



SECTORAL REVIEWS: ROAD DEVELOPMENT

"Global warming may dominate headlines today. Ecosystem degradation will do so tomorrow."

Corporate Ecosystem Services Review, World Resources Institute, 2008

"...biodiversity underpins the functioning of the ecosystems on which we depend for food and fresh water, health and recreation, and protection from natural disasters. Its loss also affects us culturally and spiritually."

Ban Ki-moon, Secretary General of the United Nations

The SIMBIOSYS Project

Biodiversity and associated ecosystem services are fundamental to humanity but are increasingly threatened by human activity in a range of sectors. The SIMBIOSYS project addressed impacts of human activity in three key sectors: bioenergy crop cultivation, road landscaping and aquaculture. Impacts of these sectors on genetic, species and landscape biodiversity were assessed. The effect of sectoral activities on the delivery of ecosystem services, including carbon sequestration, pollination, pest control via natural enemy predation and resistance to alien species invasion were also investigated. This was done by combining large-scale field-based surveys with focused smaller-scale experiments. By understanding the relationships between biodiversity and the delivery of ecosystem services, policy and management strategies within each sector can be optimized.

www.tcd.ie/research/simbiosys

Sectoral Reviews

In addition, part of the SIMBIOSYS project involved carrying out in-depth policy-orientated reviews of bioenergy crop production, road landscaping, aquaculture and wind farms on biodiversity and ecosystem services, and reviewed sectoral impacts on coastal marine ecosystems. A summary of the road development review is overleaf, and the full review is available at:

www.tcd.ie/research/simbiosys/outputs/strategicreviews/index.php

Project Details

Start Date: 01/04/2008
Duration: 54 months
Funding: € 1.6 million
Coordinator: TCD
Partners: UCD, UCC, NUIG



SECTORAL IMPACTS ON BIODIVERSITY AND ECOSYSTEM SERVICES

Road Development

The development of transport infrastructure is central to economic development and growth. However, these developments are known to negatively affect biodiversity and the delivery of ecosystem services; modifying the surrounding landscape, fragmenting habitats, and affecting the biology of plants and animals. Nevertheless, when roads are managed appropriately, they offer opportunities for biodiversity providing vegetated cover along road sides, and acting as a corridor for flora and fauna to move through the landscape. While major advances have been made to the environmental performance of the road development process in recent years, key areas for improvement remain. The aim of this paper therefore is to evaluate the national road development process and the National Roads Authority (NRA) Environmental Assessment and Construction Guidelines (NRA EACG) to identify potential improvements in biodiversity conservation for future road development.

Authors

Lisa M. J. Dolan

Environmental Research Institute & School of Biology, Earth and Environmental Sciences, UCC.

✉: l.dolan@ucc.ie

Jane Stout

Trinity Centre for Biodiversity Research and School of Natural Sciences, TCD

✉: jane.stout@tcd.ie

Pádraig M. Whelan

Environmental Research Institute & School of Biology, Earth and Environmental Sciences, UCC.

✉: p.whelan@ucc.ie

Key Messages

- Little empirical based research has been carried out on road impacts on biodiversity in Ireland.
- Opportunities exist in the planning, construction and implementation processes of road developments to improve on current best practice.
- The recommendations and requests for additional guidance put forward are intended to inform improvements to existing NRA EACG guidelines, increasing existing standards of biodiversity protection on national road schemes.
- Open and clear communication between stakeholders (contractors, statutory bodies, landowners, consultants) is central to achieving sustainable road developments.

Key recommendations

1. Implementation of best practice ecological and habitat survey methodologies as recommended by the NRA (2008) and The Heritage Council (2010).
2. Species-specific surveys required at the Route Selection stage for species where mitigation and compensatory measures are not feasible.
3. The extent of information displayed in EIS Habitat Mapping needs to be consistent and readily accessible at all contractual stages to all relevant contractors, consultants and designers.
4. Audits of Environmental Operating Plans are required to ensure they meet the necessary standards.
5. Increased protection of badger setts, bat roosts and other species/habitats required during Advanced Site Clearance.
6. A review of best practice in relation to management of aquatic systems required to ensure increased protection and focus on wetlands located adjacent to new road projects.
7. Implementation of a native only/use of Irish provenance plant material landscape planting policy.
8. Improved monitoring and data storage/management in a national open access repository (e.g. NBDC) is required to ensure effective implementation of mitigation measures (e.g. mammal fencing).