



Camera-trapping Project MUSTELIDS 2015

Research Project: Distribution and ecology of pine- and stone martens in the Val Grande National Park

The research's main aim is to investigate the distribution of *Martes* spp. in the protected area, by using two non-invasive methods: camera-trapping and faecal DNA genotyping. The latter method will allow to survey the whole study area as to confirm or improve the results obtained by camera-trapping in 2014 about both the distribution and relative abundance of marten species.

27 camera-traps placed in the valleys of the rivers Pogallo and Il Fiume

Our major aims are the following:

1. to draw a detailed picture of *Martes* spp. distribution in the study area;
2. to analyse, in a sub-area representative the habitat diversity of the whole Park, the ecological requirements and overlap of both the spatial and temporal niches of pine- and stone martens;
3. to test a method for the individual identification of both species, based on the morphology of the throat spots, with the aim of estimating their density in the study area.
4. to analyse the diet of both species and assess their trophic niche overlap.

Materials and Methods

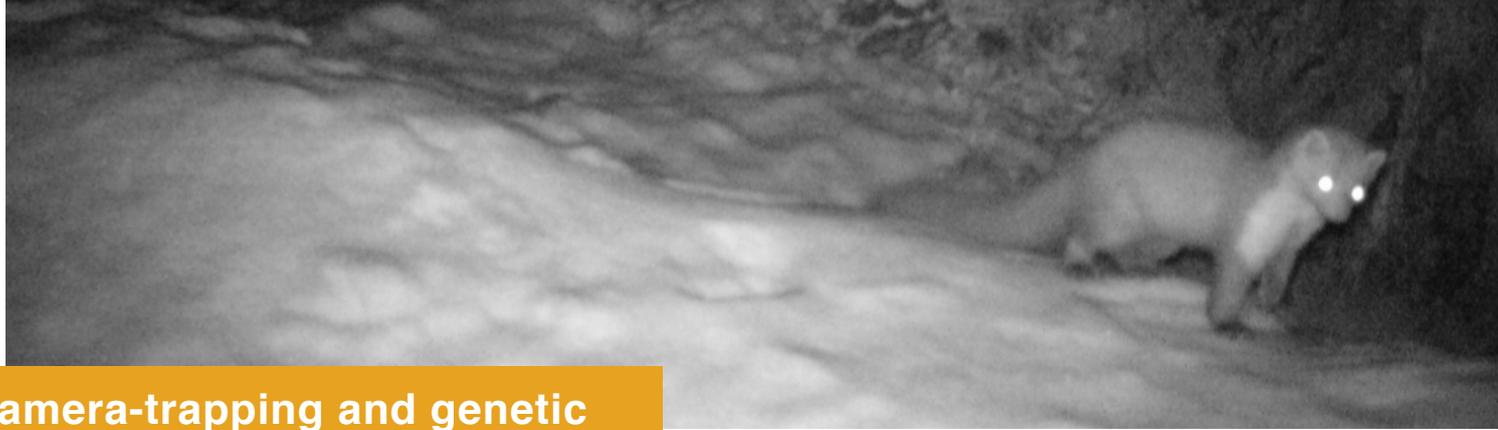
Two sampling non-invasive methods will be applied, camera-trapping, the effectiveness of which had been already tested in 2014, and faecal DNA genotyping.



Camera-trapping

will be carried out in a 39.3 km² wide sub-area (26% of the whole study area), coinciding with the valleys of the rivers Pogallo and Il Fiume. This area hosts both marten species and the major habitats (beech-, chestnut- and birch-woods, Alpine prairies, rocky areas) and height belts of the Park, and, moreover, it is easily accessible thanks to the presence of bivouacs. Following available mountain paths, a total of 27 camera-traps has been placed according to a 1 x 1 km grid, superimposed to the intensive study area.

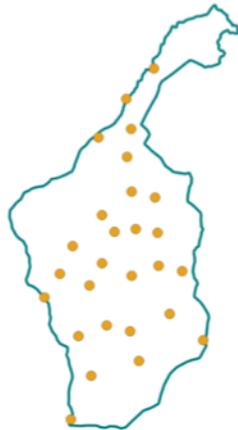




Camera-trapping and genetic census of *Mustelidae*

As already tested in 2014, to obtain pictures and videoclips as clear as to identify marten species based on diagnostic morphological characters, camera-traps will be baited to attract carnivores.

Baits will be placed 2.5 m in front of each camera, suspended to an arch as to force the animals to raise on their back paws and show



Study area and camera-traps

their head and throat spot toward the camera.

The research will be carried out from July to October 2015, when the animals are more active;



Bait

baits will be refreshed once every three weeks, when memory cards and batteries will be also replaced.

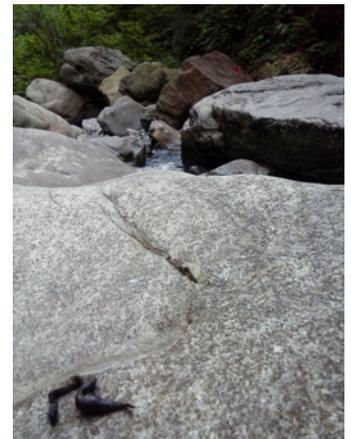
Through the **genotyping** of “fresh” faeces, marten species can be effectively identified, allowing to gather useful information on their distribution, diet, abundance and, possibly, home range size. DNA genotyping is particularly useful for marten species, as their faeces cannot be distinguished on the base of their morphology and can also be confused with those of other meso-carnivores.

Fresh faeces will be looked for along transects of known length, as to cover the major habitats of the Park in proportion to their overall area. Some habitat variables (e.g. vegetation cover, height a.s.l., etc.) will be recorded at each scat-site.

In the intensive sub-area, transects will be surveyed once a month, to assess both species habitat preferences and support camera-trapping data. In the rest of the study area, transects will be surveyed with the main aim of enhancing the distribution picture drawn by camera-trapping in 2014. All fresh scats will be georeferenced by a GPS and preserved in 99% ethanol until processing.

Collecting fresh faeces for DNA genotyping and diet analyses

The DNA extracted by each sample will be sent to the laboratories of the Department of Zoology and Animal Cell Biology, University of the Basque Country, Spain, where a PCR-RFLP method will be applied for species identification. A portion of each faecal sample will be analysed through standard procedures to identify



Faeces of mustelid

undigested remains and assess the relative importance of each food item in the diets in terms of both frequency of occurrence and volume. Diet analyses aim to assess the trophic niche of each marten species and their degree of overlap.

Expected results

The ecology of the two marten species will be investigated by analyzing their distribution in relation to environmental data in a GIS. Expected results include:

1. distribution of pine- and stone martens in the study area (including areas over the tree limit which had not been surveyed in 2014):

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2. habitat use by both species;
3. ecological and spatial niche segregation in relation to interspecific competition.

Diet analyses will allow to assess:

1. habitat-related variation in the diets of both species;
2. habitat-related variation in food niche overlap;
3. the role played by competition for food resources in shaping the distribution of marten species at small and medium-scale.

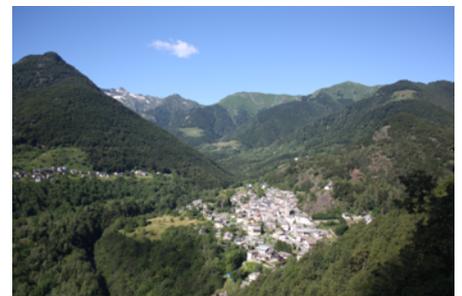
The study will provide sound data about marten ecology on the Alps, where, to our knowledge, *Martes* species have been the object of little research. The development of an effective method for individual identification from camera-trap data is currently among the aims of other groups with which are going to collaborate. The study is funded by the Val Grande National Park, which has entrusted the “Valgrande Società Cooperativa” with field work and the Department of Biosciences of the University of Milan with data analyses.



Cicogna and surroundings



Pogallo Valley



Finero e Il Fiume Valley

Val Grande National Park

The Val Grande National Park (Verbano-Cusio-Ossola province, Piedmont, NW Italy) is a protected, 14598 ha wide area which has been instituted since 1992 to preserve the widest forested area of the Alps. Notwithstanding the territory is included in a

triangle formed by the Alpine valleys Ossola, Vigizzo and Cannobina, it acts as a natural corridor connecting the pre-Alpine and Alpine belts and maintains landscape connectivity and biological connections for wild fauna and flora.