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Alectoris rufa sightings outside its traditional distribution area in Piedmont

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Abstract – During spring counts of rock partridge *Alectoris graeca* carried out in three Piedmont valleys at an altitude ranging from 1,500 to 2,200 meters a.s.l., some individuals were identified from phenotypical features as red–legged partridge *Alectoris rufa*. In order to understand the possible reasons underling these observations, we analyzed the available sources of information on *A. rufa* presence and restocking operations in Piedmont region. We used the following databases: I) wildlife management plans; II) unofficial verbal reports; III) official species range; IV) animals delivered to regional control points for hunted wildlife. The results of our analysis were the following: I) no official data about release of *A. rufa* are present in our study area; II) no documented overlap between the areal of the two species is reported (except for a narrow area in the Southern part of Maritime French Alps), III) the presence of *A. rufa* individuals is probably due to illegal restocking operations. The impact of *A. rufa* presence on populations of *A. graeca* is discussed.

Key-words: *Alectoris graeca*, *Alectoris rufa*, *Alectoris chukar*, restocking operations, hybridization.

INTRODUCTION

Three species belonging to *Alectoris* genus are reported in Italy: the red–legged partridge *A. rufa*, the rock partridge *A. graeca* and the Barbary partridge *Alectoris barbara*. The red-legged partridge and the rock partridge in some cases can hybridize and produce fertile offspring. The offspring shows phenotype and behavioral characteristics intermediate between parental taxa (Randi & Bernard Laurent 1999, Ceugnet & Aubin 2000).

Even *Alectoris chukar* was used for restocking purpose in game management. This species can also hybridize with *A. rufa* although it entails genetics and sanitary problems and an overall impact on population fitness (Barilani *et al*. 2007).

The aims of this paper is to evaluate

I) the risk of hybridation between *A. graeca* and *A. rufa* due to illegal restocking operations and
II) the consequences of these operations for the conservation of *A. graeca* population.

MATERIAL AND METHODS

Two main study areas (the Biella province and the Cuneo province) and a little area in Liguria on the border with Cuneo Province were analyzed to evaluate the presence of hybridization risk in the Alps among *Alectoris* sp. on the Alps.

The following activities were carried out to evaluate the hybridization risk:

1) analysis of wildlife management plans (Provinces of Cuneo and Biella, Piedmont Wildlife Observatory data) to verify the presence of restocking operations with red-legged partridges;
2) gathering of verbal information (data source: hunters & wildlife managers reports) about illegal introductions of red-legged partridges in the Alps;
3) comparison of red-legged partridge and rock partridge areal using distribution data from GISBAU (Uniroma - www.gisbau.uniroma1.it/index.php) and Piedmont Wildlife Observatory (www.regione.piemonte.it/agri/area_tecnico_scientifica/osserv_fauna/index.htm);
4) analysis on the phenotype of individuals delivered to the Regional control points for hunted animals.

RESULTS

The following results were obtained by our research:

- No official introductions of red-legged partridge were carried out in the Alps, neither in the province of Biella nor in the province of Cuneo.
- No areal overlap between red-legged partridge and rock partridge results from the analysis of spatial distribution of the two species.
- No information about introductions of red-legged partridge or chukar (*Alectoris chukar*) in the study areas is available. The closest red-legged partridge restocking areas are located at least 30/40 km away, in Valdieri and Upper Pesio Valley (Audino *pers. comm.*).

Despite these findings, several *A. rufa* or probable hybrid *A. rufa* x *A. graeca* individuals were observed in the two study area in recent years (Table 1).

DISCUSSION

The main conclusion indicated by these findings is that the presence of *A. rufa* individuals is probably due to illegal restocking operations. It is not possible or it is very difficult that subjects related to red-legged partridge will be found in an alpine environment coming from natural dispersion. In fact we have to consider that, in natural condition, the species can disperse at maximum distance of 5 km but only in presence of suitable habitats (Tizzani *et al.* 2011).

So it is more likely that hunters still use red-legged partridges for cynegetic purposes. This could represent a great risk for the preservation of pure population of rock partridge. A monitoring plan to assess prevalence of hybrids could be of conservation interest.

The following management actions have to be undertaken for the management of rock partridge and for the evaluation of hybridization risk:

1. Banning introductions of red-legged partridge and chukar in the Alps;
2. Careful examination of the phenotype of killed animals, delivered to the Regional Center for the examination of hunted animals;
3. Recording territorial calls during spring censuses for auditory analysis *a posteriori*;
4. Awareness campaign of the hunting associations about the potential risks of introductions.

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Table 1. Sightings of Alectoris sp. specimen out their natural range. Place, date, altitude and type are reported for each observation. n.d. = not determined.

Observ.	Place	Date	Altitude	Observation type
1	Alta Valle Nervia (Imperia)	1985	n.d.	Hybrid *A. rufa* x *A. graeca* (harvested)
2	Netro (Biella)	13 May 2008	1800 m	Mixed pair male *A. rufa* x female *A. graeca* (census operation)
3	Valdieri (Cuneo)	20 June 2009	1800 m	Hybridized male *A. rufa* x *A. graeca* (census operation)
4	Trivero (Biella)	October 2010	n.d.	*A. chuckar* (harvested)
5	Valdieri (Cuneo)	19 June 2011	1800 m	Male *A. rufa* (census operation)
6	Alta valle Pesio (Cuneo)	23 June 2011	2100 m	Mixed pair male *A. rufa* x female *A. graeca* (census operation)