

# EPBC 2025/10098: Striped Legless Lizard *Delma impar* habitat description at Birregurra–Ombersley Poultry Farm at 320 Mooleric Road, Ombersley

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11<sup>th</sup> March 2026

## Site condition

### Scoring protocol

Site condition is scored as follows (in accordance with the protocol in Appendix 2):

**1/3** = Poor – Site (on average) supports a species-poor ground flora with low structural complexity (reflecting inadequate biomass management). Dominated by a few native or predominantly introduced tussock-forming grasses with no or very few native forbs with or without embedded and/or surface rock.

**2/3** = Satisfactory – Site (on average) supports a moderately diverse ground flora with good structural complexity (reflecting some biomass management). Dominated by an average diversity of native tussock-forming grasses and average diversity of native forbs with or without embedded and/or surface rock.

**3/3** = Good – Site (on average) supports a species-rich and structurally complex ground flora (reflecting appropriate biomass management). Dominated by an above average diversity of native tussock-forming grasses and above average native forbs, together with embedded and/or surface rock.

### Recorded condition – site condition

Striped Legless Lizard (SLL) habitat is located within the road reserve along the northern edge of the project area. The road reserve supports a highly modified grassland dominated by introduced pasture grasses with sparse native tussock grasses occurring patchily.

The soils are black cracking clays with surface and embedded basalt rocks, soil cracks, and burrows which provide critical refuge habitat for SLL. However, the ground layer is structurally simplified due to grazing and slashing resulting in reduced tussock density and limited floristic diversity. The habitat quality is lower than the larger, more intact grasslands immediately north of road reserve.

### Outcome

- **1/3 – Site is degraded and subject to some rock removal, and regularly slashed and/or grazed, reducing biomass and floristic diversity.**

## Site context

### Scoring protocol

Site context is scored as follows (in accordance with the protocol in Appendix 2):

#### Connectivity

'Connectivity' has therefore been scored out of 2 according to the size of the habitat remnant, as follows.

**1/2** = Site less than 0.5 ha

**2/2** = Site equal to or greater than 0.5 ha

The site context assessment includes the total area of known or suspected Striped Legless Lizard habitat within the impact or offset site and connected to that habitat (i.e. including contiguous habitat offsite).

The Conservation Advice for the species states that:

"All populations of the striped legless lizard are likely to be important for the species recovery. The basis for this is the major loss and degradation of its grassland habitat, the ongoing pressures in remaining habitat and the highly fragmented nature of known habitat and populations".

and

"The understanding of fine scale population structure is limited and difficult to assess given the fragmented and disturbed nature of the species habitat and the difficulty in detecting the species due to its cryptic nature. For these reasons it is considered that when one or more individuals are found on a site that they are a member/s of an important population."

Therefore all impact and offset sites with confirmed Striped Legless Lizards are likely to support an important population and 'importance' is not given any weighting for site context.

Threats impacting Striped Legless Lizard and the approximate order of severity of risk are listed in Table 1 of the Conservation Advice for the species. All Striped Legless Lizard populations are likely to be subject to varying levels of cat and fox predation and this threat, which is difficult to compare between sites, is not used when scoring the 'threat' component of Site Context.

Fire and grazing have both been shown to be positively correlated with the persistence of Striped Legless Lizard, by maintaining an appropriate grassland structure and floristic diversity. However, sites that are subject to intensive and concurrent application of these disturbance regimes have been shown to have lower population persistence (Scroggie et al. 2019).

Similarly, low or no biomass reduction is also considered to be a threat to the species, as it can result in a dense sward that has reduced structural complexity and floristic diversity (Scroggie et al. 2019). The buildup of biomass can also lead to more intense and extensive uncontrolled fires, which could lead to increased mortality and habitat deterioration.

#### Threats

Threats have been scored as follows:

- Site currently subject to **continuous, intensive** grazing by livestock or kangaroos, thereby reducing the floristic and structural complexity of the habitat.
- Site subject to **frequent, widespread and intense** fires, including deliberate burns that are not sympathetic to the maintenance of Striped Legless Lizard habitat.

- Site subject to historical or ongoing ploughing, pasture improvement and agricultural intensification.
- Site subject to historical or ongoing removal of surface and/or embedded or rock.
- Site subject to frequent slashing or thereby reducing the structural complexity of the habitat.
- Site dominated by exotic grasses to the extent that the majority of the site is no longer defined as native vegetation.
- Site currently not subject to any form of appropriate biomass reduction (e.g. low-moderate intensity grazing or sympathetic ecological burns to maintain structural and floristic diversity of the habitat).

'Threats' have been scored as follows:

**0/2** = Site subject to 5 or more of the above threats.

**1/2** = Site subject to between 1 and 4 of the above threats.

**2/2** = Site subject to none of the above threats.

Connectivity and threats combine to give a **site context score of 0-4/4**.

### Recorded condition - connectivity

SLL were recorded as two separate tile transects within the road reserve, approximately 150m apart, confirming that the road reserve supports a local population. The road reserve forms the southern edge of a much larger, contiguous area of suitable habitat extending north into the Mount Gellibrand Wind Farm, which contains hundreds of hectares of moderate to high-quality grassland with large tussock grasses and abundant surface rock. Records of SLL from 2022 within the wind farm approximately 2.5km west further confirm that the site forms part of a broader regional population. The impact road reserve habitat therefore represents a small but connected portion of a much larger habitat.

### Recorded condition - threats

Site is subject to 4 of the 7 listed threats, highlighted above.

### Outcome

- **Connectivity 2/2**
- **Threats 1/2 - Four threats identified as relevant to the impact area**
- **Total: 3/4**

## Species stocking rate

### Scoring protocol

Species stocking rate is scored as follows (in accordance with the protocol in Appendix 2):

**1/3** = One individual or slough encountered in the tile grid during any of 7 monitoring events.

**2/3** = Two individuals or sloughs encountered in the tile grid during any of 7 monitoring events.

**3/3** = Three or more individuals or sloughs encountered in the tile grid during any of 7 monitoring events.

### Recorded condition – species stocking rate

Targeted surveys undertaken between October and December 2023 recorded four SLL detections within the road reserve. Photos confirmed that at least two individuals were present as detections occurred ~ 150m apart. Accordingly, the road reserve supports a confirmed occupied population of SLL and the site represents known habitat currently used by the species.

### Outcome

- **3/3 – At least two individual SLL recorded within the area during targeted surveys, however, 3/3 score is listed as a precaution as species is cryptic and may go undetected.**

## Total Habitat Quality Score

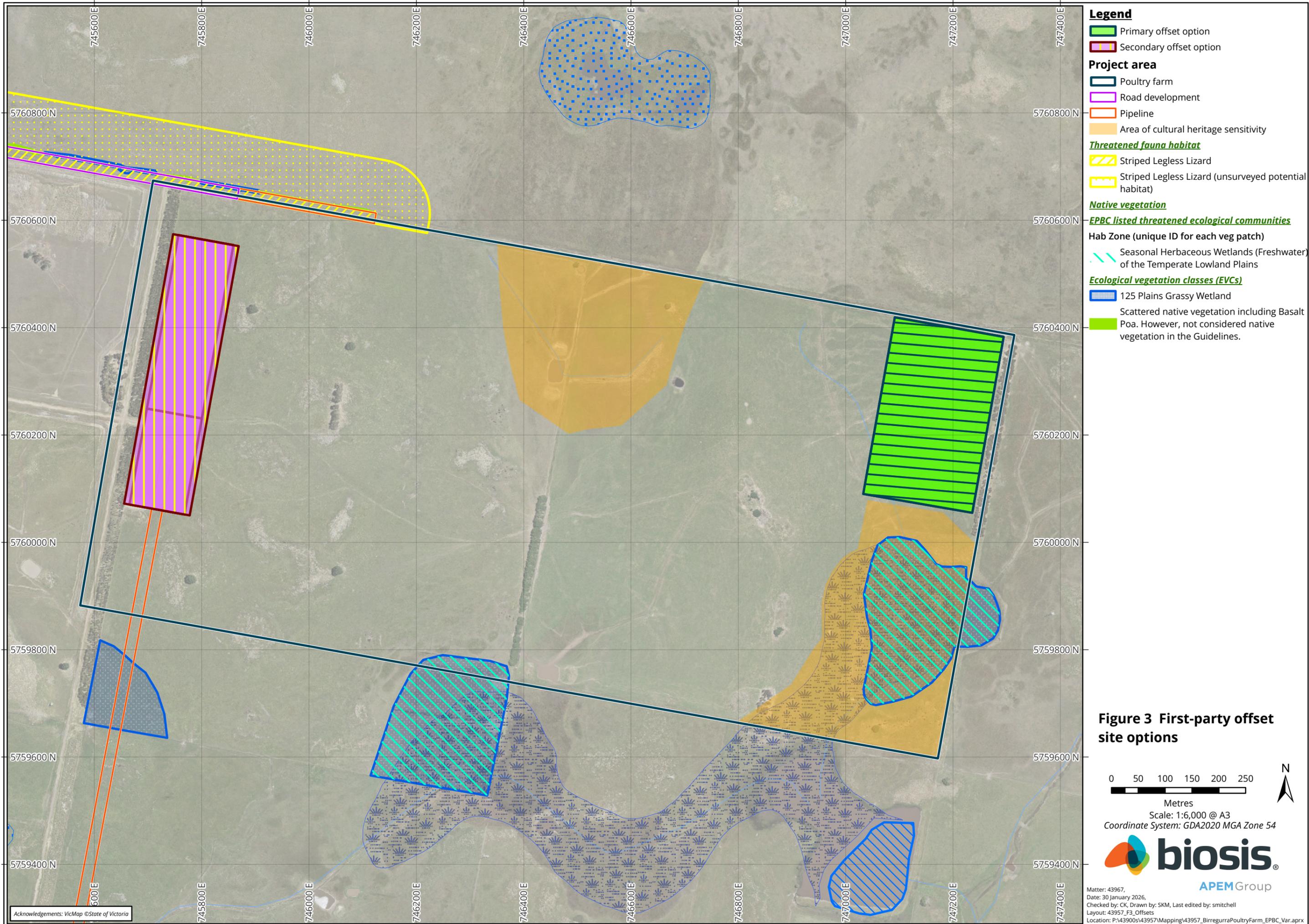
Component	Score
Site condition	1/3
Site context	3/4
Species stocking rate	3/3
<b>Total</b>	<b>7/10</b>

## Total Habitat area

The proposed action will result in the permanent removal of 1.26 hectares of SLL habitat.

## Appendix 1    Location Map

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- Legend**
- Primary offset option
  - Secondary offset option
- Project area**
- Poultry farm
  - Road development
  - Pipeline
  - Area of cultural heritage sensitivity
- Threatened fauna habitat**
- Striped Legless Lizard
  - Striped Legless Lizard (unsurveyed potential habitat)
- Native vegetation**
- EPBC listed threatened ecological communities**
- Hab Zone (unique ID for each veg patch)**
- Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains
- Ecological vegetation classes (EVCs)**
- 125 Plains Grassy Wetland
  - Scattered native vegetation including Basalt Poa. However, not considered native vegetation in the Guidelines.

**Figure 3 First-party offset site options**

0 50 100 150 200 250  
 Metres  
 Scale: 1:6,000 @ A3  
 Coordinate System: GDA2020 MGA Zone 54

**biosis**  
 APEMGroup

Matter: 43967,  
 Date: 30 January 2026,  
 Checked by: CK, Drawn by: SKM, Last edited by: smitchell  
 Layout: 43957\_F3\_Offsets  
 Location: P:\43900s\43957\Mapping\43957\_BirregurraPoultryFarm\_EPBC\_Var.aprx

## Appendix 2 EPBC Offsets Guide: Habitat Quality Scoring Method for the Striped Legless Lizard *Delma impar*

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**Prepared by Daniel Gilmore and Ian Smales**

**Draft Version 1.0**

**6 June 2020**

The EPBC Act environmental offsets policy (the policy) outlines the Australian Government's approach to the use of environmental offsets ('offsets') under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The policy is accompanied by the Offsets assessment guide (the Guide) (reference). The Guide has been developed in order to give effect to the requirements of the policy, utilising a balance sheet approach to estimate impacts and offsets for threatened species and ecological communities.

The guide is a tool to assist expert users in the Australian Government's Department of Agriculture, Water and the Environment in determining the suitability of offset proposals. The Guide is also available to proponents to assist with planning for future development proposals and estimating potential future offset requirements.

The Guide is an Excel spreadsheet with embedded formulas. Essentially it is an impact and offset calculator. One of the attributes that is used in the Offsets Guide for listed threatened species and communities is Habitat Quality.

The quality score for an area of habitat or an area of community is a measure of how well a particular site supports a particular threatened species or ecological community and contributes to its ongoing viability. It is important to note that the assessment of quality for threatened species habitat and ecological communities is not simply a scoring of vegetation 'pristineness'. Three components contribute to the calculation of habitat quality, as follows.

- **Site condition:** This is the condition of a site in relation to the ecological requirements of a threatened species or ecological community. This includes considerations such as vegetation condition and structure, the diversity of habitats present, and the number of relevant habitat features.
- **Site context:** This is the relative importance of a site in terms of its position in the landscape, taking into account the connectivity needs of a threatened species or ecological community. This includes considerations such as movement patterns of the species, the proximity of the site in relation to other areas of suitable habitat, and the role of the site in relation to the overall population or extent of a species or community.
- **Species stocking rate:** This is the usage and/or density of a species at a particular site. The principle acknowledges that a particular site may have a high value for a particular threatened species, despite appearing to have poor condition and/or context. It includes considerations such as survey data for a site in regards to a particular species population or, in the case of a threatened ecological community this may be a number of different populations. It also includes consideration of the role of the site population in regards to the overall species population viability or community extent. These components contribute to the final habitat quality score, however the weighting given to each component is dependent on the ecological requirements of the impacted species or ecological community (Figure 1, adapted from the Australian Government's EPBC Offsets Guide). For example, for some species the most important consideration is the location of a site in the landscape, whereas for others the presence of important habitat features on the site itself may be the most important influencing factor.

**Evaluate the key ecological attributes of the species or ecological community:**

- **Habitat requirements and variability:** What are the nesting, breeding, foraging, dispersal, migration and/or roosting requirements of the species? What are the various ecological components and occurrence states for the ecological community?
- **Lifecycle and population dynamics:** What are the key life cycle stages of the species/community? How do these impact its population viability or ecosystem integrity?
- **Movement and distribution patterns:** How does the species population or ecological community function across the landscape/ seascape?
- **Threatening processes:** What are the threatening processes contributing to the loss of the species or ecological community?

**Determine site characteristics in relation to species or ecological community ecology:**

Site Condition

- What is the structure and condition of the vegetation on the site?
- What is the diversity of relevant habitat species present (including both endemic and non-endemic)?
- What relevant habitat features

Site Context

- What is the connectivity with other suitable/known habitat or remnants?
- What is the importance of the site in relation to the overall species population or the occurrence of the community?
- What threats occur on or near

Species Stocking Rate

- What is the presence of the species on the site? (i.e. confirmed / modelled).
- What is the density of species known to utilise the site?
- What is the role of the site population in regards to the overall species population?



**Habitat Quality**

**Figure 1 Key considerations in determining the quality of threatened species and ecological community habitat (Adapted from the Australian Government’s EPBC Offset Guide).**

As the Australian Government has identified the need for consistency between habitat quality assessments for EPBC Act impact and offset calculations, we propose the following scoring method for the vulnerable Striped Legless Lizard. To guide scoring habitat quality of a particular location, we have drawn on relevant available literature, including the Australian Government’s Conservation Advice for Striped Legless Lizard (Threatened Species Scientific Committee 2016) and the *Referral guidelines for the striped legless lizard* (DSEWPC 2011).

Three site characteristics shown in Figure 1 contribute to habitat quality:

- Site Condition (scored as X/3)
- Site Context (scored as X/4)
- Species Stocking Rate (scored as X/3)

Where all of the criteria for a score are not met, the score will revert to the next lowest score. Thus, the total score for habitat quality is out of a possible maximum of 10.

### Site condition (X/3)

Sites that have the best potential to support viable Striped Legless Lizard populations are located in areas that support or once supported native grasslands or grassy woodlands. These areas must contain suitable tussock structure, appropriate soil type and minimal major disturbance such as ploughing (Coulson 1990, Dorrough & Ash 1999, Hadden 1995, O'Shea 1996). Sites that are rich in native tussock-forming grass species (often >20–50% cover) such as Kangaroo Grass *Themeda triandra*, Spear-grasses *Austrostipa* spp. and Poa tussocks *Poa* spp. provide good habitat for Striped Legless Lizard, although the species can also inhabit areas dominated by introduced grass species where the site has a history of grazing and pasture improvement (Coulson 1990, Smith & Robertson 1999, DEWHA 2011)(Dorrough 1995). The species shelters within grass tussocks, thick ground cover, in soil cracks and under rocks and other debris (Smith & Robertson 1999).

Site condition is scored as follows:

**1/3** = Poor – Site (on average) supports a species-poor ground flora with low structural complexity (reflecting inadequate biomass management). Dominated by a few native or predominantly introduced tussock-forming grasses with no or very few native forbs with or without embedded and/or surface rock.

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**3/3** = Good – Site (on average) supports a species-rich and structurally complex ground flora (reflecting appropriate biomass management). Dominated by an above average diversity of native tussock-forming grasses and above average native forbs, together with embedded and/or surface rock.

### Site context (X/4)

Site context relates to:

- The connectivity of the site to other suitable habitat.
- The importance of the site in relation to the overall species population.
- The number and severity of threats operating at the site.

The habitat of Striped Legless Lizard (natural temperate grassland and grassy woodland) is severely depleted and fragmented, which means many populations are now functionally isolated. Nevertheless, Striped Legless Lizard populations are known to persist in very small habitat fragments, including sites less than 1 ha. These isolated sites can still support high densities of the species. For example, 86 individuals were trapped in a 0.4 ha grassland remnant in Keilor Downs in Melbourne (Megan O'Shea, pers. comm.). This grassland remnant had been isolated from nearby populations by urban development for at least 40 years.

Low landscape and functional connectivity is now typical for most sites occupied by Striped Legless Lizard. However, surveys and research has demonstrated that in many cases Striped Legless Lizards appear to be able to persist in these isolated remnants. Therefore, connectivity to other populations may not necessarily be essential for the persistence of a population in the medium term, provided habitat structure remains suitable and existing and future threats are appropriately managed.

'Connectivity' has therefore been scored out of 2 according to the size of the habitat remnant, as follows.

**1/2** = Site less than 0.5 ha

**2/2** = Site equal to or greater than 0.5 ha

The site context assessment includes the total area of known or suspected Striped Legless Lizard habitat within the impact or offset site and connected to that habitat (i.e. including contiguous habitat offsite).

The Conservation Advice for the species states that:

"All populations of the striped legless lizard are likely to be important for the species recovery. The basis for this is the major loss and degradation of its grassland habitat, the ongoing pressures in remaining habitat and the highly fragmented nature of known habitat and populations".

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Similarly, low or no biomass reduction is also considered to be a threat to the species, as it can result in a dense sward that has reduced structural complexity and floristic diversity (Scroggie et al. 2019). The buildup of biomass can also lead to more intense and extensive uncontrolled fires, which could lead to increased mortality and habitat deterioration.

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- Site subject to historical or ongoing ploughing, pasture improvement and agricultural intensification.
- Site subject to historical or ongoing removal of surface and/or embedded or rock.

- Site subject to frequent slashing or thereby reducing the structural complexity of the habitat.
- Site dominated by exotic grasses to the extent that the majority of the site is no longer defined as native vegetation.
- Site currently not subject to any form of appropriate biomass reduction (e.g. low-moderate intensity grazing or sympathetic ecological burns to maintain structural and floristic diversity of the habitat).

Threats' have been scored as follows:

**0/2** = Site subject to 5 or more of the above threats.

**1/2** = Site subject to between 1 and 4 of the above threats.

**2/2** = Site subject to none of the above threats.

Connectivity and threats combine to give a **site context score of 0-4/4**.

### Species Stocking Rate (X/3)

The Striped Legless Lizard is a cryptic species that has the potential to go undetected despite presence on a site, even with suitable survey methods outlined by the survey guidelines. Recapture rates can be very low and therefore cannot be a true representation of the size of a population (Smith & Robertson 1999). Population densities are highly variable and have been reported ranging from 0.78 SLL/ha to 155 SLL/ha, but typically less than 30 SLL/ha (O'Shea 2016, Biosis 2012, ARAZPA 1996). The scoring of stocking rate set out here contributes a potential 3 points out of the overall total of 10 points.

Artificial shelter (tile) surveys for Striped Legless Lizards are generally conducted to detect the presence of the species at impact and offset sites. Rarely is the technique used for estimating site level densities to calculate 'stocking rates'. This is because estimating density requires Striped Legless Lizards encountered under the tiles to be captured and photographed so that they can be reliably identified from the unique scale pattern on their head.

The technique necessitates a degree of skill and training. Capturing and processing the animals is time consuming. It also involves a level of risk to Striped Legless Lizards as they sometimes drop their tail during capture and may be unduly stressed.

Therefore, we propose an alternative method using the **maximum number of Striped Legless Lizards detected at a tile grid during any site survey on a particular day** as a surrogate for density. This includes counts of sloughs as well as actual lizards (sloughs are routinely encountered under artificial shelters).

The following rationale has been used to derive an approximate density rate of Striped Legless Lizards per hectare. It assumes that habitat and distribution of Striped Legless Lizards are relatively uniformly distributed across the subject site. While it is recognised that those assumption may not hold across all sites, they are necessary underlying assumption of all survey techniques that involve representative sampling of a site, including the use of tile grids.

A grid of 50 tiles set out at 5 metre intervals has the assumption that each tile has a 'capture' or 'encounter' area for Striped Legless Lizards that covers 25 m<sup>2</sup> (i.e. a tile in the middle of a 5 x 5 metre square), hence the entire 50 tiles covers a total capture area of 1250 m<sup>2</sup> (i.e. including the capture area of each tile on the outside perimeter of the grid). The entire grid of 50 tiles is thus sampling one eighth (12.5%) of a hectare. Hence, for the present purposes, we can assume that the maximum number of Striped Legless Lizards encountered in the tile grid during any one of the minimum seven

required monitoring events can be multiplied by 8 to provide an estimate of lizard density per hectare. By this method, if the maximum number of Striped Legless Lizards encountered during any one monitoring event is one, we can assume a density of between 1 and 8 animals per hectare. If the maximum number encountered during any one monitoring event is two, we can assume a density of between 8 and 16 animals per hectare. If the number encountered is greater than 2, we can assume a density of greater than 16 animals per hectare.

These rates conform quite closely with densities described for eight sites by O'Shea (2016). Four sites had density rates of between 1.2 and 4.9 Striped Legless Lizards per hectare, while the other four sites had densities of 17.5, 18.8, 44 and 156 per hectare.

On this basis the scoring method for 'stocking rate' is as follows:

**1/3** = One individual or slough encountered in the tile grid during any of 7 monitoring events.

**2/3** = Two individuals or sloughs encountered in the tile grid during any of 7 monitoring events.

**3/3** = Three or more individuals or sloughs encountered in the tile grid during any of 7 monitoring events.

Surveys must be carried out as per the survey standards in the referral guidelines, including the minimum number of grids based on the area of the site. This standard requires fortnightly tile grid checks between 1 September and 31 December (a minimum of 7 checks). More frequent checks can be undertaken (e.g. weekly), but this is not mandatory. All sloughs must be removed during each check.

Where surveys at impact and offset sites have not been carried out in accordance with the methods outlined in the referral guidelines for Striped Legless Lizard and those surveys have detected fewer than 3 individuals/sloughs, the stocking rate is assumed to be 3/3. This includes impact sites where no survey has been undertaken for the species. The Commonwealth will generally not accept offset sites for Striped Legless Lizard that have not been subject to a targeted survey for the species.

## References

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