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Natural regeneration versus tree planting in the subalpine spruce forest *Plagiothecio-Piceetum tatricum* of the Gorce National Park (southern Poland)

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Abstract: The paper presents the results of investigations on the regeneration of subalpine spruce forests *Plagiothecio-Piceetum tatricum* in the Gorce National Park. Field studies were conducted in the southern slopes of Kudłoń, in a patch of subalpine spruce forest where the forest stand was destroyed after the outbreak of sawfly *Cephalcia falleni* Dalm., followed by the outbreaks of bark beetle *Ips typographus* L. and windstorms. The results of the natural regeneration were compared with the results of artificial tree planting. After the establishment of the Gorce National Park in 1981 the study area was subjected to strict protection. In the year 1982, due to the outbreak of *Cephalcia falleni*, the legal status of the area was changed, and till the year 2000, the study area was managed. The management practices including cutting and removing dead trees, planting and tending tree seedlings. From 1981 till 1999 in the study area, about 16,385 cubic meters of wood was removed, and 632,376 seedlings were planted. Among the planted seedlings the most abundant species was silver fir *Abies alba* Mill., which amounted to 45% of all seedlings. In the year 1996 a detailed census of seedlings and saplings was conducted. The density of young trees according to that census amounted to 6,342 individuals per hectare; most of it (73%) was of natural origin. Among the saplings (individuals taller than 0.5 m, with DBH less than 7 cm) of natural origin the most numerous species (47%) was rowan *Sorbus aucuparia* L. ssp. *aucuparia,* while among the seedlings (individuals shorter than 0.5 m, excluding germinants) of natural origin Norway spruce *Picea abies* (L.) Karst. was the dominant species (94%). The investigations indicated that the human intervention in the analysed ecosystem was not necessary. Its costs were considerable, and among the negative ecological consequences were: altering the species composition and structure of natural regeneration, soil scarification due to log transportation, almost total removal of coarse woody debris from the ecosystem, injuries to the remaining live trees, and disturbance in the habitats of the capercaillie.

Key words: subalpine spruce forest, regeneration of trees, strict protection, Gorce National Park, Carpathians, southern Poland.