



FORM PER PROGETTI BANDO DOTTORATO

1. Project title

Impact of climate change on social dynamics and demography of alpine marmots (*Marmota marmota*) in the Gran Paradiso National Park: development of monitoring and conservation guidelines

2. Proposer

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4. Key words

Sociality, Demography, Population Dynamics, Kinship dynamics, Climate change

5. Abstract

The complexity of the social interactions within and between groups in highly social species with overlapping generations have likely bottom-up effects on the demography and population dynamics of these species which until now have been rarely investigated. The Alpine marmot (*Marmota marmota*) is a key species in the trophic network of high mountain pasture environments, and the impacts of climate change on its population dynamics can have significant repercussions on the entire Alpine ecosystem. This PhD project will exploit the long-term data on life history and social behavior collected since 2006 on individually tagged alpine marmots in the Gran Paradiso National Park focusing particularly on the effects of climate change on social dynamics and demography. The project will focus on three main research actions: 1) investigating the effects of climate change and group social structure on survival; 2) using state-of-the-art Bayesian Integrated Population Models to model the population dynamics of Alpine marmots taking into account the varying social structure of family groups and the changing climate; 3) Investigate the kinship dynamics, i.e. the variation over time of the genetic relatedness within and between family groups and its relationship with Social structure, demographic rates and climatic variability. The project will lead to the development of guidelines useful to the Park Authority and other Public Administrations responsible for managing protected Alpine areas, for long-term monitoring of indicator species as a tool to measure the impacts of climate change on the Alpine ecosystem.