	*			1	1	5	1
FABACEAE (MIMOSOIDAE)	<i>Acacia salicina</i>	Cooba	*	*	*					1	1
MALVACEAE	<i>Brachychiton populneus</i>	Kurrajong	*	*	*						
MYRTACEAE	<i>Eucalyptus populnea</i> subsp. <i>bimbil</i>	Bimble Box	*	*	*			15	3	2	1
RUTACEAE	<i>Geijera parviflora</i>	Wilga	*	*	*			5	10	1	5
Shrubs.											
Family	Binomial	Name	Random Meander	Subject Site	Roadside	Plot 1	Plot 1	BESS 1	BESS 1	BESS 2	BESS 2
						% cover	Abundance	% cover	Abundance	% cover	Abundance
CAESALPINIOIDEAE	<i>Senna artemisioides</i> subsp. <i>filifolia</i>			*	*	2	10	5	10	25	25
	<i>Senna barclayana</i>	Smooth Senna		*	*	0.1	5				
CAPPARACEAE	<i>Capparis mitchellii</i>	Native Orange			*						
FABACEAE (MIMOSOIDAE)	<i>Acacia deanei</i> subsp. <i>paucijuga</i>	Green Wattle		*	*	1	2	1	5	1	1
	<i>Acacia ligulata</i>	Small Cooba		*							
MALVACEAE	<i>Sida corrugata</i>	Corrugated Sida		*	*	1	50	1	0.5	1	10
OLEACEAE	<i>Notelaea microcarpa</i> var. <i>microcarpa</i>	Velvet Mock Olive	*	*	*						
SAPINDACEAE	<i>Dodonaea viscosa</i> subsp. <i>angustifolia</i>	Sticky Hop-bush	*	*	*						
SCROPHULARIACEAE	<i>Myoporum montanum</i>	Western Boobialla		*	*	15	100	5	20	2	2
THYMELAEACEAE	<i>Pimelea neoanglica</i>				*			0.1	5		
Vines.											



Family	Binomial	Name	Random Meander	Subject Site	Roadside	Plot 1	Plot 1	BESS 1	BESS 1	BESS 2	BESS 2
APOCYNACEAE	<i>Parsonsia eucalyptophylla</i>	Gargaloo			*						
						% cover	Abundance	% cover	Abundance	% cover	Abundance
FABOIDEAE	<i>Glycine tabacina</i>	Twining Glycine	*	*	*						
OLEACEAE	<i>Jasminum lineare</i>	Desert Jasmine			*			5	20	10	20
RANUNCULACEAE	<i>Clematis microphylla</i>	Small-leaved Clematis			*						

<u>Herbs.</u>											
Family	Binomial	Name	Random Meander	Subject Site	Roadside	Plot 1	Plot 1	BESS 1	BESS 1	BESS 2	BESS 2
						% cover	Abundance	% cover	Abundance	% cover	Abundance
APIACEAE	<i>Daucus glochidiatus</i>	Native Carrot	*		*						
ASTERACEAE	<i>Vittadinia sulcata</i>	Furry Fuzzweed		*	*			0.1	10		
CAMPANULACEAE	<i>Wahlenbergia gracilenta</i>	Annual Bluebell		*	*						
CHENOPODIACEAE	<i>Chenopodium curvispicatum</i>			*	*						
	<i>Einadia nutans</i> subsp. <i>linifolia</i>		*	*	*			5	10		
	<i>Maireana brevifolia</i>	Small-leaf Bluebush	*	*	*						
CONVULVULACEAE	<i>Dichondra</i> sp. <i>Inglewood</i>			*	*	1	50				
OXALIDACEAE	<i>Oxalis perennans</i>	Oxalis	*	*	*					1	50
POACEAE	<i>Austrostipa densiflora</i>			*	*	5	50	5	50	10	100
	<i>Chloris ventricosa</i>	Tall Chloris		*	*	0.1	5				
	<i>Dichanthium sericeum</i> subsp. <i>sericeum</i>	Queensland Bluegrass		*	*	1	25				
	<i>Sporobolus creber</i>	Slender Rat's Tail Grass		*	*						
	<i>Themeda avenacea</i>	Native Oatgrass			*			0.1	5	0.1	10
ROSACEAE	<i>Acaena echinata</i>			*	*	5	100				
SINOPTERIDACEAE	<i>Cheilanthes distans</i>	Bristly Rock Fern	*	*	*						
VERBENACEAE	<i>Verbena gaudichaudii</i>			*	*	5	100	5	50	5	50

<u>Epiphytic parasite.</u>											
Family	Binomial	Name	Random Meander	Subject Site	Roadside	Plot 1	Plot 1	BESS 1	BESS 1	BESS 2	BESS 2
						% cover	Abundance	% cover	Abundance	% cover	Abundance
SANTALACEAE	<i>Korthalsella rubra</i> subsp. <i>geijericola</i>				*						

<u>Exotic species</u>	
<u>Shrubs.</u>	



Family	Binomial	Name	Random Meander	Subject Site	Roadside	Plot 1	Plot 1	BESS 1	BESS 1	BESS 2	BESS 2	HTW RW	M HTW
						% cover	Abundance	% cover	Abundance	% cover	Abundance		
CACTACEAE	<i>Opuntia stricta</i> var. <i>stricta</i>	Common Prickly Pear	*	*						0.1	1	Y	
SOLANACEAE	<i>Lycium ferocissimum</i>	African Boxthorn			*			2	10				Y
Family	Binomial	Name	Random Meander	Subject Site	Roadside	Plot 1	Plot 1	BESS 1	BESS 1	BESS 2	BESS 2	HTW RW	M HTW
						% cover	Abundance	% cover	Abundance	% cover	Abundance		
	<i>Solanum elaeagnifolium</i>	Silver-leaved Nightshade		*				0.1	5			Y	

Herbs.													
Family	Binomial	Name	Random Meander	Subject Site	Roadside	Plot 1	Plot 1	BESS 1	BESS 1	BESS 2	BESS 2	HTW RW	M HTW
						% cover	Abundance	% cover	Abundance	% cover	Abundance		
ASTERACEAE	<i>Bidens pilosa</i>	Farmer's Friend	*	*	*			1	50			Y	
	<i>Centaurea solstitialis</i>	St Barnabys Thistle		*		5	50						
	<i>Gamochaeta purpurea</i>	Purple Cudweed	*	*									
	<i>Hypochaeris glabra</i>	Flatweed		*	*			5	100				
	<i>Lactuca saligna</i>	Willow-leaved Lettuce		*	*	1	50	2	50	1	10		
	<i>Schkuhria pinnata</i>	Dwarf Marigold		*	*	60	10000	0.1	10				
	<i>Taraxacum officinale</i>	Dandelion		*		2	100						
CARYOPHYLLACEAE	<i>Cerastium glomeratum</i>	Mouse-ear Chickweed	*	*	*			2	100				
FABOIDEAE	<i>Medicago minima</i>	Woolly Burr Medic		*	*	40	1000						
	<i>Trifolium alexandrinum</i>	Berseem Clover			*			2	50	1	50		
GERANIACEAE	<i>Geranium molle</i> subsp. <i>molle</i>	Cranesbill Geranium	*	*	*			1	50				
LAMIACEAE	<i>Lamium amplexicaule</i>	Dead Nettle			*					1	10		
	<i>Prunella vulgaris</i>	Self-heal			*			0.1	10				
PLANTAGINACEAE	<i>Plantago lanceolata</i>	Plantago	*	*	*								
POACEAE	<i>Chloris virgata</i>	Feathertop Rhodes Grass			*					1	10		
	<i>Cynodon incompletus</i>			*	*	1	10						
	<i>Eragrostis ciliaris</i>	Stinkgrass			*			15	100	5	50		
	<i>Hyparrhenia hirta</i>	Coolatai Grass		*	*	5	100	20	200	60	500	Y	
	<i>Megathyrsus maximum</i> var. <i>trichoglume</i>	Green Panic			*								
	<i>Paspalum dilatatum</i>	Paspalum			*					1	10	Y	
	<i>Setaria pumila</i>	Pale Pigeon Grass			*			10	100	10	100		
PRIMULACEAE	<i>Lysimachia arvensis</i>	Scarlet Pimpernel		*	*	1	50						
RUBIACEAE	<i>Sherardia arvensis</i>	Field Madder			*								
SCROPHULARIACEAE	<i>Verbascum thapsus</i> subsp. <i>thapsus</i>	Great Mullein		*		10	100						

Legend: HTW RW = High Threat Weed; risk weighted - M HTW = Manageable High Threat Weed



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APPENDIX A: SITE PHOTOGRAPHS





Photograph 1: Plot 1 North-west corner



Photograph 2: Plot 1 North-east corner



Photograph 3: BESS entry 1.



Photograph 4: BESS entry 2.



APPENDIX B: STATEMENT OF LIMITATIONS

This work was performed in a manner consistent with that level of care and skill ordinarily exercised by other members of Kleinfelder's profession practicing in the same locality, under similar conditions and at the date the services are provided. Our conclusions, opinions, and recommendations are based on a limited number of observations and data known to date. It is possible that conditions could vary between or beyond the data evaluated. Kleinfelder makes no other representation, guarantee, or warranty, express or implied, regarding the services, communication (oral or written), report, opinion, or instrument of service provided. The science of climate change and translating climate risks into design criteria are new and evolving practices, involving many uncertainties. The projections made in this report only reflect the professional judgment of the Project Team applying a standard of care consistent with the level of care and skill of other professionals undertaking similar work in the same locality under similar conditions at the date the services are provided. For these reasons, the recommendations, predictions, and projections made within this report provide guidelines based on the knowledge available to Kleinfelder as of the date provided based on Kleinfelder's review of the resources [identified below]. Any predictions or projections made in this report are not guaranteed predictions or projections of future events. The nature and climate impacts may differ significantly from predictions based on currently available data. Kleinfelder recommends that the results of these evaluations be updated over time as science, data, and modelling techniques advance. Unless so engaged, Kleinfelder disclaims any undertaking to update these predictions in the future. Any reliance upon maps or data presented herein used to make decisions or conclusions is at the sole discretion and risk of the user. This information is provided with the understanding that the data is not guaranteed to be accurate, correct, or complete and assumes no responsibility for errors or omissions. This report may be used only by the Client and the registered design professional in responsible charge and only for the purposes stated for this specific engagement within a reasonable time from its issuance, but in no event later than two (2) years from the date of the report. The work performed was based on project information provided by Client. If Client does not retain Kleinfelder to review any plans and specifications, including any revisions or modifications to the plans and specifications, Kleinfelder assumes no responsibility for the suitability of our recommendations. In addition, if there are any changes in the field to the plans and specifications, Client must obtain written approval from Kleinfelder's engineer that such changes do not affect our recommendations. Failure to do so will vitiate Kleinfelder's recommendations. In addition to the above, the footer of letters and letter reports must indicate the Kleinfelder copyright, and the bottom front page of a bound report must contain the following:

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