Title: Are Nature-based Solutions for adaptation to climate change located strategically in the Alps?

Presenting author: Titouan Dubo[1a]

Other authors: Ignacio Palomo[b], Lucía Laorden Camacho[c], Bruno Locatelli[d], Sandra Lavorel[e]

Primary affiliations: [1]Laboratoire d'Écologie Alpine, LECA, UMR 5553 UGA-USMB-CNRS, CS 40700, 38058 Grenoble Cedex 9, France.

Email addresses: [a]: titouan.dubo@univ-grenoble-alpes.fr
[b]: Ignacio.palomo@univ-grenoble-alpes.fr
[c]: lucialaordencamacho@gmail.com
[d]: bruno.locatelli@cirad.fr
[e]: sandra.lavorel@univ-grenoble-alpes.fr

Abstract: Mountain ecosystems are already threatened by climate change that is predicted to impact them more intensively than lowlands, and consequently reduce the ecosystem services they provide to the 14 million inhabitants living within the Alpine Convention space. Initiatives addressing climate change, biodiversity loss and human well-being will be required for adapting the alpine region to climate change. While the number of Nature-based Solutions (NbS) for adaptation implemented in the Alps is rapidly increasing, their effectiveness and their potential for initiating adaptation pathways are unknown. The PORTAL project (Pathways of Transformation in the Alps) is identifying and characterising a portfolio of actual NbS for adaptation to climate change in the Alps. Here we assess the relevance of these NbS by analysing their location in relation to current supply and demand for Nature´s Contributions to People (NCPs) and to vulnerability to climatic risks. We created a spatial database of NbS and georeferenced those that were place-based. We compared NbS locations with maps of NCPs at municipality scale produced by the AlpES project, and with past, current and future climatic risks. Results show that NbS locations are not related to the supply or demand for NCP nor with climatic risks. These results indicate that the analysis of climatic vulnerability is not the main factor that determines the choice of NbS location. While they may serve other nature conservation or community purposes, we thus question their effectiveness in supporting adaptation of the alpine region to climate change. Further analyses of the effectiveness of NbS to tackle climatic risks are needed. For this we finally discuss the importance of interdisciplinary science to understand NbS implementation processes and why research on NbS should consider the changing interactions between human and nature.

Keywords: Nature-based Solutions, Climate Change Adaptation, NCP, Alps.