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The effect of river restorations on the plant diversity in riparian forests

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Invasive alien species (IAS) are one of the main threats to biodiversity. The intentional and unintentional establishment and distribution of alien species through human actions seriously affects native species composition, and in many cases, has led to the extinction of native species. Besides this negative impact on biodiversity, IAS also have a negative effect on human health and economy. In recent years, the risks associated with IAS have come to the attention of legislative authorities worldwide. Further legislative instruments were adopted to prevent the introduction of IAS, e.g. Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, laying the legislative foundation for the EU-wide Natura 2000 ecological network of protected areas. Although riparian forests, including floodplain forests, are often mentioned as the habitat most threatened by biological plant invasions, little is reported on the competition between native and (IAS). In this study, we tested whether the increase of IAS in the plant cover is directly related to the decrease of total number of species and the decrease of native species diversity. The study area is part of the Natura 2000 FFH site "Tullnerfelder Donau-Auen". The outfall of the river Traisen was relocated during the construction of the Altenwörth power plant. To conserve and restore the riparian ecosystem and improve the hydro-ecological conditions of the outfall area of the Traisen, a Life+ ecological restoration project was launched. With this study the effects of the restoration processes on the spread of invasive alien plant species and on plant diversity was analyzed in order to create prospects for ecological river restoration practice. IAS plant cover in the herb layer decreased with increasing restoration activity. The results showed that the species Impatiens parviflora and Solidago gigantea were the most invasive species in the herb layer. The importance of the herb layer for species richness and vulnerability to biological invasions is underestimated. Biological invasions need to be taken under consideration in the early planning stage of river restorations. The herb layer of riparian forest can be used as an indicator for ecological processes such as invasions and diversity loss.