

## Census of the Sicilian rock partridge *Alectoris graeca whitakeri* population in ZPS ITA010029 Monte Cofano, Capo San Vito and Monte Sparagio

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**Abstract** – During the project “LIFE09 NAT/IT/000099–SICALCONS–Urgent actions for the conservation of *Alectoris graeca whitakeri*”, this species was censused in the ZPS ITA010029 Monte Cofano, Capo San Vito and Monte Sparagio (Trapani province, Sicily) with playback technique between March and April 2011. Superimposing a UTM grid of 1 km mesh on the study area produced cells of 100 hectares. Using a GPS satellite receiver we reached, where possible, the centre of each cell from where the conspecific call was broadcasted. A total of 163 listening stations were implemented. Using software GIS ARCMAP 10.0 (ESRI) presence data were interpolated with vegetational and phytosociological maps (CORINE) to establish rock partridge’s suitable area. The range of the rock partridge in the ZPS was calculated to be 9,893 hectares, corresponding to approximately 65% of the ZPS. A total of 29 individuals were counted, corresponding to 5 pairs and 19 calling males. The Sicilian rock partridge population in the ZPS was estimated to be 66 pairs. Density values in the ZPS were lower than those reported for other areas. In the ZPS highest density was observed in Zingaro Reserve, where poaching seems to be less frequent compared to other areas of ZPS and where burning has not been recorded for years.

**Key-words:** *Alectoris graeca whitakeri*, Sicilian rock partridge, census, Sicily.

### INTRODUCTION

The Sicilian rock partridge, *Alectoris graeca whitakeri*, is an endemic subspecies in Sicily, with a population that has undergone a marked contraction and fragmentation in recent decades (Lo Valvo *et al.* 1998, AA.VV. 2008), due especially to habitat modification (fire, abandonment of grazing), agricultural mechanisation, excessive hunting, introduction of congeneric and conspecifics (Palumbo & Lo Valvo 2002) as well as probable high densities of the recently reintroduced wild boar, *Sus scrofa*. For these reasons, a hunting ban has been in place for some years.

In the framework of conservation actions for the project “LIFE09 NAT/IT/000099–SICALCONS–Urgent actions for the conservation of the *Alectoris graeca whitakeri*”, a census was carried out of the Sicilian rock partridge population present in the ZPS ITA010029 Monte Cofano, Capo San Vito and Monte Sparagio, in the province of Trapani.

### MATERIAL AND METHODS

The area in question, which is 15,524 hectares, is composed of a predominantly limestone coastal ridge. From the vegetation point of view, the ZPS presents residual holm oak, *Quercus ilex*, and downy oak woods, *Quercus s.l.*, in higher parts, while the lower parts are made up of large, open, rocky areas characterised by shrub species (*Euphorbia dendroides*, *Chamaerops humilis*, *Genista* spp.) and herbaceous species (*Ampelodesmos mauritanicus*) mixed with some reforestation of conifers and eucalyptus. The presence of vineyards, olive groves and cereal crops is negligible. There is no hunting in a large part of this area due to the presence of nature reserves and state forests.

Superimposing a UTM grid of 1 km mesh on the area in question produced cells of 100 hectares each, within which a listening station with playback was placed. During the pre-breeding period males of this species were particularly territorial (Bernard-Laurent & Laurent 1984), increasing the frequency and probability of a response to call

stimulus. Using a GPS satellite receiver (Garmin GPSmap 60CSx) we reached, where possible, the centre of each cell from where the conspecific call was produced, with the use of a digital mp3 player and amplifier. Each call was emitted for one minute followed by one minute of listening. This was repeated 4 times, pointing the amplifier to each of the 4 cardinal points.

For each response, we recorded the number of calling males and, using an optical telemeter (Mod. Swarovski Laser Guide 8x30) and digital compass (Garmin GPSmap 60CSx), the distance and direction of each calling male with respect to the listening station. The type of habitat the response originated from was also noted, as well as observations of non-calling individuals that were presumably attracted by the calls.

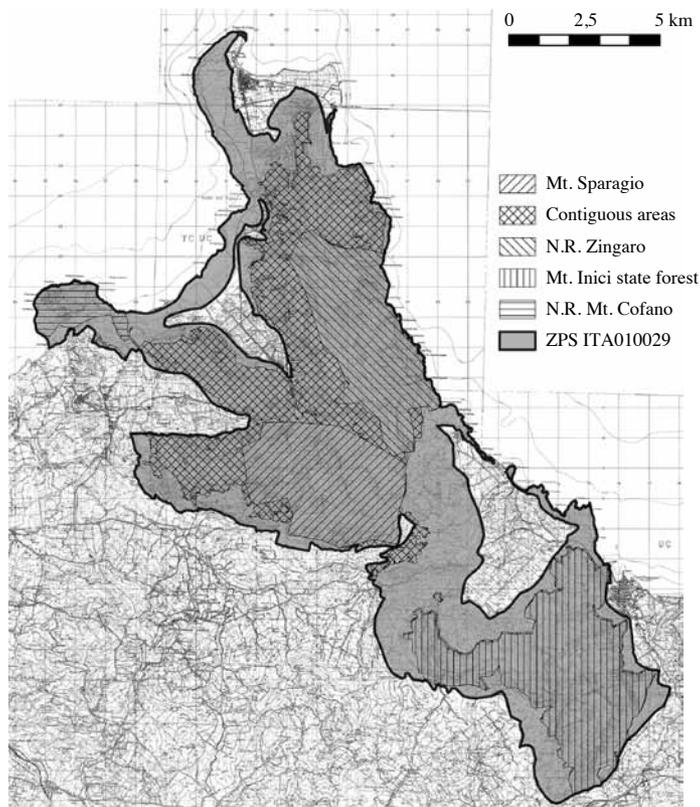
Counts were carried out between March and April 2011 in the first 4 hours of daylight and the 3 hours before dusk, avoiding the physiological reduction in the frequency of calls during the warmest hours of the day (Bernard-Laurent & Laurent 1984, Bocca 1990). Days of rain and strong winds were avoided, when there was a risk of compromising the counts, while counting was continued dur-

ing fog as males do not reduce their call frequency in these weather conditions (Bernard-Laurent & Laurent 1984).

A GPS programme was used to extrapolate from the ZPS the territorial units actually used by the rock partridge. To track the data collected within an area, it was assumed that each listening station had a surface area corresponding to 28.26 hectares, equal to that of a circle with radius of 300 m. The size of this radius was chosen by taking into account bibliographic reports for ornithological census in open habitats (see Bibby *et al.* 2000) and experience gained in the field (A.S. & G.G.).

## RESULTS

A total of 163 listening stations were implemented. The entire ZPS includes also unsuitable areas for rock partridge as urban centres, residential areas, streets, forests etc. Using software GIS ARCMAP 10.0 (ESRI) presence data were interpolated with vegetational and phytosociological maps (CORINE) to establish rock partridge's suitable area for entire population into ZPS (Fig 1). From this, the range



**Figure 1.** Distribution of Sicilian rock partridge into ZPS ITA010029 Monte Cofano, Capo San Vito and Monte Sparagio.

**Table 1.** Surface area (in hectares), estimated number of pairs and density of the Sicilian rock partridge in the different territorial units of the ZPS "ITA010029.

Area	Range in ZPS	Surface area censused	Surface area occupied	Estimated number of pairs	Pairs/km <sup>2</sup>
Nature reserve Zingaro	1,717.0	482.7	137.8	17	1.01
Nature reserve Monte Cofano	346.5	131.4	15.76	1	0.42
Monte Inici forests	2,539.0	856.5	169.6	18	0.70
Monte Sparagio	1,660.0	481.4	97.07	12	0.71
Contiguous areas	3,630.3	906.2	122.7	17	0.48
<b>Total</b>	<b>9,892.8</b>	<b>2,858.2</b>	<b>542.93</b>	<b>66</b>	<b>0.67</b>

**Table 2.** Density of rock partridge in different geographical areas. In bold, areas with data for Sicilian rock partridge.

Area	Pairs/km <sup>2</sup>	Sourcee
Dolomite Alps	2.29	Cattadori <i>et al.</i> 2003
Swiss Alps	2.9	Zbinden 1984
Maritime Alps	1.8	Bernard Laurent 1984
Italian Apennines	1.0-1.9	Sorace <i>et al.</i> 2011
Italy	1.4-1.7	Spanò <i>et al.</i> 1985
<b>Sicily</b>	3.3	Sarà 1989
<b>Madonie</b> (Palermo)	4.4	Sarà 1989
<b>Rocca Busambra</b> (Palermo)	1.6	Sarà 1989
<b>S. Vito Lo Capo</b> (Trapani)	3.9	Sarà 1989
<b>ZPS "ITA010029"</b>	0.67	Present study

of the rock partridge in the ZPS was calculated to be 9,893 hectares, corresponding to approximately 65% of the Natura 2000 site.

Overall, a response was obtained in 22 cells by at least one individual, and a total of 29 individuals were counted, corresponding to 5 pairs and 19 calling males.

Assuming that each calling male corresponds to one pair (Bernard Laurent & Laurent 1984), extrapolating from the results the Sicilian rock partridge population in the ZPS was estimated to be 66 pairs. Table 1 reports the results obtained subdivided into territorial units. Highest density was observed in Zingaro Reserve and minimum density in Monte Cofano nature reserve.

## DISCUSSION

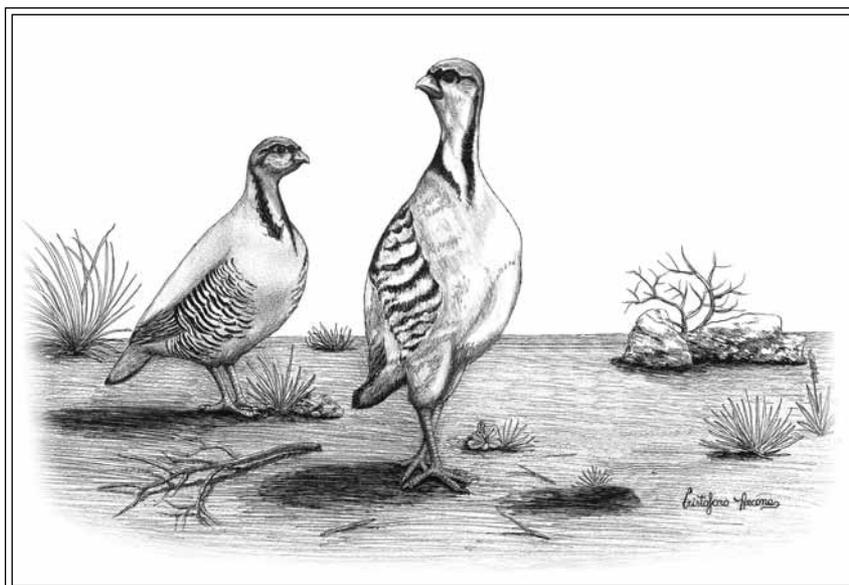
The values of density obtained in the whole of the ZPS "ITA010029" were fairly low compared with those reported by other authors both for Sicily and other geographical areas where the species is present (Tab. 2). As far as previous studies on this species in different Sicilian sites are

under concern (see Sarà 1989), these reduced values might be caused by an effective population decline or by the different methods used.

Results show major density values into Zingaro Reserve, where poaching seems to be less frequent when compared to other areas of ZPS and where burning has not been recorded for years. These density values can change in a very little time in relation to the different risks present on ZPS area. Urgent actions must be taken to preserve this western population's area of Sicilian rock partridge.

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*Alectoris graeca whitakeri* (Cristoforo Ancona)