

**Mid and long-term ecological impacts of ski run construction on alpine ecosystems**

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**Figure-1S** species richness (a) Shannon index (b) and evenness (c) of native species (pioneers + late successional) and changes on ski runs correlated to years after seeding

**Figure-2S** pioneer species (a) and late-successional species (b) cover changes on ski runs correlated to years after seeding.

**Table 1S** Site characteristics of ski run and control plots: coordinates (WGS 84), elevation (m a.s.l.), aspect and steepness ( $^{\circ}$ ), year of construction and hydro-seeding, year of sampling. Vegetation characteristics of ski run and control plots: top cover of vascular plants (%), sum cover (%) of seeded species, sum cover (%) of pioneer species, sum cover (%) of late-successional species, top cover of bare ground (%), species richness, Shannon Index, visible erosion, Root biomass ( $\text{g}/\text{cm}^2$ ), Root to shoot ratio, Rooting depth (cm), Total length of roots (cm), Root length density ( $\text{cm}/\text{cm}^3$ ).

**Table 2S** List of plant taxa surveyed in the ski run plots in 2000 and 2017 and in the control plots. Taxa are grouped in three categories: introduced seeded, native pioneer and native late-successional species. Frequency (%) is the ratio between the number of plots a species is present and the total number of plots of each survey ( $n=16$ ). Mean abundance is the mean cover (%) of a species among plots of the same survey. Taxa occurring with cover lower than 0,1 are denoted by +. Taxa are listed in decreasing order of frequency.

**Table 3S** Main physical and chemical topsoil properties of the four machine-graded ski runs and their corresponding control sites. Analyzed samples from the 2017 survey. Agg.loss is the maximum estimated aggregate loss according to equation (2), i.e.  $(a+b)$