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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REFERENCES


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.

<table>
<thead>
<tr>
<th>Obsv.</th>
<th>Place</th>
<th>Date</th>
<th>Altitude</th>
<th>Observation type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Alta Valle Nervia (Imperia)</td>
<td>1985</td>
<td>n.d.</td>
<td>Hybrid <em>A. rufa x A. graeca</em> (harvested)</td>
</tr>
<tr>
<td>2</td>
<td>Netro (Biella)</td>
<td>13 May 2008</td>
<td>1800 m</td>
<td>Mixed pair male <em>A. rufa x female A. graeca</em> (census operation)</td>
</tr>
<tr>
<td>3</td>
<td>Valdieri (Cuneo)</td>
<td>20 June 2009</td>
<td>1800 m</td>
<td>Hybridized male <em>A. rufa x A. graeca</em> (census operation)</td>
</tr>
<tr>
<td>4</td>
<td>Trivero (Biella)</td>
<td>October 2010</td>
<td>n.d.</td>
<td><em>A. chukar</em> (harvested)</td>
</tr>
<tr>
<td>5</td>
<td>Valdieri (Cuneo)</td>
<td>19 June 2011</td>
<td>1800 m</td>
<td>Male <em>A. rufa</em> (census operation)</td>
</tr>
<tr>
<td>6</td>
<td>Alta valle Pesio (Cuneo)</td>
<td>23 June 2011</td>
<td>2100 m</td>
<td>Mixed pair male <em>A. rufa x female A. graeca</em> (census operation)</td>
</tr>
</tbody>
</table>