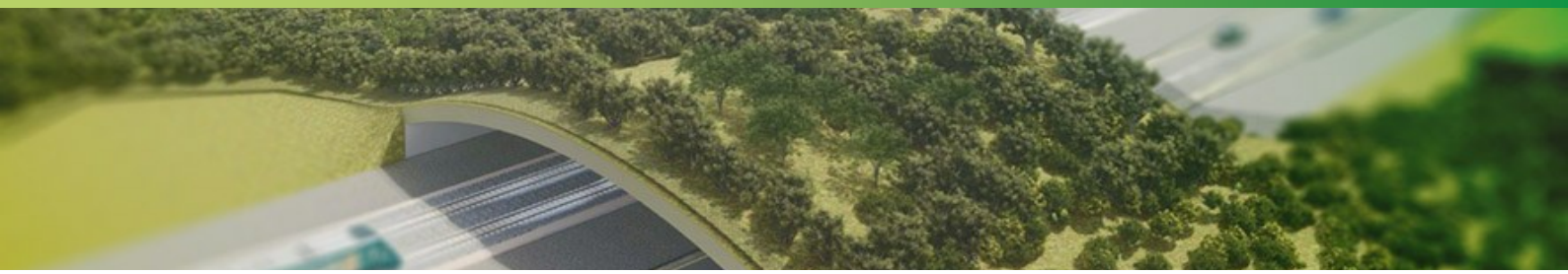
HABITAT FRAGMENTATION
DUE TO TRANSPORTATION INFRASTRUCTURE

E-Newsletter · number 27 · January 2025

EDITORIAL



We begin 2025 with significant milestones and challenges in the field of habitat fragmentation and ecological connectivity, reflecting the ongoing progress in integrating biodiversity into transport infrastructures.

In September 2024, we had the opportunity to participate in the Infrastructure and Ecology Network Europe (IENE) Congress held in Prague. During the event, Spain presented the Strategy for Defragmentation of Habitats Affected by Linear Transport Infrastructures (EDHILT), approved in July 2024. This forum made it possible to present the progress and challenges in the implementation of the strategy, as well as to share experiences with other countries working on similar projects. The interest generated in this international sphere reinforces Spain's role as a reference in the integration of biodiversity and transportation.

The implementation of the EDHILT is already underway, with its first Work Programme bringing together numerous Spanish public administrations, both at state, regional and local level. This joint effort is proving to be a notable example of inter-administrative coordination and collaboration, consolidating the Habitat Fragmentation Working Group as a benchmark in biodiversity management and sustainable transport.

Looking to the future, we are pleased to announce the next edition of the Conference on Habitat Fragmentation, which will be held in mid-October in collaboration between the Junta de Castilla y León and MITECO. This event promises to be a key space for reflection, the exchange of experiences and the identification of new lines of action within the framework of habitat defragmentation.

Here, we would like to recognize the efforts and involvement of all the administrations and stakeholders actively participating in de-fragmentation actions and the development of technical prescription documents. This joint work is crucial for continuing to advance biodiversity conservation and mitigating the impacts of linear transport infrastructures.

2025 presents us with the challenge of consolidating the progress achieved and continuing to pave the way towards a future where the coexistence of infrastructure development and biodiversity is a reality.

WORKING GROUP

Over the last few months, the Working Group on Habitat Fragmentation caused by Transport Infrastructure has begun to work on the implementation of the recently approved Strategy for the Defragmentation of Habitats Affected by Linear Transport Infrastructure (EDHILT by its Spanish acronym). Specifically, progress is being made on the preparation of the first Work Programme, which compiles the commitments to actions to be carried out in the next 5 years by the state, regional and local administrations. These actions are part of the strategic axes and actions described in the EDHILT.

On the other hand, part of the Working Group is participating in the Technical Commission created to update the document "Technical requirements for the design of wildlife crossings and perimeter fences. (Second edition, revised and expanded) – TP1". The first meeting took place on September 26, 2024 by videoconference. The schedule and methodology to be followed for the update of the document were presented, which will start from its previous version and will use the IENE Biodiversity and infrastructure manual as the main source of information. In addition, the structure and content of the document, the modifications to the existing files and the creation of new ones were discussed. The first draft of the update is expected to be available in March 2025, and the second meeting with the Technical Commission will then be convened to collect their contributions .

The date and convening of the 2025 Working Group meeting will be set soon.

NEWS

Adif completes the construction of the first cattle guard in a railway infrastructure in Spain

As is well known, the incursion of wild ungulates into linear transport infrastructure creates various safety issues for traffic.

In the specific case of high-speed railway infrastructure, a perimeter fence is in place to limit wildlife access to hazardous areas. However, along the tracks, vulnerable points arise where fenced sections are connected by branches that lack such a perimeter barrier .

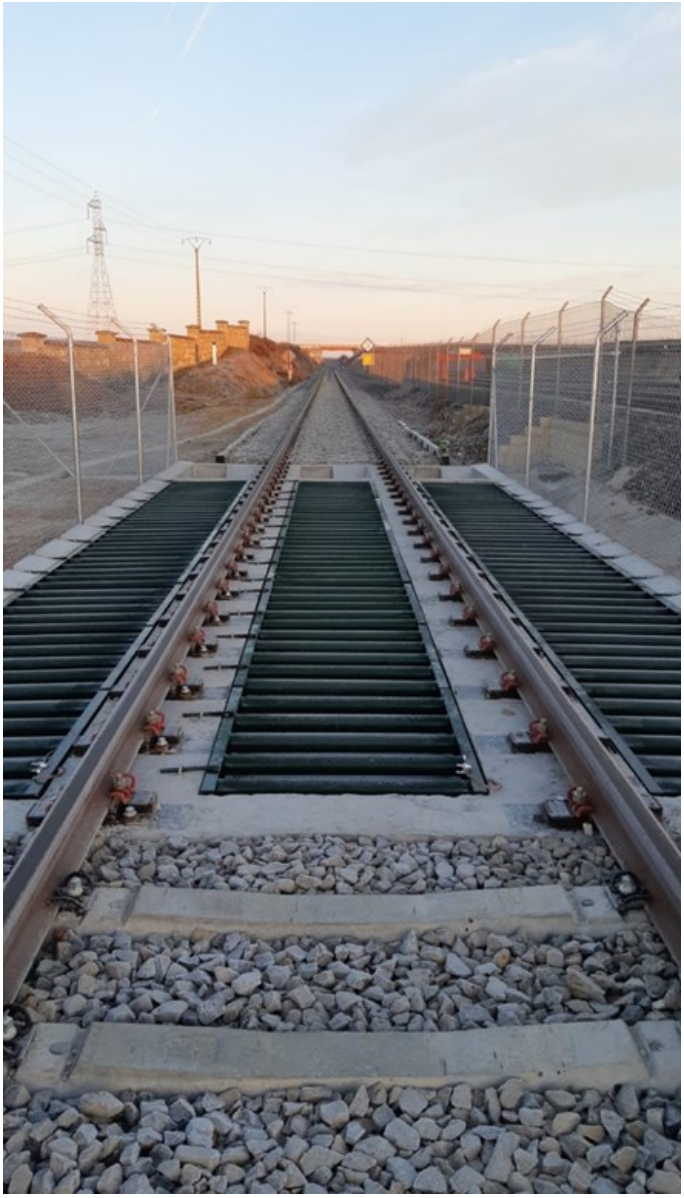
To minimize the risk of wildlife intrusion in these branches, Adif has built a cattle guard under the railway infrastructure within the maintenance base of La Hiniesta (Zamora). This is the first structure of its kind to be built on Spain's railway network.

The cattle guard consists of a longitudinal trench beneath the railway tracks, measuring 10 meters in length and 50 cm in depth, covered with steel bars. To provide an escape route for small animals that may fall between the bars, a preliminary trench has been built before the cattle guard itself, where three ramps have been installed.

Additionally, the system includes a sonic deterrent device at its entrance, equipped with infrared motion detection, which emits sounds when animals are detected near the cattle guard.

Finally, a camera trap has been installed with an automatic image transmission system to a mobile device. This will allow for continuous monitoring of both the cattle guard and its immediate surroundings, enabling the assessment of its effectiveness. The monitoring is expected to begin within the next one or two months.

Source of information: Adif Alta Velocidad



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IENE 2024: biodiversity in the headlight of future transport

In September 2024, Prague hosted the IENE 2024 International Conference, organized by the Infrastructure and Ecology Network Europe (IENE), the Czech University of Life Sciences, the Nature Conservation Agency, and the Ministry of the Environment of the Czech Republic. With more than 300 experts from 39 countries participating, the event focused on integrating biodiversity conservation into the development of transport and energy infrastructure, under the theme: "Biodiversity in the Headlight of Future Transport".

The program included presentations by renowned experts such as Gaya Herrington and Rodney van der Ree, who addressed the need to harmonize technological progress with environmental preservation.

Notably, Spain participated with seven presentations at the conference. During the oral sessions, the "Strategy for the Defragmentation of Habitats Affected by Linear Transport Infrastructure" (MITECO) was introduced, along with the findings of the following studies: "Temporal variations in the effectiveness of perimeter fencing to prevent wildlife collisions: The case of the roe deer (*Capreolus capreolus*).", "Increasing ecological connectivity and adapting roads to climate change: A practical example with the European mink (*Mustela lutreola*).", "Actions to reduce road mortality risk for large carnivores: Guidelines based on experiences in southern European countries.". In the category of short talks, speakers addressed topics such as the impact of hunting on wildlife -vehicle collisions, preliminary results on the effectiveness of dynamic signage that provides real-time alerts about wildlife collision risks, and biases in the location of carcasses in roadkill studies.

On an international level, the IENE Biodiversity and Infrastructure European Handbook was presented, updating the "Wildlife and Traffic" manual after 20 years of application.

In addition to the presentations, the conference featured workshops on mitigating ecological impacts and conserving biodiversity in infrastructure projects.

The Final Declaration of the conference emphasized the urgent need to transform current practices to align with the Paris Agreement, the Kunming-Montreal Global Biodiversity Framework, and the new EU Nature Restoration Law, among others. Some of the main proposals included: designing infrastructure that not only minimizes environmental impact but actively promotes ecosystem regeneration, avoiding new developments in pristine natural areas and prioritizing the modernization of existing infrastructure, internalizing environmental costs in transport and energy decision-making, promoting local and decentralized economies to reduce dependency on long-distance transport, and leveraging new technologies, such as artificial intelligence, to manage infrastructure in ways that benefit both biodiversity and people .

The event in Prague was not only a space for knowledge exchange and experience-sharing but also a platform to drive global collaboration for transformative change. Participants issued an urgent call to governments, businesses, investors, and researchers to work together in building a future that respects planetary boundaries, conserves biodiversity, and prioritizes human and ecological well-being.

To learn more about the presentations at the conference, the book of abstracts is available for consultation.

Source of information: Official website of the International Conference

The "Colecta" project concludes, a study that has identified animals killed on roads and collected by the conservation companies of the MITMS

The COLECTA project ("Pilot study for the collection of information on animals killed on roads in the State"), promoted by the Ministry for Ecological Transition and the Demographic Challenge (MITECO), the Ministry of Transport and Sustainable Mobility (MITMS), and the Doñana Biological Station (EBD-CSIC), began collecting data in early 2024 (see Newsletter 25). It has been supported by the road conservation centers HU-01 (Huelva), BA -05 (Fuente de Cantos, Badajoz), VA-01 (Boecillo, Valladolid), and M-03 (Arganda del Rey, Madrid) from the General Directorate of Roads of the Ministry of Transport and Sustainable Mobility.

After implementing a standardized data collection system in these four centers, the project has concluded with a total of 381 records, of which 146 corresponded to domestic animals (112 cats, 26 dogs, and 8 unidentified). The next most common group were lagomorphs, with 67 hares and 20 rabbits. Additionally, 51 carnivores were recorded, 34 of them foxes, but also badgers, mongooses, martens, polecats, and genets. A total of 27 ungulates (deer, roe deer, and wild boars) and 20 hedgehogs, among others, were also recorded.

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It was noteworthy the different distribution of species recorded by the conservation centers, with the Boecillo center recording the largest number of ungulates, while the Fuente de Cantos center identified the majority of hares, where they were even more frequent than cats.

Furthermore, 15 specimens of species included in the List of Wild Species under Special Protection Regime (LESRPE) were collected, including a Montagu's harrier (see Newsletter 26), a species considered Vulnerable.

The results of this project are very informative as they provide a source of data on animals killed on roads.

Source of information: EBD-CSIC Y MITMS
Photo: Huelva Conservation Center (HU-01)

Europe Bets on Railway Sustainability with the SYMBIOSIS Project

Europe takes another step towards sustainability with the launch of the SYMBIOSIS project (SYstemic Mobilisation for Joint Biodiversity and Infrastructure), an initiative aimed at integrating biodiversity into all phases of railway infrastructure development. With a budget of €2.8 million, funded by the Europe's Rail Joint Undertaking program of the European Union, and a duration of three years, this initiative brings together 21 partners from 13 European countries, including Spain. The project is coordinated by the International Union of Railways (UIC).

The project, which began on September 1, 2024, seeks to transform the way railway infrastructure is planned and operated across Europe, promoting a collaborative and sustainable approach. Among its main objectives are the creation of a facilitating environment that drives the prioritization of biodiversity in railway development processes and decision-making; the design of practical tools for sustainable land management that make infrastructure more resilient, efficient, and environmentally friendly; and the creation of a network that brings together railway operators and biodiversity monitoring experts to harmonize and standardize the collection, analysis, and integration of robust environmental data.

The official launch event took place on September 4-5, 2024, at the UIC headquarters, marking the beginning of an interdisciplinary collaboration that promises to revolutionize European transport. With SYMBIOSIS, Europe is leading the integration of sustainability and technology in transportation, paving the way for a greener and more resilient future.

Source of the information: SYMBIOSIS Project website

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The Tenerife Cabildo Begins Work to Transplant 15 Canary Date Palms to Prevent Infection by *Fusarium oxysporum*

The Canary Date Palm (*Phoenix canariensis*) is an iconic species of the biodiversity and landscape of the Canary Islands. Despite being protected throughout the autonomous community, it faces several threats that jeopardize its health and survival. One of these is the fungal disease known as fusariosis, primarily caused by the fungus *Fusarium oxysporum f. sp. canariensis*. In recent years, the incidence of this disease has significantly increased, especially in the urban and peri-urban areas of Tenerife. One example of this is found on the left side of the TF-5 motorway, PK 14 (IMD 87,355), where the alignment of palm trees there could act as a natural corridor for this disease, as signs of infection have been detected in some specimens in the nearby area.

Due to the concern about losing specimens of high ecological value, the Technical Roads and Mobility Service of the Tenerife Cabildo, as part of the green area conservation contract, began in November the work to transplant 15 healthy Canary date palms using the girdling method. Thanks to the implementation of this technique, both the survival rate of the transplanted specimens (transplants without prior preparation have a survival rate of less than 50%) and their resistance to pests and diseases are improved.

On the other hand, this transplant will ensure the preservation of these specimens in the face of the future expansion of the northern motorway TF-5.

Transplant process

After selecting the optimal Canary date palm specimens for transplant, a small trench is dug to loosen the root ball of the individuals. A fungicide treatment is then applied to prevent fungal infections, as well as hormone treatments to encourage subsequent rooting. Finally, a jute mesh is installed between the root ball and the dug trench, the hole is filled with topsoil, and the palms are girdled, where they must remain for at least 6 months. During this period, follow-up is carried out every two weeks to assess the condition of the specimens. Once the 6 months have passed, the final transplant is performed by breaking the plaster mold to allow the plant to develop its root system.

Currently, the work is at the 6-month girdling stage.

The palms will be relocated to the right margin of the TF-5 motorway, PK 33 (IMD 66,930), where a landscaping treatment will be developed with this Canary palm grove alongside other endemic species native to the bioclimatic zone (250 m.a.s.l.), covering a total area of 3,088.65 m^2.

The transplant will be carried out in accordance with the current legislation regarding palm tree transplants for the autonomous community of the Canary Islands.

Source of information: Tenerife Cabildo. Mobility Area. S.T. Roads and Mobility

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Construction of a specific overpass for wildlife on the C-51 road, in Rodonyà (Tarragona)

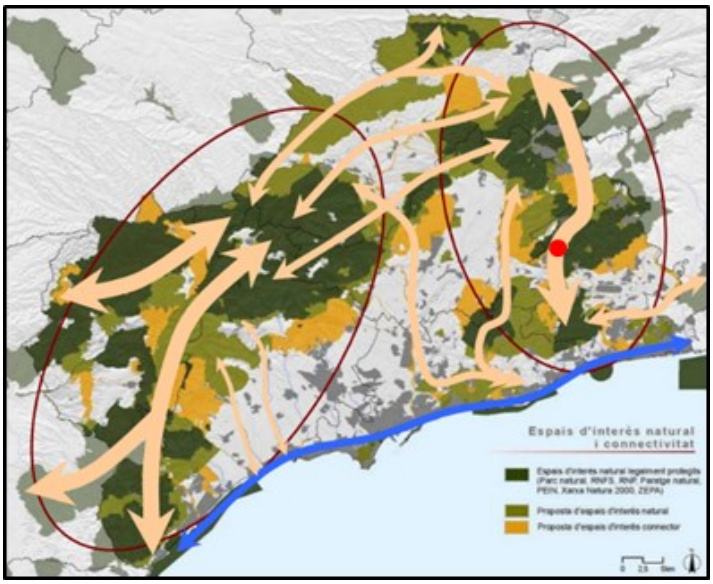
The Green Infrastructure Program of Catalonia (PIVC), promoted by the Department of Territory, Housing, and Ecological Transition of the Government of Catalonia, was established in 2017 in response to the need to take proactive and planned action to reverse the trends of biodiversity loss and the increase in fragmentation and degradation of ecosystems. The PIVC has materialized in the study, development, and promotion of more than 100 environmental actions spread throughout Catalonia, developed through its own resources and European funds.

Among the different actions, it is worth highlighting the construction of a new wildlife-specific overpass on the C-51 road at its passage through the Santa Cristina mountain pass, in the municipality of Rodonyà, with work having begun last November. This new structure aims to contribute to the de-fragmentation of natural and semi-natural habitats that serve as land connectors between the Serra de Bonastre and the Montmell-Marmellar, both Natura 2000 natural areas and PEIN (Pla d'Espais d'Interès Natural de Catalunya), which are affected by the intrusion of the C-51 at a critical point in the Camp de Tarragona.

The topographic design of the wildlife crossing will take advantage of the trench section of the surrounding area. Specifically, the crossing will consist of a bridge supported by concrete beams fixed at both ends of the road embankments with abutments. It will have a width of 32m and a length of 40m, topped with soil that will host shrub vegetation and lateral wooden screens.

The project has an execution time of 7 months and a material budget of €1,100,000, funded through European Recovery and Resilience Facility (Next Generation EU) funds.

Source: PTP of Camp de Tarragona



Main ecological connectivity flows of the Camp de Tarragona. The red dot indicates the area of intervention.

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PUBLICATIONS

Given the high number of scientific publications related to the theme of the newsletter, this issue includes only those that meet the following criteria: (1) they are published documents, (2) they are representative or applicable to the Iberian context, and (3) they focus, at least, on a taxonomic group rather than specific species.

- Ascensão, F., Barrientos, R. & D'Amico, M. (2024). A framework for large-scale risk assessment of road-related impacts, with application to mustelids. Global Ecology and Conservation, 56, e03329. https://doi.org/10.1016/j.gecco.2024.e03329

- Falcão Rodrigues, L., Mata Estacio, C., Herranz Barrera, J., Santamaría Figueroa, A. E. & Malo Arrázola, J. E. (2024). High-speed railway infrastructure leads to species-specific changes and biotic homogenisation in surrounding bird community. Plos one, 19(4), e0301899. https://doi.org/10.1371/journal.pone.0301899

- Keken, Z., Wimmerová, L., Šolcová, O., Kušta, T. & Dvořáková, P. (2024). Olfactory Repellents in Road Ecology: What We Know and What to Focus on in the Future. Sustainability, 16(14), 5920. https://doi.org/10.3390/su16145920

- Märtz, J., Brieger, F. & Bhardwaj, M. (2024). Crossings and collisions–Exploring how roe deer navigate the road network. Landscape Ecology, 39(5), 1-15. https://doi.org/10.1007/s10980-024-01897-x

- Meinzen, T. C., Burkle, L. A. & Debinski, D. M. (2024). Roadside habitat: Boon or bane for pollinating insects?. BioScience, 74(1), 54-64. https://doi.org/10.1093/biosci/biad111

- Morelli, F., Benedetti, Y., Arslan, D. & Delgado, J. (2024). Crepuscular and small but not evolutionary unique species are the reptiles less affected by roadkill in Europe. Oikos, 2024(11), e10785. https://doi.org/10.1111/oik.10785

- Pinto, T., Sillero, N., Mira, A. & Santos, S. M. (2024). Using the dead to infer about the living: Amphibian roadkill spatiotemporal dynamics suggest local populations' reduction. Science of the Total Environment, 927, 172356. https://doi.org/10.1016/j.scitotenv.2024.172356

- Pinto, T., Sillero, N., Mira, A., Sousa, L. G., Oliveira, A. & Santos, S. M. (2024). Effectiveness of permanent drift fences in reducing roadkill risk of amphibians. Journal of Environmental Management, 368, 122049. https://doi.org/10.1016/j.jenvman.2024.122049

- Showers, M. M., & Rotman, R. M. (2024). Integrative highway rights-of-way management to reduce stormwater run-off and enhance habitat. Restoration Ecology, e14350. https://doi.org/10.1111/rec.14350

- Soanes, K., Rytwinski, T., Fahrig, L., Huijser, M. P., Jaeger, J. A., Teixeira, F. Z., et al. (2024). Do wildlife crossing structures mitigate the barrier effect of roads on animal movement? A global assessment. Journal of Applied Ecology, 61(3), 417-430. https://doi.org/10.1111/1365-2664.14582

For further information on the topic, the European manual *IENE Biodiversity and Infrastructure* (2023) compiles publications and websites with up-to-date information on best practices and guidelines regarding transport ecology in different countries.

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UPCOMING CONGRESSES AND CONFERENCES

ICOET

With the slogan "Bridging Divides Through Collaboration," this conference focuses on sharing knowledge and collaboratively addressing various ecological, cultural, and institutional issues related to the impacts of transportation and other linear infrastructures. It is held in Denver, Colorado (USA) from May 11 to 15.

1st Conference on Sustainable and Resilient Roads

Organized by the Technical Association of Roads (ATC) and under the slogan "Commitment to Responsible Transport," this conference aims to promote solutions for sustainable and resilient roads, focusing on decarbonization, climate resilience, and environmental impacts. It will be held in Segovia, Castilla y León, on February 25 and 26.

III meeting of the Iberian Ecological Society (SIBECOL) y XVII National Congress of the Spanish Association of Terrestrial Ecology (AEET)

With the slogan "Another Science is Possible: Diversity, Degrowth, and Sustainability in Ecological Research," this congress, organized by the Iberian Society of Ecology (SIBECOL) together with the Spanish Association of Terrestrial Ecology (AEET), aims to inspire positive change in the field of ecology. It will be held in Pontevedra, from June 2 to 7.

ITF 2025: Transport Resilience to Global Shocks

The summit will delve into how governments will ensure the continuity of transportation systems amid current and future disruptions, such as natural disasters, pandemics, cyberattacks, and geopolitical crises. One of the sessions will focus on the development of transportation infrastructure in response to the climate crisis and the protection of biodiversity.

It will take place from May 21 to 23 in Leipzig (Germany).

CONGRESSES AND CONFERENCES HELD

IENE 2024

With the slogan "Biodiversity at the Heart of Future Transport," the IENE association organized its traditional biennial meeting in Prague, from September 9 to 13, 2024, in a hybrid format (in-person and online). A highlight was the participation of Manuel Oñorbe, representing MITECO, to present the EDHILT.

Northeastern Transportation & Wildlife Conference 2024

he conference focused on the theme "Small Scales, Big Wins: Partnering to Improve Transport Brings Cumulative Benefits for Biodiversity."

It took place in Mystic, Connecticut (USA), from September 8 to 11, 2024.

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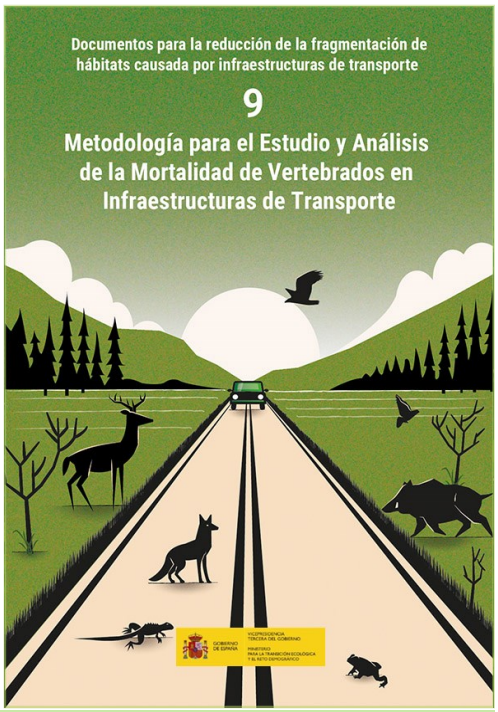
WORKING GROUP DOCUMENTS

Latest Publications

Identification of Areas to Fragment to Reduce the Impacts of Linear Transport Infrastructure on Biodiversity. Second Expanded and Revised Edition.



Methodology for the Study and Analysis of Vertebrate Mortality in Transport Infrastructure.

Previous publications

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- Publication produced within the framework of the Habitat Fragmentation Caused by Transport Infrastructure project, promoted by the Sub-Directorate General for Terrestrial and Marine Biodiversity of the Directorate-General for Biodiversity, Forests, and Desertification.
- If you wish to submit information for publication, you can send it here.
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- Editaed by: Ministry for Ecological Transition and the Demographic Challenge. NIPO: 665-20-056-2. Catalogue of Publications of the General State Administration: https://cpage.mpr.gob.es/.

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