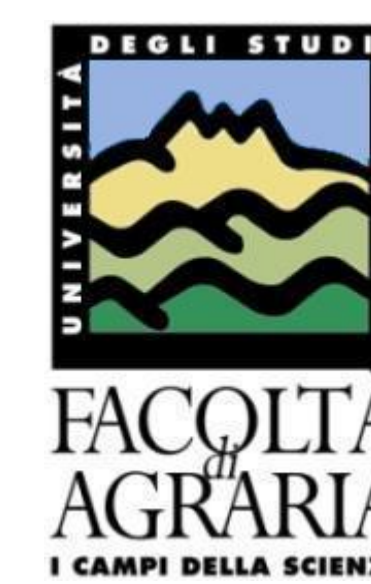




22° MEETING OF THE ALPINE IBEX EUROPEAN SPECIALIST GROUP (GSE-AIESG)

26-28 OTTOBRE 2012 – ZERNEZ (CH) PARC NAZIUNAL SVIZZER

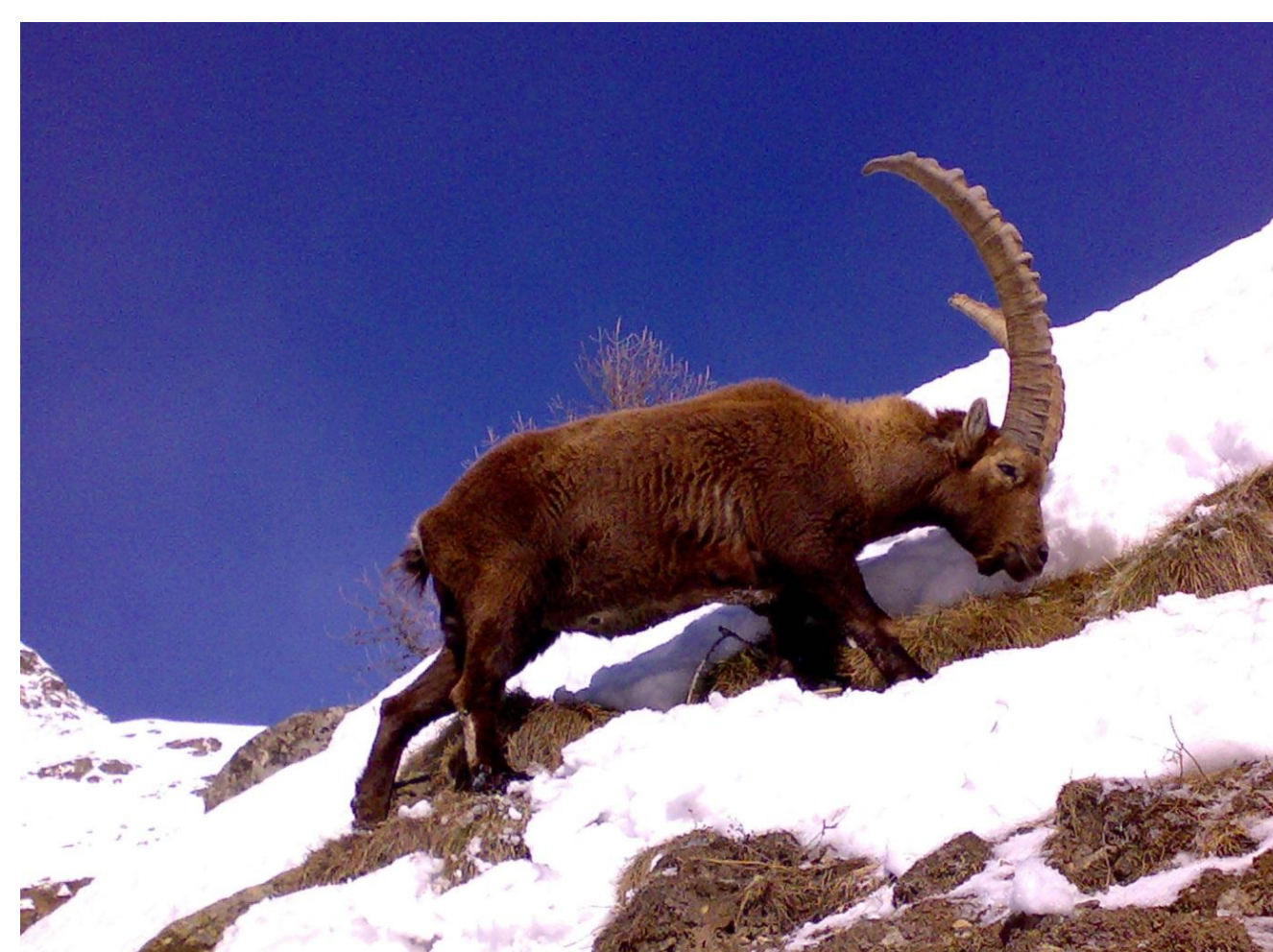


SUSTAINABLE ANTHROPIC ACTIVITY FOR IBEX SAFEGUARD IN ALPINE ENVIRONMENT (GERMANASCA VALLEY, WESTERN ALPS, ITALY).

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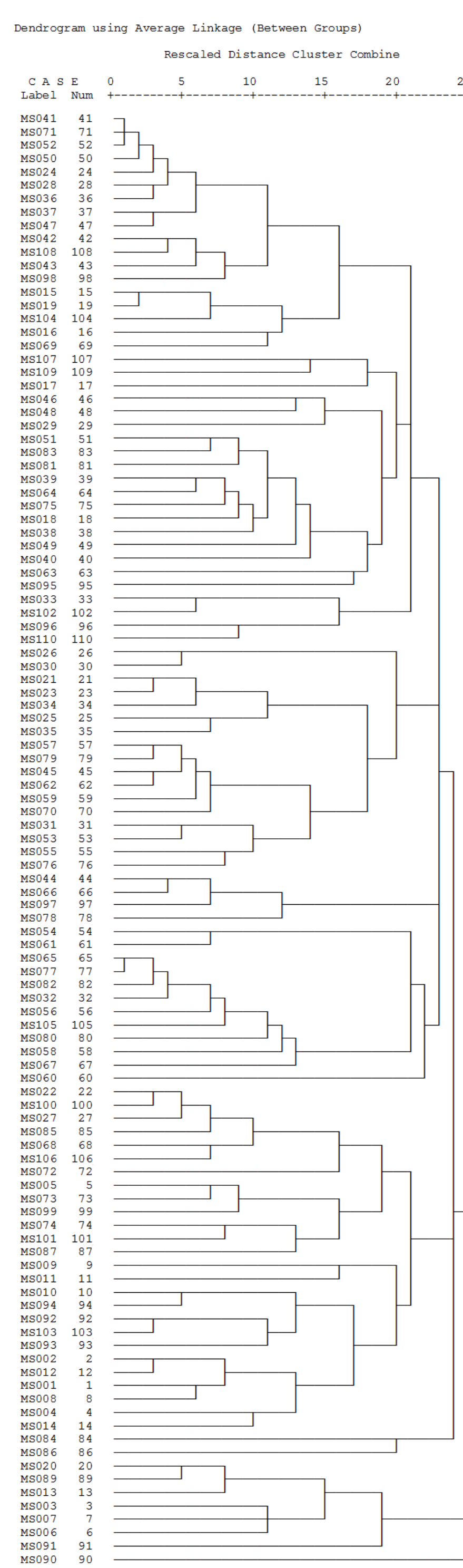
Purpose -The aim of this work is to promote pastoral activities for safeguarding ibex (*Capra ibex*), by improving vegetation quality, through special reference to the interactions with domestic herbivores.



Ibex population - The ibex population in the studied area originates from the expansion of 12 animals, reintroduced in the neighboring Val Troncea Natural Park in 1987/88, and now represents one of the most important groups of the Turin Cozie Alp (262 animals).

Materials and methods - Since 1988 the ibex has begun to use for wintering some parts of the Vallone. Continuous monitoring for 20 years allowed the determination of optimal geomorphology conditions for wintering. Ibex presence ranged from 1300 to 2800 m altitude, from 30 to 45° slope, and from 90 to 202,5° exposition. As relations between ibex presence and vegetation were hypothesized, the botanical composition of wintering areas was surveyed using the Daget & Poissonet (1969) point-quadrat method. Vegetation types were identified by Cluster analysis (Cavallero et al., 2007) and Pastoral Values calculated subsequently according to Daget & Poissonet (1972). The spatial distribution of the vegetation types was analysed by means of a χ^2 test.

*** HIERARCHICAL CLUSTER ANALYSIS ***



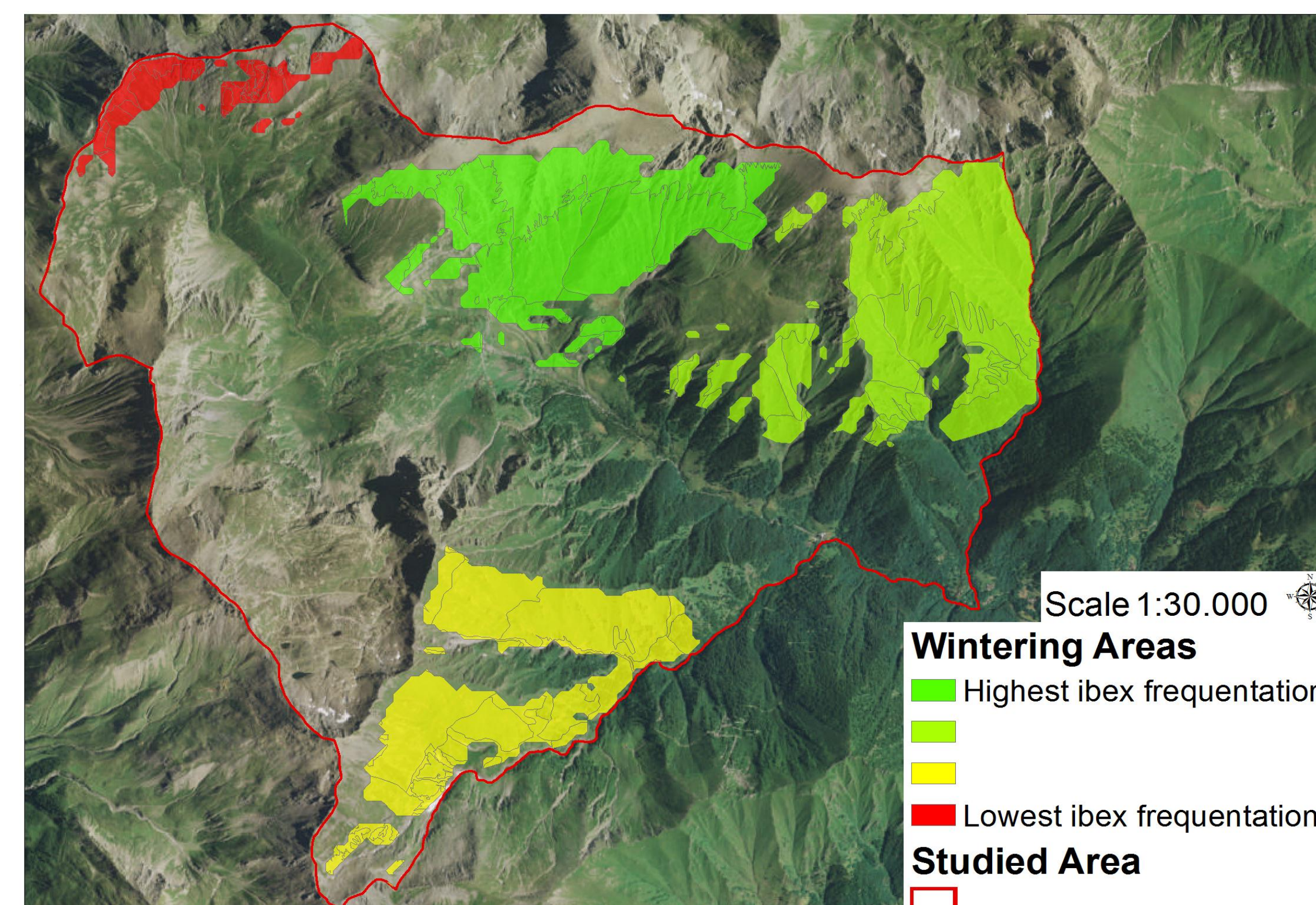
Results - Results confirmed a significant role of vegetation in defining animal predilection for particular areas. The ibex preferred areas used by domestic herbivores in which there is a higher variability of vegetation types. In fact, vegetation types environmentally different are essential to meet wild animal needs in adverse seasons. The thermic conditions types (dominated by *Sesleria varia*, *Onobrychis montana*, *Festuca gr. ovina*, or *Brachypodium rupestre*), which generally spread on the mountainsides with the highest insolation, are used by the ibex in spring, due to the earlier snow thaw. The intermediate conditions types (dominated by *Dactylis glomerata*, *Poa violacea*, *Avenella flexuosa*, *Carex sempervirens*, *Trifolium alpinum*, or *Phleum alpinum*) are used subsequently when animals need more energy to face the winter loss of reserves. The snow-belt conditions types (dominated by *Salix herbacea* or *Carex foetida*), which have the lowest surfaces in the study area, are mainly used in summer during young weaning, being this period vital for their growth.

Discussion - By analysing vegetation data, we could provide pointers for the cattle management in summer to improve vegetation composition and, consequently, to optimise the relationships between domestic and wild animals in respect of the EEC Directive 92/43/CEE. In fact, due to the multiple impacts of livestock on vegetation (i.e. defoliation, dung deposition, trampling), grazing may be considered a valid tool in land management, providing benefits for both herbivore groups. Different interventions in grazing management can be proposed depending on the objectives: a rational grazing, with balanced defoliation and dung deposition, is needed to maintain the vegetation types; a transfer of fertility, with defoliation higher than dung deposition, is suggested to maintain legume plant presence; an extensive sheep grazing helps preserving vegetation types of thermic and intermediate conditions where access is difficult for cattle; daytime rest paddocks for grazing animals are necessary on pastures needing a quick increase in fertility; a manual harvest of nitrophilous plant species helps in restore degraded vegetation; reducing as possible domestic animal movements is however needed to assure continuity of suitable winter areas for wild animals feeding. In the study area, for each intervention a priority scale (from 5, low priority, to 1, high priority) has been suggested. Proper grazing management can effectively contribute to the improvement of the alpine environment, increasing its carrying capacity in favour of the ibex population growth and being a prototype of anthropic activity, fully sustainable in an alpine environment.

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The studied Area - Located in Germanasca Valley (Piedmont), the Vallone Massello with an altitude range from 1000 m to 3000 m A.M.S.L., is characterized by a continental climate and an high amounts of snowfall. The area is included into a Site of Community Interest (SCI Val Troncea - IT1110080), the research was also aimed at understanding the sustainable role of cattle grazing in the management of these sites.



Ecological group	Ecological subgroup	Vegetation type	Facies	Pastoral value	Area (ha)
Thermic	Xerophilous	13 a <i>Sesleria varia</i>	13.03	18	97,5
Intermediate	Eutrophic	57 a <i>Dactylis glomerata</i>	57.09	41	3,5
Snow-belt	Snow-belt	77 a <i>Salix herbacea</i>	77.08	16	6,7

