

## Short Communication

# Observations of breeding and wintering European quail *Coturnix coturnix* in northern Greece

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Paper received March 2010, revision requested January 2011, accepted February 2011.

The European quail *Coturnix coturnix* is a migrant galliform whose movements are highly dependent on weather, especially rainfall (Puigcerver et al., 1999). The main breeding areas are in northern Europe, with wintering occurring in Mediterranean regions and Africa. Greece constitutes an important migratory route and stopover site for quail with a small number of birds breeding (Handrinos & Akriotis, 1997). During autumn (August - November) high levels of hunting throughout the country are undertaken on migrating quail.

We report here some short descriptive observations of European quail surveys in intensive and non-intensive agricultural areas in Soufli Region, north-eastern Greece, during the period 2000-2004.

The topography of the area is rugged, and the climate is characterized as sub-Mediterranean. The mean annual precipitation is about 664 mm and is concentrated during winter, while summer is dry and lasts from mid-June to the end of September, and northerly winds predominate during the year.

Surveys took place during spring migration using point count sampling and in autumn through monitoring hunting activities. In spring and summer, quails were detected using the calls of males, and field characteristics and weather conditions were recorded (n = 108). Point counts were undertaken in 15 sample points during early May until the end of August. Each point was visited once per year during the study period 2000 - 2004, giving a total of 75 visits. During autumn migration, birds were located by being flushed by dogs (n = 141).

Additionally, gizzards were removed to analyse their contents to assess diet (Tsachalidis et al., 2007) and body mass measurements were taken. In total 20 birds were killed during January and February (five birds per year). Mean body weight was 97.2 g for males (n = 7) and 102.9 g for females (n = 13). In general, quail arrive in Greece around mid-April and immediately start calling to attract mates. Most used wheat fields and fallow land (TABLE 1).

TABLE 1 Percentage of European quail calling in different habitats during spring and summer (A) and habitats that were harvested during autumn migration (B) in northern Greece.

Habitat type	A	B
Wheat	31.5	49.6
Fallow land	25.9	14.9
Sunflower	8.3	12.1
Sugar beet	-	9.9
Horticultural	-	7.1
Beans	-	5.0
Maize	14.8	-
Cotton	12.0	-
Clover	7.4	1.4

Males called for the entire summer, until the end of September, mostly during the early dawn. The numbers of males calling during summer fluctuated, with a peak in mid July, probably in relation to the movements of quail, especially in dry years. Similar observations were recorded by Puigcerver et al. (1999). Small young were found three times in mid October, the time where quail hunting is at its peak.

Autumnal migratory flocks from northern countries arrived in Greece in early September, with the peak of movements observed between early September and mid October. During this period birds increase their body mass, to store energy fat reserves in preparation for migration (Tsiompanoudis et al., 2005). The food of choice for laying down fat reserves appears to be sunflower and wheat seeds (Combreau et al., 2001; Tsachalidis et al., 2007) which were widely available across the study area as a result of the agriculture in the area. Autumn migration lasted until the end of November, but small migration flocks were observed around mid December, in a dry year. Migrating birds used both intensively and non-intensively cultivated areas. They were also found in pastures and meadows in relatively high numbers, as well as in cotton and sugar beet fields despite the occurrence of high levels of agricultural activities (TABLE 1). Cereals were the most important habitat for quails, determining to a large extent the species' movements, as recorded elsewhere (Panek, 1998; Rodrigues-Teijeiro et al., 2009).

Some birds over-wintered in Greece, being found mainly in tilled wheat fields and fallow land with diverse flora cover. Five birds hunted each year in January and February were found to have a body condition index and body mass that was significantly lower than birds killed during the migration period ( $t$  test,  $P < 0.05$ ). Although the study area maintains some old traditional farming practices, it appears that food availability is depleted in winter and this may affect quails inhabiting the area. In addition the possibility of hybridization (Puigcerver et al., 2007) may be present in Greece, since hunting clubs release thousands of Japanese quail *Coturnix coturnix japonica* for hunting purposes (Tsiompanoudis pers. obs.), ignoring the potential problems and consequences that may result.

European quail behaviour at our study site are summarised in TABLE 2.

TABLE 2 Brief descriptions of European quail seasonal activities.

Behavioural type	J	F	M	A	M	J	J	A	S	O	N	D
Spring arrival				■	■	■	■	■	■	■	■	■
Males calling				■	■	■	■	■	■	■	■	■
Young				■	■	■	■	■	■	■	■	■
Autumn migration											■	■

Further research is necessary for European quail in Greece to assess the impact of hunting and habitat fragmentation on the species.

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## Biographical sketches

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