

Successful conservation of Silver Fir in managed forests of Bavaria

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In Bavaria Silver Fir (*Abies alba* Mill.) is an important tree species which mainly occurs in mixed mountain forests. Naturally Silver Firs would dominate or participate in 30 % of the Bavarian forests. However, Silver Firs currently cover about 2 % of the forest area only. The great gap between actual and natural participation of Silver Fir in managed forests mainly depends on three well-known reasons:

- 1) Forest decline caused by sulfurous air pollution reduced the health of Firs dramatically and many of them died back. However, since air pollutions decreased from the middle of the 1990's up to now the vitality of Silver firs increased significantly.
- 2) With the beginning of the so called "controlled forestry" at the end of the 19th century the number of Silver Firs in South-Germany decreased significantly. Silver Firs extremely suffered from unadjusted silvicultural treatments especially even-aged regeneration types (e.g. clear-cutting). In addition, it is well-known that schematic and/or intensive thinning concepts are not in accordance with the ecological needs of Silver Firs.
- 3) During the stage of regeneration seedlings and young plants of Silver Firs are dramatically impacted by damage caused by game animals. Because of the high quality of Silver Fir buds for the nutrition of red deers and roe deers Silver Firs are preferred nutrition-plants during winter and even summer. Repeated damages reduce the power of competition of Silver Firs compared to other tree species (mainly Spruce) dramatically. In stands with low Silver Fir density or in regions with high deer density a sneaking process of segregation and even complete loss of Silver Fir can be observed.

In general we can conclude that the success of conservation of Silver Fir depends on adjusted forest management treatments concerning the different ecological needs of Silver Firs at various life stages. Therefore unevenaged forest management systems in type of long-term irregular shelterwood systems (Femelschlag) or single-tree selection systems (Plenterwald) are strongly required. However it must be taken into account that the successful regeneration of Silver Fir depends significantly on an adjusted deer density. Successful conservation and regeneration of Silver Firs: a balancing act between forest management and hunting!