

Wildlife vehicle strike and contributing factors

Koala Vehicle Strike Fact sheet 1



More than 900,000 kilometres of roads cover the Australian landscape. The ecological consequences of this network are immense and complex. Millions of native animals are injured and killed each year when they are struck by vehicles while trying to cross the road. Roads also create barriers to movement and fragmentation of habitat, among other impacts.

This fact sheet provides an introduction to the impacts of vehicle strike on koalas (*Phascolarctos cinereus*). The three other fact sheets in this series focus on how we can reduce the impact of vehicle strike on koalas:

- [Fact sheet 2: How to keep koalas off the road](#)
- [Fact sheet 3: How to change driver behaviour](#)
- [Fact sheet 4: How to record koala vehicle strike and monitor mitigation efforts.](#)

This fact sheets series aims to:

- provide a simple summary of current knowledge about koala vehicle strike
- increase understanding and awareness about
 - factors contributing to vehicle strike
 - how we can reduce the number of koala injuries and deaths from vehicle strike
 - how to effectively monitor koala vehicle strike and our efforts to mitigate it
- contribute to the development of local strategies to reduce koala vehicle strike.

Statistics

These figures highlight the scale at which koala vehicle strike occurs:

- In 2016, the koala population of New South Wales was estimated at about 36,000 (Adams–Hosking, C et al. 2016).
- An estimated 3500 koalas were killed by vehicles on NSW roads between 1980 and 2018 (NSW OEH 2019). This is likely an underestimate because many koalas injured or killed by vehicles are unlikely to be reported.
- Lismore Local Government Area (LGA) reported 200 koala vehicle strikes resulting in 147 koala deaths between 2011 and 2016 with:
 - more males hit than females
 - five hotspots accounting for most incidents
 - 12 animals hit at the same hotspot over a koala generation (6 years; Biolink 2017).
- The highest number of koalas killed on roads during spring occurs in the Lismore, Byron, Port Stephens and Tweed LGAs (NSW OEH 2019).
- About 300 koalas are killed on roads each year in southeast Queensland (Qld DEHP 2012).
- 794 koalas were admitted to Port Macquarie Koala Hospital (Port Macquarie–Hastings LGA) between 1975 and 2004 due to vehicle strike (Griffith et al. 2013).
- 4714 koalas were admitted to three koala hospitals in southeast Queensland due to vehicle strike between 1997 and 2011 (Australian Koala Foundation 2011).

A key threat

Surveys on the extent and range of wildlife being killed on Australian roads first emerged in the 1970s. Surveys have continued, but only a small number of roads and highways are monitored, making it difficult to work out how many animals are killed by vehicle strike on a national scale. A 2008 study suggested that over nine million kangaroos and wallabies were killed on Australian roads each year (Burgin and Brainwood 2008).

Many collisions involve threatened species, such as eastern quolls (*Dasyurus viverrinus*) and Tasmanian devils (*Sarcophilus harrisi*) in central Tasmania (Jones 2000) and koalas in southeast Queensland (Queensland Department of Environment and Heritage Protection (Qld DEHP) 2012). Vehicle strike has reportedly caused a rapid decline in these species.

A similar picture has emerged for koalas in New South Wales (NSW). The koala population has declined by at least 26% in NSW over the last 20 years (NSW Office of Environment and Heritage (OEH) 2018). Vehicle strike has played a key role in this decline – it is one of the most frequently reported causes of injury and death for koalas brought into care by wildlife rehabilitation groups. The koala is listed as vulnerable in NSW under both NSW and Australian Government legislation.

Factors that contribute to koala vehicle strike

Wildlife vehicle strike is not random. It tends to be clustered at specific locations or sections of road called 'hotspots'. The factors contributing to vehicle-strike hotspots vary. Hotspots are likely to occur where a road cuts through habitat that serves as a corridor for movement of wildlife (cover photo). Other factors such as vehicle speed, traffic volume and width of road verges also play a part.

Vehicle speed

How fast a vehicle is going plays a major role in koala vehicle strike. The likelihood of collision increases with vehicle speeds over 60 kilometres/hour because drivers have less time to react and avoid a collision. Even small reductions in vehicle speeds can reduce the incidence of wildlife vehicle strike (Husjer et al. 2015; Winnet & Wheeler 2002; Glista et al. 2009; Jones 2000; Hobday & Minstrell 2008). It is difficult to influence drivers to reduce vehicle speed and keep to speed limits.

Time of year

For some animals, including koalas, vehicle strikes increase at certain times of the year. In NSW, koala vehicle strikes mainly occur between July and November. This time of year is koala mating season when males are actively moving around the landscape in search of new territory and mates.

Time of day

Koalas spend a lot of time in trees, but they also move across open ground and roads. They are most active in the early morning and evening and are therefore more likely to attempt to cross the road and be struck by vehicles at these times. Low-light conditions at dawn and dusk mean drivers may find it harder to see animals crossing the road.

Traffic volume

Wildlife vehicle strike increases with increasing traffic volume. This can vary depending on the species (Fahrig et al. 1995; Litvaitis & Tash 2008; Visintin et al. 2016). Traffic volume also relates directly to the density of the road network and for koalas, increasing traffic volume on existing roads may be preferable to building new roads (Rhodes et al. 2014).

Visibility when driving

Road contours and crests, fog and roadside vegetation can obscure wildlife and increase the risk of vehicle strike because drivers do not see them. Slashing, pruning and maintaining roadside vegetation can improve driver visibility (Figure 1). Streetlights at vehicle strike hotspots can help visibility by illuminating the road and verge (Milton et al. 2015; Magnus et al. 2004).

Biology

The density of animals in habitat intersected by a road, behaviour towards vehicles and open spaces, and attractiveness of roadside vegetation can all impact an animal's risk of being hit by a vehicle. Koalas readily move across roads and open ground, which makes them vulnerable, especially during the koala mating season between July and November.

Other factors

Other factors that influence koala vehicle strike include:

- location and availability of water
- road cuttings that funnel wildlife to cross at a particular part of a road
- intersections of habitat corridors and road corridors
- weather conditions including drought and flood or high rainfall.



Figure 1 An example of road verge slashing to improve driver visibility. (Sandpiper Ecological)

References

- Adams–Hosking C et al. 2016, Use of expert knowledge to elicit population trends for the koala (*Phascolarctos cinereus*), *Diversity and Distributions*, 22(3), 249–262.
- Australian Koala Foundation 2011, Summary of koala hospital presentations, releases and major causes of death, 1997 to mid-May 2011, southeast Queensland www.savethekoala.com/deborahs-diary/koala-hospital-admissions, accessed 19/6/2019.
- Biolink Ecological Consultants 2017, Koala habitat and population assessment, Lismore Local Government Area (part), final report, prepared for Lismore City Council.
- Burgin S and Brainwood M 2008, Comparison of roadkills in peri-urban and regional areas of NSW Australia and factors influencing deaths, in: D Lunney, A Munn & W Meikle (eds) *Too close for comfort: contentious issues in human-wildlife encounters*, Royal Zoological Society of NSW, Mosman, NSW, Australia pp. 137–144.
- Fahrig L, et al. 1995, Effect of road traffic on amphibian density, *Biological Conservation* 73, 177–82.
- Glista D, et al. 2009, A review of mitigation measures for reducing wildlife mortality on roads, *Landscape and Urban Planning*, 91(1), 1–7.
- Griffith J, et al. 2013, A retrospective study of hospital admission trends of koalas to a rehabilitation facility over 30 years, *Journal of Wildlife Disease*, 49(1), 18–28.
- Hobday A and Minstrell M 2008, Distribution and abundance of roadkill on Tasmanian highways: human management options, *Wildlife Research*, 35, 712–26.
- Huijser MP, et al. 2015, Wildlife warning signs and animal detection systems aimed at reducing wildlife-vehicle collisions, in: R van der Ree, D Smith & C Grilo (eds), *Handbook of Road Ecology*, John Wiley & Sons, Sussex, UK.
- Jones M 2000, Road upgrade, road mortality and remedial measures: Impacts on a population of eastern quolls and Tasmanian devils, *Wildlife Research*, 27(3): 289–96.
- Litvaitis J and Tash J 2008, An approach to understanding wildlife-vehicle collisions, *Environmental Management*, 42(4), 688–97.
- Magnus Z, et al. 2004,. Reducing the incidence of wildlife roadkill: improving the visitor experience in Tasmania, Technical report, Cooperative Research Centre for Sustainable Tourism, Gold Coast.
- Milton S, et al. 2015, The function and management of roadside vegetation, in: R van der Ree, D Smith & C Grilo (eds), *Handbook of Road Ecology*, John Wiley & Sons, Sussex, UK.
- NSW Office of Environment and Heritage (OEH) 2018, NSW Koala Strategy, NSW OEH, Sydney.
- NSW Office of Environment and Heritage 2019, Bionet data records: koala roadkill (unpub. data), NSW OEH, Sydney.
- Queensland Department of Environment and Heritage Protection 2012, Living with Wildlife Fact Sheets – Koalas.
- Rhodes J, et al. 2014, A few large roads or many small ones? How to accommodate growth in vehicle numbers to minimise impacts on wildlife. *PLoS ONE* 9(3): e91093.
- Visintin C, et al. 2016, A simple framework for a complex problem? Predicting wildlife-vehicle collisions. *Ecology and Evolution* 6(17), 6409–6421.
- Winnett MA and Wheeler AH 2002, Vehicle-activated signs: a large-scale evaluation. Prepared for Road Safety Division, Department of Transport, UK.

More information

Find out more about koalas on our [Koala webpage](#).

Cover photo: Koala vehicle strike hotspot on Coraki Road in the Lismore Local Government Area. Locals installed a sign to mark this section of road, which is notorious for koalas being struck by cars. (Sandpiper Ecological)

Acknowledgement

Thanks to Sandpiper Ecological, Transport NSW and the Saving our Species Team for their contributions to the content of this fact sheet.

Published by:

Environment, Energy and Science, Department of Planning, Industry and Environment, Locked Bag 5022, Parramatta NSW 2124. Phone: 1300 361 967 (Environment, Energy and Science enquiries); Email: info@environment.nsw.gov.au; Website: www.environment.nsw.gov.au.

ISBN: 978-1-922431-19-6; EES 2020/0229; June 2020