

Back to basics – signage and other mitigation at road-kill hotspots in a wildlife rich landscape; Tasmania.

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1. Cradle Mtn Rd Impact on eastern quolls and Tasmanian devils of road upgrade and consequent road-kill mitigation measures (a package of chicanes, refuges, escape ramps, warning signs, education). **Mitigation as measured by road-kills and local population recovery worked but study could not identify effects of different mitigation measures**

2. Howth Impact of mitigation measures (rescue and relocation) applied to road and rail upgrade on little penguins. **Mitigation as measured by deaths and consequent breeding worked cf control site.**

3. Arthur River Rd Impact of road upgrade with a package of mitigation measures on spotted-tailed quolls and Tasmanian devils. **Limited success (hotspots disappeared) but study could not identify effects of different mitigation measures.**

4. General Field tests of behavioural effects of passive ultrasonic whistles on wildlife on roads. **Clear result (little effect on wallabies and brushtail possums alerted cf control periods)**

5. General Study of relationships of road-kill hotspots to vehicle speed. **Clear result (+ correlation) and innovative mitigation <roadkilltas.com>**



Although usually sensibly placed, rarely is wildlife signage properly assessed for effectiveness

What is usually forgotten are the very basics of

1. A null hypothesis or any clear question with objectives
2. Replication
3. Controls

So, why is it so popular?

To identify hotspots



1. Make sure animals recorded as vehicle-kills are indeed such
2. Accuracy of survey (apply correction factors, repeat) to get as large samples as possible.

-Animals may be thrown by collision off the road or be fatally injured and move.

-Animals may be removed by other animals or people

- Not every animal in plain view will be seen every survey

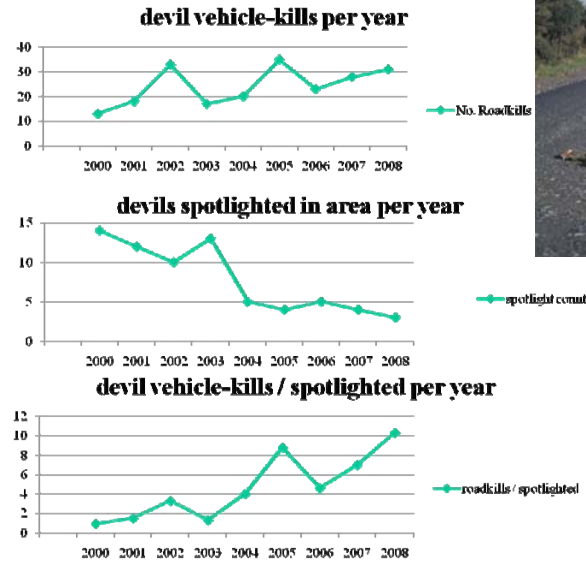
Make an effort to sample road sections for invertebrates and small vertebrates killed by vehicles.

3. If studying changes over time use replicates and controls.



Interpreting apparent trends

2003 upgrade



Some causes of vehicle-kill hotspots (temporary, short and long term)

1. In homogeneous landscapes random kills leading to secondary kills (temporary)
2. Local animal attractions - dumped rubbish (temp), spilled transport food (short)
3. adjacent crops, pets and small stock (short)
4. Local bad attitudes (short)
5. Ditches (short)
6. Rubbish tip, stock, dams (short-long),
7. Fences (short-long)
8. Creeks and other habitat corridors crossing or coming adjacent to roads (short-long)
9. Differences in soil type leading to productivity changes, reflected as animal abundance (long)
10. Cuttings - as traps (long)
11. Corners (long)
12. Geographic location (long)
13. Type of road/vehicles (long)





Displacement from habitat clearing



Cuttings and bridges can be traps, dams and rubbish dumps adjacent to roads are attractions



Carelessly placed 'safety' fences can be traps

right



wrong



Creeks and other habitat corridors crossing or adjacent to roads bring animals onto or near roads



Corners are especially hazardous

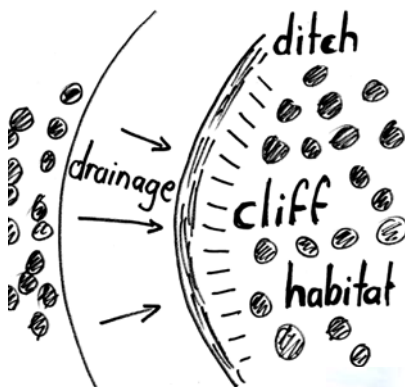
- Animals and drivers may get little warning
- Drivers are committed to direction

Corner insides are very dangerous

- There is often grass on insides because of camber and drainage
- Animals on corner insides escape **onto** roads



Combinations of hazards produce hot spots



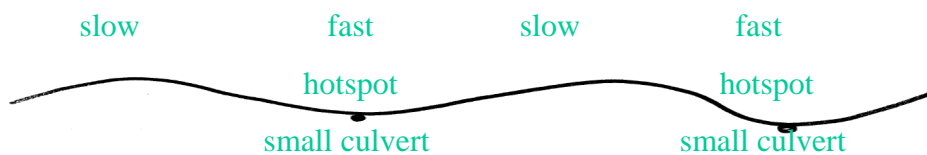
Vehicle-kills on Grasree Hill Rd through March 2009

(this 4.4 km has killed over 7,000 medium/large native animals since 1996)



Hotspots can disappear even by 'accidental' mitigation

OLD ROAD - undulating with changing speeds - clear hotspots



UPGRADED ROAD - flat with even speeds - hotspots unclear



Animals near some upgraded roads have increased chances of passing under roads through large culverts in road fill somewhat compensating for increased speeds



undulating
unsealed
slow



flat
Sealed
fast





2. Improvements to driver behaviour



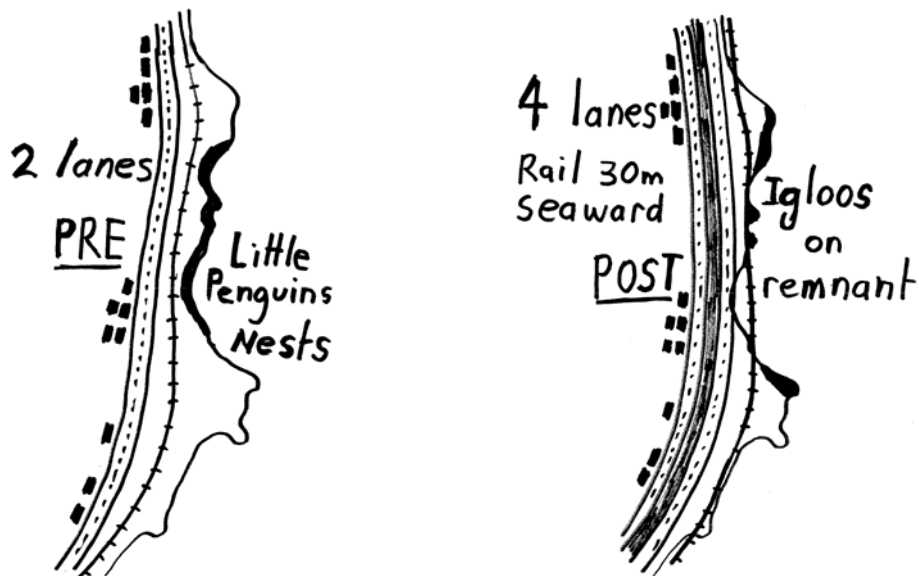
3. Improvements to local infrastructure

4. Changes in vehicles

5. Changes in animal abundance

6. Changes to animal species

Hotspots can also appear to disappear because of removal of vehicle-kill





Assessment
Relocation
Rescue
Monitor