

Wildlife mortality on the Nebo to Eton stretch of the Peak Downs Highway, Central Queensland.

A report to the Queensland Department of Transport and Main Roads

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Koala Research CQ



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Introduction

The Queensland Department of Transport and Main Roads (TMR) is currently upgrading the Eton Range on the Peak Downs Highway approximately 40 km west of Mackay. The Federal Department of the Environment and Energy (DEE) declared the Eton Range Project (realignment of the Peak Downs Highway at Eton Range) a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* due to the potential for significant impacts on koalas or koala habitat. The DEE required residual impacts, after TMR's impact mitigation, to be offset through two years of research relating to koala ecology and conservation management around the Eton to Nebo stretch of the Peak Downs Highway, and following the study, koala sensitive infrastructure to be placed at strategic locations along this portion of the Peak Downs Highway. One part of the koala study was to develop an understanding of the koala road-kills and their significance. This snapshot study of all vertebrate road-kills seeks to set the koala mortality in a broader context of wildlife mortality between Nebo and Eton.

Methods

The Peak Downs Highway between Eton and Nebo was surveyed over 12 days in spring and summer of 2017 (15th-17th & 23rd-24th February, 7th-9th November & 13th-15th December).

The highway was traversed by light utility vehicle travelling at 60 – 80 km/hr. The team consisted of a driver and a spotter; both experienced observers. Wherever a dead animal was located:

- the carcass was marked with paint to avoid double counting;
- each carcass was identified to the extent possible;
- the location was logged by hand-held GPS.

The records were included in a geographic information system for production of maps and figures (ARC Map 10.3.1).

Results

Ninety-six vertebrate carcasses were identified in the 12 days of survey (Figure 1). Over 50% of these were kangaroos or wallabies. Koalas were among the least frequent road-kills identified in the survey periods. The results are summarised in Table 1.

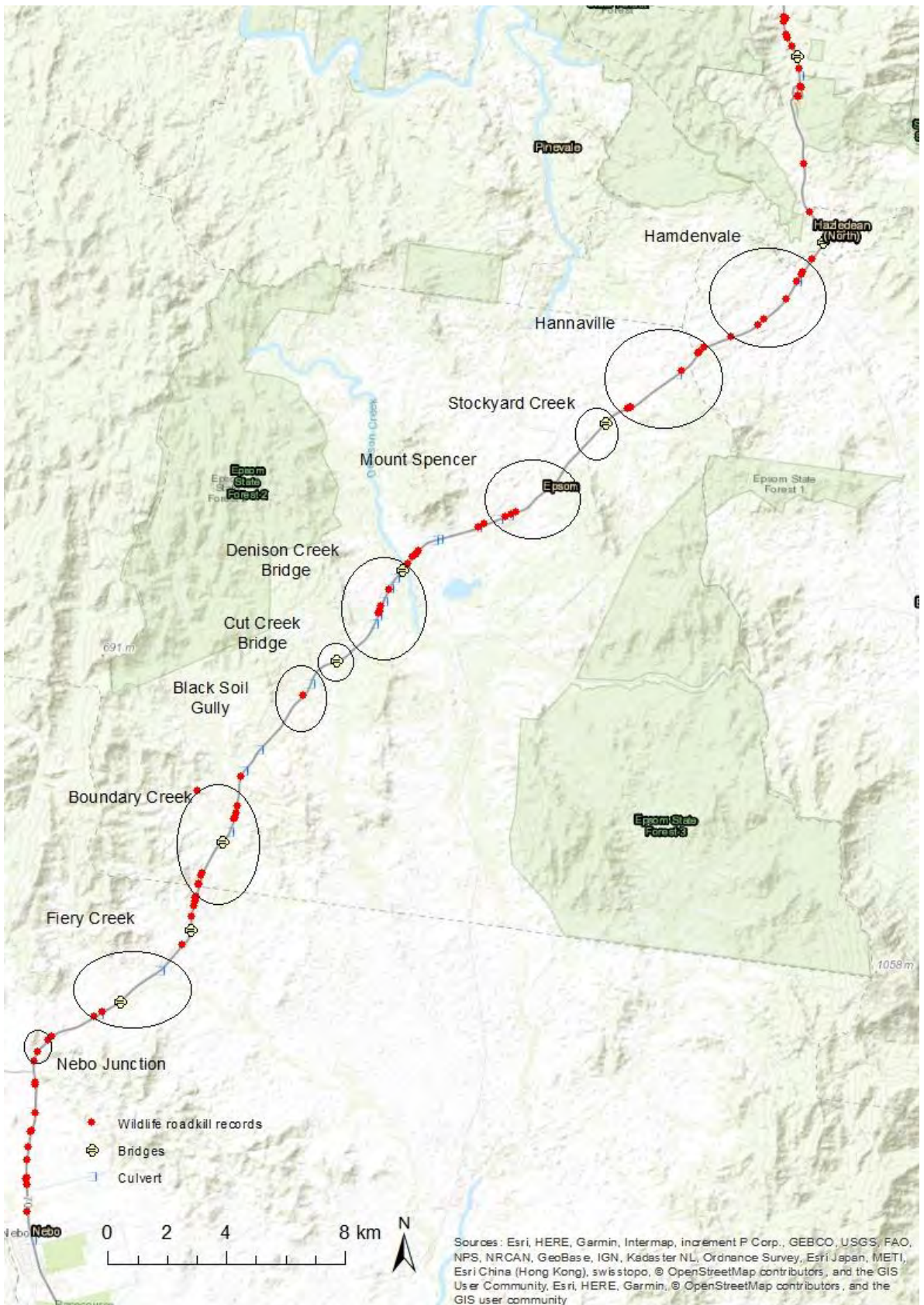


Figure 1. Distribution of vertebrate road-kills between Eton and Nebo, sampled over 12 days in 2017. The black ovals represent koala road kill clusters extracted from Melzer and Black (2018).

Table 1. Summary of the road-kill located on the Peak Downs Highway between Eton and Nebo over 12 days of survey in 2017.

Faunal group	Elements	Sample number	Relative frequency (%)
Reptiles		3	3.1
Birds	Raptors (n=4) & others	16	16.7
Gliders	greater & squirrel gliders	3	3.1
Possum	brushtail possum	9	9.4
Koala		3	3.1
Kangaroos & wallabies	eastern grey kangaroo, whiptail wallaby, agile wallaby, indeterminate	50	52.2
Other mammals	bandicoot, bettong, rabbit, pig, dingo/dog, indeterminate	12	12.4
Total		96	100

Discussion

The 12 day survey revealed a diverse assemblage of vertebrate fauna killed on the Peak Downs Highway. Extrapolating these data equates to 2,920 road-kills per year. However, these numbers should be considered as the minimum figure. There is no accounting for animals:

- that were injured, and moved off the highway before dying;
- being a victim of predation because of disability;
- whose carcass was removed by scavengers such as pigs, dogs or raptors;
- with seasonal differences in activity or distribution.

Two species of conservation significance occurred in this sample. The koala is listed as *vulnerable* under both the Nature Conservation Act 1992 (Queensland), and the Environmental Protection and Biodiversity Conservation Act 1999 (Commonwealth). The greater glider is listed as *vulnerable* under the Nature Conservation Act 1992 (Queensland), and the Environmental Protection and Biodiversity Conservation Act 1999 (Commonwealth).

Three dead koalas and two dead greater gliders were found during the survey period. There is an intense focus on koala injury and mortality along the highway because of public concern for an iconic species. There is much less community and media interest in the greater glider, probably reflecting the high status the koala has in the Australian community (Jackson 2011).

These data suggest that the road-kill impacts on koala and greater glider populations may be much less than that on populations of other faunal groups (6.2 % of total records, Table 1). However, this was a very limited survey and did not take account of seasonal differences in species activity or distribution. More extensive and seasonal survey work would be required to ascertain the ecological toll on these vulnerable species. Despite that, the study flags the need to consider the maintenance of species diversity near the highway, and to plan to mitigate threats to species of conservation significance.

Management options to mitigate the impacts of wildlife road-kills are limited. Large vertebrates can be deflected from entering carriageways through the strategic installation of barrier fences, overpasses and/or underpasses (Department of Transport and Main Roads 2000). Barrier fences and underpasses are being installed at the Eton Range Realignment Project to target koala mortality in particular. However, this infrastructure will also influence macropod, brushtail possum, dog and pig movements, as well as domestic and feral stock. Figure 2 shows the relationship between macropod

kills and koala road-kill clusters (Melzer and Black 2018). This suggests that the construction of koala underpasses with barrier fences will have some influence on macropod mortality at least.

Gliders usually attempt to glide across the gaps formed by road carriageways. Fauna fences and underpasses will not reduce the likelihood of road mortality for these species. A successful crossing depends on the glide distance of the species, and the height of, and distance between trees on each side of the road. The mitigation of threats to this species require the installation of glider poles and the removal of high-tension barbed wire fencing in the glider's glide zone.

Birds, small mammals and reptiles cannot efficiently be deflected from entering a road reserve or carriage-way. Raptors are attracted to road kills and subsequently killed by vehicles. Therefore, some overall reduction in the frequency of road kills may reduce the raptor strike rate. Otherwise, mitigation is reliant on reducing vehicle speeds and driver behaviour.

The approach taken in this survey provides a method to monitor the effect of installation of road-kill mitigation infrastructure. It is recommended that vehicle-based road-kill surveys be undertaken during spring each year for five years post construction, and the data examined for significant changes in road-kill frequency among faunal species likely to be sensitive to the construction of barrier fences (e.g. koalas, macropods, possum). Timing the surveys for spring targets the peak activity period for koalas. This pre-wet season period is also a time when macropod activity is likely to increase on road verges due to the relative abundance of food resources in the dry season. Undertaking the surveys at the same time annually provides directly comparable data independent of species-specific seasonal or phenological variability in activity or abundance. Standardisation of both road survey speed, and of survey duration are important (Collinson *et al.* 2014). Greatest accuracy is achieved at survey rates of 40-50 km/hr. However, there are issues with driver safety, with one study recommending survey speeds of no less than 10-20km/hr below the posted speed limit (Clevenger *et al.* 2003). Surveys need to be undertaken on consecutive days with survey duration standardised to allow meaningful data comparison. The survey extent should encompass the areas where fauna sensitive infrastructure has been constructed, as well as areas where installation has not been undertaken, for comparison.

Conclusions

A diverse assemblage of vertebrate fauna were killed on the Nebo to Eton stretch of the Peak downs Highway. This included species of conservation significance (koala, greater glider).

The road toll was greatest for macropods (>52%) and least for koalas, gliders and reptiles (each approx. 3%).

Strategic installation of barrier fences on bridges and culverts, of a suitable design to function as fauna underpasses, will mitigate impacts on koalas, and also other large terrestrial vertebrate fauna.

Systematic vehicle-based road-kill surveys provide a suitable method to monitor the effectiveness of constructed road-kill mitigation infrastructure.

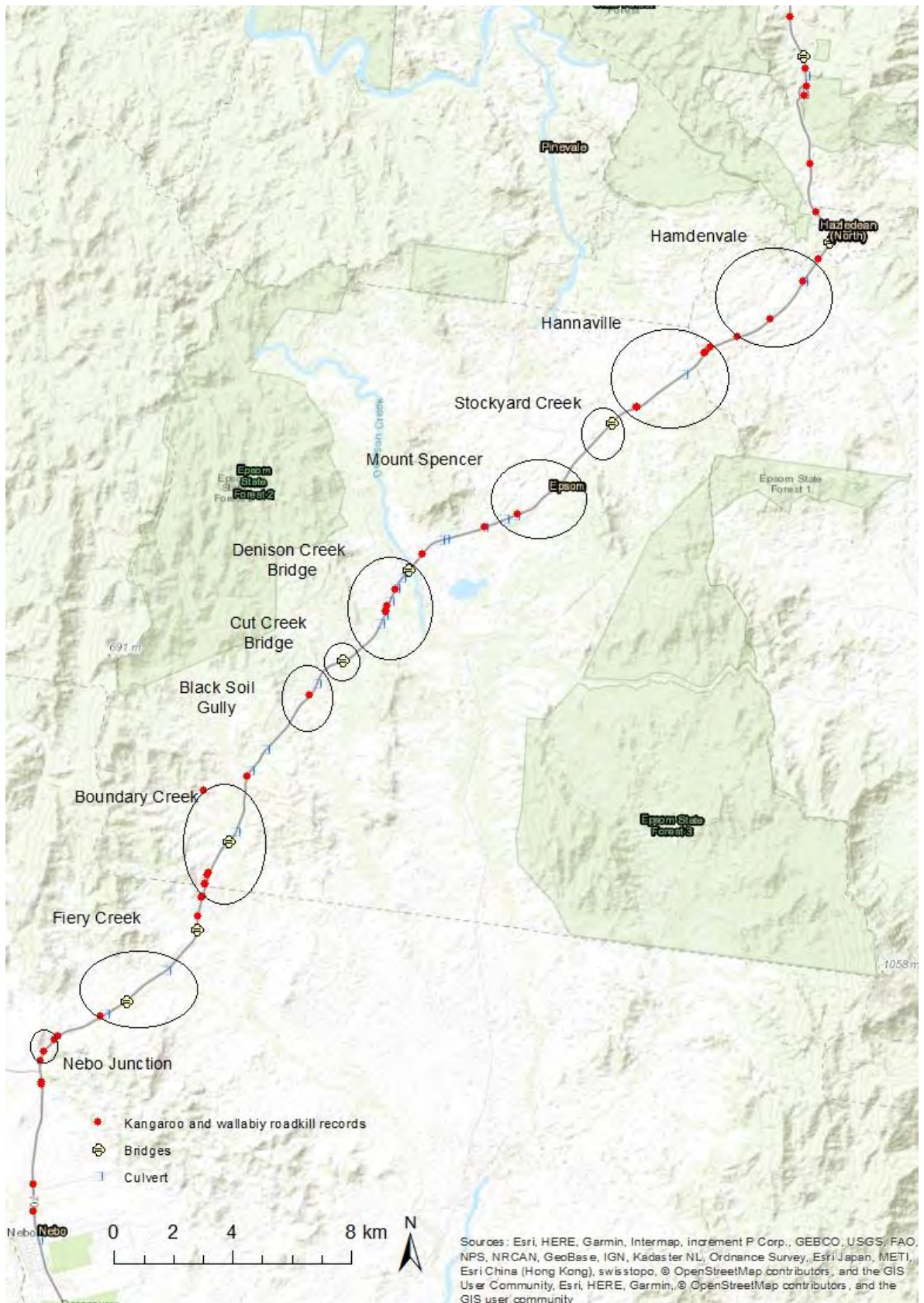


Figure 2. Association of macropod road-kills and koala road kill clusters. Macropod kills were recorded over 12 days in 2017. Koala clusters are extracted from Melzer and Black (2018).

References

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