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Tasmania *unenviable leader in* Roadkill

Speed Kills
Mitigating Roadkill in Tasmania

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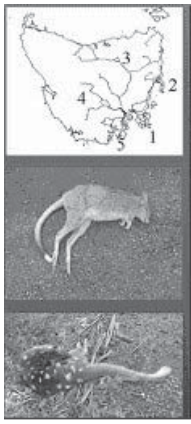
Many people agree Tasmania has a lot of roadkill; indeed it is one of the oft-heard comments from tourists departing Tasmania. Our recently completed research shows that an observant driver will likely encounter about one carcass every three kilometres along Tasmania's major roads; rates are higher in late summer and autumn and lowest in winter. The amount of roadkill also varies regionally with more roadkill occurring on the Tasman Peninsula than in the Huon area. Brushtail possums, pademelons and wallabies were the most common roadkill. The study was undertaken to provide baseline information on the distribution and abundance of roadkill in Tasmania with the goal of supporting subsequent mitigation attempts: results show there are roadkill hotspots where focused mitigation measures such as speed reduction can be effective.

Tasmanians are not surprised to hear that roadkill levels are high; it is only natural, some say, because we have a lot of animals. We agree. Without any animals there would be no roadkill. Logically, as animal numbers increase, faunal mortality on roads will also increase. We contend, however, this is not the only possible outcome. The increase in roadkill need not be proportional to abundance. The natural abundance of unique fauna that Tasmanians and our visitors enjoy – and is the envy of other Australians – does not come without responsibility. We should protect our rich landscape and cherish it for ourselves and those who will come later. Why is it not accepted that living in a state with plentiful animal life requires some different attitudes and behaviours?

Our attitudes and behaviours reflect the values we hold. Consider the analogy of schools and speed limits. Lots of children are found near schools at certain times of the day and year. Having a lot of children crossing roads on their way to school is not an excuse for more traffic accidents; instead we institute speed zones in these critical areas. We hope no one would argue that lots of children will unfortunately result in lots of pedestrian mortality – any level is unacceptable. A similar mindset could also help save our wildlife. We suggest a few simple solutions can decrease the incidence of faunal deaths on Tasmania's roads. The decision we face is, do we accept these solutions and modify our behaviour, or explain away the responsibility to protect our unique biota?

Recent research

We recently completed a three-year study to determine the frequency and distribution of roadkill on major Tasmanian roads, and are now completing the analyses. Our survey vehicle was equipped with a GPS to record the location and speed of the vehicle every time a roadkill was encountered, and roadkill items were identified without stopping the vehicle or removing the roadkill. We undertook over 150 journeys of an average of 100km between 2001 and 2004 (>15,000km total) in five general areas radiating from Hobart, and repeated routes every season. The average density of roadkill was one carcass every 2.7km. This rate is higher than reports from NSW, Victoria, Queensland and Western Australia. Higher density areas may exist but, at the scale of this study, Tasmania is an unenviable leader in roadkill. The highest average density of roadkill was observed for the Tasman Peninsula (almost one animal every 2km), and the lowest was the Midlands (almost one animal every 4km). On some individual journeys we observed a density of over one carcass per kilometre for a 100km journey.



Survey Region	Total trips	Total items	Total distance	Mean density (kills per km)
1. Tasman	31	1332	2871 km	0.464
2. East Coast	25	1019	2759 km	0.369
3. Midlands	20	890	3248 km	0.274
4. Central	31	1191	2727 km	0.437
5. South	31	743	2002 km	0.371

Illustration of the five survey routes travelled between 2001 and 2004, and the average density observed in each of five regions radiating from Hobart. Note that over 2000km and 20 trips were completed in each region.

We recorded over 50 different taxa, ranging from wombats and wallabies to bandicoots and bettongs. A total of 32 bird and two reptile species were included in this total. While we believe that the dominant species have been well measured, our list should not be considered a complete

Item	Number	% items	% trips	% identified items
Unidentified mammal	2149	37.76	98.05	n/a
Brush-tailed possum	1558	27.38	97.40	48.03
Pademelon	414	7.27	78.57	12.76
Rabbit	336	5.90	71.43	10.36
Unidentified bird	298	5.24	79.22	n/a
Wallaby	233	4.09	58.44	7.18
Silver gull	82	1.44	25.32	2.53
Spur-wing plover	75	1.32	31.17	2.31
Forest raven	69	1.21	32.47	3.12
Tasmanian devil	49	0.86	19.48	1.51

list of species killed on Tasmanian roads. Other species will be encountered at even lower rates than we observed here. One key finding is that the 10 most common taxa account for over 99% of all roadkill.

The top 10 most common roadkill items were identified in our study. For example, a total of 1558 brush-tailed possums were observed on 97.4% of the journeys we undertook. They comprised 27.4% of all items on roads, and 48% of all items that could be identified to a specific taxon. The tenth most common animal, Tasmanian devils, while seen on almost 1 in 5 trips (20%) represented only 1% of all roadkill items. Unidentified taxa dominated the records (37.76%).

Our research also revealed that animal carcasses are not distributed randomly along roads. In fact, between 50% and 70% of roadkill occurs in only 10–20% of the road. This means mitigation attempts can target localised 'hotspots'. Finally, speed is obviously linked with roadkill. We found, using our vehicle speed as a proxy for the speed of the vehicle that killed the animal, 50% of the roadkill is observed where vehicles can travel faster than 80km hr^{-1}.

Roadkill in perspective

Roadkill is not the only source of human-induced mortality for wildlife in Tasmania. Legal harvesting, crop and tree protection, and habitat degradation all impact native populations. For the common species, such as possums and wallabies, these legal forms of killing are equal, or exceed the estimates of roadkill we have made. Wildlife managers believe (we hope) that our wildlife can cope with these impacts, and we are not irrevocably damaging populations. Yet when additional problems arise, such as disease, drought, fires, and roadkill, further pressures are placed on animal populations. Roadkill is one source of mortality we can minimise to improve the population status of our unique fauna.

Extrapolating roadkill to the whole of Tasmania for a whole year

So what is the likely scale of roadkill in Tasmania over a whole year? We can suggest some numbers based on extrapolating from our data. We have included the calculation here, to allow the reader to judge the quality of the extrapolation, and to demonstrate how such numbers are reached.

Our study area covered 1872km of highway over three years, with an average roadkill density of 0.372km^{-1}. This corresponds to an average standing stock (the number of roadkill that would be encountered if all 1872km could be instantaneously surveyed) of 696 roadkill in this survey area. Using the figure of 3507km of state and federal high-way (A and B roads) in Tasmania, we covered 53% of this road type in our survey; thus, we estimate a standing stock of 1305 roadkill on state and federal highway. If the roadkill turnover time (the time for all roadkill to be removed and fresh carcasses created) is four weeks, standing stock corresponds to 17,000 roadkill per year on major highways. Now the numbers get a bit curly, and we suggest these for illustrative purposes, rather than to derive an exact number. If we estimate the roadkill abundance based on all Tasmania roads (23,380km), this leads to a 'guesstimate' of 113,066 roadkills statewide per year. If the turnover time is shorter, say one week, then the estimate is 450,000; if turnover time is longer, say eight weeks, the number is smaller, ~56,000. One final correction necessary is the amount of roadkill that remains on the road visible to a driver. Wildlife Biologist Nick Mooney (DPIWE) estimates that only 30% of roadkill remains visible on a road or road margin; thus multiplying the higher of the above figures leads to estimates of close to **one million animals per year** killed on Tasmanian roads.

Roadkill mitigation options

We do not believe roadkill can be completely eliminated. That said, after completing 15,000 kilometres of survey and recording over 5000 carcasses, we can provide information to allow a management response to reduce roadkill if there is community desire for such action. Without this baseline information, responses may not be the most effective, nor can we determine effectiveness. The choice not to respond may be legitimate, but let us make that choice on the basis of some information.

To effectively mitigate the death of animals on roads requires an understanding of the distribution and abundance of roadkill, which we have provided, and an understanding of the causal mechanism. Roadkill occurs

in a two-step process. The behaviour of an animal or bird leads it onto a road for a variety of reasons, including warmth, food, water, crossing or light. Once on the road, a roadkill occurs when a vehicle, driven by a human, collides with that animal. To adapt a popular slogan: 'cars don't kill animals, people do'. Thus, we can mitigate animal behaviour, such as convincing animals to avoid crossing roads, or we can mitigate human behaviour, convincing people not to hit animals. Which one of those choices sounds easier?

Despite the apparent logic of modifying the behaviour of intelligent humans, changing animal behaviour has in fact received more attention. Reflectors, whistles, horns, lights, vegetation management, bridges and ramps have all been advocated and tried as roadkill reduction devices. Tests of efficacy have been unconvincing, particularly for car-mounted whistles. A DPIWE researcher, Zoe Magnus, devised a clever test to examine whistle performance. In comprehensive tests with whistles plugged or open, and without the driver knowing the whistle state, there was no difference in the number of animals seen on the road and struck by the test vehicle. We remain unconvinced that strategies for changing animal behaviour will be applicable for the suite of animals killed, can be applied to a large region, or that they in fact work.

Changing human behaviour is, in principle, a simple alternative. One can talk to a human or leave a warning message (e.g. roadsign). That said, encouraging humans to avoid roadkill is a sensitive issue. Motoring bodies are cautious about recommending avoidance of animals on the road. Swerving to avoid an animal may be more dangerous for the driver, and lead to an increase in accidents. We value human life more highly than other animal life, and agree that swerving to avoid a collision may be a risky response. Swerving, however, is only necessary when speed is too great to slow down when an animal is encountered on the road. Our data indicates that a speed reduction to 80km hr^{-1}, in key 'hotspot' locations identified in our study would be an effective mitigation and reduce roadkill by up to 50%.

So what would a slowing of speed mean in terms of delays to journeys?

To conclude, consider the following hypothetical calculation about a journey from Hobart to Launceston, a distance of approximately 200km. At a legal speed of 100km hr^{-1} assuming it could be driven the whole distance), this journey requires two hours of drive time. If night-time speed were reduced by 20% (to 80km hr^{-1}) in only 10% of the road (our identified 'hotspots'), there would be a distance of 20km where speed was reduced to 80km hr^{-1}. This would add an extra three minutes to the journey. An extra three minutes at night, to reduce roadkill by 50%. Is this too much to ask Tasmania?

Acknowledgement

We appreciate the assistance and information provided by a large number of people who have assisted this study, particularly Scott Ling, Doug Ling, and Matt Sherlock.

King and Flinders Island Pademelon Kill

In early December, at the request of several groups, I filed an appeal in the Administrative Appeals Tribunal (AAT) over the King and Flinders Island Wallaby and Pademelon Management Plans which were approved by the Federal Government on 1 December. I also applied for a stay of the plans until the appeal is heard.

On Wednesday 21 December a hearing was to be held to determine whether a stay would be allowed. I was advised by the AAT that Department of Environment and Heritage (DEH) solicitors would appear at the hearing, and would oppose a stay, claiming that two or three butchers are getting set up to handle the meat under the expectation they would get a permit, and they would lose money if the stay were granted. The permit applicant has also stated that he would lose a year's contract of skins. The DEH barrister and solicitor handed me a 288-page affidavit just prior to the hearing. When the hearing started I immediately asked for an adjournment to peruse the documents, which was granted until 13 January. No activities under the plans were allowed until then.

However, in spite of a seven-page submission and supporting arguments, we lost the appeal for a stay. The full hearing will be held in early April, and is likely to last five days. The deputy president of the Tribunal made it very clear that, if we won the appeal, if anyone proceeded with an export program in the meantime, they would do so at their own risk.

Pat O'Brien, President
Wildlife Protection Association of Australia Inc.

TCT Position

Readers will recall that in #301 of *The Tasmanian Conservationist* we discussed how the Draft Wildlife Management Plans for the commercial harvest of wallabies and pademelons on King and Flinders Island fell far short of the very reasonable criteria established in the Whitemark Agreement. The Australian Government subsequently approved the plans, changing only a handful of words. As frustrating as this behaviour is, the TCT is not ready to go to appeal without viewing the Statement of Reasons for the decision to approve the plans, and getting legal advice on this. We are still awaiting this information, whilst the Wildlife Protection Association of Australia is proceeding at breakneck speed. It is therefore unlikely that we will be in a position to join this particular appeal. Although our two organisations have quite different methods and objectives, we wish them all the best in this matter and await with interest the decision of the AAT.

Craig Woodfield