

## Conservation status, reproduction biology and restoration need of the European emblematic orchid - *Cypripedium calceolus* L.

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Conservation status of a species indicates how likely the species will go extinct in the future. Many factors are considered to determine the status: population size with its overall increase or decrease over time, reproduction success, and known threats. Various systems of assessment of conservation status are used at international, multi-country, national and local levels. The most well-known is certainly IUCN red listing.

*Cypripedium calceolus* L. – lady's-slipper orchid, is largely recognized in Europe as an emblem for nature conservation. The species distribution is scattered widely in Eurasia but throughout most of the range it is highly fragmented. In the IUCN red list the species is in the category LC-least concern as “neither the geographic range of the species nor the size of the populations fall within the thresholds for any of the threatened categories and the existing threats for the species and habitats are unlikely to cause the populations to decline quickly in the near future”. The regional European assessment categorizes the species as NT (near threat) and EU conservation status in all biogeographical regions is unfavourable-inadequate. The species is listed as threatened in most national red lists of Europe and has become extinct in some. *C. calceolus* is threatened by habitat destruction that includes agriculture intensification, inappropriate forest management such as clear cutting, also replacement of natural forests with spruce plantations where decalcification processes spoil the soil for the orchid, and collection. Also, overgrazing affects the species, while the abandonment of traditional grazing activities leads to natural succession where the over-growing bush layer outcompetes the orchid.

How much should we really bother about the fate of this species and what can we do? There are certain traits that may be crucial for the long-run persistence of populations:

- small population size - low number of genets (even a population of 1000 shoots may have only 100 genets or clones);
- clones are long-lived only in favourable conditions and are not eternal;
- deceiving pollination system enables only low fruit set – usually less than 25 per cent of flowers set fruit;
- fruits contain many seeds but about half of them are non-viable without embryos, even in Estonian populations with high genetic diversity;
- seeds germinate only with the help of *Tulasnella* fungi and seedlings are rare and the mortality of them high as in many species;
- the populations are not well connected due to lack of suitable habitats.

During the last decades the species has been successfully propagated asymbiotically and the seedlings planted to natural populations leading to successful restoration. These techniques together with assurance of high genetic diversity of progeny should be more actively employed and many parks and woods on calcareous soils could inhabit lady's-slippers to enlarge the number and size of populations on larger areas giving better connectivity and possibilities for crossing.