

Fallow deer (*Dama dama* Linnaeus, 1758) in the province of Rieti (central Italy): origin and first data on the competition with native red deer and roe deer

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Abstract

The most recent literature describing the distribution and abundance of fallow deer (*Dama dama*) in Italy does not indicate the presence of this species in the province of Rieti. Some reports indicate the presence of the species in the middle valley of the river Velino. To test the reliability of those reports a field study was undertaken using three different techniques: fixed points census, line transects, and snow tracking. The area investigated was about 3,500 hectares. Given the topography of the study area these techniques were carried out opportunistically. Fallow deer were located, and the population was estimated to be about 70-90 individuals. Investigation in the Archives of the Provincial Command of the State Forestry Corps of Rieti allowed the origin of the population to be traced. The fallow deer escaped from a group of individuals reared on an estate called Santogna in 2001-2002. The animals came from the Presidential Estate of Castelporziano (Roma). The population of this invasive species is problematic because it dominates the native red deer (*Cervus elaphus*) and roe deer (*Capreolus capreolus*), and restricts their natural expansion.

Keywords: allochthonous, competitor, *Dama dama*, distribution, Rieti province

Introduction

The fallow deer (*Dama dama*) is a species native of the eastern portion of the Mediterranean. The current distribution is considered almost entirely man-made, with the exception of the population in Turkey in the National Park Termessos (Carnevali et al., 2009; Pedrotti et al., 2001). The species is quite common in Western Europe, particularly in England. The populations derived from groups kept in captivity for ornamental and hunting purposes, introduced in estates and game reserves, and escaped from pens (Apollonio, 2003; Scalera, 2001). The species is social and this characteristic limits its ability to dispersal. The deer is classified as a ruminant, of the intermediate type with the ability to use a variety of pasture and vegetation types (Perco, 1987). These features allow it to adapt easily to different environments, except for arid areas and those where the snow cover is persistent. The high level of interspecific competition with other deer species and the dominance of fallow deer in deer killed for venison (Carnevali et al., 2009; Perco, 1987; Scalera, 2001) poses management problems in areas of sympatry, particularly where expansion of native species is possible. For these areas ISPRA (Institute for Protection and Environment Research) proposes drastic steps to contain or eradicate the fallow deer (Carnevali et al., 2009). The Italian distribution area of the species (about 2,700 km²) is very fragmented and comprises: Tuscany, Umbria, Tuscany and Romagna Apennines, the area between the Ligurian Apennines and the provinces of Alessandria and Pavia. Fallow deer are also spread in the Alps, provinces of Belluno, Treviso and Pordenone, and present in the plains or low hills of Veneto, Friuli-Venezia Giulia and Piemonte. Isolated nuclei, sometimes significant, occur in peninsular Italy and on islands. Overall fallow deer occur in 60 out of 113 provinces (53%) (Carnevali et al., 2009). No data are available for Rieti. To fill this gap a study has started to acquire the first data on a group of deer reported in the middle valley of the Velino (province of Rieti). The aim of survey was threefold: 1 - define the distribution and abundance of the population, 2 - identify the source of the population, 3 - determine potential interference between fallow deer and other deer species.

Materials and methods

The surveys were preceded by a preliminary phase aimed at verifying the presence of the species. Successful outcome of this phase was followed by investigations of the distribution and origin of the nucleus. The study area, identified according to reports, is mountainous with altitudes between 850 m a.s.l. and 1,500 m a.s.l. The area is characterized by extensive mixed forest with a predominance of *Quercus* spp. at lower altitudes and *Fagus sylvatica* at higher ones. The woods are interspersed with large areas of natural pasture. The snow is sporadic and shallow with an average snowpack and low persistence. The field surveys were conducted from September 2008 to March 2011 using fixed points census (after finding 10 sites), line transects (for detection of signs of presence), and snow tracking (technique applied in an "opportunistic" way on routes identified in conjunction with the snow deposition). The area of distribution was estimated using the MCP (minimum convex polygon), with geo-referenced signs of presence. To trace the origins of the population we investigated information held by the State Forestry Department (CFS) of the middle valley of the Velino (Post, Bournemouth), the Archives of the Provincial Command of the CFS of Rieti, and a fenced area of about 600 hectares called Santogna near the town of L'Aquila in which the CFS has maintained a herd of fallow deer. Interviews were conducted with some operators employed at Santogna in the 1980s and 1990s.

Results

A total of 36 sessions of fixed point census were performed (18 at sunrise, and 18 at sunset). Transects were searched 13 times for a total of 546 km. Six snow tracking sessions were carried out for a total of 42 km. The analysis of data collected showed that the population of fallow deer numbers 70–90 deer, and the area used is about 3,500 hectares in the municipalities of Borbona and Posta. The nucleus of deer, the only one present in the province of Rieti in the wild, is derived from the herd reared by CFS in the area named Santogna (Leonessa municipality, province of Rieti). The oldest data refer to 1964, when the CFS of Rieti acquired from the Presidential Estate of Castelporziano (Rome) 6 deer (2 ♂ and 4 ♀) to be placed in the enclosure of Santogna. In 1970, 20 fallow deer were introduced (6 ♂ and 14 ♀) to an area of about 70 ha of the estate of Santogna fenced with metal mesh 3 m high. The documents show that the breeding of deer was uncontrolled and, because of inbreeding, the population condition weakened, especially the female component. The farm was managed until December 1992 at which time approximately 150 deer were present, about 100 of which were males. It was not possible to find documents that describe the development of breeding after 1992. In 1998, during inspections conducted in the drafting of legislation of the Province of Rieti Wildlife, approved by the Lazio Region in 2001 (Del Zoppo, pers. comm.), the fenced enclosure still housed animals. Between 2001 and 2002 the population was reduced to about 120 animals due to escapes. For at least a couple of years, deer, including escapees, continued to frequent the compound, in which they continued to be fed. The animals gradually began their dispersal giving rise to the wild population censused in this study (Durante, pers. comm.).

Discussion

The area currently occupied by fallow deer also has a population of roe deer. This area also lies along the lines of expansion of two different populations of red deer, one coming from the reserve of the Velino-Sirente through the Regional Natural Reserve of the Duchessa and the Mountains National Park Gran Sasso Monti della Laga. Knowing the competition and the dominance of fallow deer over red deer and roe deer, which are native species of great conservation concern, a rapid decision needs to be made on the most appropriate management arrangements to control fallow deer. The aim must be to prevent the fallow deer adversely affecting the natural expansion and consolidation of the roe deer. The fallow deer population should also be monitored over the next few years to assess its effects on the roe and red deer populations.

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