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# SIBERIAN LARCH (*LARIX SIBIRICA* LEDEB.) FORESTS IN A CHANGING ENVIRONMENT – A REVIEW

# DER EINFLUSS VERÄNDERTER UMWELTBEDINGUNGEN AUF DEN ZUSTAND VON WÄLDERN AUS SIBIRISCHER LÄRCHE (*LARIX SIBIRICA* LEDEB.) – EIN ÜBERBLICK

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## SUMMARY

Siberian larch (*Larix sibirica*) is a stand-building tree species in the eastern Siberian taiga and central Asian forest-steppe. However, climate warming, extensive forest fires, and human impact have considerably reduced the area occupied by Siberian larch forests in central Asia over the past decades. The Mongolian forest-steppe may serve as an example of a zonal ecotone, where Siberian larch forests are at the dry edge of their distribution area, and are particularly suffering from climate change, logging and pastoral pressure. Thereby, some Siberian larch forests respond more sensitively than others. In order to understand the reasons for these differences, we reviewed existing literature for the current state of knowledge on the influence of various geoecological factors on *Larix sibirica*. Based on this review, we point to existing knowledge gaps, the probable development of Siberian larch forests under climate change and human impact, as well as possible measures.

Our review focuses on the species-specific geoecological requirements of Siberian larch and on the influence of insolation, water supply, soil conditions, fire and biotic factors. This knowledge is essential for understanding the differentiated response of Siberian larch forests to environmental changes. Enhanced drought stress is a well-documented threat for Siberian larch in southern Siberia and the central Asian forest-steppe. Climate warming involves intensification of droughts and will thus reduce the vitality and extent of Siberian larch forests. Most likely, steppe vegetation will replace many larch-forest stands in the forest-steppe, if the ongoing environmental changes, especially the thawing of permafrost, will continue. In addition, logging and pasture have reduced tree regrowth after forest disturbance, and have enhanced the sensitiveness of larch forests to environmental changes. As a result, the larch-forest area in central Asia has already decreased.

The outcomes of this review stress the importance of sustainable forest management in the forest-steppe, especially in areas where forests are at risk because of climate change. Without