

## Jonathan Temme

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**From:** Jonathan Temme  
**Sent:** Monday, 29 April 2013 1:15 PM  
**To:** 'Davies, Peter'  
**Subject:** RE: Willogoleche Wind Farm, Hallett, SA  
**Attachments:** 121030\_WIL2\_Further information request.pdf

Hi Peter,

In relation to the further information request received 30 Oct 2012 (attached), I have provided a response to points 1,2 & 4 (see below). Our ecologists propose to address points 3, 5 & 6 and we were wondering whether you could advise whether you think this will satisfy your requirements. The proponent is hoping to ensure that all outstanding matters are addressed within this request so that an outcome can be achieved without need for further correspondence.

### *Point 1*

As detailed within the initial referral (submitted back in 2011) and the additional information (submitted in October 2012) A total of 0.82 hectares of TEC will be removed as part of wind farm layout. At this stage the wind farm layout comprises of turbines and hardstand areas, access tracks and underground reticulation.

At present, the proponent, GDF SUEZ Australian Energy (formerly International Power) are yet to determine the layout and siting of infrastructure associated with the wind farm, such as construction compounds, substation, grid connection line, maintenance facilities, car parking, vehicular access routes etc. These components of the project will all be designed during the pre-construction phase. The siting and design of this infrastructure will be subject to further survey work to ensure that TEC are avoided. If impact cannot be avoided, a referral will be made to DSEWPC for these additional areas.

### *Point 2*

The 0.82 ha area of TEC that will be impacted by the wind farm layout is based on the following calculations:

- WTG + hardstand 30x40m (0.12 ha)
- Access tracks 15m wide
- Underground reticulation 6m

Post construction the access tracks will only be 6m wide and the underground reticulation will be located within this 15m wide buffer. The calculations have been based on a 15m wide buffer as this accounts for ground disturbed by construction but not associated for with the final 6m width of the tracks (such as cut and fill) representing a worst case scenario. Similarly, the 30m x 40m dimension for the turbine hardstand areas caters for cut and fill and represents a worst case scenario.

Areas disturbed by construction but not associated with final land-take, including areas of TEC will be subject to the reinstatement and management plan prepared by an independent ecological consultancy (see Appendix 2 of the additional information sent in October 2012). Furthermore, consultant was engaged to prepare a hydrology and surface drainage assessment which considered modification of surface drainage from access tracks and other infrastructure on the TEC. A range of avoidance and mitigation measures have been proposed, as detailed within Appendix 1 of the additional information submitted in October 2012.

Finally, The proponent is proposing an off-set area which is aimed at providing a representative patch of an Iron Grass Natural Temperate Grassland of South Australia community which can be restored and protected and provide an overall biodiversity gain. The proponent engaged EBS to identify and assess a suitable offset area (refer to Appendix 4). The off-set incorporates an area identified as Class C Iron-grass Natural Temperate Grassland. Condition Class C areas are significantly degraded (low condition) and therefore is not a listed ecological community under the EPBC Act. Condition Class C areas are still considered to be amenable to Class B through rehabilitation measures such as weed control, natural regeneration and protection from grazing (EBS, 2011). It is intended that the

off-set will allow for rehabilitation of the area to Class A or B EPBC listing over time. The preferred Class C area identified during the survey totals 9.1 hectares. A 4 hectare section of this area will be incorporated within the fenced off-set area. The off-set is almost five times the area of Class B vegetation that will be cleared during development. EBS has prepared a Management Plan submission (Appendix 5) for the offset area. This work will be commissioned prior to the offset area being established at the commencement of construction.

*Point 3*

Whilst post-construction the access tracks and cables will be a maximum of 6m wide, the idea of the 15m buffer used to calculate vegetation clearance was to allow for indirect impacts such as edge effects. Onsite activity will be managed to eliminate impacts beyond the 15m buffer and the Lomandra Reinstatement Plan will be implemented for affected areas within the buffer.

If this method is not accepted, EBS will need to quantify all the Irongrass areas (Classes B and C) adjacent the tracks and also determine what the likely edge effect width would be to calculate the area of potential indirect impact from weed invasion and run-off. Long term impacts on viability will also need to be estimated.

*Point 4*

The proposed access tracks are a preliminary layout which is yet to undergo formal engineering design. The alternative wind farm layout presented in Figure 5.2 of the *Willogoleche Wind Farm Hydrology and Surface Drainage Assessment* (Appendix 1 of the Additional Information) proposed amendments to the preliminary layout to reduce impacts, including those to areas of Lomandra. Some of the alternative layout was proposed outside of sections which have undergone vegetation survey. This alternative layout will be considered when designing the finalised engineered layout during the pre-construction phase.

As the track layout is yet to be determined, we believe that any additional surveys that may be required should wait until the finalised track layout is known. This will then allow the finalised area of Lomandra clearance to be determined. If this clearance is greater than the proposed 0.82 ha, we are easily able to increase the proposed 4ha Class C offset area as it is located within a 9.1ha Class C patch of Lomandra.

*Point 5*

EBS will quantify the amount of Irongrass Grassland from within the past 10 years and will seek advice on the reliability of the older records from Jean Turner, Ecologist Mid-North (DEWNR).

*Point 6*

EBS will need to assess a number of considerations in relation to the proposed offset area as outlined in *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy* (October 2012).

I look forward to hearing from you.

Kind Regards,

Jonathan Temme  
Senior Development Officer

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From: Jonathan Temme  
Sent: Friday, 5 April 2013 10:50 AM  
To: 'Davies, Peter'  
Subject: RE: Willogoleche Wind Farm, Hallett, SA [SEC=UNCLASSIFIED]

Hi Peter,

Further to our discussion over the phone late last month, I have referred some of the points within the attached further information request to our ecologists for clarification and assistance. Once I hear back from them I will provide a response.

Many thanks,

Jonathan Temme  
Senior Development Officer

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From: Davies, Peter [<mailto:Peter.Davies@environment.gov.au>]  
Sent: Thursday, 7 February 2013 3:38 PM  
To: Jonathan Temme; 'simon.klapish@ipplc.com.au'; 'heidi.hirtler@sa.gov.au'  
Subject: Willogoleche Wind Farm, Hallett, SA [SEC=UNCLASSIFIED]

Dear Ms Hirtlet, Mr Temme and Mr Klapish

Firstly I would like to introduce myself as the new desk officer for the assessment under the EPBC Act of the Willogoleche wind farm proposal. I read into the file and I note that the project has been determined to be a controlled action under the EPBC Act with assessment to be on preliminary documentation. I also note that DSEWPaC has requested further information about proposed offset areas. Once this information has been received we can get the proposal out for public comment. Please let me know if I am correct with my summary of the present situation and whether I can assist you with progressing this project.

Yours sincerely,

*Peter Davies*

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**Willogoleche Hill  
EPBC Offset Area Investigation**

# Willogoleche Hill EPBC Offset Area Investigation

4 June 2013

Version 4

Prepared by EBS Ecology for Wind Prospect Pty Ltd on behalf of Willogoleche Power Pty Ltd.

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Front cover photo: *Ptilotus spathulatus* (Pussy Tails) in offset area - Patch1.

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# 1 INTRODUCTION

EBS Ecology were contracted by Wind Prospect (on behalf of Willogoleche Power Pty Ltd) to undertake an assessment of *Lomandra* grassland communities as a potential offset to satisfy the requirements of DSEWPC in relation to the current EPBC assessment within the proposed Willogoleche Wind Farm project. The offset area is aimed at providing a representative patch of an Iron Grass Natural Temperate Grassland of South Australia community which can be restored and protected and provide an overall biodiversity gain. Under the *EPBC Act 1999 Environmental Offsets Policy (2012)*, the patch must meet a series of Offset Principles outlined in the document to deliver an overall conservation outcome that improves or maintains the health, diversity and productivity of the environment as it relates to these matters. The patch must also meet minimum criteria to qualify as a 'Class C' patch as listed under the *Commonwealth Listing Advice on Iron-grass Natural Temperate Grassland of South Australia (TSSC 2007)*. Previously, suitable offset areas have been identified which are now lie within the boundaries of an environmental stewardship program. The program aims to maintain and / or improve the condition and extent of targeted matters of national environmental significance under the *Environment Protection and Biodiversity Conservation Act 1999*. Patches of *Lomandra* grassland cannot be covered under multiple agreements and therefore suitable areas outside the stewardship program needed to be identified.

## 1.1 Objectives

The objectives of the project were to:

- Identify an offset area of at least 3.6ha in size as required by DSEWPC.
- Identify the vegetation type and condition of potential offset areas
- Identify the range and extent of *Lomandra* grasslands in potential offset areas
- Assess the condition of the *Lomandra* Grassland
- Make observations of any other potential benefits of offset area
- Assess the selected offset areas against the Offset Requirements under the *EPBC Act 1999 Environmental Offsets Policy (2012)*



## 2 BACKGROUND INFORMATION

The majority of Iron-grass grassland remnants are on land currently used for agricultural production, either in non-arable grazing areas, or non-arable patches within cropping land (Turner, 2010). This area is extensively grazed by sheep with other native grazing animals prevalent in the wider area.

EBS Ecology has conducted numerous ecological assessments within proximity of this site and all background information regarding this proposal should be referred to in the following reports:

- EBS (2010) *Willogoleche Wind Farm B-WTG01 – BWTG10 and B-WTG12, Ecological Assessment.*
- EBS (2010) *Willogoleche Wind Farm Extension, Ecological Assessment.*
- EBS (2010) *Willogoleche Wind Farm Assessment against the EPBC Criteria for Iron-grass Grassland Threatened Ecological Community*
- EBS (2011) *Willogoleche Wind Farm Native Vegetation Clearance Report.*

## 2.1 Site details

The patches assessed as part of this survey are located on the western foot slopes of Willogoleche Hill (

Figure 1). The slopes are gentle to moderate with clay loam soils of very shallow depths with rock outcropping occurring throughout. Slopes further to the west of these patches are used for cropping and grazing where the soil depth allows tillage. Some pasture improvement is evident throughout the foot slope areas, most likely through periodical addition of phosphorus fertilizers and legume broadcast seeding.

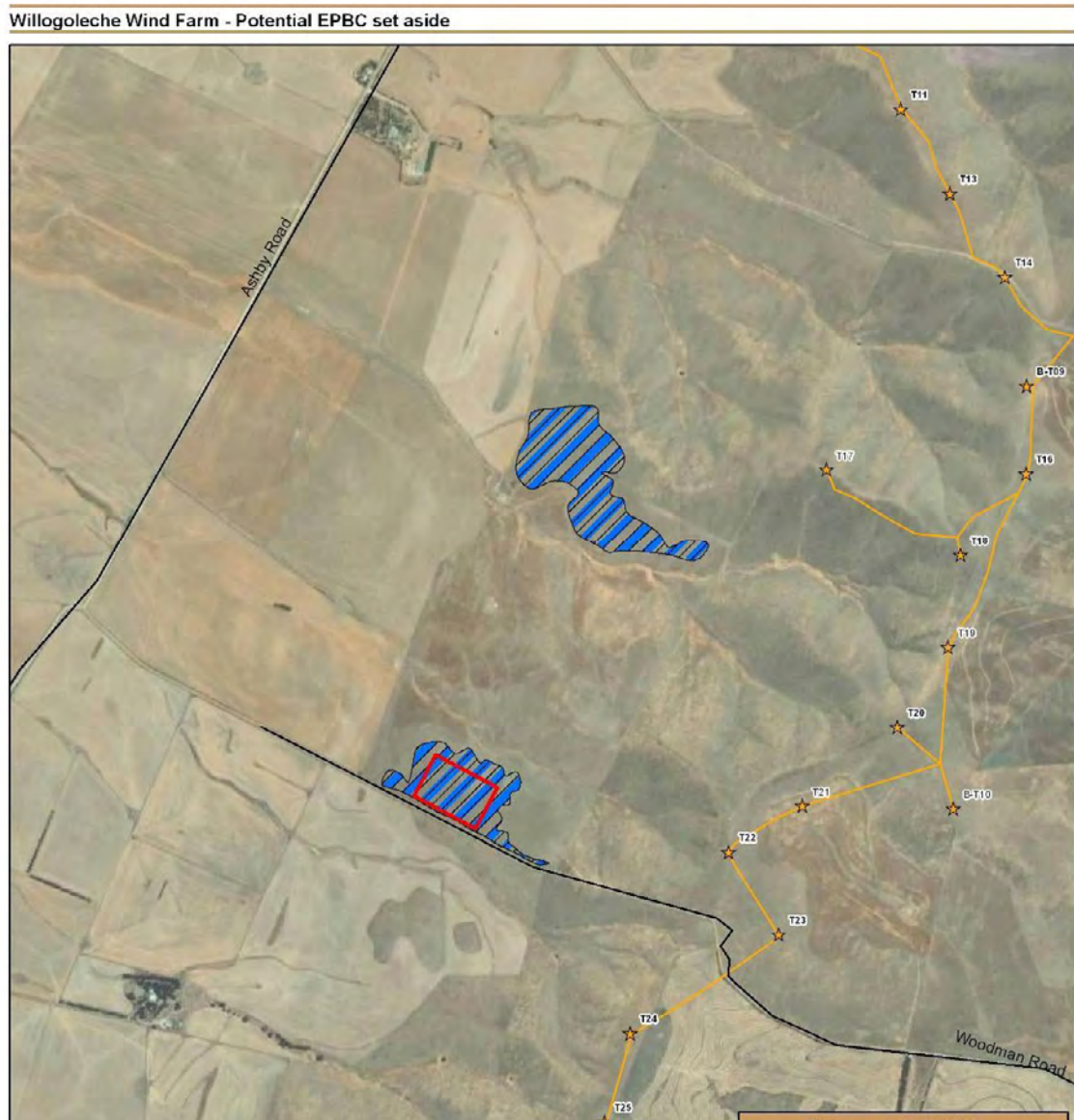


Figure 1. Survey location and assessment sites.

### 3 METHODS

Targeted surveys for the potential offset areas were undertaken following communication with the landowner and having previous knowledge of the vegetation associations present in the wider area. The survey was undertaken at a time of year which allowed for highest potential species diversity. This coincides with the emergence of annual herbaceous species and bulbous species from families such as Liliaceae (*Bulbine bulbosa*, *Wurmbea dioica*, and *Arthropodium* spp.), Stackhousiaceae (*Stackhousia monogyna*) and Orchidaceae.

#### 3.1 Field survey

##### 3.1.1 Species diversity

Species diversity totals were based on a 50 x 50m plot. These were measured with a tape and squared using an opti-square with each corner pegged. The plot was traversed on foot in a series of transects approximately five metres apart. All species observed within this plot were recorded with totals calculated to compare against benchmark criteria outlined in the *Commonwealth Listing Advice on Iron-grass Natural Temperate Grassland of South Australia* (Table 1) (TSSC 2007).

Table 1. Condition Classes for *Lomandra* grasslands.

Class	Minimum Size	Diversity of Native Species <sup>1</sup>	No. of Broad-leaved Herbaceous Species <sup>1</sup> in addition to identified disturbance resistant species <sup>2</sup>	No. of Perennial Grass Species <sup>1</sup>	Tussock Count <sup>3</sup>
Listed ecological community					
A	0.1 ha	> 30	+10	≥5	1/m
B	0.25 ha	> 15	+3	>4	1/m
Degraded patches amenable to rehabilitation					
C		> 5	No minimum	≥1	No minimum

<sup>1</sup> As measured in a 50m X 50m quadrat;

<sup>2</sup> The following species are identified as disturbance resistant species: *Ptilotus spathulatus* forma *spathulatus*; *Sida corrugata*; *Oxalis perennans*; *Convolvulus erubescens*; *Euphorbia drummondii*; and, *Maireana enchylaenoides*; and,

<sup>3</sup> As measured along a 50m transect.

##### 3.1.2 Grassland extent

The extent of *Lomandra* grassland patches were recorded using hand held Garmin GPS (Accuracy +/- 15m) units which are carried around the extent of the grassland present. The track log was saved with the relevant patch number and entered into Arc GIS software to enable the total area to be calculated.

##### 3.1.3 Tussock Density

Tussock density is calculated by using the point centred quarter method. This is used to quickly and accurately establish the population densities of any given species or stratum (Mitchell 2007). It is

considered that this is far more efficient than a plot method and more accurate for estimating cover than a qualitative measure over a wider area. Data was collected at 10m intervals along a 100m transect giving a total of ten replicates per transect. Approximate cover values were assigned based on individual tussocks covering an area of 50cm x 50cm each.

#### **3.1.4 Fauna**

Suitable offset areas containing *Lomandra* Grassland communities were checked for the presence of Pygmy Blue-tongue Lizards as the lower slopes in this area provide optimum habitat conditions for this species. This was conducted by using an opti-scope to check spider holes observed in the area.

## 4 RESULTS

The potential offset areas were assessed over two days (5<sup>th</sup> and 6<sup>th</sup> September 2012). A number of potential sites were highlighted prior to the site visit. Two of these were suitable for a thorough assessment due to having a dominant overstorey of *Lomandra multiflora* subsp. *dura* tussocks. Each of these sites were assessed using 50 x 50m plots and a point centred quarter for tussock density. The general vicinity of each site was checked for the presence of Pygmy Blue-tongue Lizards. The two patches qualify as Class C grasslands based species diversity and number of native grass species. There is no minimum for tussock counts and size of patch in this class.

### 4.1 Field survey

The two sites assessed were mapped with a hand held GPS unit. Patch 1 was the smallest area covering a total of just over 9 hectares. Patch 2 covered an area of over 14 hectares (Table 2).

Table 2. Patch area

Site	Area (Ha)
Patch 1	9.11
Patch 2	14.24
<b>Total</b>	<b>23.35</b>

#### 4.1.1 Flora species

The two patches were assessed with 50 x 50m plots for species diversity. Patch 1 had a total of 17 species of which 9 were native indigenous species (Table 3) (Figure 2). Patch 2 had a total of 15 species of which 7 were native indigenous species (

Figure 2. Typical view of Patch 1.

Table 4) (Figure 3).

Table 3. Offset patch 1 - 50 x 50m plot results.

Family Name	Scientific Name	Common Name	Introduced
LILIACEAE	<i>Lomandra multiflora</i> ssp. <i>dura</i>	Hard Mat-rush	
GERANIACEAE	<i>Erodium botrys</i>	Long Heron's-bill	*
BORAGINACEAE	<i>Echium plantagineum</i>	Salvation Jane	*
GRAMINEAE	<i>Avena barbata</i>	Bearded Oat	*
LEGUMINOSAE	<i>Trifolium</i> sp.	Clover	*
POLYGONACEAE	<i>Rumex</i> sp.	Dock	*
CHENOPODIACEAE	<i>Maireana enchylaenoides</i>	Wingless Fissure-plant	
COMPOSITAE	<i>Vittadinia cuneata</i> var.	Fuzzy New Holland Daisy	
COMPOSITAE	<i>Onopordum acaulon</i>	Horse Thistle	*
GRAMINEAE	<i>Austrostipa scabra</i> ssp.	Rough Spear-grass	
OXALIDACEAE	<i>Oxalis perennans</i>	Native Sorrel	
RHAMNACEAE	<i>Cryptandra amara</i> var.	Cryptandra	
GRAMINEAE	<i>Enneapogon nigricans</i>	Black-head Grass	
LEGUMINOSAE	<i>Medicago minima</i> var. <i>minima</i>	Little Medic	*
LABIATAE	<i>Salvia verbenaca</i> var.	Wild Sage	*
AMARANTHACEAE	<i>Ptilotus spathulatus</i>	Pussy-tails	
CARYOPHYLLACEAE	<i>Scleranthus pungens</i>	Prickly Knawel	
		Native	9
		Exotic	8
		Species Total	17





Figure 2. Typical view of Patch 1.

Table 4. Offset patch 2 - 50 x 50m plot results.

Family Name	Scientific Name	Common Name	Introduced	
GRAMINEAE	<i>Austrostipa scabra ssp.</i>	Rough Spear-grass		
LILIACEAE	<i>Lomandra multiflora ssp. dura</i>	Hard Mat-rush		
COMPOSITAE	<i>Hypochaeris radicata</i>	Rough Cat's Ear	*	
GRAMINEAE	<i>Avena barbata</i>	Bearded Oat	*	
BORAGINACEAE	<i>Echium plantagineum</i>	Salvation Jane	*	
LEGUMINOSAE	<i>Trifolium sp.</i>	Clover	*	
LEGUMINOSAE	<i>Medicago minima var. minima</i>	Little Medic	*	
GERANIACEAE	<i>Erodium botrys</i>	Long Heron's-bill	*	
POLYGONACEAE	<i>Rumex sp.</i>	Dock	*	
RUBIACEAE	<i>Asperula conferta</i>	Common Woodruff		
OXALIDACEAE	<i>Oxalis perennans</i>	Native Sorrel		
RHAMNACEAE	<i>Cryptandra amara var.</i>	Cryptandra		
ROSACEAE	<i>Acaena novae-zelandiae</i>	Biddy-biddy		
COMPOSITAE	<i>Vittadinia cuneata var.</i>	Fuzzy New Holland Daisy		
CONVOLVULACEAE	<i>Convolvulus erubescens complex</i>			
			Native	7
			Exotic	8
			Species Total	15



Figure 3. Typical view of Patch 2.

#### 4.1.2 Lomandra Density

Point centred quarters were used to assess the density of the *Lomandra* tussocks as an indication to the cover they provide. An area previously assessed as a Class B grassland was also assessed to give an indicative value of area cover in a very good condition site.

Table 5. Lomandra density with reference patch and two offset areas.

Site	Lomandra density / ha	Approximate cover
Class B grassland	2,006	5.01%
Patch 1	1,238	3.09%
Patch 2	1,587	3.96%

#### 4.1.3 Fauna species

Very few spider holes were observed in the general area. A total of three spider holes were found in the general area of the Lomandra patches. All holes had spiders occupying them at the time of the survey and no Pygmy Blue-tongue Lizards were recorded.

## 5 DISCUSSION

### 5.1 Species diversity

Both plots assessed as part of this survey had more than the minimum requirement of five indigenous species (Table 1). Species diversity was low in comparison to typical *Lomandra* grassland plots of this size. Dominant cover primarily consisted of *Medicago* (Medic Clovers), *Trifolium* spp. (Clovers) and *Avena barbata* (Wild Oats). These compete heavily with native species for available resources. Small herbaceous and shrubby native species such as *Vittadinia cuneata* (Fuzzy New Holland Daisy) and *Cryptandra amara* (Cryptandra) were subject to considerable grazing pressure at the time of the survey.

### 5.2 Tussock density

The density of *Lomandra* plants was assessed using a point centred quarter methodology. Previous literature gives cover of Lomandra tussocks in listed communities at 10 – 30% (Robertson 1998). This

seems far higher than what is commonly observed in other good quality *Lomandra* patches and assessing cover based on a percentage range over a one hectare plot is extremely subjective. Less than 50% of *Lomandra* quadrats assessed as part of the Robertson survey contained greater than 5% cover so cover values assessed as part of this survey may be more typical for this community.

### 5.3 Community extent

Patch 1 was measured at 9.11ha and Patch 2 at 14.24ha. Fragmented *Lomandra* grasslands were recorded along the roadside adjacent to Patch 1 representing degraded edges of the wider community.

### 5.4 Pygmy Blue-tongue Lizards

It is unlikely that Pygmy Blue-tongue lizards would be found in the immediate area. The low slopes in this area are ideal habitat from a visual perspective. The number of spider holes found in the area was extremely low. These patches are very fragmented from other areas that support ideal habitat so it would be unlikely that these patches support Blue-tongue communities. Restoration and connectivity with the wider stewardship areas may allow an improvement in the overall quality of habitat and provide suitable conditions in the future.

### 5.5 Overall condition and management issues

The overall condition of Patch 1 and Patch 2 at the time of the survey was poor with vegetative cover being dominated by alien species. There were moderate numbers of native species present in the ground layer but these were being fairly heavily grazed, most probably by kangaroos and rabbits in addition to domestic stock. Significant weeds were not recorded in high densities throughout the wider area. Low densities of *Echium plantagineum* (Patterson's Curse) were widespread and scattered individual occurrences of *Onopordum acaulon* (Horse Thistle) were recorded. Primarily, weed management will be focussed on reducing the nitrate in the soil which will enable native species to compete with the more aggressive annual grasses.

### 5.6 EPBC Act 1999 Environmental Offsets Policy

The EOP applies to the project due to expected impacts to Nationally Critically Endangered *Iron-grass Natural Temperate Grassland of South Australia*. This action carries offset obligations to deliver an overall conservation outcome that improves or maintains the health, diversity and productivity of the environment as it relates to these matters (DSEWPac 2011). Under the EOP a suitable offset must:

**Deliver an overall conservation outcome that improves or maintains the viability of the aspect of the environment that is protected by national environment law and affected by the proposed action.**

Patch 1 contains *Iron-grass Natural Temperate Grassland of South Australia* in a condition rated as 'Class C' under the *Commonwealth Listing Advice on Iron-grass Natural Temperate Grassland of South Australia* (Table 1) (TSSC 2007). The area has been significantly compromised by weeds and grazing, resulting in a low diversity of native species (nine species) and a high incidence of exotic grass and herbs. This level of degradation is consistent across the property with other examples of the TEC with no patches being classified a 'Class A' under the *Commonwealth Listing Advice*. Proposed management of Patch 1 will include fencing to protect from overgrazing by domestic stock and feral and native herbivores, and a weed management and revegetation program which will be undertaken to improve the patch condition from Class C to Class A. Negotiations will be undertaken with the landowner to place the patch under Heritage Agreement with the South Australian State Government.

### **Be built around direct offsets but may include other compensatory measures**

A minimum of 3.9 hectares is required to offset the clearance of *Iron-grass Natural Temperate Grassland* associated with the Willogoleche Wind Farm. 100% of the offset requirement will be achieved by direct offsets within Patch 1.

The proposed management of the offset aims to address the following key Recovery Actions from the *National Recovery Plan for the Iron-grass Natural Temperate Grassland of South Australia ecological community, (2012)*:

- Strategy 3: Increase the area of the EPBC listed *Iron-grass Natural Temperate Grassland* secured and managed for conservation
- Strategy 4: Maintain or improve the condition and integrity\* of the EPBC listed *Iron-grass Natural Temperate Grassland* remnants using 'best practices' strategies
- Strategy 5: Increase the area of occupancy of the EPBC listed *Iron-grass Natural Temperate Grassland* ecological community across its natural range

### **Be in proportion to the level of statutory protection that applies to the protected matter**

It is proposed that the development will result in the removal of Class B *Iron-grass Natural Temperate Grassland of South Australia*. The offset area contains the same TEC, but classified as Class C.

### **Be of a size and scale proportionate to the impacts on the protected matter**

It is proposed that the development will result in the removal of approximately 0.82 ha of *Iron-grass Natural Temperate Grassland of South Australia*. The offset area contains 4 hectares of the same TEC. Management of the 4 hectares of Class C *Iron-grass* community will result in a conservation gain that adequately compensates for the impacts associated with the development. The proposed offset area met the requirements of 90% minimum direct offset and is considered to compensate for the total quantum of impact under the EPBC Offsets Assessment Guide (DSEWPC, 2012).

### **Effectively account for and manage the risks of the offset not succeeding**

The risk that the impact upon the protected matter will be too great for the offset area to compensate for is considered minimal. Preliminary infrastructure designs resulted in the potential for 4.12 ha of Grade-B Iron-grass Natural Temperate Grassland of South Australia to be cleared. However, a review of the design of the infrastructure layout enabled much of the Grassland to be avoided, resulting in total clearance of approximately 0.82 ha of the Grade-B Iron-grass Natural Temperate Grassland of South Australia. This is considered to be a very small proportion (0.006%) of the total area of the TEC (Classes A and B) within the local area (50km radius) and approximately 0.005% of the estimated total area of the ecological community (EBS, 2012).

The second level of risk which relates to whether the offset will compensate for the action over a period of time will be dependent on the effectiveness of the management actions imposed as part of the proposed Offset Management Plan. Broadly the management actions will involve restoration activities (weed management and revegetation), removal of domestic grazing through fencing and potential protection under the state government Heritage Agreement Scheme.

The proposed offset is considered a 'direct' offset and therefore presents a lower risk than other compensatory measures.

**Be additional to what is already required, determined by law or planning regulations or agreed to under other schemes or programs (this does not preclude state or territory offsets)**

A required SEB (Significant Environmental Benefit) under the *Native Vegetation Act, 1991*, to adequately offset the total clearance, is 143.43ha, however the proponent has opted to make a payment into the Native Vegetation Fund of \$141,935.76 (EBS, 2011). This is a separate offset arrangement to the proposed EPBC Offset.

**Be efficient, effective, timely, transparent, scientifically robust and reasonable**

The proposed set-aside is not aligned with the proposed SEB offset under the state's *Native Vegetation Act, 1991*. Initially a proposed set-aside area was identified on the property containing approximately 27.59 ha. The area contained Condition Class C Iron-grass Natural Temperate Grassland (in accordance with the EPBC Act criteria) and was considered suitable given the vegetation present was of relatively high quality and with management opportunities to improve the overall condition (EBS, 2011). The landowner then applied for a Stewardship scheme which resulted in DSEWPC advising the proponent that an EPBC offset could not be located over a Stewardship program. An alternative area was then identified.

It is likely that management of the offset area will begin at around the same time as the impacts arising from the wind farm are occurring.

A number of reports have sought to analyse the benefits to the TEC's ecological function and values across the project area and within the region. This report provides scientific information on the investigation of two potential areas and determines the condition and suitability of each area. An *Offset*

*Management Plan* is also proposed to outline the management activities required to improve the condition of the selected offset area from 'Class C' to 'Class A'. The *Willogoleche Wind Farm Regional Lomandra Assessment* (EBS, 2012) provided a desktop analysis to determine the overall significance of Iron-grass Natural Temperate Grassland of South Australia within the region and across the state. This information helps to highlight the importance of management and conservation of small remnants across the region.

**Have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced.**

It is anticipated that the proposed offset management plan will address the following issues:

- Clear offset objectives
- Land tenure and ongoing third party contractual arrangements
- Fencing plan
- Weed management
- Revegetation plan
- Potential Heritage Agreement Scheme arrangements
- Timing and Costings
- Monitoring techniques and ongoing reporting arrangements
- Document review dates

The annual monitoring reports will report on:

- Annual monitoring outcomes compared with 'Class A' reference sites
- Review of monitoring methodology (if applicable)
- Overall performance of offset area.

## 6 RECOMMENDATIONS

It is the opinion of EBS Ecology that Patch 1 (Figure 1) is the most suitable as an offset area for the following reasons:

- Patch 1 qualifies as Condition Class C when assessed against the benchmark criteria outlined in the *Commonwealth Listing Advice on Iron-grass Natural Temperate Grassland of South Australia* (Table 1) (TSSC 2007).
- Patch 1 can be more easily fenced due to the existing fencing on the boundary;
- Patch 1 adjoins the road reserve which also contains some fragmented remnants of the wider community;
- Patch 1 has a higher species diversity in the representative 50 x 50m plot; and
- Patch 1 can be accessed from the road reserve and therefore managed more easily.

Approximately 4ha within Patch 1 has been selected to establish the offset area. This area is part of the core community contained within Patch 1. It has a *Lomandra* density more consistent with the better reference communities within the wider area. A number of native species are also persisting Patch 1 despite current grazing regimes. Negotiations with the local council are recommended to avoid sub-lease of the adjacent road reserve as a grazing area and protection for the community on a long term basis would provide additional connectivity of the offset area to the stewardship area. A management plan outlining targets, goals, threats, management and monitoring comparisons with good quality reference communities within the region should be undertaken.

## 7 REFERENCES

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- Turner, J (2012) *National Recovery Plan for the Iron-grass Natural Temperate Grassland of South Australia ecological community*. Department of Environment and Natural Resources Adelaide SA.





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Friday, 28 June 2013

*Re: Wind Prospect Wind Farm – EPBC referrals assistance*

Dear Jonathan,

This response is to provide further information on the currency of DEWNR Irongrass Grassland records used for the Willogoleche Wind Farm Regional Lomandra Assessment (EBS Ecology 2012). For those records over 10 years old, further assessment has been provided of the reliability for the purpose of quantifying regional significance of the Willogoleche Wind Farm impacts.

The limitations of the Regional Lomandra Assessment (EBS Ecology 2012) stated that the dataset sourced from DEWNR, which included records of current distribution and condition of the TEC across South Australia, was incomplete. Many of the patches were broadly mapped using aerial photography or other general landscape information. The patches were divided into two groups, 'confirmed' and 'unconfirmed' records. The patches of Iron-grass Natural Temperate Grassland of South Australia mapped as 'confirmed' were those patches where some level of field survey or ground truthing was undertaken. All areas mapped as 'unconfirmed' were those which were never formally ground truthed. A number of additional data fields were assessed as part of the filtering process which helped identify those records considered to be valid. The methodology for verifying Lomandra spp. Grassland records for the regional study are outlined in more detail below.

1. The description of the vegetation association derived from or recorded at survey site within the polygon was used to eliminate records of Lomandra spp. growing in other communities (eg shrublands). This enabled the removal of 50 records from the data set (total of 873 records).
2. Those records listed as 'Native Vegetation' as opposed to Iron-grass (Lomandra spp.) Natural Temperate Grassland were removed from the dataset (375 records).
3. Additional records removed included those where:
  - the codes describing ground truthing effort and source and type of ground truthing was listed as 'Unknown' or 'Not Checked'

- the name of other data source that provided data about the polygon, is recorded as 'Desktop'
- the code for condition class of the TEC occurring in the polygon is 'Unknown' or 'Very Low', which means that where a condition class has been assigned, the confidence in the rating is insignificant or probably unrecorded and therefore 'unknown'. This applies to 655 records.
- TEC comments include descriptions of vegetation which are not Iron-grass Natural Temperate Grassland of South Australia

This eliminated a further 657 records from the dataset. The remaining data which was mapped as part of the Regional Lomandra Assessment contained 165 records. Fifty-six of those records are dated pre-2002, the oldest record from 1991.

4. For those records regarded as 'confirmed' the following data fields were assessed to help determine the reliability of the records.

- TEC description of the vegetation association is derived from or recorded at survey site within the polygon. Each of the records needed to be described as Lomandra Grassland (47 records), or otherwise have a vegetation type description of Lomandra Grassland constructed using available data sources, which were regarded as potentially reliable (9 records), based on the reputation of the surveyor or the program associated with the observation.
- TEC Ground truthing indicates what level of assessment has been undertaken. All records but three have been recorded as SU (Survey Sites - DEWNR methodology) or GT (Ground Truth Trip - general field work undertaken). The three exceptions were recorded during a Mid North On-ground Works assessment (grazing management course), which suggests data was obtained from field inspection.
- TEC Confidence is the level of certainty that the community is the Threatened Ecological Community. This is recorded as High, Medium or Low. The majority of the confirmed records have been assigned a 'high' or 'medium' confidence level (49 records), with seven records receiving a 'low' confidence. These communities were mainly found growing in association with other shrubland species and there was possibly some trepidation in classifying the community as the TEC.
- TEC Condition Class Reliability is derived from the quality and adequacy of data available. The categories include:
  - i. Very low = Based on a very brief description;
  - ii. Low = Based on a qualitative description and / or incomplete plant list;
  - iii. Moderate = Based on a comprehensive plant list recorded from general area > 50X50m quadrat or method unspecified;

- iv. High = Based on a comprehensive plant list within a specified quadrat area (50X50m) or targeted ground truthing;
- v. Not relevant = Not assessed by TEC criteria

Most of the records received reliability ratings of 'high' (40 records) with three 'moderate', three 'very low' and ten records as 'unknown'. Those recorded as 'very low' include one record from a landholder reporting on grazed patches of Lomandra on his property, and two recorded during a Fleurieu Roadside survey by Michael Hyde in 1998.

- TEC Genera records the number of native species including perennial grasses and broadleaf species. The majority of records (46) have numbers of plants recorded which directs the TEC condition class, whilst ten records have only comments regarding the type and quality of the grasslands (eg Very Poor regeneration, Moderate grazing pressure, Excellent sp diversity, Excellent ground covers etc), indicating survey effort, but no recording of individual species.

Given that the records in question have not been re-assessed in the preceding decade, it is not possible to completely verify the current status of the communities without ground truthing. It is likely that the majority of these previously ground-truthed patches are still present in some form, however their condition ratings may have changed over the past ten years, particularly due to degrading factors such as grazing and weed invasion.

Yours sincerely,

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