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Habitat and population management of Roe deer (Capreolus capreolus) in Northeastern Romania

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Abstract: Roe deer (Capreolus capreolus) is a key game species and an important ecological indicator in Romanian hunting grounds. The present study aims to assess the habitat suitability and population trends of roe deer in selected hunting areas in northeastern Romania (Moldova region), based on game management plans, bonitation data, and field observations. We analyzed land use types (forests, pastures, crops), water availability, and quiet zones as core elements of habitat quality. The results indicate that hunting grounds with a balanced proportion of forested areas and open pastures offer optimal conditions for roe deer population growth. However, anthropogenic disturbances such as agricultural intensification, illegal logging, and competition with domestic livestock were observed to negatively influence local densities. The study emphasizes the need for habitat conservation measures, better enforcement of game laws, and adaptive harvest strategies to ensure sustainable populations. Insights from this study may support regional wildlife policies and contribute to biodiversity preservation efforts in the Carpathian foothills. *Keywords: roe deer; habitat suitability; game management; northeastern Romania; wildlife conservation.*

Introduction

Materials and Methods

The roe deer (Capreolus capreolus) is a widely distributed and ecologically significant cervid in Europe, exhibiting high genetic diversity and adaptability to various habitats. In Romania, the species is broadly present, with recent range expansion towards the southeast. It holds key ecological and game management value. Roe deer favor heterogeneous landscapes that ensure both cover and forage. Habitat quality, fragmentation, and anthropogenic pressures influence spatial distribution and activity. This study assesses the relationship between habitat structure and roe deer presence in northeastern Romania, focusing on hunting grounds in Neamţ, Iaşi, and Bacău. Results highlight the need for habitat-based management, integrating modern tools (GIS, camera traps) to ensure sustainable population monitoring and conservation.

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This study is based on documentary and observational data collected between 2021–2024 in Moldavia (*Neamţ, Iaşi, Bacău counties*). Data sources included legislative and technical documents on hunting ground management, habitat structure reports, and field observations. The research is descriptive and comparative, due to limited access to updated population statistics.

Table 1. Productive hunting area in the analyzed counties

County	Forest (ha)	Pasture (ha)	Arable land (ha)	Total productive area (ha)
Neamț	262,840	60,070	195,176	526,457
Iași	96,355	77,218	334,540	528,113
Bacău	283,384	92,700	244,517	632,300

Results

The region of Moldavia, particularly the counties of Neamţ, Iaşi, and Bacău, provides a diverse range of habitats favorable for *Capreolus capreolus*. These areas are predominantly hilly and sub-mountainous, with a heterogeneous landscape that includes forests, pastures, and agricultural land.

Neamț County

Neamț has extensive forest coverage (262,840 ha), creating compact and continuous woodland habitats. Quiet zones are relatively well preserved, offering favorable conditions for roe deer (Figure 1.).



Figure 1. Hunting trail with handrail in hilly forest habitat – Neamț County (original)

Iași County

With only 96,355 ha of forest and a dominance of arable land, Iași features fragmented habitats. Roe deer here tend to use forest edges, shelterbelts, and transitional zones (Figure 2.).



Figure 2. Mixed forest (deciduous and coniferous) in a hilly area of Iași County (original)

Bacău County

Bacău presents the largest productive hunting area (632,300 ha), with 283,384 ha of forest. The centralwestern forested zone supports stable roe deer populations due to its continuity and reduced disturbance (Figure 3.).



Figure 3. Shelter area in a coniferous forest in Bacău county (original)



Figure 4. Improvised salt lick – impact on cervid visitation frequency (original)



The ideal habitat for roe deer in the region of Moldavia includes:

well-developed deciduous forests with dense undergrowth,

open areas such as pastures and hayfields accessible for feeding,

permanent water sources (streams, springs, artificial watering sites),

functional hunting infrastructure: feeders, salt licks, observation towers, shelters.
Disturbing Factors

Habitat fragmentation, caused by land restitution and construction, reduces connectivity and disrupts seasonal movements. Monocultures provide temporary food but lack refuge zones. Poaching with wire snares and human disturbances (e.g., ATVs, motorbiking) negatively affect roe deer, while poor maintenance of feeders forces them to travel longer distances, increasing stress and risk.

Long winters with thick snow cover increase juvenile roe deer mortality, especially in areas with rugged terrain and no reserve feeding plots. In the analyzed hunting grounds, infrastructure includes feeders placed in secluded areas, near migration corridors, to support roe deer during harsh conditions. These feeders provide hay, maize, and other concentrated feed during winter.

Salt licks, typically made from tree trunks with applied rock salt, are frequently visited by roe deer and other ruminants, particularly in summer when electrolyte intake is crucial. Their presence is indicated by licking marks and droppings. In the studied areas, salt licks are usually improvised but strategically placed near travel paths or quiet zones. Additionally, wallowing sites, used by cervids for thermoregulation and parasite removal, can be natural (marshy areas) or artificial (constructed near water sources). These sites often form micro-centers of faunal activity, especially during hot weather.

According to game management regulations, each hunting ground must include a quiet zone covering at least 10% of its area, which is essential during gestation, fawning, and winter, when cervids reduce their mobility. These zones, strategically placed away from roads and human activity, are crucial for maintaining the health and demographic structure of the roe deer population. Direct observations and snow tracks during January–February are reliable methods for estimating population density, especially along predefined transects. Observations from hunting towers or trails, particularly during twilight hours, are also effective for monitoring roe deer activity (Figure 7a and Figure 7b).

Among the most frequent signs of active presence are:

droppings (black, shiny pellets grouped into compact piles);

\$ gnawed trees or wounded bark, particularly during the hormonal discharge period of males (July-September);

Characteristic trails frequently used between shelter areas and food or water sources.

These signs are more visible in the dense forests of Neamț and Bacău counties, compared to the more open landscapes of Iași, where human activity can quickly alter or cover them.

Sustainable management of hunting grounds requires balancing wildlife exploitation with habitat preservation. For roe deer, it is vital to maintain feeding plots year-round, especially during food scarcity (Figure 8a). Regular upkeep of salt licks and watering sites near quiet zones supports their health. Limiting unauthorized access protects quiet zones and reduces stress. Camera traps in dense forests help monitor roe deer activity (Figure 8b). Periodic population assessments are key to setting harvest quotas and ensuring sustainability.

Figure 5. Typical cervid feeder placed in deciduous forest and supplied with herbaceous plants (original)



Figure 6. a. Salt lick used by cervids – visible rubbing marks and signs of activity around the tree trunk; b. Watering site created by narrowing a gully, combined with an improvised salt lick (original)



Figure 7. a. Direct observation of roe deer in winter habitat – complementary wildlife monitoring method b. Fixed observation tower placed in forest–pasture transition zone – used for wildlife observation (original)



Figure 8. a. Roe deer buck observed in a natural fallow field with diverse vegetation – active use of open habitat b. Group of cervids captured by a camera trap in a coniferous forest – indicator of effective quiet zones (original)

Conclusions

