

Carnívoros en las carreteras:

lo que *sabemos* y lo que aún *no* sabemos



Clara Grilo

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BIOPOLIS

Carnívoros en las carreteras ...en el Mundo

Molecular Ecology (2006) 15, 1733–1741 doi: 10.1111/j.1365-294X.2006.02907.x

FAST-TRACK

A southern California freeway is a physical and social barrier to gene flow in carnivores

SETH P. D. RILEY,*†JOHN P. POLLINGER,*RAYMOND M. SAUVAJOT,*ERIC C. YORK,†CASSITY BROMLEY,†TODD K. FULLER†and ROBERT K. WAYNE*

*Department of Ecology and Evolutionary Biology, 621 Charles Young Dr. South, University of California, Los Angeles, CA 90095, USA, †Santa Monica Mountains National Recreation Area, National Park Service, 401 W. Hillcrest Dr., Thousand Oaks, CA 91360, USA, ‡Department of Natural Resources Conservation, Holdsworth Natural Resources Center, 160 Holdsworth Way, Amherst, MA 01003-9285, USA



Canis latrans

Efecto barrera

Molecular Ecology (2006) 15, 1733–1741

doi: 10.1111/j.1365-294X.2006.02907.x

FAST-TRACK

A southern California freeway is a physical and social barrier to gene flow in carnivores

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Lynx rufus

Efecto barrera



Chrysocyon brachyurus

Mortalidad

Received: 9 December 2020 | Revised: 10 April 2021 | Accepted: 13 April 2021
DOI: 10.1002/evl.2655

ORIGINAL RESEARCH

Ecology and Evolution WILEY

Do all roads lead to resistance? State road density is the main impediment to gene flow in a flagship species inhabiting a severely fragmented anthropogenic landscape

Katharina Westekemper¹ | Annika Tiesmeyer^{2,3} | Katharina Steyer^{2,3} | Carsten Nowak² | Johannes Signer¹ | Niko Balkenhol¹



Felis silvestris

Efecto barrera

Carnívoros en las carreteras

...en la P. Iberica

Los carnívoros *no responden todos*
de la misma manera a las carreteras



Lobo gris



Oso pardo



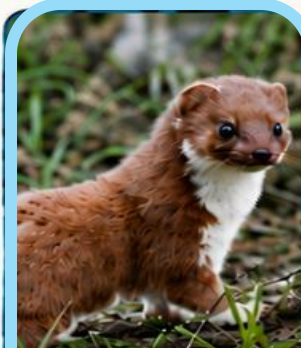
Lince ibérico



Gato montés



Zorro rojo



Comadreja



Armiño



Turón



Marta



Visón europeo



Garduña



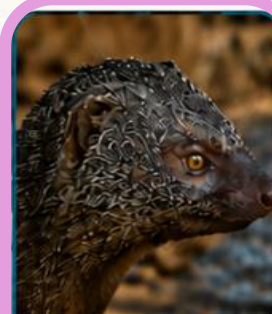
Tejón



Gineta



Nutria



Meloncillo

Carnívoros en las carreteras

*¿Evitan los carnívoros las carreteras?
¿Cómo afectan sus poblaciones?*

Las carreteras no son siempre evitadas:



Algunas especies
las **evitan**



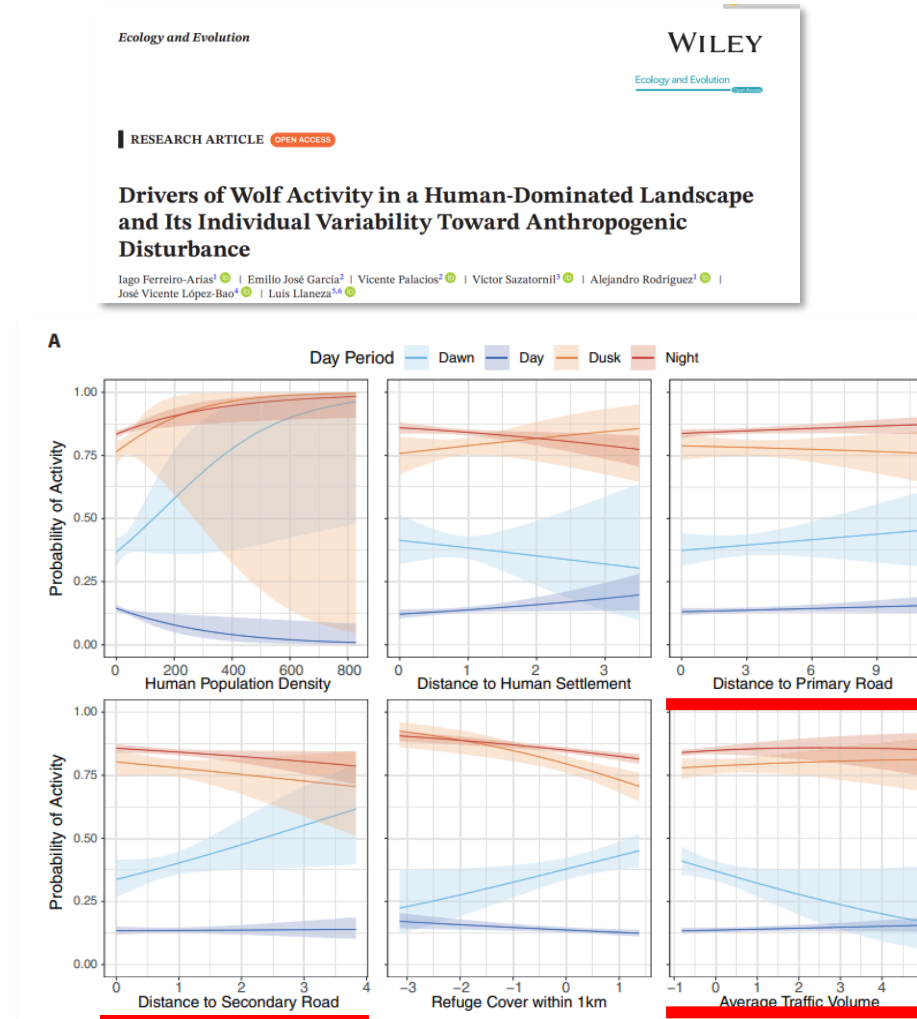
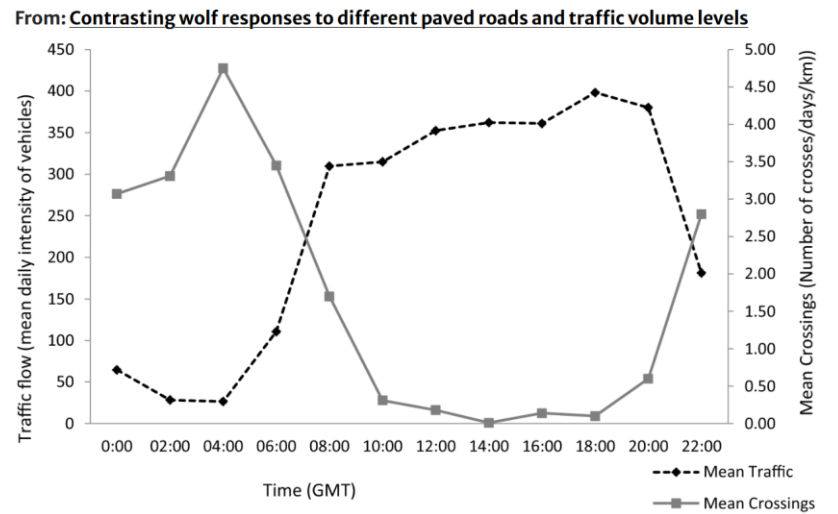
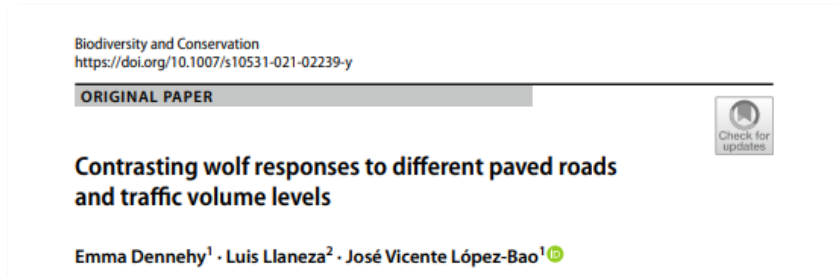
Otras
las **cruzan**



Otras incluso
utilizan sus
proximidades

Carnívoros en las carreteras

Lobo *Evita* las carreteras durante el dia



Carnívoros en las carreteras

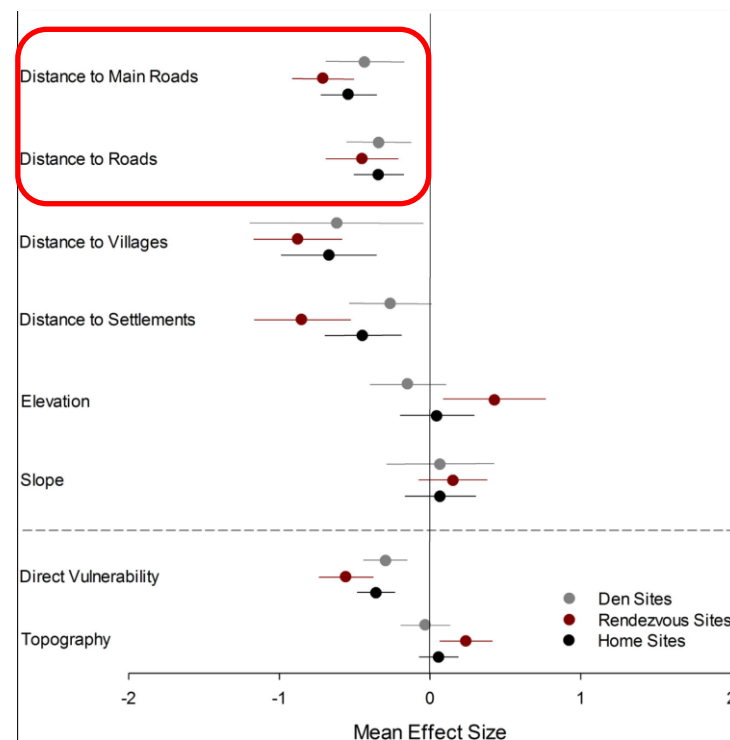
Lobo *Evita* las carreteras



Review

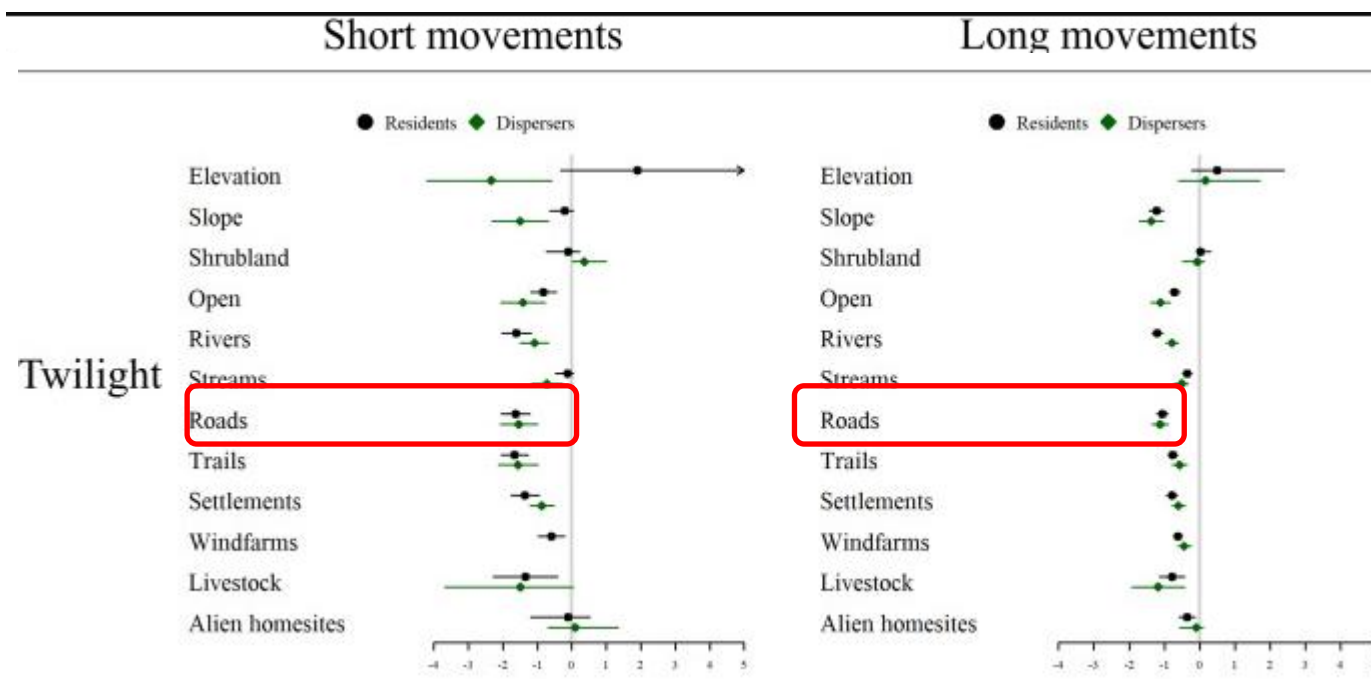
The role of human-related risk in breeding site selection by wolves

Victor Sazatornil^a, Alejandro Rodríguez^b, Michael Klaczek^c, Mohsen Ahmadi^d, Francisco Álvares^e, Stephen Arthur^f, Juan Carlos Blanco^g, Bridget L. Borg^h, Dean Cluffⁱ, Yolanda Cortés^j, Emilio J. García^k, Eli Geffen^l, Bilal Habib^m, Yorgos Iliopoulosⁿ, Mohammad Kaboli^o, Miha Krofel^p, Luis Llaneza^q, Francesca Marucco^r, John K. Oakleaf^s, David K. Person^t, Hubert Potočník^u, Nina Ražen^v, Helena Rio-Maior^e, Håkan Sand^w, David Unger^x, Petter Wabakken^y, José Vicente López-Bao^{z,aa,*}



Designing the landscape of coexistence: Integrating risk avoidance, habitat selection and functional connectivity to inform large carnivore conservation

Helena Rio-Maior^{a,b,*}, Mónica Nakamura^a, Francisco Álvares^a, Pedro Beja^{a,c}



Carnívoros en las carreteras

Garduña/Geneta/Téjon *no Evitan las carreteras*

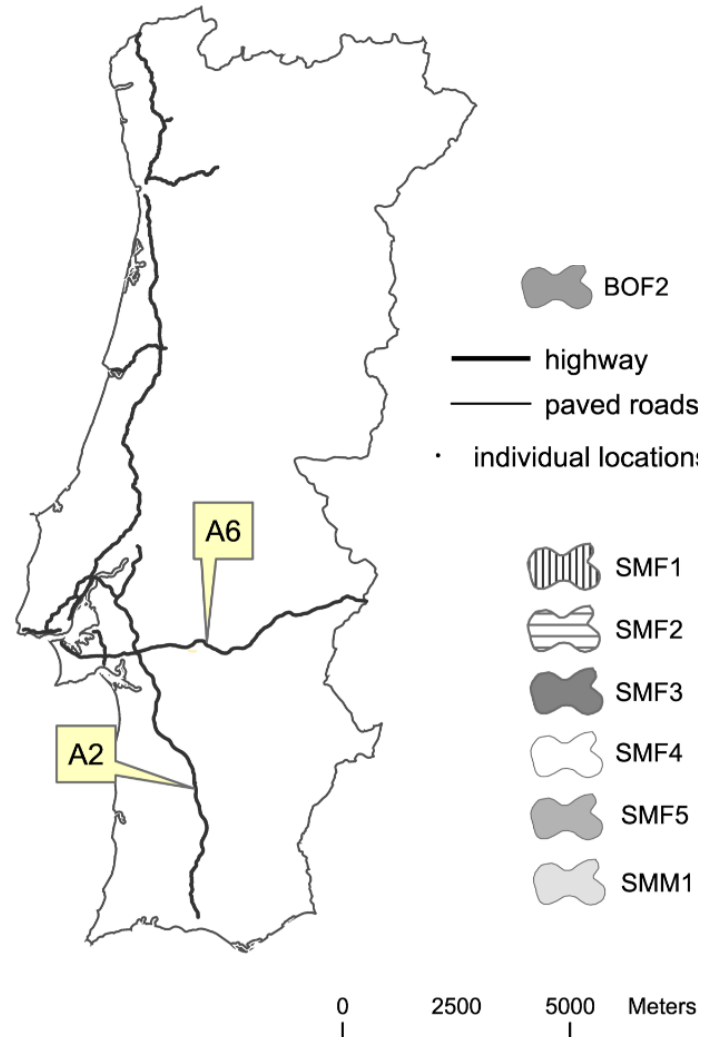
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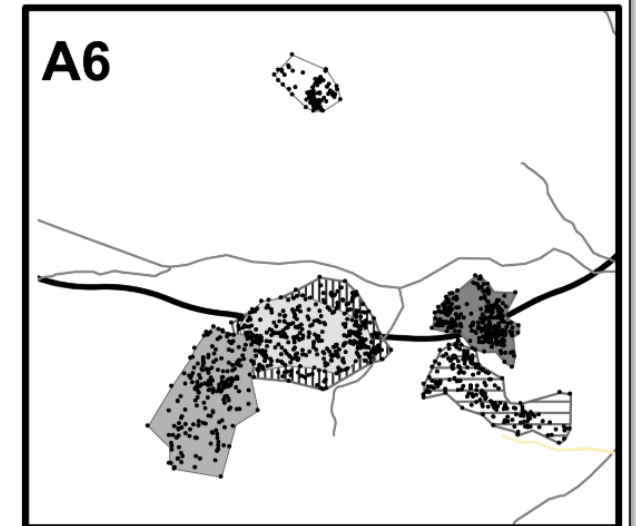
Individual Spatial Responses towards Roads: Implications for Mortality Risk

Clara Grilo^{1,2,3}, Joana Sousa¹, Fernando Ascensão¹, Hugo Matos¹, Inês Leitão¹, Paula Pinheiro¹, Monica Costa¹, João Bernardo¹, Dyana Reto¹, Rui Lourenço³, Margarida Santos-Reis¹, Eloy Revilla²

¹ Centro de Biologia Ambiental, University of Lisboa, Lisboa, Portugal, ² Department of Conservation Biology, Estación Biológica de Doñana-Consejo Superior de Investigaciones Científicas, Seville, Spain, ³ Institute of Mediterranean Agrarian and Environmental Sciences, University of Évora, Évora, Portugal

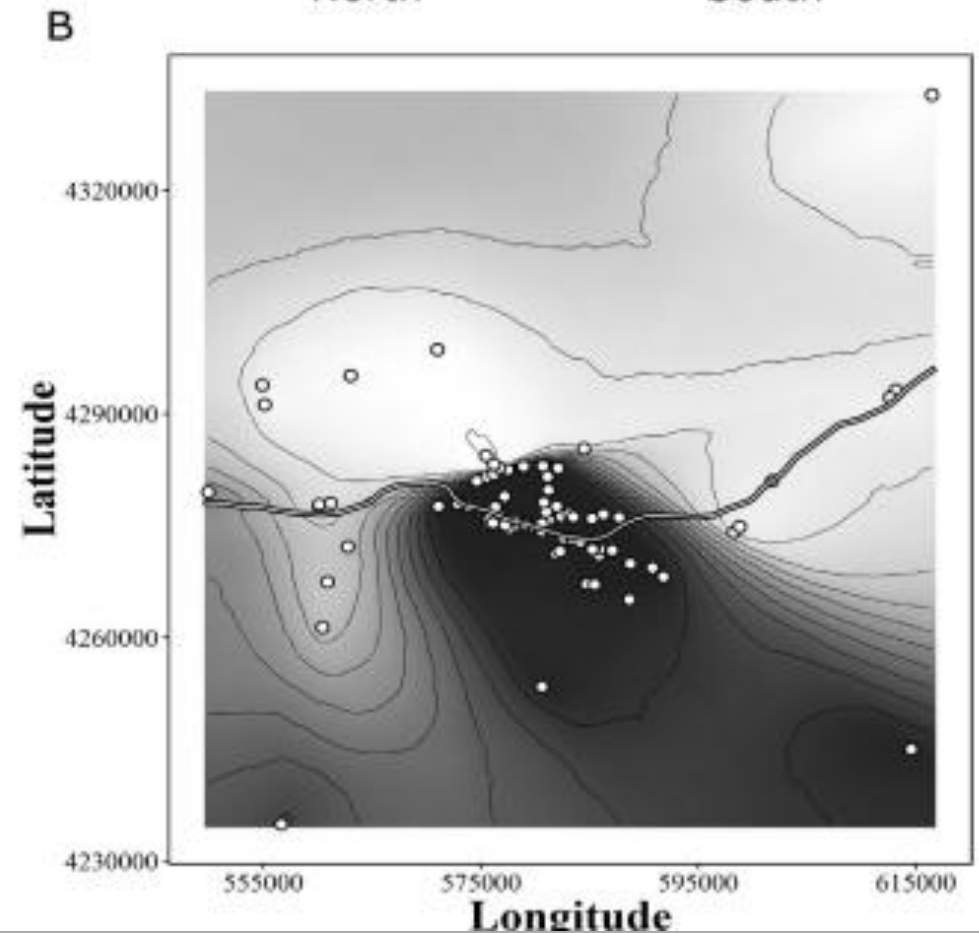
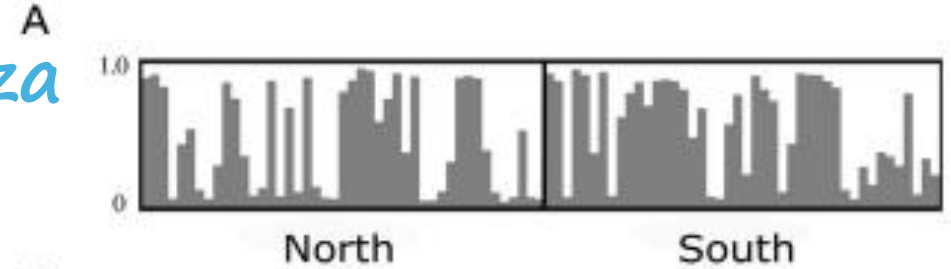


- A-6 fue construida en 1995
- 8.373 vehículos/día,
- 3.011 vehículos/día circulan entre las 18:00 y las 06:00 horas.



Carnívoros en las carreteras

Geneta evita las autopista pero cruza



Carnívoros en las carreteras

Tejoneras cerca de las carreteras

Biodiversity and Conservation (2018) 27:2951–2970
<https://doi.org/10.1007/s10531-018-1580-4>

ORIGINAL PAPER



Drivers of sett site location by European badgers in Portugal

Dário Hipólito¹ · Diana Guedes¹ · Diogo Cabecinha² · Ana Serronha³ · Clara Grilo^{1,4} · Margarida Santos-Reis² · Pedro Monterroso³ · João Carvalho^{1,5} · Carlos Fonseca¹ · Xosé Pardavila⁶ · Emílio Virgós⁷ · Luís M. Rosalino¹

Received: 15 December 2017 / Revised: 2 June 2018 / Accepted: 12 June 2018 / Published online: 15 June 2018
© Springer Nature B.V. 2018

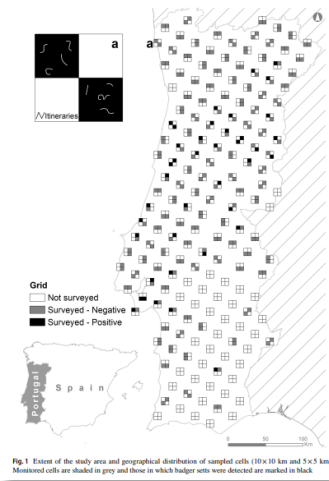


Table 4 Principal Component Analysis (PCA) variable loadings (i.e. representing the correlations between the original covariates and the principle components) used in the GLMM models, reflecting covariates included in the best models (see Table 1 for descriptions of covariates)

Covariate	PC1_AD Loading	PC4_AD Loading
Anthropogenic disturbance		
2-lane paved road (distance)	−0.474	0.720
Hunting area	0.295	0.502
Houses	−0.598	0.062
Pollution	0.054	0.017
Wind farms	0.003	0.001
Livestock	− 0.080	− 0.028
Human presence	0.040	−0.045
Unpaved road	− 0.404	− 0.122
4-lane highway (distance)	− 0.395	− 0.456

High correlated variables showing similar relationships in both principle components (i.e. both positive or both negative) are in bold

Carnívoros en las carreteras

Zorros, las garduñas, y las comadreja hicieron un uso más intensivo de las zonas próximas a la autopista

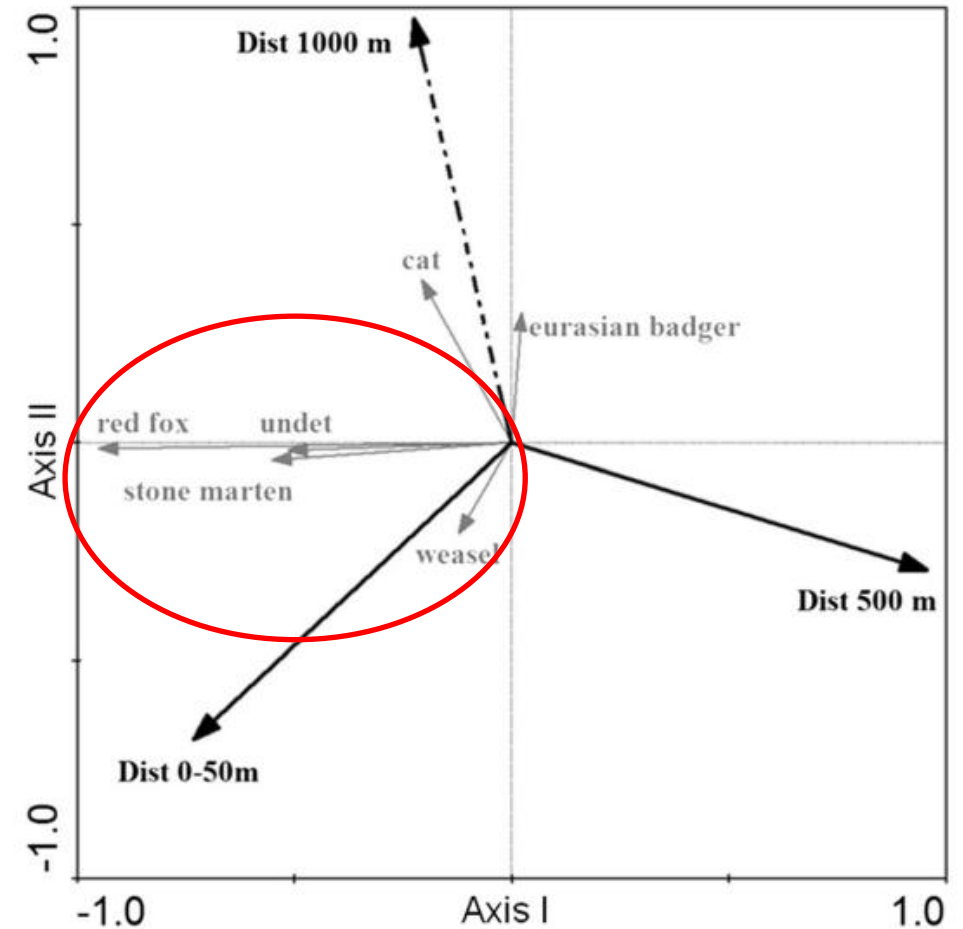
Eur J Wildl Res (2017) 63: 64
DOI 10.1007/s10344-017-1118-1



ORIGINAL ARTICLE

Small-scale alterations in carnivore activity patterns close to motorways

Cristina Mata¹ • Pablo Ruiz-Capillas^{1,2} • Juan E. Malo¹



Carnívoros en las carreteras

Las carreteras no son siempre evitadas:



Algunas especies
las **evitan**



Otras
las **cruzan**



Otras incluso
utilizan sus
proximidades

.....esto puede modificar interacciones ecológicas y el riesgo de atropello

Carnívoros en las carreteras

Gatos monteses dedicaron **más tiempo a cazar** con tráfico intenso
Éxito de caza no se vio afectado

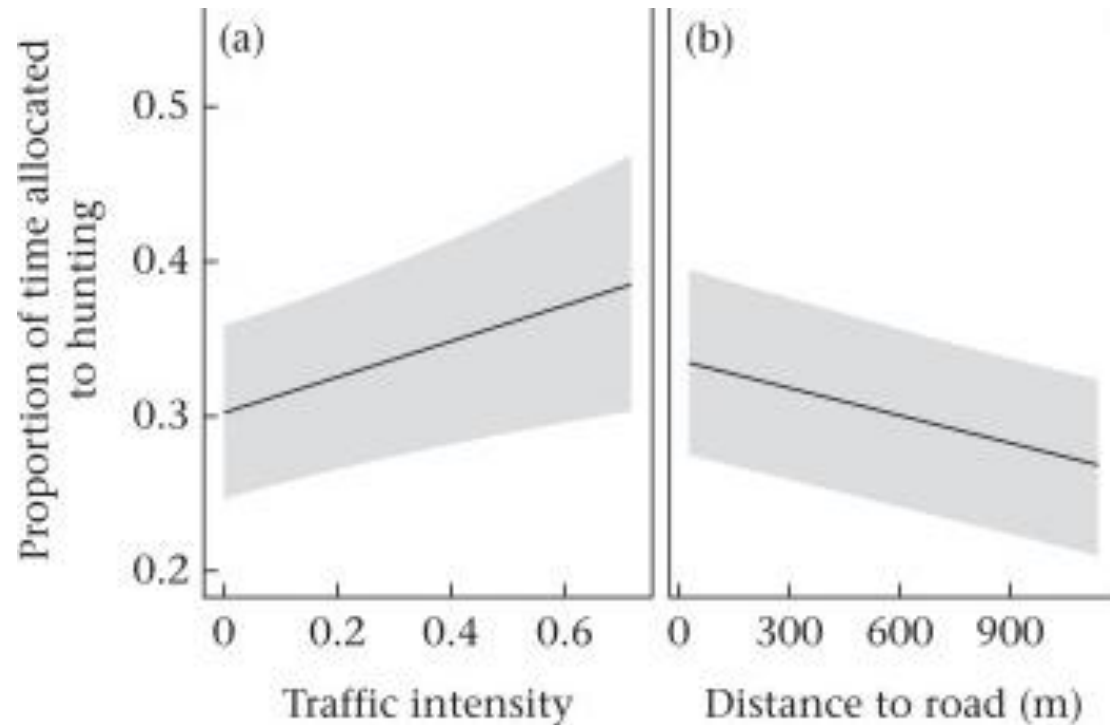


Animal Behaviour
Volume 207, January 2024, Pages 131-146



Humans and traffic influence European wildcat behaviour in pastoral landscapes

Héctor Ruiz-Villar ^a ✉, Ana Morales-González ^b, José Vicente López-Bao ^{a,1}, Francisco Palomares ^{b,1}



Carnívoros en las carreteras

Cambios en las interacciones depredador-presa



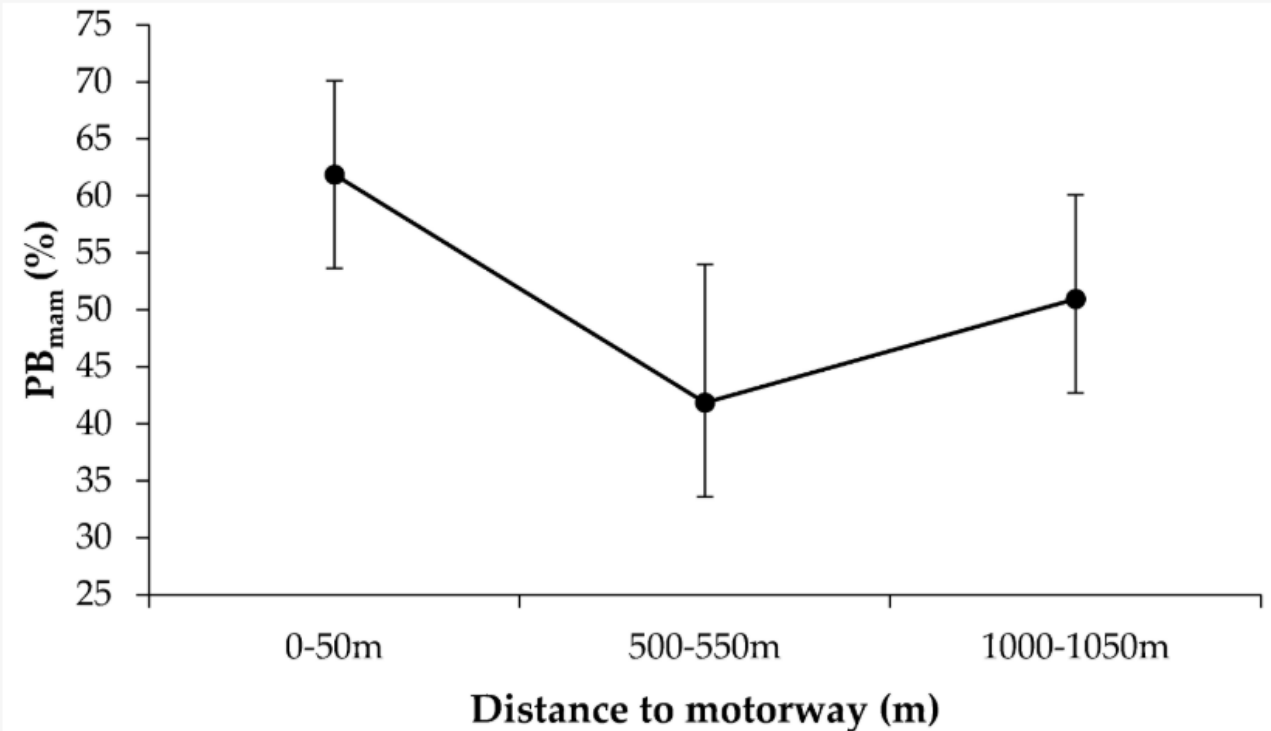
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Open Access Article

Do Roads Alter the Trophic Behavior of the Mesocarnivore Community Living Close to Them?

by Pablo Ruiz-Capillas¹ , Cristina Mata^{1,2,*} , Beatriz Fernández¹ , Carlos Fernandes^{3,4} and Juan E. Malo^{1,2}



Carnívoros en las carreteras

Atropellos *aumentan* en zonas
de abundancia de presas

Journal of Environmental Management 247 (2019) 644–650



Contents lists available at ScienceDirect

Journal of Environmental Management

journal homepage: www.elsevier.com/locate/jenvman



Research article

Factors influencing predator roadkills: The availability of prey in road verges

Carmo Silva^{a,b,*}, M. Paula Simões^{a,1}, António Mira^{a,b}, Sara M. Santos^{a,b}

^a Instituto de Ciências Agrárias e Ambientais Mediterrânicas, Universidade de Évora, Pólo da Mitra, 7002-554, Évora, Portugal

^b Unidade de Biologia da Conservação, Departamento de Biologia, Universidade de Évora, Pólo da Mitra, 7002-554, Évora, Portugal

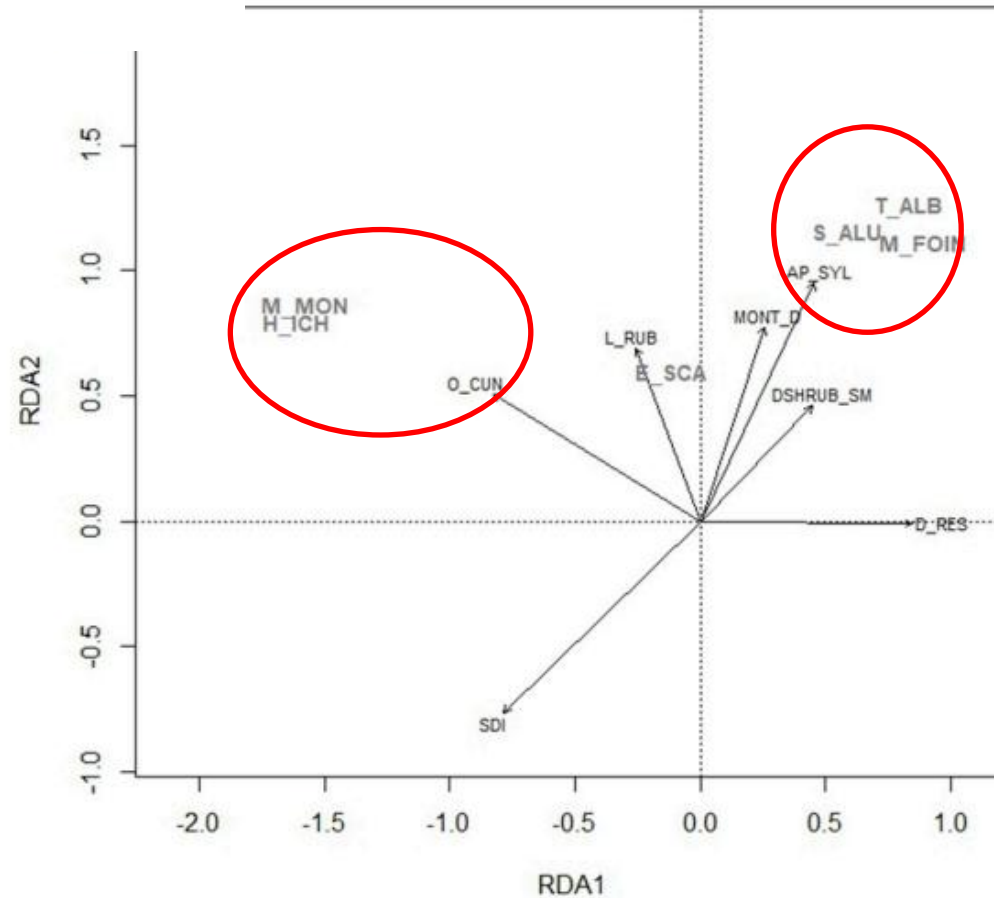


Fig. 2. Ordination biplot for the first two axes of total RDA. Explanatory variables are represented by black arrows and response variables (predator species) by bold grey acronyms (see [Table 1](#) for variables acronyms; source: [R](#)

Carnívoros en las carreteras

Mammalian Biology (2024) 104:175–183
<https://doi.org/10.1007/s42991-024-00400-y>

ORIGINAL ARTICLE

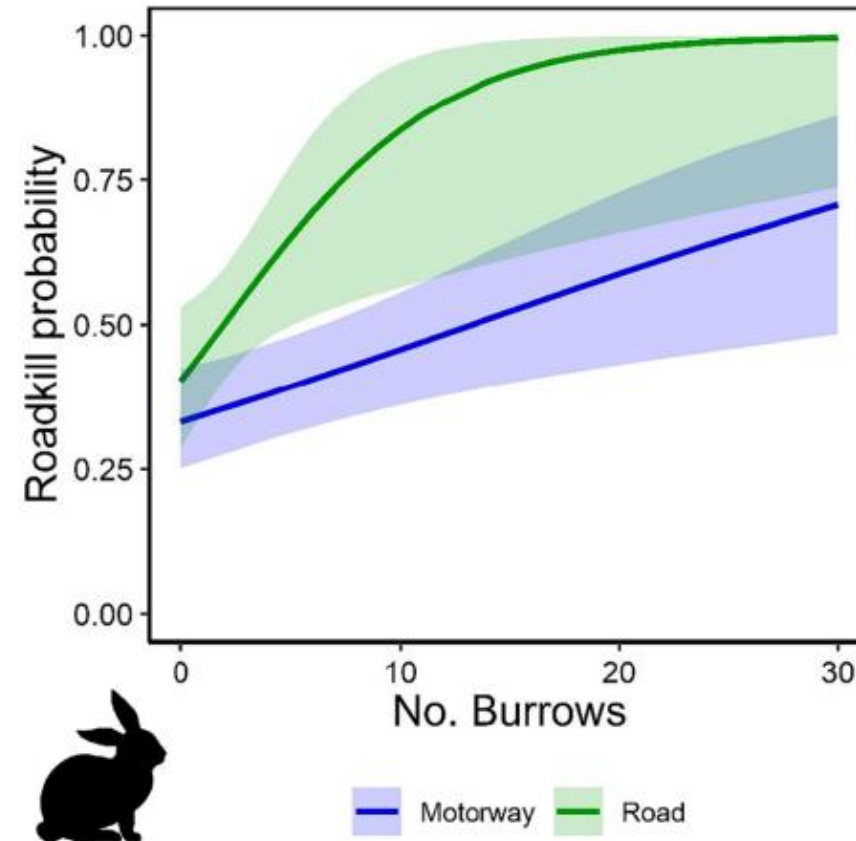
Factors determining roadkills in a mammal carnivore are road-type specific

Guillermo Carmona¹ · Emilio Virgós² · Tamara Burgos² · Rafael Barrientos¹

Received: 10 May 2023 / Accepted: 23 January 2024 / Published online: 16 February 2024
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Atropellos de turón asociados con la abundancia de madrigueras de conejo.



Carnívoros en las carreteras



*¿Qué carnívoros mueren
más en las carreteras?*



*¿Qué impacto tienen
sobre sus poblaciones?*



No basta saber cuántos animales mueren.

**Tenemos que saber qué significa esa mortalidad
para la población.**

Carnívoros en las carreteras

PROYECTO SAFE

STOP ATROPELLOS DE FAUNA EN ESPAÑA



Carnívoros en las carreteras

PROYECTO SAFE

STOP ATROPELLOS DE FAUNA EN ESPAÑA



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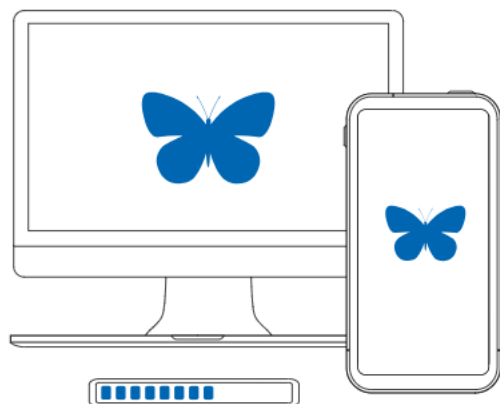
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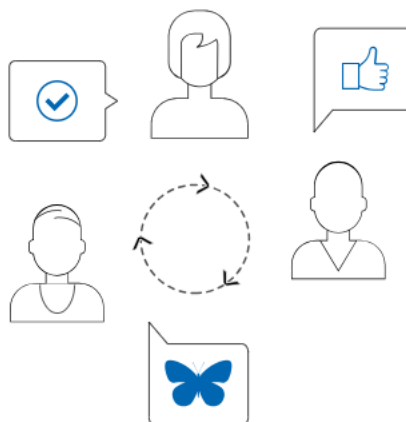
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Scientific

Figura 1. Localización de los recorridos realizados en el proyecto SAFE, en cuadrículas UTM 10x10 km.

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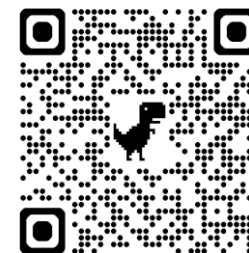


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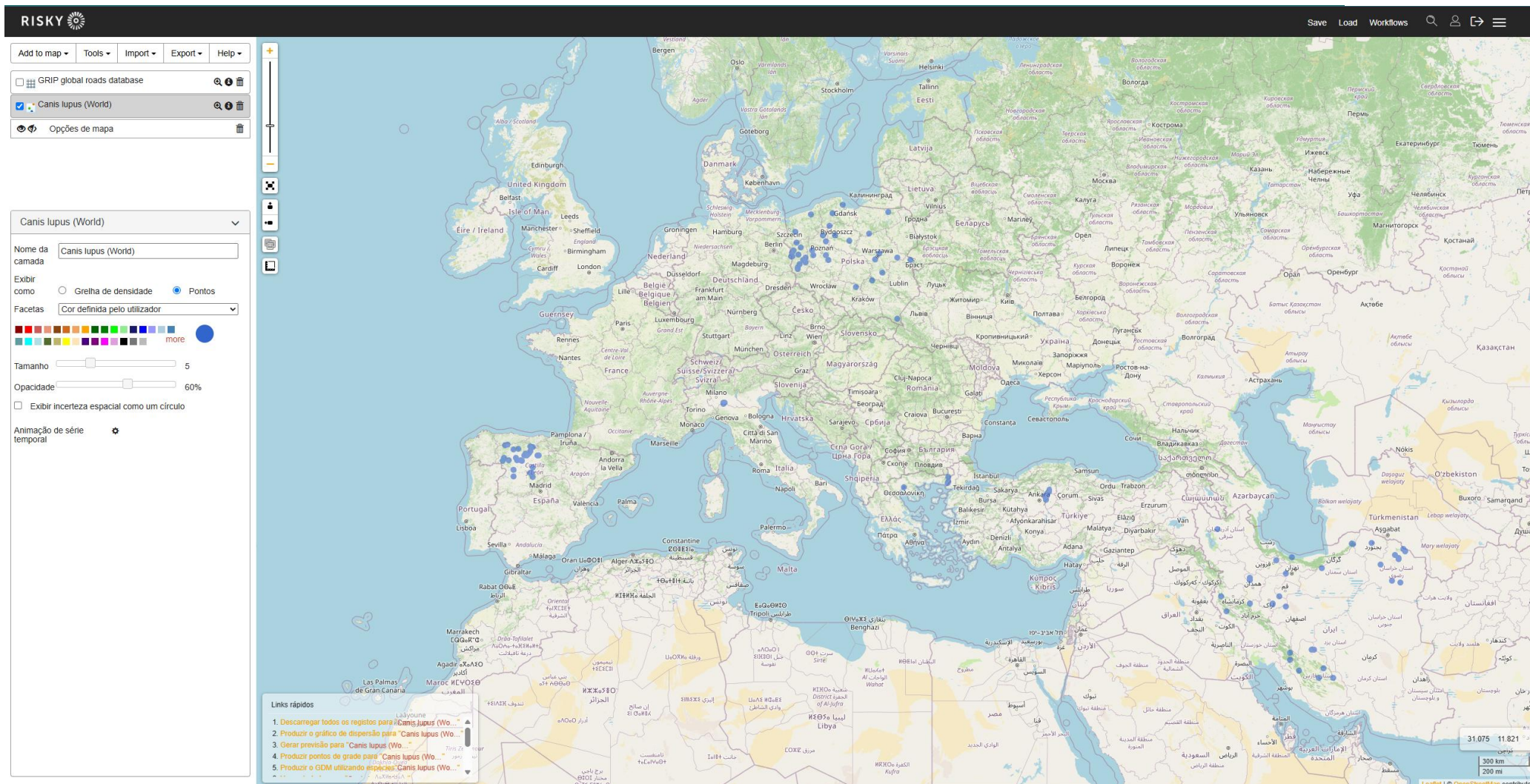
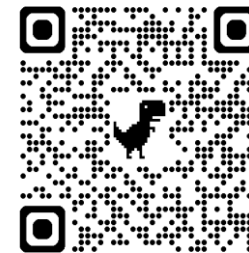
Search

Note: the simple search attempts to match a known **species/taxon** - by its scientific name or common name. If there are no name matches, a **full text** search will be performed on your query

RISKY



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Carnívoros en las carreteras

Los atropellos son la principal causa de mortalidad



	No. atropellos	Población	% de pob atropellada
2024	162	2401	6.7%
2023	144	2021	7.1%

~76% de la mortalidad detectada

Carnívoros en las carreteras

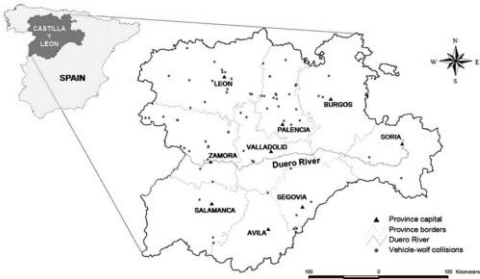
Mayor mortalidad en autopistas y carreteras con cercas

Eur J Wildl Res (2011) 57:399–409
DOI 10.1007/s10344-010-0446-1

ORIGINAL PAPER

Factors influencing wolf *Canis lupus* roadkills in Northwest Spain

Victor Javier Colino-Rabanal • Miguel Lizana • Salvador J. Peris



		Coefficient (B)	Std. error	Wald	p (> z)	Odds ratio
TM	Intercept α	-9.98	1.09	-9.19	<0.001	
	Speed	0.04	0.01	3.56	<0.001	1.043
	Sinuosity	-0.02	0.03	-0.79	0.427	0.980
	Fences	1.01	0.50	2.02	0.044	2.743
LM1000	Intercept α	-5.276	0.597	-8.83	<0.001	
	Unirrigated1000	0.004	0.005	0.94	0.350	1.004
	Irrigated1000	0.009	0.006	1.47	0.140	1.009
	ED1000	-0.004	0.006	-0.77	0.440	0.996
LM5000	Intercept α	-5.246	0.855	-6.13	<0.001	
	Forest5000	-0.003	0.011	-0.23	0.822	0.997
	Unirrigated5000	0.003	0.008	0.39	0.699	1.003
	Irrigated5000	0.017	0.009	1.82	0.068	1.017
AM	ED5000	-0.005	0.011	-0.5	0.614	0.995
	Intercept α	-1.963	0.282	-6.97	<0.001	
	Municbordi	-0.042	0.018	-2.31	0.021	0.958
TM+AM	Popularea	0.018	0.012	1.44	0.151	1.018
	Intercept α	-5.764	1.177	-4.9	<0.001	
	Speed	0.039	0.012	3.26	0.001	1.040
	Sinuosity	-0.022	0.026	-0.86	0.392	0.978
	Fences	1.160	0.511	2.27	0.023	3.191
	Municbord	-0.034	0.020	-1.7	0.089	0.967
	Popularea	0.031	0.014	2.18	0.029	1.032

Carnívoros en las carreteras

Mayor mortalidad de guarduñas durante el periodo de alimentación de las crías



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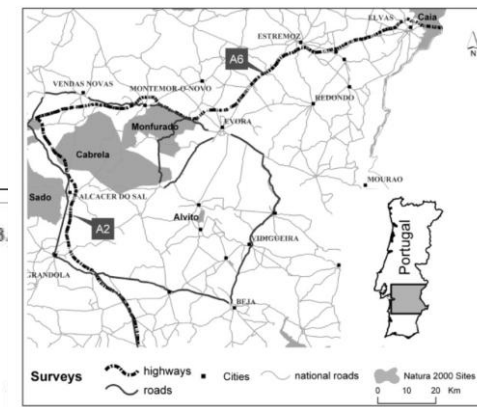
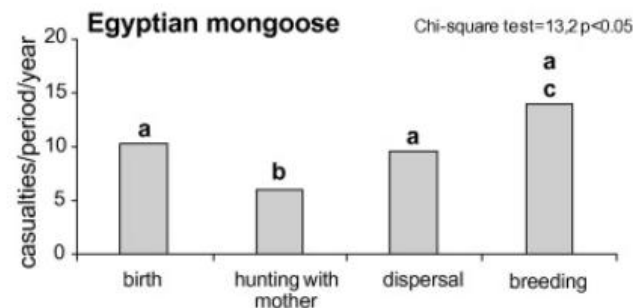
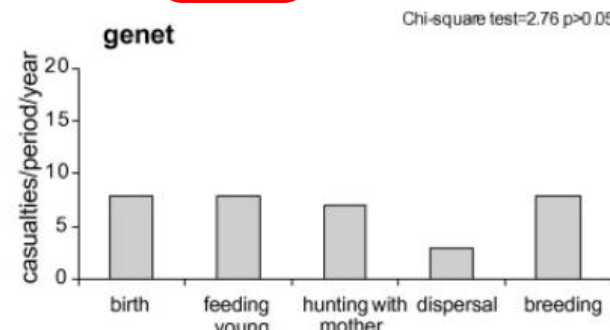
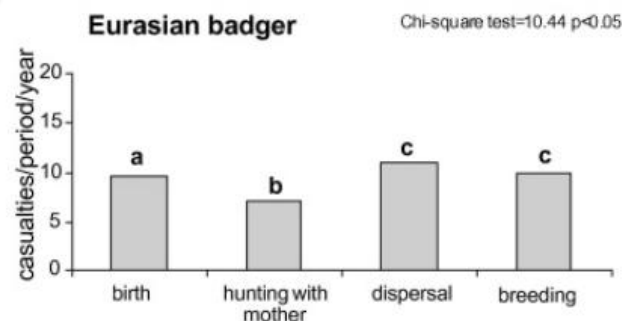
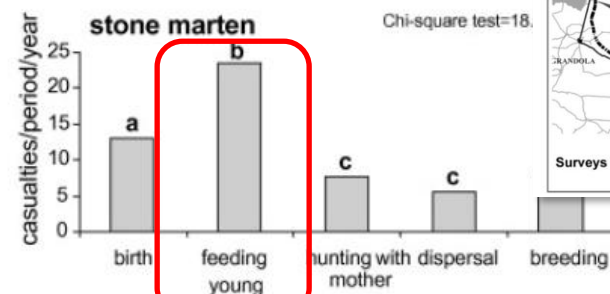
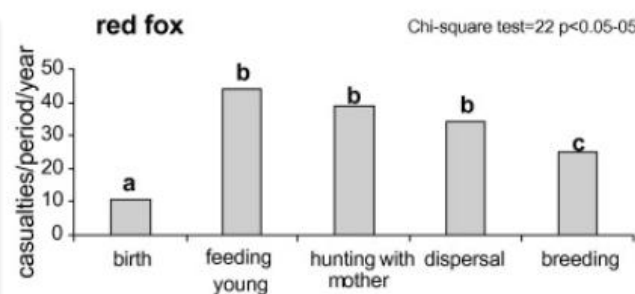
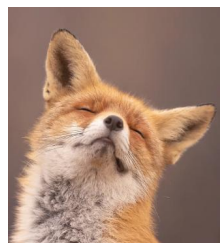


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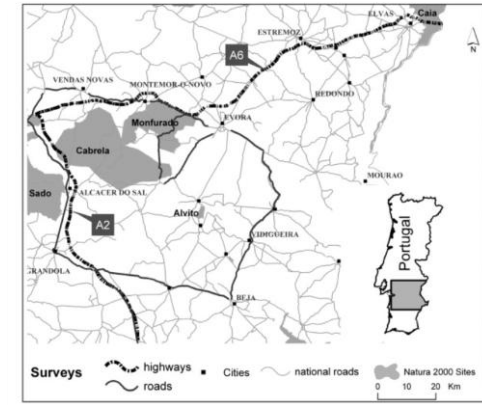
Spatial-temporal patterns in Mediterranean carnivore road casualties: Consequences for mitigation

Clara Grilo^{a,*}, John A. Bissonette^b, Margarida Santos-Reis^a

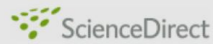


Carnívoros en las carreteras

Las curvas aumentan el riesgo de atropello



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Spatial-temporal patterns in Mediterranean carnivore road casualties: Consequences for mitigation

Clara Grilo^{a,*}, John A. Bissonette^b, Margarida Santos-Reis^a



Table 4 – Logistic regression of five species models with the selected variables, coefficients (β) standard error (SE(β)), Wald test and p-value, model accuracy and validation.

Species	Variables	β	SE	Wald	p-Value	Model accuracy (%) ^a			Validation (%) ^a		
						%ccp	%cca	%tcc	%ccp	%cca	%tcc
Red fox	URBAN	−0.022	0.0110	4.154	0.042	60	60	60	94	18	56
	N_PASSAGES	0.373	0.0980	14.370	0.000						
	Constant	−0.278	0.14d2	3.818	0.051						
Stone marten	NR	1.256	0.004	8.447	0.000	64	73	69	64	67	65
	OAKWOOD	0.012	0.333	14.275	0.004						
	Constant	−1.417	0.353	16.108	0.000						
Eurasian badger	URBAN	−0.062	0.0300	4.371	0.037	68	68	68	67	73	70
	D_ROAD	0.001	0.0000	8.019	0.005						
	Constant	−0.367	0.2870	1.636	0.201						
Genet	D_CURVE	−0.0003	0.0001	7.917	0.005	78	40	59	81	41	62
	Constant	0.373	0.2110	3.127	0.077						
Egyptian mongoose	D_CURVE	−0.0002	0.0008	6.073	0.014	76	42	59	80	45	63
	Constant	0.302	0.1940	2.433	0.119						

^a %ccp – Correct classification of presences, %cca – correct classification of absences, %tcc – total correct classification.

Carnívoros en las carreteras

RISKY 

Iberian Carnivores on the Road:
Just a **RISKY** Crossing or an Extinction **RISK**?

©Jacinto Román

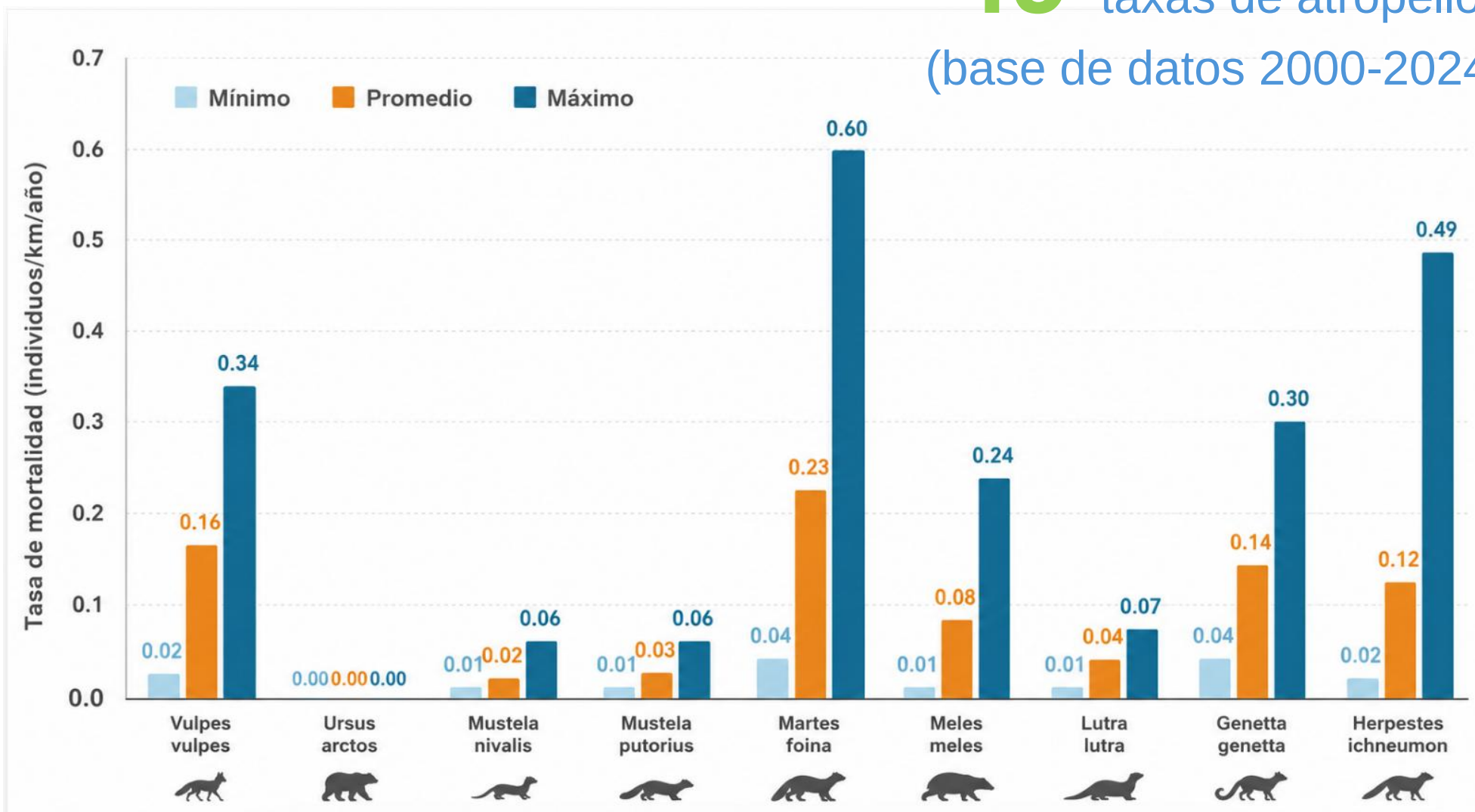
Clara Grilo, Tomé Neves, Filipa Coutinho Soares

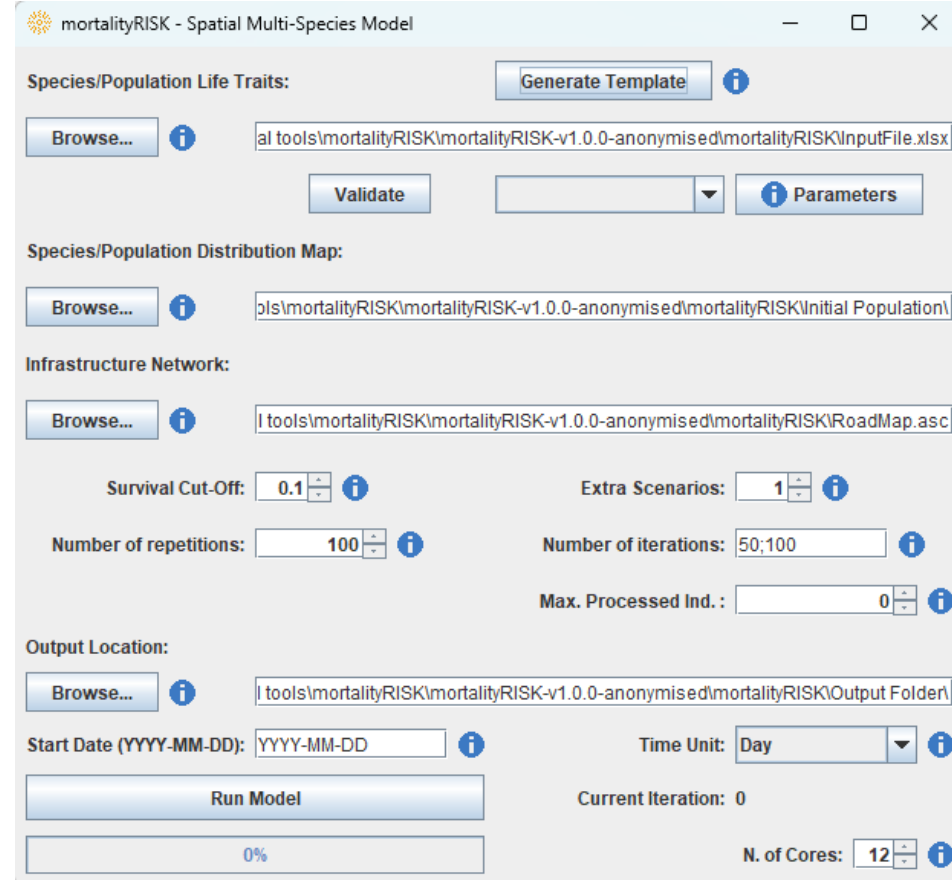


Carnívoros en las carreteras

0.13
ind/km/año

49 tasas de atropello
(base de datos 2000-2024)





Carnívoros en las carreteras



Modelo: 10x10 km | 25 años | 100 replicados



+



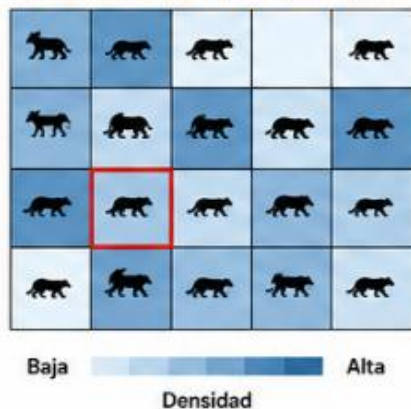
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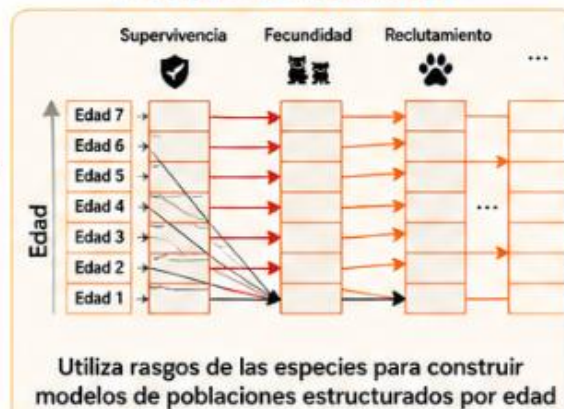
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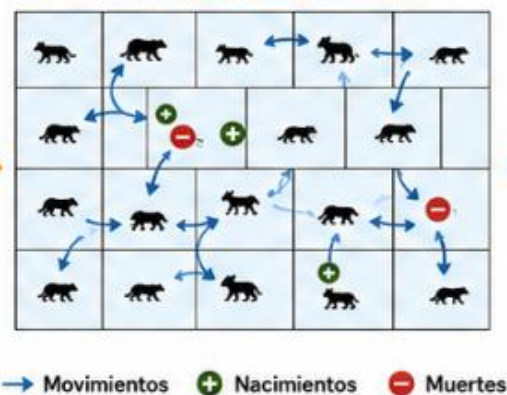
1. DENSIDAD POBLACIONAL



2. MODELO DEMOGRÁFICO



3. SIMULACIÓN ESTOCÁSTICA



4. RESULTADOS (50 AÑOS)



Carnívoros en las carreteras



Especie	Tamaño de camada (litters size)	Crías por año (litters per year)	Edad a 1ª reproducción (días)	Intervalo entre partos (días)	Longevidad máxima (meses)	Tasa de supervivencia del adulto	Densidad poblacional (ind/km²)	Rango hogar (km²)
<i>Vulpes vulpes</i>	4.6	1.0	365	365	180	0.640	0.74	3.5
<i>Ursus arctos</i>	2.2	0.4	1460	913	600	0.830	0.06	310.8
<i>Mustela nivalis</i>	5.0	1.0	202	274	120	0.473	3.63	0.1
<i>Mustela putorius</i>	5.0	1.0	224	253	168	0.320	4.11	0.5
<i>Martes foina</i>	3.8	1.1	365	365	217	0.553	4.90	2.2
<i>Meles meles</i>	3.1	1.0	365	365	194	0.730	2.17	1.2
<i>Lutra lutra</i>	2.0	1.0	1095	365	264	0.750	0.31	21.3
<i>Genetta genetta</i>	2.3	2.0	1557	183	408	0.912	0.92	10.9
<i>Herpestes ichneumon</i>	3.0	1.5	400	365	248	0.805	0.81	2.2
<i>Lynx pardinus</i>	3.0	1.0	1095	365	156	0.974–0.954	*2401	11.18–9.87

*población total

Fuentes principales:

ECOLOGY
ECOLOGICAL SOCIETY OF AMERICA

DATA PAPER | OPEN ACCESS

PanTHERIA: a species-level database of life history, ecology, and geography of extant and recently extinct mammals

Ecological Archives E090-184



Animal Diversity Web

ECOLOGY
ECOLOGICAL SOCIETY OF AMERICA

Data Paper | Free Access

An amniote life-history database to perform comparative analyses with birds, mammals, and reptiles

Ecological Archives E096-269

Nathan P. Myhrvold, Elita Baldrige, Benjamin Chan, Dhileep Sivam, Daniel L. Freeman, S. K. Morgan Ernest

Global Ecology and Biogeography

A Journal of
Macroecology

RESEARCH ARTICLE | OPEN ACCESS |

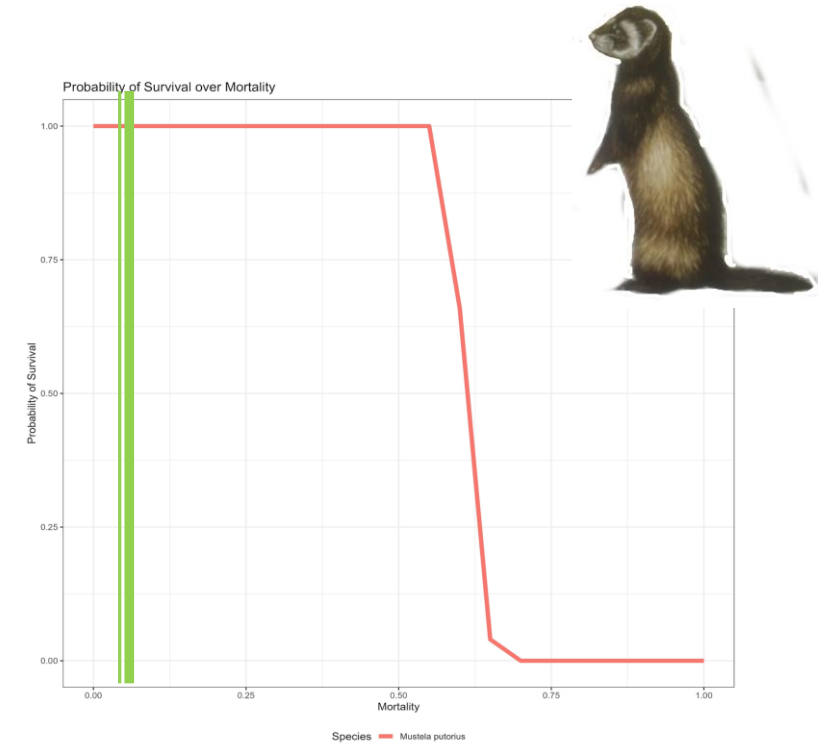
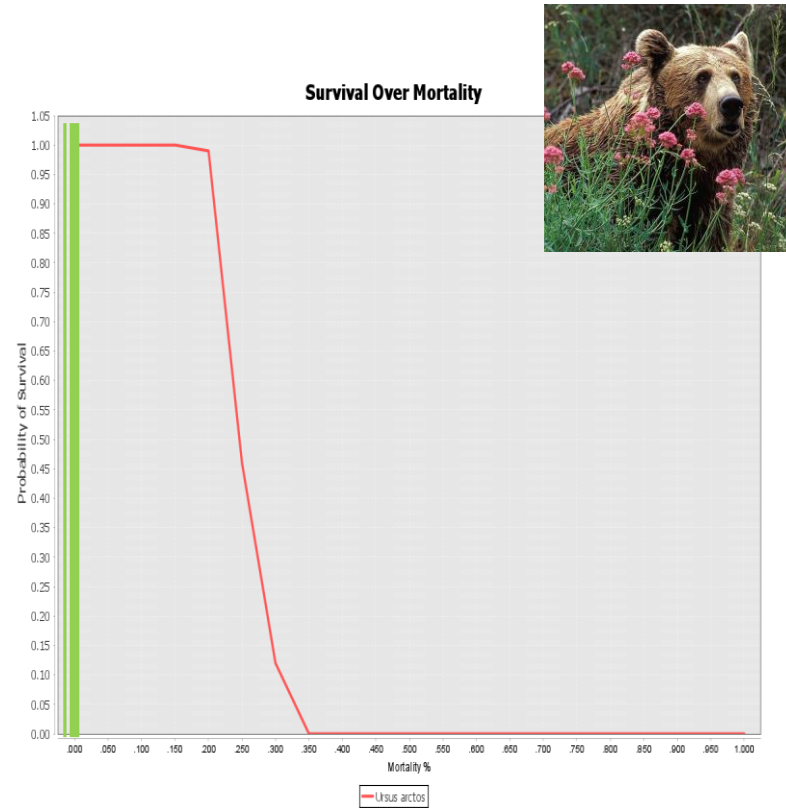
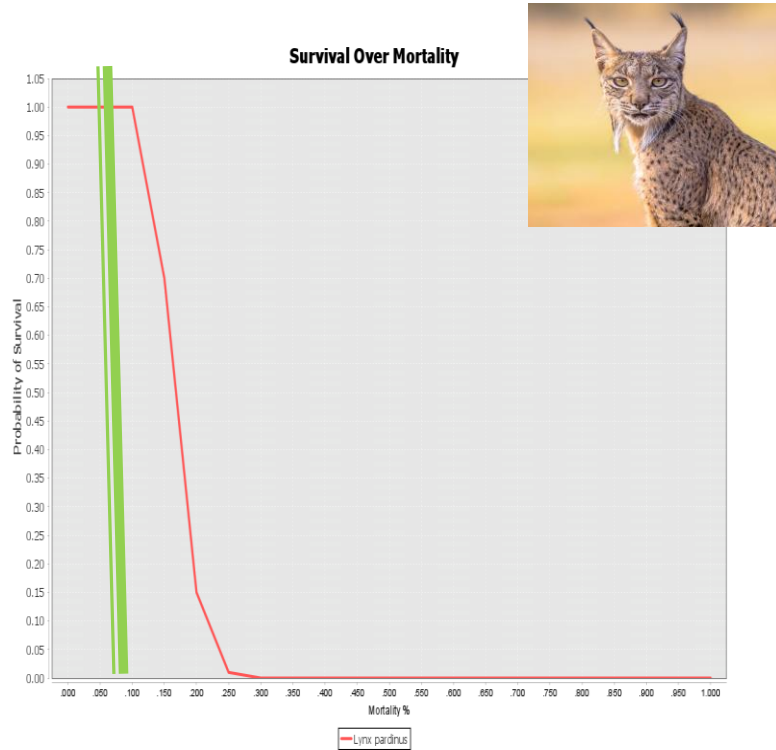
Population density estimates for terrestrial mammal species

Lucía Santini, Ana Benítez-López, Carsten F. Dormann, Mark A. J. Huijbregts

Carnívoros en las carreteras

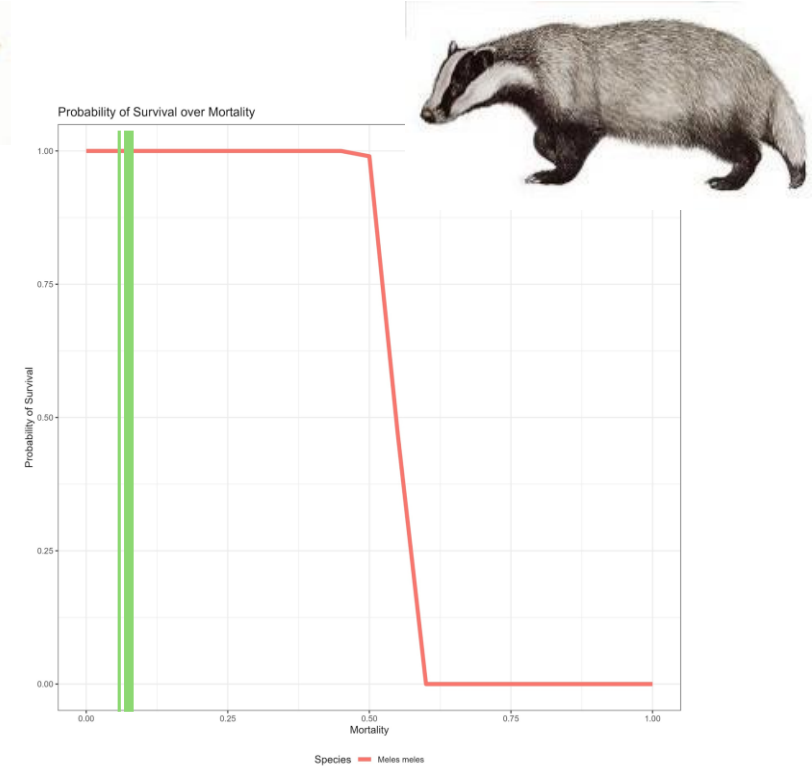
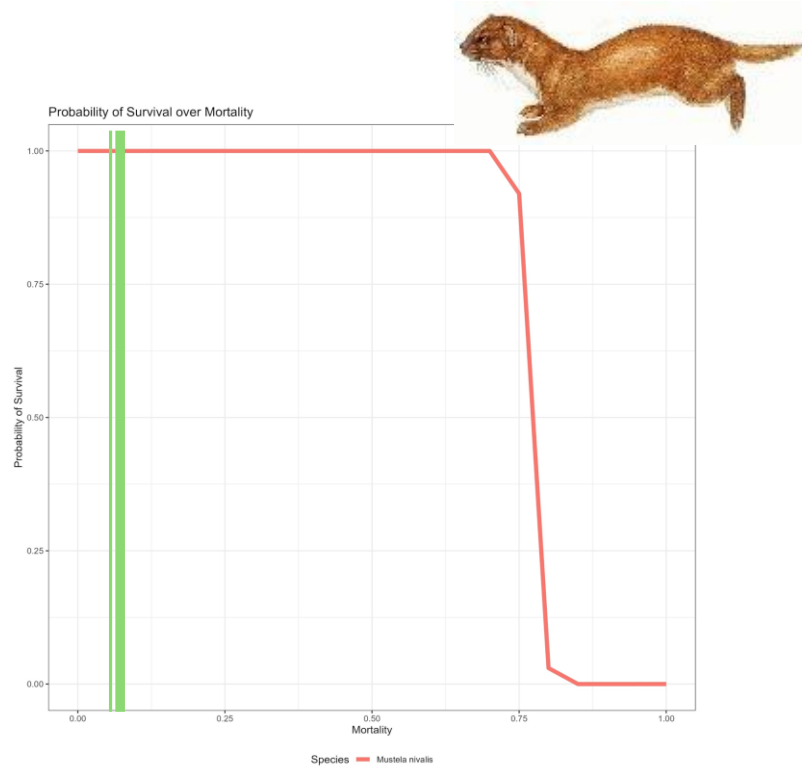
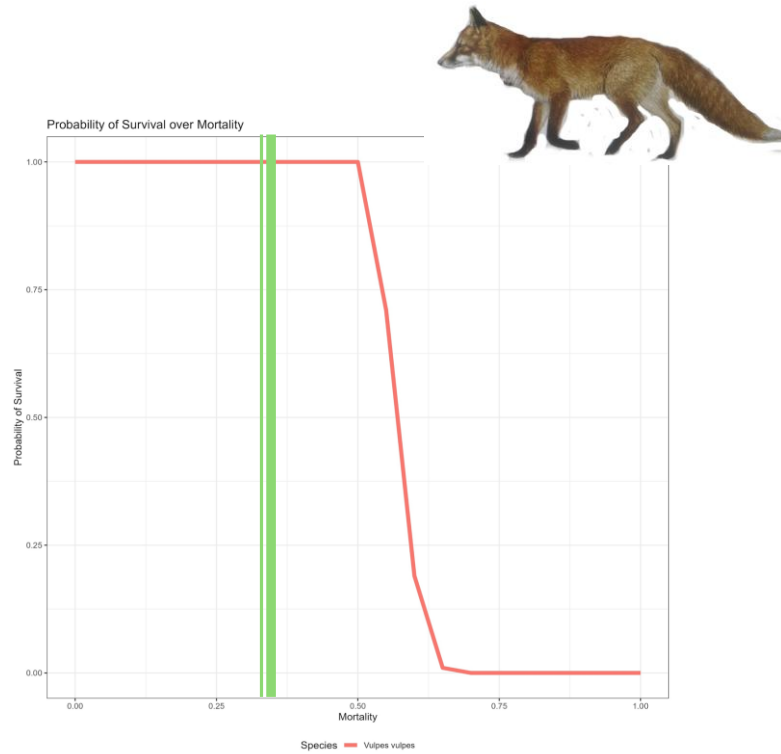


Distintas tasa de atropello = el mismo impacto poblacional



Carnívoros en las carreteras

RISKY



Carnívoros en las carreteras

¿Qué *medidas* reducen la mortalidad y mantienen la permeabilidad de las carreteras?

Carnívoros en las carreteras

Mitigación

Carnívoros utilizan distintos tipos de pasos

Ecol Res (2007) 22: 57–66
DOI 10.1007/s11284-006-0004-1

ORIGINAL ARTICLE

Fernando Ascensão · António Mira

Factors affecting culvert use by vertebrates along two stretches of road in southern Portugal



Table 3 Mean crossing rate (CR) and number of culverts (*N*) used by fauna groups by season (small mammals exclude hedgehogs)

	Spring	<i>N</i>	Summer	<i>N</i>	Autumn	<i>N</i>	CV
Reptiles	0.57	7	0.46	7	0.67	1	17.9
Hedgehog	0.63	7	0.39	9	0.48	10	24.6
Small mammals	0.77	33	0.78	29	0.53	26	20.8
Lagomorphs	0.60	10	0.75	8	0.54	8	17.6
Weasel	0.40	1	0.25	3	0.42	7	25.8
Stone marten	0.47	20	0.52	16	0.45	21	6.5
Badger	0.58	7	0.39	7	0.57	7	20.4
Genet	0.39	15	0.44	8	0.36	14	9.4
E. mongoose	0.42	17	0.40	13	0.35	11	9.0
Fox	0.27	7	0.50	4	0.33	7	32.8
Dog	0.20	2	0.38	2	0.42	6	35.5
Cat	0.24	9	0.30	10	0.45	15	32.8

Seasonal variability in mean values is expressed using the coefficient of variation ($CV = 100 \times \text{standard deviation} / \text{mean}$) (Yanes et al. 1995)

Carnívoros en las carreteras

Carnívoros utilizan distintos tipos de pasos



Journal of Environmental Management 88 (2008) 407–415

Journal of
Environmental
Management

www.elsevier.com/locate/jenvman

Are motorway wildlife passages worth building? Vertebrate use of road-crossing structures on a Spanish motorway

C. Mata*, I. Hervás, J. Herranz, F. Suárez, J.E. Malo

Departamento de Ecología, Facultad de Ciencias, Universidad Autónoma de Madrid, E-28049 Madrid, Spain

Received 21 June 2006; received in revised form 31 January 2007; accepted 10 March 2007
Available online 30 April 2007



Table 2. Mean number of day-detections per crossing structure for species and species groups detected throughout the monitoring period (10 days for each crossing structure)

	Circular culverts <i>n</i> =14	Adapted culverts <i>n</i> =7	Open span underpasses <i>n</i> =7	Wildlife underpasses <i>n</i> =5	Overpasses <i>n</i> =6	Wildlife overpasses <i>n</i> =4	Mean
<i>Species</i>							
Western hedgehog (<i>Erinaceus europaeus</i>)	—	—	—	—	0.17	—	0.02
Polecat (<i>Mustela putorius</i>)	—	0.14	—	0.20	—	—	0.05
European badger (<i>Meles meles</i>)	1.00	3.14	2.71	1.60	0.17	—	1.49
Small-spotted genet (<i>Genetta genetta</i>)	—	—	0.29	—	—	—	0.05
Red fox (<i>Vulpes vulpes</i>)	1.07	2.43	4.71	3.60	3.00	3.50	2.67

Carnívoros en las carreteras

El uso aumenta cuando los pasos están más *naturalizados*



Biodivers Conserv (2008) 17:1685–1699
DOI 10.1007/s10531-008-9374-8

ORIGINAL PAPER

Response of carnivores to existing highway culverts and underpasses: implications for road planning and mitigation

Clara Grilo · John A. Bissonette · Margarida Santos-Reis

Biodivers Conserv (2008) 17:1685–1699

1693

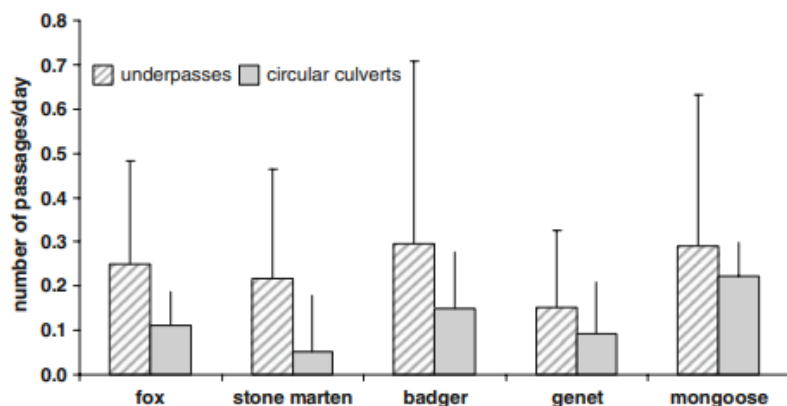


Table 4 Variables retained in the stepwise regression model for each carnivore species, coefficients (B), standard error, significances, *P*-value (*t* test) and deviance explained (D)

Species	Variables	B	Std Error	P-value	D
Fox ^a	(Constant)	−2.03	0.037	0.000	0.146
	Oak woodland_500 m	0.01	0.004	0.010	
	Height vegetation	0.09	0.04	0.030	
Stone marten ^a	(Constant)	−3.04	0.501	0.000	0.311
	Width (1)	0.09	0.430	0.040	
	Width (2)	1.2	0.380	0.002	
	Oak woodland_500 m	0.01	0.005	0.010	
Badger ^a	(Constant)	−2.61	0.640	0.001	0.395
	Oak woodland_500 m	0.01	0.003	0.010	
	Distance to roads	0.00	0.001	0.003	
	Cover distance	−0.31	0.120	0.010	
	Type of riparian vegetation (1)	0.78	0.260	0.005	
Genet ^a	Type of riparian vegetation (2)	0.16	0.300	0.590	0.245
	(Constant)	−3.11	0.770	0.000	
	Distance to roads	0.01	0.001	0.010	
	Oak woodland_500 m	0.00	0.004	0.010	
	Human use (1)	−0.69	0.330	0.040	
Mongoose ^a	Human use (2)	−0.83	0.450	0.070	0.195
	(Constant)	−1.20	0.230	0.000	
	% Shrub cover_500 m	0.01	0.003	0.008	
	Stream direction (1)	0.26	0.320	0.410	
	Stream direction (2)	0.90	0.290	0.003	

^a The data used for these species were square root transformed

Carnívoros en las carreteras

La presencia de agua condiciona el uso

Environ Monit Assess (2013) 185:6235–6246
DOI 10.1007/s10661-012-3020-3

Towards effective culvert design: monitoring seasonal use and behavior by Mediterranean mesocarnivores

Ana Marta Serronha · Ana Rita Amaro Mateus ·
Finn Eaton · Margarida Santos-Reis · Clara Grilo

Variables	Estimate	SE	Z value	Significance
Red fox				
Intercept	−0.476	0.326	−1.460	0.144
Open areas	−0.045	0.023	−1.999	0.046
Stone marten				
Intercept	0.572	0.299	1.914	0.055
Vegetation at entrance	−0.045	0.016	25.962	<0.001
Water presence	−1.113	0.440	−2.532	0.011
Otter				
Intercept	−1.308	0.622	−2.102	0.036
Orientation of riparian vegetation	0.513	0.262	1.954	0.050
Genet				
Intercept	−0.243	0.277	−0.877	0.380
Water presence	−2.181	0.662	−3.296	0.001

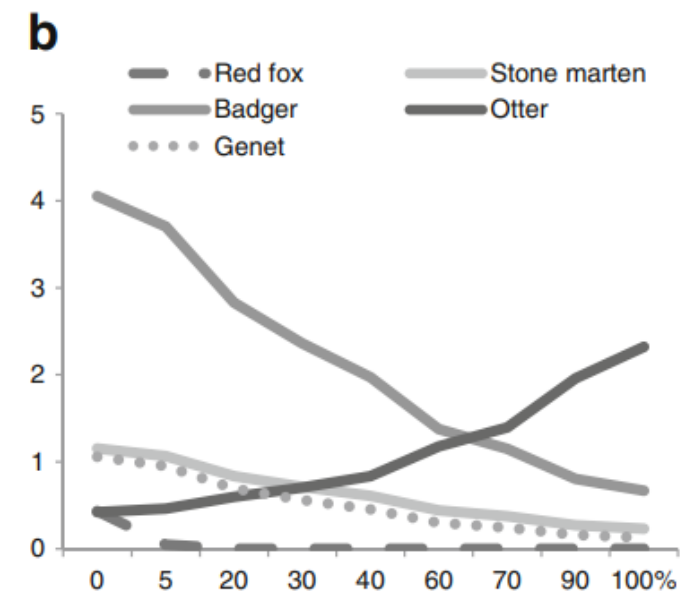
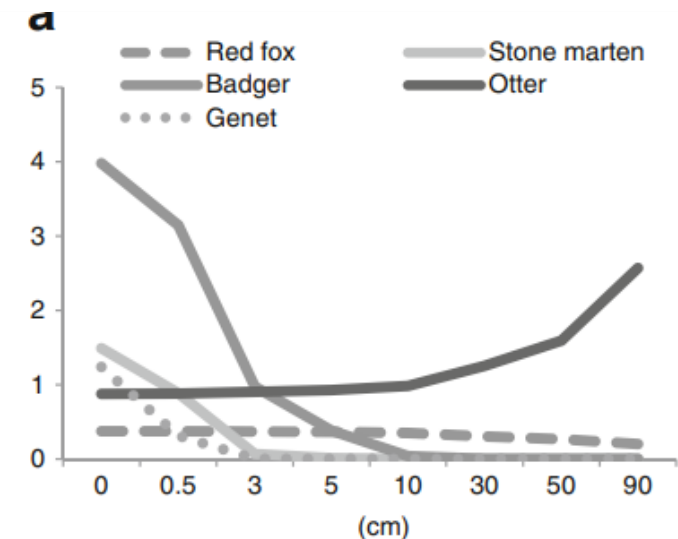


Fig. 3 Number of carnivore crossings per day in culverts obtained from the GLMM Poisson models related with water depth (in centimeters) (a) and percentage of cover (b)

Carnívoros en las carreteras



RTP notícias

PAÍS

MUNDIAL 2026

EUROPA

MUNDO

OPINIÃO

VÍDEOS

PAÍS

Instalada nova tecnologia para seguir lince ibérico

A tecnologia permite conhecer todos os passos do animal, numa altura em que se multiplicam os atropelamentos do lince ibérico.

RTP / 13 Abril 2024, 21:02



AMBIENTE

Lince-ibérico: pedidas medidas de proteção e conservação

Uma resolução da Assembleia da República, hoje publicada em Diário da República, recomenda ao Governo a adoção de medidas para a proteção e conservação do lince-ibérico.

No documento pede-se que, entre outras medidas, se "proceda a uma avaliação detalhada da permeabilidade das estradas nas zonas de presença do lince-ibérico, como a autoestrada A23 e outras vias críticas, se implemente passagens para fauna e barreiras físicas que redirecionem os linces para zonas de travessia seguras e sejam reduzidos "os limites de velocidade nas estradas que atravessam os territórios críticos do lince, instale sinalização adequada e outros meios de diminuição do tráfego e da velocidade".

A resolução insta também o Governo a fomentar a criação de corredores ecológicos que permitam a dispersão natural do lince-ibérico, assegurando a conexão entre as populações de Portugal e Espanha, promovendo a diversidade genética e a expansão territorial da espécie.

13 / ABRIL / 2024



© Carlos Nunes | LPN

TAGS

LINCE-IBÉRICO, PROTEÇÃO,
CONSERVAÇÃO

Carnívoros en las carreteras



Ecoduto na zona da Serra da Falperra, na A24, para a passagem de lobos ibéricos



Carnívoros en las carreteras;

aún que no se sabe sobre los impactos



Especies no estudiadas

(e.g. urso, gato bravo, armiño, turón, comadreja)



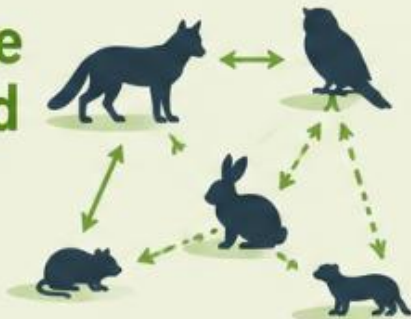
Efectos cumulativos

(e.g. barrera, mortalidad, stress)



Estructura de la comunidad

(e.g. composición, relaciones entre especies)



Cambios en las respuestas comportamentales

(e.g. cómo afecta a la supervivencia y reproducción)



Carnívoros en las carreteras

aún que no se sabe sobre la mitigación



Conectividad
funcional



Reducción de
perturbación
y estrés



Carnívoros en las carreteras

lo que hace falta

De la respuesta de los
individuos



... a las alteraciones en las
poblaciones y comunidades

1

**MONITORIZACIÓN
REGIONAL**

2

**MODELOS
DE MORTALIDAD**

3

**GENÉTICA
Y CONECTIVIDAD**

4

**INTERACCIONES
ENTRE ESPECIES**

5

**LAS CARRETERAS PUEDEN CONTRIBUIR
A UNA GANANCIA DE BIODIVERSIDAD**

Gracias! obrigada!



Clara Grilo

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Universidade do Porto

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