Effect of artificial light on wildlife use of underpasses

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Co-use of wildlife crossing structures
How does lighting wildlife crossing structures influence their use by wildlife?
Study area
Equipment and setup

Reconyx HC600
HyperFire™

4 cameras/underpass

2 reference cameras/site
Study design

Account for influence of foreign object in the structure

Lights

Lighting Equipment

After lighting

After lighting and equipment removed

Cameras

Night

1  11  16  21  31  36  41  51
Study questions

1. Is there an effect of artificial lighting on the number of crossings (in total and per species)?

2. Does the number of crossings return to baseline levels following the light treatment?
Results

Overview

Only species to complete enough crossings to analyze:
  Red Fox
  Eastern Grey Kangaroos
  Swamp Wallaby

No complete crossings at Symes Rd site so removed from further analysis
Total number of crossings during trial: 18
Total number of crossings during trial:

- Blackjack Rd: 18
- Ellerys Rd: 29
- Specimen Gully Rd: 29

Site
Total number of crossings during trial:

<table>
<thead>
<tr>
<th>Site</th>
<th>Baseline</th>
<th>Off1</th>
<th>Off2</th>
<th>On1</th>
<th>On2</th>
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<tr>
<td>Blackjack Rd</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Ellerys Rd</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Specimen Gully Rd</td>
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<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
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</tbody>
</table>

18 crossings
29 crossings
147 crossings
Total number of crossings during trial: 38

Site

Corresponding graph showing predicted mean crossing frequency per night.
Total number of crossings during trial:

- Blackjack Rd: 38
- Specimen Gully Rd: 836

Predicted mean crossing frequency / night for different sites and conditions.
Total number of crossings during trial:

- Site 1: 133
Summing up

Light doesn’t seem to impact crossing rate

Exception: Red Fox at 1 Site

Probably a reflection of the types of species captured
Additional Result

High variation between sites, low baseline crossing rates by most species

Why aren’t crossing structures used more and by more species?

We need continued monitoring and reassessment of sites to make sure they’re “working”
Brush-tailed phascogale (*Phascogale tapoatafa*)
Sambar deer (*Rusa unicolor*)
Common wombat (*Vombatus ursinus*)
Some consideration about the structures

Flooding

Vegetation/rocks

Dead ends

Location
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Red fox with joey of Eastern grey kangaroo