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HABITAT PREFERENCES OF ROE DEER (*Capreolus capreolus*) IN KASTAMONU : CASE STUDY OF ELEKDAĞI WILDLIFE DEVELOPMENT AREA

Özkan EVCİN*, Ömer KÜÇÜK, Erol AKKUZU, Abdullah UGIŞ
* Department of Forest Engineering, Kastamonu University, Turkey.

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ABSTRACT
Determining the habitat preferences of wild animals and conserving their habitats are constitute the basis of wildlife protection. Therefore, researches and studies of wildlife habitat preference and the protection of these areas are important. This study was held in Kastamonu Elekdağı Wildlife Development Area, one of the roe deer's important habitat in Kastamonu region (Capreolus capreolus) in terms of biodiversity and hunting tourism. To determine the habitat preferences of roe deer, datas obtained from direct observation. Additionally, inventory records of Forestry and Water Affairs 10th Regional National Parks Directorate have used. All datas were applicated to digital maps and results were evaluated.
KEYWORDS: Roe deer, Kastamonu, Wildlife, *Capreolus capreolus*.

INTRODUCTION
Wildlife is a term which includes animal species, fungi, plants and other organisms living in the wild without human influence on an ecosystem. Therefore, protection, planning and development of wildlife are required to be evaluated with all components of the ecosystem.
Turkey forests constitutes lots of important wildlife areas. Benefitting from wild animals in these areas with regular and sustainable way is only possible with a good planned management and regulation of their habitat [1].
Improving and management of factors which is essential for wildlife (such as food, water, cover, etc.) with all aspects, is very important for conserving and development of wildlife. Thus, a good management of wildlife, can only be possible in accordance with the principles of sustainability.
Implementation of the sustainability is gaining importance in the management of forest resources. In addition to that, [2] states that wildlife is strongly related with management of forest resources
Recognition of the ecological requirements for the species of wildlife and taking the necessary precautions is very important in order to increase the protection of threatened species and their populations. [3] defines that animal species will show the best improvement with a good suitable environments for these species. Such areas are considered at the forefront for hunting tourism.
Ruminants are one of most important species for hunting tourism in many countries. Roe deer (*Capreolus capreolus*) is the smallest species of Cervidae family in Turkey. Deer's distribution generally varies according to climatic conditions [4,5,6], habitat structure [7], vegetative structure and nutrient sources [8, 9]. There is a large distribution area of roe deer on the Palaearctic. Including Western Russia [10], in Europe (Ireland, Cyprus, Corsica, Sardinia, Sicily and many of the small island except) roe deer makes the distribution. Except Europe, roe deer can be found in northern Syria, Iraq, Iran, North Caucasus. It has become extinct in Israel and Lebanon [11].
Roe deer distrubuted in Turkey on West and north of Marmara region, northwest of the Aegean region, Black Sea Region, north of Eastern Anatolia, Southeastern Anatolia and the central and east of Mediterranean region [12, 13, 3, 14, 15, 16, 17, 18] (Figure 1).

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Figure 1. Distribution map of Roe deer in Turkey

According to [19] Roe deers are one of important species for hunting tourism and have a high potential in terms of hunting economy and bringing a good income. Thus, inventory of wildlife has a very important place. However, a detailed inventory work or studies on habitats of roe deer has not yet reached a sufficient level [18]. Kastamonu is This study was held in Kastamonu Elekdağı Wildlife Development Area, one of the roe deer's important habitat in Kastamonu region (Capreolus capreolus) in terms of biodiversity and hunting tourism. Kastamonu is important area with its rich geography advantages having agricultural areas, forests, wetlands, mountains, caves and canyons. In addition to that, Kastamonu has lots of places that suitable for roe deers.
Studies about habitat preferences of roe deer in Turkey very limited [16, 20, 17, 18]. In this study habitat preferences of roe deers in Elekdağ Wildlife Development Area, where an important distrubution area of roe deers, were determined.

MATERIALS AND METHODS

Study Area

Elekdağ Wildlife Development Area is located in Kastamonu Province Taşköprü District. Study area has an altitude varies between 1500-2000 m. Total area is 4,236 ha (Figure 2, Figure 3).

Figure 2. Elekdağı Wildlife Development Area (Google Earth)

Figure 3. A view from Elekdağı Wildlife Development Area (Photo: Özkan EVCİN)

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Major tree species are *Pinus nigra*, *Pinus sylvestris*, *Abies nordmanniana subsp. Bornmulleriana*, *Quercus* sp., *Fagus orientalis* and *Carpinus* sp.. Some medicinal and aromatic plants such as *Rubus* sp., *Rosa canina*, *Cistus* sp. and etc. are also distrubuted in the area[21].

Some big mammal species which are distrubuted in Elekdağ Wildlife Development Area are wild boar (*Sus scrofa*), red deer (*Cervus elaphus*), roe deer (*Capreolus capreolus*), jackal (*Canis aureus*), wolf (*Canis lupus*), red fox (*Vulpes vulpes*), Brown bear (*Ursus arctos*) ve bobcat (*Lynx lynx*) [22].

Method

The method was conducted in two parts as office and field work. Office studies contains researching previous literature studies about roe deers ecology, morphology, biology and browsing previous inventories done by 10th National Parks District of Turkey.

Field studies include, using direct and non-direct methods for roe deers and applying camera-traps on the field. Due to previous studies on roe deers [17] and density of footprints and feces of roe deers, camera-traps were applied to possible dense populated areas by using opportunistic camera-trap method [23]. Cameratraps were applied to different habitat types, adjusting at least one week, set both day&night mode.

Studies were carried out between 2012-2013 years at four seasons (January- February, April-May, July- August, October-November), field study were done every month twice a week.

Field studies with direct observations were started between daylight hours- evening sunset, by selecting the appropriate spots as mentioned in literature [24, 25, 26]. During direct observation binoculars, camera and field observation telescope were used. Observed or photographed roe deers were recorded with coordinates to direct observation card (Figure 4).

DIRECT OBSERVATION CARD

Observer :
Location :

Observation No	Date	Time	Habitat	Individuals		Behavior
				Male	Female	

Figure 4. Direct Observation Card

Data obtained from cameratraps, direct and non-direct observation, previous inventory records (2008-2013) and forest stand habitat maps were combined by using ArcGIS software. The resulting data are applied to all fields by sampling. Thus, the common stand types of deer have been identified.

RESULTS AND DISCUSSION

The obtained result of the implementation of all data to digital map, results were categorized in three groups (Figure 5).

1. Type-1 : Areas having very loose or damage oak structure, agricultural areas and areas without forest.
2. Type-2: Areas covered with deciduous trees.
3. Type-3: Loose pine stands or pine stands without litter

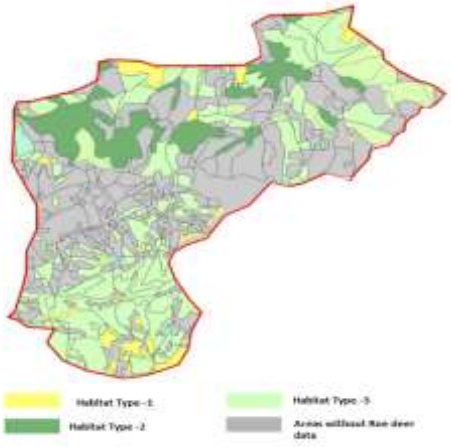

Figure 5. Habitat preferences of roe deers in Elekdağ WDA

According to results, type-1; This area consist tall and dense grass located in open areas. Roe deers prefers tall grass and fresh plants of agricultural areas. Similar results was expressed by[24].

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Type-2; This area consists a forest with deciduous trees of beech and oak. Roe deers uses young and fresh shoots and acorns of these species as a food source. These tree speices was found close to wetlands usually. This situation agree with the statement of [12] and [3] as " Roe deer do not prefer pure coniferous forests" and "roe deer is fed with dry leaves in winter, so to meet the increasing demand of water they must live close in water resources."

Type-3: ; This area consists with a coniferious forest (blackpine, scotspine, fir) with loose closure. Loose closure gives deer easy movement and serves as a preferable area. Fresh green grass and meadow due to loose canopy layer can be an important source of food. In addition to that [27] states, roe deers needs mature coniferous stands on areas where has snow-covered field in winter.

Fresh and soft herbs, roots and shoots of buds and young shoots of deciduous trees determined as food preferences of roe on Elekdağ WDA (Figure 6). Observations of similar food preferences were also stated by [24] and [26].

Figure 6. A female roe in Elekdağı region (Photo: Özkan EVCİN)

CONCLUSION

Roe deer is an important species for both hunting and wildlife. The results of the study shows that, general area of Kastamonu habitats are similar to the habitat types of Elekdağ wildlife development area. Therefore, roe deers are considered distrubute in similar habitat types in Kastamonu [21, 17, 18].

The main applications are proposed to be done in order to protect deer with their habitat as follows:

Local people should be made aware against the poaching and detailed information should be given about the damage to the economy of the country and genre.

Ecosystem- based planning (Protection and promotion of food supply plants, avoiding hard logging, establishment of wildlife corridors etc.) should be preferred in areas where roe deer show their distrubution

Roe deer prefer areas with a rich variety plants and near wetlands [18]. Therefore, the conservation of wetlands and the factors that may cause water pollution (pesticides, household and industrial waste, etc.) should be considered.

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