27/8/12

RSPCA Australian Alan White Scholarship Progress Report

Can road crossing structures be used to preserve squirrel glider populations?

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Roads and traffic negatively impact wildlife populations, fragmenting habitat and increasing mortality rates through roadkill. In Australia, arboreal mammals like the squirrel glider (*Petaurus norfolcensis*) are particularly susceptible, as they struggle to cross the gaps in tree cover associated with large road. A potential solution is to install crossing structures, such as glider poles and aerial rope bridges to provide safe passage over roads. In 2007, five crossing structures (2 rope bridges and 3 glider poles) were used along the Hume Freeway in north-east Victoria to mitigate negative impacts on squirrel glider populations (Figure 1). My PhD research investigates how effective these structures really are at preserving this threatened species.

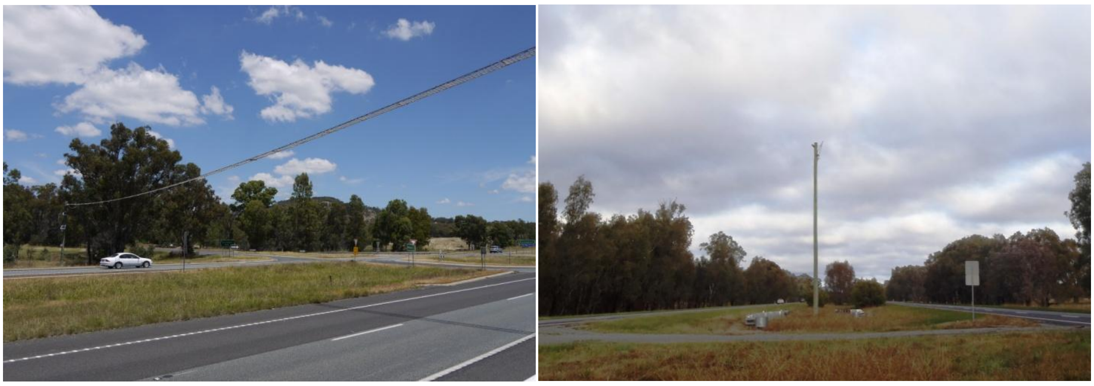

Figure 1. A rope bridge (left) and glider pole (right) installed along the Hume Freeway in north-east Victoria.

We monitor the structures using motion-sensing cameras to discover how often animals were using them to cross the freeway. From 2007 – 2011, squirrel gliders were detected using all five structures to cross the freeway (Figure 2). The crossing rate increased over time as animals grew accustomed to the structures, with up to 2.5 crossings per night at rope bridges and 0.35 per night at glider poles. Other species detected using rope bridges included common brushtail possums, common ringtail possums and the endangered brush-tailed phascogale. We also installed new cameras on the glider poles in early 2012 which provide more reliable monitoring than the previous equipment.

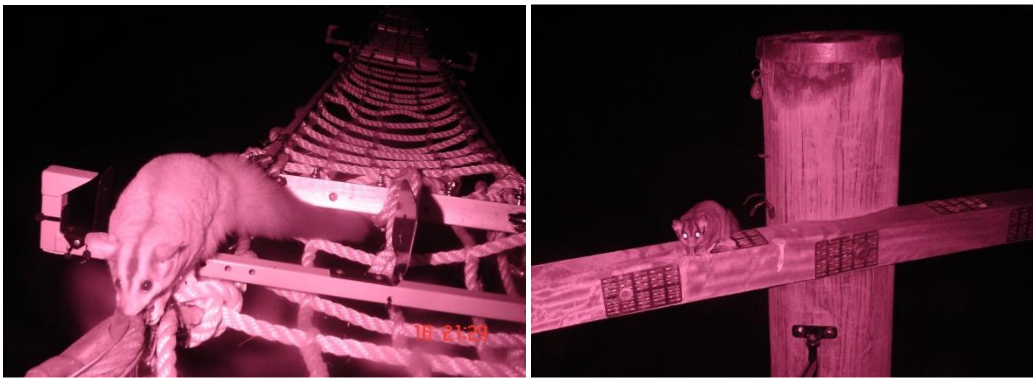

Figure 2. A squirrel glider using the rope bridge (left) and glider pole (right) to cross the Hume Freeway in north-east Victoria.

Squirrel gliders crossed the 'Longwood' rope bridge much more frequently than the other structures, despite a similar population size at all sites. To see if this was due to a higher number of gliders crossing, or just a few individuals crossing regularly, we installed a microchip scanner on one end of the bridge. Animals captured during mark-recapture surveys are given microchips for individual identification and these are recorded as they move over scanners installed on the bridge. During a six month trial, only three individual squirrel gliders were detected crossing the bridge, each making regular, repeated crossings. It is likely that these three individuals belong to the same social group and use the bridge to access territory on either side of the freeway. However, if the rope bridge is only used by a few individuals, it may not have positive impacts on the whole population. This information is critical to evaluating the effectiveness of crossing structures and scanners will now be used to monitor both rope bridges.

Now that we know that squirrel gliders will use rope bridges and glider poles to cross the freeway, we need to know the impacts on local populations. In late-2011 we conducted our annual mark-recapture trapping surveys at 15 sites along the freeway, collecting data on population size, survival rates, reproductive activity and gene flow (Figure 3). The results from these surveys will be compared to research conducted before the crossing structures were installed to determine if the impacts of road (roadkill and habitat fragmentation) have been reduced, allowing roadside squirrel glider populations to persist long-term. I hope that these findings will help road agencies to effectively minimise the impacts of future road projects on a range of arboreal mammals.

Figure 3. A tagged squirrel glider being released after capture.

The RSPCA Australia Alan White Scholarship has been invaluable to this project, funding the purchase of essential monitoring equipment. I am very grateful for the support and look forward to sharing my final results.