ISSN 0394-1914

HYSTRIX
the Italian Journal of Mammalogy

Volume 25 (Supplement) • 2014

published by
Associazione Teriologica Italiana

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Impact Factor (2012) 0.352

***HYSTRIX*, the Italian Journal of Mammalogy** is an Open Access Journal published twice per year (one volume, consisting of two issues) by Associazione Teriologica Italiana. Printed copies of the journal are sent free of charge to members of the Association who have paid the yearly subscription fee of 30 €. Single issues can be purchased by members at 35 €. All payments must be made to Associazione Teriologica Italiana onlus by bank transfer on c/c n. 54471, Cassa Rurale ed Artigiana di Cantù, Italy, banking coordinates IBAN: IT13I0843051080000000054471.

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Information about this journal can be accessed at http://www.italian-journal-of-mammalogy.it

The Editorial Office can be contacted at info@italian-journal-of-mammalogy.it

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IX Congresso Italiano di Teriologia

Civitella Alfedena (AQ), 7-10 Maggio 2014

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Publication information: Hystrix, the Italian Journal of Mammalogy is published as a printed edition (ISSN 0394-1914) twice per year. A single copy of the printed edition is sent to all members of Associazione Teriologica Italiana. The electronic edition (ISSN 1825-5272), in Adobe® Acrobat® format is published "online first" on the Journal web site (http://italian-journal-of-mammalogy.it). Articles accepted for publication will be available in electronic format prior to the printed edition, for a prompt access to the latest peer-reviewed research.

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Finito di stampare nel mese di aprile 2014 - Typeset in LaTeX

Stampato con il contributo di – Printed with the contribution of

Progetto LIFE09/NAT/IT/000160 Arctos; Società Italiana di Ecopatologia della Fauna (SIEF)

Stampa: Edizioni Belvedere, via Adige, 45 – 04100 Latina (Italia)

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Riassunti: Comunicazioni e Poster

edited by
S. Imperio, S. Mazzaracca, D.G. Preatoni

Organizzato da
Associazione Teriologica Italiana onlus

In collaborazione con

Parco Nazionale
d'Abruzzo Lazio e Molise

Società Italiana di
Ecopatologia della Fauna

Progetto LIFE09/NAT/IT/000160 Arctos

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Cover and vegetation phenology as drivers of fine-scale habitat selection by european roe deer (*Capreolus capreolus*) in the italian Alps

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The European roe deer (*Capreolus capreolus*) occupies a wide range of habitats in Europe, from deciduous and coniferous continental forests, to Mediterranean shrubwoods, to agricultural plains. Thanks to its high ecological plasticity, this species ranges also in Northern and Alpine environments, where harsh winters and a short vegetation growing season are potential limiting factors to distribution and abundance. Habitat and resource selection at the fine-scale have been investigated in optimal habitats, or in controlled settings. To our knowledge, no specific study has assessed fine-scale habitat selection at the two extremes of the distribution range of this species, i.e. the northern latitudes and the alpine environment. On top of macro-habitat analysis, a fine-scale habitat selection allows to assess the relevance of food-related variables, such as group of plants, and their phenological states, and other specific components of the habitat, such as hiding cover.

In this study, we assessed fine-scale habitat selection by European roe deer (*Capreolus capreolus*) from the beginning of the spring green up (April) until the end of the breeding season and establishment of family groups (October) in a very diverse environment in the Italian Alps. We used conventional logistic regression to assess habitat selection throughout the study period, and conditional logistic regression to take into account the temporal aspect of habitat selection on a weekly basis. We sampled topographic covariates (elevation, aspect and slope), habitat-related covariates (such as vegetation communities and cover) and food-related components of habitat (vegetation composition and phenology) in used and available locations along the movement trajectories of 14 adult roe deer equipped with GPS telemetry collars.

Our results indicate that roe deer did not select any particular altitudinal range or aspect class, whereas they selected mildly steep slopes and dense canopy cover, probably to avoid heat stress during warm summer days. In accordance with previous observations, roe deer preferred young forest stands to climax environments, in which the dominant overstory species were ash (*Fraxinus* spp.) and hazel (*Corylus avellana*). The selection of food-related components of habitat reflected the selection of macro-habitats, since roe deer positively selected shrubs (in particular, *Fraxinus* spp., *Erica herbacea*, *Rhododendron* spp. and *Vaccinium* spp.) throughout the study period, whereas selection for grasses and sedges emerged only at a weekly scale. Habitat selection was clearly related to vegetation phenology, since roe deer selected plants in the most nutritive phenological stages, i.e. shrubs with buds, new leaves and fruits, and newly emergent grasses and sedges. Finally, we found temporal variation in habitat selection patterns by roe deer for food-related habitat components, but not for topographic and macro-habitat covariates or cover. However, I found higher regression coefficients for all drivers of habitat selection at the weekly scale compared to the seasonal home range scale. Our findings confirm the dependence on specific plant typology and phenology stages of a species with high nutritional requirements, such as a selective browser with low fat accumulation. Despite its high ecological plasticity, roe deer distribution might therefore be directly affected by land use practices (esp. forestry management of mature forest) and variation of the vegetation growing season due to climate change. For example, a contraction could be expected at the southern end of the distribution, whereas and expansion might be foreseen at the northern altitudes, or at intermediate altitudes in the alpine range.