Fauna Sensitive Road Design Manual Volume 2: Preferred Practices



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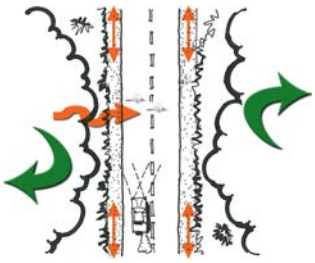
Presentation

- Impact of roads
- Why create Fauna Sensitive Road Design Manuals?
- Aim of *Fauna Sensitive Road Design*
- How do we mitigate the effect of roads on fauna?
- Costing & things to consider

Effects of roads on fauna

- Loss, fragmentation and degradation of habitat
- Invasion by weeds, disease, dust, pollution and feral fauna
- Disturbance due to vehicle movement, noise, headlights
- Wildlife-Vehicle Collisions
- Barrier to the movement of fauna
- Changed climatic conditions



Questions

1. How well do certain practices/mitigation measures work?
2. Under what circumstances do particular structures function best?
3. And, for which species?
4. How can overall performance be maintained and improved?

Results?

- Significant lack of scientific rigour with monitoring.
- Difficulties in comparing results across studies
- Monitoring results were not published




Fauna Sensitive Road Design Manual

Volume 1: Past and Existing Practices 2001

Volume 2: Preferred Practices

1. How well do certain practices/mitigation measures work?
2. Under what circumstances do particular structures function best?
3. And, for which species?
4. How can overall performance be maintained and improved?

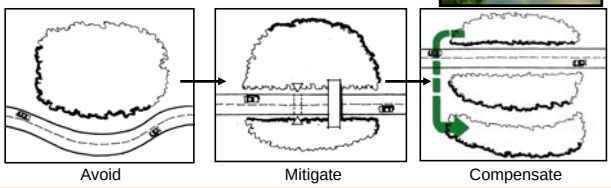
- Applicable across Australia
- **Best overall, locally relevant, outcome**

Objectives of FSRD

1. Avoid environmentally sensitive areas

By avoiding such areas many of the mitigation and compensation measures may not be necessary.

Environmental expert involved early



Avoid Mitigate Compensate

Objectives of FSRD

2. Identify the nature of the issues

- Value of the species
- Habitat-type
- Intensity of road use
- Topography
- Upgrade or new road
- Size, complexity, functionality and aesthetics and other requirements demanded for the structures
- Future land use
- Due purpose, or solely faunal

- **Make the hard decisions**

Objectives of FSRD

3. Identify the **goals** for mitigation using the **SMART** technique

Specific
Measurable
Achievable
Realistic
Time-framed

Objectives of FSRD

4. Design mitigation structures for faunal groups, communities and ecosystem processes

Cost-effective to build individual multi-use structures that serve multiple species

Structures should accommodate a wide range of species- **if possible!!**

Objectives of FSRD

5. Research and Monitoring

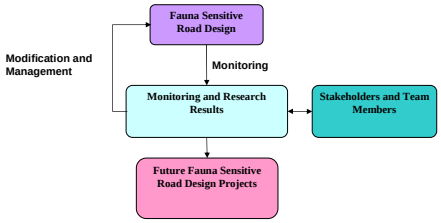
An **integral** part of the project from the outset

Cost effective to study a large number of structures simultaneously, using **standard and consistent** methods

Formal feedback mechanisms

Objectives of FSRD

5. Research and Monitoring (cont)



Objectives of FSRD

6. Maintenance of structures

Include maintenance into project budgets

Consider maintenance cost when designing structures

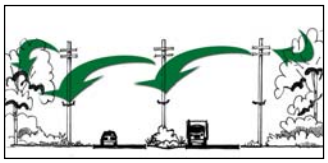
What are FSRD measures?

1. Overpasses
   - Movement of fauna above roads
2. Underpasses
   - Movement of fauna below roads
3. Non-structural mitigation
   - Designs that facilitate “natural” permeability

1. Overpasses

Gilder poles

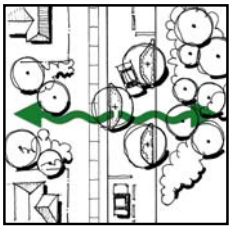
Gliders and Tree Kangaroos



1. Overpasses

Local traffic management

All Species



MainRoads

1. Overpasses

Canopy bridge

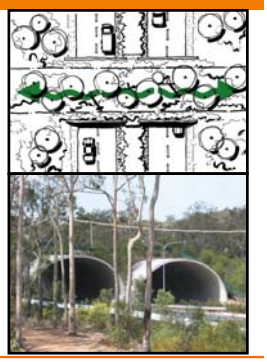
Arboreal species

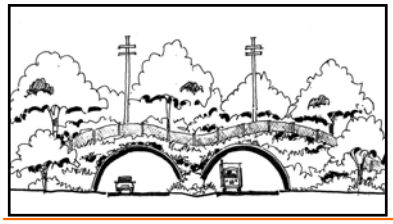
MainRoads

1. Overpasses

Land bridge

All species (excl. aquatic spp.)



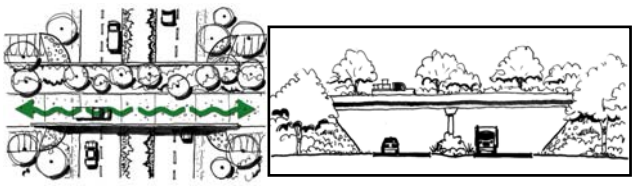


MainRoads

1. Overpasses

Small roads overpass (dual purpose)

All species

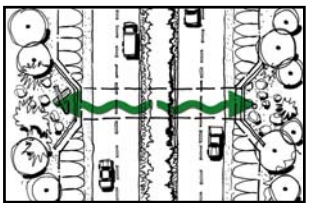


MainRoads

2. Underpasses

Culvert

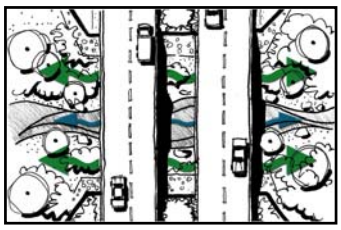
Terrestrial and aquatic species



2. Underpasses

Bridge

Aquatic and terrestrial species *(If dry passage included)*



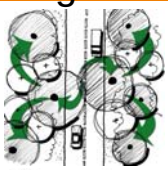
3. Non-structural Mitigation

Canopy Connectivity

Arboreal Species

Flight Birds

Flying Invertebrates



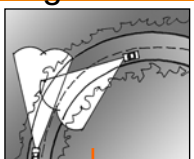
3. Non-structural Mitigation

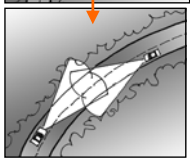
Lighting

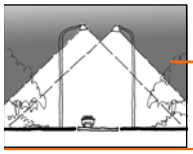
Directional street lighting

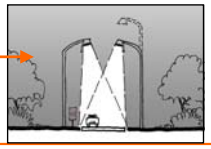
Headlight barriers
(vegetation or structural) along roadside

Road design









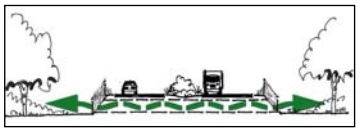
Barrier Structures

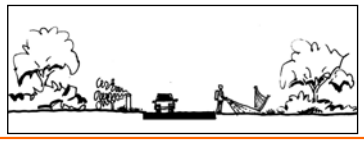
Non-palatable Vegetation

Fauna exclusion fencing

Chemical repellents

Only Temporary use





Costing of structures

There are a few factors which, for instance, must be considered:

- Length of fauna structure
- Locational issues (geotechnical or ground factors/difficulties)
- Construction matters (for example, pre-fabricated or more complex)
- Other works which may be included or excluded in the cost structure (for example, landscaping/vegetation)

Things to Consider

Be **proactive** rather than reactive to fauna mitigation

It is more cost-effective to install mitigation structures during construction rather than attempting to retrofit structures.

The **precautionary principle** – better to restore and maintain connectivity than not.

Tugun Bypass: Hidden Valley bridge construction

Acknowledgements

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PacificLink Alliance
Rainforest CRC
SMEC
Swedish Road Authority (Vagverket)
University of Queensland (UQ)
Victoria Roads (VicRoads)

Rope bridges on the Palmerston Highway