

# Towards Sustainable Roads and Powerlines

Our vision is to see the rainforests of Australia managed and utilised in a scientifically sound and sustainable manner to yield economic and social benefits to the community, while ensuring conservation of the unique cultural and natural features of the rainforest.



Image courtesy Birgit Kuehn

Rainforest CRC researchers have been working with infrastructure managers for more than fifteen years to encourage sustainable design, construction and maintenance practices in the Wet Tropics World Heritage Area.

- A variety of projects have examined the impacts of roads and powerline clearings through rainforest areas with respect to habitat fragmentation and edge effects, erosion, penetration of noise and pollutants, wildlife road mortality and invasions by weeds and feral animals.
- Being able to mitigate the impacts of roads and powerline clearings through reduction or prevention has been the focus of Rainforest CRC research during the past six to eight years, and impact research continues. For smaller tourist and access roads through the forest, the continued maintenance of the canopy above the road will substantially reduce impacts in fragmentation, edge effects and pest invasions.
- The impacts of powerlines have been reduced by building tall towers with a small, cleared 'footprint' that carries the powerline above the forest canopy, thereby preventing fragmentation by swathe clearing, erosion and pest invasion. These types of powerlines are maintained using helicopters capable of landing on the tower platforms.
- Fragmentation and mortality of terrestrial rainforest fauna due to road and highway traffic has been reduced through the construction of underpass tunnels, or the upgrade of water-bearing culverts, while rope bridge overpasses suspended ten metres above the road have proven successful for road crossings by arboreal fauna.
- Research into the impacts of highways on rainforest flora and fauna culminated in studies prepared as part of the proposed upgrade of a busy two-lane highway through World Heritage rainforest near Cairns in the far northern region of Queensland, Australia. Research has demonstrated that current levels of fragmentation and mortality of arboreal and terrestrial fauna should be reduced by building long road bridges above the canopy when the four-lane highway is constructed. Rainforest canopy can be maintained through careful design of bridges. Stream pollutants can be removed from road run-off, while fencing that directs animals under the bridges can reduce wildlife road kill and fragmentation.
- Best practice manuals for the planning, design, construction and operation of roads and powerlines in the rainforests of the Wet Tropics have made use of Rainforest CRC research extensively.
- Elsewhere in Australia, the Rainforest CRC's large research base has been applied to projects in non-rainforest habitats.

[www.rainforest-crc.jcu.edu.au](http://www.rainforest-crc.jcu.edu.au)



**Rainforest CRC**

**Cooperative Research  
Centre for Tropical  
Rainforest Ecology and  
Management**



**Established and supported  
under the Australian  
Cooperative Research  
Centres Programme**

*The Cooperative Research Centre for Tropical Rainforest Ecology and Management (abbreviated to Rainforest CRC) was established in 1993 as a research and education partnership and involves twelve core partners including three major universities, Commonwealth and State Government agencies and the tourism industry. A range of world-class experts support an exciting Centre portfolio covering key areas of research including environmental planning and management in tropical landscapes; managing and monitoring impacts arising from rainforest visitation and use; conservation principles and management; evaluating ecosystems goods and services in a dynamic landscape; and involving Indigenous communities in capacity building and collaborative management. Centre research comes under eight broad Program themes, each involving Project personnel and research user representatives with interests in particular research areas.*





## Rainforest CRC Recommended Reading

Available for download from  
<http://www.rainforest-crc.jcu.edu.au/research/project4.5.htm>

Goosem, M. (2005). *Wildlife Surveillance Assessment Compton Road Upgrade 2005*. Report to the Brisbane City Council. Cooperative Research Centre for Tropical Rainforest Ecology and Management. April 2005. Unpublished report.

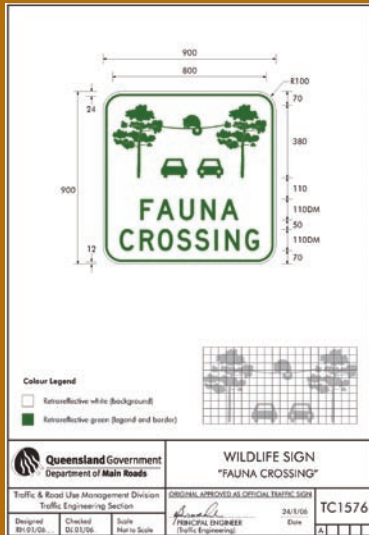
Goosem, M., Harriss, C., Chester, G. and Tucker, N. (2004). *Kuranda Range: Applying Research to Planning and Design Review*. Report to the Queensland Department of Main Roads. Cooperative Research Centre for Tropical Rainforest Ecology and Management. April 2004. Unpublished Report.

Chester, G., Harriss, C. and Goosem, M. (2004). *Kennedy Highway, Kuranda Range Proposed Upgrade: Assessment of Net Adverse Impacts*. Report to the Queensland Department of Main Roads. Cooperative Research Centre for Tropical Rainforest Ecology and Management. May 2004. Unpublished report.

Goosem, M. and Turton, S. (2002). *Weed incursions along roads and powerlines in the Wet Tropics of Queensland World Heritage Area: Potential of Remote Sensing as an Indicator of Weed Infestations*. Report to the Wet Tropics Management Authority. Cooperative Research Centre for Tropical Rainforest Ecology and Management. August 2002. Unpublished report.

Goosem, M. and Weston, N. (2002) *Underpasses and overpasses*. Wildlife Australia Magazine. Wildlife Preservation Society of Queensland, Brisbane. Spring 2002, Vol. 39, No. 3. p. 34-37.

Weston, N. (2001) *Bridging the rainforest gap*. Wildlife Australia Magazine. Wildlife Preservation Society of Queensland, Brisbane. Summer 2000/2001, Vol. 37, No. 4. p. 16-19.



The Queensland Department of Main Roads has incorporated new designs for its road signs. Signs such as this fauna crossing warning will become more frequent in the coming years as more arboreal animal crossings are installed.

Supporting the sustainable use, management and conservation of Australia's tropical rainforests through world-class research, training and technology transfer.

The Rainforest CRC has produced a number of quality research reports, workshop and conference proceedings and best practice manuals. Hard copies may be obtained by contacting our Headquarters Office. Our publications are also available for download at [www.rainforest-crc.jcu.edu.au/publications/publications.htm](http://www.rainforest-crc.jcu.edu.au/publications/publications.htm).



Image courtesy Miriam Goosem Video-capture courtesy David Thompson Image courtesy Miriam Goosem Image courtesy of Powerlink Queensland Image courtesy Jonathan Munro

Available for download from  
<http://www.blackwell-synergy.com/toc/emr/2/3>

Goosem, M., Izumi, Y. and Turton, S. (2001). Efforts to restore habitat connectivity for an upland tropical rainforest fauna: A trial of underpasses below roads. *Ecological Management and Restoration* 2, 196-202.

Available for download from  
<http://www.icoet.net/ICOET2005.html>

Goosem, M., Weston, N. and Bushnell, S. (2005). *Effectiveness of rope bridge arboreal overpasses and faunal underpasses in providing connectivity for rainforest fauna*. The International Conference on Ecology and Transportation (ICOET) 2005, San Diego, California.

Available for download from  
<http://www.mainroads.qld.gov.au/MRWEB/Prod/Content.nsf/DOCINDEX/Road+Related>

Queensland Department of Main Roads (1997). *Roads in the Wet Tropics: Planning, Design, Construction, Maintenance*

and Operation. Best Practice Manual. Queensland Department of Main Roads. Technology and Environment Division, Brisbane.

Available for download from  
<http://www.rainforest-crc.jcu.edu.au/publications/publications.htm>

Goosem, M. and Turton, S. (2002). *Impacts of roads and powerlines on the Wet Tropics World Heritage Area. Stage II Report, July 2000*. Report to the Wet Tropics Management Authority and Cooperative Research Centre for Tropical Rainforest Ecology and Management. Rainforest CRC, 210 pp.

Available for purchase at  
<http://www.rzsnsw.org.au/ForestFauna2.htm>

Goosem, M. (2004). Linear infrastructure in tropical rainforests: mitigating impacts on fauna of roads and powerline clearings. (In) *Conservation of Australia's Forest Fauna*. Lunney, D. (ed). Royal Zoological Society of New South Wales, Mosman NSW, pp. 418-434. ISBN 0 95860 858 X



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