PRESENTATION

ROAD ECOLOGY
OECOLOGIA AUSTRALIS SPECIAL ISSUE

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In recent decades the natural landscape has undergone rapid large scale changes mainly due to human activities. Such changes are due to different economic and social activities, citing conversion of land use (e.g. agriculture and forestry), expansion of urban areas and construction of means of travel and freight transport, whether by road or rail. The expansion of road projects, associated with the increased number of vehicles in circulation has intensified the negative effects of roads on biodiversity.

Road Ecology is a new line of research which comprises environmental, social and economic actions aiming to minimize the negative effects of road projects. This line emerged 20 years ago, and it is still under widespread development, especially in emerging countries.

One of the biggest concerns on conservation today is the loss of ecological processes at the population, community and ecosystem levels. Highways and railroads can act on all these levels, generating impacts over the short, medium and long term on different geographic scales and intensities.

This present issue of Oecologia Australis is an initiative of the Brazilian Center for Research on Road Ecology (Federal University of Lavras) together with the postgraduate program in ecology (Federal University of Rio de Janeiro), and summarizes the degree of development of Road Ecology in different regions of the world (Figure 1), contributing to the direction of future actions in the scientific and public policies for biodiversity conservation.

This edition brings 13 articles from different Ecology Road knowledge areas. The articles cover topics related to territorial planning (Lydecker & Forman), knowledge gaps (Peter *et al.*, Rosa & Bager), mitigation measures (Bellis *et al.*, Jones & Pickvance), study methods (Helldin *et al.*, Teixeira *et al.*, Ouren & Coffin), economics (Huijser *et al.*), and even from regions of the world where the impact of roads is still understudied (Casella & Paranhos, Gallina & Badillo, D'Amico *et al.*, Pragatheesh & Rajvanshi).

Lydecker & Forman present an innovative proposal for the use of road verges integrating ecological aspects and agricultural production. Two articles (Rosa & Bager, Peter *et al.*) summarize the existing information of road effects on different groups of vertebrates and address knowledge gaps. Peter *et al.* focus their analysis on small mammals, while Rosa & Bager discuss factors and mechanisms that affect vertebrates associated to highways.

Regarding mitigation, Bellis *et al.* address the issue of monitoring wildlife crossing structures in Vermont (USA) and conclude that the effective evaluation of these systems should consider a multi-taxa approach. Jones & Pickvance assess the role of overpasses built for large mammals to restore bird population connectivity.

Among the articles that primarily address the study methods, Helldin *et al.* evaluate the effects of noise on different bird populations in Sweden. The authors propose a method to evaluate the effective loss of habitat and the case study found that the effect of noise can be underestimated in important bird sites. Teixeira *et al.* analyze the effect of different biological and ecological aspects on identifying roadkill hotspots, and conclude that the mitigation of road-kills should consider these parameters for its successful planning. Ouren & Coffin test several methods to monitor off-highway vehicles seeking support for decision making by land managers in the conflicts between visitation and biodiversity. Huijser *et al.* provide the first cost-benefit analysis to justify the implementation of mitigation measures

on Brazilian highways using capybaras as a model species.

Finally, another four articles focus on different aspects of Road Ecology. D'Amico *et al.* evaluate the road network as an invasion corridor for the spread of synanthropic bird species in New Zealand. Pragatheesh & Rajvanshi present data on snake roadkill, relating the levels to environmental and spatial factors in India. Casella & Paranhos evaluates loss of Cerrado vegetation over a 16-year time scenario, concluding that the presence of the highway was a major factor in the changing landscape in Brazil. Gallina & Badillo summarize the evolution of Road Ecology in Mexico.

Figure 1: Geographical distribution of the articles in the special issue of Road Ecology - Oecologia Australis.

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