

# Roads and Ecology

## Impacts, Challenges and Opportunities

# Overview

- Introduction
- Ecological Impacts of Roads
- Ecological Impact Assessment
- Opportunities
- Sources of information



# Introduction

- Widespread
- In most landscapes
- Increasing
- Affect terrestrial and aquatic ecosystems



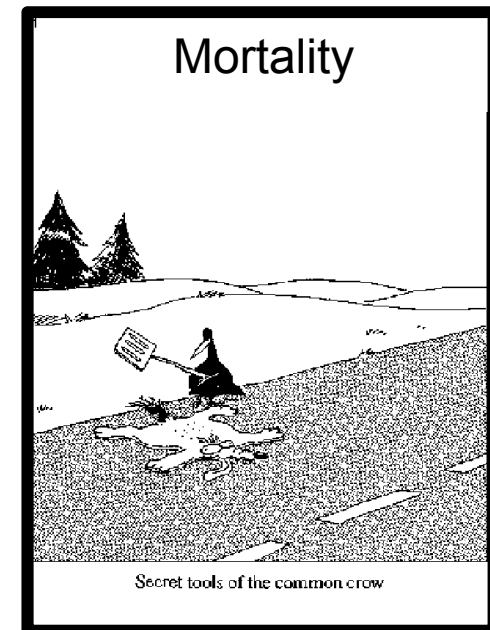
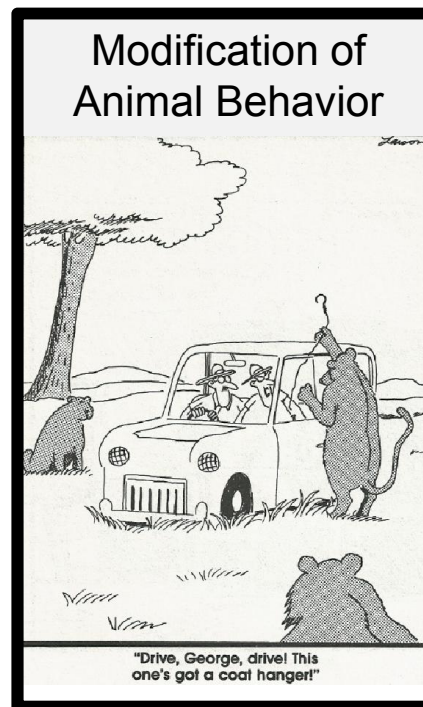
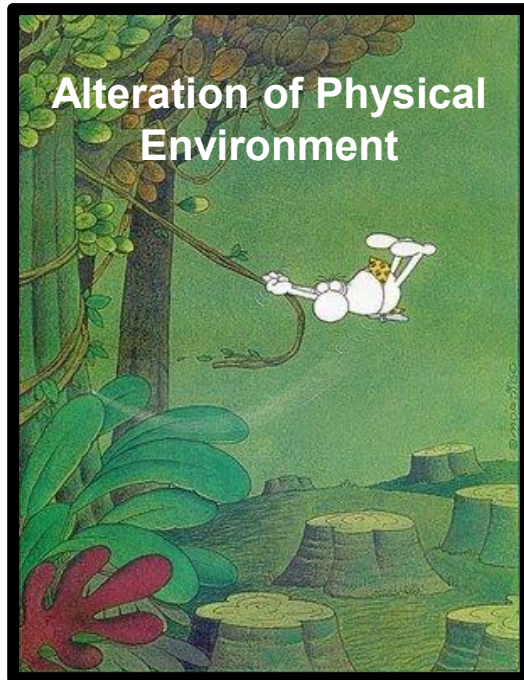
# Ecological Impacts

Roads facilitate environmental degradation at a scale disproportionate to the land they occupy, Bellis 2007

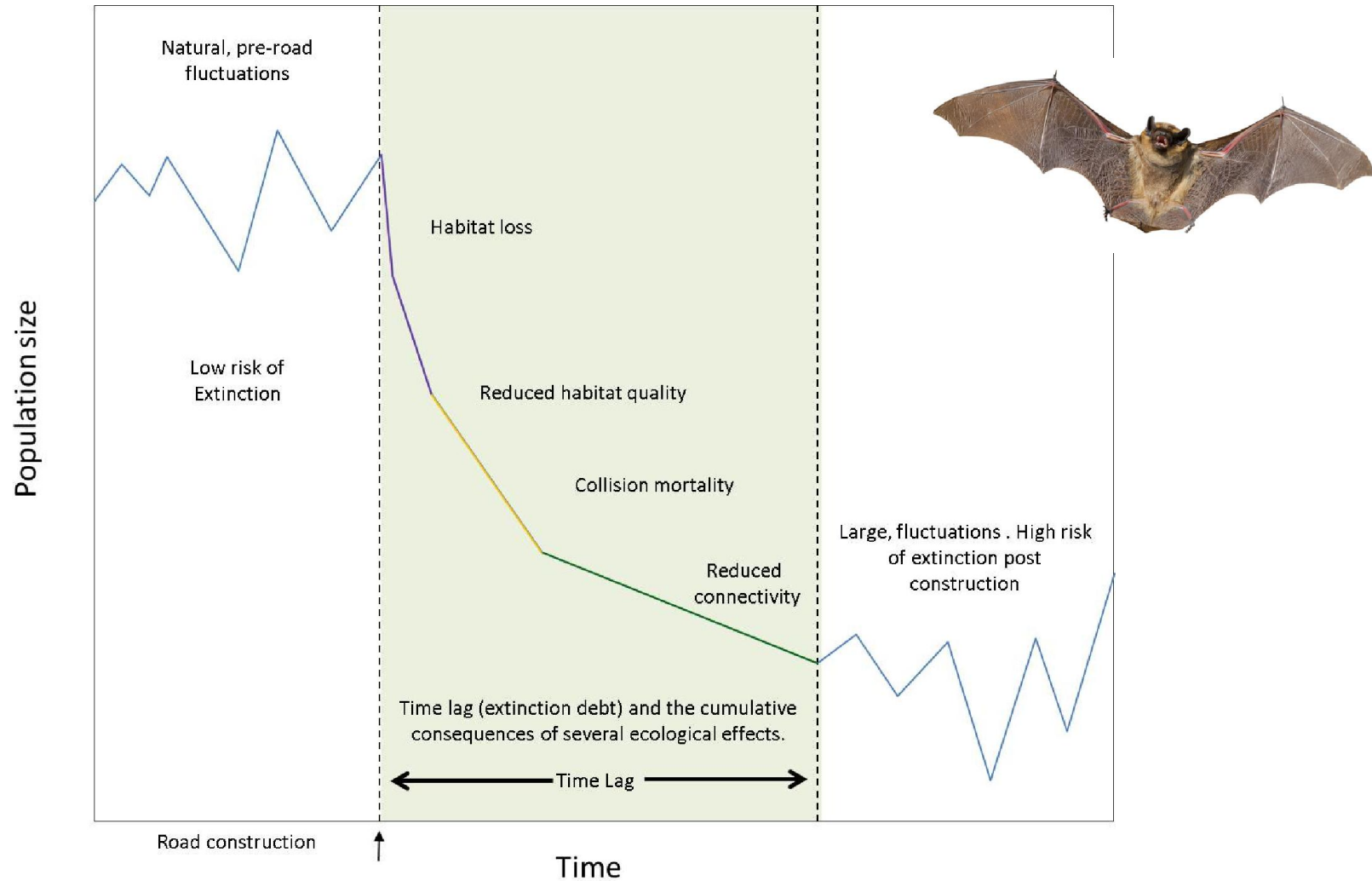




# Ecological Impacts



# Cumulative Impacts



Forman et al, 2003

# Cumulative Impacts

Predators

4 -Wheeling

Global warming

Food sources

Weeds

River flow

**‘Seagull is NZ's latest endangered species’**



**stuff**

30/10/2014 October

**Red-billed gull:** predicted drop in population of 50-70% in the next 30 years

# Ecological Impact Assessment (EcIA) is:

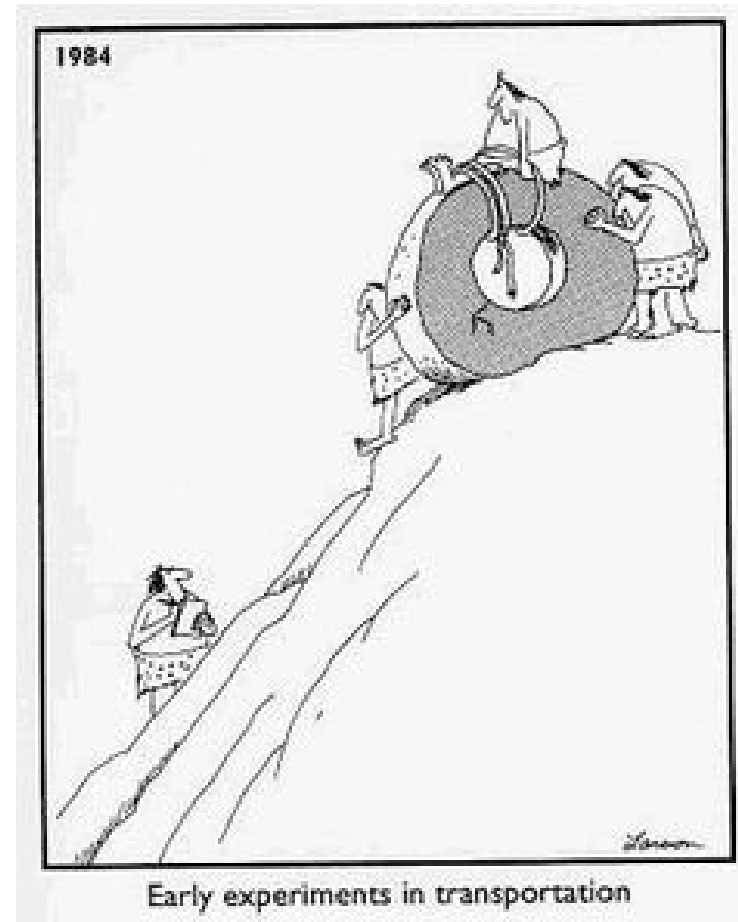
‘The formal process of identifying, quantifying and evaluating the potential impacts of defined actions on ecosystems or their components; and providing a scientifically defensible approach to ecosystem management.’

Treweek (1995)



# EclA Components

- Baseline studies
- Impact assessment
- Impact evaluation
- Mitigation
- Monitoring



(Treweek, 1995)

# Baseline Studies

## Describe the Existing Environment



### Challenges:

- Available time and budget
- Scientific method often difficult to employ
- Bias towards certain groups
- Potential to miss ecological values

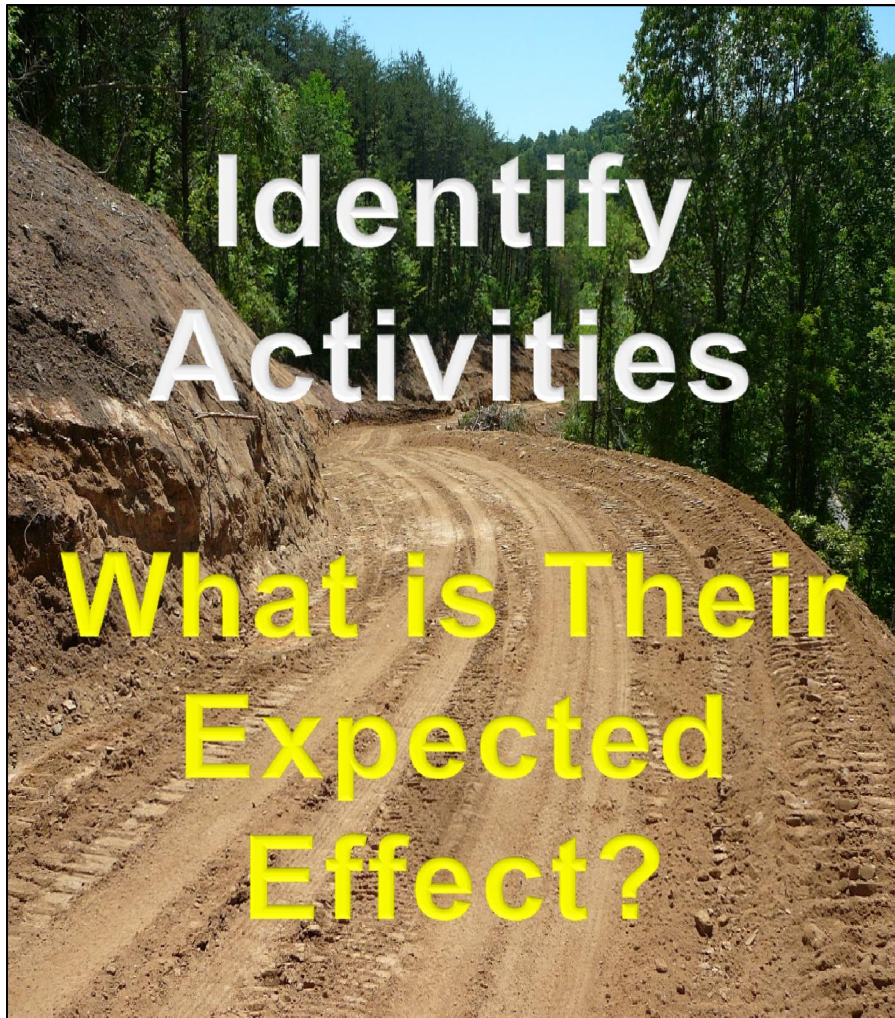


# Baseline





# Impact Assessment



## Challenges:

- Ecosystems complex
- Shortage of long-term datasets
- Before After Control Impact (BACI) difficult

# Ecological Evaluation



- Predict the consequences of development on ecological components (ecological significance)
- Provide a basis for comparison with other categories of impact (ecological importance)
- Ranking criteria used



# Ecological Evaluation



## Challenges:

- One component of many
- How to compare with other categories
- Information available
- Difficulties quantifying data









# Mitigation



- Understand ecosystem function
- Define performance standards.

## Challenges:

- Tested mitigation strategies
- Road environment



# Mitigation

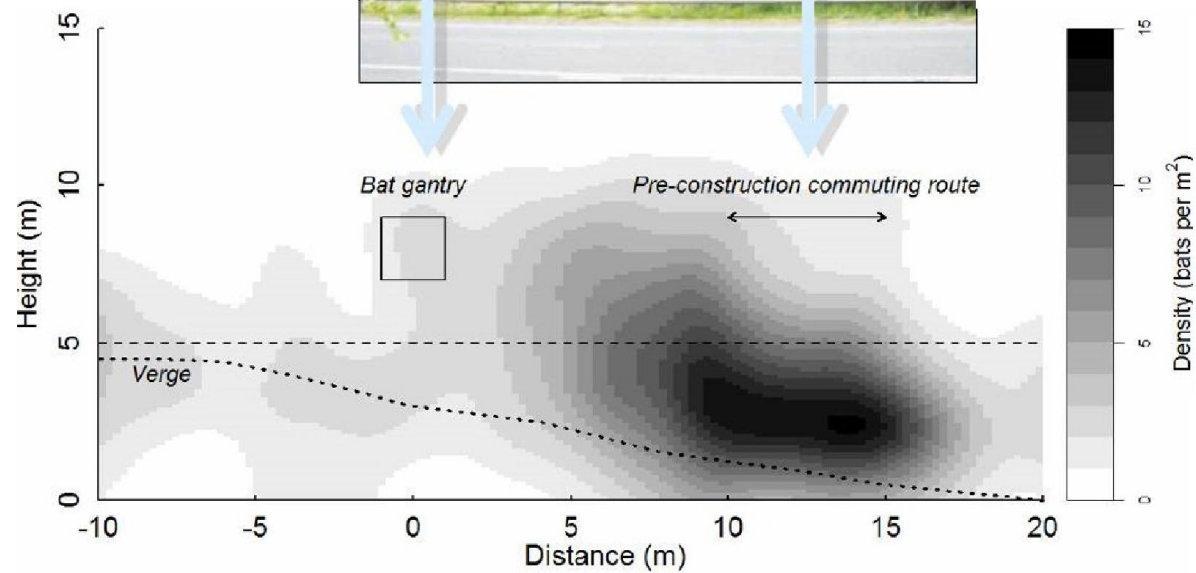




# Mitigation



9 year old  
bat gantry



Kernal intensity estimation

Altringham, 2014



# Monitoring

- Monitor whether EclA predictions are correct.
- Monitor if the mitigation worked.
- Ask the right questions



# Monitoring



# Opportunities



  
**KEEP  
CALM  
AND  
trust  
the statistician**



# Opportunities



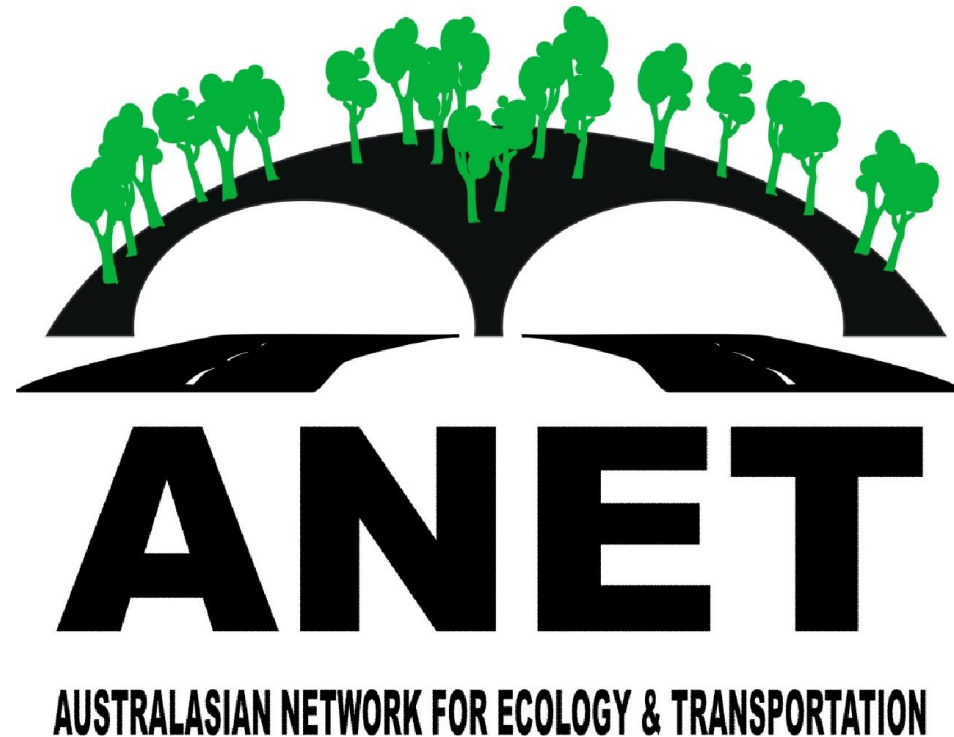
# Sources of Information

- Draft EIANZ Ecological Impact Assessment Guidelines
- IEEM Guidelines for Ecological Impact Assessment in the United Kingdom
- Conservation Evidence

<http://www.conservationevidence.com/>



# Australasian Network of Ecology and Transportation



<http://ecoltrans.net/>

Thank you