habitat fragmentation due to transportation infrastructure

e-bulletin · **JULY 2005** · number 2

CONTENTS

Additional Information

Dirección General para la Biodiversidad. Ministerio de Medio Ambiente.

Infra Eco Network Europe (IENE)

Suggestions or contributions to the bulletin

All comments and information you might have on the different sections of the bulletin are welcomed, please send all your comments and suggestions to the following adress:

habitats.transporte@mma.es

EDITORIAL

Responsibility for accidents caused by collisions with wildlife: an inflection point

In recent years, the conflicts caused by collisions between vehicles and wildlife have increased. This has brought about serious unrest within the hunting community as a result of claims presented by insurance companies to the landowners of hunting areas, when the collision included deer, wild boar or other game species.

This situation will change notably with the parliamentary approbation on 28th of April 2005, of a modification to the sixth additional statute of the traffic, motor vehicle circulation and road safety law. According to this modification, damages from accidents produced by a collision with game will only be claimed from the beneficiaries of hunting (or in their absence, the landowners) when the accident "*is the direct consequence of the act of hunting or from a lack of diligence in the conservation of the hunting area.*" Furthermore, the modification establishes that damages can be claimed from those responsible for public roads where an accident has occurred if it has occurred *"as a consequence of their responsibility in the conservational state of the same and in its signposting"*.

Amongst the results of the approved modification, it is predictable that the following will stand out: increased driver responsibility, since drivers could be made responsible for the damages caused by the accident, in the event that they have breached the law; the insurance companies of the vehicles (or in their absence, the drivers themselves) may have to face the responsibility of the cost of the damages produced by a collision with game in those stretches of road where wild animals frequently cross, and where signposting obliges the driver to reduce speed (normally to a limit of 50-60 km/hr), whenever it has been proved that the vehicle was travelling over the speed limit. Finally, damages can be claimed from the companies responsible for the road, creating a new orientation to the problem.

Until now, the rise in accidents caused by collisions with wild boar and other ungulates was attributed to the increase in the number of animals, which many of these species have experienced in the past few decades but other points generating the problem have not been kept in mind. It is true that ungulate populations have expanded greatly but the problem has also been aggravated by the increase in traffic intensity and also road improvements, meaning that vehicles can travel at faster speeds. Also, new roads (or existing, improved roads) have become imposing barriers which obstruct the movement of animals since they do not take into account a sufficient number of wildlife passages which assist wild animals in crossing with fewer risks. Large mammals require extensive areas of land to move about in order to find basic resources such as food and water, and to reproduce. If they find barriers which limit the access to these resources, many animals will try to cross them, using specific wildlife

crossings or directly across the tarmac.

As a result, the construction of wildlife passages, and in general, the design of an adequate permeability of the wildlife passages, has moved from being a conservation tool in biological diversity to an indispensable measure for guaranteeing road users' safety. According to the new legislation, the construction of wildlife passages has become an indispensable element in preventing claims being presented to the companies responsible for the roads for damages in accidents caused by game species.

top

OPINIONS

A long awaited reform

Last April 28th saw the modification to the sixth additional statute of the traffic, motor vehicle circulation and road safety law in parliament. The new edition is as follows:

"In traffic accidents caused by the running over of game, the driver of the vehicle will be responsible when failure to follow the circulation laws can be attributed to him or her.

Personal and patrimonial damages in these accidents will only be claimed from the beneficiaries of hunting, or, in their absence, the landowners when the accident is the direct consequence of the act of hunting or from a lack of diligence in the conservation of the hunting area.

Those responsible for public roads can also be held responsible if an accident occurs as a consequence of their responsibility in the conservational state of the same and in its signposting".

This is still a provisional text since it is still open to revision during the parliamentary procedure. However, in principle only the form would be affected.

Without a doubt, it deals with an important reform, which responds to a great social demand. On the one hand, this comes from the hunting sector, which was systematically condemned to pay the economic consequences that were caused by accidents with game animals, and on the other, the conservation sector, which demanded a greater investment in prevention and safety measures from the appropriate road management administration.

Once the revised text is published in the Official State Bulletin, a series of doubts about its application are considered. We must keep in mind that at present, the question of the responsibility derived from the running over of animals on the road is regulated in different legal texts. On one side, the Civil Code regulates the question of extra contractual responsibility in its article 1,902 and more specifically it refers to damages caused by game in article 1,906. The Hunting Law of 1970, applicable even in those autonomous communities which do not have their own hunting laws, refers to damages caused by hunting in article 33, repealing article 1,906 of the Civil Code. Subsequently, some autonomic hunting laws also regulated this question although with substantial differences amongst them. This now leads to a situation of absolute juridical insecurity since the legal dealing is different depending on the location of the accident.

In my opinion, the autonomous hunting laws should not have legislated this question, since the running over of a wild animal on a road has no relation to hunting.


Rangers, Environment and Housing Department, Generalitat de Catalunya

The fact is that once this reform is approved definitively, the autonomous communities that have regulated this matter should adapt their legislation in accordance with the traffic, motor vehicle circulation and road safety law.

I understand that this is the way it is because, although the autonomous communities are fully competent on the subject of hunting, we are faced with an accident which occurs on roads, dual carriageways and motorways and deals with a clear assumption of civil extra contractual responsibility and, according to article 8 and 21 of article 149.1 and 149.3, of the constitution.

The contrary solution would lead us towards the absurd which is the situation at the moment and which is none other than the application of a different juridical rule to the same fact, depending on the autonomous community where the accident has taken place.

We are faced with an important reform, which I hope will be interpretated by our tribunals in the correct sense, that is, to prevent a series of responsibilities being established *a priori.* Now it will be necessary to see who is the true culprit in each case. Furthermore, after many years, our legislation will finally be on equal terms with the rest of the European countries

Jorge Bernad Danzberger
Lawyer

top

WORKING GROUP

Annual meeting of the Working Group, and projects for writing up the technical prescriptions for the design of wildlife crossings and perimetral fencing

The 8th meeting of the Working Group on Fragmentation of Habitats caused by Transport Infrastructure took place in Madrid at the National Head Office of Biodiversity (MIMAM), on the 2nd of June and was attended by 33 people who were representatives of transport consultants and the environment of 14 autonomous communities and the State.

The main order of the day consisted of the presentation of the second draft of the document *Technical Prescriptions for the Design of Wildlife Crossings and Perimetral Fencing,* prepared for a comission created within the group and whose publication is expected to be ready by 2006. Those who attended also revised other work such as the translation of the European manual *COST 341. Wildlife and Traffic,* which is in the printing stage. They also set in motion the data base on bibliographies and applied measures in the Spanish State to make roads permeable for wildlife passages and prevention of road accidents and collisions with large mammals which appears in the Ministry of the Environment's web page. It is anticipated that consultation of this base will be possible in the coming months.

top

NEWS

Studies on accidents caused by the presence of animals on the road

From the point of view of road safety, the presence of animals on roads where motor vehicles travel constitutes a grave problem since a very high risk of accidents exists with occasional mortal consequences.

The National Head Office of Traffic has carried out a descriptive study of this problem. In order to do this, officials from the Guardia Civil Traffic Section filled out a questionnaire in which they registered a series of data on those accidents, which as far as they were aware, occurred as a result of the presence of animals on the road.

The study took place over one year (from February 2003 to January 2004) and included accidents caused by the presence of all kinds of animals, domestic and wild, and whether the result of the accident was only material damage or included victims.

A total of 6,227 accidents were registered, of which 316 resulted in victims. Amongst these, 17 deaths were counted, 76 serious injuries and 396 slight injuries. The different variables were analysed such as the type of road where the accident occurred, the types of animals present in the serious accidents, territorial and temporal distribution as well as the roads on which the highest frequency of these types of accidents occurred.

This study is available in the web page of the National Head Office of Traffic by clicking here.

Candelaria Mederos. National Head Office of Traffic. National Observatory of Road Safety.

top

Study on road accidents involving vertebrates in the Parque Natural de l'Albufera (Valencia)

Vicent Benedito and Sara Rodríguez

Between June 2003 and July 2004, a study was carried out on the accidents that occurred on one stretch of the CV-500 road (including a part of the dual carriageway) and on the access road to the village of Palmar, both in the Parque Natural de l'Albufera (Valencia). These roads pass through rice fields, or between the Devesa (on the whole, old sandbanks with forest vegetation and scrub) and rice fields, interchanging with areas urbanised to various degrees.

Very high frequencies of accidents were obtained, above those obtained in the majority of the studies of which we have references both in Spain and in other countries. In accordance with our experience in the sample, we want to point out that in these types of projects the results represent underestimates that in some groups of animals can be important.

Amongst the vertebrates that were run over, birds in particular stand out. Their annual abundance and distribution is explained by their seasonal cycle and by their use of territory, or by both of these (as well as from structural aspects of the roads). The abundance of young mallard run over on the road should be pointed out since a large number of females nest in the “Devesa” and in order to access the rice fields, they have to cross the road.

6 genets were also run over between 2003 and 2004, and 4 so far this 2005. The road intercepts the genets' territory.

Bats form another group that are seriously affected, and they are possibly the vertebrate group in which the underestimate is the greatest, in which case the impact of roads on them would be even more important.

The majority of the accidents were due to the complete absence of mitigation measures. In the Parque Natural de l’Albufera, the barrier effect and road accidents are a great threat to many vertebrate species (not only birds), some of which are protected, for example, bats. This is a fact to be kept in mind in the design of roads that affect wetlands.

Finally, mitigation measures of varying nature were proposed, in accordance with the characteristics of each stretch of road, some of which contemplate important structural changes.

The study is included in a convention between the Polytechnic University of Valencia and the Valencia Town Hall (Oficina Técnica Devesa – Albufera).

Vicent Benedito Durà, Ángela Jaramillo i Sara Rodríguez. Department of Hydraulic Engineering and Environment. Universitat Politècnica de València.

top

Reinforcement of fencing for wild boar in the AS-1 dual carriageway: Mieres- Gijón

The AS-1 dual carriageway, known as the Minera dual carriageway, which became functional at the end of 2002, registered a high number of accidents caused by wild boar, with a total of 21 collisions in a 24km stretch between December 2002 and February 2004. The Road Conservation Service of the Environment, Political Territory and Infrastructure Department in the Principality of Asturias applied different systems in order to reduce the number of accidents such as the reinforcement of fences with pegs and barbed wire, or reflectors, but without achieving positive results.

Carme Rosell (Minuartia)

Finally, the problem has been solved with the installation of fence reinforcement consisting of an electro-soldered grid mesh 5cm wide and 30cm high, which was sunk into the ground between 15 and 30cm, depending on how hard the ground was. The mesh was joined by means of stainless steel washers. Use of this reinforcement has succeeded in preventing wild boar from lifting the fences and reaching the dual carriageway and it also helps to drive them towards viaducts and tunnels or towards the under passes which meet the requirements necessary for this species to get across.

According to the specialised manuals, in order to prevent the wild boar lifting the fences, it is necessary to construct fences with posts every 4 metres and with the mesh buried, at least 15cm at the base. However, where there are accidents on roads that already count on perimetral fences, the installation of this reinforcement can contribute to a notable reduction to the problem.

Joaquín Belón. Service for the Conservation of Roads of the Ministry of the Environment Ordination of the Territory and Infrastructures, Principado de Asturias.

Carme Rosell. MINUARTIA, Estudis Ambientals.

top

Impact of two types of barrier on the wolves in Castilla and León

Recently a summary has been published of the study financed by the National Head Office of Biodiversity (Department of the Environment) together with la Junta de Castilla y León on the influence of two types of barriers for wolves (*Canis lupus*) in this autonomous community (Blanco *et al*. 2005).

F. J. García

The study analyses the effects of the two types of barrier on a population of wolves in expansion, which lives in an agricultural environment in Valladolid and Zamora. The barriers were: 1) the dual carriageway A-6 between Tordesillas and Villalpando, with 4 lanes, fenced, in a flat area without specific wildlife passages; 2) the River Duero corridor, which consists of the river itself, and various lineal infrastructures nearby.

Between March 1997 and October 2001, the 4 radio-tracked wolves that lived less than 15 km from the carriageway crossed it using bridges for vehicles between 4% and 33% of the 45-163 days that they were tracked. Also, another 4 dual carriageways studied in areas without radio-tracked wolves have not held back the expansion of the population. On the contrary, only 3 of the 8 wolves at less than 5km from the River Duero were detected crossing it and 2 of those started to do so immediately after serious disturbances in the habitat. Furthermore, the Duero corridor seems to have held back the expansion of the population during more than 15 years, so it seems to constitute a semi permeable barrier for this species.

The study suggests that the accumulation of various obstacles can have a synergic effect, creating a much greater barrier effect than if they were separate. During the study, the number of dual carriageways in the area has multiplied by 5 and the construction of hotels, petrol stations and other roads nearby the dual carriageways is probably increasing the barrier effect of these. The study recommends the routine inclusion of wildlife passes in each new infrastructure that is built, following the recommendations described in the specialised bibliography.

Blanco, J.C., Cortés, Y. y Virgós, E. (2005). Wolf response to two kinds of barriers in an agricultural habitat in Spain. *Canadian Journal of Zoology*, 83: 312-323.

Juan Carlos Blanco. Consultants in Biology for Conservation.

top

Study of the Effectiveness of Wildlife Passages in the Rías Bajas dual carriageways

Recently, an article has been published on the effectiveness of wildlife passages

(Mata *et al.* 2005) as a measure destined to alleviate the barrier effect of wildlife.The article presented the results of a study that was carried out on the Rías Bajas (A-52) dual carriageways by some members of the Grupo de Ecología Terrestre of the University of Madrid in a convention with the CEDEX. In this study,

CEDEX (Ministry for Public Works/ Universidad Autónoma de Madrid)

intensive monitoring was carried out on 82 transversal structures of the road including all types present, both those inherent to the road (drainage systems, bridges and other under passes) and others especially adapted or constructed for wildlife use (oversized drainage systems and specially designed wildlife passages).

In total, 1,122 recordings – day were obtained corresponding to almost all of the terrestrial vertebrate species present in the study area.

The results show that the structural aspects (amplitude and position above or below the road) are the most determining for the animals that use the transversal structures of the road, resulting in the complementary use between species of the different types of passages. The surrounding vegetation and human activity in the area exercised little influence. In general, a direct relation between the size of the animal and the dimensions of the passages used is observed.

The different use of the types of passages according to the species means that in general, the correct measures in new roads should focus on the establishment of varied typologies and not only on the investment of a reduced number of large, specific wildlife passages. Furthermore, the relation between the size of the passage and the vertebrates that use them gives an indication about the desirable distance between transversal structures on the road. Passages with large dimensions and higher costs should cover the needs of the connectivity of populations of large species and large territories. The existence of viaducts and/or specific wildlife passages each 3-5 km are desirable. The connectivity of smaller species can be re-established through suitable drainage constructions and the conditioning of structural type passages on the road.

Mata. C.; Hervás, I.; Herranz, J.; Suárez, F. & Malo, J. E. (2005). Complementary use by vertebrates of crossing structures along a fenced Spanish dual carriageway. *Biological Conservation*, 124: 397-405.

Cristina Mata, Israel Hervás, Jesús Herranz, Juan I. Dolent and Francisco Suárez. Department of Ecology. Universidad Autónoma de Madrid.

top

Identification and diagnose of areas of interaction between ecological corridors and large capacity roads in Euskadi

The design and establishment of ecological corridor networks that connect natural areas encounter added difficulties in those areas of the territory where the main barriers are found for the displacement of wildlife. In the recently presented technical proposal of delimitation and management of the Red de Corredores Ecológicos de la Comunidad

Mikel Gurrutxaga (IKT)

Autónoma del
País Vasco, which has been carried out by IKT S.A. and assigned by the Basque Government Biodiversity Department, special attention has been paid to those stretches of motorway and dual carriageways which intersect with the planned connections. In these stretches, the existing transversal structures have been studied (tunnels, viaducts, drainage systems, etc.) with the aim of planning corrective measures for the improvement of their permeability.

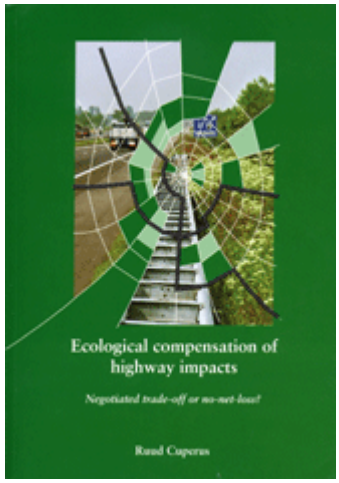
In order to do this, the potential permeability of the transversal structures (on the basis of its dimensions, location in the countryside and integration in the landscape) has been estimated and those negative factors which have been making it difficult for wildlife to use them have been identified (such as the scarcity of vegetation cover, the presence of perimetral fencing at access points, the absence of dry riverbeds, the storage of machinery and other objects in under passes etc.). As a previous step to the preparation of ecoducts and passages specifically designed for wildlife in constructed road infrastructures, the planned corrective measures in the existent transversal structures are characterised by their simplicity and low cost, in such a way that they constitute a first step in the search for solutions to the barrier effect.

Mikel Gurrutxaga San Vicente. Ingurune Naturaleko eta GISeko Saila / Department of Environment and GIS - IKT .

top

PUBLICATIONS

Ecological compensation of highway impacts: Negotiated trade-off or no-net-loss?



This is the edition of a doctorate thesis written by Ruud Cuperus (University of Leiden, 2004). It offers a critical examination on how the principle of ecological compensation has been applied in the planning and construction of the Dutch roads of national status (motorways and other trunk roads). The first part of the book is dedicated to the principle of ecological compensation and it asks questions which will be confronted in the study.

The second part compiles 6 articles published by the author between 1996 and 2003 in specialised magazines (originals published in English or translated into this language in the thesis); they analyse particular cases of application of compensatory measures on Dutch motorways, and also global aspects of the experiences across the country. This part finishes with summaries of the results grouped by themes: planification and desicion taking, implementation, costs of compensation, evaluation and surveying, legal aspects, public support and deficits in knowledge. The third and last part of the book discusses some problems and unresolved aspects of ecological compensation. This discussion and the general conclusions bring us to a series of recommendations. The volume ends by discussing the perspectives of the principle of compensation and sums up the conclusions of the book. Apart from this being an interesting book for its contents, it is relevant, being the first dedicated to this subject in a European context.

top

EVENTS

ESA-INTECOL 2005 Joint Meeting: Ecology at multiple scales. 7-12 August 2005. Montreal (Canada). Organisers: International Association for Ecology (INTECOL) and Ecological Society of America (ESA). Within the framework of this conference, a symposium entitled: *Reducing habitat fragmentation by roads: A comparison of measures and scales* will be carried out.

More information at: http://www.intecol.net/; http://www.esa.org

The International Conference on Ecology & Transportation (ICOET). 29 August - 2 September 2005. San Diego, California (United States). Organisers: California Department of Transportation y Road Ecology Center.

More information at: http://www.icoet.net/ICOET2005.html

Sustainable Planning 2005. Second International Conference on Sustainable Planning & Development. 12-15 September 2005. Bologna (Italia). Organisers: Wessex Institute of Technology (United Kingdom). One of the topics that will be dealt with in this conference is the evaluation of environmental impact.

More information at:

http://www.wessex.ac.uk/conferences/2005/spd05/index.html

World conference on ecological restoration. 12-18 September 2005. Zaragoza. Organisers: Society for Ecological Restoration International (SERI) and Instituto Pirenaico de Ecología-CSIC.

More information at: http://www.ser.org/content/2005Conference.asp

Seminar on Linear Infrastructures and Biodiversity. 13-14 October 2005. Évora (Portugal). Organisers: Universidad de Évora.

More information at: Universidade de Évora. Departamento de Biología. Unidade de Biología da Conservação. Pólo da Mitra. 7002-554 Évora

Coloquio Routes et petite faune sauvage. 21-22 Septiembre 2005. Chambéry, Savoia (France).Organisers: *Sétra (Service d'études techniques des routes et autoroutes), Ministère de l'Equipement, des Transports, de l'Aménagement du territoire, du Tourisme et de la Mer*, y *D4E (Direction des études économiques et de l'évaluation environnementale), Ministère de l'Ecologie et Développement durable*. This conference centres on the state of the question of small, wild animal protection during the planification and construction of transport infrastructures.

More information at: cendrine.labelle@equipement.gouv.fr

top

DATABASE AND OTHER ACTION PRODUCTS COST 341

The European project of technological exchange COST 341. Fragmentation of habitats caused by transport infrastructures (1999-2003) generated these materials:

COST 341.The Fragmentation of the habitat in relation to transport infrastructures in Spain. This can be obtained from the Servicio de Publicaciones of the Ministry of the Environment.

Wildlife and traffic. A European handbook for identifying conflicts and designing solutions. This can be ordered here. It is hoped that a translation in Spanish will be available at the end of 2005.

CD-ROM, which integrates all the documents, elaborated during the Action COST 341. This can be obtained at entity IENE.

CD-ROM with the minutes of the proceedings of the Action COST 341 conference closing ceremony. This can be obtained through the web page IENE.

Data Base. This can be consulted on the IENE web page. It contains bliographical records on the fragmentation of habitats and the measures applied in order to reduce it in all the countries participating in the Action. If you wish to send information on the Spanish State to be incorporated into the database, you can complete the forms from bibliografía and medidas preventivas y correctoras and send them to habitats.transporte@mma.es.

top

- This publication comes out every six months within the framework of the Fragmentation Habitat Due to Transportation Infrastructure Project. It is promoted by the Dirección General para la Biodiversidad, Ministerio de Medio Ambiente. MINUARTIA, Estudis Ambientals is undertaking the technical administration of the project.

- To subscribe to the bulletin, please send your personal details (name, organisation, address, e-mail, telephone number and fax) to the following address habitats.transporte@mma.es. If you do not want to receive further issues of this bulletin any more, please send a message under the subject “Unsubscribe”.